



VT Trader 2.0 Help Manual

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Printed: May 2011

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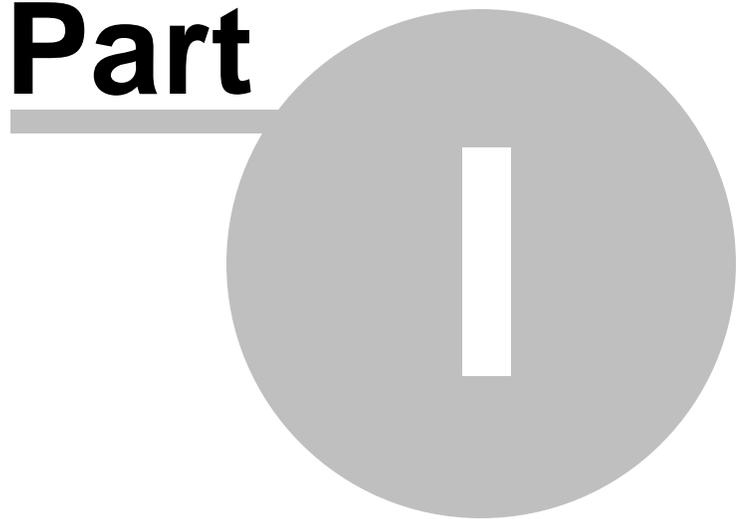
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Getting Started with VT Trader 2.0

Part



1 Getting Started with VT Trader 2.0

Thank you for your interest in VT Trader, a world-class electronic FOREX trading platform brought to you Capital Market Services, LLC and Visual Trading Systems, LLC. Please take a few moments to thoroughly read through this entire help manual to better familiarize yourself with the VT Trader software.

This manual (*released in May 2011*) is a guide for the use of VT Trader 2.0's interface, features, and functionality. It is up-to-date with the most current VT Trader 2.0 release version. It is best viewed with a screen resolution of 1280 pixels or wider.

1.1 PC System Requirements

For VT Trader 2.0 to function properly the following guidelines should be followed:

Minimum System Requirements:

- Microsoft Windows XP (*or Windows Vista or Windows 7*) operating system
- Intel® Core™ 2 Duo e4300 1.80 GHz processor (*or equivalent processor*)
- 1.0 gigabyte of RAM
- 200 megabytes of free hard disk space
- Internet Explorer 5.0 (*or higher*)
- Monitor that supports 1024x768 with a color depth of 32 bits (*16,777,216 colors*) or higher resolution
- A high-speed (*broadband*) Internet connection such as DSL or a cable modem is vital for online currency trading

Recommended System Requirements:

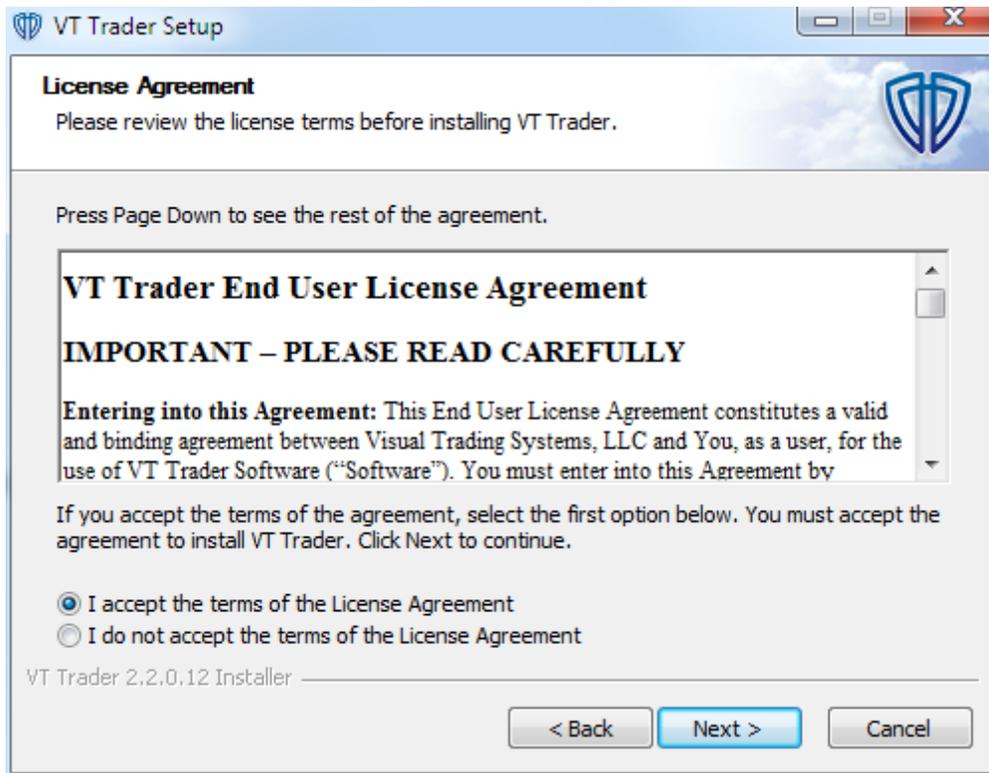
- Microsoft Windows XP (*or Windows Vista or Windows 7*) operating system
- Intel® Core™ 2 Duo e6600 2.4 GHz (*or faster*) processor (*or equivalent processor*)
- 2.0+ gigabytes of RAM
- 200+ megabytes of free hard disk space
- Internet Explorer 6.0 (*or higher*)
- Monitor that supports 1024x768 with a color depth of 32 bits (*16,777,216 colors*) or higher resolution
- A high-speed (*broadband*) Internet connection such as DSL or a cable modem is vital for online currency trading

1.2 How to install VT Trader...

To install VT Trader on your computer you must first download the VT Trader executable file to your computer's hard drive. Then, run the executable file by double-clicking it with the left mouse button. Follow the on-screen instructions to complete the installation; you may click the **[Cancel]** button at any time to abort the installation process



Before choosing your installation options, you must agree to the *End User License Agreement*. Please read through the agreement and then select the radio button next to, "*I accept the terms of the License Agreement*" to proceed.



Click the **[Next >]** button to proceed. Choose the type of installation you want to perform for VT Trader 2.0. You can choose to a *Standalone* installation or a *Portable* installation.

The *Standalone* installation distributes VT Trader's files into 2 directory structures - a read-only program files directory and an additional *Data* directory. The standalone installation also creates a VT Trader desktop shortcut and VT Trader Start Menu program group. The read-only program files typically install to C:\Program Files\VT Trader\ (or C:\Program Files (x86)\VT Trader\ if you're using a 64-bit Windows operating system). You can change this installation directory in the next step of installation process if you choose to. The additional *Data* directory installs under the *Users* directory tree.

In Windows® XP variants, the *Data* directory installs to:

C:\Documents and Settings\<Windows User Account Name>\My Documents\VTSystems\VT Trader\<Unique # Generated By VT Trader>

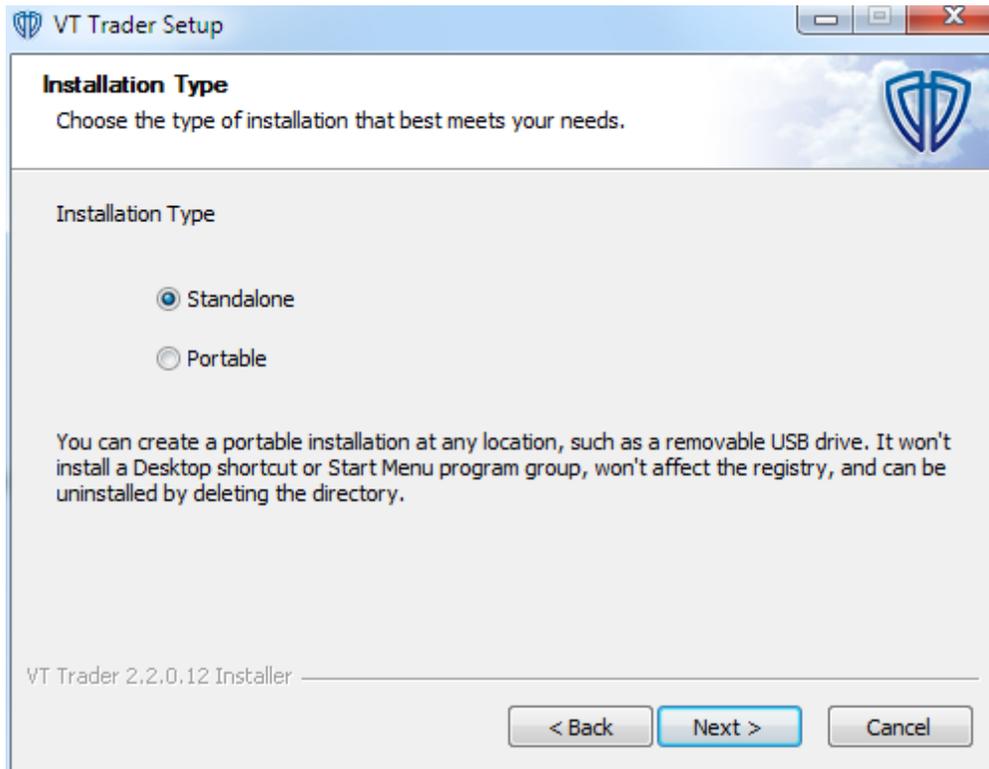
In Windows® Vista and Windows® 7 variants, the *Data* directory installs to:

C:\Users\<Windows User Account Name>\Documents\VTSystems\VT Trader\<Unique # Generated By VT Trader>

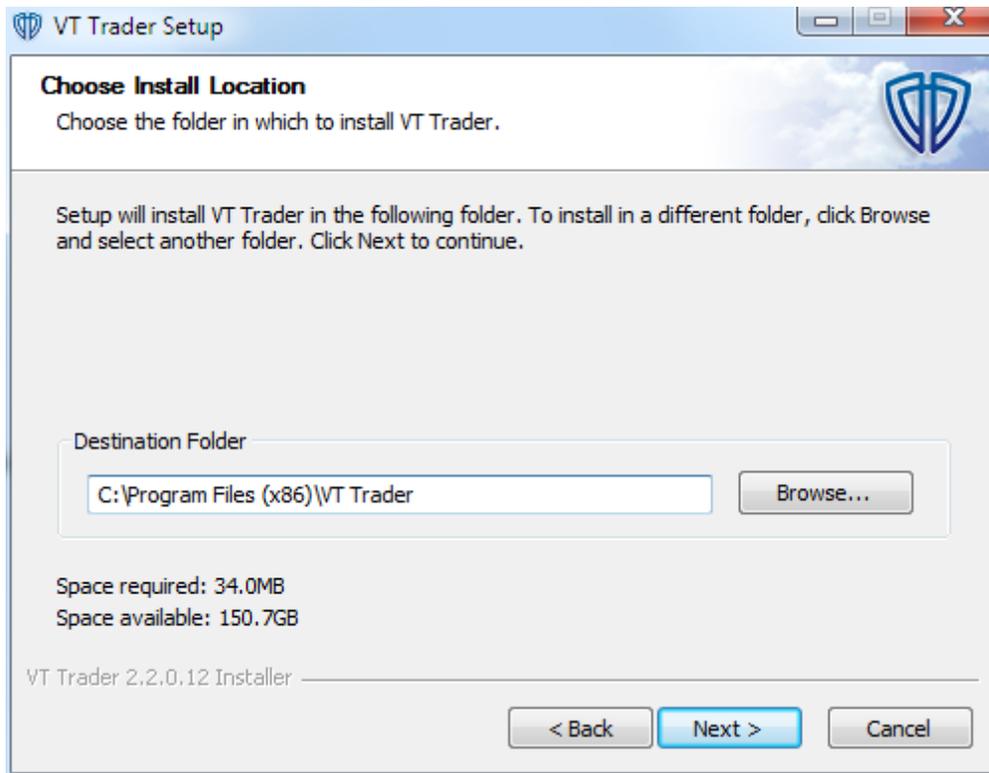
Note: In order to utilize VT Trader 2 as a COM server, you must choose a *Standalone* installation.

The *Portable* installation distributes VT Trader's files into only 1 directory. It will not install a VT Trader desktop shortcut or Start Menu program group, will not affect the registry, and can be uninstalled by simply deleting its directory. You can create a *Portable* installation at any location on your hard drive or even on a removable USB drive. However, your Windows user account must have read and write file privileges to the installation location you choose in order for VT Trader to function properly. By default, a *Portable* installation of VT Trader will create its directory on your Windows Desktop. You can change

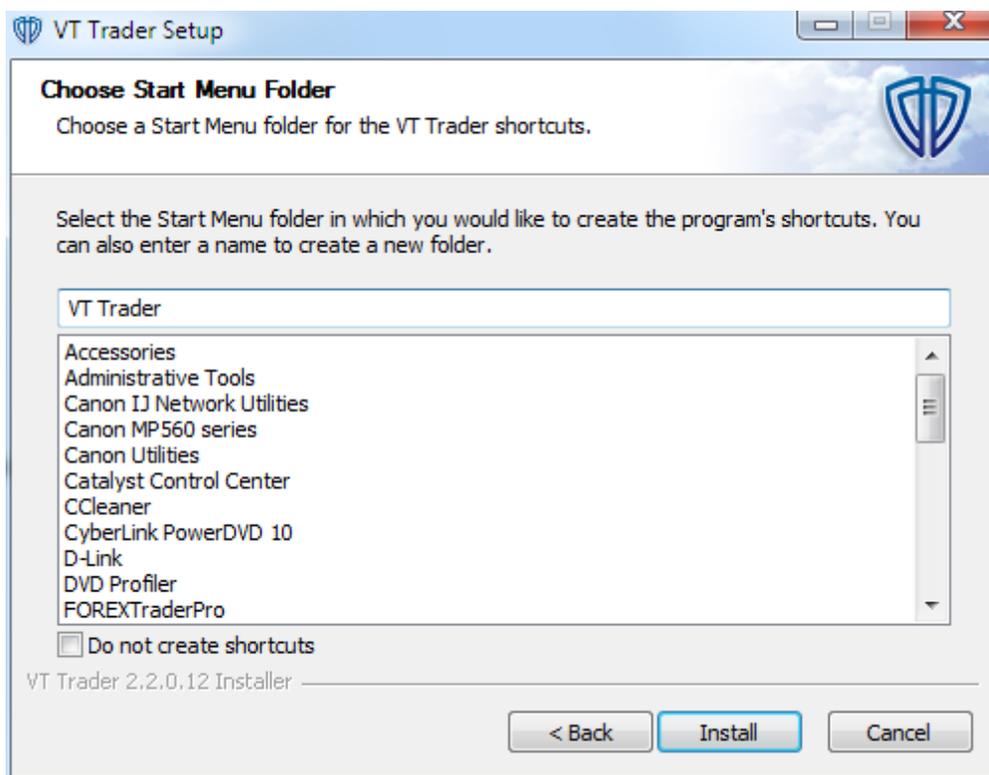
this installation directory in the next step of installation process if you choose to.



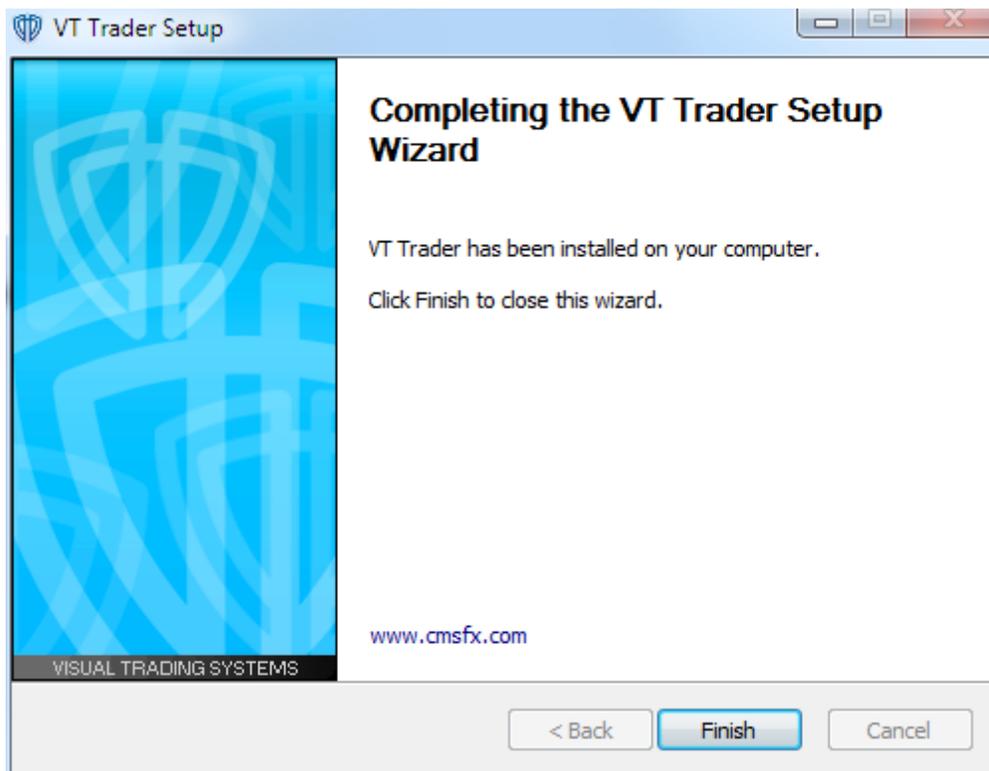
Click the **[Next >]** button to proceed. Choose an installation location for VT Trader. If the default *Destination Folder* is acceptable then change nothing. If you want to change the *Destination Folder* you can do so by clicking the **[Browse...]** button and selecting an alternate install location.



Click the **[Next >]** button to proceed. If you chose the Portable installation type, **[Next >]** copies the VT Trader files onto your computer's hard drive. If you chose the *Standalone* installation type, choose the *Start Menu Folder*.



If you chose the *Standalone* installation type, click the **[Install]** button to copy the VT Trader files onto your computer's hard drive.

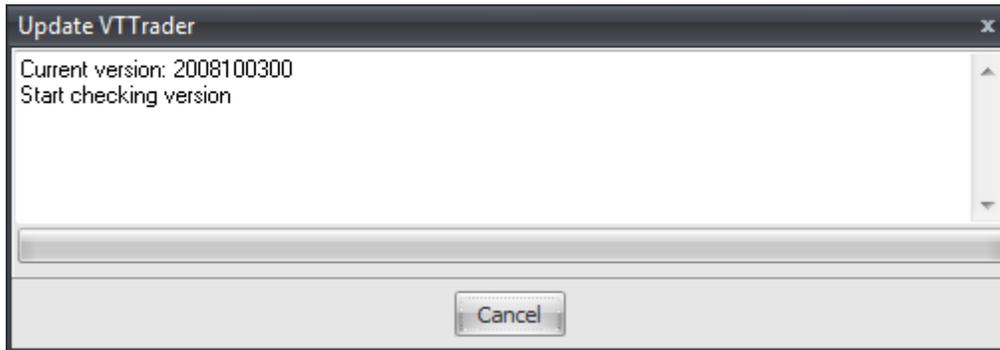


Click the **[Finish]** button to complete the installation process.

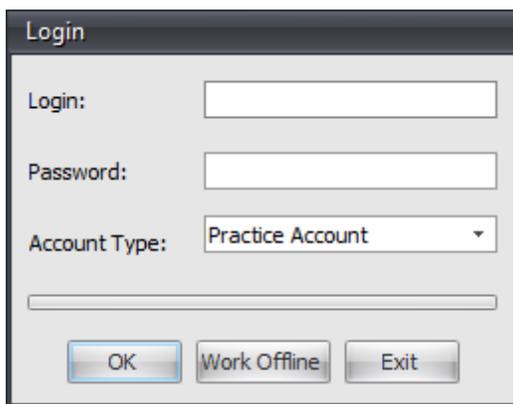
1.3 How to login to VT Trader...

Once VT Trader has been properly [installed](#)⁽¹⁷⁾, it can be launched by double-clicking the VT Trader desktop icon with the left mouse button or by selecting the VT Trader link from the VT Trader program group in the Windows Start Menu.

VT Trader checks for updates and prompts you to install any new updates if a new version is available. If an update is available you can install the update, choose to skip it and install it at a later time, or choose not to install it at all and to not be notified about it again. However, if the available update is *required* you will not be able to access your trading account until you install the update.



Next, the **Login** window is shown. Type your *Login* and *Password*. Choose the type of account to login to from the *Account Type* selection menu.



The following command buttons are all available at different times during the login process:

[OK]

This command continues the login process by verifying the current VT Trader version, login name,

and password to connect you to your broker's trading and charting services. VT Trader's interface will load in a few moments if the login is successful.

[Work Offline]

The command loads VT Trader's interface without connecting to your broker's services. In this *Offline* mode of operation your account and trading-related data will not be accessible, no connections to the broker's services are active, and no trading actions can be conducted. Only instruments and chart intervals previously opened in VT Trader while it was connected to the broker's charting service will be cached and available for viewing in *Offline* mode.

[Exit]

This command cancels the login process and shuts down VT Trader.

If the login process fails or is canceled, the following buttons become available:

[Retry]

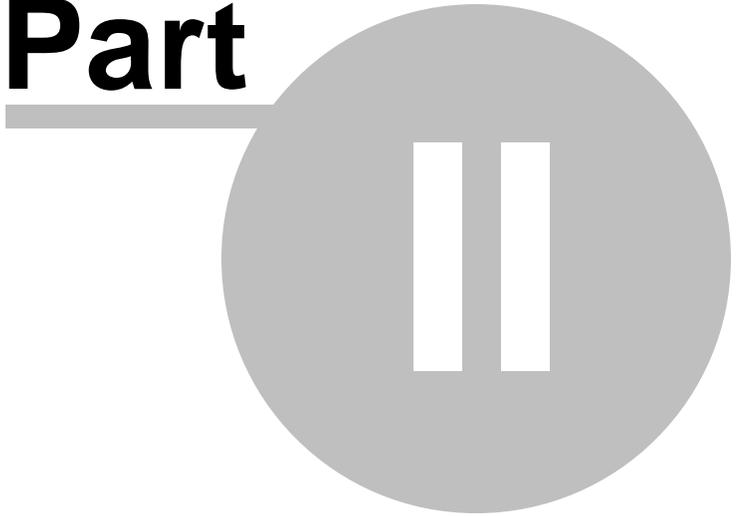
This command returns you to the **Login** window.

[Cancel]

This command immediately stops the login process.

VT Trader 2.0's Interface

Part



2 VT Trader 2.0's Interface

***Fluent* User Interface**

The *Fluent* user interface (*UI*) makes finding VT Trader's commands easier than ever before by better organizing them based on the common tasks you are most likely to perform while using VT Trader. The *Fluent* UI includes the **Ribbon**, the **VT Trader Button**, and the **Quick Access Toolbar**.

The **Ribbon** is the wide band running across the top of the main VT Trader program window which contains the majority of VT Trader's commands. The common tasks are divided up into tabs according to the types of commands they represent. The tabs are then further divided into groups of related commands. The **VT Trader Button** and the **Quick Access Toolbar** are located in the upper, left corner of VT Trader's main program window providing you with convenient access to a few of the most commonly used commands in VT Trader.

Please click on these links to learn more about the [Fluent](#)^[30], [UI Ribbon](#)^[30], [VT Trader Button](#)^[54], and the [Quick Access Toolbar](#)^[55].

"Docked" Windows Concept

VT Trader 2.0's intuitive docking approach allows windows to be docked into simple or complex configurations or remain as separate windows. This new functionality allows you to create an almost infinite number of "docked" and "floating" window arrangements which can be conveniently saved as *Desktop Workspaces*.

However, unlike most traditional docking interfaces, VT Trader's interface shows *docking zone selectors* as a window is being moved indicating every possible location that the active window can be docked to inside VT Trader's main docking site. You can dock any window to any side of any other window - top, bottom, left, or right. Windows can even be "docked" together in the same location to create tabbed panels.

Docked windows also have special caption buttons and contextual menus available allowing you to auto-hide windows(s), "undock" windows, maximize windows within their docking panel, quickly locate and make tabs active, and reposition the tabs in a tabbed panel. To make working with your *Desktop Workspace(s)* even easier, "floating" windows have their own Windows Taskbar buttons; this allows you to quickly and easily minimize any "floating" window(s) you do not wish to remain visible while working in VT Trader's main program window and restore them only when necessary.

Please [click here](#)^[27] to learn more about how VT Trader 2.0's docking concepts works.

Task Windows

VT Trader's UI is centered around the use of task windows. The general purpose of these windows is to provide you with up-to-the-second, real-time account information, trading information, alerts, news events, and important announcements. The main task windows have been divided into groups based on the type(s) of general task(s) they help you perform.

Please [click here](#)^[73] to learn more about each of the task windows included in VT Trader.

Main Program Window Status Bar and VT Notification Icon

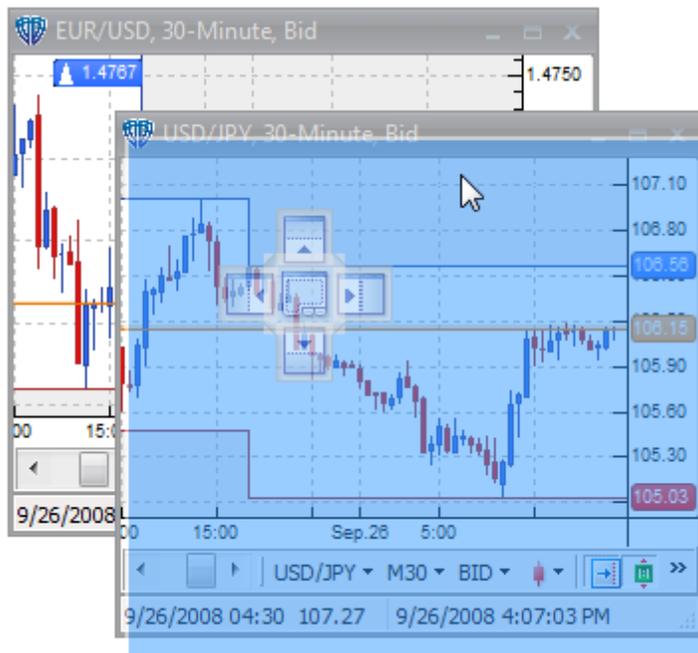
VT Trader 2.0's UI also includes a new **Status Bar** shown across the bottom of the main program window and a dedicated **VT Trader Notification Icon** shown in the Windows operating system's Notification Area (*the area in the taskbar where the computer's local time is shown*).

Please click on these links to learn more about the [Status Bar](#)^[58] and [VT Notification Icon](#)^[58].

2.1 Docking - How it works...

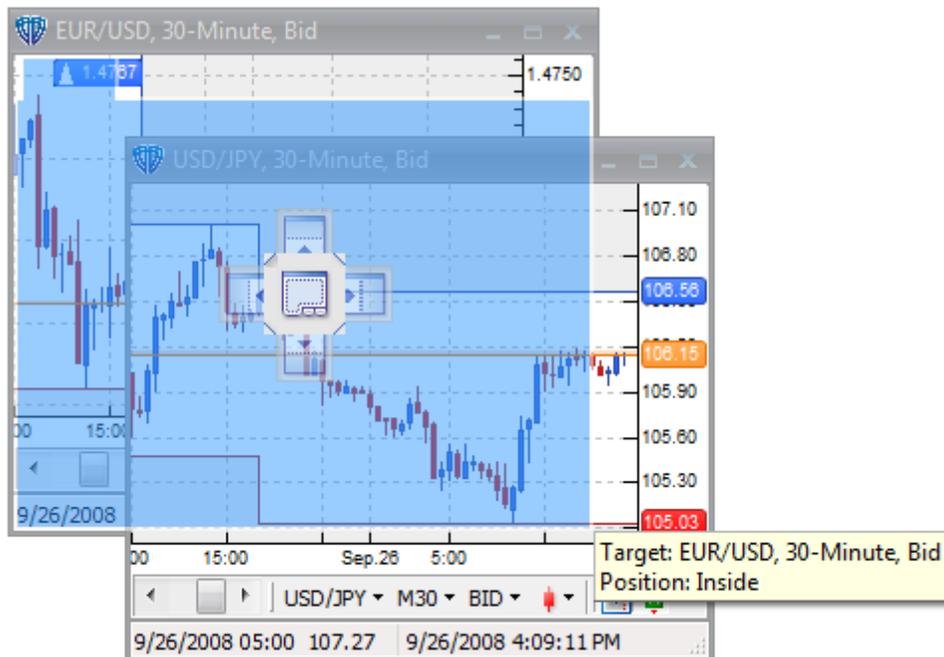
As mentioned in the interface introduction, VT Trader 2 uses a sophisticated and intuitive "docking" concept to create *Desktop Workspaces*. You simply drag a window to the desired location, which can be a docking site or another window, and drop it there.

Docking zone selectors are shown as a window is being moved indicating every possible location that the active window can be docked to. You can dock any window inside the platform's main docking site and/or to any side of any other window - top, bottom, left, or right. Windows can even be docked together in the same location to create tabbed panels.



While dragging, the *highlighted docking zone* indicates the location that the window will have when released. A hint window specifying the target location is also shown. **Note:** Pressing and holding down the **Ctrl** key while dragging the window will prevent it from docking when released; this lets you easily

move windows around without accidentally docking them.



Docked windows, tabbed panels, and window tabs have some special contextual menus and caption buttons allowing you to further customize the arrangement of your *Desktop Workspaces*.

Docked windows have a special contextual menu that is activated by clicking the right mouse button while the cursor is positioned over the window's caption bar. You can *Hide* (i.e. close) or *Undock* the window from this menu. It is also possible to quickly undock a window by simply double-clicking the left mouse button while the cursor is positioned over the window's caption bar; the newly "floating" window can then be quickly docked back into its original location by following the same procedure. Additionally, depending on the window's location within the main docking site, you may also be able to *Restore*, *Maximize*, or *Auto-Hide* the window.

Auto-Hiding a window means that only its window caption will be visible in a tab along one of the sides of the main docking site. Only windows that are docked to the main docking site or in a tabbed panel that is docked to the main docking site can be auto-hidden. Window that can be auto-hidden will have an additional *Auto-Hide* button shaped like a pushpin in their caption bar and the *Auto-Hide* option in their caption bar's contextual menu.



Tabbed panels have a special *Switch Tabs* caption button at their top-right corner that looks like an upside-down triangle; it shows a selection menu of the windows currently located in the tabbed panel. Selecting a window from the *Switch Tabs* selection menu makes the window in that tab visible.



Window Tabs located in a tabbed panel also have a special contextual menu that is activated by clicking the right mouse button while the cursor is positioned over the tab's caption. You can *Hide* (i.e. close) the active tab, choose a different tab from the *Tabs* submenu, or reposition the window tabs at the *Top* or *Bottom* of the tabbed panel. You can also rearrange the order of the tabs in a tabbed panel by positioning the cursor over the tab's caption, clicking (and holding down) the left mouse button, and dragging the tab to its new location.

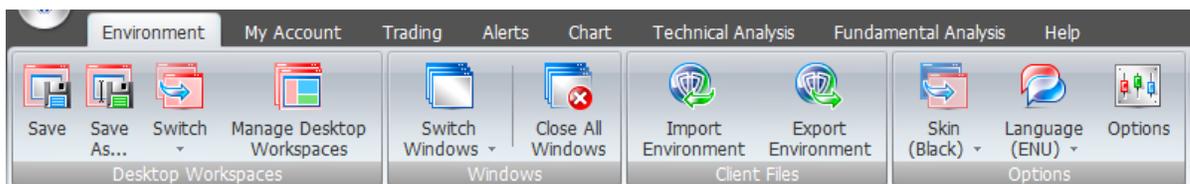


Along with "docked" windows, you can also have "floating" windows in your *Desktop Workspaces*. "Floating" windows look and function just like ordinary application windows; they have their own *Minimize*, *Maximize*, and *Close* caption buttons. However, "floating" windows also have their own Windows Taskbar buttons. Thanks to this added functionality, you can quickly and easily minimize any "floating" window(s) you do not wish to remain visible while working in VT Trader's main program window and restore them only when necessary.



2.2 Fluent UI Ribbon

The **Ribbon** is the wide band (which can be minimized using the [Quick Access Toolbar's contextual menu](#)^[55]) running across the top of VT Trader's main application window. It contains the majority of VT Trader's commands. The common tasks are divided up into tabs according to the types of commands they represent. The tabs are then further divided into groups of related commands.



The **Fluent UI Ribbon** is divided into the following menu tabs:

Environment Menu

The **Environment** menu contains all of the commands that affects VT Trader's overall "look and feel"

and general functionality. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [Desktop Workspaces](#) ^[33]
- [Windows](#) ^[33]
- [Client Files](#) ^[34]
- [Options](#) ^[34]

My Account Menu

The **My Account** menu contains commands that are related to your trading account. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [Account Actions](#) ^[35]
- [Account Summary](#) ^[36]
- [Reports](#) ^[36]

Trading Menu

The **Trading Terminal** menu will likely be one of your most commonly used menus. It contains all of the commands that will help you while you are performing trading actions. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [Place New Order\(s\)](#) ^[37]
- [Close](#) ^[38]
- [Dealing Rates](#) ^[38]
- [Trading Windows](#) ^[39]
- [Messages](#) ^[39]
- [Trading Tools](#) ^[40]

Alerts Menu

You can create and modify price alerts using the commands in the **Alerts** menu. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [Price Alerts](#) ^[40]

Chart Menu

You can quickly and easily open new charts or manipulate the active chart using the commands provided in the **Chart** menu. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [Open Chart](#) ^[41]
- [Chart Templates](#) ^[41]

- [Active Chart](#)^[42]
- [Show/Hide](#)^[43]
- [Zoom](#)^[44]
- [Axes](#)^[45]
- [Print](#)^[46]

Technical Analysis Menu

While analyzing charts, you may rely on various tools to assist you in the analysis process. The **Technical Analysis** menu provides you convenient access to all of VT Trader's technical analysis tools including (*but not limited to*): data inspection, chart patterns, symbols, lines, channels, shapes, Fibonacci, Gann, 100+ commonly used indicators, and 100+ basic trading systems. You can also create your own custom indicators and trading systems using VT Trader's two specially-designed "builder" tools. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [Analysis Tools](#)^[46]
- [Drawing Tools](#)^[47]
- [Indicators](#)^[49]
- [Trading Systems](#)^[50]

Fundamental Analysis Menu

You can keep up-to-date with real-time streaming news, Forex market highlights, as well as accompanying market experts' commentary by using the resources provided in the **Fundamental** menu. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [News](#)^[51]
- [Forex Resources](#)^[51]

Help Menu

The **Help** menu provides you with access to VT Trader's help materials, troubleshooting tools, and version information. It also allows you to communicate directly with your broker's dealing support department and customer service department via chat. Click on the group's name to learn more about its commands. The groups included in this menu are:

- [Support Resources](#)^[52]
- [Troubleshooting](#)^[52]
- [Contact Us](#)^[53]
- [Version](#)^[53]

2.2.1 Environment Tab

2.2.1.1 Desktop Workspaces Group



The **Desktop Workspaces** group contains the following commands:

Save

Saving the active desktop workspace preserves the location and configuration of windows (*including "floating" windows*) and any custom properties, drawing tools, indicators, and trading systems attached to open chart windows.

Save As...

This command saves the active desktop workspace as a new file. The location and configuration of windows (*including "floating" windows*) and any custom properties, drawing tools, indicators, and trading systems attached to open chart windows are saved. Desktop workspace files are saved into VT Trader's *Data -> Desktops* folder. All available desktop workspaces are shown in the **Switch** command's selection menu.

Switch

You can load (*view*) any of your saved desktop workspaces by using the **Switch** command's selection menu.

Manage Desktop Workspaces

This command opens the **Desktop Workspaces Management** window. Please [click here](#)¹⁵⁰ to learn more about the **Desktop Workspaces Management** window.

2.2.1.2 Windows Group



The **Windows** group contains the following commands:

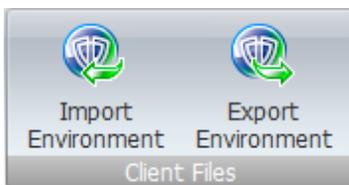
Switch Windows

All of the application's open windows are shown in this command's selection menu. Choosing a window makes it the active window. If the chosen window was hidden behind other windows or minimized it will be brought to the front.

Close All Windows

This command closes all of the application's open windows.

2.2.1.3 Client Files Group



The **Client Files** group contains the following commands:

Import Environment

You can select any combination of items to import from a previously created VT Trader environment archive (*.vtenv file extension*) using the **Import Environment** command. You can import: *Options (User Preferences), Desktop Workspaces, Chart Templates, Custom Indicators, and Custom Trading Systems*. You can choose to *Ignore, Rename, or Replace* duplicate files during the import process.

Export Environment

You can select any combination of items to export to an existing (*or new*) VT Trader environment archive (*.vtenv file extension*) using the **Export Environment** command. You can export: *Options (User Preferences), Desktop Workspaces, Chart Templates, Custom Indicators, and Custom Trading Systems*.

2.2.1.4 Options Group



The **Options** group contains the following commands:

Skin

This command contains a selection menu that includes all skins available for use by VT Trader. The active (*in use*) skin's name is shown. Choosing a different skin changes the appearance of VT Trader's interface.

Language

This command contains a selection menu that includes all available languages supported by VT Trader. The active (*in use*) language is shown. Choosing a different language changes the language throughout VT Trader's interface.

Options

You can open the **Options** window using this command. Please [click here](#)⁵⁹ to learn more about the **Options** window.

2.2.2 My Account Tab

2.2.2.1 Account Actions Group



The **Account Actions** group contains the following commands:

Login

This command is only *enabled* if there is currently no connection to your broker's services (*for example, if you are working in Offline Mode*).

Logout

This command disconnects you from your broker's services and shifts VT Trader into *Offline* mode. While *Offline*, your account and trading-related data will not be accessible, no connections to the broker's services are active, and no trading actions can be conducted. Only instruments and chart intervals previously opened in VT Trader while it was connected to the broker's charting service will be cached and available for viewing in *Offline* mode.

Change Password...

This command allows you to change the password that is assigned to your account.

Fund Your Account

If you are logged into a live trading account, this command opens a new Internet browser window with instructions for adding and withdrawing funds from your account. However, if you are logged into

a practice trading account this command opens a new Internet browser window that provides you with an application to request a live trading account from your broker.

2.2.2.2 Account Summary Group



The **Account Summary** group contains the following commands:

Account Profile

This command opens a new Internet browser window showing Forex.com's *MyAccount* website section. You can review your account summary information, account profile, various detailed account/trading reports, access Forex.com's market research resources, and much more.

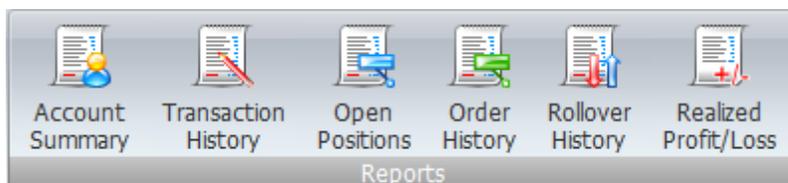
Account Information

This command opens the **Account Information** window. Please [click here](#)⁷⁴ to learn more about the **Account Information** window.

Currency Portfolio

This command opens the **Currency Portfolio** window. Please [click here](#)⁸⁰ to learn more about the **Currency Portfolio** window.

2.2.2.3 Reports Group



Each report opens a new Internet browser window Forex.com's *MyAccount* website *Reports* section showing that report's detailed information. Reports can be exported to Microsoft Excel or printed for your convenience.

The **Reports** group contains the following commands:

Account Summary

This report provides the current account balance as well as all deposits, withdrawals, interest earned, and fees charged (*if any*) for any selected month.

Transaction History

This report provides complete trade details for any selected date range, including the deal date/time, instrument, trade direction (*buy or sell*), contract size, and executed deal rate.

Open Positions

This report provides a summary of all open positions, including contract size, USD value, average rate of open positions, current market rate, and unrealized profit/loss.

Order History

This report provides details of all order activity for a selected data range, including the order entry date/time, its reference number, and any action details for the order.

Rollover History

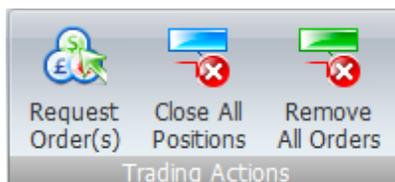
This report provides rollover details for any transaction held open past 17:00 EST for any selected date range, including the rollover date, rollover rate, and USD value.

Realized Profit/Loss

This report provides complete trade details with profit/loss for any selected date range, including the deal date/time, instrument, trade direction (*buy or sell*), contract size, and executed deal rate.

2.2.3 Trading Tab

2.2.3.1 Place New Order(s) Group



The **Place New Order(s)** group contains the following commands:

Buy Market Order

This command requests a *Buy* market order at the instrument's current *Ask* price.

Sell Market Order

This command requests a *Sell* market order at the instrument's current *Bid* price.

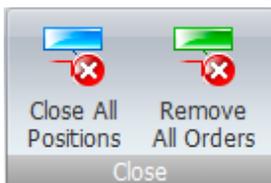
Conditional Buy

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Buy* order. **Entry Limit** requests an *Entry Limit Buy* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Buy* order bias. **If/Then** requests an *If/Then* order with *Buy* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Buy* order bias.

Conditional Sell

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Sell* order. **Entry Limit** requests an *Entry Limit Sell* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Sell* order bias. **If/Then** requests an *If/Then* order with *Sell* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Sell* order bias.

2.2.3.2 Close Group



The **Close** group contains the following commands:

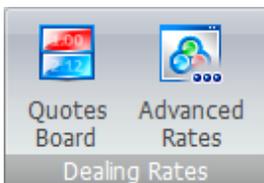
Close All Positions

This command closes all of the account's open positions at the instruments' current market prices.

Remove All Orders

This command cancels (*removes*) all of the account's orders.

2.2.3.3 Dealing Rates Group



The **Dealing Rates** group contains the following commands:

Quotes Board

This command opens the **Quotes Board** window. Please [click here](#)⁸⁹ to learn more about the **Quotes Board** window.

Advanced Rates

This command opens the **Advanced Rates** window. Please [click here](#)^[94] to learn more about the **Advanced Rates** window.

2.2.3.4 Trading Windows Group



The **Trading Windows** group contains the following commands:

Open Positions

This command opens the **Open Positions** window. Please [click here](#)^[107] to learn more about the **Open Positions** window.

Pending Orders

This command opens the **Pending Orders** window. Please [click here](#)^[108] to learn more about the **Pending Orders** window.

2.2.3.5 Messages Group



The **Messages** group contains the following commands:

Trading Activity

This command opens the **Trading Activity** window. Please [click here](#)^[174] to learn more about the **Trading Activity** window.

Trading Log

This command opens the **Trading Log** window. Please [click here](#)^[114] to learn more about the **Trading Log** window.

2.2.3.6 Trading Tools Group



The **Trading Tools** group contains the following commands:

Currency Calculator

This command opens a **Currency Calculator** tool. The **Currency Calculator** allows you to convert an amount of one currency into the value of another currency. Please [click here](#)^[120] to learn more about the **Currency Calculator** tool.

Pip Calculator

This command opens the **Pip Calculator** tool. The **Pip Calculator** allows you to calculate the value of 1 pip respective to the selected currency pair. Please [click here](#)^[120] to learn more about the **Pip Calculator** tool.

2.2.4 Alerts Tab

2.2.4.1 Price Alerts Group



The **Price Alerts** group contains the following commands:

New

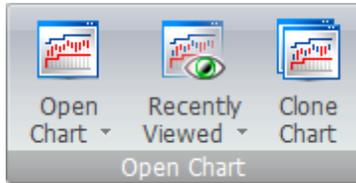
This command opens the **Price Alert** window. Please [click here](#)^[179] to learn more about the **Price Alert** window.

Active Price Alerts Summary

This command opens the **Active Price Alerts Summary** window. Please [click here](#)^[180] to learn more about the **Active Price Alerts Summary** window.

2.2.5 Chart Tab

2.2.5.1 Open Chart Group



The **Open Chart** group contains the following commands:

Open Chart

This command contains a selection menu that includes all of the instruments available in VT Trader. You can quickly open a new chart window by choosing your desired instrument. The new chart opens based on your settings for the *Chart Interval* and *Chart Type* options in the *Options window -> General section -> Miscellaneous subsection*.

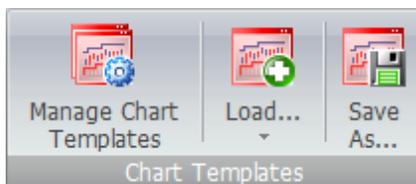
Recently Viewed

This command contains a selection menu that includes your ten mostly recently viewed charts. You can quickly reopen one of these charts by choosing your desired chart.

Clone Chart

You can quickly create a new, duplicate chart window of the active chart window by using the **Clone Chart** command.

2.2.5.2 Chart Templates Group



The **Chart Templates** group contains the following commands:

Manage Chart Templates

This command opens the **Chart Templates Management** window. Please [click here](#)^[152] to learn more about the **Chart Templates Management** window.

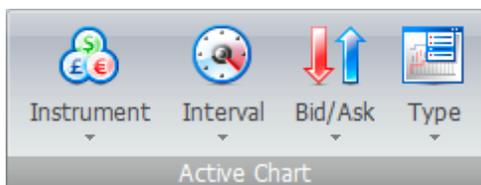
Load...

You can load (*apply*) any of your saved chart templates to the active chart window by using the **Load...** command's selection menu.

Save As...

This command saves the active chart window's properties configuration as a new [chart template](#)^[152] file. All properties included in the [Chart Properties](#)^[131] window are included in the chart template. Once saved, the new chart template is shown in the **Load...** command's selection menu. Chart template files are saved into VT Trader's *Data -> ChartTemplates* folder.

2.2.5.3 Active Chart Group



The **Active Chart** group contains the following commands:

Instrument

This command contains a selection menu that includes all of the trading instruments available in VT Trader. You can change the chart window's current instrument by choosing your desired instrument from the selection menu.

Interval

This command contains a selection menu that includes all of the chart intervals available for use in the chart window. You can change chart window's current interval by choosing your desired interval from the selection menu. The following chart intervals are currently available in VT Trader:

- Tick (*each incoming price is a "tick"; a "tick" is the smallest possible interval*)
- 1-Minute
- 5-Minute
- 10-Minute
- 15-Minute
- 30-Minute
- 1-Hour
- 2-hour
- 4-Hour
- Daily (*each new day starts at 5:00 PM ET*)
- Weekly (*each new week starts at 12:00 AM (00:00) ET on Monday*)
- Monthly

Bid/Ask

A trading instrument typically have two possible prices at any given time - its bid price and its ask

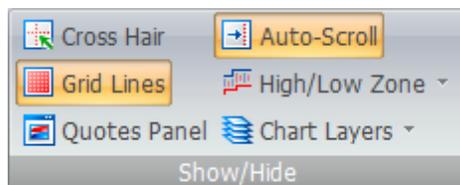
price (*a.k.a. the bid/offer spread, bid/ask spread, or buy/sell spread*). You sell at the bid price and you buy at the ask price. An instrument's chart is constructed using either its bid or ask prices; this command lets you choose that bias.

Type

This command contains a selection menu that includes all of the types of charts available for use in the chart window. You can change the chart window's current chart type by choosing your desired type from the selection menu. The following chart types are currently available in VT Trader:

- Japanese Candlesticks (Filled)
- Japanese Candlesticks (Hollow)
- Heikin-Ashi Candlesticks
- Bars (O/H/L/C)
- Bars
- Line
- Point and Figure
- Renko

2.2.5.4 Show/Hide Group



The **Show/Hide** group contains the following commands:

Cross Hair

This command is a toggle button. It *shows* or *hides* the *Cross Hair* in the active chart window. Please [click here](#)^[240] to learn more about the *Cross Hair* tool.

Grid Lines

This command is a toggle button. It *shows* or *hides* the *Grid Lines* in the active chart window.

Quotes Panel

This command is a toggle button. It *shows* or *hides* the *Quotes Panel* in the active chart window.

Auto-Scroll

This command is a toggle button. It *enables* or *disables* the *Auto-Scroll to Current Time* property of the active chart window. While *enabled*, the active chart window will always automatically move the chart's price data to the instrument's most recent incoming price tick. *Disabling* this property allows you to easily perform technical analysis throughout the instrument's historical price data without the

chart automatically returning to the most recent price tick.

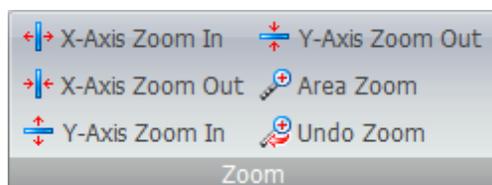
High/Low Zone

This command contains a selection menu that includes all of the *High/Low Zone* choices available for use in the active chart window. The choices in the list will vary depending on the active chart's interval; only intervals larger than the active chart's interval are available to that chart window. The *High/Low Zone*'s boundaries are defined by the *High/Low Zone* selections in the chart's (or *chart template*'s) properties. You can quickly change (or *hide*) the current *High/Low Zone* used in the active chart by choosing your desired *High/Low Zone* from the selection menu.

Chart Layers

This command contains a selection menu that includes all of the *Chart Layers* it is possible to use in the active chart window. You can change a layer's *visibility* and/or its *brightness* by choosing it from the selection menu. Any object(s) attached to the active chart window that are part of the chosen layer will be affected by these changes. For example, if you draw 3 trend lines in the chart window, choose the *Trend Lines* layer, and remove the *visibility* option's check mark, all 3 trend lines will be hidden from view; to restore them, you must *re-enable* that layer's *visibility* option.

2.2.5.5 Zoom Group



The **Zoom** group contains the following commands:

X-Axis Zoom In

You can increase the horizontal (*left-to-right*) size of the active chart window's data using this command.

X-Axis Zoom Out

You can decrease the horizontal (*left-to-right*) size of the active chart window's data using this command.

Y-Axis Zoom In

You can increase the vertical (*top-to-bottom*) size of the active chart window's data using this command.

Y-Axis Zoom Out

You can decrease the vertical (*top-to-bottom*) size of the active chart window's data using this

command.

Area Zoom

This command allows you to define a rectangular portion of the active chart window using the cursor to automatically zoom in on. The portion of the active chart window within your rectangular selection area will be magnified to fill the entire viewable area of the chart window.

Undo Zoom

You can undo the most recent action performed with any of the zooming commands by using this command.

2.2.5.6 Axes Group



The **Axes** group contains the following commands:

Auto-Size Y-Axis

This command is a toggle button. It *enables* or *disables* the *Auto-Size Y-Axis* property of the active chart window. While *enabled*, the active chart window automatically resizes its price data (and indicator data, if available) so it is shown with the highest high price (or indicator value) and lowest low price (or indicator value) at the respective top and bottom of the viewable chart area based on the *Auto-Size Y-Axis Min/Max Bounds* option's selection in the [Chart Properties](#) ^[131] window (or *Chart Template Properties* window, if the chart window has an assigned chart template). Please [click here](#) ^[131] to learn more about the *Auto-Size Y-Axis Min/Max Bounds* option. *Disabling* the *Auto-Size Y-Axis* property allows you to manually control the scaling (*sizing*) of the data in the viewable area of the chart window using the *Zoom* commands, the Y-Axis's drag-and-drop zooming functionality, or the Y-Axis's *Scale Settings*.

Reset X-Axis

You can quickly restore the X-Axis's zoom level back to its default value using this command.

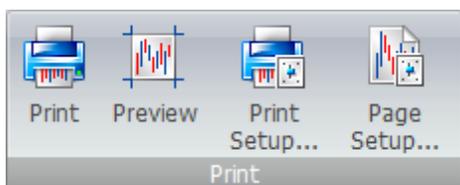
Reset Y-Axis

You can quickly restore the Y-Axis's zoom level back to its default value using this command.

Reset Axes

You can quickly restore the X-Axis's zoom level and the Y-Axis's zoom level back to their default values using this command.

2.2.5.7 Print Group



The **Print** group contains the following commands:

Print

You can print the active chart window by using this command.

Preview

You can view a preview of what the active chart window will look like when it is printed by using this command.

Print Setup...

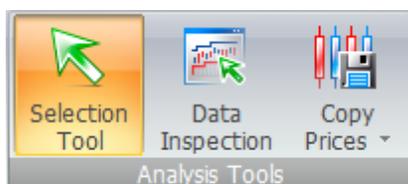
This command opens the Windows operating system's **Print Setup** dialog window. You can choose the printer you want to print with along with the type of paper and paper orientation.

Page Setup...

This command opens VT Trader's **Page Setup** window. The **Page Setup** window defines the document setup and color properties for printing the active chart.

2.2.6 Technical Analysis Tab

2.2.6.1 Analysis Tools Group



The **Analysis Tools** group contains the following commands:

Selection Tool

You can use this command to return the cursor to its default arrow pointer cursor type after using one or more drawing tools while the *Auto-Switch to Select Drawing Tool* option is *disabled*.

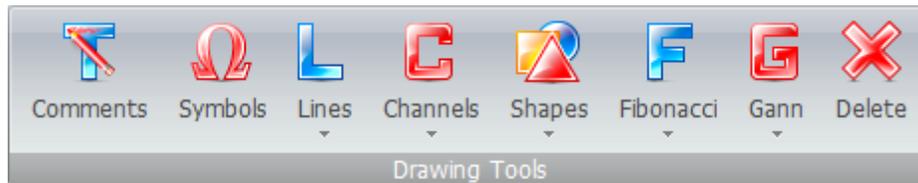
Data Inspection

This command opens the **Data Inspection** window. Please [click here](#)^[154] to learn more about the **Data Inspection** window.

Copy Prices

This command contains a selection menu with two options: *Select by Date Range* and *Select Entire Date Range*. Please [click here](#)^[241] to learn more about the **Copy Prices** tool.

2.2.6.2 Drawing Tools Group



The **Drawing Tools** group contains the following commands:

Comments

This command activates the **Comments** tool. Please [click here](#)^[243] to learn more about the **Comments** tool.

Symbols

This command activates the **Symbols** tool. Please [click here](#)^[246] to learn more about the **Symbols** tool.

Lines

This command contains a selection menu that includes all of the line tools currently available for use in the chart window. The line tools included in this command's selection menu are:

- [Trend Line](#)^[256]
- [Trend Line By Angle](#)^[259]
- [Vertical Line](#)^[250]
- [Horizontal Line](#)^[253]
- [Regression Line](#)^[263]

Channels

This command contains a selection menu that includes all of the channel tools currently available for use in the chart window. The channel tools included in this command's selection menu are:

- [Standard Deviation Channel](#)^[265]
- [Standard Error Channel](#)^[269]
- [Raff Regression Channel](#)^[272]
- [Equidistant Channel](#)^[276]
- [Andrew's Pitchfork](#)^[279]

Shapes

This command contains a selection menu that includes all of the shape tools currently available for use in the chart window. The shape tools included in this command's selection menu are:

- [Ellipse](#)^[282]
- [Rectangle](#)^[286]
- [Triangle](#)^[290]

Fibonacci

This command contains a selection menu that includes all of the Fibonacci tools currently available for use in the chart window. The Fibonacci tools included in this command's selection menu are:

- [Fibonacci Retracement](#)^[293]
- [Fibonacci Expansion](#)^[297]
- [Fibonacci Time Extension](#)^[301]
- [Fibonacci Channel](#)^[305]
- [Fibonacci Fan](#)^[309]
- [Fibonacci Arc](#)^[313]

Gann

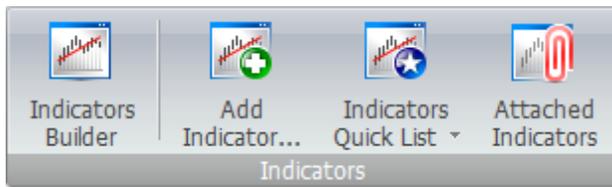
This command contains a selection menu that includes all of the Gann tools currently available for use in the chart window. The Gann tools included in this command's selection menu are:

- [Gann Line](#)^[317]
- [Gann Fan](#)^[321]
- [Gann Grid](#)^[324]

Delete

You can delete one or more selected tools from the active chart window by using the **Delete** command.

2.2.6.3 Indicators Group



The **Indicators** group contains the following commands:

Indicators Builder

This command opens the **Indicators Builder** tool. Please [click here](#)^[182] to learn more about the **Indicators Builder**.

Add Indicator...

This command opens the **Add Indicator** window. You can review categorized lists of indicators, choose an indicator from one of the lists, review its description, and add it to the chart using the **Add Indicator** window.

Indicators Quick List

This command includes a selection menu. The **Indicators Quick List** can be likened to your "Favorites" in Internet Explorer or your "Bookmarks" in Mozilla Firefox. You can configure the **Indicators Quick List** to include only the indicators that you use most frequently or desire to have easily available. You may need to configure your **Indicators Quick List** before it best fits your needs. *Configure Quick List* is the first item included in the selection menu. Please [click here](#)^[235] to learn more about configuring your **Indicator Quick List**.

Attached Indicators

This command opens the **Attached Indicators** window. You can review a summary listing of indicators currently attached to the active chart window, *add* additional indicators to the chart, change the *properties* of any attached indicator, and *delete* attached indicators using the **Attached Indicators** window. The **Attached Indicators** window also allows you to directly edit an indicator by opening it in an **Indicator Editor** window. Please [click here](#)^[184] to learn more about editing indicators using an **Indicator Editor** window.

2.2.6.4 Trading Systems Group



The **Trading Systems** group contains the following commands:

Trading Systems Builder

This command opens the **Trading Systems Builder** tool. Please [click here](#)^[205] to learn more about the **Trading Systems Builder**.

Add Trading System...

This command opens the **Add Trading System** window. You can review categorized lists of trading systems, choose a trading system from one of the lists, review its description, and add it to the chart using the **Add Trading System** window.

Trading Systems Quick List

This command includes a selection menu. The **Trading Systems Quick List** can be likened to your "Favorites" in Internet Explorer or your "Bookmarks" in Mozilla Firefox. You can configure the **Trading Systems Quick List** to include only the trading systems that you use most frequently or desire to have easily available. You may need to configure your **Trading Systems Quick List** before it best fits your needs. *Configure Quick List* is the first item included in the selection menu. Please [click here](#)^[236] to learn more about configuring your **Trading Systems Quick List**.

Attached Trading Systems

This command opens the **Attached Trading Systems** window. You can review a summary listing of trading systems currently attached to the active chart window, *add* additional trading systems to the chart, change the *properties* of any attached trading system, *enable* or *disable Auto-Trading* mode for any attached trading system, and *delete* attached trading systems using the **Attached Trading Systems** window. The **Attached Trading Systems** window also allows you to directly edit a trading system by opening it in a **Trading System Editor** window. Please [click here](#)^[207] to learn more about editing trading systems using a **Trading System Editor** window.

Active Trading Systems Summary

This command opens an **Active Trading Systems Summary** window that looks and functions similarly to the **Attached Trading Systems** window. However, this command's **Active Trading Systems Summary** window provides you with a summary list of trading systems currently attached to every open chart in VT Trader. You can change the *properties* of any attached trading system, *enable* or *disable Auto-Trading* mode for any attached trading system, and *delete* attached trading systems using the **Active Trading Systems Summary** window. The **Active Trading Systems Summary** window also allows you to directly edit a trading system by opening it in a **Trading System Editor** window. Please [click here](#)^[207] to learn more about editing trading systems using a **Trading System Editor** window.

2.2.7 Fundamental Analysis Tab

2.2.7.1 News Group



The **News** group contains the following commands:

Dow Jones News

This command opens the **Dow Jones News** window. Please [click here](#)^[166] to learn more about the **Dow Jones News** window.

Market Commentaries

This command opens the **Market Commentaries** window. Please [click here](#)^[167] to learn more about the **Market Commentaries** window.

2.2.7.2 Forex Resources Group



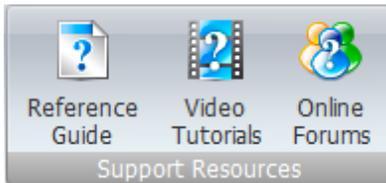
The **Forex Resources** group contains the following commands:

Economic Calendar

This command opens the **Economic Calendar** window. Please [click here](#)^[172] to learn more about the **Economic Calendar** window.

2.2.8 Help Tab

2.2.8.1 Support Resources Group



The **Support Resources** group contains the following commands:

Reference Guide

The VT Trader reference guide is available in 3 formats: Windows Help (*.chm file extension*), Portable Document Format (PDF) (*.pdf file extension*), and Internet-based (*no download required; it can be read online using your Internet browser*). This command opens the online version of VT Trader's comprehensive reference guide. The reference guides are searchable by their table of contents, index, and even by keyword(s). If you want to print a copy of the reference guide you should use the PDF format; however, printing is not advisable since the reference guide is very lengthy and updated frequently.

Video Tutorials

This command opens a new Internet browser window that provides you with links to some VT Trader **Video Tutorials**.

Online Forums

This command opens a new Internet browser window that provides you with access to the **Online Support Forums** for VT Trader. **Note:** These support forums are **not** for reporting issues related to your (*or others'*) broker(s), trading experiences, order-related questions/concerns/claims, or in any way not directly related to the functionality of VT Trader and its features.

2.2.8.2 Troubleshooting Group

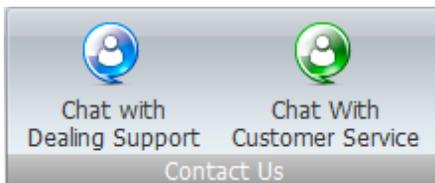


The **Troubleshooting** group contains the following commands:

Delete All Chart History

This command deletes all of the historical chart data saved into VT Trader's *Cache -> HistoryCache* folder. This command is useful when you need to force VT Trader to download fresh historical data for your charts. For example, in the event that VT Trader caches historical chart data that contains one or more bad ticks, you can use this command to forcefully delete that cached data so that you can later download fresh historical data without the bad tick(s) once your broker has corrected the data in their charting service.

2.2.8.3 Contact Us Group



The **Contact Us** group contains the following commands:

Chat with Dealing Support

This command opens a real-time chat window for direct communication with your broker's dealing support personnel.

Chat with Customer Support

This command opens a real-time chat window for direct communication with your broker's customer service personnel.

2.2.8.4 Version Group



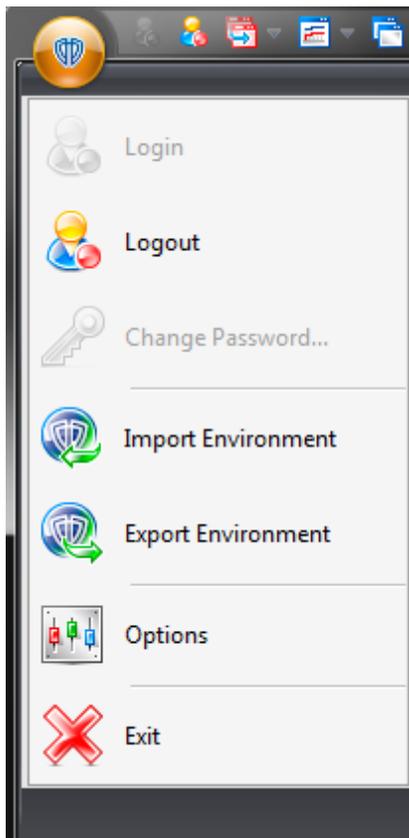
The **Version** group contains the following commands:

About

This command opens a splash screen that includes VT Trader's current version information. You can click once with the left mouse button while the cursor is positioned anywhere within the **About** splash screen to close it.

2.3 VT Trader Button

The **VT Trader Button** includes a few of the most commonly used commands in VT Trader. It is located in the upper, left corner of VT Trader's main program window.



The **VT Trader Button** contains the following commands:

Login

This command is only *enabled* if there is currently no connection to your broker's services (*for example, if you are working in Offline mode*).

Logout

This command disconnects you from your broker's services and transitions VT Trader into *Offline* mode. While *Offline*, your account and trading-related data will not be accessible, no connections to the broker's services are active, and no trading actions can be conducted. Only instruments and chart intervals previously opened in VT Trader while it was connected to the broker's charting service will be cached and available for viewing in *Offline* mode.

Change Password...

This command changes your account's password.

Import Environment

You can select any combination of items to import from a previously created VT Trader environment archive (*.vtenv file extension*) using the **Import Environment** command. You can import: *Options (User Preferences), Desktop Workspaces, Chart Templates, Custom Indicators, and Custom Trading Systems*. You can choose to *Ignore, Rename, or Replace* duplicate files during the import process.

Export Environment

You can select any combination of items to export to an existing (*or new*) VT Trader environment archive (*.vtenv file extension*) using the **Export Environment** command. You can export: *Options (User Preferences), Desktop Workspaces, Chart Templates, Custom Indicators, and Custom Trading Systems*.

Options

This command opens the **Options** window. Please [click here](#)⁵⁹ to learn more about the **Options** window.

Exit

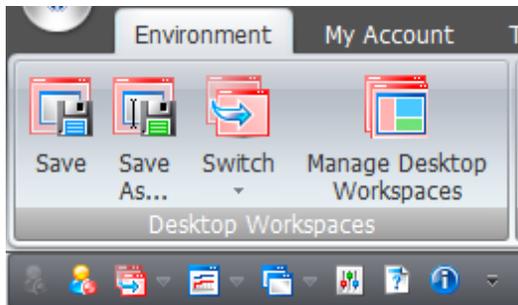
This command exits (*shuts down*) VT Trader. Upon exit, the connection to the broker's services is disconnected and (*if selected*) all of the changes made to the active desktop workspace are automatically saved. The state of any trading system(s) left running in *Auto-Trade Mode* is also saved.

2.4 Quick Access Toolbar

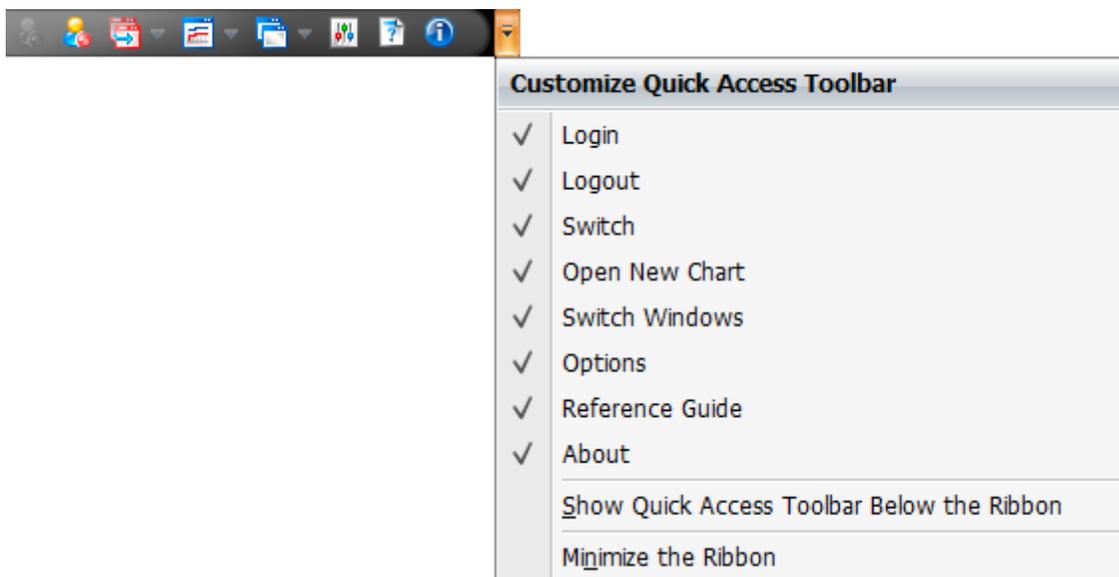
The **Quick Access Toolbar** includes some of the most commonly used commands in VT Trader. It is located in the upper, left corner of VT Trader's main program window directly to the right of the **VT Trader Button**.



However, the **Quick Access Toolbar** can be relocated into its own panel directly below the **Fluent UI Ribbon** by using the *Show Quick Access Toolbar Below the Ribbon* command in its contextual menu.

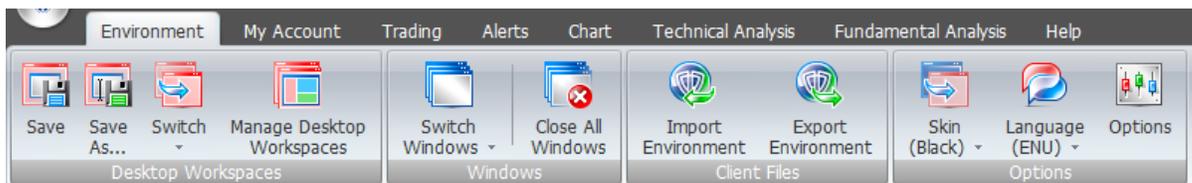


The **Quick Access Toolbar's** contextual menu can be activated by clicking the left mouse button once while the cursor is positioned over the upside down triangle graphic at the far right end of the toolbar. From the contextual menu, it is not yet possible to fully customize the **Quick Access Toolbar**, but you can show or hide the commands included in it.

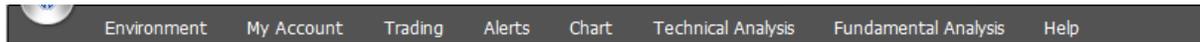


You can also, and perhaps most importantly, minimize the **Fluent UI Ribbon** using the **Quick Access Toolbar's** contextual menu. While the **Ribbon** is minimized, only its main menu tabs are visible; clicking on a menu tab temporarily shows its grouped commands.

From...



To...



The **Quick Access Toolbar** contains the following commands in its default arrangement:

Login

This command is only *enabled* if there is currently no connection to your broker's services (*for example, if you are working in Offline Mode*).

Logout

This command disconnects you from your broker's services and transitions VT Trader into *Offline* mode. While *Offline*, your account and trading-related data will not be accessible, no connections to the broker's services are active, and no trading actions can be conducted. Only instruments and chart intervals previously opened in VT Trader while it was connected to the broker's charting service will be cached and available for viewing in *Offline* mode.

Switch Desktop Workspace

You can load (*view*) any of your saved desktop workspaces by using the **Switch** command's selection menu.

Open New Chart

This command contains a selection menu that includes all of the instruments available in VT Trader. You can quickly open a new chart window by choosing your desired instrument. The new chart opens based on your settings for the *Chart Interval* and *Chart Type* options in the *Options window -> General section -> Miscellaneous section -> New Chart Defaults section*.

Switch Windows

All of the application's open windows are shown in this command's selection menu. Choosing a window makes it the active window. If the chosen window was hidden behind other windows or minimized it will be brought to the front.

Options

This command opens the **Options** window. Please [click here](#)⁵⁹ to learn more about the **Options** window.

Reference Guide

The VT Trader reference guide is available in 3 formats: Windows Help (*.chm file extension*), Portable Document Format (PDF) (*.pdf file extension*), and Internet-based (*no download required; it can be read online using your Internet browser*). This command opens the online version of VT Trader's comprehensive reference guide. The reference guides are searchable by their table of contents, index, and even by keyword(s). If you want to print a copy of the reference guide you should use the PDF format; however, printing is not advisable since the reference guide is very lengthy and updated frequently.

About

This command opens a splash screen that includes VT Trader's current version information. You can click once with the left mouse button while the cursor is positioned anywhere within the **About** splash screen to close it.

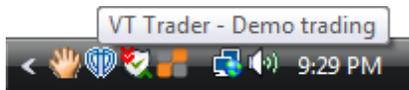
2.5 VT Trader Status Bar

The **Status Bar** is the small band running across the bottom of the main VT Trader program window. It contains VT Trader's version information and current date/time. It also contains an icon that allows you to quickly and easily *enable* or *disable* all of VT Trader's sounds.



2.6 VT Trader Notification Icon

The **VT Trader Notification Icon** is located in the *Notification Area* at the bottom, right corner of the Windows taskbar. When you move the mouse cursor over the **VT Trader Notification Icon** it shows the name of the broker's service that you are currently connected to. Positioning the mouse cursor over top of the notification icon and double-clicking the left mouse button will restore VT Trader if it's minimized.



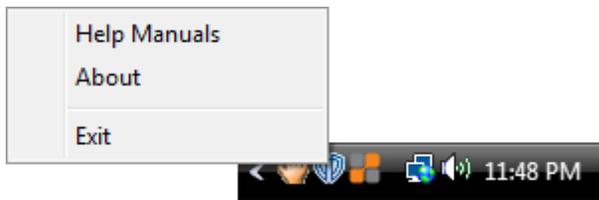
If there is one or more trading systems running in *Auto-Trade* mode in VT Trader the **VT Trader Notification Icon** will show a green, flashing circular LED over top of the icon.



If VT Trader is currently disconnected from your broker's services and running in *Offline* mode the **VT Trader Notification Icon** will show a red, flashing circular LED over top of the icon.



The icon's contextual menu can be opened by clicking the right mouse button while the cursor is hovering over the **VT Notification Icon**. This menu allows quick, one-click access to VT Trader's online support materials, version information, and for exiting the platform.



2.7 Options (User Preferences)

The **Options** window defines all of VT Trader's main application options and connection parameters. It is divided into the following sections:

General

The **General** section contains all of the options that affect VT Trader "as a whole". Click on the subsection's name to learn more about its options. The subsections included in this section are:

- [Instruments](#) ^[60]
- [Trading](#) ^[62]
- [Desktop Workspaces](#) ^[64]
- [Print Page Setup](#) ^[66]
- [Miscellaneous](#) ^[68]

Communication

The **Communication** section contains all of the options that affect VT Trader "as a whole". Click on the subsection's name to learn more about its options. The subsections included in this section are:

- [Common](#) ^[70]

Sounds

The **Sounds** section defines all of the sounds used by VT Trader each time the sound's corresponding action is performed. Each action can be assigned a standard VT Trader sound or a custom sound of your choosing (*.mp3, .wav, or .wma file formats are acceptable*). The actions that can be associated with sounds are:

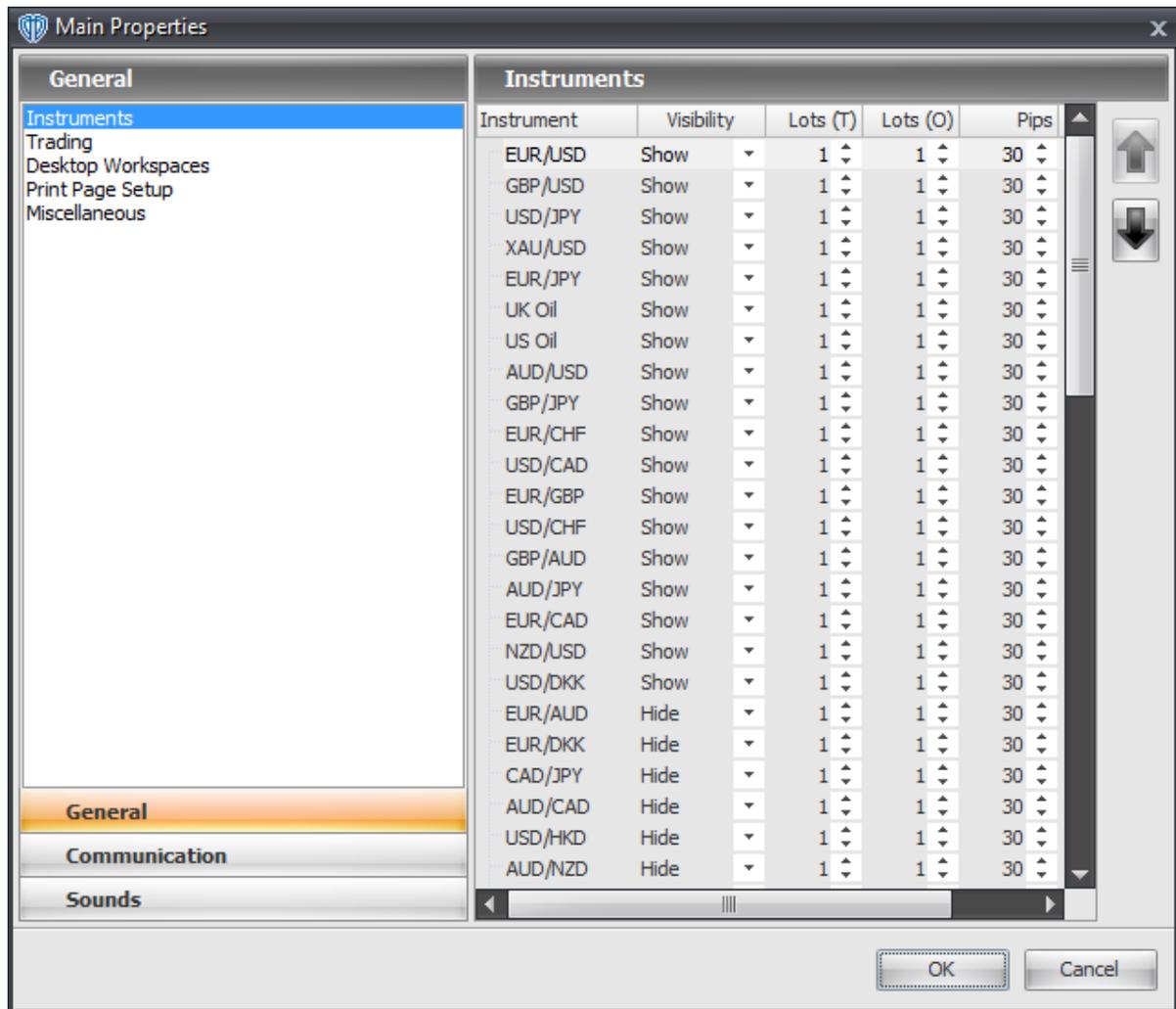
- General
 - Startup
 - Alert
 - Reconnection
 - Disconnection

- Incoming News Headline
- Error
- Margin Call
- Insufficient Funds
- Requote Request
- Position
 - Open
 - Close
- Entry Stop Buy Order
 - Place
 - Remove
 - Change
- Entry Stop Sell Order
 - Place
 - Remove
 - Change
- Entry Limit Buy Order
 - Place
 - Remove
 - Change
- Entry Limit Sell Order
 - Place
 - Remove
 - Change
- Stop Order
 - Place
 - Remove
 - Change
- Limit Order
 - Place
 - Remove
 - Change

2.7.1 General

2.7.1.1 Instruments

The **Instruments** subsection includes only 1 group: **Instruments**. The **Instruments** subsection contains a list of all of the trading instruments made available to you by your broker. The **[^]** and **[v]** buttons define the order the instruments are shown in throughout VT Trader's interface in menus and windows that do not specifically allow for column sorting by instrument



Instruments Group

The **Instruments** list contains the following options:

Visibility

This option *Shows (enables)* or *Hides (disables)* the instrument. You will not receive price updates for hidden instruments, you cannot perform trading actions against hidden instruments, nor will hidden instruments be shown anywhere in VT Trader's interface.

Lots (T)

This option defines the default number of lots that is used when requesting buy or sell market orders for the instrument. This option also applies to the *1-Click Orders (1CO)* trading mode.

Lots (O)

This option defines the default number of lots that is used when requesting entry orders for the

instrument.

Pips

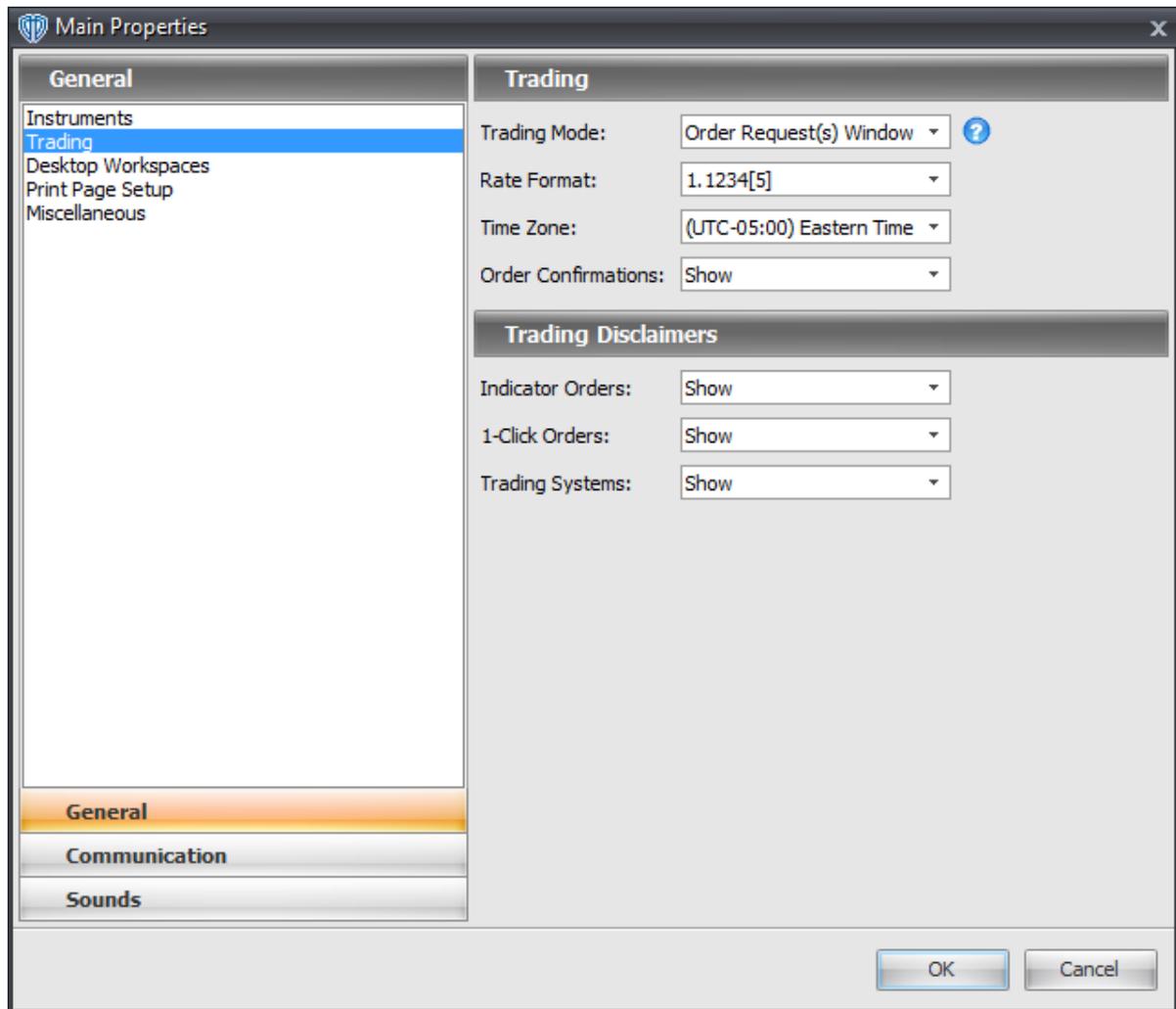
This option defines the default number of pips away from the current market price used when requesting entry orders for the instrument. This options does not apply to entry orders requested at a specific price using an instrument's chart window.

Margin

This option defines the maximum leverage ratio for the instrument. It is a read-only value and cannot be changed.

2.7.1.2 Trading

The **Trading** subsection is divided into three groups: **Trading**, **Suggested Stop Rate**, and **Trading Disclaimers**.



Trading Group

The **Trading** group contains the following options:

Trading Mode

This option defines how market orders are requested. It is a selection menu with two choices: *Order Request(s) Window* and *1-Click Orders (1CO)*.

Order Request(s) Window

This is the standard trading mode. An order request(s) window opens and you must review the order information before submission.

1-Click Orders (1CO)

Use this trading mode with caution! Market orders are submitted **IMMEDIATELY**. You will not have the opportunity to review or confirm the order information. For your safety, this trading mode imposes

a 2-second mouse click delay between duplicate order requests. Any additional (*duplicate*) order request(s) attempted during the 2-second delay period will be ignored.

Rate Format

This option defines how an instrument's "fractional pip" digit (*a.k.a. "pipette"*) is shown throughout VT Trader's interface. You can hide the fractional pip digit or you can show it appended to the rest of the digits, in parentheses, or in brackets.

Time Zone

This option defines what time zone is used throughout VT Trader's interface when referencing dates and times.

Order Confirmations

This option *Shows* or *Hides* the *Request for Confirmation* dialog window that is normally shown when you submit one or more orders. The *Request for Confirmation* dialog window gives you an additional chance to recheck your order information before submission.

Trading Disclaimers Group

The **Trading Disclaimers** group contains the following options:

Indicator Orders

This option *Shows* or *Hides* the disclaimer window that is normally shown each time you submit an indicator order. If the disclaimer window is shown, you must click [**I Agree**] to proceed.

1-Click Orders

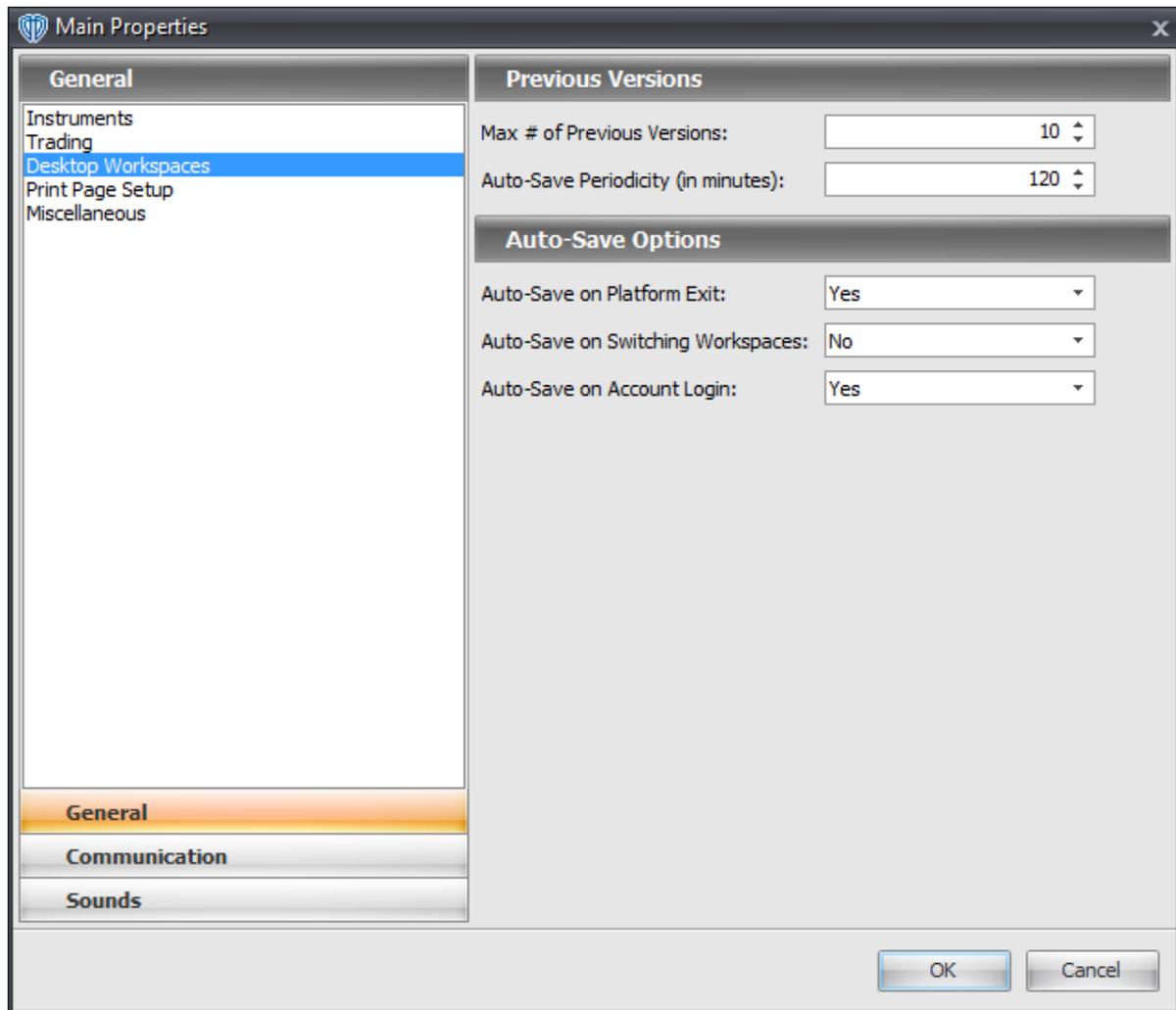
This option *Shows* or *Hides* the disclaimer window that is normally shown each time you choose the 1-Click Orders (*1CO*) **Trading Mode**. If the disclaimer window is shown, you must click [**I Agree**] to use the 1-Click Orders trading mode.

Trading Systems

This option *Shows* or *Hides* the disclaimer window that is normally shown each time you attach a trading system to a chart. If the disclaimer window is shown, you must click [**I Agree**] to proceed.

2.7.1.3 Desktop Workspaces

The **Desktop Workspaces** subsection is divided into two groups: **Previous Versions** and **Auto-Save Options**.



Previous Versions Group

The **Previous Versions** group contains the following options:

Max # of Previous Versions

VT Trader automatically creates *previous version* backup files of the active desktop workspace. This option defines the maximum number of previous versions that VT Trader maintains. All previous versions created of any desktop workspaces are saved into VT Trader's *Data -> Desktops -> Backups* folder.

Auto-Save Periodicity (in minutes)

This option defines how frequently (*in minutes*) VT Trader automatically saves the current state of the active desktop workspace.

Auto-Save Options Group

The **Auto-Save Options** group contains the following options:

Auto-Save on Platform Exit

While *Yes* is chosen, the active desktop workspace is automatically saved when you exit VT Trader. VT Trader will not automatically save the active desktop workspace (*layout template*) when you exit VT Trader if the broker's charting service is unavailable; this helps ensure that you will not lose your previous chart setups and associated technical analysis to an automatic save when the chart(s) cannot be loaded.

Auto-Save on Switching Workspaces

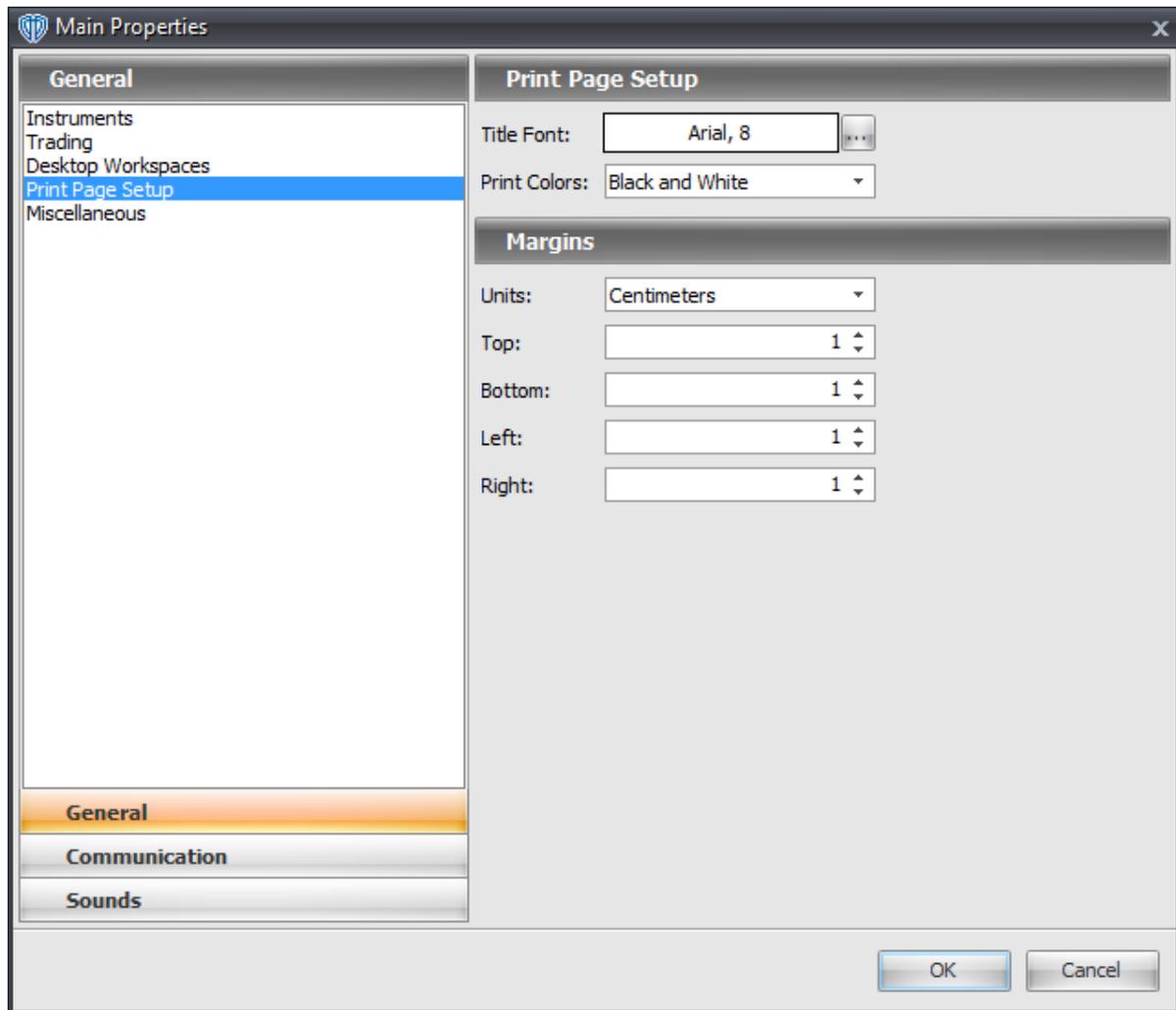
While *Yes* is chosen, the active desktop workspace is automatically saved when you switch to another desktop workspace.

Auto-Save on Account Login

While *Yes* is chosen, the active desktop workspace is automatically saved when you use the *Account Login* option to login to your account from working in *Offline* mode.

2.7.1.4 Print Page Setup

The **Print Page Setup** subsection is divided into two groups: **Print Page Setup** and **Margins**.



Print Page Setup Group

The **Print Page Setup** group contains the following options:

Title Font

This option defines the font attributes of the page title used when printing charts. You can change its font attributes by using the [...] button.

Print Colors

This option defines if charts will be printed in *Black and White* or *Full Color*.

Margins Group

The **Margins** group contains the following options:

Units

This option defines the type of measurement units used for the document's page margins. It is a selection menu with two choices: *Centimeters* and *Inches*.

Top

This option defines the document's top page margin for printed charts.

Bottom

This option defines the document's bottom page margin for printed charts.

Left

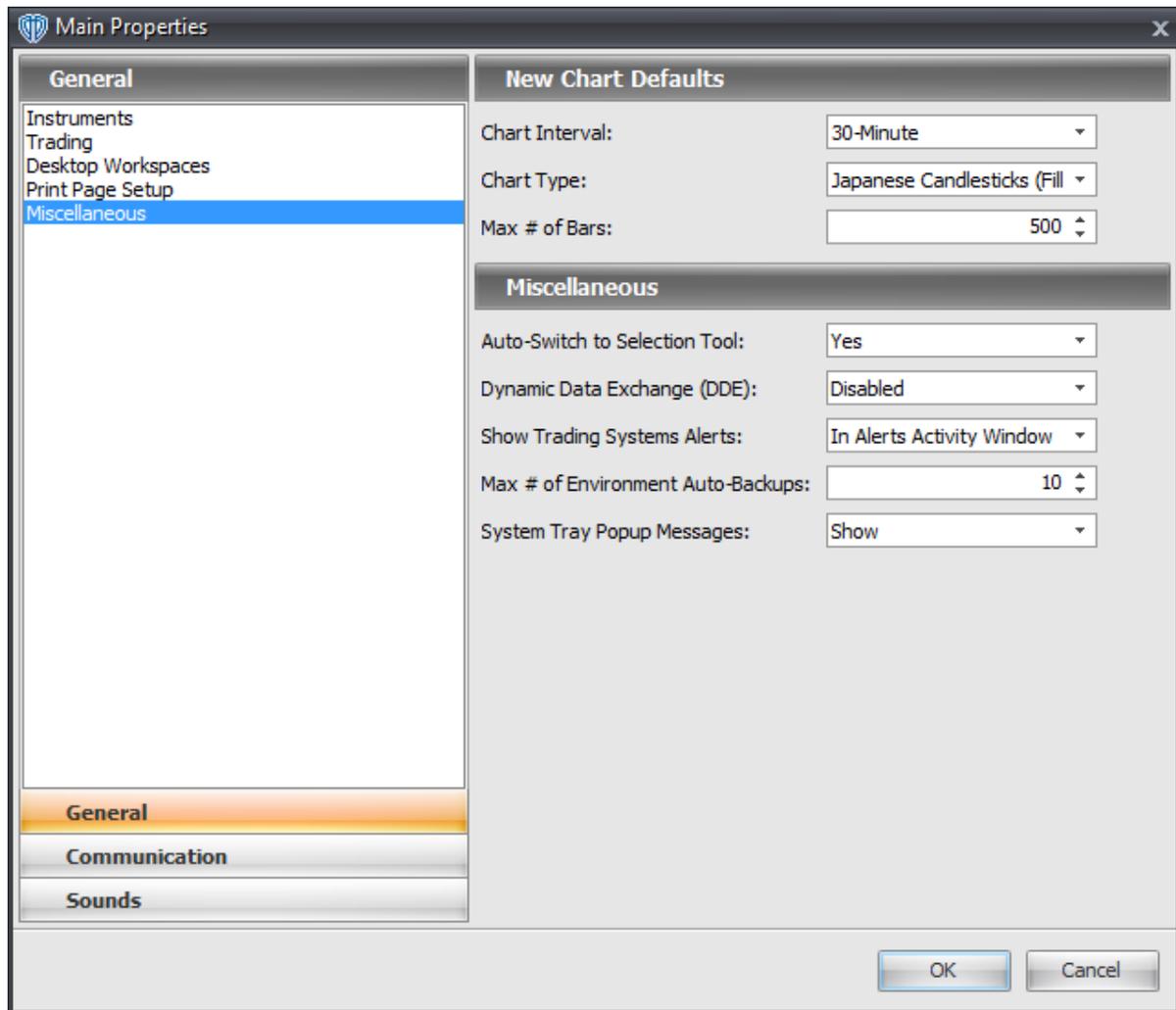
This option defines the document's left page margin for printed charts.

Right

This option defines the document's right page margin for printed charts.

2.7.1.5 Miscellaneous

The **Miscellaneous** subsection is divided into two groups: **New Chart Defaults** and **Miscellaneous**.



New Chart Defaults Group

The **New Chart Defaults** group contains the following options:

Chart Interval

This option defines the chart interval used for any new chart window being opened.

Chart Type

This option defines the chart type used for any new chart window being opened.

Max # of Bars

This option defines the number of price bars downloaded from your broker's charting service and loaded into every open chart window each time VT Trader is started. The minimum amount of price history that can be loaded is 100 price bars; the maximum number that can be loaded is 5,000 price bars. Changes made to this option's value are applied only after the next time VT Trader is started.

Miscellaneous Group

The **Miscellaneous** group contains the following options:

Auto-Switch to Selection Tool

This option is a selection menu with two choices: *Yes* and *No*. While *Yes* is chosen, the mouse cursor will automatically switch back to the *Selection Tool* after you have used one of the other drawing tools in a chart window. While *No* is chosen, the mouse cursor will remain as the selected [drawing tool](#)^[239] after being chosen (*for example, the Fibonacci Fan*); you'll be able to use the same [drawing tool](#)^[239] on the chart several times in succession without the need to reselect it each time you want to use it.

Dynamic Data Exchange (DDE)

This option is a selection menu with two choices: *Enabled* and *Disabled*. While *enabled*, you will be able to use the sample DDE.xls file distributed with VT Trader. Changes made to this option's value are applied only after the next time VT Trader is started. VT Trader must remain open and connected to your brokers services while you are using DDE commands.

Show Trading System Alerts

This option defines in which window the any active trading systems show their message alerts. It is a selection menu with two choices: *In Trading Systems Alerts Window* and *In Trading Activity Window*. While *In Trading Activity Window* is chosen, message alerts generated by active trading systems are shown in the [Trading Activity](#)^[174] window. While *In Trading Systems Alerts Window* is chosen, message alerts generated by active trading systems are shown in the **Trading Systems Alerts** window.

Max # of Environment Auto-Backups

VT Trader automatically creates *environment* backup files each time you start the platform. This option defines the maximum number of environment backup archives that VT Trader maintains. The environment backup archives created include all client files just as if you were creating an environment file for export using the [Export Environment](#)^[34] command with all options selected. All environment backup archives created are saved into VT Trader's *Data -> StartupBackups* folder.

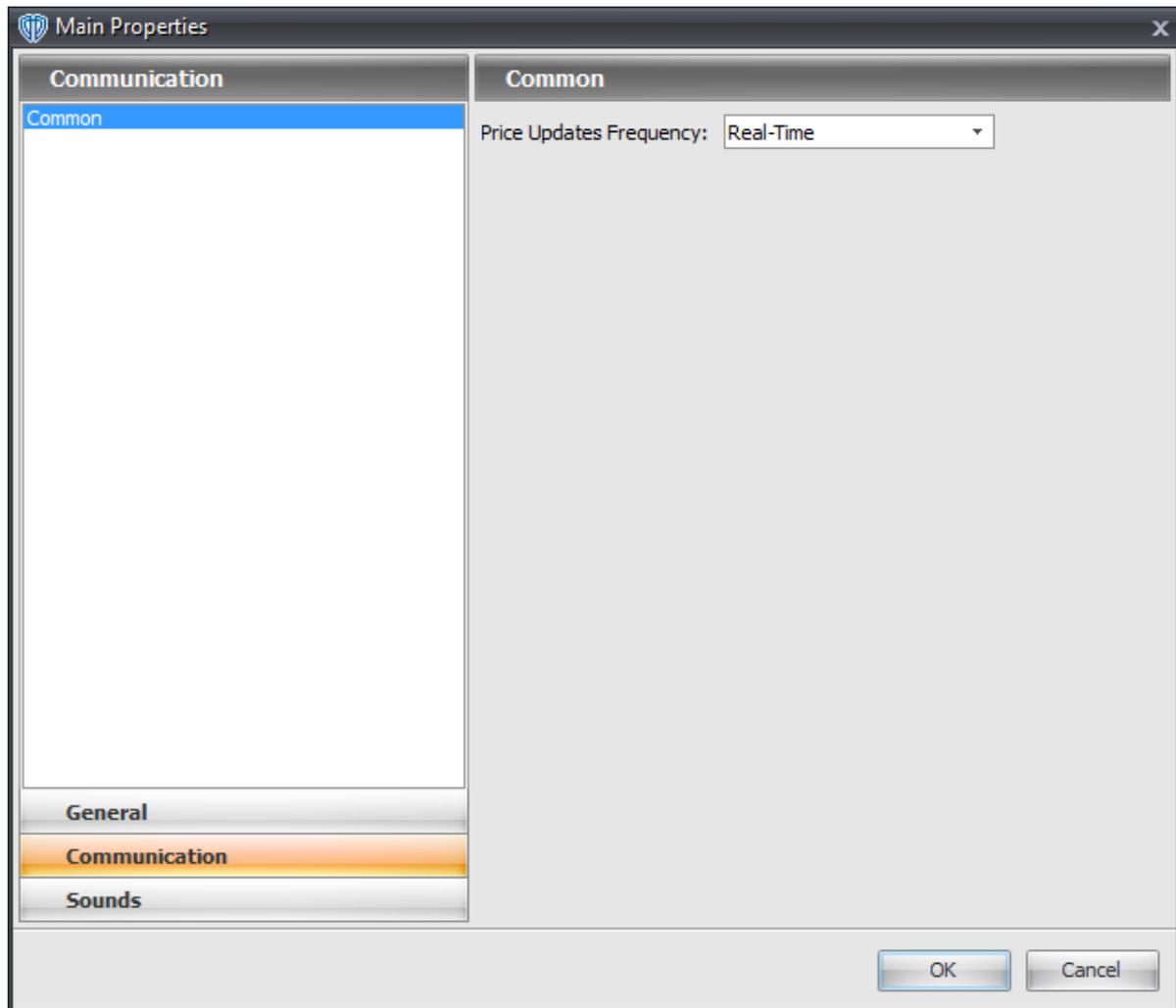
System Tray Pop-Up Messages

This option is a selection menu with two choices: *Show* and *Hide*. While *Show* is chosen, VT Trader shows messages (*price alerts, drawing tools' alerts, and trading systems' alerts*) in small pop-up windows that appear at the bottom, right side of your computer monitor.

2.7.2 Communication

2.7.2.1 Common

The **Common** subsection includes only 1 group: **Common**.



Common Group

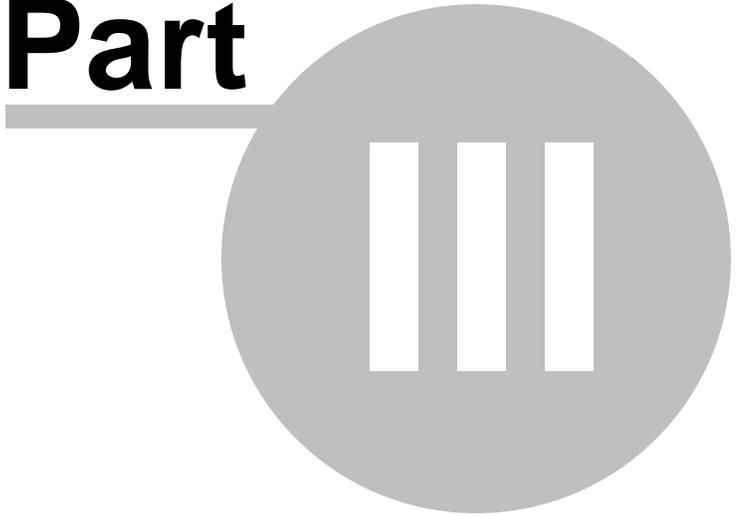
The **Common** group contains the following options:

Price Updates Frequency

This option defines the speed that VT Trader receives price updates for the available trading instruments. It is a selection menu with several choices ranging from *Real-Time* to *5 seconds*. While *Real-Time* is chosen, VT Trader receives price updates as frequently as the broker's service broadcasts those prices (*which could be up to several times per second*). While any other selection is chosen, VT Trader receives price updates from the broker's service at that respective interval.

Task Windows

Part



3 Task Windows

VT Trader's user interface is centered around the use of task windows. The general purpose of these windows is to provide you with up-to-the-second, real-time account information, trading information, alerts, news events, and important announcements. The main task windows have been divided into groups based on the type(s) of general task(s) they help you perform. To learn more about each of the task windows, please click on their names below:

Account(s) Summary

- [Account Information Status Bar](#)^[79]
- [Account Information](#)^[74]
- [Currency Portfolio](#)^[80]
- [Reports](#)^[89]

Dealing Rates

- [Quotes Board](#)^[89]
- [Advanced Rates](#)^[94]

Trading

- [Open Positions](#)^[101]
- [Pending Orders](#)^[108]
- [Trading Activity](#)^[114]

Trading Tools

- [Currency Calculator](#)^[120]
- [Pip Calculator](#)^[120]

Desktop Workspaces

- [Desktop Workspaces Management](#)^[150]

Chart Window

- [Chart Window](#)^[121]
- [Chart Templates Management](#)^[152]

Technical (Chart) Analysis

- [Data \(Chart\) Inspection](#)^[154]

Fundamental Analysis

- [Dow Jones News](#)^[166]
- [Market Commentaries](#)^[161]
- [Economic Calendar](#)^[172]

Alerts

- [New Alert...](#)^[179]
- [Active Price Alerts Summary](#)^[180]
- [Alerts Activity](#)^[174]
- Trading Systems Alerts

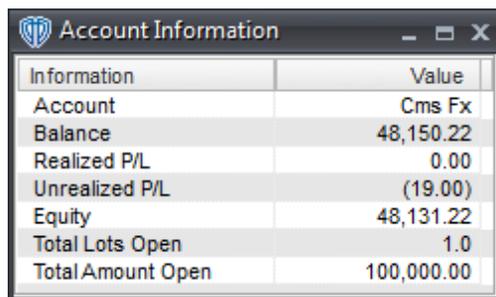
Technical Indicators and Trading Systems

- [Indicators Builder](#)^[182]
- [Indicators Quick List \(Configuration\)](#)^[235]
- Attached Indicators
- [Trading Systems Builder](#)^[205]
- [Trading Systems Quick List \(Configuration\)](#)^[236]
- Attached Trading Systems
- [Active Trading Systems Summary](#)^[181]

3.1 Accounts Summary

3.1.1 Account Information

The **Account Information** window provides you with an overview of your account(s)'s status. The **Account Information** window's [contextual menu](#)^[76] provides you with additional account-specific functionality as well as access to the window's [properties](#)^[77].



Information	Value
Account	Cms Fx
Balance	48,150.22
Realized P/L	0.00
Unrealized P/L	(19.00)
Equity	48,131.22
Total Lots Open	1.0
Total Amount Open	100,000.00

Explanations of Account Information Data

Account

Account is the name associated with the trading account. It is typically specified by the account's owner while completing the broker's customer agreement.

Balance

Balance is the sum of all deposits, interest income and realized gains less all withdrawals, realized losses and incidental fees.

Realized P/L

Realized Profit/Loss is the sum of all gains and losses on positions that have been closed out at the end of the trading day (17:00 ET).

Unrealized P/L

Unrealized Profit/Loss is the gains and losses of all open positions, calculated at the current market rate(s).

Equity (a.k.a. Margin Balance)

Equity (or **Margin Balance**) is the **Account Balance** plus all current **Realized P/L** and **Unrealized P/L**.

Total Lots Open

Total Lots Open is the cumulative sum of lots open in the account.

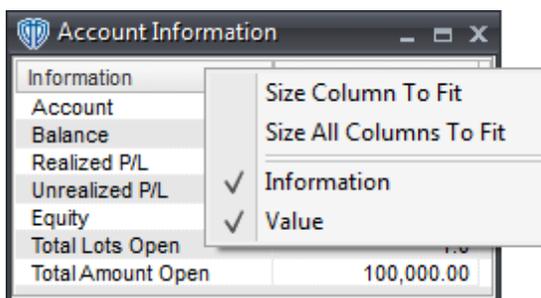
Total Amount Open

Total Amount Open is the cumulative sum of currency units open in the account respective to the total number of lots open.

Appearance Customizations

Each column of data in the **Account Information** window can be automatically (or manually) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|>. While the left mouse button is held down, move the mouse to the left or right to resize the column.

It is also possible to change the location of each column respective to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after

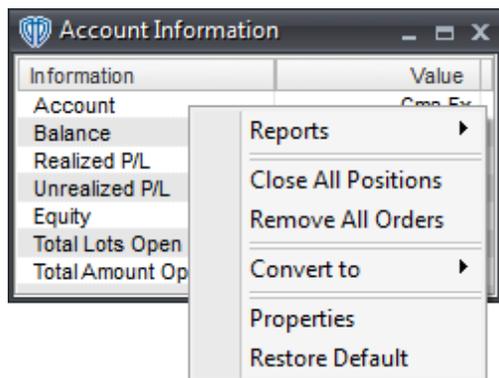
clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Information, Value*).

To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can further customize the appearance of the window and its data by using the window's [properties](#) [77].

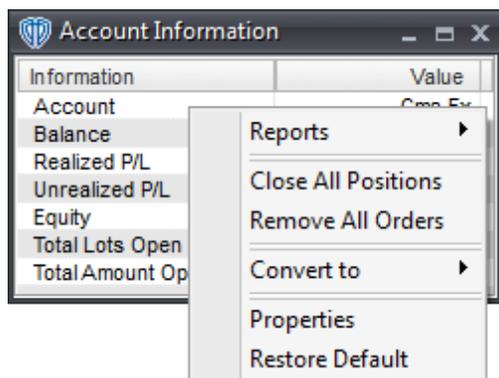
Contextual Menu

The **Account Information** window's [contextual menu](#) [76] provides you with additional functionality and access to the window's [properties](#) [77]. To activate the [contextual menu](#) [76], click the right mouse button while the cursor is positioned over any account's row.



3.1.1.1 Contextual Menu

The **Account Information** window's contextual menu provides you with additional functionality and access to the window's [properties](#) [77]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any account-related row.



The **Account Information** window's contextual menu contains the following commands:

Reports

This command is a selection menu that includes a submenu with several different report types. Each report opens in a new Internet browser window. Please click here to learn more about the available reports.

Close All Positions

This command closes all of the account's open positions at the instruments' current market prices.

Remove All Orders

This command cancels (*removes*) all of the account's orders.

Convert To

This command dynamically converts the account's *Balance*, *Realized P/L*, *Unrealized P/L*, and *Equity* into another currency using current market prices.

Properties

This command opens the **Account Information** [properties](#) window.

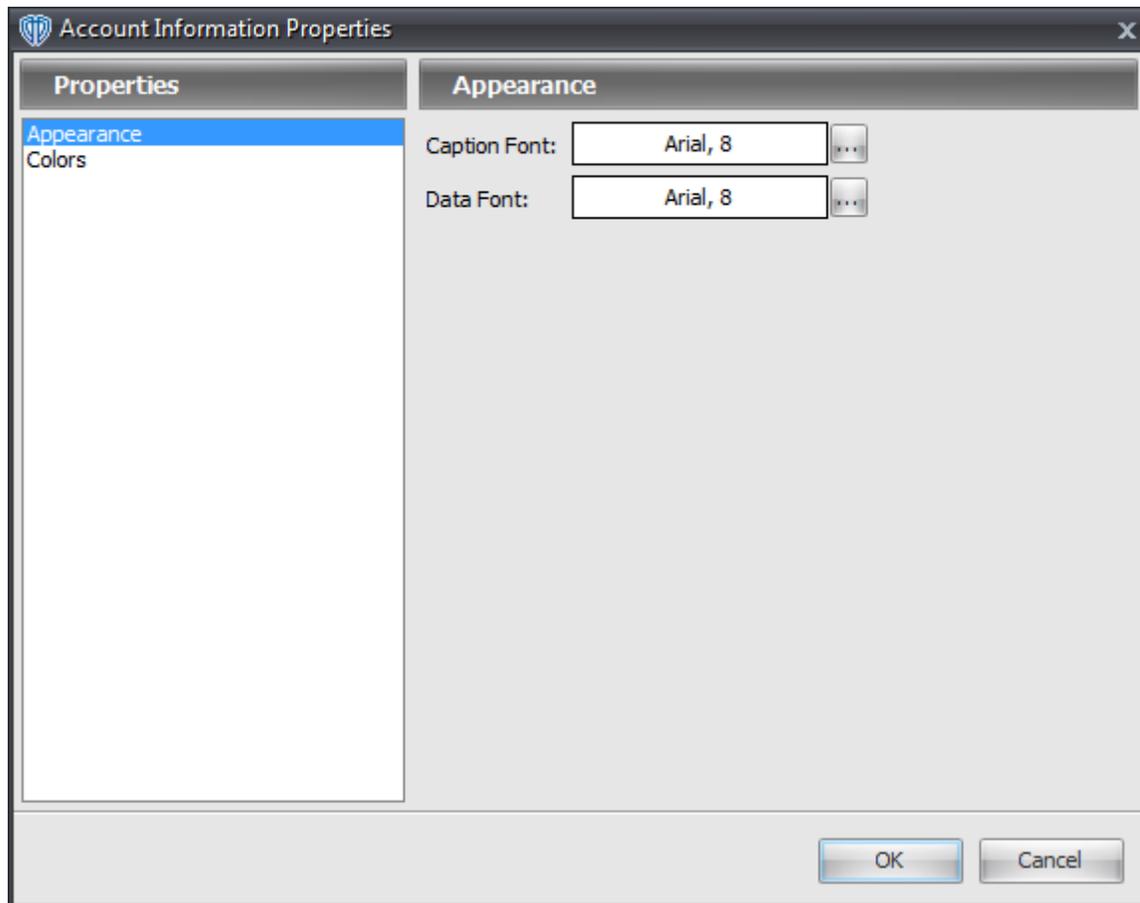
Restore Default

This command resets any custom properties currently used in the **Account Information** window back to their default values.

3.1.1.2 Properties

The **Account Information** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

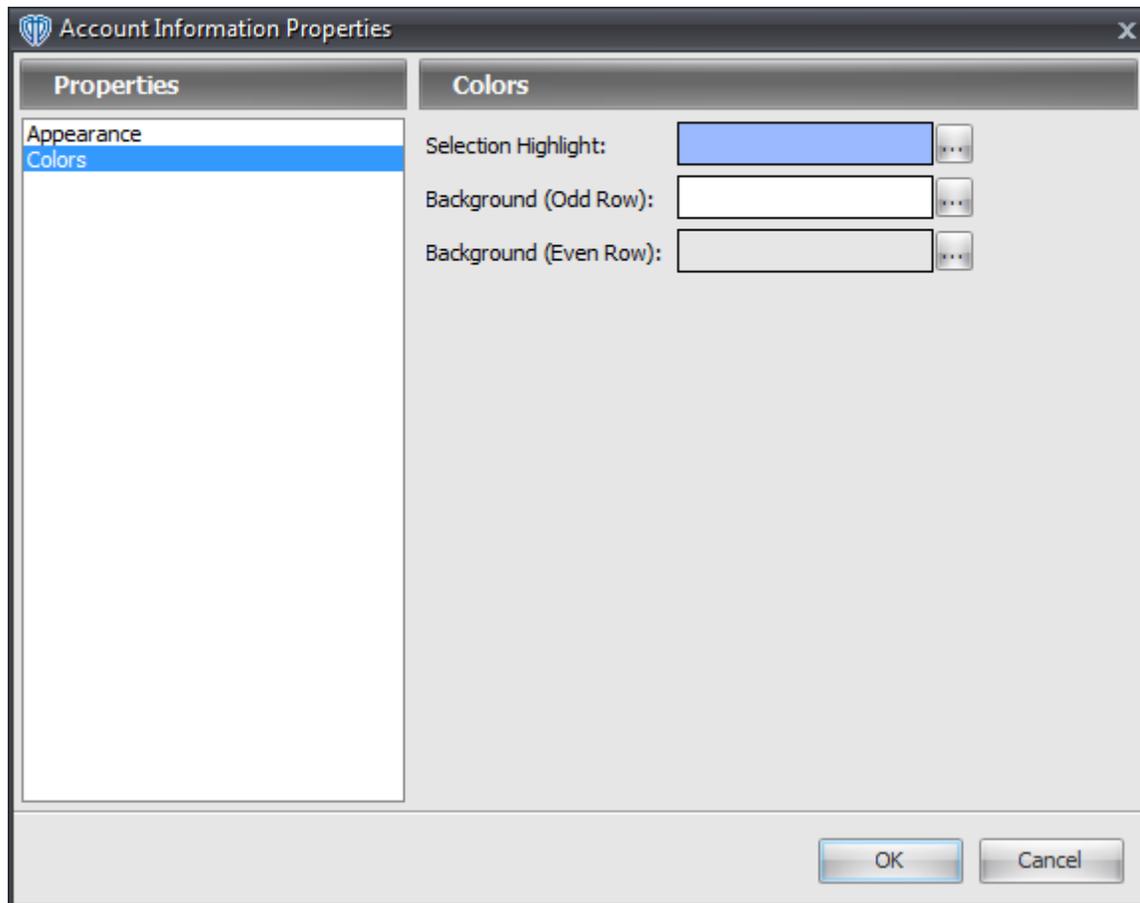
Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window. You can change the color by using the [...] button.

Background (Even Row)

This option defines the background color of all even-numbered rows in the window. You can change the color by using the [...] button.

3.1.2 Account Information Status Bar

The **Account Information** status bar provides you with an overview of your account's funds.

Account Balance: 48,150.22 Realized P/L: 0.00 Unrealized P/L: 0.00 Equity: 48,150.22

Explanations of Account Information Status Bar Data

Account Balance

Account Balance is the sum of all deposits, interest income and realized gains less all withdrawals, realized losses and incidental fees.

Realized P/L

Realized Profit/Loss is the sum of all gains and losses on positions that have been closed out at the end of the trading day (17:00 ET).

Unrealized P/L

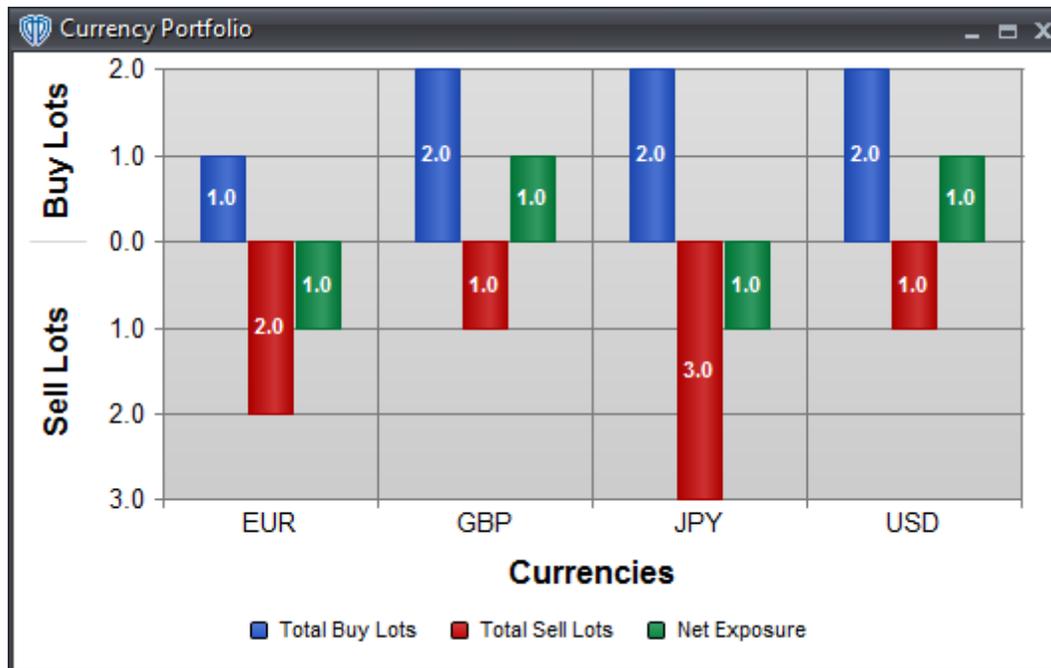
Unrealized Profit/Loss is the gains and losses of all open positions, calculated at the current market rate(s).

Equity (a.k.a. Margin Balance)

Equity (or Margin Balance) is the **Account Balance** plus all current **Realized P/L** and **Unrealized P/L**.

3.1.3 Currency Portfolio Window

The **Currency Portfolio** window provides you with per currency lot exposure statistics. The **Currency Portfolio** window shows the data in a visually appealing, easy-to-understand bar graph (*chart*) format.



Explanations of Currency Portfolio Data

Currency

The **Currency** is one of the two currencies in a currency pair (for example, in EUR/USD currency pair, EUR is one currency and USD is the other).

Total Buy Lots

Total Buy Lots is the cumulative total number of lots in all open *Buy* positions in the currency.

Total Sell Lots

Total Sell Lots is the cumulative total number of lots in all open *Sell* positions in the currency.

Net Exposure

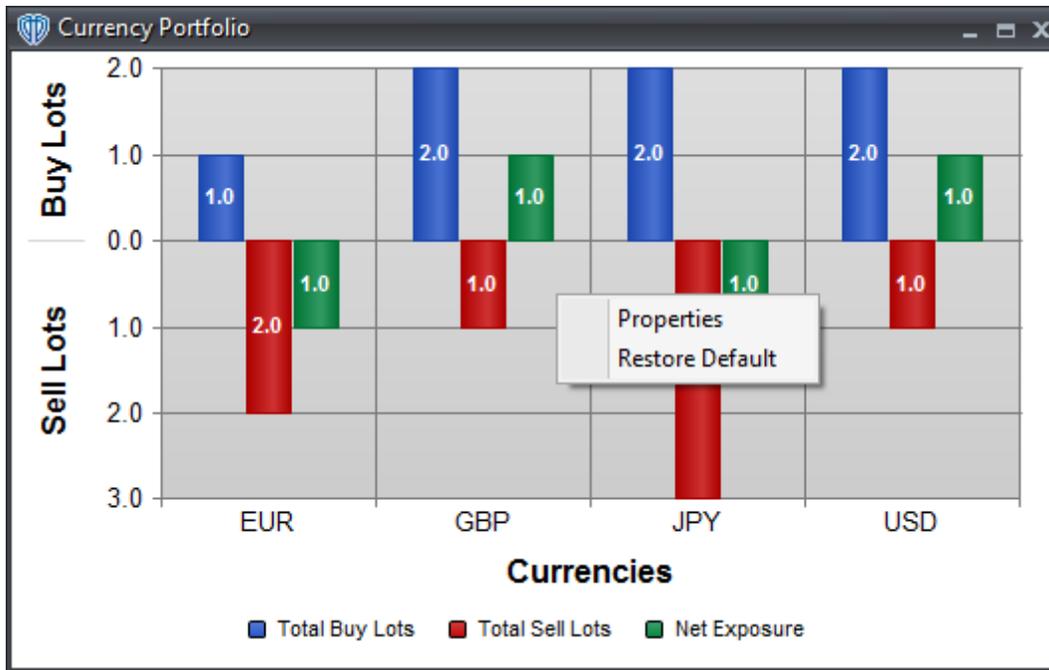
Net Exposure is the cumulative total number of lots in all open *Buy* positions in the currency minus the cumulative total number of lots in all open *Sell* positions in the currency.

Appearance Customizations

You can customize the appearance of the window and its data by using the window's [properties](#)^[83].

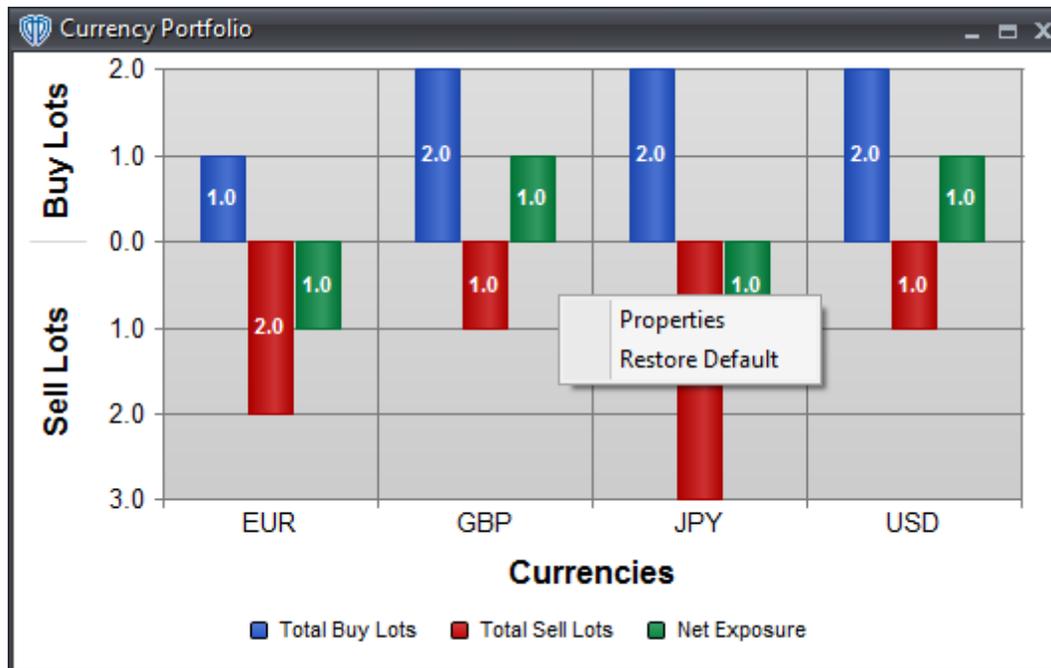
Contextual Menu

The **Currency Portfolio** window's [contextual menu](#)^[82] provides you with additional functionality and access to the window's [properties](#)^[83]. To activate the [contextual menu](#)^[82], click the right mouse button while the cursor is positioned over any part of the bar graph.



3.1.3.1 Contextual Menu

The **Currency Portfolio** window's contextual menu provides you with additional functionality and access to the window's [properties](#)^[83]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any part of the bar graph.



The **Currency Portfolio** window's contextual menu contains the following commands:

Selected Accounts, All Accounts, Select Account(s)...

You can change the data that is calculated in this window by using these menu commands. *All Accounts* includes data from all of your accounts. *Selected Accounts* includes data only from those accounts that have check marks next to them in the **Account(s) Information** window. *Select Account(s)* shows a dialog window that includes a full list of your accounts. *Enabling* or *disabling* accounts from this dialog window *enables* or *disables* those accounts in the **Account(s) Information** window.

Properties

This command opens the **Currency Portfolio** [properties](#) ^[83] window.

Restore Default

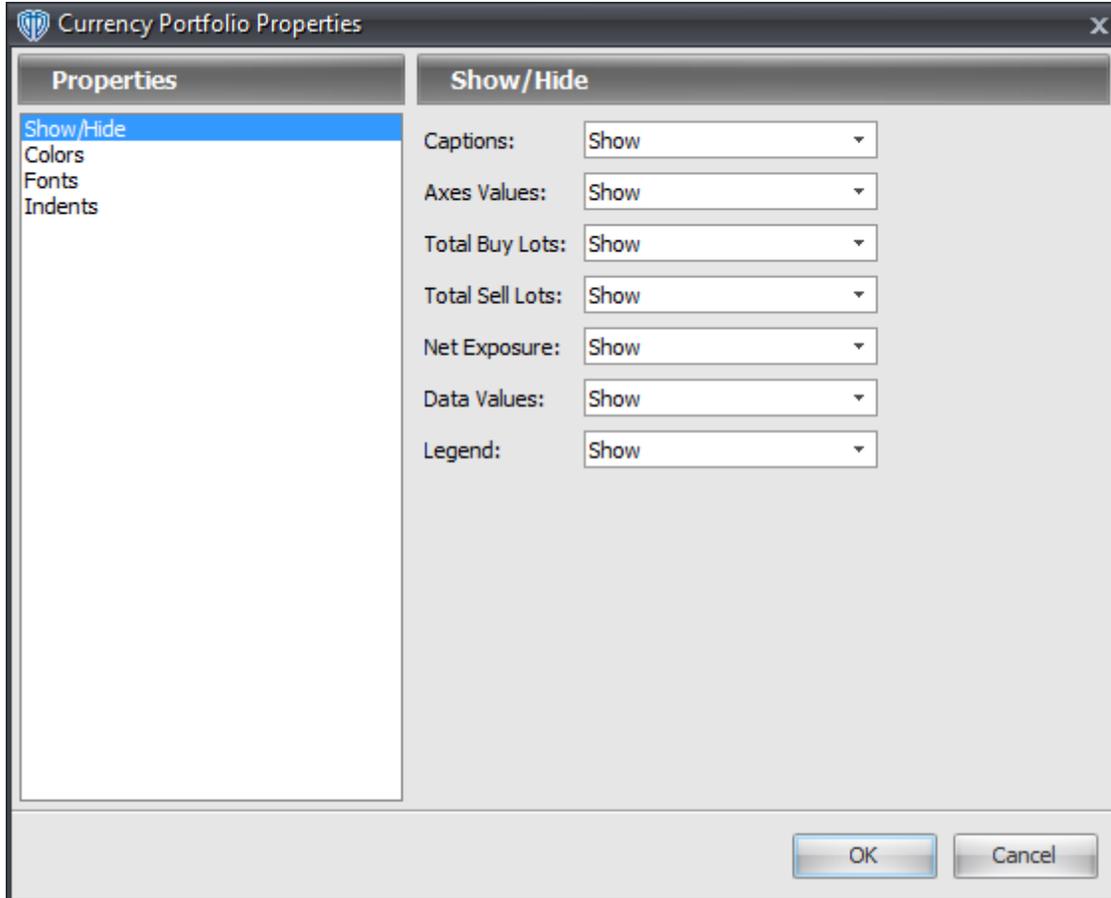
This command resets any custom properties currently used in the **Currency Portfolio** window back to their default values.

3.1.3.2 Properties

The **Currency Portfolio** properties window is divided into four sections: **Show/Hide**, **Colors**, **Fonts**, and **Indents**.

Show/Hide Section

The **Show/Hide** section shows or hides the graph's elements.



The **Show/Hide** section contains the following options:

Captions

This option *Shows* or *Hides* the graph's axes captions.

Axes Values

This option *Shows* or *Hides* the graph's axes data values (*i.e. lot values and instruments*).

Total Buy Lots

This option *Shows* or *Hides* the graph's Total Buy Lots bars.

Total Sell Lots

This option *Shows* or *Hides* the graph's Total Sell Lots bars.

Net Exposure

This option *Shows* or *Hides* the graph's Net Exposure bars.

Data Values

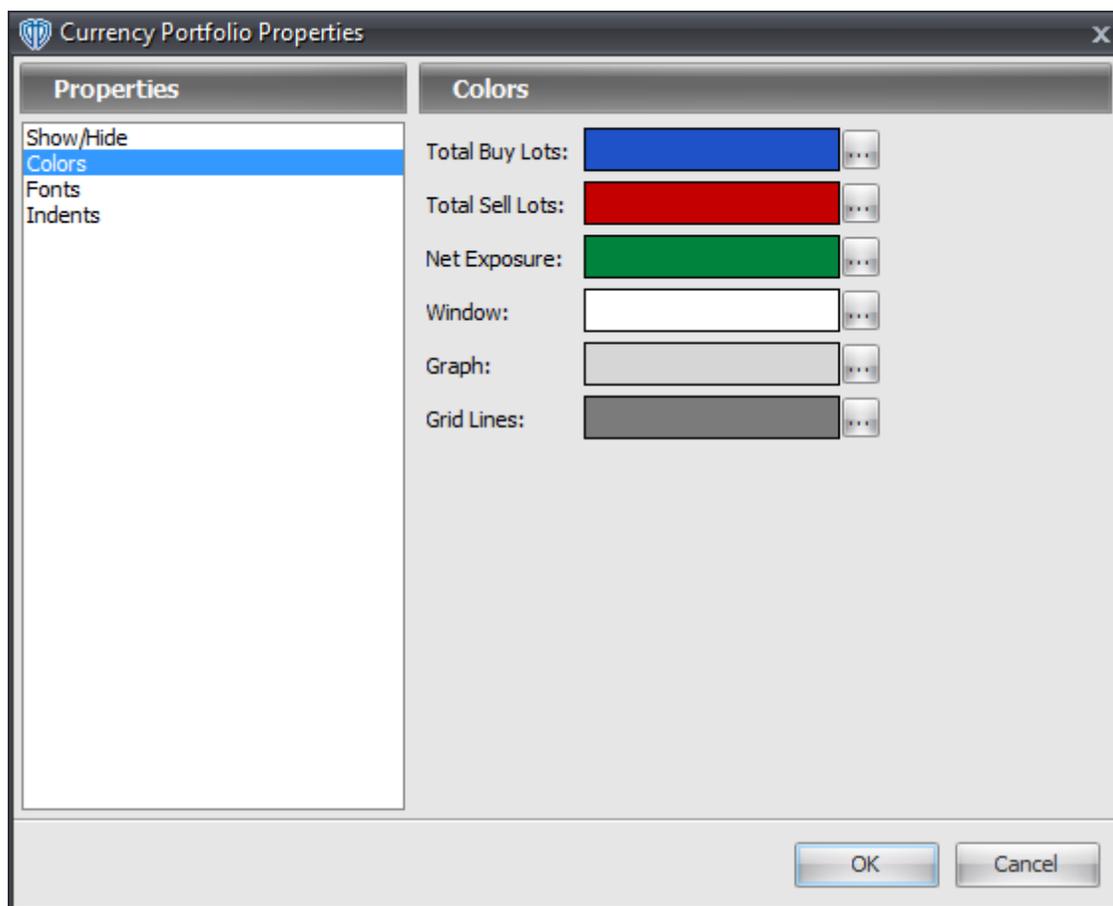
This option *Shows* or *Hides* the data values that correspond to each of the graph's bars.

Legend

This option *Shows* or *Hides* the graph's Legend.

Colors Section

The **Colors** section defines the colors of the graph's elements.



The **Colors** section contains the following options:

Total Buy Lots

This option defines the color of the graph's Total Buy Lots bars. You can change the color by using the [...] button.

Total Sell Lots

This option defines the color of the graph's Total Sell Lots bars. You can change the color by using the [...] button.

Net Exposure

This option defines the color of the graph's Net Exposure bars. You can change the color by using the [...] button.

Window

This option defines the background color of the graph's window. You can change its color by using the [...] button.

Graph

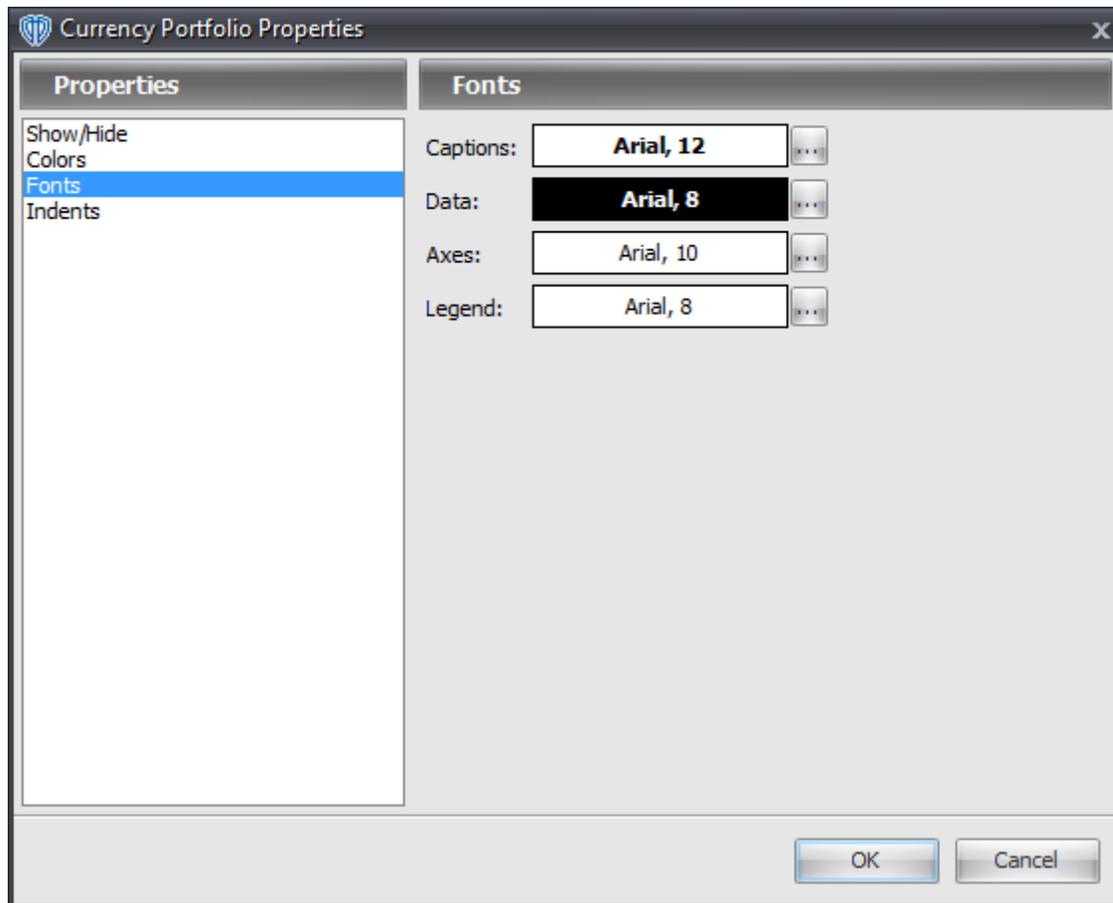
This option defines the background color of the graph. You can change its color by using the [...] button.

Grid Lines

This option defines the color of the graph's grid lines. You can change their color by using the [...] button.

Fonts Section

The **Fonts** section defines the font attributes used by the graph's text elements.



The **Fonts** section contains the following options:

Captions

This option defines font attributes for the graph's captions. You can change their font attributes by using the [...] button.

Data

This option defines font attributes for the data values that correspond to each of the graph's bars. You can change their font attributes by using the [...] button.

Axes

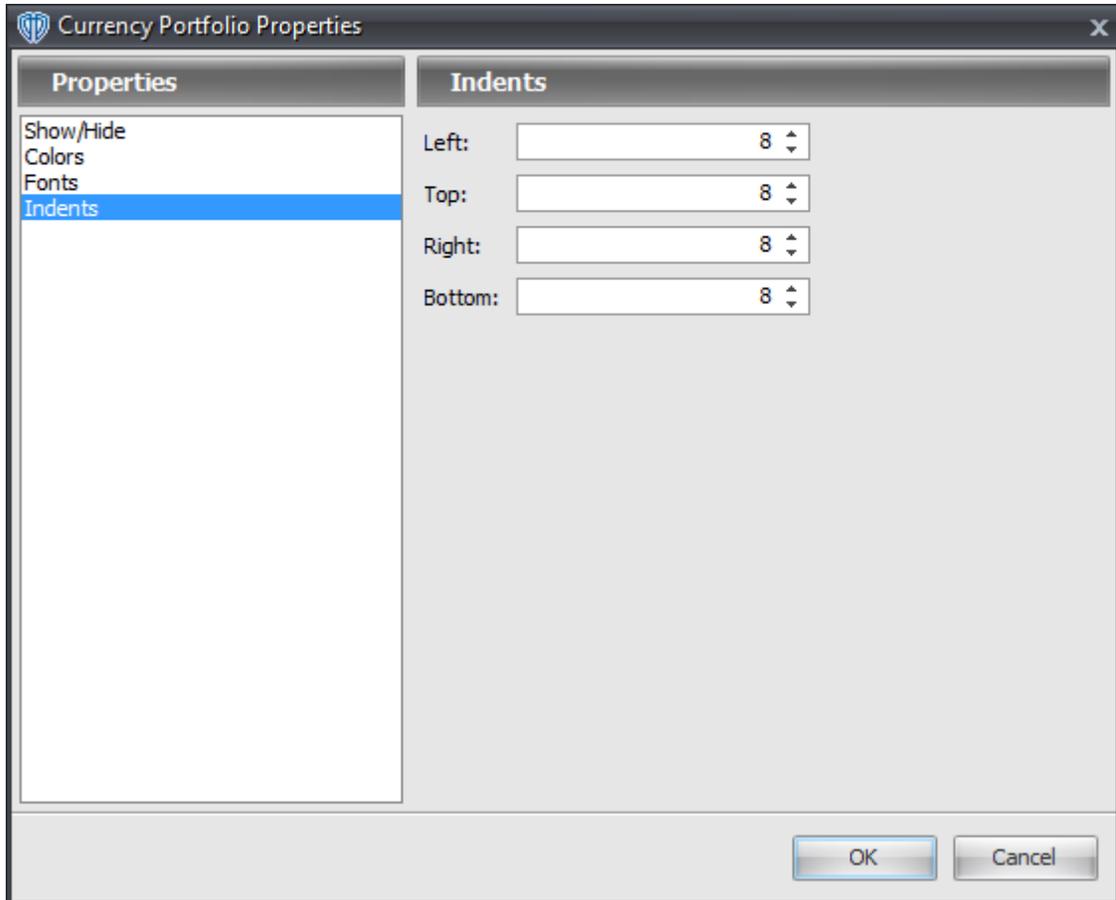
This option defines font attributes for the graph's axes values. You can change their font attributes by using the [...] button.

Legend

This option defines font attributes for the graph's legend. You can change its font attributes by using the [...] button.

Indents Section

The **Indents** section defines the spacing between the bar graph and the window's edges.



The **Indents** section contains the following options:

Left

This option defines the graph's left window margin.

Top

This option defines the graph's top window margin.

Right

This option defines the graph's right window margin.

Bottom

This option defines the graph's bottom window margin.

3.1.4 Reports

Each report opens a new Internet browser window Forex.com's *MyAccount* website *Reports* section showing that report's detailed information. Reports can be exported to Microsoft Excel or printed for your convenience. A description of each report is provided below:

Account Summary

This report provides the current account balance as well as all deposits, withdrawals, interest earned, and fees charged (*if any*) for any selected month.

Transaction History

This report provides complete trade details for any selected date range, including the deal date/time, instrument, trade direction (*buy or sell*), contract size, and executed deal rate.

Open Positions

This report provides a summary of all open positions, including contract size, USD value, average rate of open positions, current market rate, and unrealized profit/loss.

Order History

This report provides details of all order activity for a selected data range, including the order entry date/time, its reference number, and any action details for the order.

Rollover History

This report provides rollover details for any transaction held open past 17:00 EST for any selected date range, including the rollover date, rollover rate, and USD value.

Realized Profit/Loss

This report provides complete trade details with profit/loss for any selected date range, including the deal date/time, instrument, trade direction (*buy or sell*), contract size, and executed deal rate.

3.2 Dealing Rates

3.2.1 Quotes Board Window

The **Quotes Board** window contains several individual **Instrument Panels**. Each panel provides you with a unique overview of that instrument's associated market data. Please [click here](#)⁹⁰ to learn more about the **Instrument Panels** and their contextual menus.



Appearance Customizations

The instrument panels in the **Quotes Board** window can be resized by using the *Panel Size* command in an instrument panel's [contextual menu](#)^[92]. Instrument panels can be rearranged at your discretion by using the [^] and [v] buttons in the [Instruments](#)^[60] subsection of the **Options** window.

3.2.1.1 Instrument Panel

Each **Instrument Panel** in the **Quotes Board** window provides you with a unique overview of that instrument's associated market data.



You can create new price alerts and conduct trading actions on any of the available *Instruments*. *Buy* and *Sell* market orders can be requested by positioning the cursor over the Instrument panel's *Bid* (*Sell*) or *Ask* (*Buy*) buttons and clicking the left mouse button. These orders will be requested using the *Trading Mode* defined in VT Trader's **Options** window. You can also request *Buy* and *Sell* market orders, *Entry Stop Buy*, *Entry Limit Buy*, *Entry Stop Sell*, and *Entry Limit Sell* entry orders, as well as

One Cancels Other (OCO), If/Then, and If/Then OCO orders by using the panel's [contextual menu](#)^[97].

Explanations of Instrument Panel Data

Instrument

The **Instrument** (*i.e. currency pairs, CFDs, stocks, indices, etc.*) on which trading actions can be conducted is shown in the upper, left corner of the **Instrument Panel**. Each time an instrument's prices are updated, its caption area is highlighted.

Trading Mode Icon

The small icon located between the **Instrument** and the **Time** is the **Trading Mode** icon. This icon shows the current *Trading Mode* defined in VT Trader's **Options** window.

Time

Time is the most recent time that the instrument's price has changed.

Bid (Sell) and Ask (Buy)

The **Bid** is the price at which you can *sell* the instrument. The **Ask** is the price at which you can *buy* the instrument. The instrument's prices change as soon as the smallest movement of prices in the market for the instrument has occurred. When an instrument's **Bid/Ask** are updated, that instrument's **Bid** and **Ask** buttons change colors. If the new price is higher than the previous price, the **Bid/Ask** buttons turn blue; if the new price is lower than the previous price, the **Bid/Ask** buttons turn red.

Spread

The small button located between **Low** and **High** shows the **Spread**. An instrument's spread is the difference between its **Ask** price and its **Bid** price. $\text{Spread} = \text{Ask} - \text{Bid}$. The spread is determined by your broker. As a general rule the spread typically remains static, but it can change depending on the volatility in the market. Your broker determines if the spread they offer remains static or changes dynamically with market volatility.

Low

The lowest **Bid** price attained by the instrument within the current day is the **Low**. Each day is typically started at 5:00 PM ET, however, you should verify the daily rollover time with your broker.

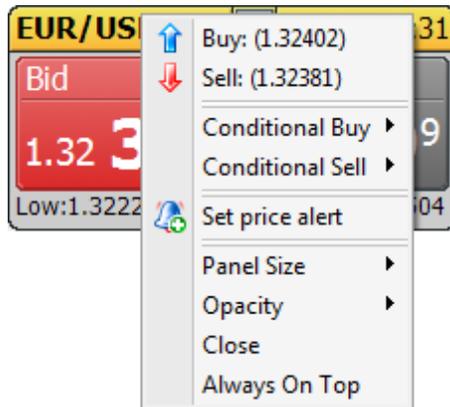
High

The highest **Ask** price attained by the instrument within the current day is the **High**. Each day is typically started at 5:00 PM ET, however, you should verify the daily rollover time with your broker.

Contextual Menu

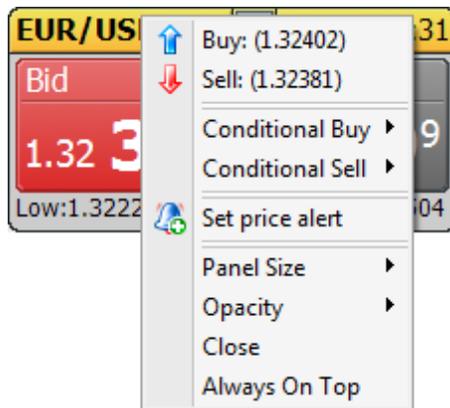
Each instrument panel's [contextual menu](#)^[97] provides you with additional functionality. To activate an

instrument panel's [contextual menu](#), click the right mouse button while the cursor is positioned over the panel.



3.2.1.1.1 Contextual Menu

Each **Instrument Panel's** contextual menu provides you with additional functionality. To activate an **Instrument Panel's** contextual menu, click the right mouse button while the cursor is positioned over the panel.



Each **Instrument Panel's** contextual menu contains the following commands:

Buy

This command requests a *Buy* market order at the instrument's current *Ask* price.

Sell

This command requests a *Sell* market order at the instrument's current *Bid* price.

Conditional Buy

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Buy* order. **Entry Limit** requests an *Entry Limit Buy* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Buy* order bias. **If/Then** requests an *If/Then* order with *Buy* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Buy* order bias.

Conditional Sell

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Sell* order. **Entry Limit** requests an *Entry Limit Sell* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Sell* order bias. **If/Then** requests an *If/Then* order with *Sell* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Sell* order bias.

New Price Alert

This command opens the [Price Alert](#)^[179] window.

Open Chart

This command opens a new chart window for that instrument.

Detach

This command is only available if the contextual menu is activated while the instrument panel is attached to the **Quotes Board** window. It actually creates an additional, duplicate instrument panel that is detached from VT Trader's main program window.

Panel Size

This command defines the visual size of the instrument panels. You may choose a *Large*, *Medium*, or *Small* panel size. Every visible instrument panel in the **Quotes Board** window will be resized according to your choice. * If the instrument panel is detached from the **Quotes Board** window, this command only affects the detached panel.

Add/Remove Instruments

This command is only available if the contextual menu is activated while the instrument panel is attached to the **Quotes Board** window. It opens the [Instruments](#)^[60] subsection of the **Options** window.

Opacity

This command is only available if the instrument panel is detached from VT Trader's main program window. You can change the opacity (*a.k.a. transparency*) level of the detached panel. 100% makes the panel completely "solid"; 90% - 10% give the detached panel increasingly greater levels of transparency as the opacity approaches zero.

Close

This command is only available if the instrument panel is detached from VT Trader's main program window. This command closes the detached instrument panel.

Always on Top

This command is only available if the instrument panel is detached from VT Trader's main program window. While *enabled*, the detached panel remains visible on top of all other open windows.

3.2.2 Advanced Rates Window

The **Advanced Rates** window provides you with a detailed overview of your chosen instruments and their associated market data.

Instrument	Bid (Sell)	Ask (Buy)	Spread	Time	High	Low	Pip Value	Currency	Trade Size	Order Size	Margin
EUR/USD	1.3628[1] ▲	1.3629[8]	1.7	11:53:43 AM	1.3737[8]	1.3576[4]	10.00	USD	100000	100000	100:1
GBP/USD	1.6128[1] ▼	1.6130[4]	2.3	11:53:46 AM	1.6133[8]	1.6009[9]	10.00	USD	100000	100000	100:1
USD/JPY	83.09[4]	83.11[4] ▲	2.0	11:53:46 AM	83.29[4]	82.33[0]	12.03	USD	100000	100000	100:1
XAU/USD	1363.60 ▼	1364.15 ▼	55.00	11:53:44 AM	1366.53	1350.93	0.10	USD	10	10	100:1
EUR/JPY	113.24[3]	113.27[4] ▼	3.1	11:53:45 AM	113.32[6]	112.60[3]	12.03	USD	100000	100000	100:1
UK Oil	101.88 ▲	101.93 ▲	5.00	11:53:39 AM	103.35	101.32	1.00	USD	100	100	100:1
US Oil	90.63 ▲	90.68 ▲	5.00	11:53:39 AM	90.85	89.28	1.00	USD	100	100	100:1
AUD/USD	1.0059[0]	1.0060[6] ▼	1.6	11:53:45 AM	1.0142[8]	1.0009[4]	10.00	USD	100000	100000	100:1
GBP/JPY	134.01[7] ▼	134.06[4]	4.7	11:53:46 AM	134.11[9]	132.46[0]	12.03	USD	100000	100000	100:1
EUR/CHF	1.3163[8]	1.3168[1] ▲	4.3	11:53:46 AM	1.3179[5]	1.3084[8]	10.35	USD	100000	100000	100:1
USD/CAD	0.9950[3]	0.9953[1] ▲	2.8	11:53:39 AM	0.9989[2]	0.9930[6]	10.05	USD	100000	100000	100:1
EUR/GBP	0.8448[6]	0.8451[5] ▲	2.9	11:53:47 AM	0.8530[3]	0.8443[4]	16.13	USD	100000	100000	100:1

You can create new price alerts and conduct trading actions on any of the available *Instruments*. *Buy* and *Sell* market orders can be requested by positioning the cursor over the Instrument's *Bid (Sell)* or *Ask (Buy)* cells and clicking the left mouse button. These orders will be requested using the *Trading Mode* defined in VT Trader's **Options** window. You can also request *Buy* and *Sell* market orders, *Entry Stop Buy*, *Entry Limit Buy*, *Entry Stop Sell*, and *Entry Limit Sell* entry orders, as well as *One Cancels Other (OCO)*, *If/Then*, and *If/Then OCO* orders by using the window's [contextual menu](#)^[97].

Explanations of Advanced Rates Data

Instrument

The **Instrument** (*i.e. currency pairs, CFDs, stocks, indices, etc.*) on which trading actions can be conducted is shown in this column. Each time an instrument's prices are updated, its cell is highlighted. The highlighting behavior is defined by the window's [properties](#)^[98].

Bid (Sell) and Ask (Buy)

The **Bid** is the price at which you can *sell* the instrument. The **Ask** is the price at which you can *buy* the instrument. The instrument's prices change as soon as the smallest movement of prices in the market for the instrument has occurred. When an instrument's **Bid/Ask** prices are updated, it is possible to draw up/down arrow graphics next to the prices and highlight the cells. The graphic drawing and highlighting behaviors are defined by the window's [properties](#)^[98].

Spread

The difference between the instrument's **Ask** price and **Bid** price is its spread. $\text{Spread} = \text{Ask} - \text{Bid}$. The spread is determined by your broker. As a general rule the spread typically remains static, but it can change depending on the volatility in the market. Your broker determines if the spread they offer remains static or changes dynamically with market volatility.

Time

Time is the most recent time that the instrument's price has changed.

High

The highest **Ask** price attained by the instrument within the current day is the **High**. Each day is typically started at 17:00 ET, however, you should verify the daily rollover time with your broker.

Low

The lowest **Bid** price attained by the instrument within the current day is the **Low**. Each day is typically started at 17:00 ET, however, you should verify the daily rollover time with your broker.

Pip Value

Pip Value is the value of 1 pip. This value is calculated in the account's currency for 1.0 standard lot of the instrument.

Currency

Currency is the currency in which the instrument's **Pip Value** is calculated.

Trade Size

The **Trade Size** is the equivalent number of units of the instrument respective to the **Lots (T)** value defined in the [Instruments](#) subsection of the **Options** window.

Order Size

The **Order Size** is the equivalent number of units of the instrument respective to the **Lots (O)** value defined in the [Instruments](#) subsection of the **Options** window.

Margin

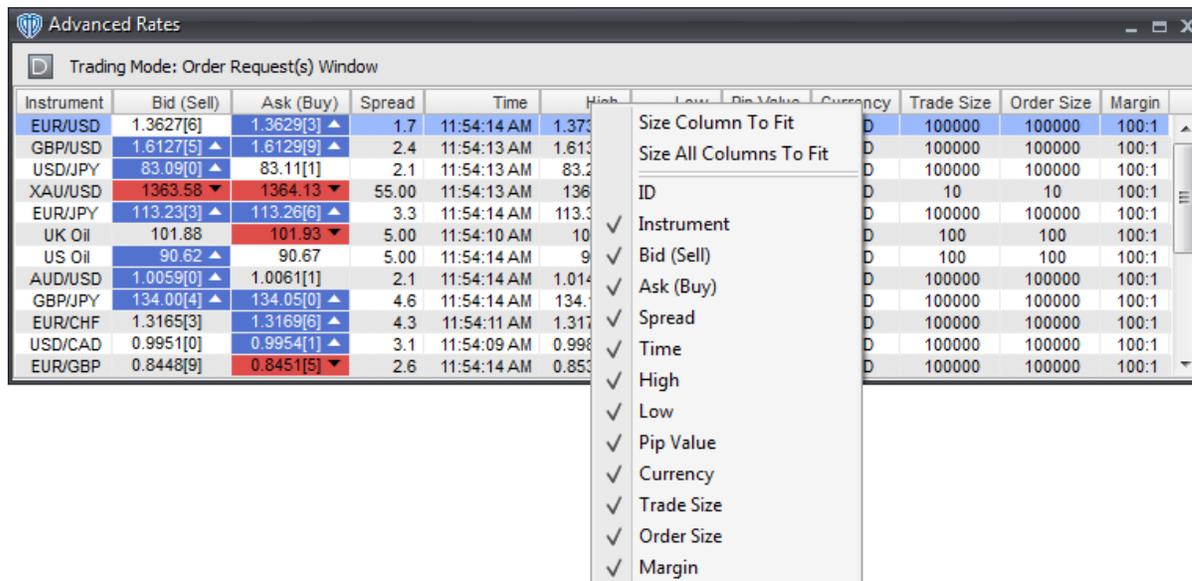
Margin is the maximum leverage ratio offered by the broker for the instrument based on your account type.

Appearance Customizations

Each column of data in the **Advanced Rates** window can be automatically (*or manually*) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the

right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|->. While the left mouse button is held down, move the mouse to the left or right to resize the column.

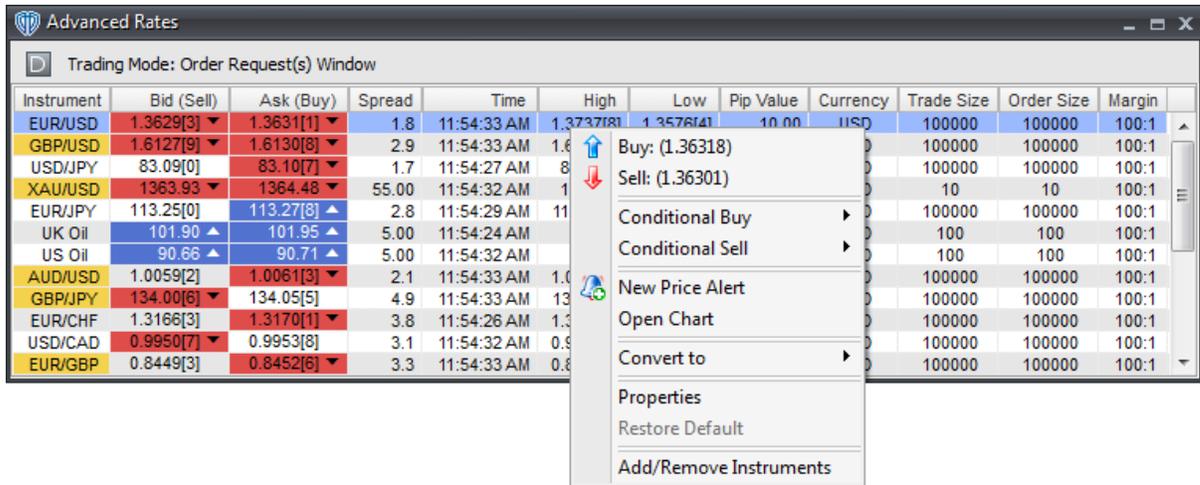
It is also possible to change the location of each column respective to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Spread, Time, Pip Value, etc.*).

To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can further customize the appearance of the window and its data by using the window's [properties](#) ^[98].

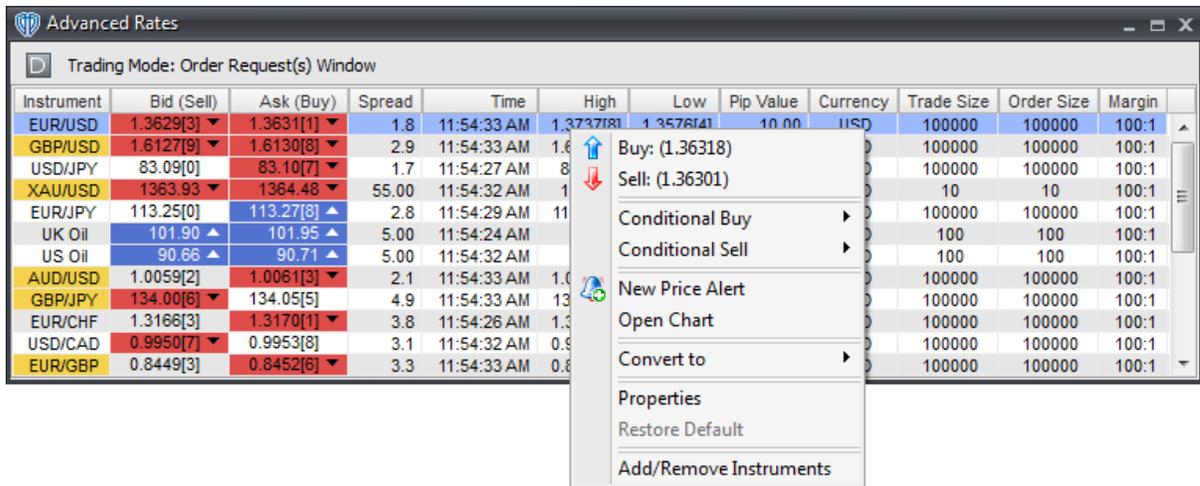
Contextual Menu

The **Advanced Rates** window's [contextual menu](#) ^[97] provides you with additional functionality and access to the window's [properties](#) ^[98]. To activate the [contextual menu](#) ^[97], click the right mouse button while the cursor is positioned over any instrument's row.



3.2.2.1 Contextual Menu

The **Advanced Rates** window's contextual menu provides you with additional functionality and access to the window's [properties](#)^[98]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any instrument's row.



The **Advanced Rates** window's contextual menu contains the following commands:

Buy

This command requests a *Buy* market order at the instrument's current *Ask* price.

Sell

This command requests a *Sell* market order at the instrument's current *Bid* price.

Conditional Buy

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Buy* order. **Entry Limit** requests an *Entry Limit Buy* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Buy* order bias. **If/Then** requests an *If/Then* order with *Buy* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Buy* order bias.

Conditional Sell

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Sell* order. **Entry Limit** requests an *Entry Limit Sell* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Sell* order bias. **If/Then** requests an *If/Then* order with *Sell* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Sell* order bias.

New Price Alert

This command opens the [Price Alert](#)^[179] window.

Open Chart

This command opens a new chart window for that instrument.

Convert To

This command dynamically converts the instruments' **Pip Value** into another currency using current market prices.

Properties

This command opens the **Advanced Rates** [properties](#)^[98] window.

Restore Default

This command resets any custom properties currently used in the **Advanced Rates** window back to their default values.

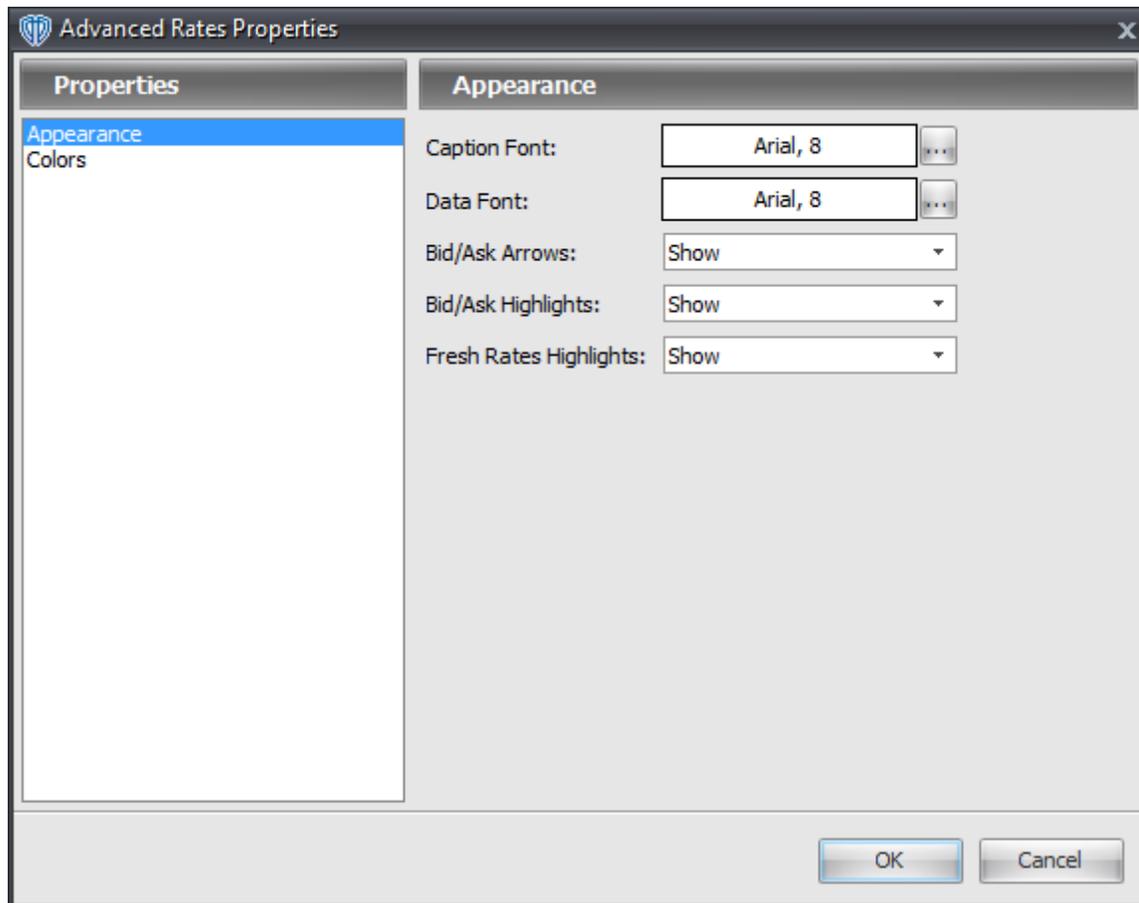
Add/Remove Instruments

This command opens the [Instruments](#)^[60] subsection of the **Options** window.

3.2.2.2 Properties

The **Advanced Rates** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Bid/Ask Arrows

This option *Shows* or *Hides* the up/down arrow graphics that can be shown in the window's *Bid (Sell)* and *Ask (Buy)* columns' cells. An up arrow is drawn if the current price is greater than the previous price while a down arrow is drawn if the current price is less than the previous price. The color of the arrow graphics are defined by the **Bid/Ask Arrow Up** and **Bid/Ask Arrow Down** options.

Bid/Ask Highlights

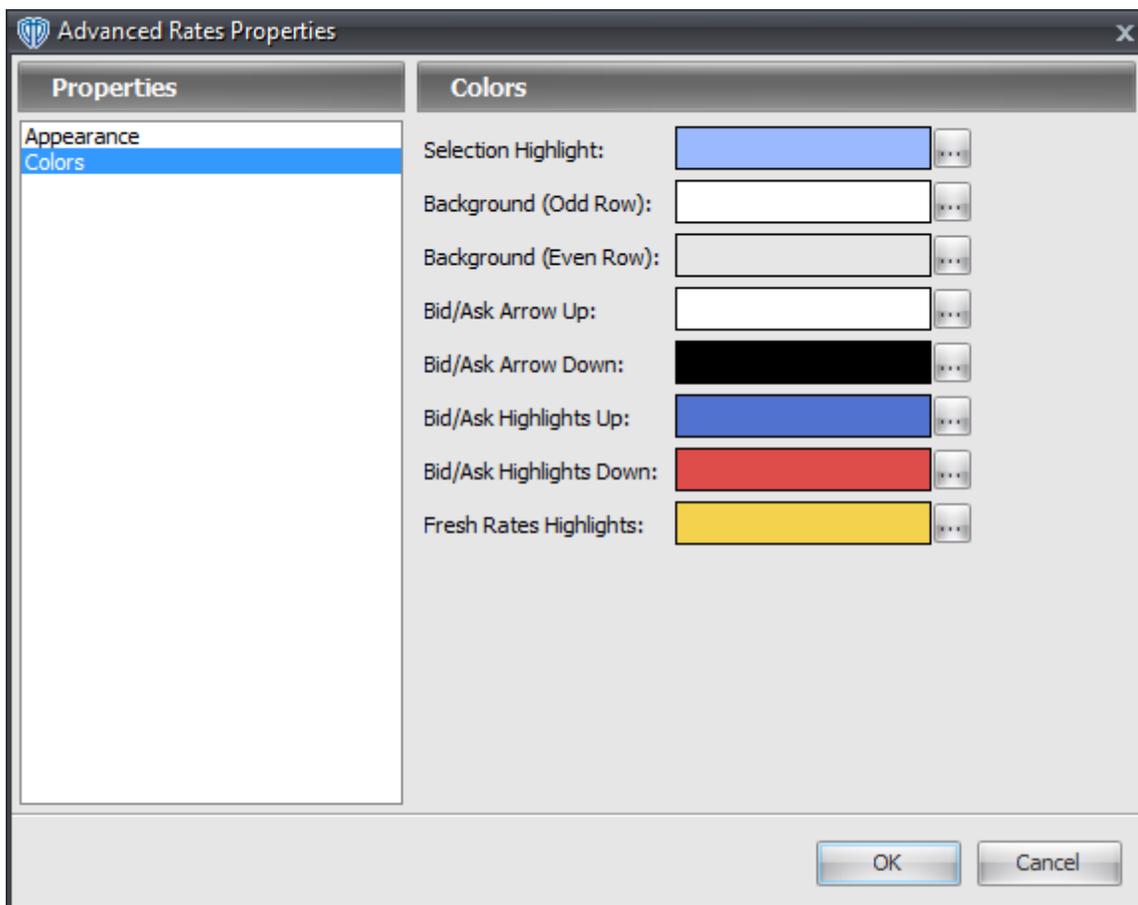
This option *Shows* or *Hides* the highlight (*i.e. background color of the cell*) that can be shown in the window's *Bid (Sell)* and *Ask (Buy)* columns' cells. The **Bid/Ask Highlights Up** option is used to

define the color the cell if the current price is greater than the previous price and the **Bid/Ask Highlights Down** option is used to define the color the cell if the current price is less than the previous price.

Fresh Rates Highlights

This option *Shows* or *Hides* the highlight (*i.e. background color of the cell*) that can be shown in the window's *Instrument* column's cells. The cell is highlighted each time updated prices are received for that instrument. The **Fresh Rates Highlights** option defines the color of cell when it is highlighted.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window. You can change

the color by using the [...] button.

Background (Even Row)

This option defines the background color of all even-numbered rows in the window. You can change the color by using the [...] button.

Bid/Ask Arrow Up

This option defines the color of the up arrow graphic shown in the *Bid (Sell)* and *Buy (Ask)* columns' cells if *Show* is chosen for the **Bid/Ask Arrows** option. You can change the color by using the [...] button.

Bid/Ask Arrow Down

This option defines the color of the down arrow graphic shown in the *Bid (Sell)* and *Buy (Ask)* columns' cells if *Show* is chosen for the **Bid/Ask Arrows** option. You can change the color by using the [...] button.

Bid/Ask Highlights Up

This option defines the color of the highlight shown in the *Bid (Sell)* and *Buy (Ask)* columns' cells if *Show* is chosen for the **Bid/Ask Highlights** option. You can change the color by using the [...] button.

Bid/Ask Highlights Down

This option defines the color of the highlight shown in the *Bid (Sell)* and *Buy (Ask)* columns' cells if *Show* is chosen for the **Bid/Ask Highlights** option. You can change the color by using the [...] button.

Fresh Rates Highlights

This option defines the color of the highlight shown in the *Instrument* column's cells if *Show* is chosen for the **Fresh Rates Highlights** option. You can change the color by using the [...] button.

3.3 Trading

3.3.1 Open Positions Window

The **Open Positions** window shows detailed information about open positions with respect to each traded instrument. The open position in any given instrument is cumulative; it is a summation of all individual deals open in that respective instrument. The **Open Positions** window's [contextual menu](#)^[104] provides you with additional position-specific and deal-specific functionality as well as access to the window's [properties](#)^[106].

Instrument	Buy/Sell	Lots	Amount	Open	Close	Stop	Limit	Pips P/L	Unrealized P/L	Currency	Date/Time
EUR/JPY	Buy	1.0	100,000.00	113.32[9]	113.31[8]	113.13[9]		-1.1	(13.23)	USD	2/10/2011 11:58:31 AM
79848281	Buy	1.0	100,000.00	113.32[9]	113.31[8]			-1.1	(13.23)	USD	2/10/2011 11:58:31 AM
GBP/USD	Sell	1.0	100,000.00	1.6124[5]	1.6123[1]	1.6154[5]	1.6094[5]	1.4	14.00	USD	2/10/2011 11:57:57 AM
79848264	Sell	1.0	100,000.00	1.6124[5]	1.6123[1]			1.4	14.00	USD	2/10/2011 11:57:57 AM
Total		2.0	200,000.00					0.3	0.77	USD	

Explanations of Open Positions Data

Instrument

This is the **Instrument** associated with the open position (*or deal*). This column also shows the reference number for each open deal in the **Instrument**.

Lots

Lots is the number of lots currently open in the instrument's cumulative position (*or in each open deal*).

Amount

Amount is the number of units of the base currency (*i.e. the first currency of the instrument; EUR in EUR/USD, for example*) respective to the number of lots being traded in the instrument's cumulative position (*or in each open deal*).

B/S

B/S is the direction of the open position (*or deal*) in the **Instrument**. *B*=Buy and *S*=Sell.

Open

Open is the Instrument's price (*Bid or Ask, respective to B/S*) that the position (*or deal*) was opened at. For the instrument's cumulative open position, it is the average open price of all open deals.

Close

Close is the Instrument's current price (*Bid or Ask, respective to B/S*) at which it is possible to immediately close the open position (*or deal(s)*).

Stop

If a conditional stop order has been attached to the open position, this column shows its price. If no conditional stop order is attached to the position, this column will be empty (*blank*).

Limit

If a conditional limit order has been attached to the open position, this column shows its price. If no conditional limit order is attached to the position, this column will be empty (*blank*).

Pips P/L

Pips P/L is the open position's floating profit/loss in pips.

Unrealized P/L

Unrealized P/L is the open position's floating profit/loss. **Unrealized P/L** is calculated in the currency shown in the **Currency** column.

Currency

Currency is the currency in which the position's (or deal's) profit or loss is calculated.

Date/Time

Date/Time is the date and time that the position (or deal) was confirmed by your broker. **Date/Time** is shown in the following format: *Month/Day/Year Hour:Minute:Seconds AM/PM*.

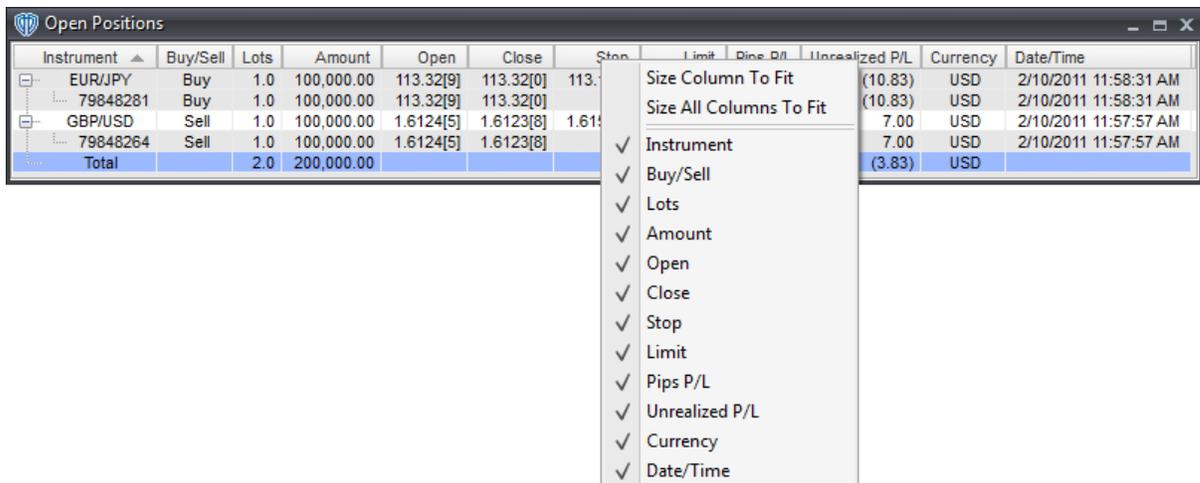
Total Row

This row (in accordance with each column's data) shows a summary status of all open positions. The values are calculated in the currency shown in the **Currency** column.

Appearance Customizations

Each column of data in the **Open Positions** window can be automatically (or manually) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|->. While the left mouse button is held down, move the mouse to the left or right to resize the column.

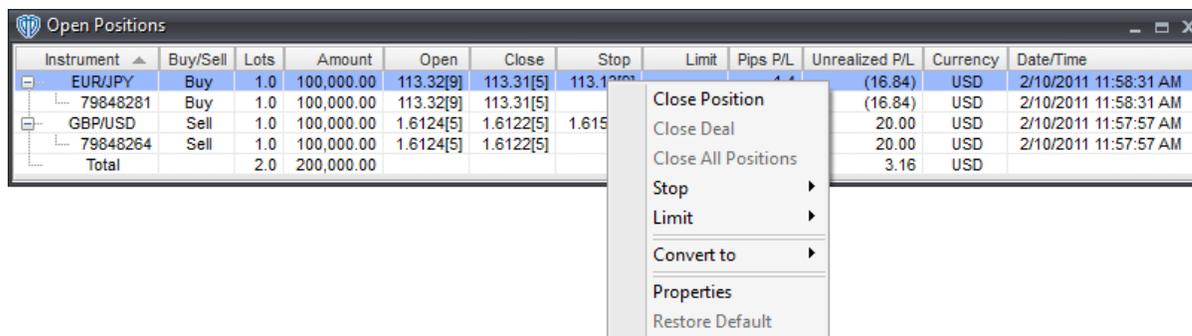
It is also possible to change the location of each column respective to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Instrument, B/S, Unrealized P/L, etc.*).

To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can further customize the appearance of the window and its data by using the window's [properties](#) ^[106].

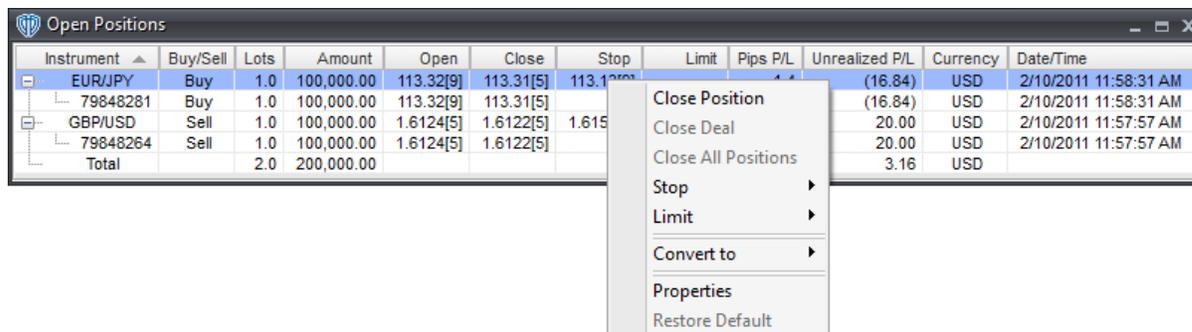
Contextual Menu

The **Open Positions** window's [contextual menu](#) ^[104] provides you with additional functionality and access to the window's [properties](#) ^[106]. To activate the [contextual menu](#) ^[104], click the right mouse button while the cursor is positioned over any position's row.



3.3.1.1 Contextual Menu

The **Open Positions** window's contextual menu provides you with additional position-specific functionality and access to the window's [properties](#) ^[106]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any position's row.



The **Open Positions** window's contextual menu contains the following commands:

Close Position

This command closes the selected open position at the instrument's current market price.

Close Deal

This command closes the selected deal at the instrument's current market price. * Note: This command is only available if your broker supports this functionality.

Close All Positions

This command closes all of the open positions shown in the window at the instruments' current market prices. * This command is only available if the contextual menu is activated while the cursor is hovering over the *Total* row.

Stop

This command is a selection menu that includes a submenu with three commands: **Attach**, **Edit**, and **Remove**. **Attach** adds (*attaches*) a new stop order to the open position. It is only active if no existing stop order exists. **Edit** modifies the existing stop order attached to the open position. It is only active if an existing stop order is attached. **Remove** deletes the existing stop order attached to the open position. It is only active if an existing stop order exists. * This command is only available for the instrument's cumulative open position row, not for its individual deals.

Limit

This command is a selection menu that includes a submenu with three commands: **Attach**, **Edit**, and **Remove**. **Attach** adds (*attaches*) a new limit order to the open position. It is only active if no existing limit order exists. **Edit** modifies the existing limit order attached to the open position. It is only active if an existing limit order is attached. **Remove** deletes the existing limit order attached to the open position. It is only active if an existing limit order exists. * This command is only available for the instrument's cumulative open position row, not for its individual deals.

Convert To

This command dynamically converts the **Open Positions** window's **Unrealized P/L** values into another currency using current market prices.

Properties

This command opens the **Open Positions** [properties](#)  window.

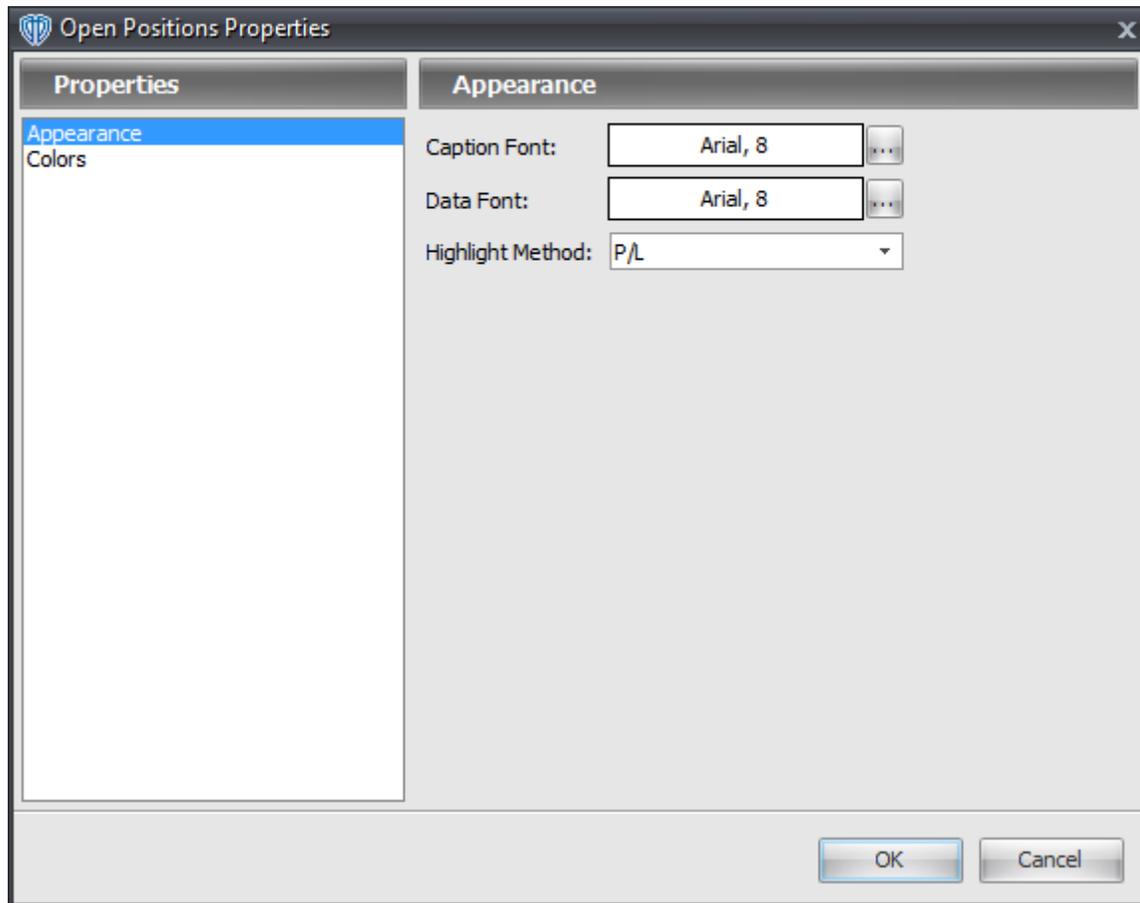
Restore Default

This command resets any custom properties currently used in the **Open Positions** window back to their default values.

3.3.1.2 Properties

The **Open Positions** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

Data Font

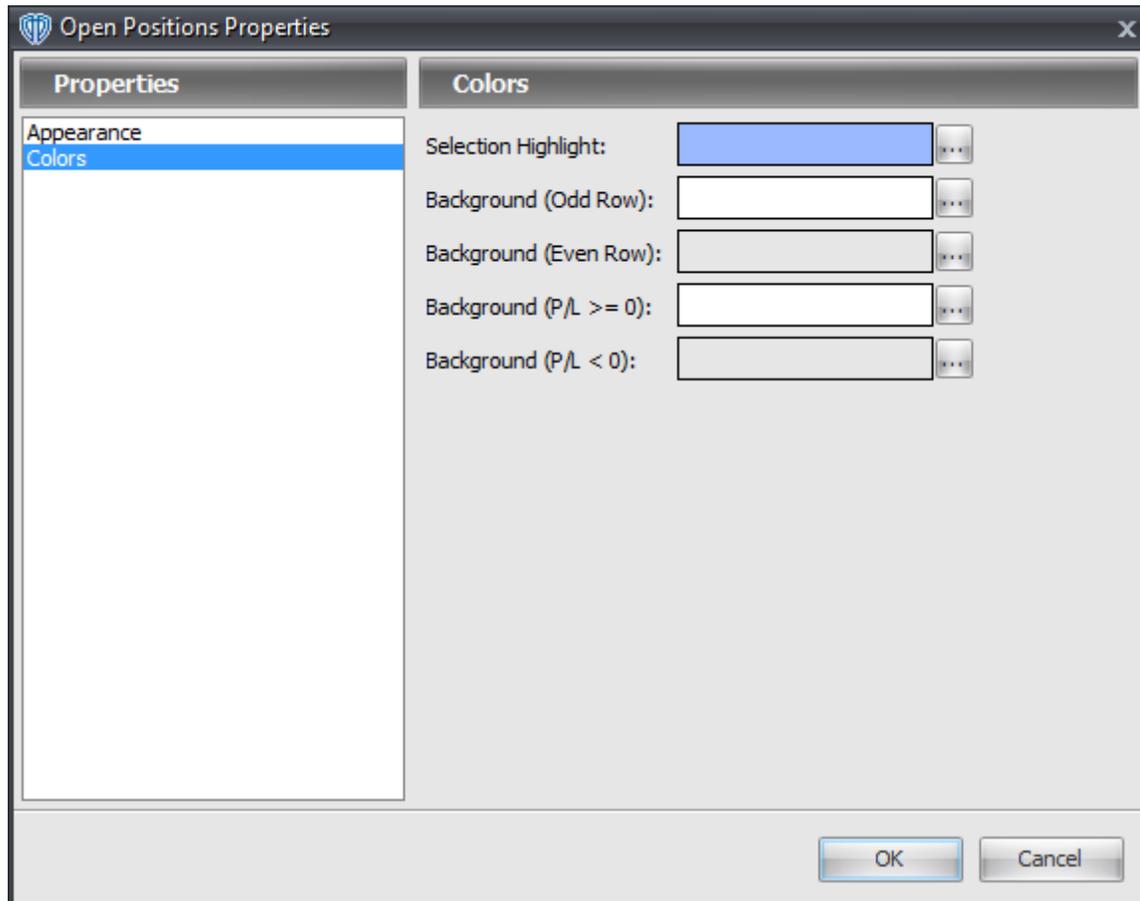
This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Highlight Method

This option defines how the background colors of the window's rows are determined. It is a selection

menu with two choices: *Background* and *P/L*. If *Background* is chosen, the **Background (Odd Row)** and **Background (Even Row)** options are used to color the rows. If *P/L* is chosen, the **Background (P/L >= 0)** and **Background (P/L < 0)** options are used to dynamically color the rows.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window while *Background* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

Background (Even Row)

This option defines the background color of all even-numbered rows in the window while *Background* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

Background (P/L >=0)

This option defines the background color of any row in the window that shows a *Net P/L* value greater than or equal to zero while *P/L* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

Background (P/L < 0)

This option defines the background color of any row in the window that shows a *Net P/L* value less than zero while *P/L* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

3.3.2 Pending Orders Window

The **Pending Orders** window shows detailed information about pending orders. The **Pending Orders** window's [contextual menu](#)^[111] provides you with additional order-specific functionality and access to the window's [properties](#)^[111].



Reference Number	Instr...	Type	Basis	Buy/Sell	Lots	Amount	Rate	Trailing Pips	Associated	Expiry	Date/Time
163537369	EUR/JPY	Single	Stop	Sell	1.0	100,000.00	113.13[9]	17	Yes	GTC	2/10/2011 11:58:46 AM
163537221	EUR/USD	Single	Limit	Sell	1.0	100,000.00	1.3640[9]		No	GTC	2/10/2011 11:57:15 AM
163537221	EUR/USD	OCO	Limit	Buy	1.0	100,000.00	1.3632[5]		No	GTC	2/10/2011 11:57:15 AM
163537221	EUR/USD	OCO	Stop	Buy	1.0	100,000.00	1.3692[5]		No	GTC	2/10/2011 11:57:15 AM
163537296	GBP/USD	Single	Limit	Buy	1.0	100,000.00	1.6094[5]		Yes	GTC	2/10/2011 11:58:16 AM
163537296	GBP/USD	Single	Stop	Buy	1.0	100,000.00	1.6154[5]		Yes	GTC	2/10/2011 11:58:16 AM

Explanations of Pending Orders Data

Reference Number

The **Reference Number** is a unique identification number assigned to the order.

Instrument

This is the **Instrument** associated with the order.

Type

Type is the type of order requested (*i.e. Single, OCO, If Then, If Then/OCO, or Trailing Stop*).

Basis

This is the **Basis** of the order requested (*i.e. Stop or Limit*).

Buy/Sell

Buy/Sell identifies whether the order is to *Buy* or *Sell* the base currency (*i.e. the first currency of*

*the instrument; EUR in EUR/USD, for example) of the **Instrument**.*

Lots

Lots is the number of lots in the order.

Amount

Amount is the number of units of the base currency (*i.e. the first currency of the instrument; EUR in EUR/USD, for example*) respective to the number of lots in the order.

Expiry

Expiry identifies when the order will be automatically canceled if it has not been activated. *GTC* =Good Till Canceled and *Day=Cancel at End of Day*.

Rate

Rate is the **instrument's** price at which the order will be executed.

Trailing Pips

Trailing Pips is the number of pips away from the current rate that the order will follow behind. This value is only available for *trailing entry stop orders* and *associated trailing stop orders*.

Associated

Associated identifies whether the order is associated (*attached*) to an open position.

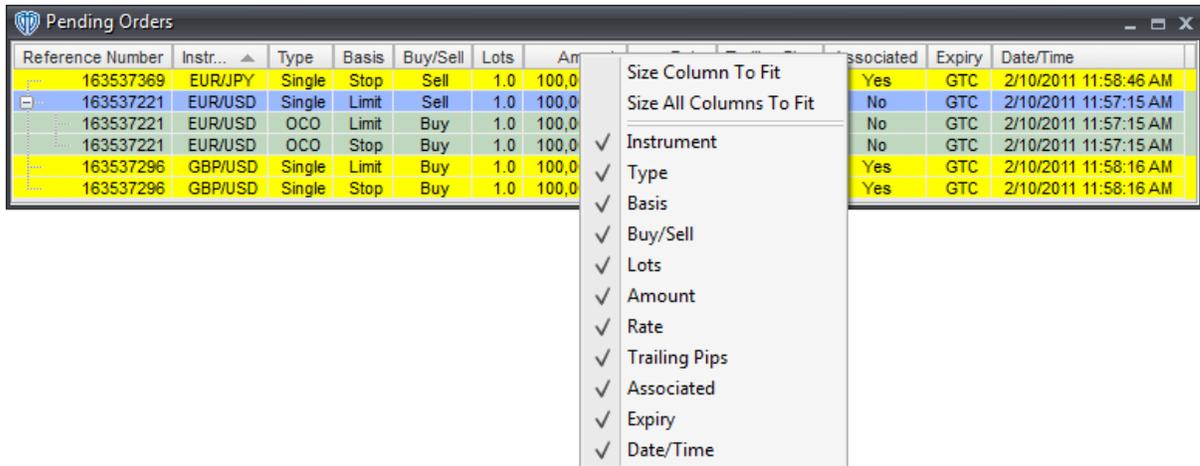
Date/Time

Date/Time is the date and time that the order was initially confirmed (*or most recently modified by you and confirmed*) by your broker. **Date/Time** is shown in the following format: *Month/Day/Year Hour:Minute:Seconds AM/PM*.

Appearance Customizations

Each column of data in the **Pending Orders** window can be automatically (*or manually*) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|->. While the left mouse button is held down, move the mouse to the left or right to resize the column.

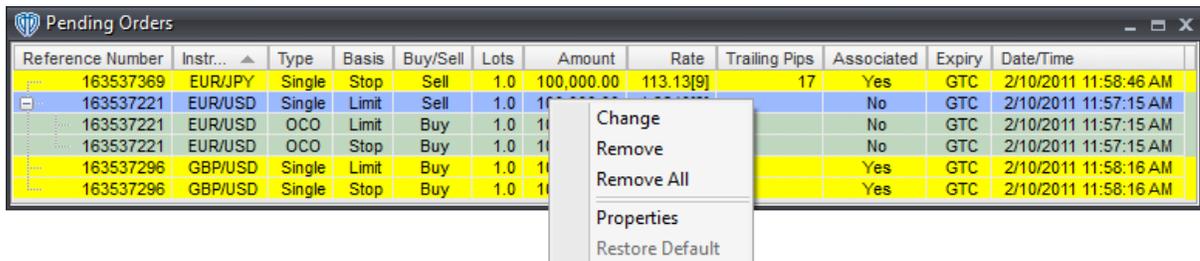
It is also possible to change the location of each column relative to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Instrument, T, Expiry, etc.*).

To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can further customize the appearance of the window and its data by using the window's [properties](#) .

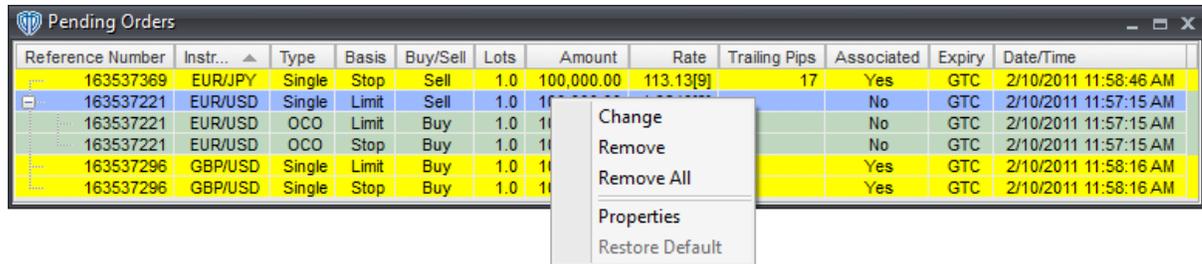
Contextual Menu

The **Pending Orders** window's [contextual menu](#)  provides you with additional functionality and access to the window's [properties](#) . To activate the [contextual menu](#) , click the right mouse button while the cursor is positioned over any position's row.



3.3.2.1 Contextual Menu

The **Pending Orders** window's contextual menu provides you with additional functionality and access to the window's [properties](#)^[11]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any order's row.



The **Pending Orders** window's contextual menu contains the following commands:

Change

This command changes the rate (*price*) of the selected order.

Remove

This command cancels (*removes*) the selected order.

Remove All

This command cancels (*removes*) all of the orders shown in the window.

Properties

This command opens the **Pending Orders** [properties](#)^[11] window.

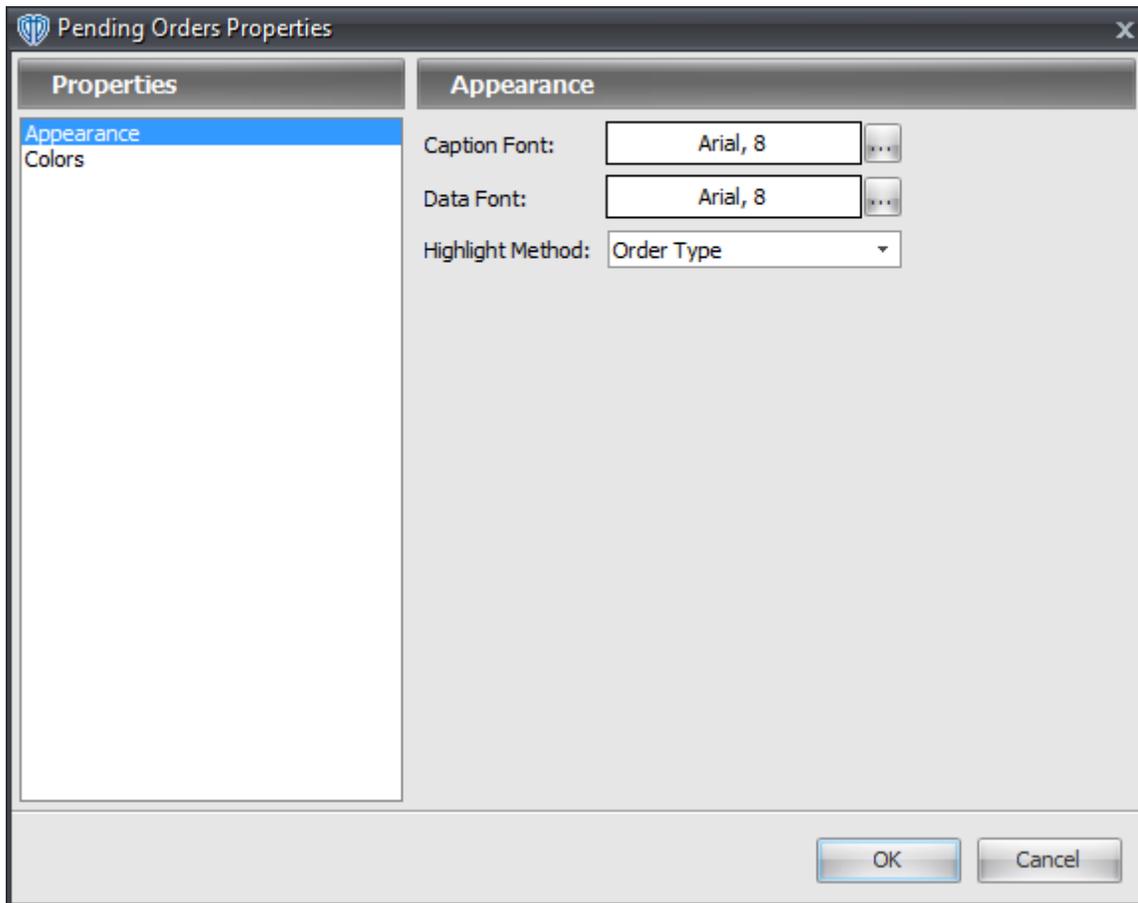
Restore Default

This command resets any custom properties currently used in the **Pending Orders** window back to their default values.

3.3.2.2 Properties

The **Pending Orders** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

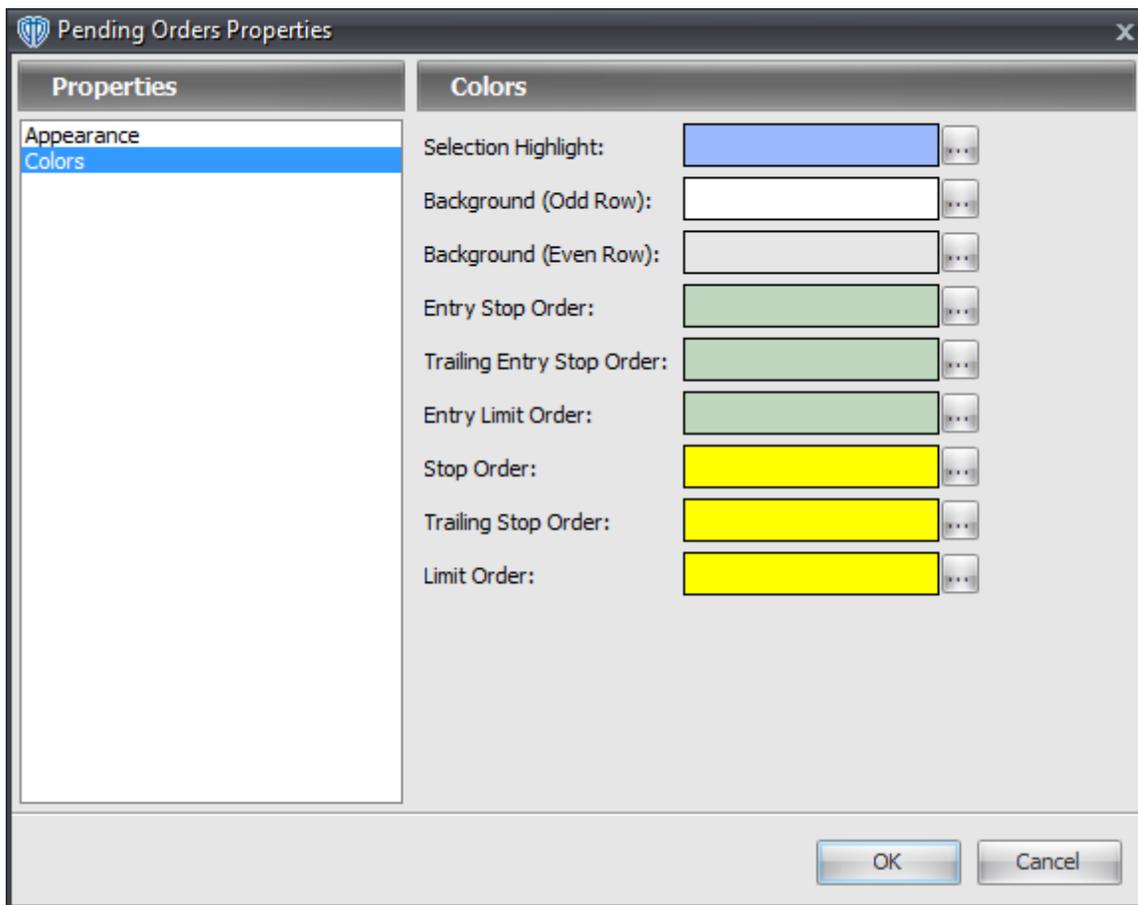
Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Highlight Method

This option defines how the background colors of the window's rows are determined. It is a selection menu with two choices: *Background* and *Order Type*. If *Background* is chosen, the **Background (Odd Row)** and **Background (Even Row)** options are used to color the rows. If *Order Type* is chosen, the order type-specific options are used to dynamically color the rows.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window while *Background* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

Background (Even Row)

This option defines the background color of all even-numbered rows in the window while *Background* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

Entry Stop Order

This option defines the background color of any row in the window that shows an entry stop order while *Order Type* is chosen as the **Highlight Method**. You can change the color by using the [...]

button.

Trailing Entry Stop Order

This option defines the background color of any row in the window that shows a trailing entry stop order while *Order Type* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

Entry Limit Order

This option defines the background color of any row in the window that shows an entry limit order while *Order Type* is chosen as the **Highlight Method**. You can change the color by using the [...] button.

Stop Order

This option defines the background color of any row in the window that shows an associated stop order while *Order Type* is chosen as the **Highlight Method**.

Trailing Stop Order

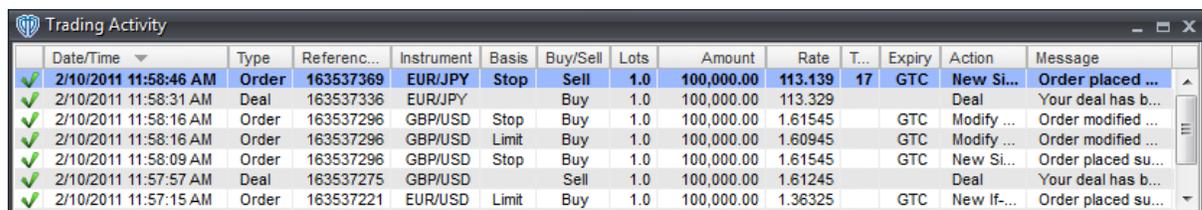
This option defines the background color of any row in the window that shows an associated trailing stop order while *Order Type* is chosen as the **Highlight Method**.

Limit Order

This option defines the background color of any row in the window that shows an associated limit order while *Order Type* is chosen as the **Highlight Method**.

3.3.3 Trading Activity Window

The **Trading Activity** window shows trading-related messages sent and received by VT Trader.



Date/Time	Type	Referenc...	Instrument	Basis	Buy/Sell	Lots	Amount	Rate	T...	Expiry	Action	Message
2/10/2011 11:58:46 AM	Order	163537369	EUR/JPY	Stop	Sell	1.0	100,000.00	113.139	17	GTC	New Si...	Order placed ...
2/10/2011 11:58:31 AM	Deal	163537336	EUR/JPY		Buy	1.0	100,000.00	113.329			Deal	Your deal has b...
2/10/2011 11:58:16 AM	Order	163537296	GBP/USD	Stop	Buy	1.0	100,000.00	1.61545		GTC	Modify ...	Order modified ...
2/10/2011 11:58:16 AM	Order	163537296	GBP/USD	Limit	Buy	1.0	100,000.00	1.60945		GTC	Modify ...	Order modified ...
2/10/2011 11:58:09 AM	Order	163537296	GBP/USD	Stop	Buy	1.0	100,000.00	1.61545		GTC	New Si...	Order placed su...
2/10/2011 11:57:57 AM	Deal	163537275	GBP/USD		Sell	1.0	100,000.00	1.61245			Deal	Your deal has b...
2/10/2011 11:57:15 AM	Order	163537221	EUR/USD	Limit	Buy	1.0	100,000.00	1.36325		GTC	New If...	Order placed su...

Explanations of Trading Activity Data

Date/Time

Date/Time is the date and time of the requested action. **Date/Time** is shown in the following format: *Month/Day/Year Hour:Minute:Seconds AM/PM*.

Type

Type identifies the type of action (*Deal or Order*) that was requested.

Reference Number

The **Reference Number** is a unique identification number that identifies the action.

Instrument

This is the **Instrument** associated with the action.

Basis

Basis identifies the order basis for the action (*i.e. Stop or Limit*)

Buy/Sell

Buy/Sell identifies the directional bias for the action.

Lots

Lots is the number of lots for the action.

Amount

Amount is the number of units of the base currency (*i.e. the first currency of the instrument; EUR in EUR/USD, for example*) respective to the number of lots for the requested action.

Expiry

Expiry identifies the order expiration. *GTC=Good Till Canceled* and *Day=Cancel at End of Day*. This information is only provided for orders.

Rate

Rate is the instrument's price at which the action was requested.

Trailing Pips

Trailing Pips is the number of pips away from the current rate that the order will follow behind. This value is only available for *trailing entry stop orders* and *associated trailing stop orders*.

Action

Action defines the action being requested.

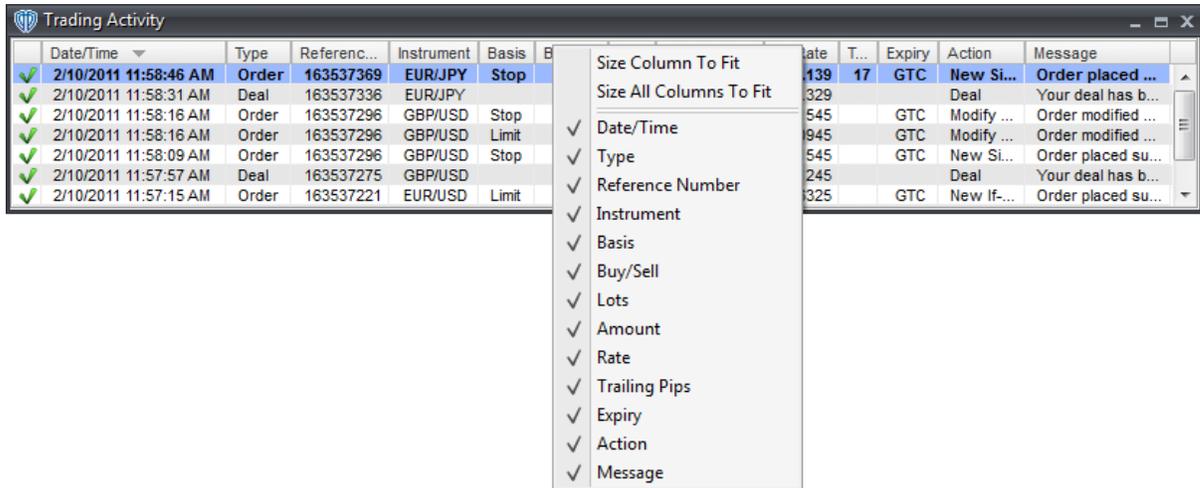
Message

The **Message** provides details pertaining to the action that generated the message.

Appearance Customizations

Each column of data in the **Trading Activity** window can be automatically (*or manually*) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|>. While the left mouse button is held down, move the mouse to the left or right to resize the column.

It is also possible to change the location of each column respective to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Date/Time, Instrument, Message, etc.*).

To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can customize the appearance of the window and its data by using the window's [properties](#)^[117].

Contextual Menu

The **Trading Activity** window's [contextual menu](#)^[117] provides you with additional functionality and access to the window's [properties](#)^[117]. To activate the [contextual menu](#)^[117], click the right mouse button while the cursor is positioned over any message's row.

Date/Time	Type	Referenc...	Instrument	Basis	Buy/Sell	Lots	Amount	Rate	T...	Expiry	Action	Message
2/10/2011 11:58:46 AM	Order	163537369	EUR/JPY	Stop	Sell	1.0	100,000.00	113.139	17	GTC	New Si...	Order placed ...
2/10/2011 11:58:31 AM	Deal	163537336	EUR/JPY		Buy			113.329			Deal	Your deal has b...
2/10/2011 11:58:16 AM	Order	163537296	GBP/USD	Stop	Buy			1.61545		GTC	Modify ...	Order modified ...
2/10/2011 11:58:16 AM	Order	163537296	GBP/USD	Limit	Buy			1.60945		GTC	Modify ...	Order modified ...
2/10/2011 11:58:09 AM	Order	163537296	GBP/USD	Stop	Buy			1.61545		GTC	New Si...	Order placed su...
2/10/2011 11:57:57 AM	Deal	163537275	GBP/USD		Sell			1.61245			Deal	Your deal has b...
2/10/2011 11:57:15 AM	Order	163537221	EUR/USD	Limit	Buy			1.36325		GTC	New If...	Order placed su...

3.3.3.1 Contextual Menu

The **Trading Activity** window's contextual menu provides you with additional functionality. To activate the contextual menu, click the right mouse button while the cursor is positioned over any message's row.

Date/Time	Type	Referenc...	Instrument	Basis	Buy/Sell	Lots	Amount	Rate	T...	Expiry	Action	Message
2/10/2011 11:58:46 AM	Order	163537369	EUR/JPY	Stop	Sell	1.0	100,000.00	113.139	17	GTC	New Si...	Order placed ...
2/10/2011 11:58:31 AM	Deal	163537336	EUR/JPY		Buy			113.329			Deal	Your deal has b...
2/10/2011 11:58:16 AM	Order	163537296	GBP/USD	Stop	Buy			1.61545		GTC	Modify ...	Order modified ...
2/10/2011 11:58:16 AM	Order	163537296	GBP/USD	Limit	Buy			1.60945		GTC	Modify ...	Order modified ...
2/10/2011 11:58:09 AM	Order	163537296	GBP/USD	Stop	Buy			1.61545		GTC	New Si...	Order placed su...
2/10/2011 11:57:57 AM	Deal	163537275	GBP/USD		Sell			1.61245			Deal	Your deal has b...
2/10/2011 11:57:15 AM	Order	163537221	EUR/USD	Limit	Buy			1.36325		GTC	New If...	Order placed su...

The **Trading Activity** window's contextual menu contains the following commands:

Clear Log

This command erases the contents of the window.

Save Log

This command saves the contents of the window to a text file.

Properties

This command opens the **Trading Activity properties** window.

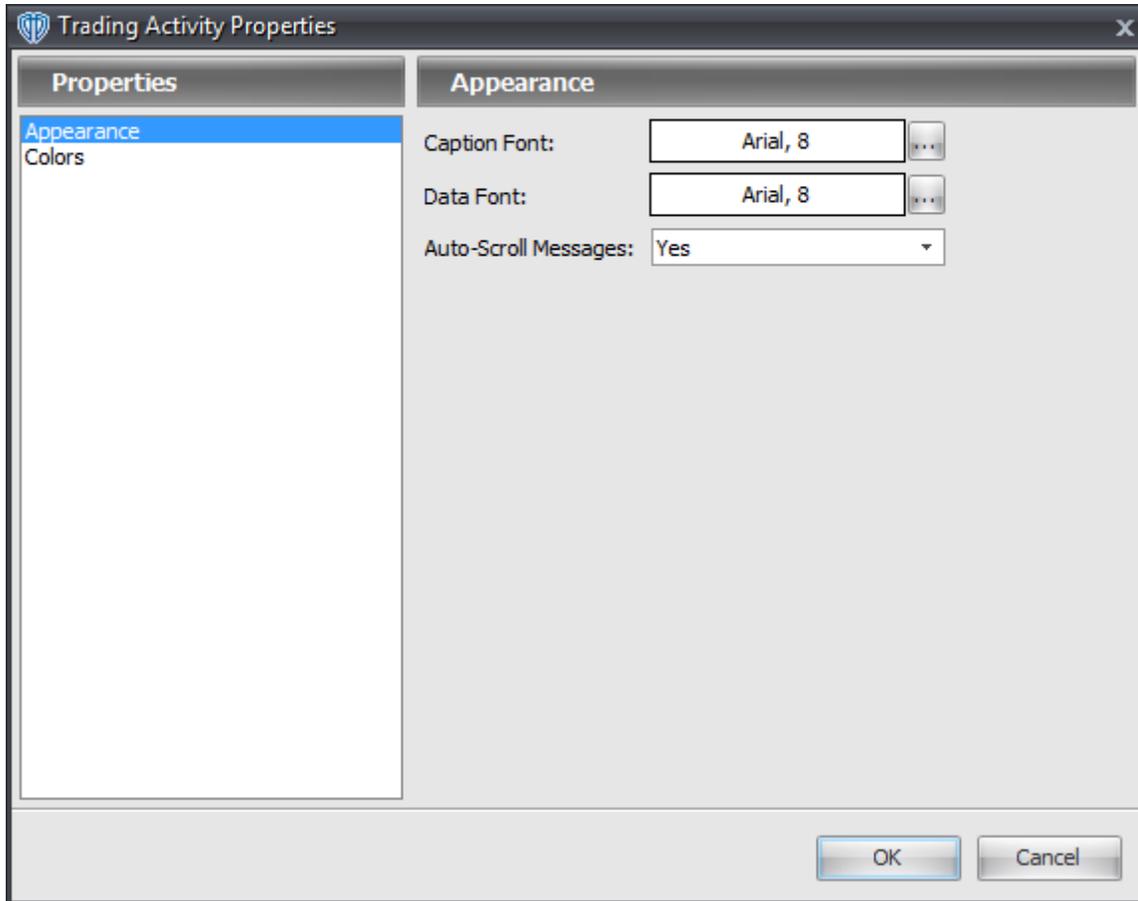
Restore Default

This command resets any custom properties currently used in the **Trading Activity** window back to their default values.

3.3.3.2 Properties

The **Trading Activity** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

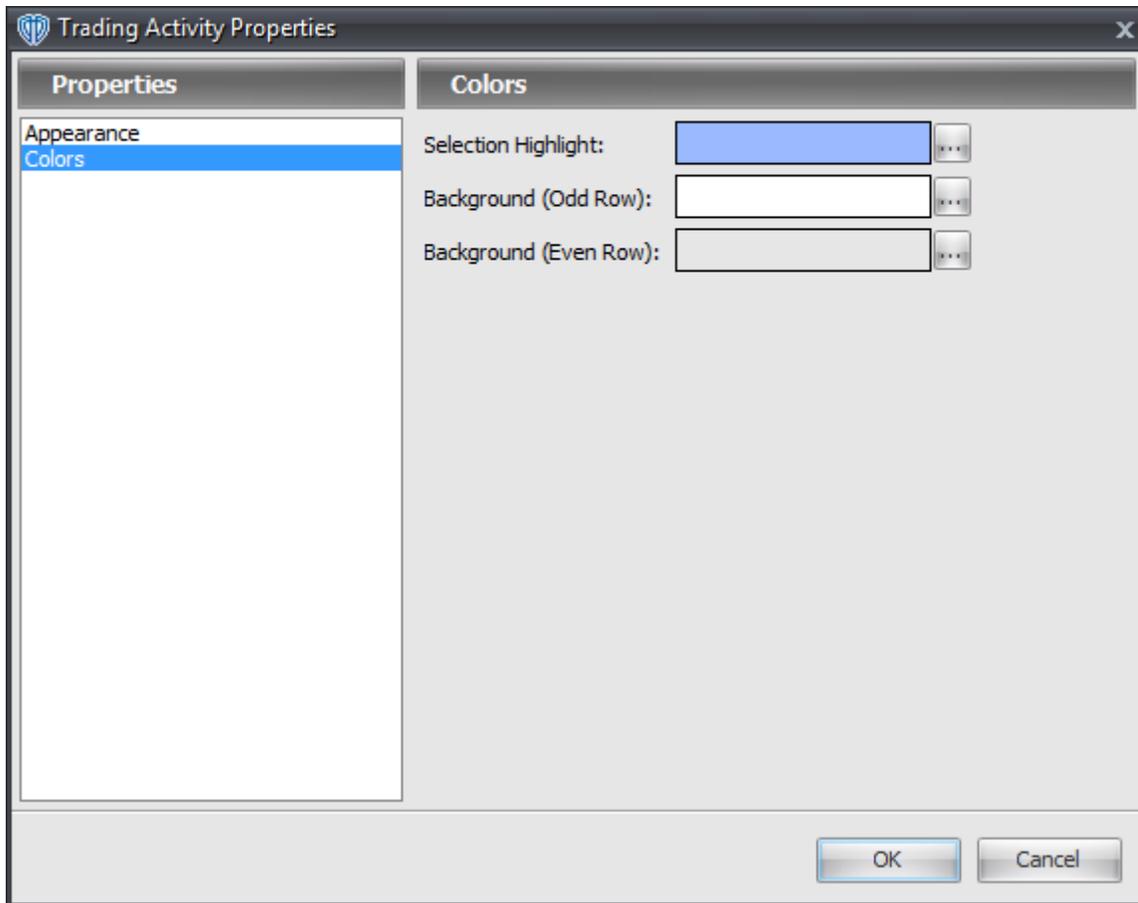
Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Auto-Scroll Messages

This option is a selection menu with two choices: *Yes* and *No*. While *Yes* is chosen, the [Trading Log](#) window "jumps" to the newest message received. If you select one or more messages, this option is temporarily *disabled* while the message(s) remain selected; this allows you easily view and/or search through the messages without having to completely disable this option by choosing *No*.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window. You can change the color by using the [...] button.

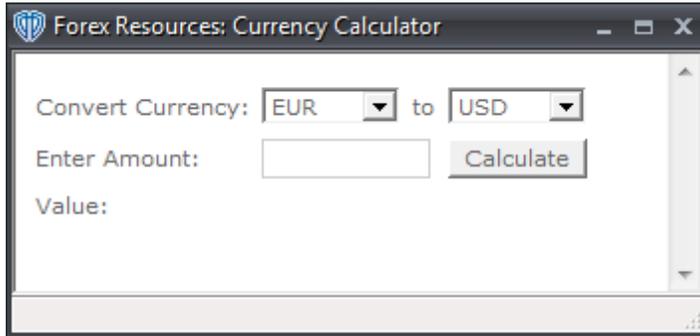
Background (Even Row)

This option defines the background color of all even-numbered rows in the window. You can change the color by using the [...] button.

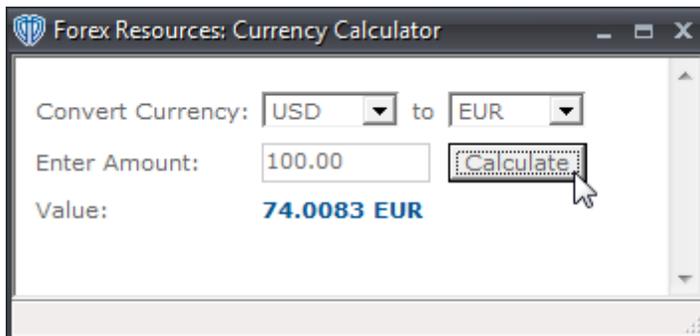
3.4 Trading Tools

3.4.1 Currency Calculator

The **Currency Calculator** is a very simple, yet useful, tool included in VT Trader.



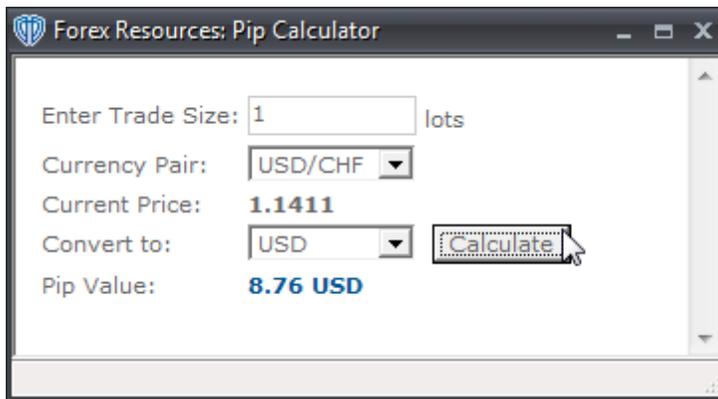
You can quickly enter the amount of the first currency (*the base currency*) and convert that amount into the second currency. In the example below, \$100.00 USD (*U.S. dollars*) has been converted into the EUR currency (*Euro*).



3.4.2 Pip Calculator

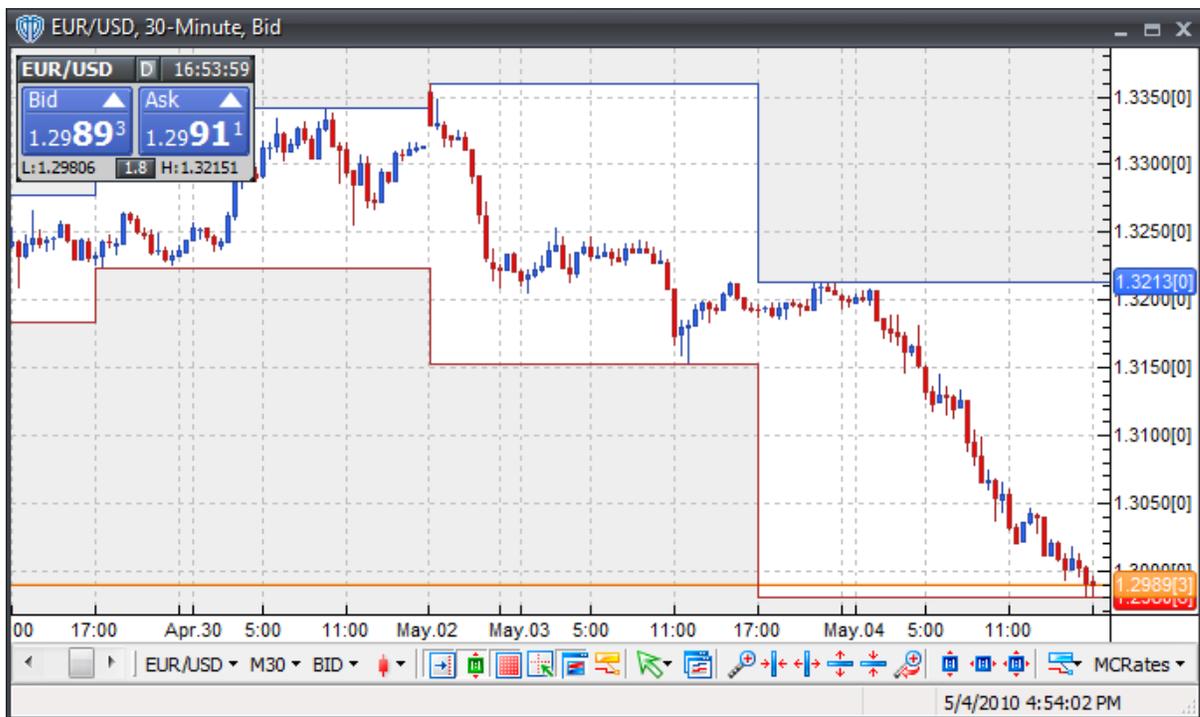
The **Pip Calculator** is another very simple, yet useful, tool included in VT Trader. You can quickly determine the value of 1 pip of a currency pair based on the trade amount (*in Lots*) calculated in your choice of currency.

In the example below, 1 pip of the USD/CHF currency pair based on a 1 lot trade amount is equal to \$8.76 USD (*U.S. Dollars*).



3.5 Chart Window

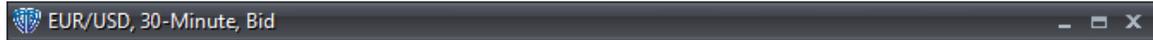
Chart windows associated with various instruments and time intervals will be your primary focus while performing technical analysis in VT Trader. You can also conduct actual trading actions and monitor trading activity directly from the chart window(s). Each chart window can be manipulated by using the commands in the [Ribbon's](#) [Chart](#) menu, its own [contextual menu](#)^[128], its *custom Chart Properties* (or its assigned *Chart Template Properties*), and/or its [toolbar](#)^[124].



A **Chart** window can be broken down into several different areas of interest.

Caption Bar

The **Caption Bar** shows the instrument chart interval, and Bid/Ask chart type.



Price Frame and Technical Indicator Frame(s)

The price frame along with any technical indicator frames (*which can be positioned above and/or below the main price frame*) shows the instrument's price data and any technical indicators' data. These areas also show many other elements that help define the chart's characteristics and aid in your technical analysis.

Some of the chart's basic visual elements include: the instruments panel, the X-axis and Y-axis, grid lines, high/low zone, the current price line and its spread band, and hidden labels. The spread band is attached to the current price line; it is an area equal to the difference between the *Bid/Ask* prices of the instrument. The grid lines are vertical and horizontal lines that are shown in the price frame (*and any visible indicator frame(s)*). The vertical grid lines are automatically drawn predefined increments (*based on the chart's Interval*). The horizontal grid lines are drawn at predefined price levels (*usually rounded numbers of price such as 1.2000, 1.2050, and 1.2100*).

Indicators, indicator labels, trading systems, trading system labels, and price alert labels are also shown in this area (*overlaid in the price frame and in separate frames above and/or below the price frame*). Position-related labels, pending order-related labels, and indicator order-related labels are shown according to your *All Accounts/Position* selections if you are conducting trading activities in the instrument you are analyzing in the chart window.

Any drawing tools you are using in the chart window to assist with your technical analysis will also be shown in these areas.

Chart elements are shown using *layers*. Each type of chart element is assigned to a *layer*. A particular chart window's various *layers* can be shown or hidden at your discretion by using the *Ribbon -> Chart menu -> Show/Hide group -> Chart Layers* selection menu or the Chart Properties window (*or the Chart Template Properties window if the chart is using a template*).

Y-Axis

The **Y-axis** is located along the right side of the chart window. It shows the instrument's price values. You can use the **Y-axis** to adjust the chart's Y-Axis (*vertical*) zoom level by positioning the cursor over top of the **Y-axis**, clicking and holding down the left mouse button, and moving the cursor to a new location within the **Y-axis**. Releasing the left mouse button applies the zoom action. Moving the cursor to a higher location zooms in the **Y-axis** scale, while moving it to a lower location zooms out the **Y-axis** scale.

X-Axis

The **X-axis** is located along the bottom side of the chart window directly below the **instrument data area**. It shows the chart interval's date/time values. You can use the **X-axis** to adjust the chart's **X-axis** (*horizontal*) zoom level by positioning the cursor over top of the **X-axis**, clicking and holding down the left mouse button, and moving the cursor to a new location within the **X-axis**. Releasing the left mouse button applies the zoom action. Moving the cursor to the right zooms in the **X-axis** scale, while moving it to left zooms out the **X-axis** scale.



Quotes Panel

The **Quotes Panel** is located in the top, left corner of the chart window. Its data is specific to the instrument being viewed in the chart window. The **Quotes Panel** shown in the chart window looks and functions exactly like its [Instrument Panel](#)^[90] counterpart in the [Quotes Board](#)^[89] window. Please [click here](#)^[90] to learn more about the **Quotes Panel**.

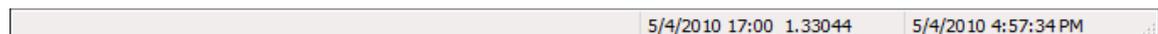
Chart Window Toolbar

The **chart window's toolbar** provides you quick, easy access to a variety of very useful chart-related commands and drawing tools. Please [click here](#)^[124] to learn more about the chart window toolbar's commands.



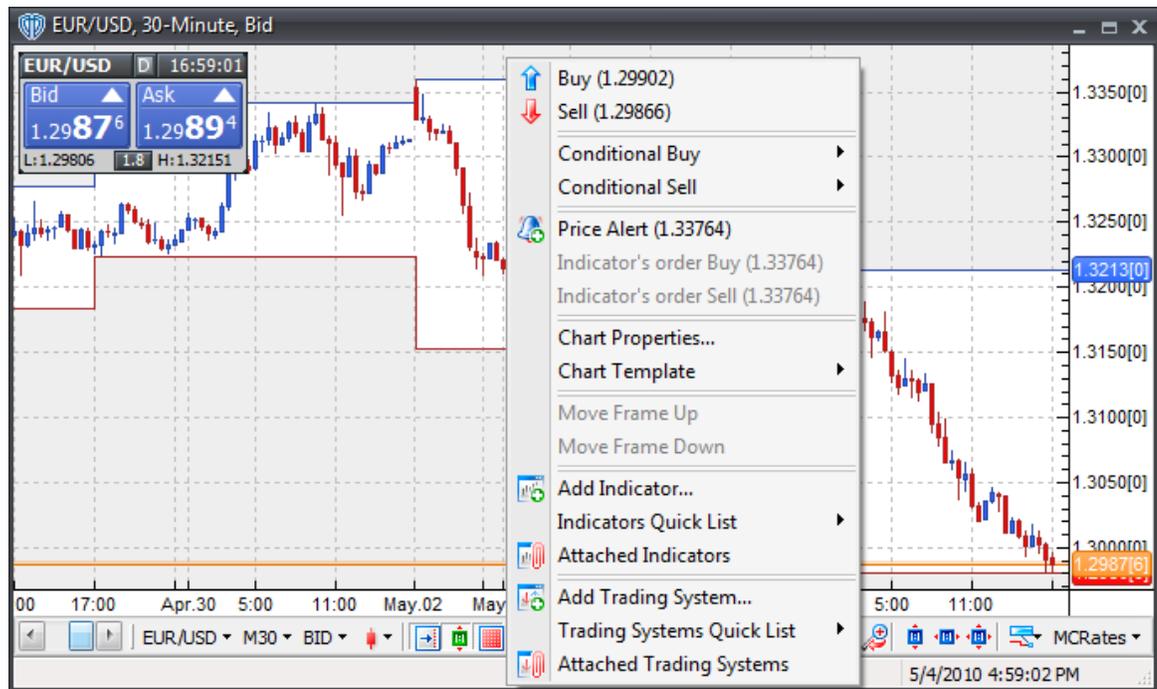
Status Bar

The **Status Bar** (from left-to-right) shows the date/time and prices of the selected bar or candle (if one is selected - not shown in screenshot below), the date/time stamp and price value according to the cursor's position within the chart, and the current date and time provided by your broker.



Contextual Menu

The chart window's [contextual menu](#)^[128] provides you with trading-related functionality, technical analysis-related functionality, access to the window's properties, and more. To activate the [contextual menu](#)^[128], click the right mouse button while the cursor is positioned anywhere within the window.



3.5.1 Chart Window Toolbar

The **Chart Window Toolbar** provides you quick, easy access to a variety of very useful chart-related commands and drawing tools.



Explanations of Chart Window Toolbar Commands

Instrument

This command contains a selection menu that includes all of the instruments available in VT Trader. You can change the chart window's current instrument by choosing your desired instrument from the selection menu.

Interval

This command contains a selection menu that includes all of the chart intervals available for use in the chart window. You can change chart window's current interval by choosing your desired interval from the selection menu. The following chart intervals are currently available in VT Trader:

- Tick (*each incoming price is a "tick"; a "tick" is the smallest possible interval*)
- 1-Minute
- 5-Minute

- 10-Minute
- 15-Minute
- 30-Minute
- 1-Hour
- 2-hour
- 4-Hour
- Daily (*each new day starts at 17:00 ET*)
- Weekly (*each new week starts at 12:00 AM (00:00) ET on Monday*)
- Monthly

Bid/Ask

An instrument has two possible prices at any given time - its bid price and its ask price. You sell at the bid price and you buy at the ask price. VT Trader can construct an instrument's chart using either its bid or ask prices. You can choose an instrument's bid or ask price bias using the **Bid/Ask** command.

Type

This command contains a selection menu that includes all of the types of charts available for use in the chart window. You can change chart window's current chart type by choosing your desired type from the selection menu. The following chart types are currently available in VT Trader:

- Japanese Candlesticks (Filled)
- Japanese Candlesticks (Hollow)
- Heikin-Ashi Candlesticks
- Bars (O/H/L/C)
- Bars
- Line
- Point and Figure
- Renko

Auto-Scroll Chart to Current Time

This command is a toggle button. It *enables* or *disables* the *Auto-Scroll to Current Time* property of the active chart window. While *enabled*, the active chart window will always automatically move the chart's price data to the instrument's most recent incoming price tick. *Disabling* this property allows you to easily perform technical analysis throughout the instrument's historical price data without the chart automatically returning to the most recent price tick.

Auto-Size Y-Axis

This command is a toggle button. It *enables* or *disables* the *Auto-Size Y-Axis* property of the active chart window. While *enabled*, the active chart window automatically resizes its pricing data to show the highest high price and lowest low price at the respective top and bottom of the viewable chart area. If one or more indicators are shown in the main price frame, the highest high and lowest low values of the indicator(s) are also considered while auto-sizing. For example, if an attached indicator's value has a higher high value (*and/or a lower low value*) than the price bars, then the indicator's value(s) will be used for the auto-sizing of the viewable data. *Disabling* this property allows you to manually control the scaling (*sizing*) of the data in the viewable area of the chart window using the *Zoom* commands, the *Y-Axis's* drag-and-drop zooming functionality, or the *Y-Axis's Scale Settings*.

Show Grid Lines

This command is a toggle button. It *shows* or *hides* the *Grid Lines* in the active chart window.

Show Cross Hair

This command is a toggle button. It *shows* or *hides* the *Cross Hair* in the active chart window. Please [click here](#)^[240] to learn more about the *Cross Hair* tool.

Show Quotes Panel

This command is a toggle button. It *shows* or *hides* the *Quotes Panel* in the active chart window.

Set All Labels to Default Position

This command quickly resets all of the labels shown in the active chart window back to their default positions.

Drawing Tool Selection

This command allows you to quickly select any of VT Trader's drawing tools for use. Please [click here](#)^[239] to learn more about the drawing tools included in VT Trader.

Clone Chart

You can quickly create a new, duplicate (*clone*) chart window of the active chart window by using the **Clone Chart** command.

Area Zoom

This command allows you to define a rectangular portion of the active chart window using the cursor to automatically zoom in on. The portion of the active chart window within your rectangular selection area will be magnified to fill the entire viewable area of the chart window.

X-Axis Zoom Out

You can decrease the horizontal (*left-to-right*) size of the active chart window's data using this command.

X-Axis Zoom In

You can increase the horizontal (*left-to-right*) size of the active chart window's data using this command.

Y-Axis Zoom In

You can increase the vertical (*top-to-bottom*) size of the active chart window's data using this command.

Y-Axis Zoom Out

You can decrease the vertical (*top-to-bottom*) size of the active chart window's data using this command.

Undo Zoom

You can undo the most recent action performed with any of the zooming commands by using this command.

Reset X-Axis

You can quickly restore the X-Axis's zoom level back to its default value using this command.

Reset Y-Axis

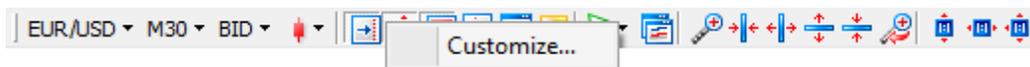
You can quickly restore the Y-Axis's zoom level back to its default value using this command.

Reset Axes

You can quickly restore the X-Axis's zoom level and the Y-Axis's zoom level back to their default values using this command.

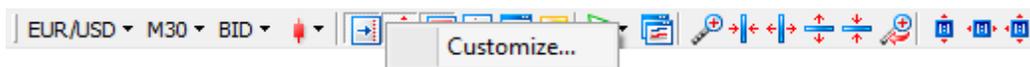
Contextual Menu

The **Chart Window Toolbar** contextual menu's *Customize...* command allows you add or remove icons from the toolbar. To activate the contextual menu and [customize](#)^[127] the toolbar, click the right mouse button while the cursor is positioned anywhere within the toolbar. Please [click here](#)^[127] to learn more about customizing the chart window's toolbar.

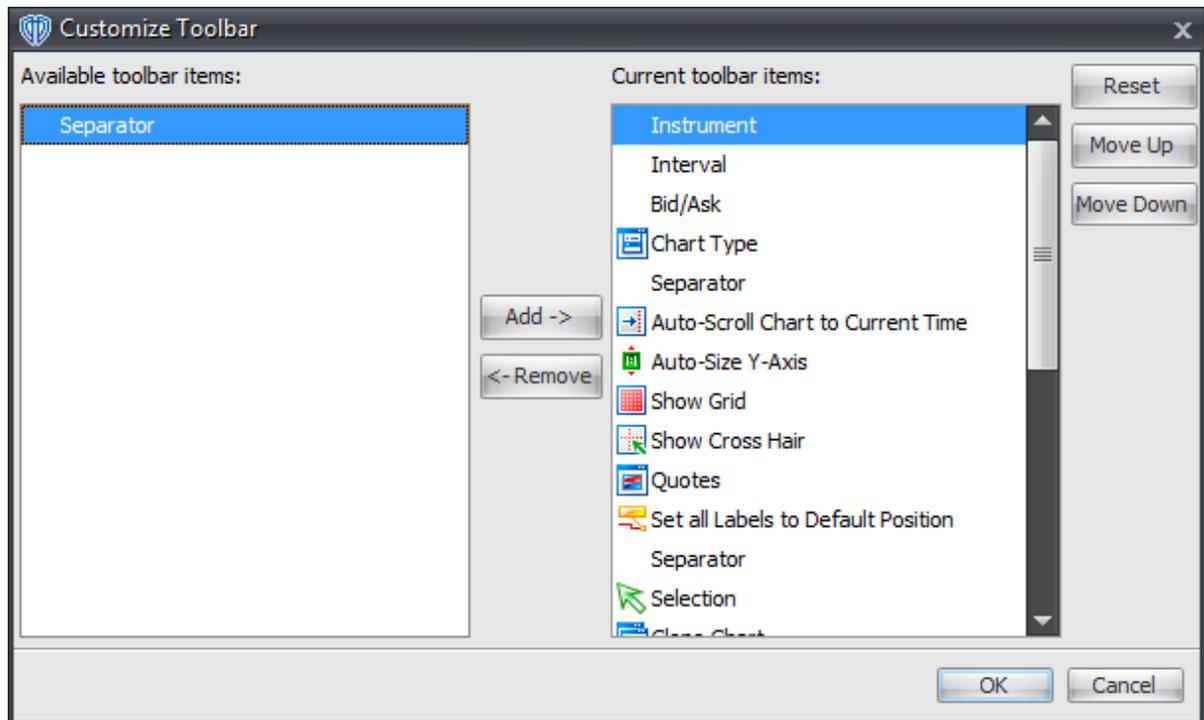


3.5.1.1 Customize...

You can customize the commands shown in the [chart window toolbar](#)^[124] by selecting the *Customize...* command from its contextual menu.



Once selected, a **Customize Toolbar** window is opened...



You can use the **[Add ->]**, **[<- Remove]**, **[Move Up]**, and/or **[Move Down]** buttons to create a unique arrangement for the [chart window toolbar](#)^[124]. The **[Reset]** button returns [chart window toolbar](#)^[124] back to its default arrangement. The *Available toolbar items* selection menu shows the available commands not included in the [chart window toolbar](#)^[124]. The *Current toolbar items* section shows tools that are currently included in the [chart window toolbar](#)^[124].

3.5.2 Contextual Menu

The chart window's contextual menu provides you with trading-related functionality, technical analysis-related functionality, access to the window's custom properties, and more. To activate the contextual menu, click the right mouse button while the cursor is positioned anywhere within the window.



The **Chart window's contextual menu** contains the following commands:

Buy

This command requests a *Buy* market order at the instrument's current *Ask* price.

Sell

This command requests a *Sell* market order at the instrument's current *Bid* price.

Conditional Buy

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Buy* order. **Entry Limit** requests an *Entry Limit Buy* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Buy* order bias. **If/Then** requests an *If/Then* order with *Buy* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Buy* order bias.

Conditional Sell

This command is a selection menu that includes a submenu with five commands: **Entry Stop**, **Entry Limit**, **One Cancels Other (OCO)**, **If/Then**, and **If/Then OCO**. **Entry Stop** requests an *Entry Stop Sell* order. **Entry Limit** requests an *Entry Limit Sell* order. **One Cancels Other (OCO)** requests a *One Cancels Other (OCO)* order with *Sell* order bias. **If/Then** requests an *If/Then* order with *Sell* order bias. **If/Then OCO** requests an *If/Then OCO* order with *Sell* order bias.

Price Alert

This command opens the [Price Alert](#)¹⁷⁹ window.

Indicator's Order Buy

This command requests an *Indicator Order to Buy* based on any indicator currently attached to the chart window. To request an *Indicator Order to Buy* for an indicator shown in its own frame, you must activate the contextual menu while the cursor is positioned within the indicator's frame.

Indicator's Order Sell

This command requests an *Indicator Order to Sell* based on any indicator currently attached to the chart window. To request an *Indicator Order to Sell* for an indicator shown in its own frame, you must activate the contextual menu while the cursor is positioned within the indicator's frame.

Chart Properties...

This command opens the active chart window's custom [Chart Properties](#) window. This [Chart Properties](#) window is identical to the **Chart Template Properties** window except that only the active chart will be modified if any properties are changed. If any of the active chart window's custom chart properties are changed while the chart is assigned to a *chart template*, the chart is disassociated from the *chart template* and begins using its custom chart properties.

Chart Template

This command is a selection menu that includes a submenu with two commands: **Load Template...** and **Save Template As**. The **Load Template...** command loads (*applies*) any of your saved *chart templates* to the active chart window. If the active chart window is currently assigned to a *chart template*, that *chart template* will have a check mark next to its name in this command's selection menu. The **Save Template As** command saves the active chart window's properties configuration as a new *chart template* file. All properties included in the **Chart Properties** window are included in the *chart template*. The new *chart template* file is saved into VT Trader's *Data -> ChartTemplates* folder. Once saved, the new chart template is shown in the **Load Template...** command's selection menu and in the *Ribbon -> Chart menu -> Chart Templates group -> Load...* command's selection menu.

Move Frame Up

This command moves the frame up that the cursor was positioned over when the contextual menu was activated. This command will be available if the contextual menu was activated from within a frame that had an additional frame directly above it.

Move Frame Down

This command moves the frame down that the cursor was positioned over when the contextual menu was activated. This command will be available if the contextual menu was activated from within a frame that had an additional frame directly below it.

Add Indicator...

This command opens the **Add Indicator** window. You can review categorized lists of indicators, choose an indicator from one of the lists, review its description, and add it to the chart using the **Add Indicator** window.

Indicators Quick List

This command includes a selection menu. The **Indicators Quick List** can be likened to your "Favorites" in Internet Explorer or your "Bookmarks" in Mozilla Firefox. You can configure the **Indicators Quick List** to include only the indicators that you use most frequently or desire to have easily available. You may need to configure your **Indicators Quick List** before it best fits your needs. Please [click here](#)^[235] to learn more about configuring your **Indicator Quick List**.

Attached Indicators

This command opens the **Attached Indicators** window. You can review a summary listing of indicators currently attached to the active chart window, *add* additional indicators to the chart, change the *properties* of any attached indicator, and *delete* attached indicators using the **Attached Indicators** window. The **Attached Indicators** window also allows you to directly edit an indicator by opening it in an **Indicator Editor** window. Please [click here](#)^[184] to learn more about editing indicators using an **Indicator Editor** window.

Add Trading System...

This command opens the **Add Trading System** window. You can review categorized lists of trading systems, choose a trading system from one of the lists, review its description, and add it to the chart using the **Add Trading System** window.

Trading Systems Quick List

This command includes a selection menu. The **Trading Systems Quick List** can be likened to your "Favorites" in Internet Explorer or your "Bookmarks" in Mozilla Firefox. You can configure the **Trading Systems Quick List** to include only the trading systems that you use most frequently or desire to have easily available. You may need to configure your **Trading Systems Quick List** before it best fits your needs. Please [click here](#)^[236] to learn more about configuring your **Trading Systems Quick List**.

Attached Trading Systems

This command opens the **Attached Trading Systems** window. You can review a summary listing of trading systems currently attached to the active chart window, *add* additional trading systems to the chart, change the *properties* of any attached trading system, *enable* or *disable Auto-Trading* mode for any attached trading system, and *delete* attached trading systems using the **Attached Trading Systems** window. The **Attached Trading Systems** window also allows you to directly edit a trading system by opening it in a **Trading System Editor** window. Please [click here](#)^[207] to learn more about editing trading systems using a **Trading System Editor** window.

3.5.3 Chart Properties

The **Chart Properties** window defines the main set of properties used by the chart window(s). It is important to note that each chart window in VT Trader is always operating in one of two different chart properties modes. Those modes are: [Chart Template Mode](#)^[152] or the chart window's own *Custom Chart Properties Mode*. Chart windows assigned to a *chart template* will be automatically redrawn each time that *chart template* is modified. New chart windows are always opened using the "primary" *chart template*. Open chart windows that are using their own custom chart properties will not be affected by

changes made to any *chart template*.

Effectively, there is a 3-level hierarchy that determines how [chart templates](#)^[152], *chart properties*, and *per chart elements' properties* are applied to each chart.

Level 1 (*highest level*): Chart Template ->

Level 2: Custom Chart Properties ->

Level 3 (*lowest level*): Per Chart Elements' Custom Properties

It is easy to determine if the active chart window is assigned to a *chart template* or if it is using its own custom chart properties. If it is assigned to a *chart template*, the *Ribbon -> Chart -menu -> Chart Templates group -> Load...* command's selection menu and the *chart window contextual menu -> Chart Template -> Load Template...* command's selection menu will have a check mark next to the assigned chart template's name. If no *chart template* has a check mark next to its name, the chart window is using its own custom chart properties. If the active chart window is assigned to a *chart template*, however, any time you modify its properties that chart immediately disassociates itself from the *chart template* and switches to using its own custom chart properties.

The **Chart Properties** window is divided into the following sections (*and subsections*):

Appearance

The **Appearance** section defines the active chart window's general appearance properties. Click on the subsection's name to learn more about its options. The subsections included in this section are:

- [Chart](#)^[133]
- [Show/Hide](#)^[135]
- [Miscellaneous](#)^[137]
- [High/Low Zone](#)^[138]
- [Cross Hair](#)^[140]

Labels

The **Labels** section defines the default properties for all of the various types of *Chart Labels* that can be shown in the active chart window. You can define each label's *Label Color*, *Border Color* (*position-related labels have separate Label/Border Colors based on Net Profit/Loss*), *Font Attributes*, and *Line Color/Width/Style*. You can also define the *Placement* (*i.e. Chart or Y-Axis*) of the *Current Rate*, *High Line*, and *Low Line* labels. Note: Any label shown in the active chart window can be customized using its own individual custom properties without affecting these default properties or any other labels (*by positioning the cursor over the label shown in the chart window, clicking the right mouse button, and choosing "Properties" from its contextual menu*).

Layers

The **Layers** section defines the properties for all of the various *Chart Layers* that can be shown or hidden in the active chart window. You can define each layer's *visibility* and *brightness*. Any object(s) attached

to the active chart window that are part of the chosen layer will be affected by these properties. For example, if you draw 3 trend lines in the chart window, choose the *Trend Lines* layer, and choose *No* for the *Visibility* property, all 3 trend lines are hidden from view; choose *Yes* to show them again.

Chart Types

The **Chart Types** section defines the properties for all of the various *Chart Types* that can be used in the active chart window. Please [click here](#)^[142] to learn more about each of the chart types. For candlestick chart types, you can choose the up/down candle fill colors and the up/down candle border color/width. For bar and line chart types, you can choose the up/down bar/line colors and bar/line width. For the Point and Figure chart type, you can choose the up/down X/O colors/width, price array, box size, and reversal amount. For the Renko chart type, you can choose the up/down brick colors, up/down brick border colors/width, and box size.

Drawing Tools

The **Drawing Tools** section defines the basic properties for all of the various *Drawing Tools* that can be used in the active chart window. Please [click here](#)^[239] to learn more about each of the drawing tools. Note: Any drawing object shown in the active chart window can be customized using its own individual custom properties without affecting these default properties or any other drawing tools (*by selecting the object in the chart window, clicking the right mouse button, and choosing "Properties" from its contextual menu*).

Attached Indicators

This section is a simple read-only summary list showing the names of any indicators currently attached to the active chart window. If/when the chart properties are saved (*and/or loaded*) as a *chart template*, each attached indicator's custom properties are also saved (*and/or loaded*) as part of the *chart template*.

Attached Trading Systems

This section is a simple read-only summary list showing the names of any trading systems currently attached to the active chart window. If/when the chart properties are saved (*and/or loaded*) as a *chart template*, each attached trading system's custom properties are also saved (*and/or loaded*) as part of the *chart template*.

3.5.3.1 Chart

The **Chart** subsection contains two groups: **Chart** and **Axes**.

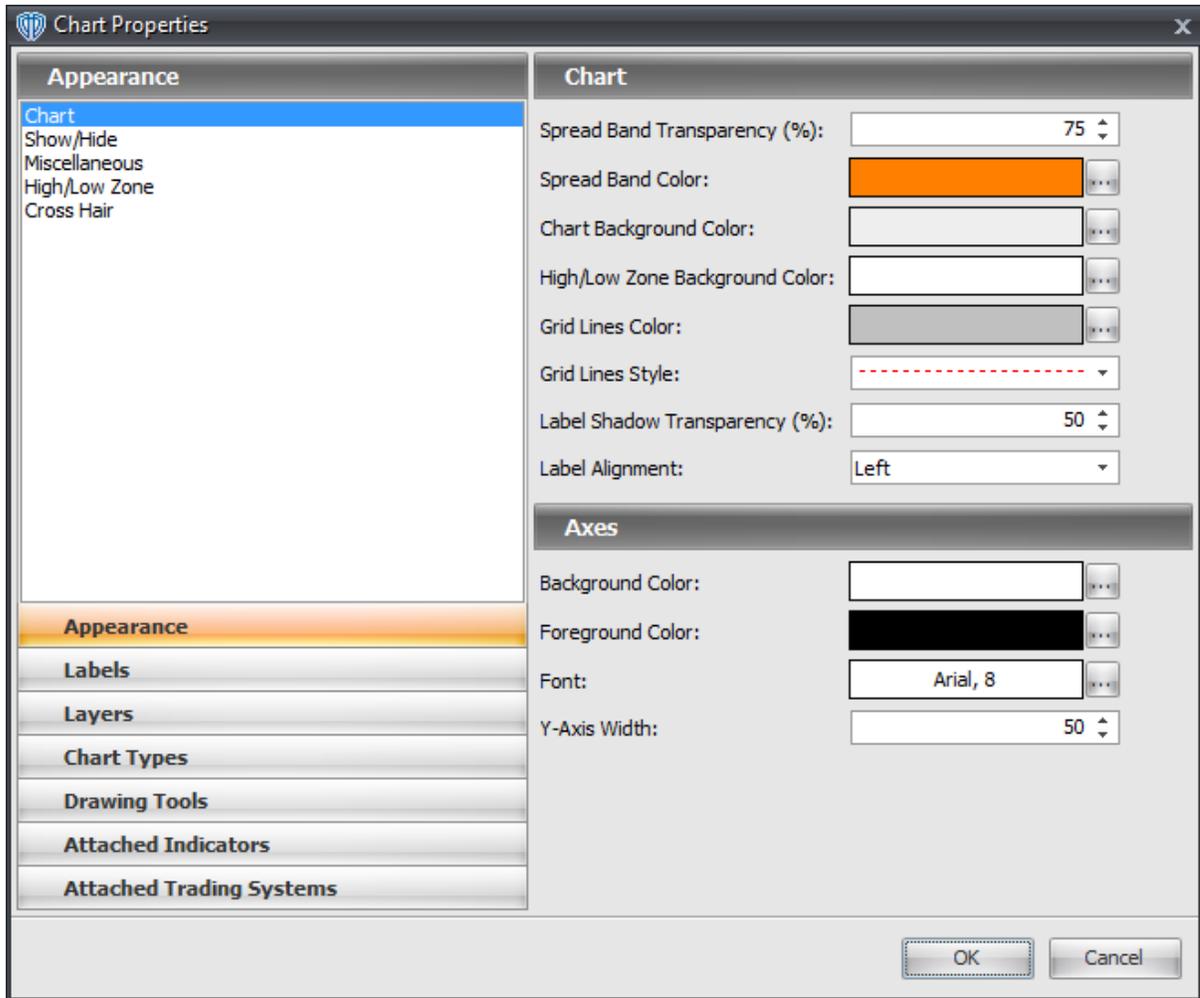


Chart Group

The **Chart** group contains the following options:

Spread Band Transparency (%)

This option defines the transparency of the spread band.

Spread Band Color

This option defines the color of the spread band. You can change its color by using the [...] button.

Chart Background Color

This option defines the main background color of the active chart window. You can change its color by using the [...] button.

High/Low Zone Background Color

This option defines the color of the high/low zone. You can change its color by using the [...] button.

Grid Lines Color

This option defines the color of the grid lines. You can change its color by using the [...] button.

Grid Lines Style

This option defines the style of the grid lines.

Label Shadow Transparency (%)

This option defines the transparency of the labels' shadows.

Label Alignment

This option is a selection menu with two choices: *Left* and *Right*. It defines the default placement of the labels when they are initially shown in the active chart window.

Axes Group

The **Axes** group contains the following options:

Background Color

This option defines the background color of the X-Axis and Y-Axis areas. You can change the color by using the [...] button.

Foreground Color

This option defines the color of the X-Axis date/time marker lines and the Y-Axis price marker lines on the axes inside edges. You can change the color by using the [...] button.

Font

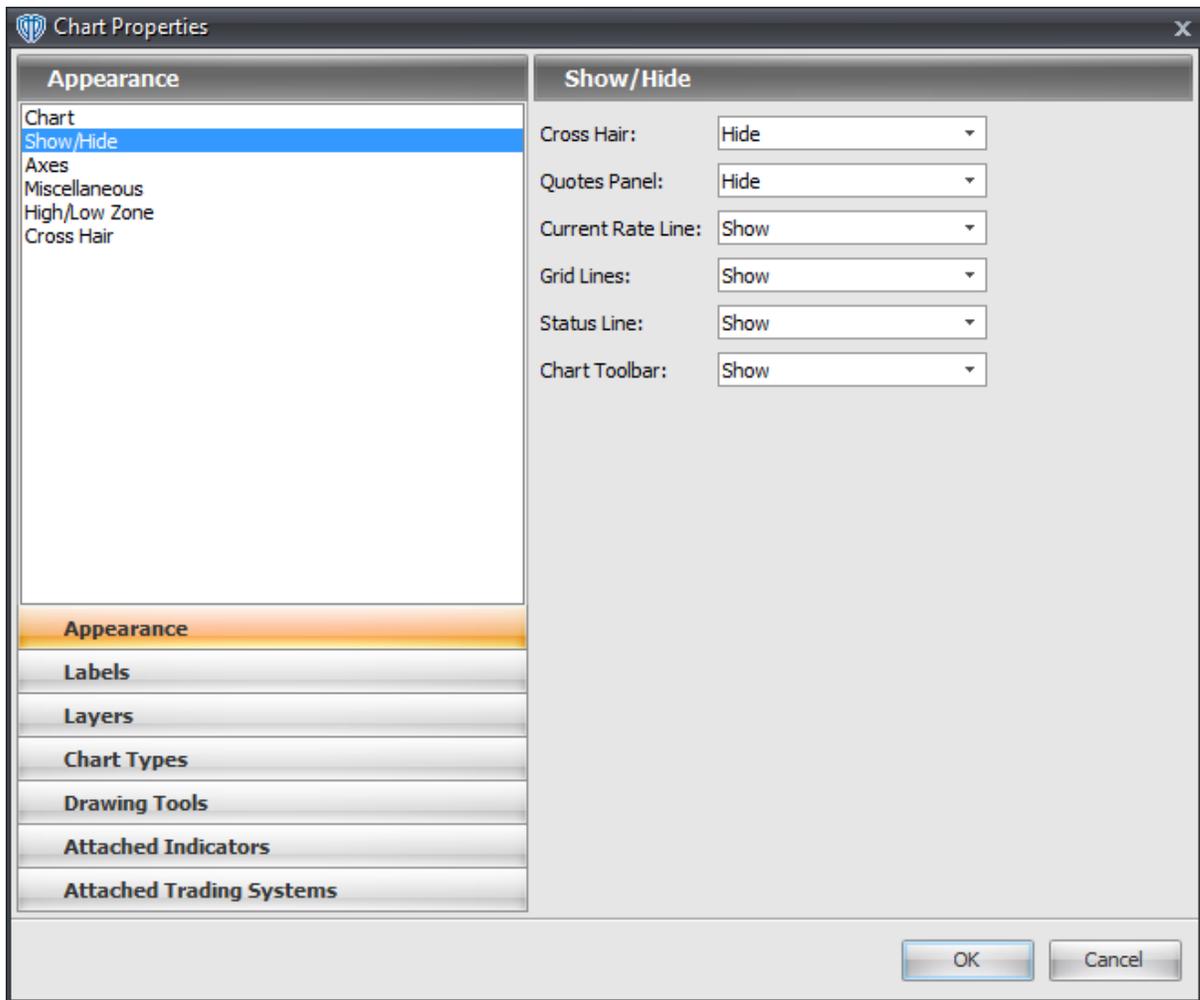
This option defines the font attributes of the X-Axis and Y-Axis values. You can change their font attributes by using the [...] button.

Y-Axis Width

This option defines the width (*in pixels*) of the Y-Axis area.

3.5.3.2 Show/Hide

The **Show/Hide** subsection only contains one group: **Show/Hide**.



Show/Hide Group

The **Show/Hide** group contains the following options:

Cross Hair

This option *shows* or *hides* the [cross hair tool](#)^[240] in the active chart window.

Quotes Panel

This option *shows* or *hides* the instrument panel in the active chart window.

Current Rate Line

This option *shows* or *hides* the current rate line in the active chart window.

Grid Lines

This option *shows* or *hides* the vertical and horizontal grid lines in the active chart window.

Status Line

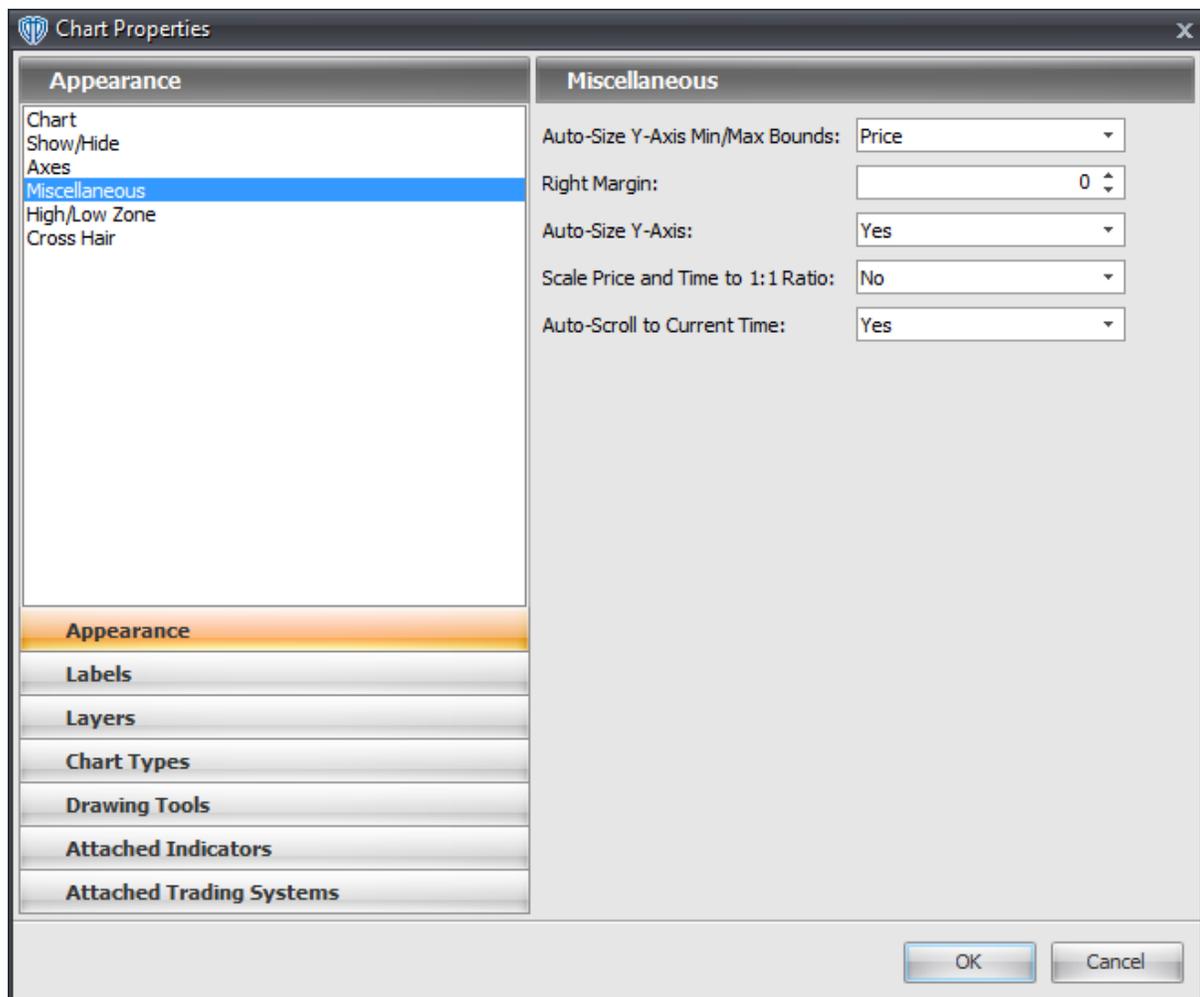
This option *shows* or *hides* the status line in the active chart window.

Chart Toolbar

This option *shows* or *hides* the [toolbar](#)^[24] in the active chart window.

3.5.3.3 Miscellaneous

The **Miscellaneous** subsection only contains one group: **Miscellaneous**.



Miscellaneous Group

The **Miscellaneous** group contains the following options:

Auto-Size Y-Axis Min/Max Bounds

This option is a selection menu with two choices: *Price* and *All Data*. It defines what data is considered for auto-sizing while the **Auto-Size Y-Axis** option is defined as *Yes*. The *Price* selection auto-sizes the Y-Axis based on only the highest high price and lowest low price currently visible in the active chart window's price frame. The *All Data* selection auto-sizes the Y-Axis based on the highest high value and lowest low value of any data array currently visible in the price frame. For example, if an attached indicator's value has a higher high value (*and/or a lower low value*) than the price bars, then the indicator's value is used for the auto-sizing of the viewable data.

Right Margin

This option defines the width of the right margin of the active chart window. The *Right Margin* is the offset (*distance - in pixels*) between instrument's current rate (*price*) and the right edge of the price frame.

Auto-Size Y-Axis

This option *enables* or *disables* the **Auto-Size Y-Axis** property of the active chart window. While *Yes* is chosen, the active chart window automatically resizes its price data (*and indicator data, if available*) so it is shown with the highest high price (*or indicator value*) and lowest low price (*or indicator value*) at the respective top and bottom of the viewable chart area based on the **Auto-Size Y-Axis Min/Max Bounds** property. While *No* is chosen, you can manually control the scaling (*sizing*) of the data in the viewable area of the chart window using the *Zoom* commands, the Y-Axis's drag-and-drop zooming functionality, or the Y-Axis's *Scale Settings*.

Scale Price and Time to 1:1 Ratio

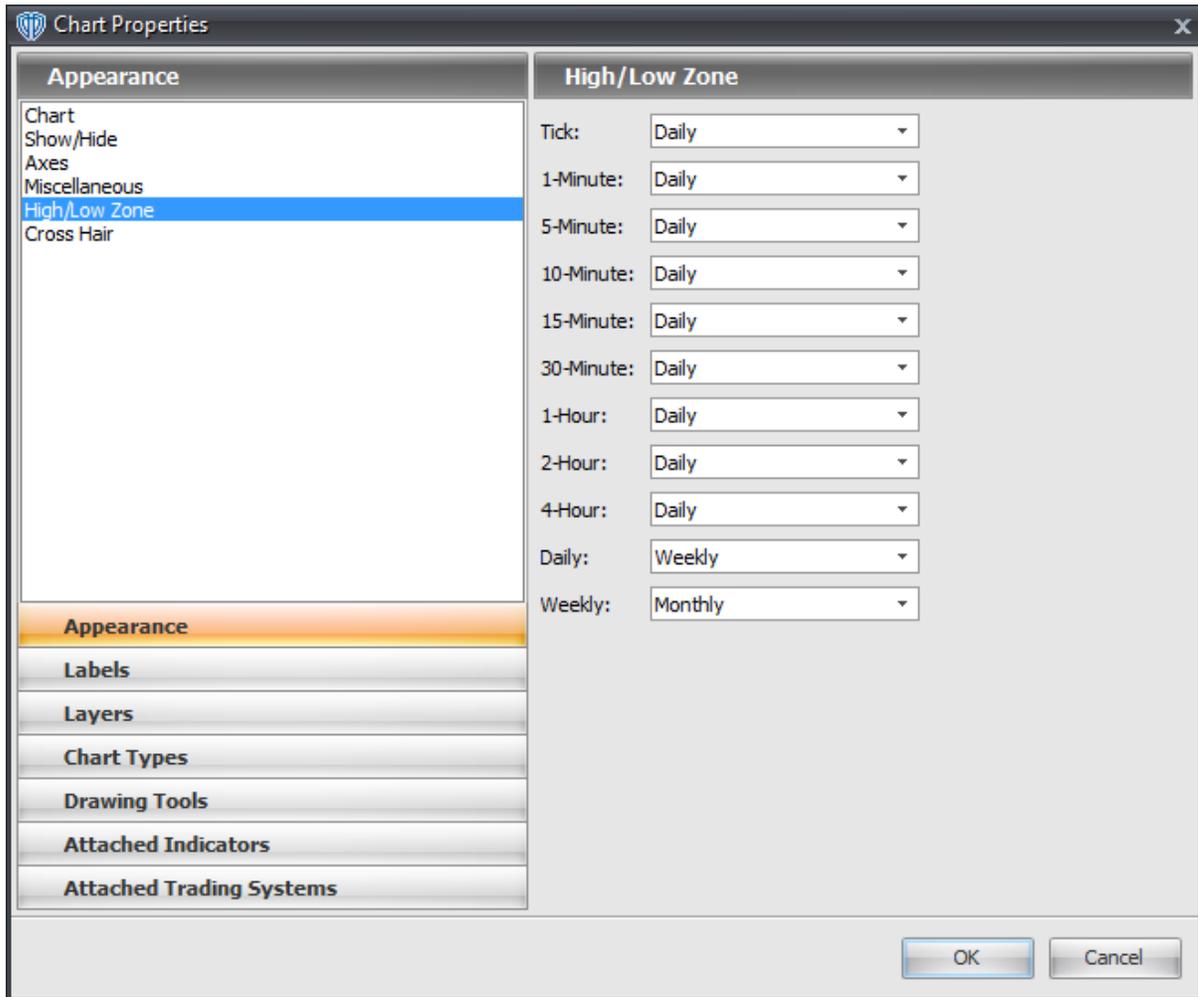
The option links the X-Axis and Y-Axis zoom levels in a 1:1 ratio. This means that 1 unit of time is equal to 1 unit of price; the distance between each bar (*or each candle's wick*) in the active chart window is equal to the distance between each 1 pip of price change. While *Yes* is chosen, the *X-Axis* and *Y-Axis Zoom In/Out* commands remain active, however, the chart will be zoomed in/out according to the linked 1:1 ratio. Changing the X-Axis zoom level automatically changes the Y-Axis zoom level accordingly (*or vice versa*) to maintain the 1:1 ratio. Additionally, the *Area Zoom* command is *disabled*.

Auto-Scroll to Current Time

This option *enables* or *disables* the **Auto-Scroll to Current Time** property of the active chart window. While *Yes* is chosen, the active chart window will always automatically move the chart's price data to the instrument's most recent incoming price tick. While *No* is chosen, you can easily perform technical analysis throughout the instrument's historical price data without the chart automatically returning to the most recent price tick.

3.5.3.4 High/Low Zone

The **High/Low Zone** subsection only contains one group: **High/Low Zone**.



High/Low Zone Group

The **High/Low Zone** group contains the following options:

Tick

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **Tick** interval data.

1-Minute

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **1-Minute** interval data.

5-Minute

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **5-Minute** interval data.

10-Minute

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **10-Minute** interval data.

15-Minute

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **15-Minute** interval data.

30-Minute

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **30-Minute** interval data.

1-Hour

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **1-Hour** interval data.

2-Hour

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **2-Hour** interval data.

4-Hour

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **4-Hour** interval data.

Daily

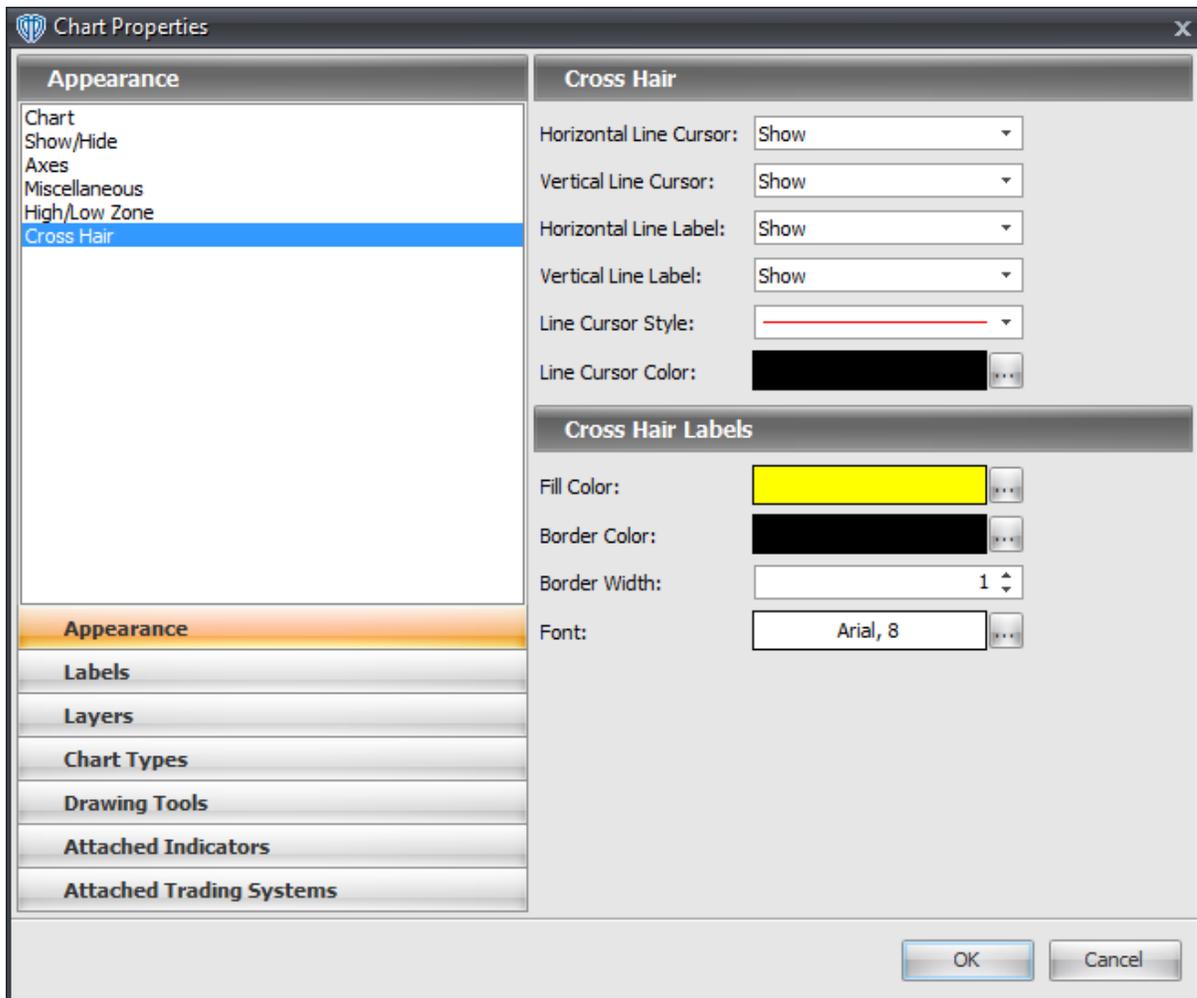
This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **Daily** interval data.

Weekly

This option defines the default high/low zone selection that is used in the active chart window while you are viewing an instrument's **Weekly** interval data.

3.5.3.5 Cross Hair

The Cross Hair subsection is divided into two groups: **Cross Hair** and **Cross Hair Labels**.



Cross Hair Group

The **Cross Hair** group contains the following options:

Horizontal Line Cursor

This option *shows* or *hides* the cross hair's horizontal line in the active chart window.

Vertical Line Cursor

This option *shows* or *hides* the cross hair's vertical line in the active chart window.

Horizontal Line Label

This option *shows* or *hides* the cross hair's horizontal line label in the active chart window.

Vertical Line Label

This option *shows* or *hides* the cross hair's vertical line label in the active chart window.

Line Cursor Style

This option defines the style of the cross hair's horizontal and vertical lines in the active chart window.

Line Cursor Color

This option defines the color of the cross hair's horizontal and vertical lines in the active chart window. You can change the color by using the [...] button.

Cross Hair Labels Group

The **Cross Hair Labels** group contains the following options:

Fill Color

This option defines the color of the cross hair's horizontal line vertical line labels. You can change the color by using the [...] button.

Border Color

This option defines the border color of the cross hair's horizontal line vertical line labels. You can change the color by using the [...] button.

Border Width

This option defines the border width (*in pixels*) of the cross hair's horizontal line vertical line labels.

Font

This option defines the font attributes used for the cross hair's vertical and horizontal lines labels. You can change the font attributes by using the [...] button.

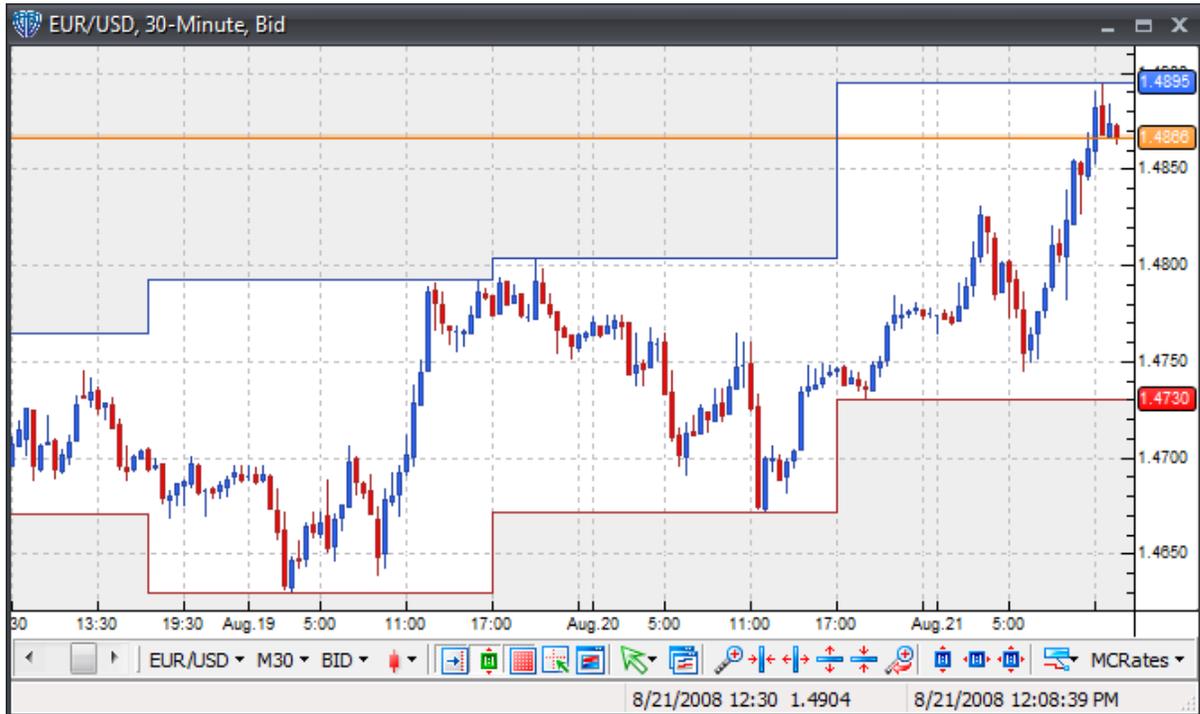
3.5.4 Chart Types

VT Trader supports many of the most commonly used types of charts for performing technical analysis. Please click on the chart type's name to learn more about it.

- [Japanese Candlesticks \(Filled\)](#)^[143]
- [Japanese Candlesticks \(Hollow\)](#)^[143]
- [Bars \(O/H/L/C\)](#)^[144]
- [Bars](#)^[145]
- [Line](#)^[146]
- [Heikin-Ashi Candlesticks](#)^[147]
- [Point & Figure](#)^[148]
- [Renko](#)^[149]

Japanese Candlesticks (Filled)

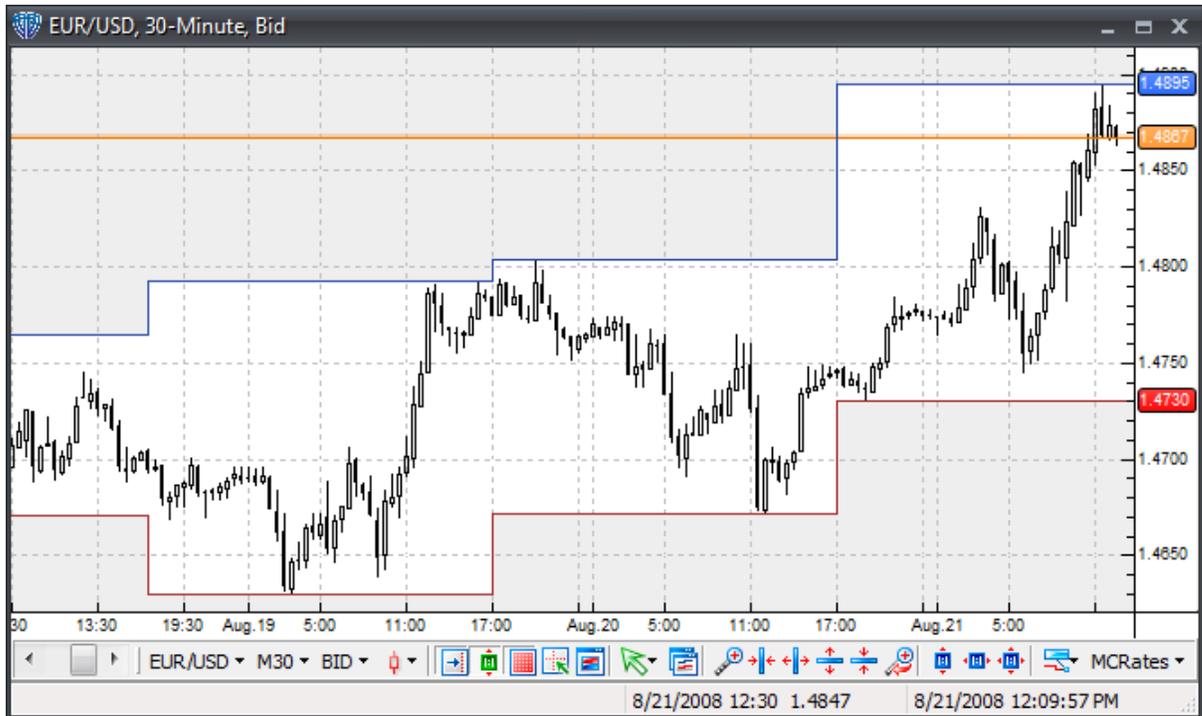
Japanese Candlesticks charts show price data using the chart intervals Open, High, Low, and Close prices.



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Japanese Candlesticks (Hollow)

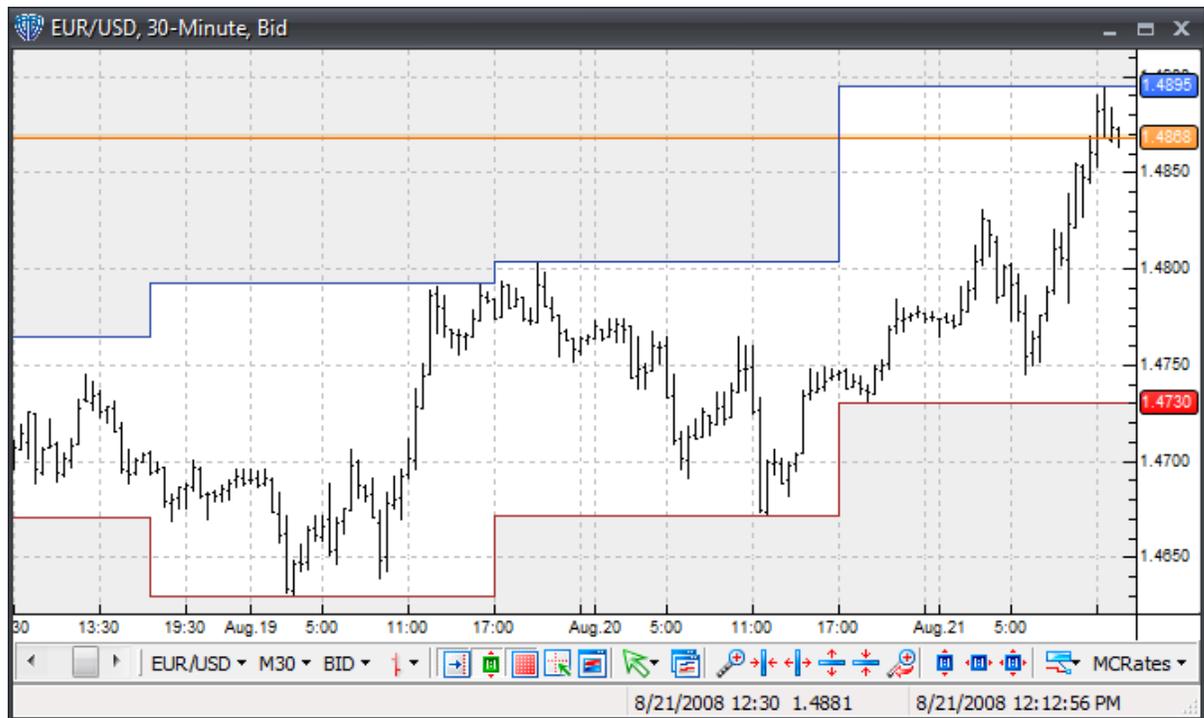
Japanese Candlesticks charts show price data using the chart intervals Open, High, Low, and Close prices. Candlesticks with a transparent fill are bull candles ($Close > Open$) and candlesticks with a color fill are bear candles ($Close < Open$).



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Bars (O/H/L/C)

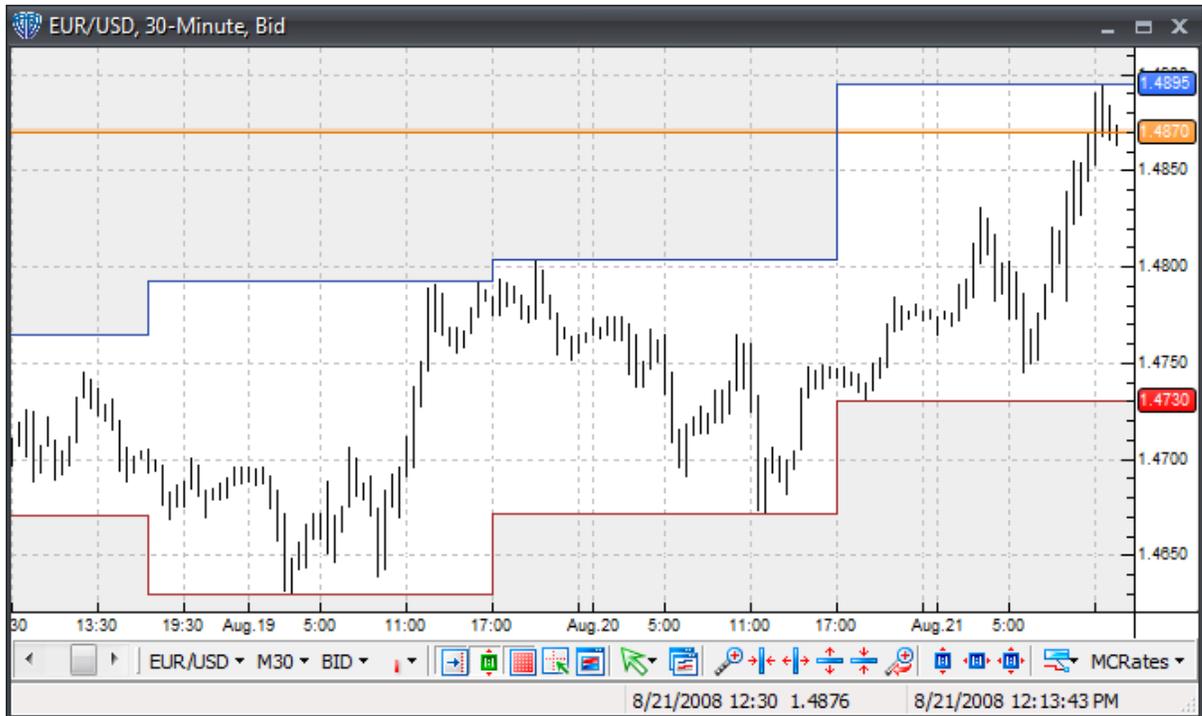
O/H/L/C Bar charts show price data using the chart interval's Open, High, Low, Close prices. The small lines protruding from the left and right sides of each bar represent the Open price (*left protrusion*) and Close price (*right protrusion*).



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Bars

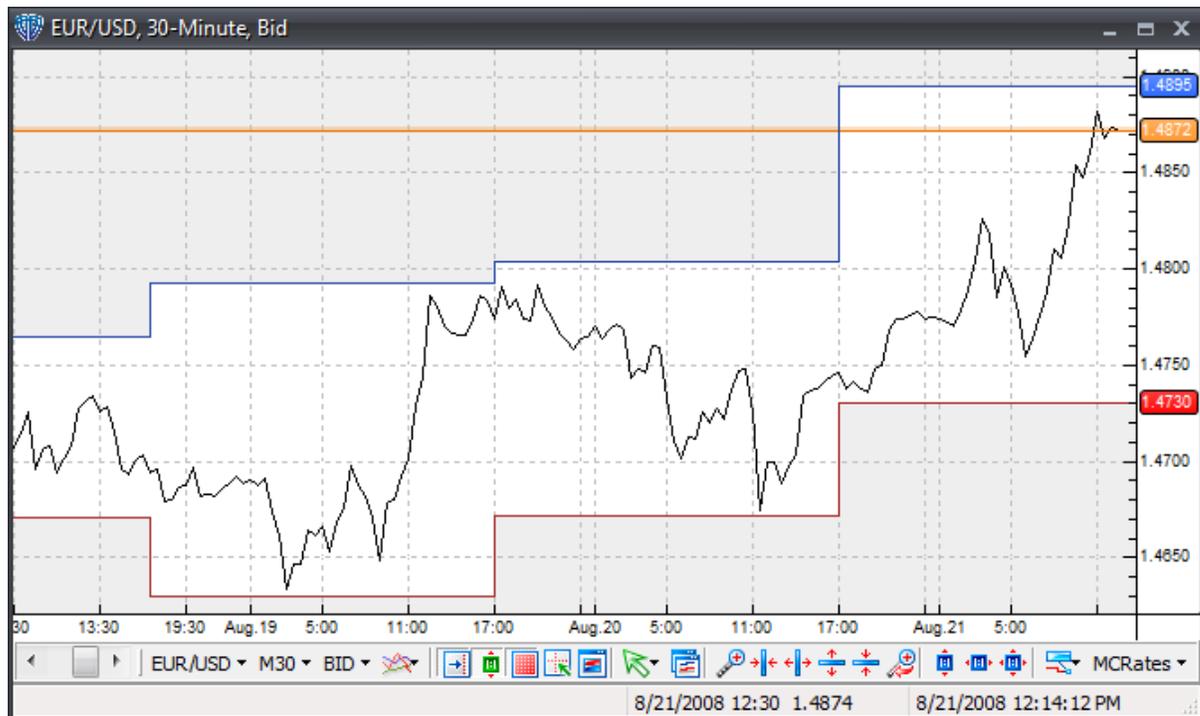
Bar charts show price data using the chart interval's High and Low prices.



[Return to Chart Types](#) ^[142]

Line

Line charts show price data using only the chart interval's Close prices.



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Heikin-Ashi Candlesticks

Heikin-Ashi Candlesticks charts (*Heikin* means "average" or "balance" in Japanese and *Ashi* means "foot" or "bar") are modified versions of the Japanese candlesticks chart. They attempt to eliminate irregularities often found in traditional candlesticks charts thereby offering a better visual representation of trends and consolidations. Heikin-Ashi Candlesticks charts show price data using formulas based on the chart interval's Open, High, Low, Close prices. The Heikin-Ashi prices are calculated using the formulas:

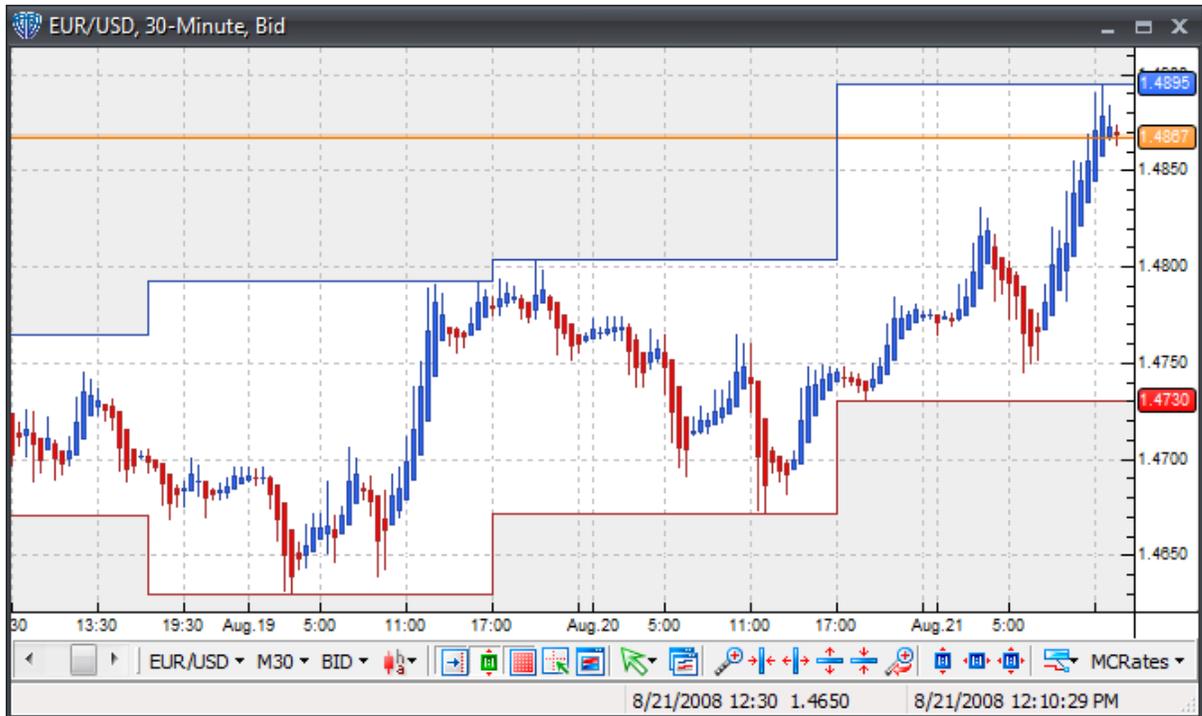
$$\text{haClose} = (\text{O} + \text{H} + \text{L} + \text{C}) / 4$$

$$\text{haOpen} = (\text{haOpen (previous bar)} + \text{haClose (previous bar)}) / 2$$

$$\text{haHigh} = \text{Maximum}(\text{H}, \text{haOpen}, \text{haClose})$$

$$\text{haLow} = \text{Minimum}(\text{L}, \text{haOpen}, \text{haClose})$$

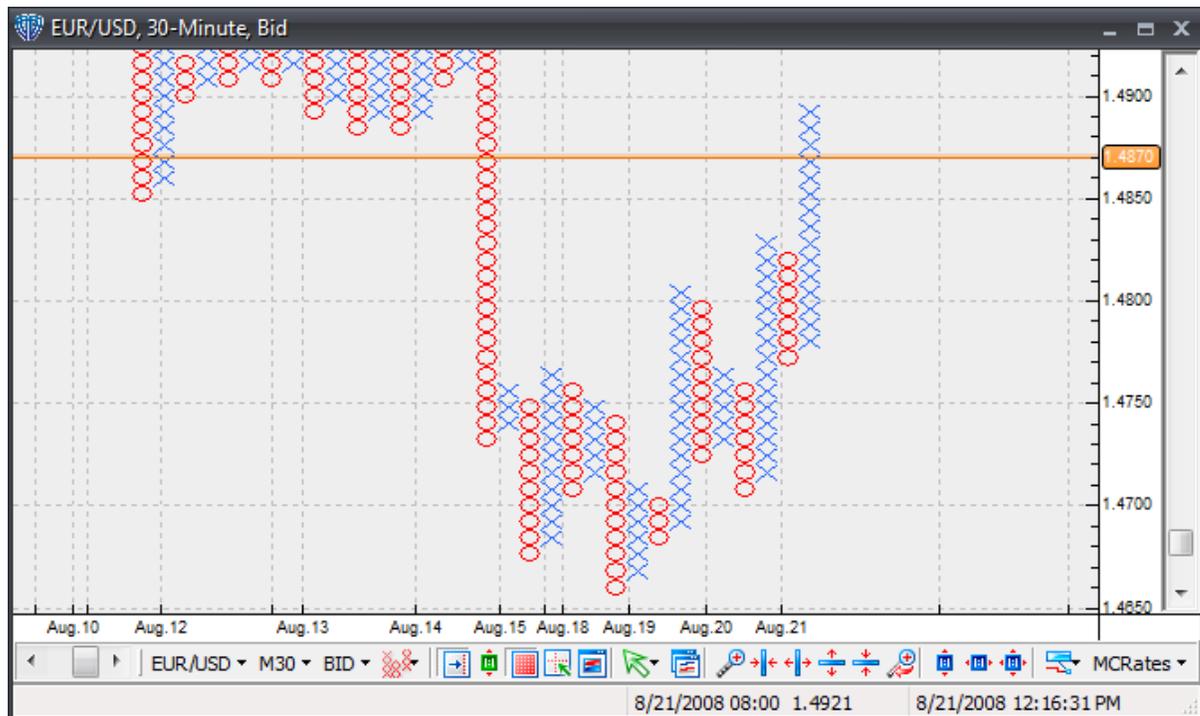
The "open," "high," "low," and "close" referred to are of the current bar. The prefix ha- indicates the corresponding Heikin-Ashi modified values. The "ha" values in the **Data Inspection** window correspond to the Heikin-Ashi prices. The "ha" values are also visible in the chart window's scroll panel (*in place of the traditional O,H,L,C values*) when the *Chart Type* is set to *Heikin-Ashi Candlesticks*.



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Point and Figure

Point and Figure charts calculate and show price data using the defined *Price*, *Box Size*, and *Reversal Amount* options. Point & Figure charts do not show time in a linear fashion. Each rising column of X's or declining column of O's can represent varying amounts of time depending on the price movements.



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Renko

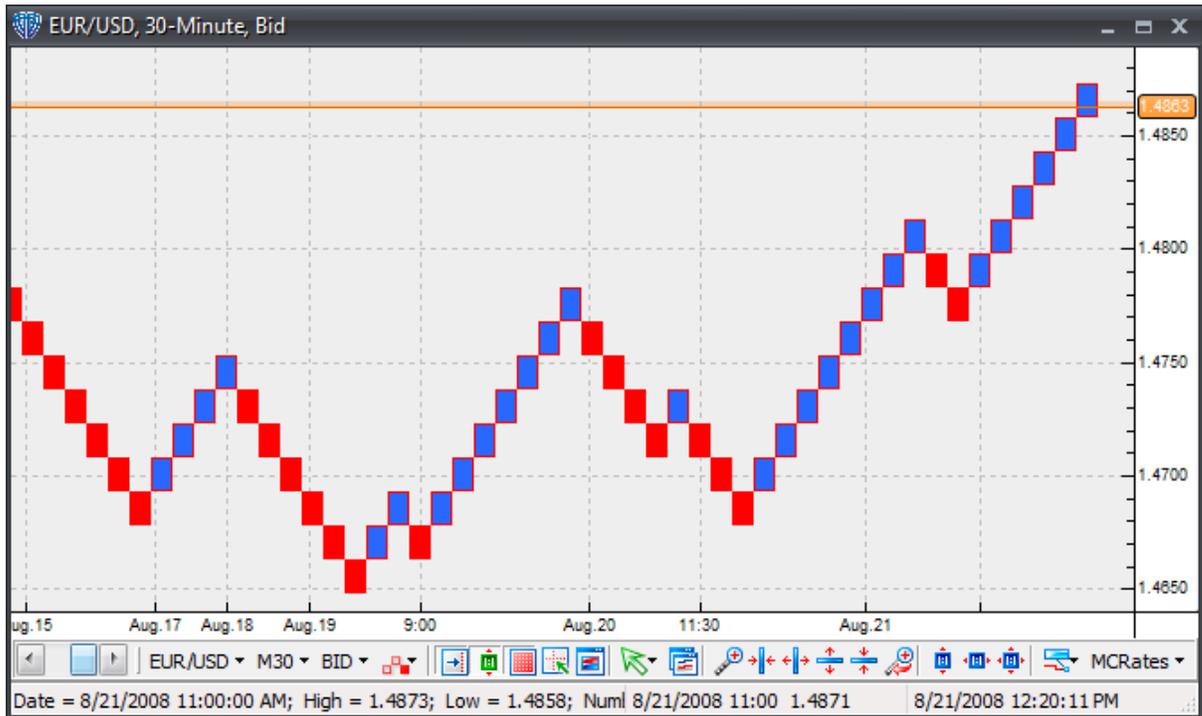
Renko charts were introduced by Steve Nison. This charting method assumed its name from the Japanese word "renga" meaning bricks.

Each brick is drawn in the direction of the prior price move only if a fixed amount (*i.e. the box size*) has been exceeded. The bricks are always equal in size. For example, in a 10 unit Renko chart, a 40 point rally is shown as four equally sized, 10 unit high Renko bricks.

To formulate Renko bricks, today's close price is compared with the high and low prices of the previous brick. When the close price rises above the top of the previous brick by the specified box size or more, one or more equal height, up bricks are drawn in the next column. If the close price falls below the bottom of the previous brick by the specified box size or more, one or more equal height, down bricks are drawn in the next column.

If the market moves up more than the amount required to draw one brick, but less than the amount required to draw two bricks, only one brick is drawn. For example, in a 10 unit Renko chart, if the base price is 1.2000 and the market moves to 1.2015, then one brick is drawn from the base price of 1.2000 - 1.2010. The rest of the move -- from 1.2010 to 1.2015 -- is not shown on the Renko chart. The same rule applies anytime the price does not fall on a box size divisor.

Basic trend reversals are signaled with the emergence of an up or down brick. A new up brick indicates the beginning of a new uptrend. A new down brick indicates the beginning of a new downtrend. Renko charts are excellent for helping determine major support and resistance levels since their main purpose is to define the underlying trend direction by filtering out minor price movements.



[Return to Chart Types](#) ^[142]

3.6 Desktop Workspaces Management

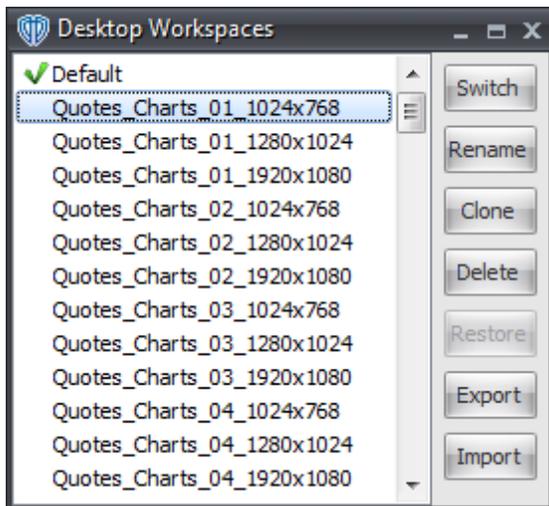
To best utilize the **Desktop Managements Management** window, it's necessary to first understand what *desktop workspaces* are and how they function in VT Trader.

What is a *desktop workspace*?

Simply defined, a *desktop workspace* is a predefined spatial arrangement of VT Trader windows that is saved to a file that can then be (re)loaded quickly and easily. Desktop workspaces are saved as . desktop files and stored in *VT Trader's Data -> Desktops folder*.

What is the Desktop Workspaces Management Window?

You can use the **Desktop Workspaces Template Management** window to *load (switch), rename, clone, delete, restore, import, and export* existing *desktop workspaces*. You can also restore any existing desktop workspace back to VT Trader's "factory default" *desktop workspace* configuration.



The **Desktop Workspaces** window contains the following commands:

Switch

You can load (*view*) any of your saved desktop workspaces by using the **Switch** command's selection menu.

Rename

This command allows you to change the name of the selected *desktop workspace*.

Clone

This command creates a copy of the selected *desktop workspace*. You must give the cloned *desktop workspace* a new name when prompted; it is not possible to save over an existing *desktop workspace*.

Delete

This command moves the selected *desktop workspace* to the Windows Recycle Bin for deletion.

Restore

VT Trader automatically creates *previous version* backup files of the active desktop workspace based on your settings for the *Max # of Previous Versions* and *Auto-Save Periodicity (in minutes)* options in the *Options window -> General section -> Desktop Workspaces subsection*. You can restore the active desktop workspace back to one of its previous states or back to VT Trader's "factory default" state by using this command's selection menu. Only previous versions of the active desktop workspace are shown in this selection menu. All previous versions created of any desktop workspaces are saved into VT Trader's *Data -> Desktops -> Backups* folder.

Export

This command exports the selected *desktop workspace* so that it can be saved in a designated folder on your computer. *Desktop Workspaces* are saved with a *.desktop* file extension. An exported *desktop workspace* can be imported into VT Trader using the **Import** command.

Import

This command imports VT Trader desktop workspace files previously saved in the .desktop format.

Note: You cannot import VT Trader 1.x desktop templates into any version of VT Trader 2.

3.7 Chart Templates Management

To best utilize the **Chart Templates Management** window, it's necessary to first understand what *chart templates* are and how they function in VT Trader.

What is a *chart template*?

Simply defined, a *chart template* is a predefined set of properties, indicators, and trading systems associated with a chart that can be saved to a file and then later assigned (*loaded or applied*) to one or more chart windows quickly and easily. Please [click here](#)^[131] to learn more about what [chart properties](#)^[131] are included in each *chart template*. Chart templates are saved as .vtcharttpl files (*short for "VT chart template"*) and stored in *VT Trader's Data -> ChartTemplates folder*.

How do *chart templates* function in VT Trader?

There is a 3-level hierarchy that determines how *chart templates*, [chart properties](#)^[131], and *per chart elements' properties* are applied to each chart.

Level 1 (*highest level*): Chart Template ->

Level 2: Custom Chart Properties ->

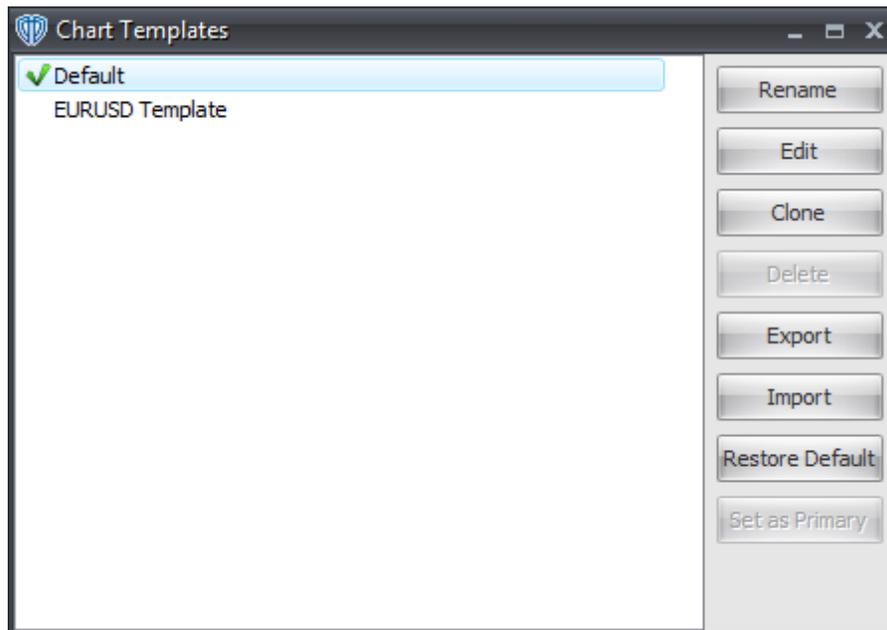
Level 3 (*lowest level*): Per Chart Elements' Custom Properties

Each new chart window is opened with an assigned chart template; the chart template used for this purpose is the "primary" *chart template* as defined in the **Chart Templates Management** window. However, any time you modify a specific chart window's [chart properties](#)^[131] that chart immediately disassociates itself from any *chart template* and switches to using its own custom chart properties. Working with drawing objects in a chart window does not affect the chart window's *chart template* association should one exist. Additionally, any chart element that has custom properties assigned to it will not be overwritten should a *chart template* be assigned to that chart window. For example, if you change the color of a specific chart label in a chart window, that specific chart label would retain its custom color if/when that chart window was assigned a *chart template*.

Please do not worry if this sounds complicated. VT Trader includes several detailed confirmation messages (*and error messages*) to help guide your use of *chart templates*. You will always know exactly how VT Trader is managing the *chart template(s)* and any associated chart windows as you perform *chart template*-related actions.

What is the Chart Template Management Window?

You can use the **Chart Template Management** window to *rename, edit, clone, delete, import, and export* existing *chart templates*. You can also restore any existing chart template back to VT Trader's "factory default" *chart template* configuration and define any *chart template* as the "primary" to be applied to any newly opened any new chart window.



The **Chart Template Management** window contains the following commands:

Rename

This command allows you to change the name of the selected *chart template*.

Edit

This command allows you to make changes to the selected *chart template's* properties. Any changes made to the selected *chart template* will be applied to the chart window(s) assigned to that *chart template*.

Clone

This command creates a copy of the selected *chart template*. You must give the cloned *chart template* a new name when prompted; it is not possible to save over an existing *chart template*.

Delete

This command moves the selected *chart template* to the Windows Recycle Bin for deletion. When a *chart template* is deleted, all chart windows assigned to it immediately switch to using their own custom [chart properties](#)^[13].

Export

This command exports the selected *chart template* so that it can be saved in a designated folder on your computer. *Chart templates* are saved with a *.vtcharttpl* file extension. An exported *chart template* can be imported into VT Trader using the **Import** command.

Import

This command imports a *chart template* file that was previously exported from VT Trader. Importing a *chart template* adds it to the **Chart Template Management** window's list. If a *chart template* with the same *Name* already exists in VT Trader a (1) is appended to the imported *chart template*'s name to help distinguish it from the existing *chart template*.

Restore Default

This command modifies the selected *chart template* by restoring it back to VT Trader's "factory default" *chart template* configuration.

Set as Primary

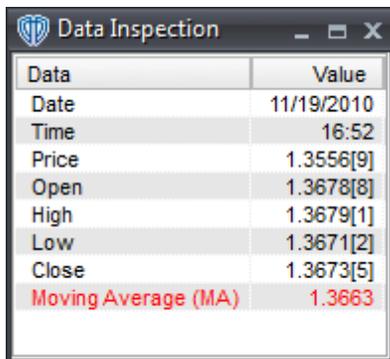
This command sets the selected *chart template* as the "primary". Each new chart window is opened with this *chart template* assigned to it.

3.8 Technical (Chart) Analysis

3.8.1 Data Inspection Window

The **Data Inspection** window shows date/time, price, indicator data, and trading system data associated with the active chart window.

This window consists of two columns: the **Data** column and the **Value** column. It also consists of several rows that are visible at all times; the data shown in these rows correspond to the active chart (type) being viewed. The **Data Inspection** window also shows the names and values of each indicator's output variables (*and/or Indicator Output Enabled trading system's output variables*) currently attached to the active chart (*assuming their Hide In Inspect option is disabled*).



Data	Value
Date	11/19/2010
Time	16:52
Price	1.3556[9]
Open	1.3678[8]
High	1.3679[1]
Low	1.3671[2]
Close	1.3673[5]
Moving Average (MA)	1.3663

Note: If the cursor is positioned over the currently forming candle, bar, Point and Figure X or O, or Renko box the values in the **Data Inspection** window automatically update with the new, incoming values as those new values become available (*or are calculated*). You do not need to move the cursor away from

the currently forming bar or candle and then reposition it over top of that bar or candle again to view the new, updated values.

Japanese Candlestick Charts and Bar Charts

If the active chart is a Japanese Candlestick chart (*filled or hollow*) or bar chart, the rows that always remain visible show the following names in the **Data** column:

Date/Time/Price - shows the date, close time of bar/candle, and price (*horizontal cross hair*^[240] price value) under the current position of the cursor; the format is month/day/year time price (*I.E.: 06/03/07 11:45 1.1234*); this data changes as the cursor is moved around within the chart window

Open - shows the open price of the bar/candle under the current position of the cursor in the **Value** column

High - shows the high price of the bar/candle under the current position of the cursor in the **Value** column

Low - shows the low price of the bar/candle under the current position of the cursor in the **Value** column

Close - shows the close price of the bar/candle under the current position of the cursor in the **Value** column

Heikin-Ashi Candlestick Charts

If the active chart is a Heikin-Ashi Candlestick chart, the rows that always remain visible show the following names in the **Data** column:

Date/Time/Price - shows the date, close time of Heikin-Ashi candle, and price (*horizontal cross hair*^[240] price value) under the current position of the cursor; the format is month/day/year time price (*I.E.: 06/03/07 11:45 1.1234*); this data changes as the cursor is moved around within the chart window

haOpen - shows the Heikin-Ashi open price of the candle under the current position of the cursor in the **Value** column

haHigh - shows the Heikin-Ashi high price of the candle under the current position of the cursor in the **Value** column

haLow - shows the Heikin-Ashi low price of the candle under the current position of the cursor in the **Value** column

haClose - shows the Heikin-Ashi close price of the candle under the current position of the cursor in the **Value** column

Point and Figure Charts

If the active chart is a Point and Figure chart, the rows that always remain visible show the following

information in the **Data** column:

The **Data** column shows X or O depending on if the cursor is positioned over a column of X's or O's in the active chart. A row will be shown in this window for each X or O in the column. In the **Value** column, each X or O row will contain the Date/Time/Price of that X or O. The **Value** column data will have the format of Date Time Price (*I.E. 08/13/07 11:00 1.3700*).

Renko Charts

If the active chart is a Renko chart, the rows that always remain visible show the following names in the **Data** column:

Date/Time/Price - shows the date, close time of Renko box, and price (*horizontal cross hair*^[240] price value) under the current position of the cursor; the format is month/day/year time price (*I.E.: 06/03/07 11:45 1.1234*); this data changes as the cursor is moved around within the chart window

Box Number - shows the number of the Renko box (*numbered from #1 - current number beginning with left-most box shown in chart window*) under the current position of the cursor in the **Value** column

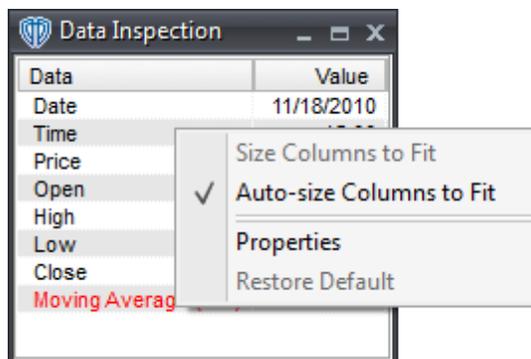
Box High - shows the high price of the Renko box under the current position of the cursor in the **Value** column

Box Low - shows the low price of the Renko box under the current position of the cursor in the **Value** column

Appearance Customizations

Each column in the **Data Inspection** window can be automatically (*or manually*) resized at your discretion.

To automatically resize one or more columns, position the cursor over any row and click the right mouse button. You may select *Size Columns to Fit* or *Auto-Size All Columns to Fit* from the [contextual menu](#)^[157] depending on the action you want to perform.



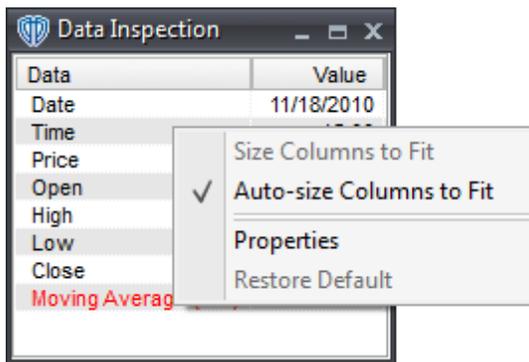
To manually resize a column, you must ensure the *Auto-Size All Columns to Fit* command is *disabled* in the contextual menu, then click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and

appear similar to this: <-|->. While the left mouse button is held down, move the mouse to the left or right to resize the column.

You can customize the appearance of the window and its data by using the window's [properties](#)^[158].

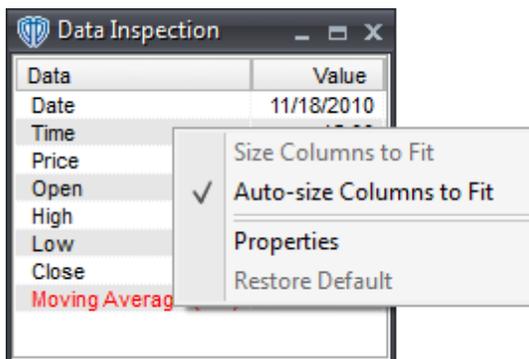
Contextual Menu

The **Data Inspection** window's [contextual menu](#)^[157] provides you with additional functionality and access to the window's [properties](#)^[158]. To activate the [contextual menu](#)^[157], click the right mouse button while the cursor is positioned over any data row.



3.8.1.1 Contextual Menu

The **Data Inspection** window's contextual menu provides you with additional functionality and access to the window's [properties](#)^[158]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any data row.



The **Data Inspection** window's contextual menu contains the following commands:

Size Columns to Fit

This command sizes the window's columns to accommodate their data. This command is only

enabled if the **Auto-Size Columns to Fit** command is *disabled*.

Auto-Size Columns to Fit

This command, while *enabled*, continuously auto-sizes the window's columns to accommodate their data.

Properties

This command opens the **Data Inspection [properties](#)** ¹⁵⁸ window.

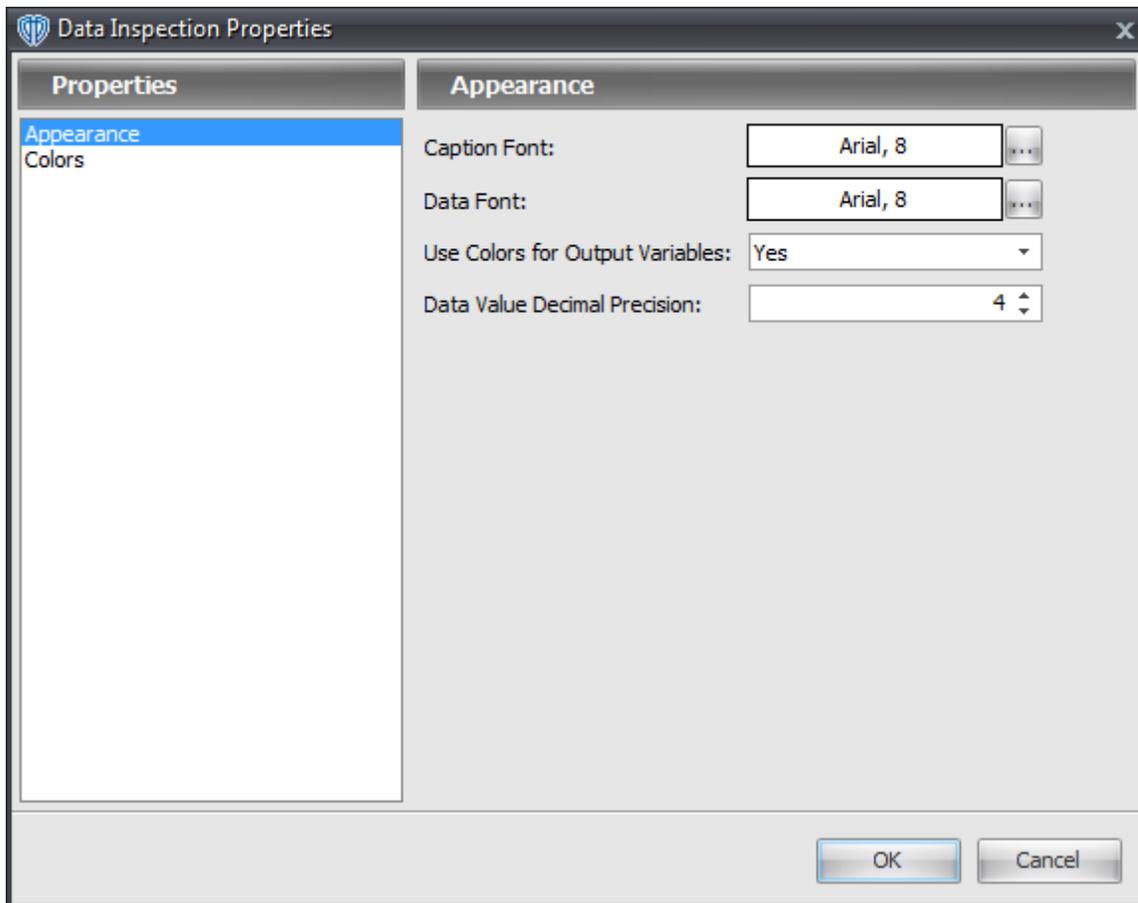
Restore Default

This command resets any custom properties currently used in the **Data Inspection** window back to their default values.

3.8.1.2 Properties

The **Data Inspection** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

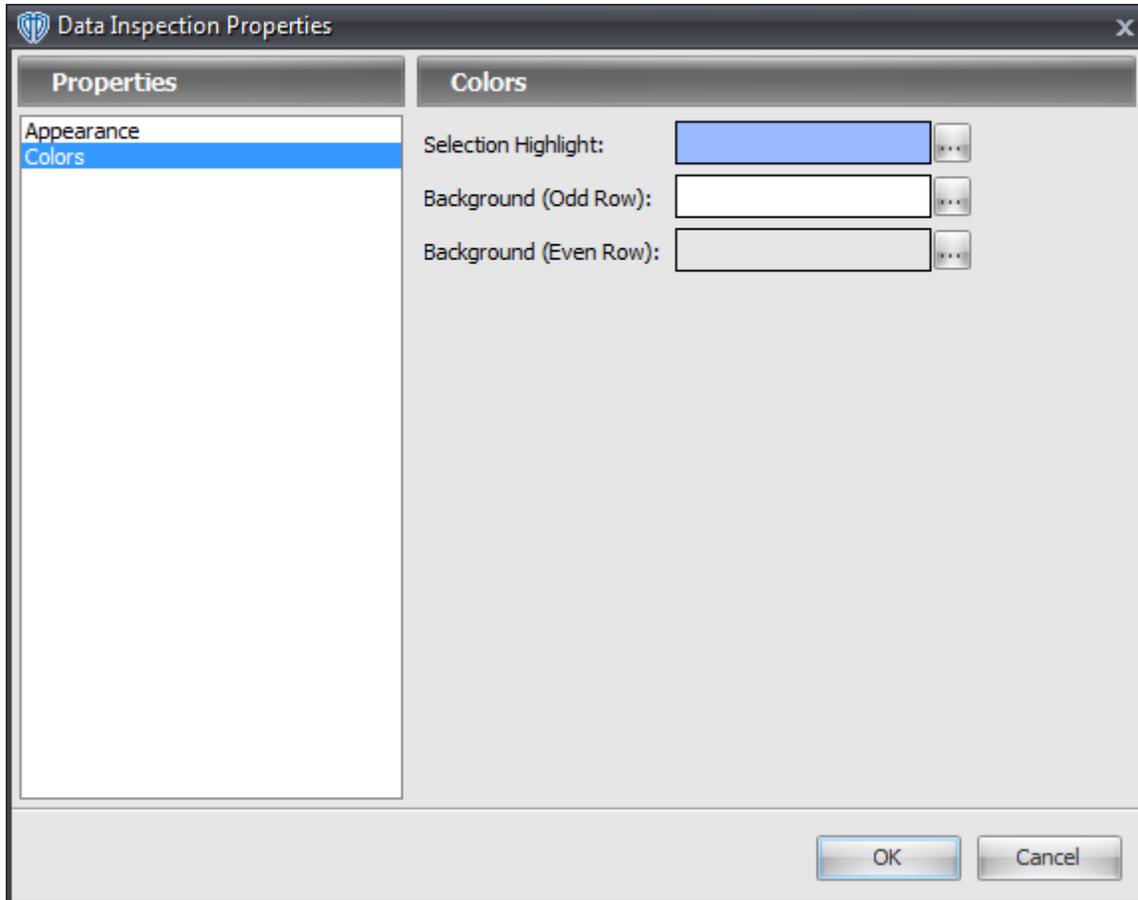
Use Colors for Output Variables

This option is a selection menu with two choices: *Yes* and *No*. While *Yes* is chosen, output variables' names and data values are shown in the **Data Inspection** window using their own colors. While *No* is chosen, output variables' names and data values are shown using the color black.

Data Value Decimal Precision

This option defines the number of decimal places of precision shown in the output variables' data values. This option applies to the **Data Inspection** window, indicator labels, and trading system labels.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window. You can change the color by using the [...] button.

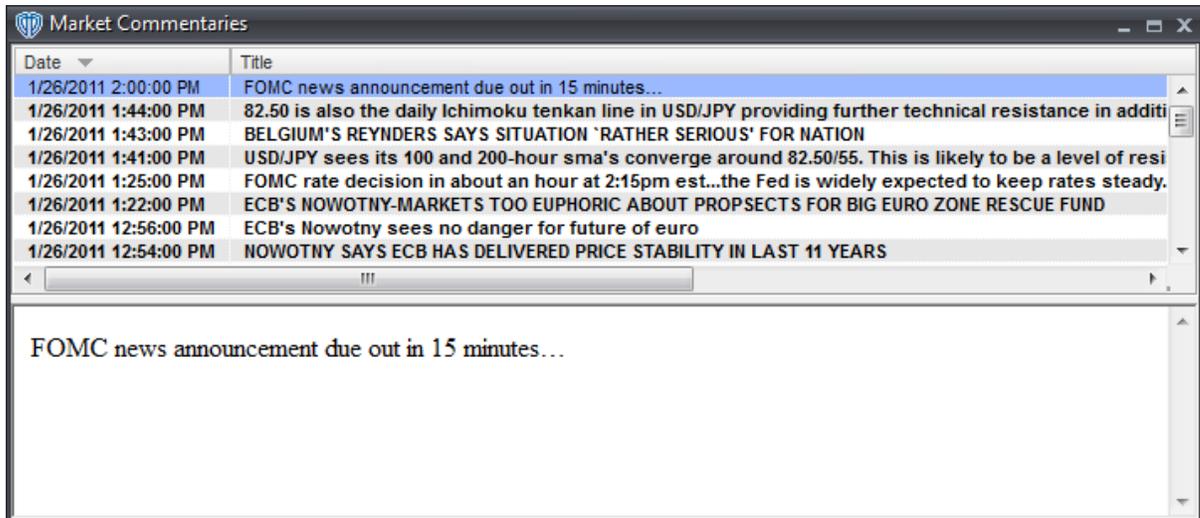
Background (Even Row)

This option defines the background color of all even-numbered rows in the window. You can change the color by using the [...] button.

3.9 Fundamental Analysis

3.9.1 Market Commentaries Window

The **Market Commentaries** window provides you with actionable analysis of news, events and technical levels that impact currency prices - as it happens. Updates are published up to 20 times an hour by Forex.com's senior traders and experienced research team.



You can read the news messages by clicking on the news headlines. The news message will be shown in the bottom frame of the window or in a separate window if you have the *Show Message in Separate Window* command enabled in the window's [contextual menu](#)^[163].

Explanations of Commentaries Data

Date/Time

The date and time that the commentary message was sent out is its **Date/Time**.

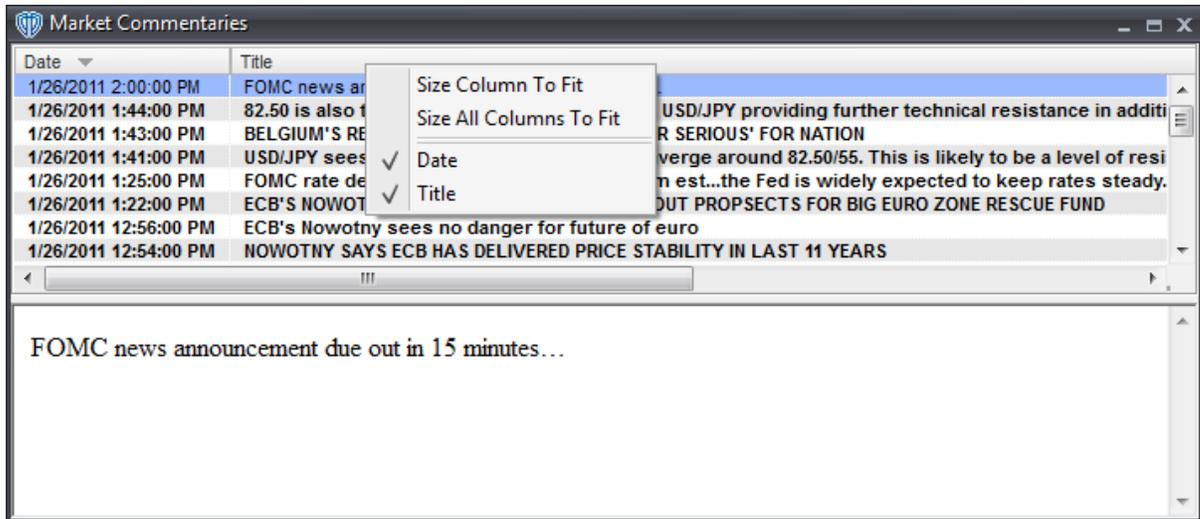
Title

The **Title** is a brief description of the new message's content.

Appearance Customizations

Each column of data in the **Market Commentaries** window can be automatically (*or manually*) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|->. While the left mouse button is held down, move the mouse to the left or right to resize the column.

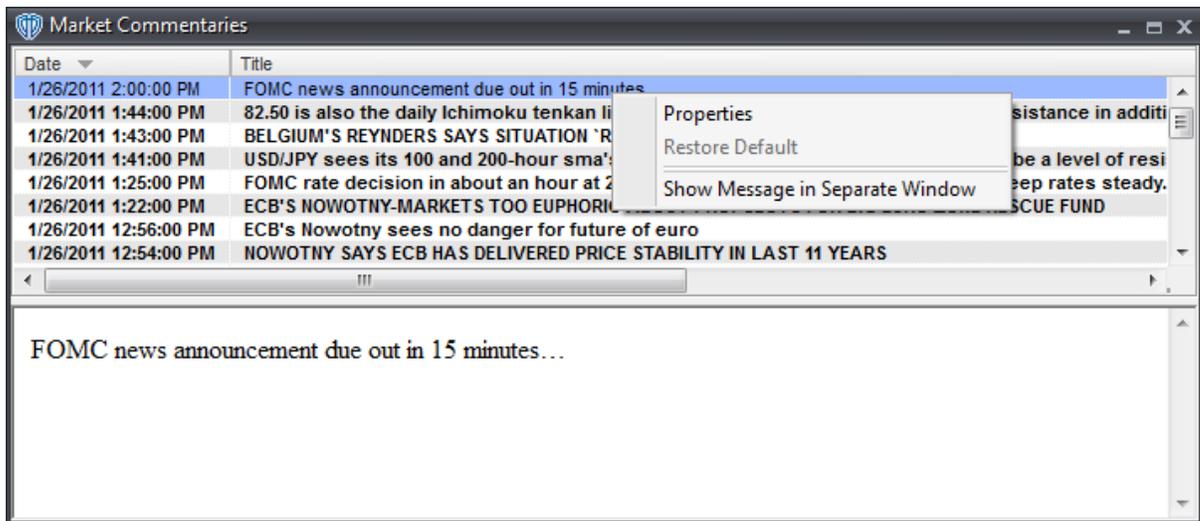
It is also possible to change the location of each column respective to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Date*, *Title*).

To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can further customize the appearance of the window and its data by using the window's [properties](#) ^[164].

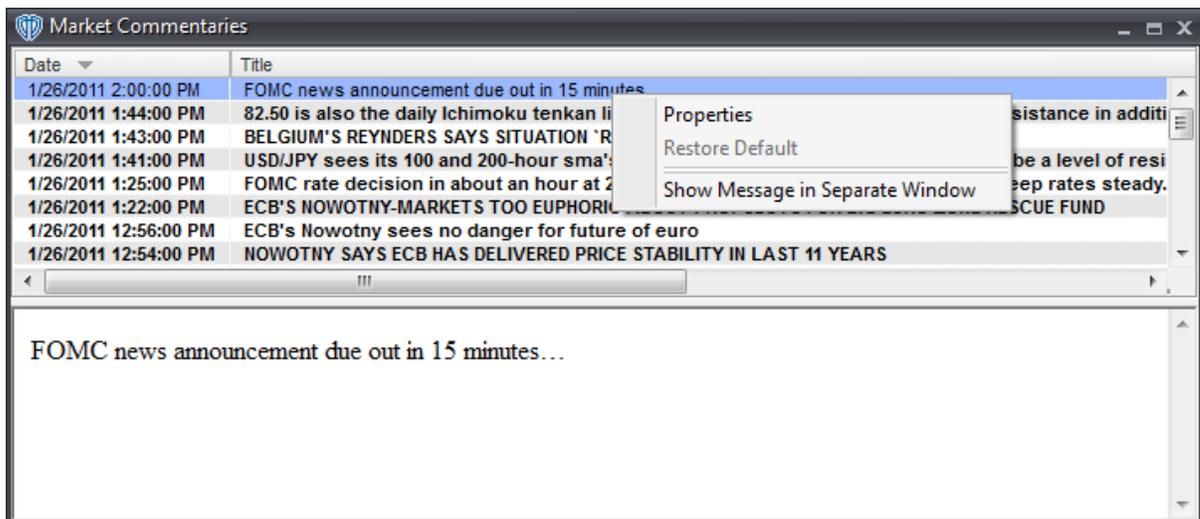
Contextual Menu

The **Market Commentaries** window's [contextual menu](#) ^[163] provides you with additional functionality and access to the window's [properties](#) ^[164]. To activate the [contextual menu](#) ^[163], click the right mouse button while the cursor is positioned over any news row.



3.9.1.1 Contextual Menu

The **Market Commentaries** window's contextual menu provides you with additional functionality and access to the window's [properties](#)^[164]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any news row.



The **Market Commentaries** window's contextual menu contains the following commands:

Properties

This command opens the **Market Commentaries** [properties](#)^[164] window.

Restore Default

This command resets any custom properties currently used in the **Market Commentaries** window back to their default values.

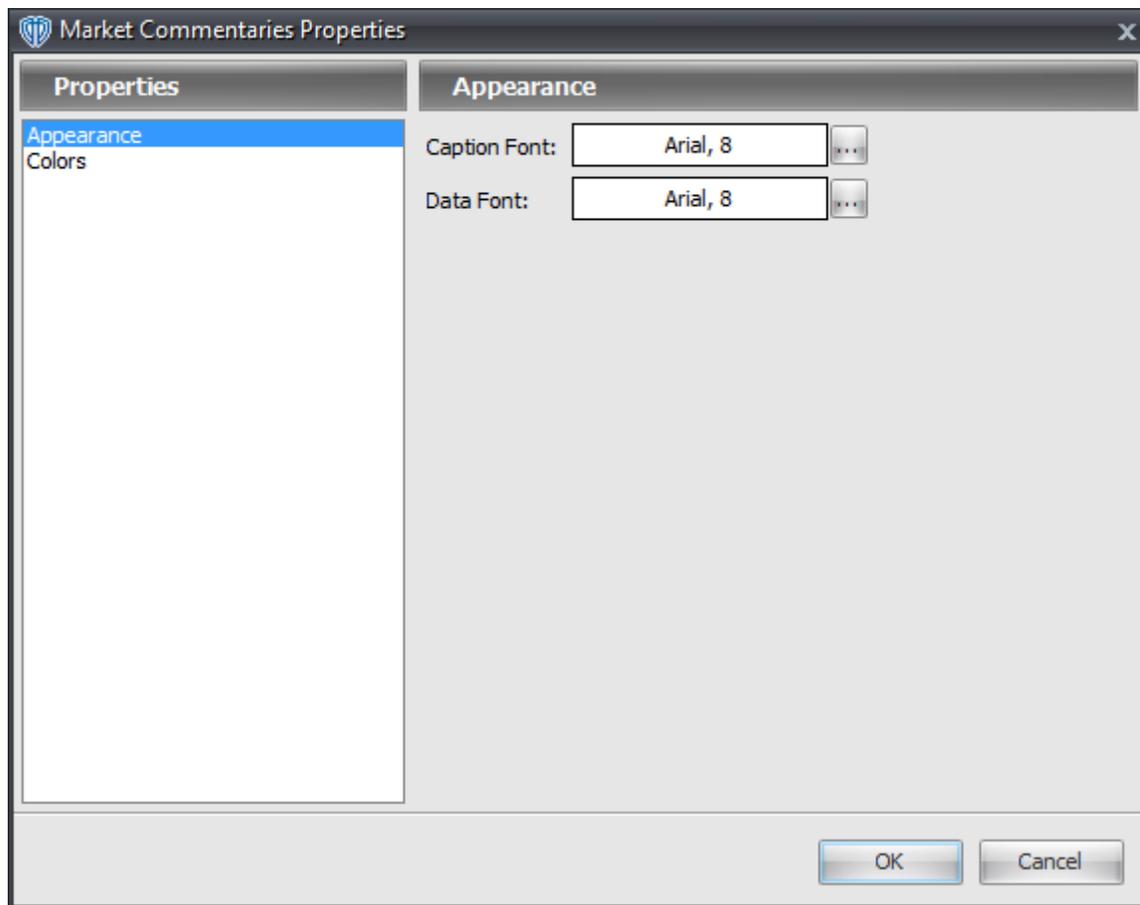
Show Message in Separate Window

This command, while *enabled*, hides the bottom frame of the **Market Commentaries** window and opens each new message you select in its own separate window.

3.9.1.2 Properties

The **Market Commentaries** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

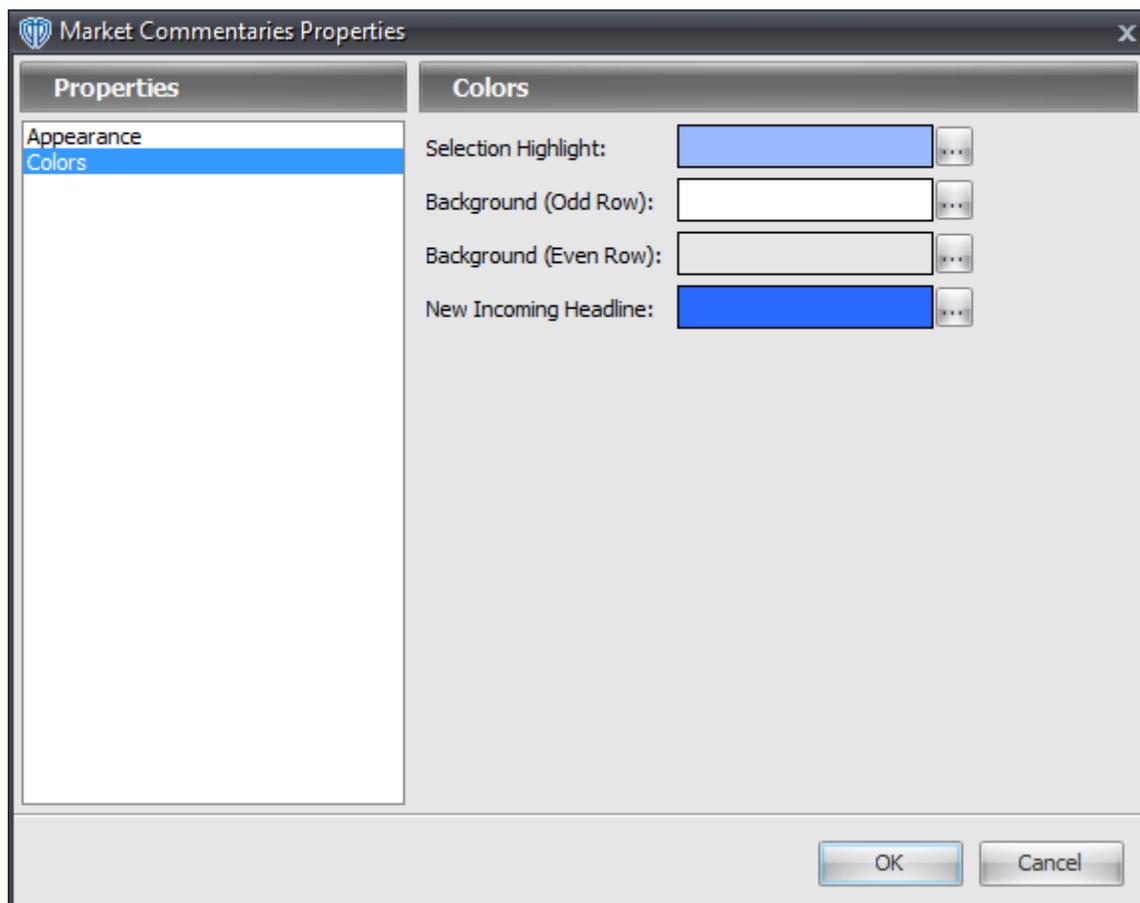
Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window. You can change the color by using the [...] button.

Background (Even Row)

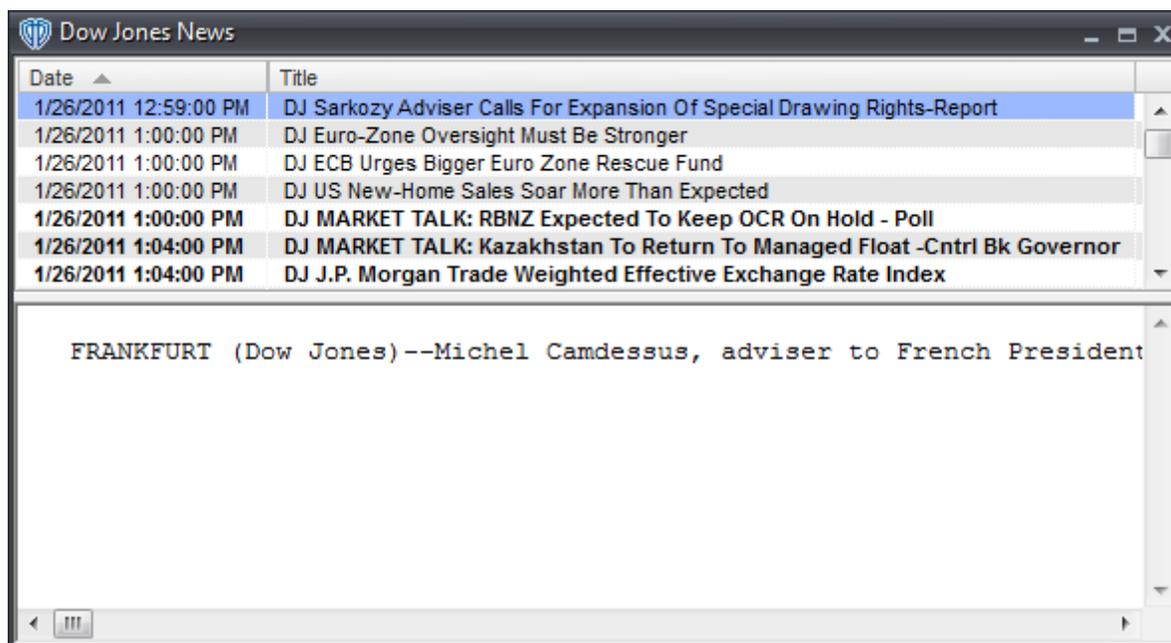
This option defines the background color of all even-numbered rows in the window. You can change the color by using the [...] button.

New Incoming Headline

This option defines the background color of the most recent news headline's row. You can change the color by using the [...] button.

3.9.2 Dow Jones News Window

The **Dow Jones News** window provides you with up-to-the-minute, real-time news from the **Dow Jones** news service.



You can read the news messages by clicking on the news headlines. The news message will be shown in the bottom frame of the window or in a separate window if you have the *Show Message in Separate Window* command enabled in the window's [contextual menu](#)¹⁶⁸.

Explanations of Dow Jones News Data

Date/Time

The date and time that the news message was sent out is its **Date/Time**.

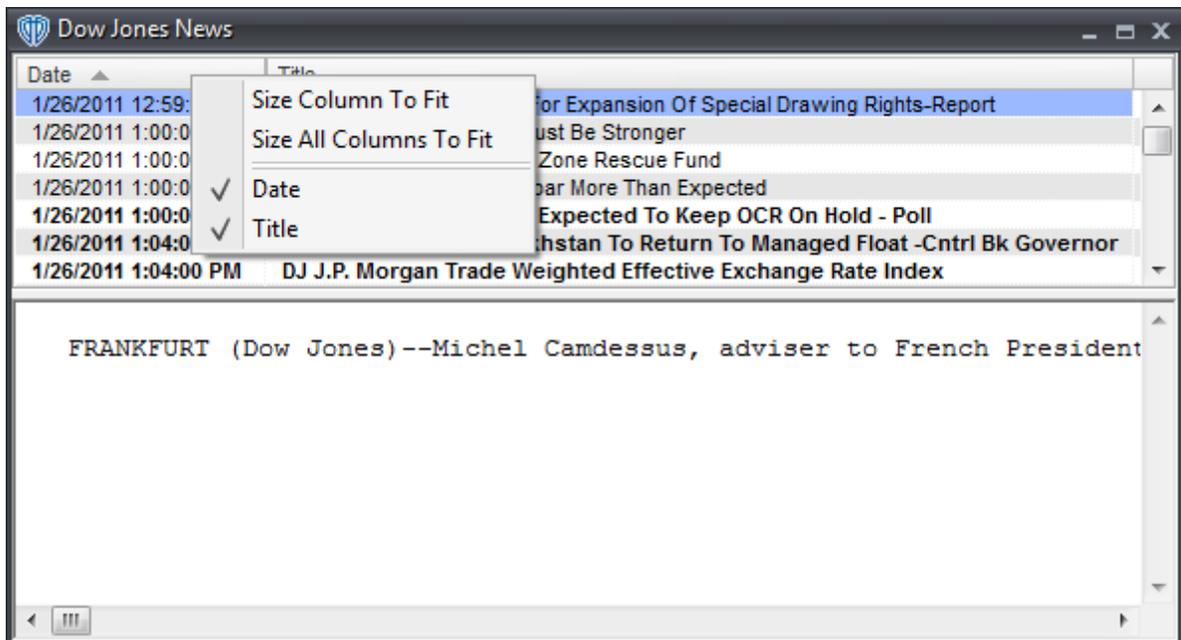
Title

The **Title** is a brief description of the new message's content.

Appearance Customizations

Each column of data in the **Dow Jones News** window can be automatically (*or manually*) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|->. While the left mouse button is held down, move the mouse to the left or right to resize the column.

It is also possible to change the location of each column respective to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Date, Title*).

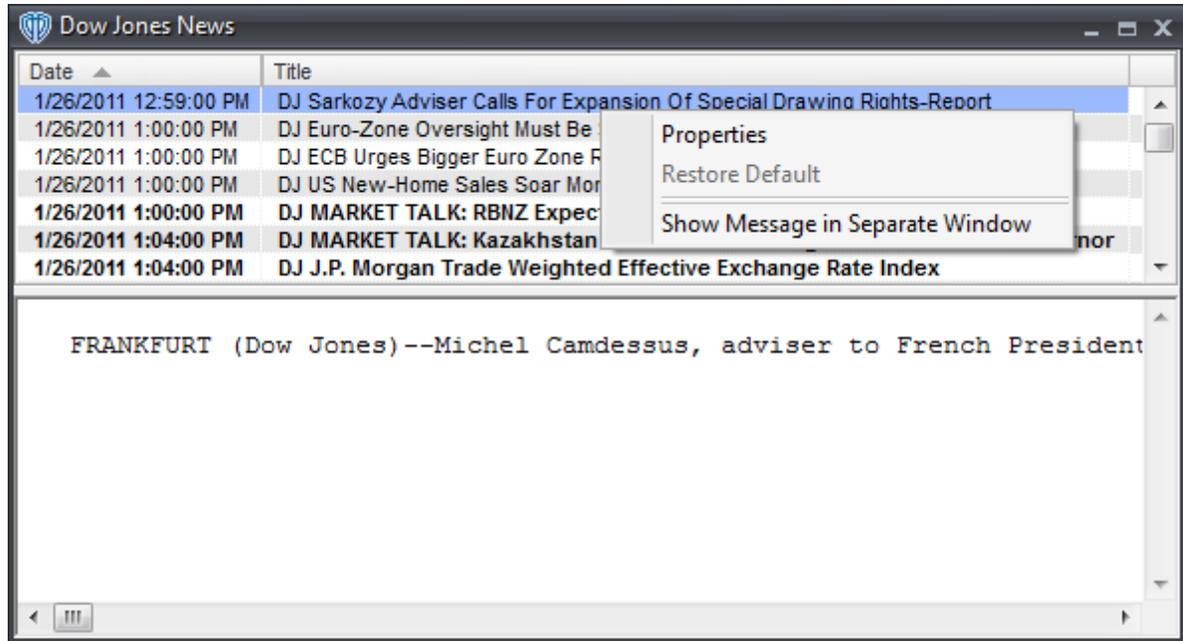
To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can further customize the appearance of the window and its data by using the window's [properties](#)



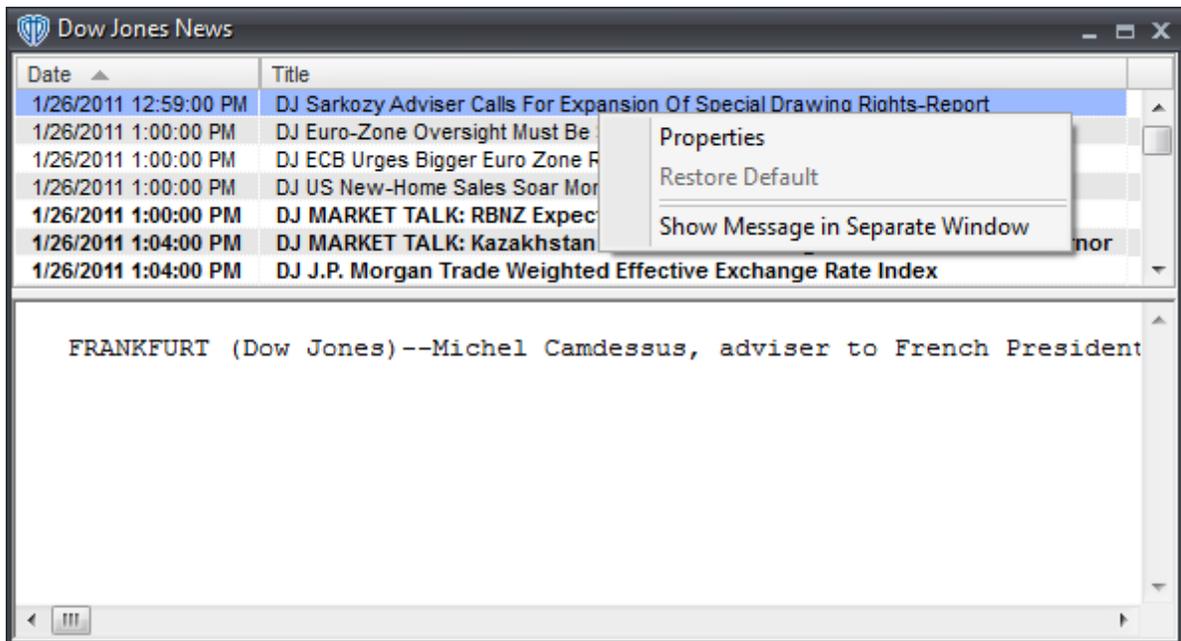
Contextual Menu

The **Dow Jones News** window's [contextual menu](#)^[168] provides you with additional functionality and access to the window's [properties](#)^[169]. To activate the [contextual menu](#)^[168], click the right mouse button while the cursor is positioned over any news row.



3.9.2.1 Contextual Menu

The **Dow Jones News** window's contextual menu provides you with additional functionality and access to the window's [properties](#)^[169]. To activate the contextual menu, click the right mouse button while the cursor is positioned over any news row.



The **Dow Jones News** window's contextual menu contains the following commands:

Properties

This command opens the **Dow Jones News** [properties](#) window.

Restore Default

This command resets any custom properties currently used in the **Dow Jones News** window back to their default values.

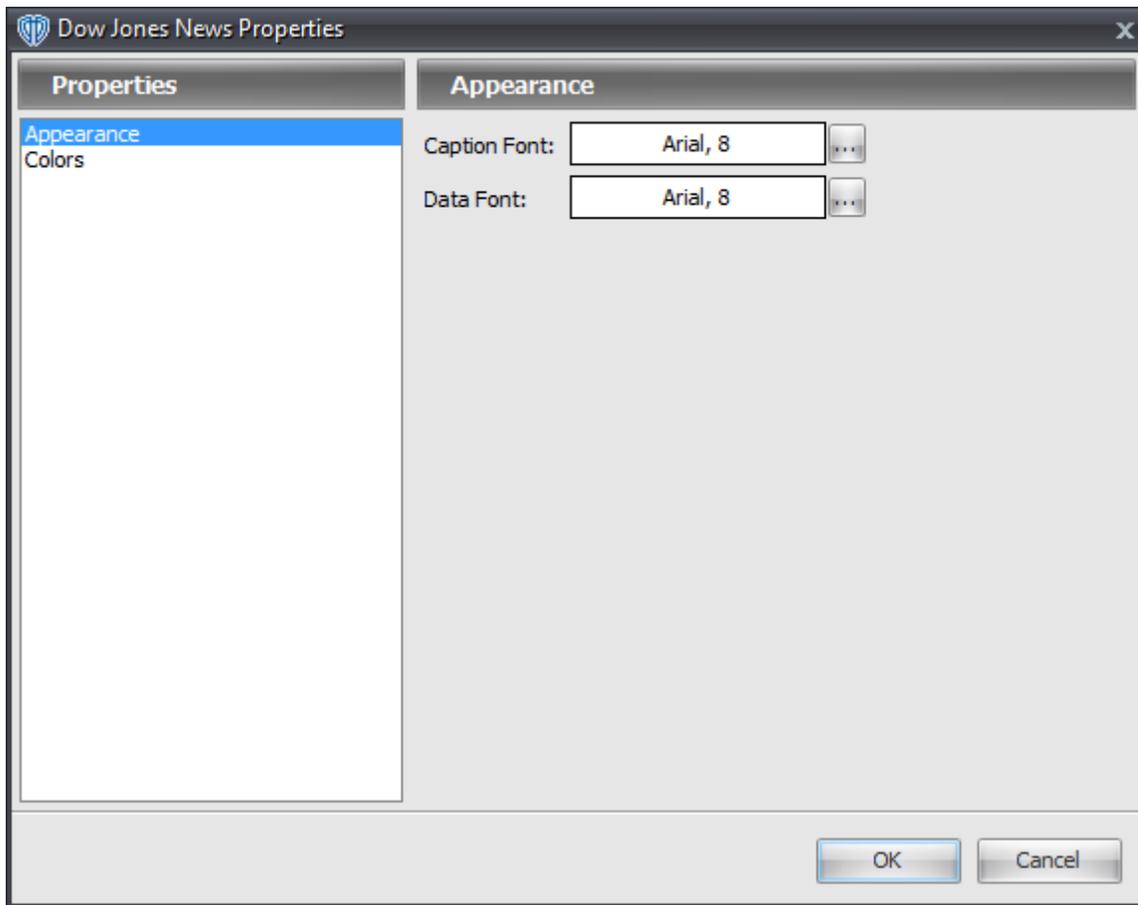
Show Message in Separate Window

This command, while *enabled*, hides the bottom frame of the **Dow Jones News** window and opens each new message you select in its own separate window.

3.9.2.2 Properties

The **Dow Jones News** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

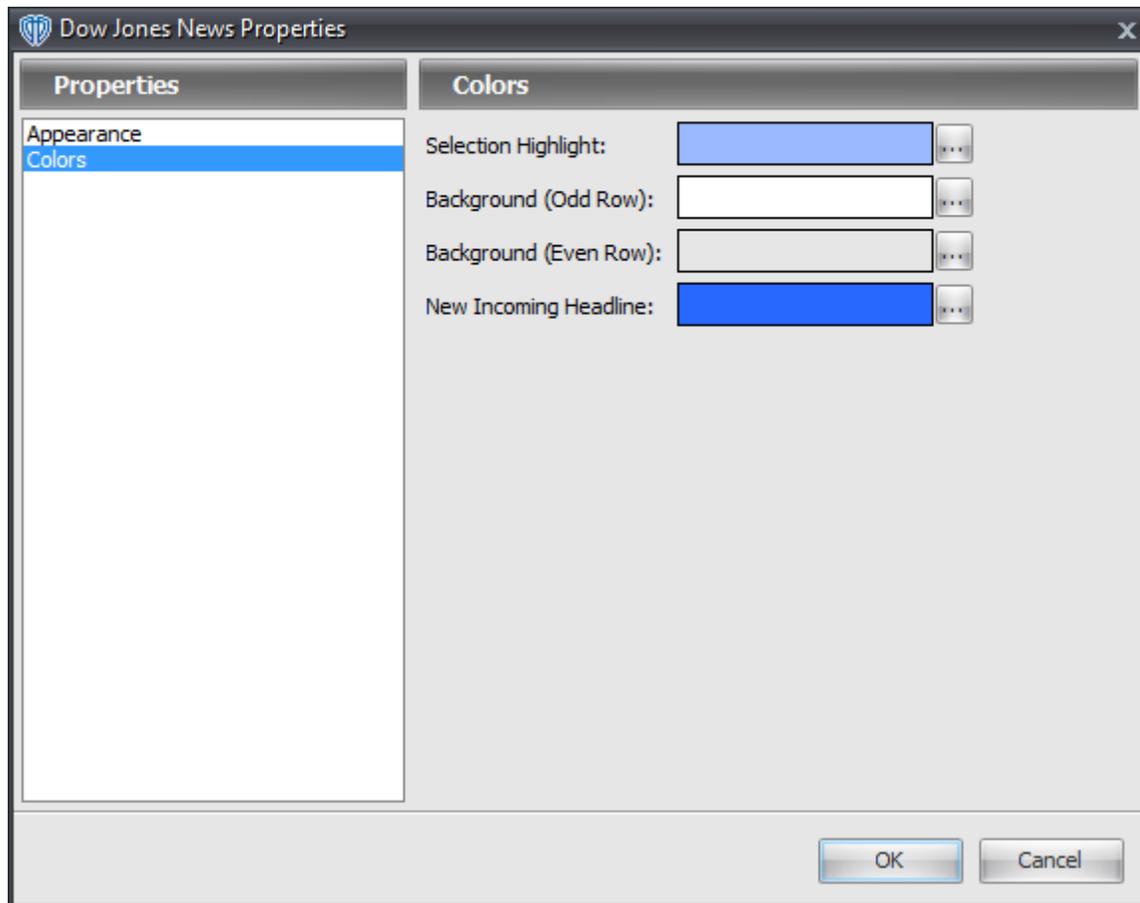
Caption Font

This option defines the font attributes used for window's column captions. You can change the font attributes by using the [...] button.

Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the [...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window. You can change the color by using the [...] button.

Background (Even Row)

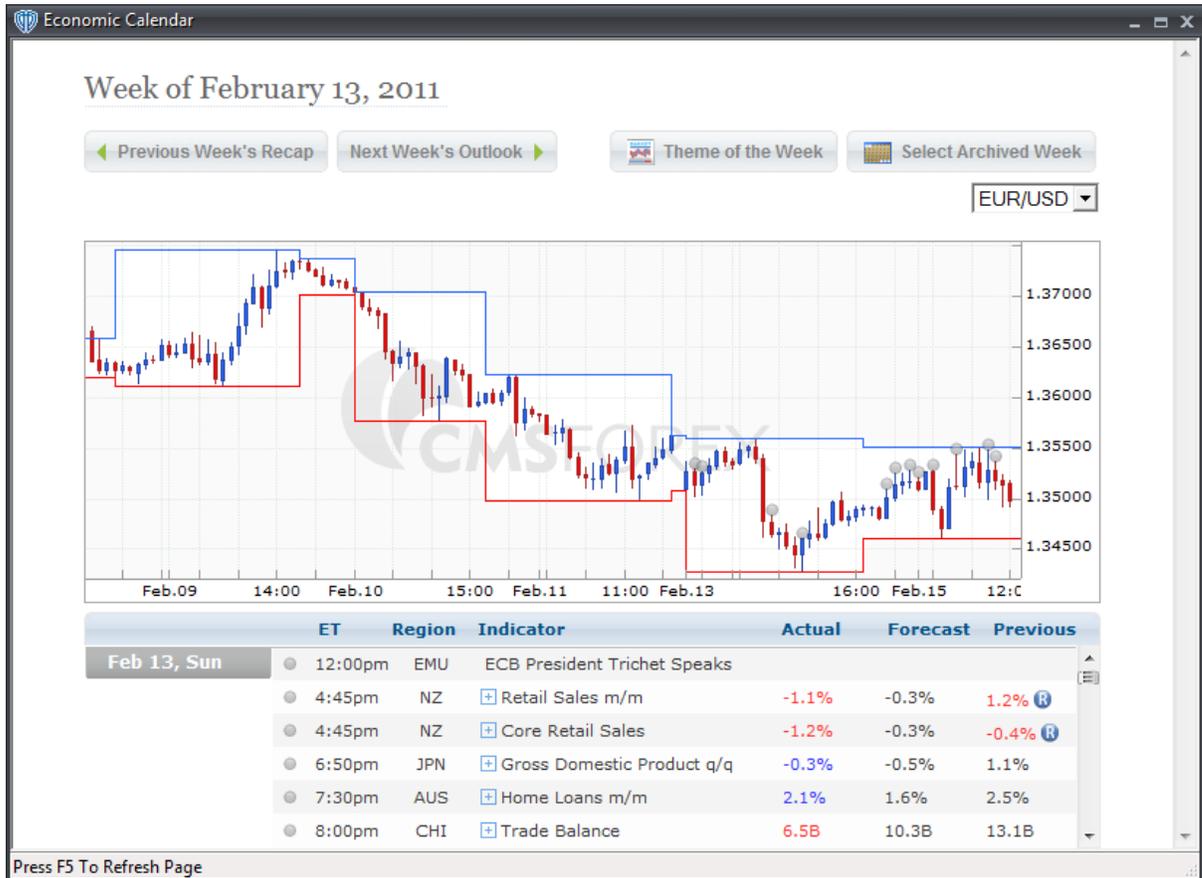
This option defines the background color of all even-numbered rows in the window. You can change the color by using the [...] button.

New Incoming Headline

This option defines the background color of the most recent news headline's row. You can change the color by using the [...] button.

3.9.3 Economic Calendar Window

The **Economic Calendar** window provides you with a recap of the FX market's weekly highlights and economic indicator (*news*) data along with a chart showing round orbs above the candles corresponding to the dates/times of the respective economic events.



By Clicking the *Theme of the Week* link, you can read the week's market highlights.

Week of February 13, 2011

Theme of the week February 13, 2011

Euro Struggles at Start of the Week: The Euro fell against its rivals as a host of news items pressured the single currency. A meeting of finance ministers continue to expose divisions in going forward with the "grand bargain", there was concerns about a restructure deal floundering for German bank WestLB, the ECB had to intervene last week to buy Portugal bonds in the secondary market as yields there rose to as high as 7.6%, and there were fresh concerns about Ireland (opposition party wanted to restructure parts of its EFSF rescue deal) and Greece (reluctant to sell assets to pay off debt). All in all, a combination that helped Euro bears.

US - Focus on Budget and Slew of Data: In the US, President Obama and his administration laid out their budget. The 2011 budget deficit would be a record \$1.645 trillion (thanks to the tax compromise passed late last year) though the administration laid out cuts of \$1.1 trillion from the deficit over the next 10 years. While that may focus investors attention to the US' worrying fiscal picture, the markets will also be busy with data on retail sales, consumer and producer inflation, manufacturing, jobs, and housing. We should come away from this week with a better picture the US economy. Is consumer spending sustaining? Did manufacturing improve in February? Did core inflation rise - putting more pressure on the Fed? And did jobless claims stay near the 400K level? We'll have answers to these questions by the end of the week.

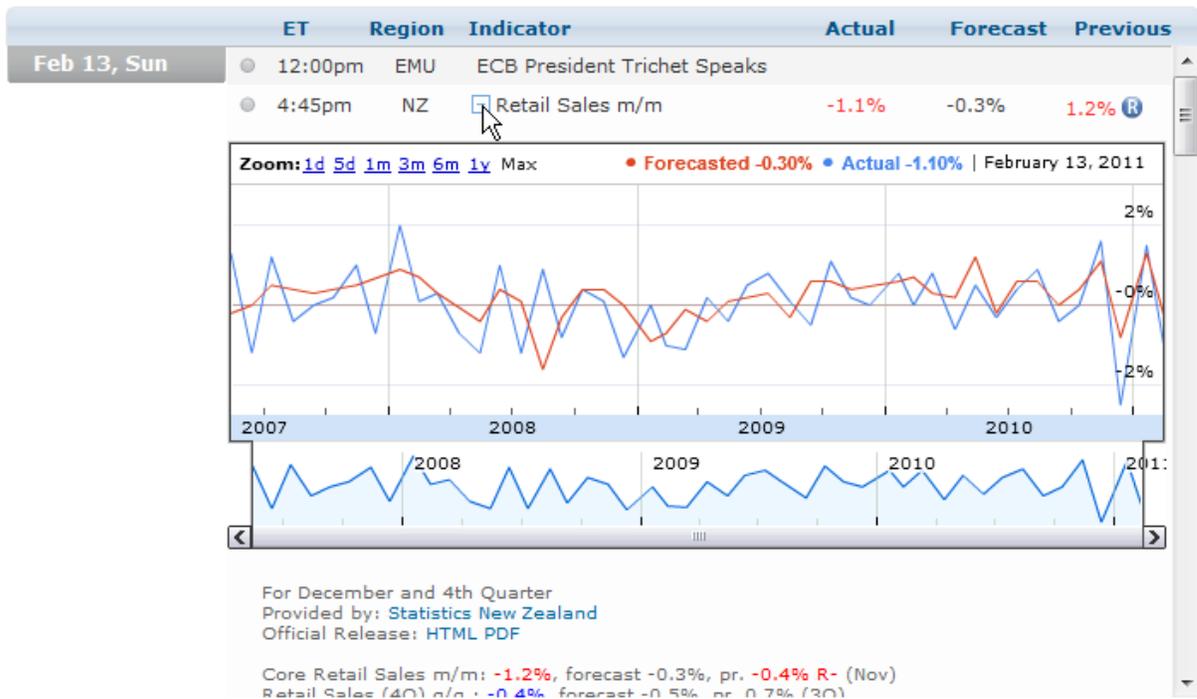
By clicking the *Previous Week's Recap*, *Next Week's Outlook*, or *Select Archive Week* links, you can read the archived market highlights, economic data, and expert commentary for that chosen week.

[◀ Previous Week's Recap](#)
[Next Week's Outlook ▶](#)
[📰 Theme of the Week](#)
[📅 Select Archived Week](#)



Feb 13, 2011						
Su	Mo	Tu	We	Th	Fr	Sa
30	31	1	2	3	4	5
6	7	8	9	10	11	12
<u>13</u>	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	1	2	3	4	5
6	7	8	9	10	11	12

Clicking the + symbol in front of each economic indicator displays additional information about it.



3.10 Alerts

3.10.1 Alerts Activity Window

The **Alerts Activity** window shows trading system alert messages if the "In Alerts Activity Window" selection is chosen in the *Show Trading Systems Alerts* command in the [Options](#) window.

Date/Time	Type	Message
1/4/2011 10:53:22 AM	Message	EUR/USD 5-Minute BID Short signal detected! The Close price crossed below the TSRL.
1/4/2011 10:53:21 AM	Message	EUR/USD 5-Minute BID Short signal detected! The Close price crossed below the TSRL.
1/4/2011 10:53:21 AM	Message	EUR/USD 5-Minute BID Short signal detected! The Close price crossed below the TSRL.
1/4/2011 10:53:20 AM	Message	EUR/USD 5-Minute BID Short signal detected! The Close price crossed below the TSRL.

Explanations of Alerts Activity Data

Date/Time

Date/Time is the date and time that the trading system alert was generated. **Date/Time** is shown in the following format: *Month/Day/Year Hour:Minute:Seconds AM/PM*.

Type

Type defines the type of message (*Alert*) that was generated.

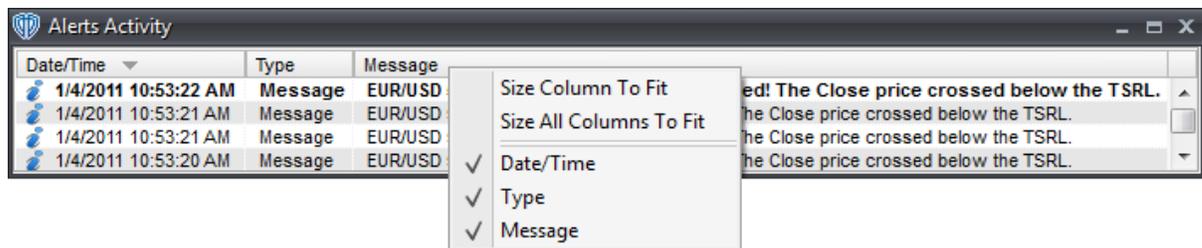
Message

The **Message** is the details pertaining to the trading system condition(s) that generated the alert message. The most recent incoming message is shown using a bold font attribute making it easy to identify.

Appearance Customizations

Each column of data in the **Alerts Activity** window can be automatically (*or manually*) resized, moved, or hidden at your discretion.

To automatically resize one or more columns, position the cursor over any column caption and click the right mouse button. You may select *Size Column to Fit* or *Size All Columns to Fit* from the contextual menu depending on the action you want to perform.



To manually resize a column, you must click and hold down the left mouse button while the cursor is positioned over the column divider directly to the right of the column you want to resize. The cursor will change and appear similar to this: <-|->. While the left mouse button is held down, move the mouse to the left or right to resize the column.

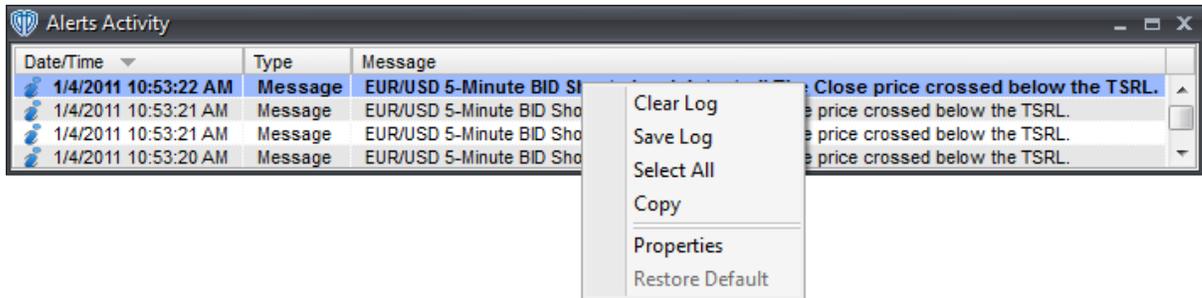
It is also possible to change the location of each column respective to the other visible columns. Moving a column can be accomplished by dragging and dropping the desired column into its new location after clicking and holding down the left mouse button while the cursor is positioned over that column's caption (*Date/Time, Type, Message*).

To hide one or more columns, position the cursor over any column caption and click the right mouse button. Select any column from the contextual menu that you want to hide. Visible columns have a check mark next to their caption name while hidden columns do not. To show a hidden column you simply need to reselect it from the column caption's contextual menu.

You can customize the appearance of the window and its data by using the window's [properties](#).

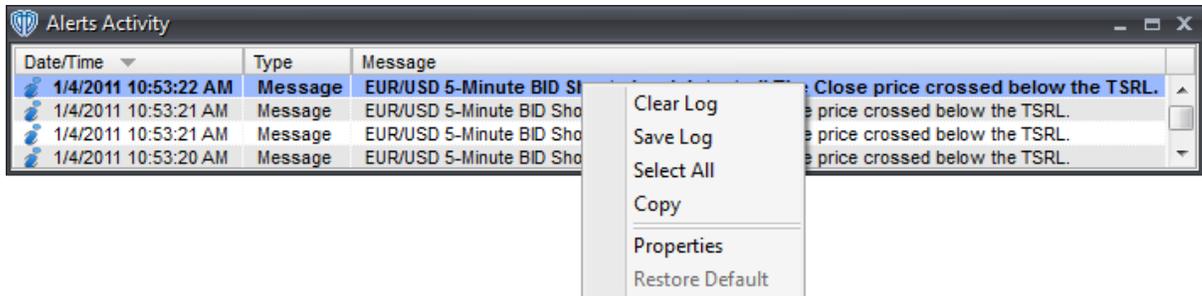
Contextual Menu

The **Alerts Activity** window's [contextual menu](#) provides you with additional functionality and access to the window's [properties](#). To activate the [contextual menu](#), click the right mouse button while the cursor is positioned over any message's row.



3.10.1.1 Contextual Menu

The **Alerts Activity** window's contextual menu provides you with additional functionality. To activate the contextual menu, click the right mouse button while the cursor is positioned over any message's row.



The **Alerts Activity** window's contextual menu contains the following commands:

Clear Log

This command erases the contents of the window.

Save Log

This command saves the contents of the window to a text file.

Select All

This command selects all of the messages shown in the window. This command is typically used in conjunction with the **Copy** command.

Copy

This command saves the selected message(s) to the computer's clipboard so that you can paste them into a text file and save them.

Properties

This command opens the **Alerts Activity** [properties](#) window.

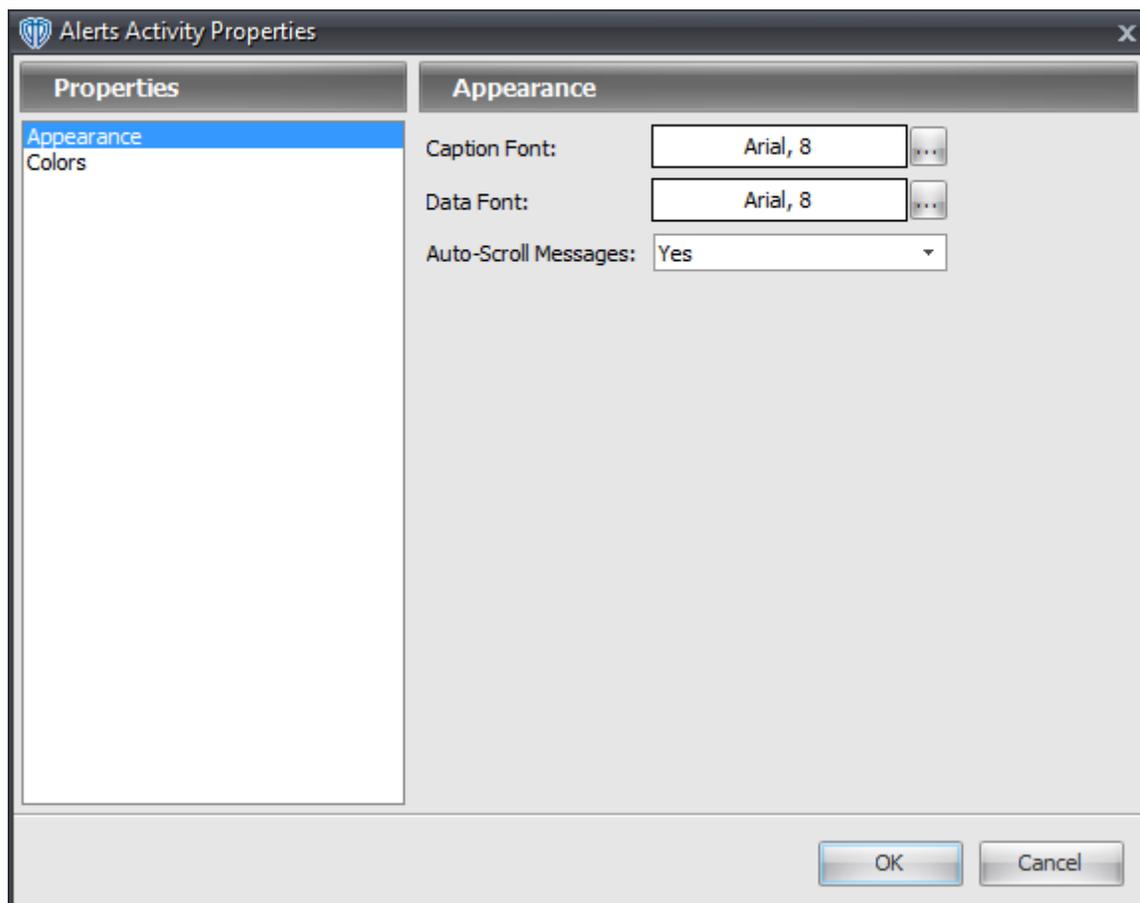
Restore Default

This command resets any custom properties currently used in the **Alerts Activity** window back to their default values.

3.10.1.2 Properties

The **Alerts Activity** properties window is divided into two sections: **Appearance** and **Colors**.

Appearance Section



The **Appearance** section contains the following options:

Caption Font

This option defines the font attributes used for window's column captions. You can change the font

attributes by using the [...] button.

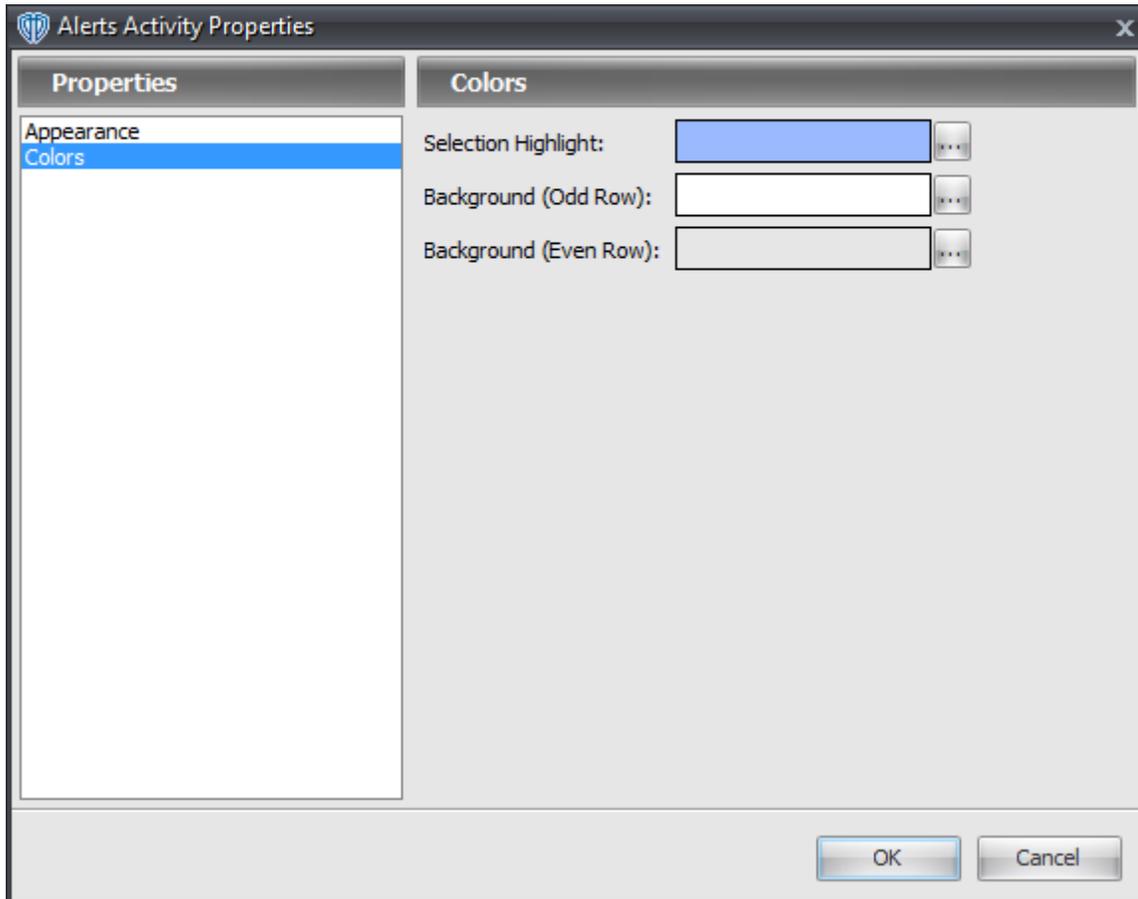
Data Font

This option defines the font attributes used for the the data shown in the window. You can change the font attributes by using the [...] button.

Auto-Scroll Messages

This option is a selection menu with two choices: *Yes* and *No*. While *Yes* is chosen, the [Alerts Activity](#) window "jumps" to the newest message received. If you select one or more messages, this option is temporarily *disabled* while the message(s) remain selected; this allows you easily view and/or search through the messages without having to completely disable this option by choosing *No*.

Colors Section



The **Colors** section contains the following options:

Selection Highlight

This option defines the color the selected row in the window. You can change the color by using the

[...] button.

Background (Odd Row)

This option defines the background color of all odd-numbered rows in the window. You can change the color by using the [...] button.

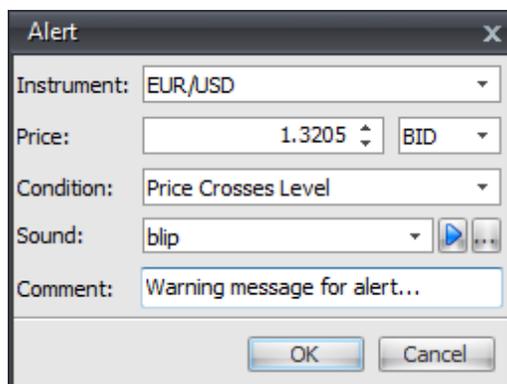
Background (Even Row)

This option defines the background color of all even-numbered rows in the window. You can change the color by using the [...] button.

3.10.2 Price Alert Window

A price alert warns you that an instrument's current market price is interacting with the alert level you defined. A price alert is shown in an instrument's chart window(s) as a small label attached to a horizontal line at the price alert level. When a price alert is activated, you are notified by a small dialog window attached to [VT Trader's Notification Icon](#)^[58], by a message shown in the [Trading Activity](#)^[174] window, and by a sound file being played (*if you define a sound file*).

You can create new price alerts or edit existing price alerts using the **Price Alert** window.



The **Price Alerts** window contains the following options:

Instrument

This is the instrument associated with the price alert.

Price

This is the Instrument's price (*bid or ask*) that the price alert is activated at.

Condition

This defines the condition used to activate the price alert as the instrument interacts with the price

alert level. The price alert can be activated using seven different conditions: *Price Crosses Level*, *Price Crosses Above Level*, *Price Crosses Below Level*, *Price > Level*, *Price >= Level*, *Price < Level*, and *Price <= Level*. The *cross* conditions activate the price alert only for the price ticks that actually cross above and/or below the alert level. The *>*, *>=*, *<* and *<=* conditions continuously activates the price alert for every price tick that satisfies the respective condition.

Sound

This is the sound file that is played when the price alert is activated. You can choose any sound from the selection menu or you can click the [...] button to choose any custom sound file (*.mp3*, *.wav*, or *.wma* file formats are acceptable).

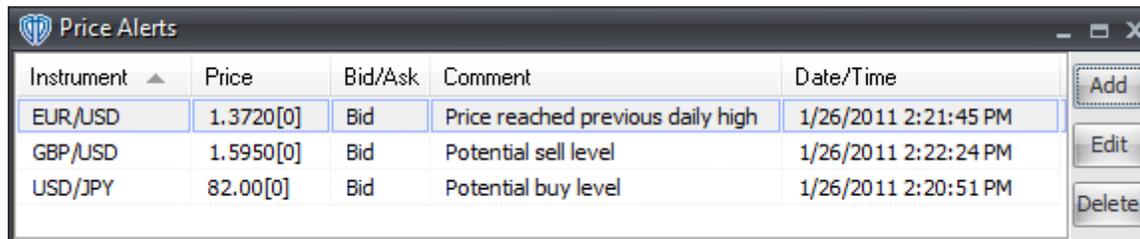
Comment

This lets you include additional remarks (*comments*) in the price alert's message notification.

3.10.3 Active Price Alerts Summary Window

A price alert warns you that an instrument's current market price is interacting with the alert level you defined. A price alert is shown in an instrument's chart window(s) as a small label attached to a horizontal line at the price alert level. When a price alert is activated, you are notified by a small dialog window attached to [VT Trader's Notification Icon](#)^[58], by a message shown in the [Alerts Activity](#)^[174] window, and by a sound file being played (*if you define a sound file*).

You can quickly review a summary of all of the active pending price alerts, create new price alerts, and edit (*or delete*) existing price alerts using the **Active Price Alerts Summary** window.



Instrument ▲	Price	Bid/Ask	Comment	Date/Time	
EUR/USD	1.3720[0]	Bid	Price reached previous daily high	1/26/2011 2:21:45 PM	Add
GBP/USD	1.5950[0]	Bid	Potential sell level	1/26/2011 2:22:24 PM	Edit
USD/JPY	82.00[0]	Bid	Potential buy level	1/26/2011 2:20:51 PM	Delete

Explanations of Active Price Alerts Summary Data

Instrument

This is the instrument associated with the price alert.

Price and Bid/Ask

This is the Instrument's price (*bid or ask*) that the price alert is activated at.

Comment

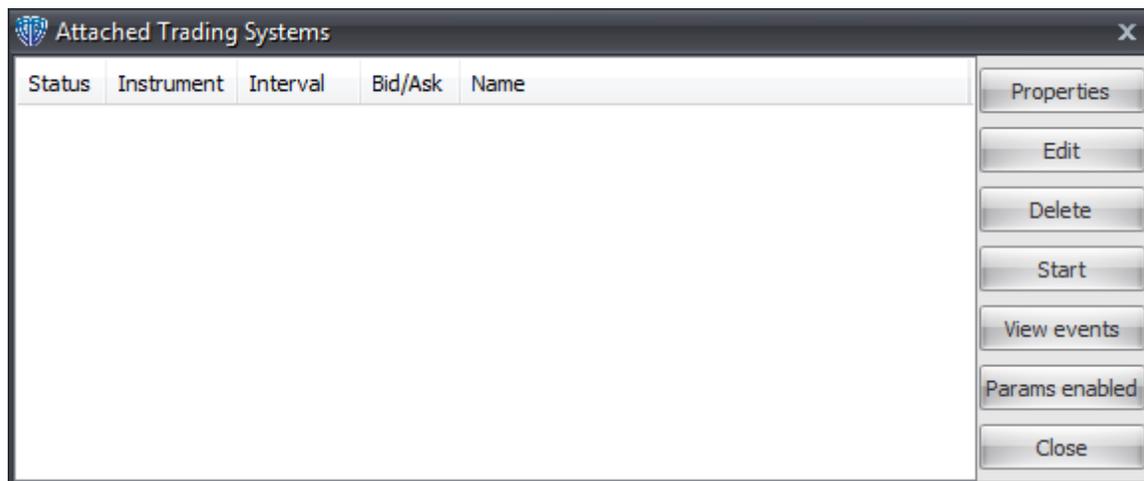
These are the additional remarks (*comments*) shown in the price alert's message notification.

Date/Time

This is the date and time that the price alert was created.

3.11 Active Trading Systems Summary

You can quickly review a list of all trading systems currently active (*attached to chart windows*) across all of your accounts using the **Active Trading Systems Summary** window. By selecting an active trading system and using the command buttons provided, you can adjust its [properties](#)^[182], [edit](#)^[182] it using a [Trading Systems Editor](#)^[207] window, [delete](#)^[182] it from the chart it is attached to, [start/stop](#)^[182] its *Auto-Trade* mode, and [view its events](#)^[182] and [enabled parameters](#)^[182].



The **Active Trading Systems Summary** window includes 5 columns for displaying information related to the trading systems.

The **Status** column shows the operational mode of the trading system. Trading systems operating in *Auto-Trade* mode show a [▶] icon while systems operating in *Recommendation Only* mode show a [III] icon. The **Instrument**, **Interval**, and **Bid/Ask** columns show the instrument, chart interval, and chart type that the trading system is attached to. The **Name** column shows the trading system's name and input properties.

The **Active Trading Systems Summary** window also includes several command buttons that operate in conjunction with the selected trading system.

The [**Properties**] button opens an additional **Trading Systems Properties** window that allows you to adjust the selected trading system's input variables' parameters and auto-trading parameters. This command is not available if the trading system is operating in *Auto-Trade* mode.

The [**Edit**] button opens a [Trading Systems Editor](#)^[207] window for the selected trading system. This command is not available if the trading system is operating in *Auto-Trade* mode.

The [**Delete**] button deletes the selected trading system from the chart it is attached to. If the trading system is operating in *Auto-Trade* mode when it is deleted, you will be responsible for managing any positions that were opened previously (*and not closed*) by the now deleted trading system.

The [**Start/Stop**] button *enables (starts) or disables (stops) Auto-Trade* mode for the selected trading system. If the selected trading system is operating in *Auto-Trade* mode (*the button label will be [Stop]*), clicking this button will stop the trading system and switch it into *Recommendation Only* mode. However, if the trading system is operating in *Recommendation Only* mode (*the button label will be [Start]*), clicking this button will *enable (start) Auto-Trade* mode.

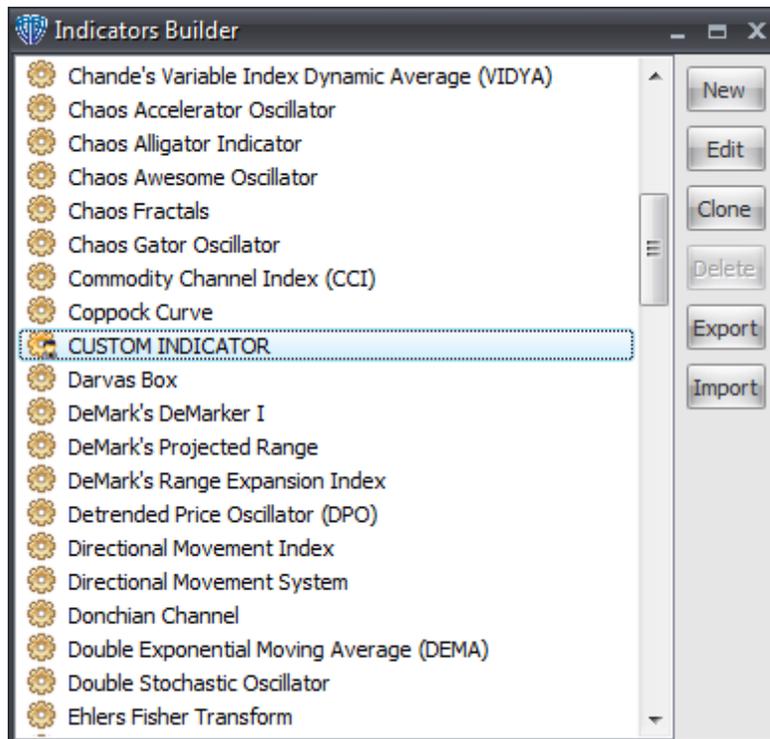
The [**View Events**] button opens an additional **Trading System Events** window that shows the selected trading system's events that have taken place along with their corresponding dates/times.

The [**Params Enabled**] button opens an additional **Trading Systems Parameters** window containing a list of the selected trading system's output variables and their respective function(s). Using the **Trading Systems Parameters** window, you can temporarily disable an output variable's function by removing the check mark from its corresponding function column(s).

The [**Close**] button closes the **Active Trading Systems Summary** window.

3.12 Indicators Builder

The **Indicators Builder** is a unique component in VT Trader. Using the **Indicators Builder**, you can create *new*, custom indicators and: *edit*, *clone*, *delete*, *import*, and *export* existing indicators. Icons directly to the left of each indicator's name help you differentiate standard VT Trader indicators from your custom indicators. Standard indicators included with VT Trader are identified with a gear (*or sprocket*) icon. Custom indicators are identified by a gear+person icon.



The **Indicators Builder** window contains the following commands:

New

This command begins the creation of a new custom indicator by opening an [Indicator Editor](#)^[184] window.

Edit

This command allows you to make changes to the selected indicator by opening it in an [Indicator Editor](#)^[184] window.

Clone

This command creates a copy of the selected indicator and adds it to the indicator list with (2) appended to the indicator name (*to distinguish the copy from the original indicator*).

Delete

This command moves the selected indicator to the Windows® Recycle Bin for deletion. If this command is *disabled*, you must first edit the indicator by removing the check mark next to the *Protect from deletion* option in the [General Tab](#)^[192] of its [Indicator Editor](#)^[184] window.

Export

This command exports the selected indicator so that it can be saved in a designated directory on your computer. Indicators are saved with a .vtscr file extension. An exported indicator can be imported into VT Trader using the **Import** command.

Import

This command imports an indicator file that was previously exported from VT Trader with a .vsrc file extension. Importing an indicator adds it to the indicator list using the text in the *Name* field in the [General Tab](#)^[192] of its [Indicator Editor](#)^[184] window. If an indicator with the same *Name* already exists in VT Trader a (2) will be appended to the imported indicator's name to help distinguish it from the existing indicator.

3.12.1 Indicator Editor Window

You can create new, custom technical indicators or edit existing technical indicators by using **Indicator Editor** window. The window caption shows the *name* of the indicator being created or edited. For ease of use, the **Indicator Editor** window consists of the [Indicator Editor Toolbar](#)^[184] and several separate tabs containing the various properties of the indicator.

To learn more about each of the **Indicator Editor** tabs, please click on its name below:

- [General Tab](#)^[192]
- [Input Variable\(s\) Tab](#)^[195]
- [Output Variable\(s\) Tab](#)^[200]
- [Horizontal Line\(s\) Tab](#)^[202]
- [Formula Tab](#)^[204]

3.12.1.1 Indicator Editor Toolbar

The **Indicator Editor Toolbar** provides you quick, easy access to a variety of very useful editing-related commands.



Explanations of Indicator Editor Toolbar Commands

Copy

This command copies the selected text to the PC's clipboard for later pasting.

Paste

This command inserts the contents of PC's clipboard into the active text box.

Cut

This command cuts (*removes*) the selected text from the active text box and copies it to the PC's clipboard for later pasting.

Undo

This command reverses the previous action such as deleting a line of code in the Formula tab.

Redo

This command reverses the previous *Undo* action.

Search

This command finds the partial word or whole word being searched for. For example, searching for *H* would find all occurrences of *H* and *High* in the formula code. You can also specify the search direction (*up or down*). The search begins at the current cursor location and searches in the specified direction. Each time an occurrence of the search word is found the window scrolls to the text's location in the formula code and highlights it. Clicking the [**Find Next**] button continues searching for more occurrences of the search word. When the search reaches the ending or beginning of the formula code an additional dialog window is shown that asks if you want to continue searching from that location.

Replace

This command extends the *Search* command's functionality by adding *Replace* and *Replace All* commands. The *Replace* command finds the partial word or whole word being searched for and replaces it with the specified text. For example, searching for *High* in the formula code and replacing the next occurrence with *Low* is accomplished by clicking the [**Replace**] button; replacing all occurrences of *High* with *Low* using only one action is accomplished by clicking the [**Replace All**] button. The search and replace begins at the current cursor location and searches in the specified direction. Each time an occurrence of the search word is found the window scrolls to the text's location in the formula code, highlights it, and replaces it. Clicking the [**Find Next**] button continues searching for more occurrences of the search word. When the search reaches the ending or beginning of the formula code an additional dialog window is shown that asks if you want to continue searching from that location.

Editor Options

This command opens the [Editor Options](#)^[186] window.

Save

This command saves any changes made to the indicator.

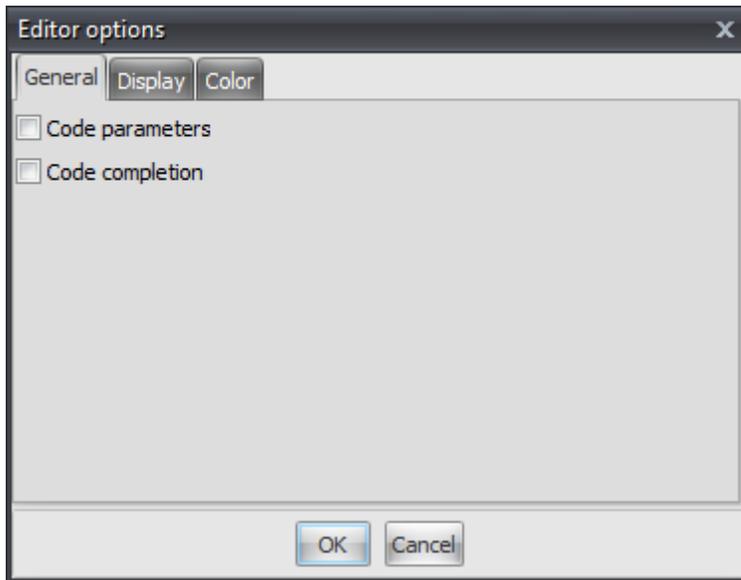
Close

This command closes and exits the [Indicator Editor](#)^[184] window. If the indicator has unsaved changes, you will be prompted to save the indicator before being able to close the window.

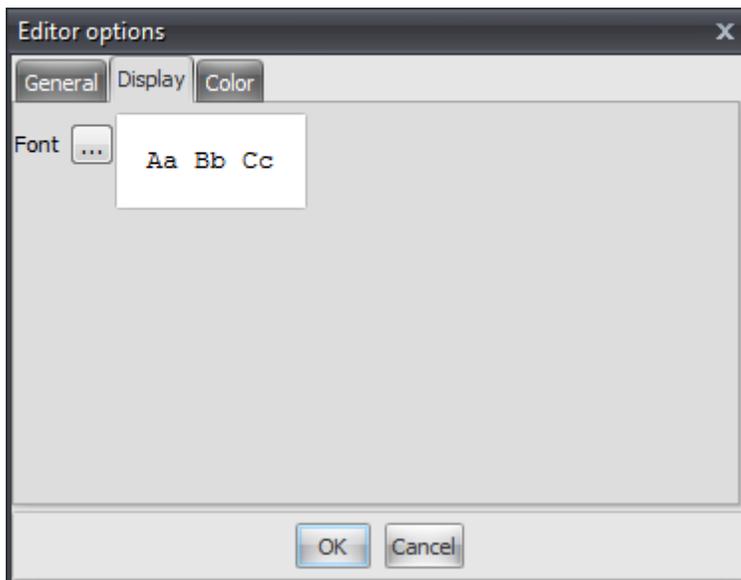
3.12.1.1.1 Editor Options

The **Editor Options** window defines the options and properties used by the [Indicator Editor](#)^[184]. This window is divided into 3 tabs: **General**, **Display**, and **Color**.

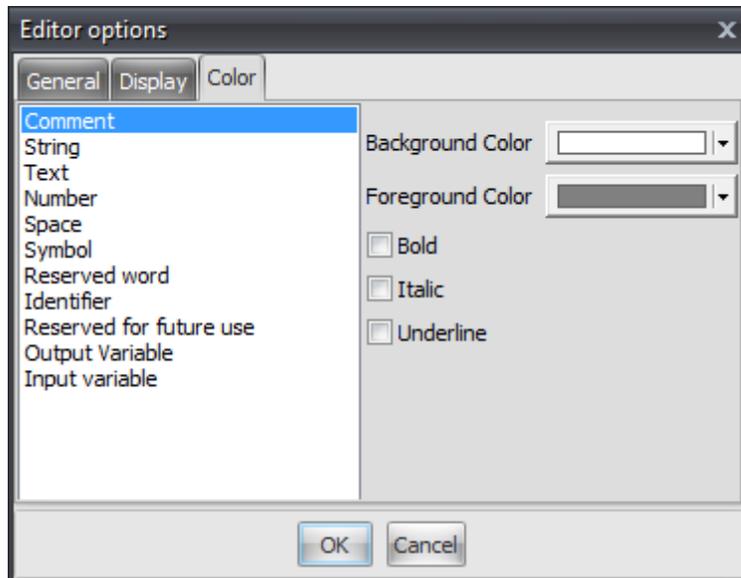
In the **General** tab, you can *enable* or *disable* the *Code Parameters* and/or *Code Completion* features used while typing text in the [Indicator Editor's](#)^[184] Formula tab. Please click on these links to learn more about the [Code Parameters](#)^[187] and [Code Completion](#)^[191] features.



In the **Display** tab, you can define the font type used while typing text in the [Indicator Editor's](#)^[184] Formula tab.



In the **Color** tab, you can define the font colors and attributes used while typing text in the [Indicator Editor's](#)^[184] Formula tab. Each type of text item can its own *Background Color*, *Foreground Color*, and *Font Attributes* assigned to it.

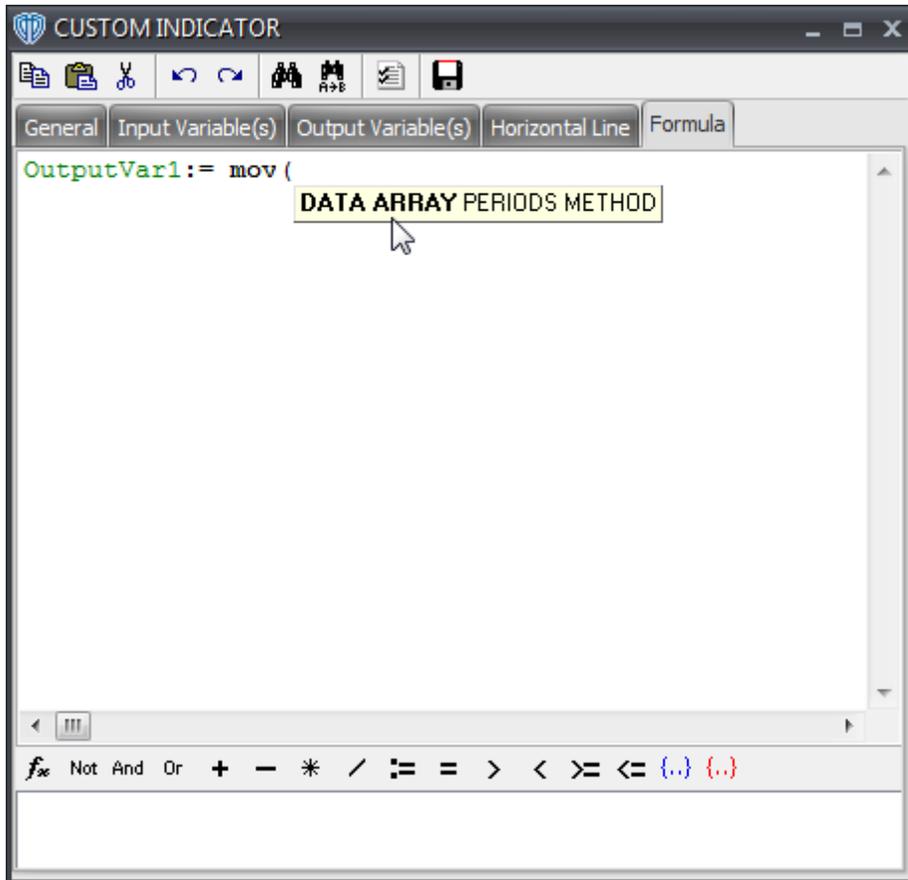


Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the **Editor Options** window without saving your changes.

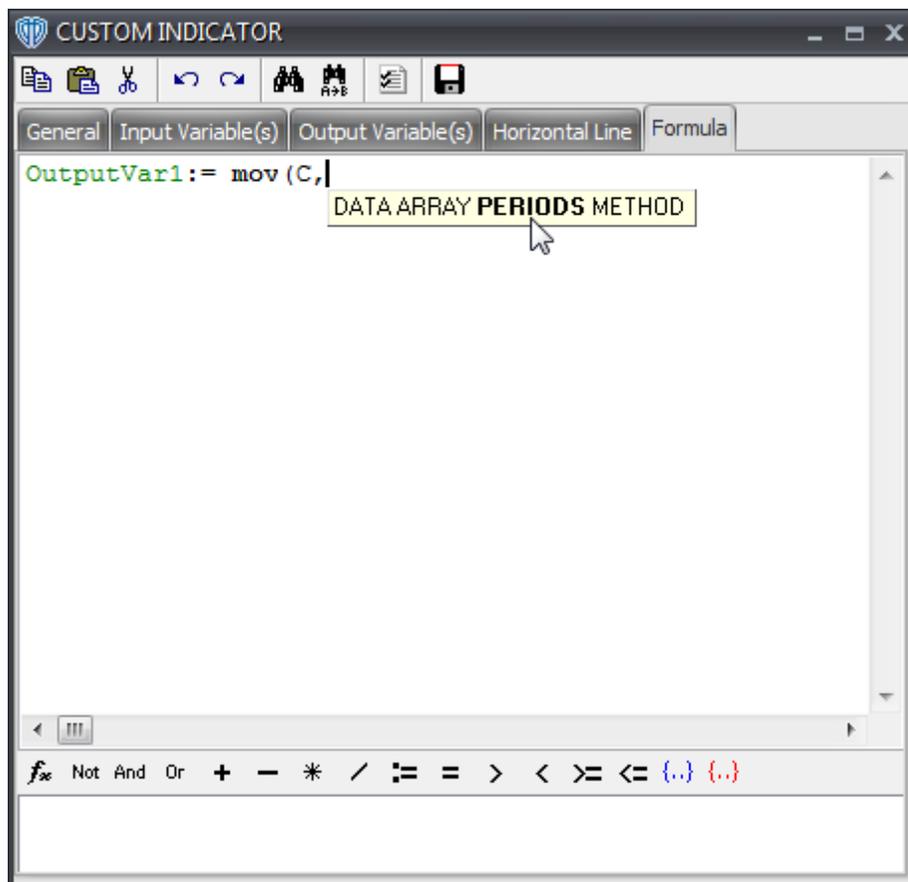
3.12.1.1.1 Code Parameters

The **Code Parameters** feature shows a "hint" as you are typing the name of a [function](#)^[329]. The **Code Parameters** hint dialog shows which, if any, input types that [function](#)^[329] requires and the order in which those parameters should be provided to the [function](#)^[329].

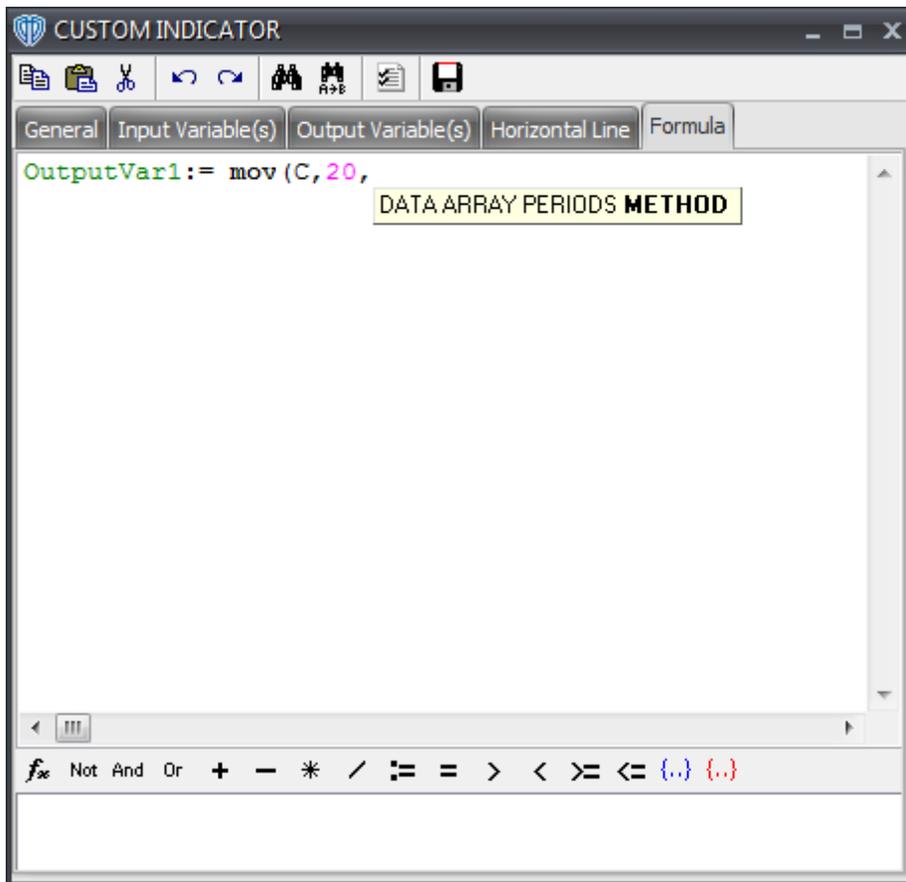
Using the **mov()** (*moving average*) function as an example, once you have typed "mov(" the **Code Parameters** hint dialog shows [DATA ARRAY, PERIODS, METHOD].



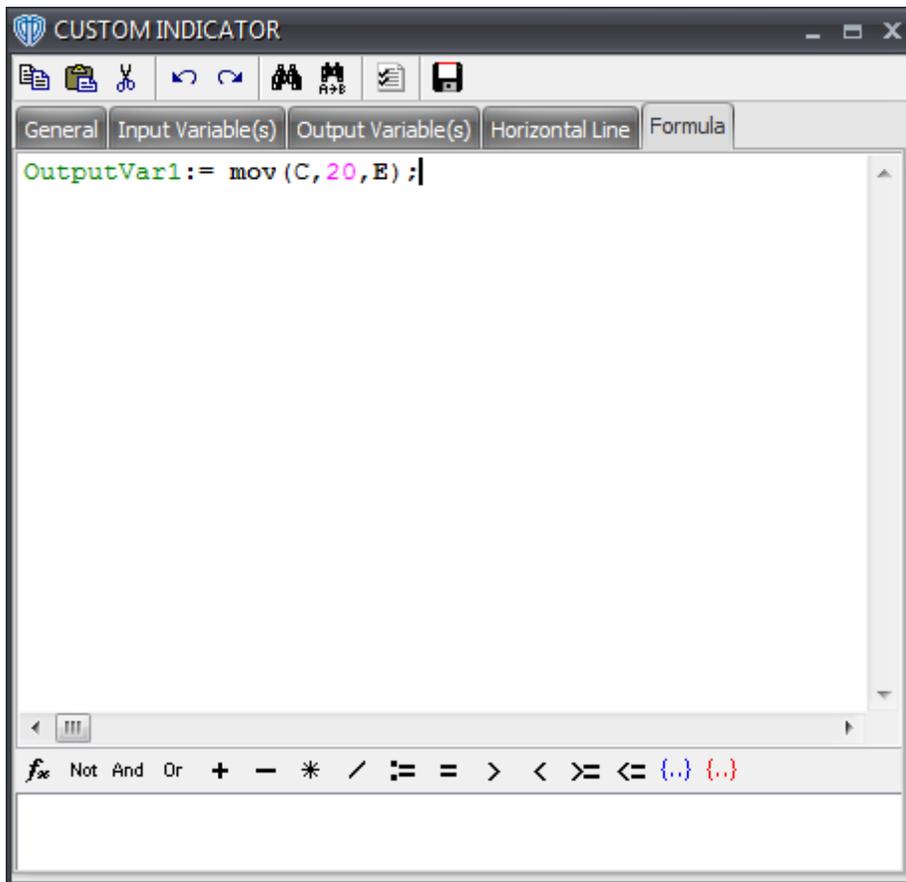
As you type each parameter, the next required parameter is indicated in **Bold**.



Continuing...



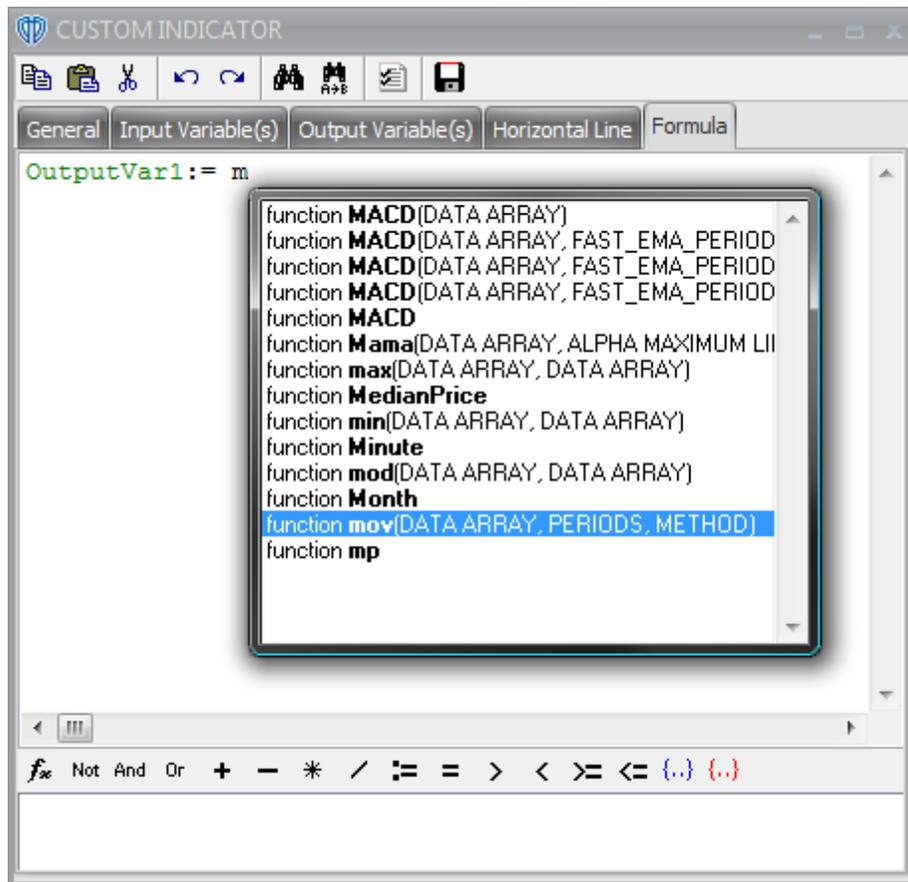
The hint dialog remains visible until the last required parameter has been typed then disappears allowing you to continue writing your formula.



3.12.1.1.1.2 Code Completion

The **Code Completion** feature is activated when you press the *CTRL + SPACEBAR* keys on your keyboard. It shows a list of available [functions](#)^[329] (or *data arrays*) in a selection menu for you to choose from while you are typing your formula. The **Code Completion** feature is best used in conjunction with the **Code Parameters** feature.

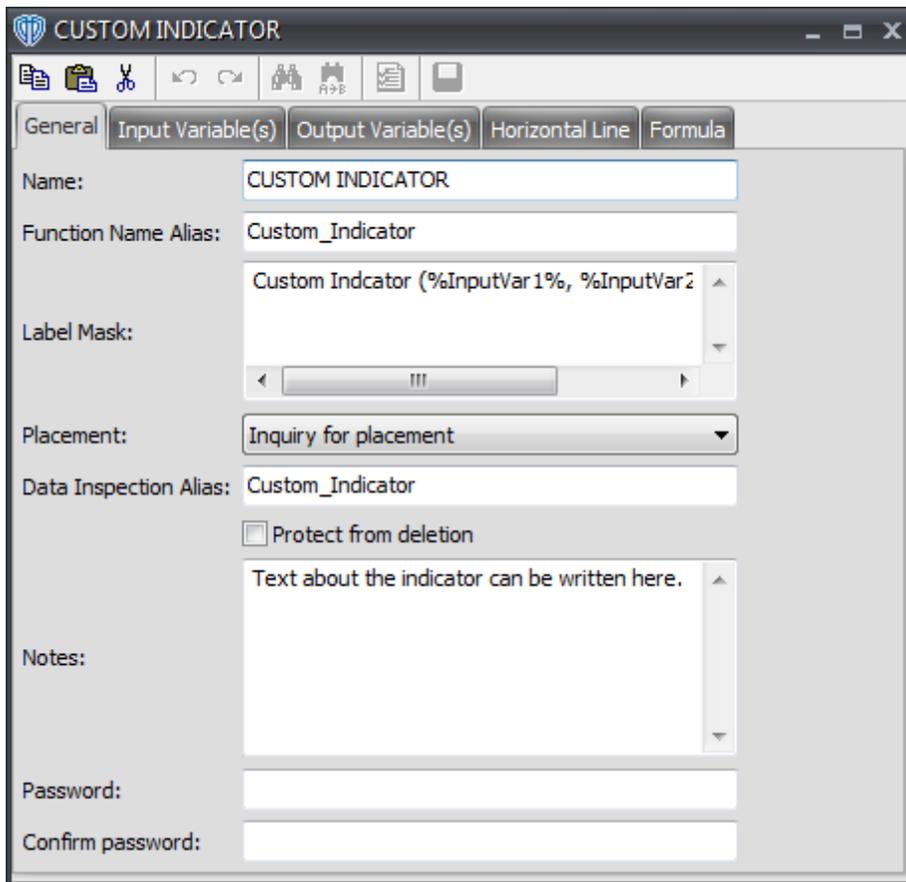
For example, let's assume that you want to use the **mov()** (*moving average*) function, but you cannot remember the function's full name. Once you have typed "m" you press the *CTRL + SPACEBAR* keys to activate the **Code Complete** feature for assistance. The Code Complete feature shows a list of every function that starts with the letter "m".



Once you have made your selection, it is inserted into the formula. The **Code Completion** dialog then disappears allowing you to continue writing your formula.

3.12.1.2 General Tab

The [Indicator Editor's](#)¹⁸⁴ **General** tab defines the indicator's basic attributes.



Explanations of General Tab's Items

Name

The **Name** identifies the indicator throughout VT Trader. The indicator's **Name** is used in the [Indicators Builder](#)^[182], [Indicator Editor](#)^[184] window, [Indicators Quick List](#)^[235], and in the Add Indicator window shown when attaching an indicator to a chart window.

Function Name Alias

The **Function Name Alias** makes it possible to refer to the indicator and its formula from within other indicators and trading systems. For example, in the formula script of your custom indicator you could reference the standard RSI indicator using its **Function Name Alias** of `vt_RSI`. It's important when referencing an existing indicator that you provide the function any necessary input arguments it requires; these arguments are the input variables from the referenced indicator's [Input Variable\(s\) tab](#)^[195]. The `vt_RSI()` function requires two such arguments: *pr* (*DATA ARRAY type*) and *tpr* (*INTEGER type*). The resulting function for a 14-period RSI of close prices when referenced in your custom indicator's formula looks like this:

```
vt_RSI(close,14)
```

The output returned by an indicator's **Function Name Alias** differs depending on how many output

variables the referenced indicator's [Output Variable\(s\) tab](#)^[200] includes. In our example, the standard RSI indicator only includes one output variable called *RSIndex* (its **Var Name**). If the indicator being referenced by its **Function Name Alias** has more than one output variable, you need to specify which output variable you want to reference by including a . (*period*) after the **Function Name Alias** followed by the output variable's **Var Name**. For example, the standard MACD indicator has three output variables: *FL*, *SL*, and *OsMA*. To reference the standard MACD's Fast Line (*FL*) you must use its **Function Name Alias** of `vt_MACD` along with all of its function parameters followed by `.FL`. It looks like this:

```
vt_MACD(C, 12, 26, E, 9, E) .FL
```

Please note: Any function's arguments can be made adjustable by creating the necessary input variables (*of the correct type(s)*) in your custom indicator's [Input Variable\(s\) tab](#)^[195] and replacing their non-adjustable argument values in the function with the newly created input variable(s)'s **Name(s)**.

The **Function Name Alias** is not case-sensitive; for example, using `vt_RSI` is the same as using `vt_rsi`. It may include only letters and numbers. Use of the underscore (`_`) character is also allowed. It may not include any spaces or begin with a number. The **Function Name Alias** is used as the actual file name for the indicator when it is saved. If an existing indicator with the same **Function Name Alias** is found on the your PC VT Trader shows a warning dialog notifying you of the conflict when you attempt to save the indicator. You must resolve the naming conflict before you will be able to save the indicator.

Label Mask

The **Label Mask** multiple-line text box can be used to help identify the indicator while it is attached to a chart window. It is possible to include the name of the indicator, the values of input variables, the current value of output variables, and/or any other desired text in the indicator's label. The **Label Mask** can show multiple lines of text; you can use the *Enter* (or *Return*) key to separate the information into multiple lines of text.

To show the value of an input variable in the indicator's label it is necessary to type the input variable's name (*as defined by the **Name** in the [Input Variable\(s\) tab](#)*^[195]) between % characters. To include the value of an output variable in the indicator's label it is necessary to type the output variable's name (*as defined by the **Var Name** in the [Output Variable\(s\) tab](#)*^[200]) between % characters.

Placement

The **Placement** selection menu defines the default placement of the indicator while it is attached to a chart window. If *Price Frame* is chosen, the indicator will be shown in the *main price area* frame. If *New Frame* is chosen, the indicator will be shown in a separate, additional frame. If *Inquiry for placement* is chosen, you will be prompted to choose the location that the indicator will be shown in when you attempt to attach it to the chart window. You can choose a separate, additional frame or an already existing frame. The dialog window's frame list defines all frames that are already shown in the chart window (*the existing frames are numbered Frame 1, Frame 2, Frame 3, etc. from the top-down as shown in the chart window; the main price frame is labeled as Price Frame*).

If *Inquiry for placement* is defined for a number of indicators those indicators can be shown in the same frame. This might be useful if/when you want to analyze the same indicator but with different values of input variables. Additionally, it is possible to show several different indicators in the same frame, however, it's very important that take into account how each indicator scales. It does not

make sense to place two or more indicators into one frame if the units of measurement of at least one of them is incomparable to those of other indicators. For example, the RSI and Slow Stochastic both scale from 0 -100 so it would be acceptable to show those indicators within the same frame if you chose to do so. However, displaying the RSI and the MACD in the same frame would be a bad idea since their scales are very different.

Data Inspection Alias

The **Data Inspection Alias** identifies the indicator (*and its output variable(s)*) in the [Data Inspection](#) ^[154] window while the indicator is attached to the chart window.

Protect from Deletion

The **Protect from deletion** option prevents accidental deletion of the indicator. This option is *enabled* by default when a new indicator is created. It is not possible to delete the indicator from the [Indicators Builder](#) ^[182] while the **Protect from deletion** option is *enabled* (*the [Delete] button is disabled while the indicator is selected*). *Disabling* the **Protect from deletion** option by removing the check mark next to it allows the indicator to be deleted.

Notes

The **Notes** provides additional information relating to the indicator. This may be any kind of information considered useful. Typically, a description of the indicator as well as suggested methods of use and references to the appropriate documentation will be provided in the **Notes**.

Password

You may supply a **Password** (*a phrase or combination of letters and numbers*) to keep the indicator's formula and main properties confidential thus protecting it from accidental or purposeful editing. The **Password** must be confirmed in the **Confirm Password** text box before it can be applied. If a **Password** has been supplied when someone tries to edit the indicator he/she will be prompted to provide it. If the **Password** is not typed correctly, it will not be possible to edit the indicator.

Confirm Password

The **Password** must be successfully retyped in the **Confirm Password** text box before it can be applied.

3.12.1.3 Input Variable(s) Tab

To best utilize the [Indicator Editor's](#) ^[184] **Input Variable(s)** tab, it's necessary to understand what *input variables* are and how they are used in VT Trader's scripting language.

What are *input variables* and how do I use them?

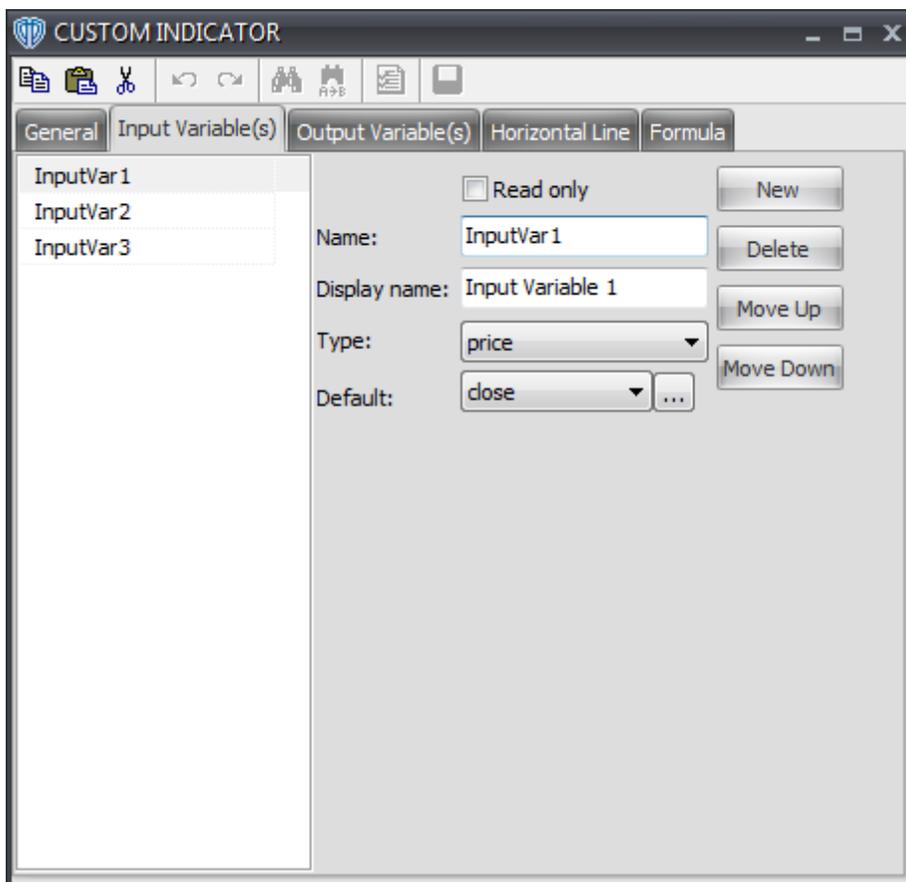
Simply defined, an input variable is a value that you provide to the formula script. VT Trader's scripting language uses the input variables' values while evaluating expressions and/or performing calculations. Input variables (*and their Default values*) are included in the Indicator Properties window. This properties window is used to modify an indicator's properties while it is attached to a chart window.

Input variables are often used to allow you to change the values of a function's arguments, or perform

actions such as selecting, enabling, or disabling (*via enumeration lists*) specific parameters or conditions used by an indicator without the need to edit its formula script. For example, the [Relative Strength Index \(RSI\)](#)^[656] indicator included with VT Trader uses two input variables: *Price* (*Name = pr*) and *Periods* (*Name = tpr*). These two input variables allow you to specify the predefined price data array and number of periods used to calculate the RSI. You provide these values to the formula script from the RSI's properties window when you add the RSI to the chart window (*or change the RSI's properties while it is attached to the chart window*).

What is the Input Variable(s) Tab?

The [Indicator Editor's](#)^[184] **Input Variable(s)** tab defines any input variables used in the formula script. You can create as many new input variables as necessary.



Clicking the [**New**] button creates a new input variable. Clicking the [**Delete**] button deletes the selected input variable. Clicking the [**Move Up**] or [**Move Down**] button moves the input variable's respective position up or down in the tab's variable list as well as up or down in the indicator's or trading system's properties window.

Explanations of Input Variable(s) Tab's Items

Read Only

While *enabled*, the input variable's value in the indicator's properties window will be a read-only value that cannot be changed. *Enabling* this option is useful if you want to see the input variable's **Display Name** and **Default** value in the properties window, but you do not need to be able to change its value (or you do not want others to be able to change it).

Name

The **Name** makes it possible to refer to the input variable and its value from within the formula script. The **Name** is not case-sensitive; for example, using *Periods* is the same as using *periods*. It may include only letters and numbers. Use of the underscore (`_`) character is also allowed. It may not include any spaces or begin with a number. An input variable's **Name** must not be the same name as any other existing input variable, [existing function](#)^[334] or [reserved function](#)^[400], [constant](#)^[333], or [predefined data array](#)^[334]. Additionally, no [input variables](#)^[195] should have the same **Name** as any [output variables](#)^[200] **Var Name(s)** within the same formula script.

Display Name

The **Display Name** is the text shown in the indicator's properties window to identify the input variable. This text should be descriptive enough that it is easy to understand what the input variable is and what **Type** of value you need to provide when you are attaching the indicator to the chart window (or changing its properties while it is attached to the chart window).

Type

An input variable must be defined as a certain **Type** of variable. The **Type** value defines what type of data can be used as the input variable's **Default** value. The variable's **Type** selection is also used by the formula script; **Type** defines what type of data the formula script should expect to process when the input variable's value is passed into the scripting engine. An input variable can provide the formula script with any any of the following types of data: *integer*, *integer (with bounds)*, *float*, *float (with bounds)*, *price*, *MA type*, *Enumeration*, and *Bars Forward*. Please [click here](#)^[198] to learn more about each input variable **Type**.

Default

The **Default** value is the initial value of the input variable shown in the indicator's properties window; however, this value can be changed as needed (assuming the input variable's **Read-Only** option is disabled). The **Default** value is provided to the formula script along with the input variable's **Type**. The formula script uses this value while evaluating any expressions and/or performing any calculations that require the input variable's value.

Min Bounds

The **Min Bounds** value defines the lowest value that can be used for the **Default** value. **Min Bounds** is only available if the *integer (with bounds)*, *float (with bounds)*, or *Bars Forward* variable **Type** is selected.

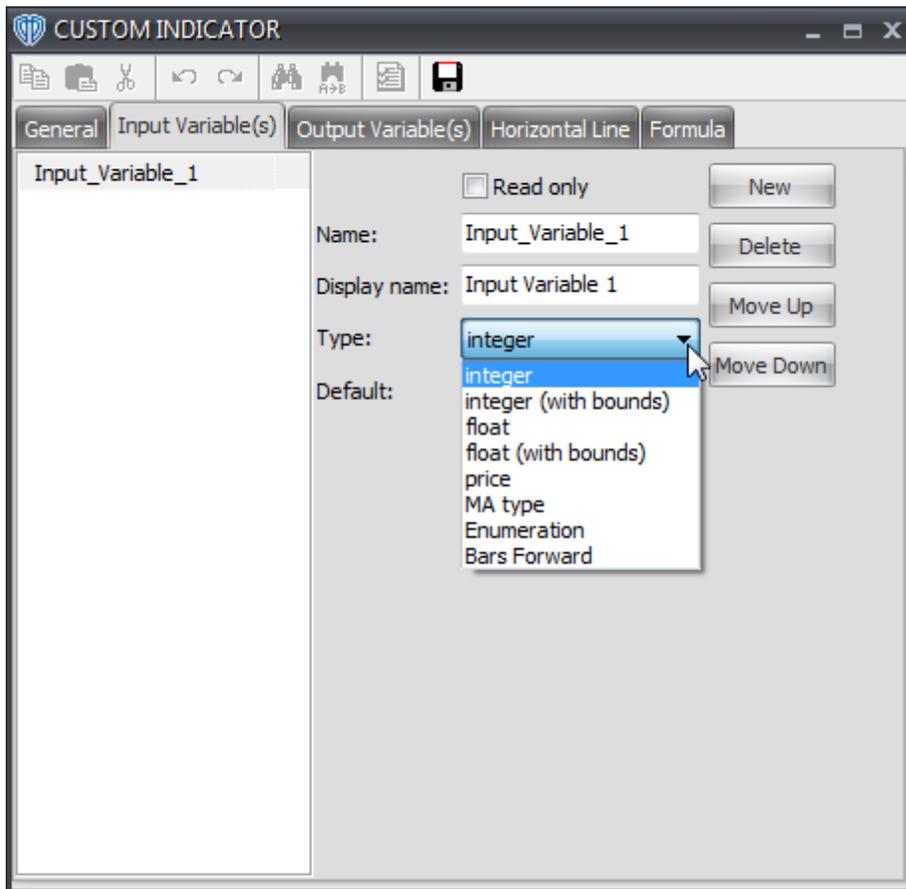
Max Bounds

The **Max Bounds** value defines the highest value that can be used for the **Default** value. **Max Bounds** is only available if the *integer (with bounds)*, *float (with bounds)*, or *Bars Forward* variable **Type** is selected.

3.12.1.3.1 Type

An input variable must be defined as a certain [Type](#)^[195] of variable. The [Type](#)^[195] of the variable defines what type of data can be used as the input variable's [Default](#)^[195] value. The variable's [Type](#)^[195] selection is also used by the formula script; [Type](#)^[195] defines what type of data the formula script should expect to process when the input variable's value is passed into the scripting engine.

An input variable can provide the formula script with any any of the following types of data: *integer*, *integer (with bounds)*, *float*, *float (with bounds)*, *price*, *MA type*, *Enumeration*, and *Bars Forward*. Please continue reading to learn more about each input variable [Type](#)^[195].



Explanations of the Types of Input Variables

Integer

An input variable of the **Integer** [Type](#)^[195] can be any positive or negative whole number (... , -2, -1, 0, 1, 2, ..., and so on...).

Integer (with bounds)

An input variable of the **Integer (with bounds) Type** can be any positive or negative whole number between the defined **Min. Bounds** and **Max. Bounds** values.

Float

An input variable of the **Float Type** can be any positive or negative number rounded out to 5 decimal places.

Float (with bounds)

An input variable of the **Float (with bounds) Type** can be any positive or negative number rounded out to 5 decimal places between the defined **Min. Bounds** and **Max. Bounds** values.

Price

An input variable of the **Price Type** can be any of the **predefined data arrays**: *close, open, low, high, Median Price, Typical Price, Indicator (the value of an Indicator already attached to the chart window), Volume, haOpen, haClose, haLow, or haHigh*; "ha" values are price values associated with the Heikin-Ashi Candlestick Chart Type).

MA Type

An input variable of the **MA Type** can be any of the available moving average **constants**: *Simple, Weighted, Exponential, Sine Weighted, Triangular, End Point, or Volume-Adjusted*. The **MA Type** selection is often used in conjunction with the built-in *moving average function mov()* or when it is desirable to apply a type of data smoothing (*averaging*) to the data array being analyzed.

Enumeration

An input variable of the **Enumeration Type** can be any of the predefined values added to a enumeration (*selection*) list. Before an enumeration list can be used, it must be populated. The enumeration list can be populated (*or edited*) by clicking the [...] button shown directly to the right of the **Default** value's text box while the **Enumeration Type** is selected. An enumeration list item may include only letters and numbers. Use of the underscore (_) character is also allowed. It may not include any spaces or begin with a number.

Important Note: Each item in the selection menu is assigned an internal list position number that corresponds to their location in the list; the first item (*top*) in the enumeration list is assigned the position number 0, the second item is assigned 1, the third item is assigned 2, etc. You must use the list item's number (*not its actual name shown in the enumeration list*) in the formula script to when constructing your expressions and conditions.

For example, let's assume that you have an indicator that includes a moving average and a moving average of the moving average. Let's also assume that you would like to create some logic that allows you to show (*or hide*) the moving average of the moving average. You can accomplish this by using an **Enumeration Type** **input variable** called *MaDisplay* (its **Name**; "Display MA of MA?" will be its **Display Name**) that includes two items in the list (*from top-down*): No, Yes. The VT Trader formula script written in the **Formula tab** could potentially look like this:

```
{5-period simple moving average of close prices}

MA := mov(C,5,S);
```

```
{If MaDisplay is "Yes" (which has an assigned list position number of
1),
calculate and show a 5-period MA of the 5-period MA of close prices}

MA_of_MA := if(DisplayMA=1, mov(MA,5,S), NULL);
```

In this example, *MA* and *MA_of_MA* would be the [output variables](#)^[200] defined in the [Output Variable\(s\) tab](#)^[200].

Another good example demonstrating the use of an enumeration list is found in VT Trader's [Rate of Change \(ROC\)](#)^[648] indicator. Its *Calculation Method* [input variable](#)^[195] uses an enumeration list allowing you to specify if the [ROC](#)^[648] is calculated in *Points* or *Percent*.

Bars Forward

An input variable of the [Bars Forward Type](#)^[195] can be any positive or negative whole number between the defined [Min. Bounds](#)^[195] and [Max. Bounds](#)^[195] values. The [Bars Forward Type](#)^[195] is used in conjunction with the scripting language's [ref\(\)](#)^[377] function to **visually** shift the resulting calculation plot forward ahead of the current market or backwards behind the current market price by the number of bars specified. **Important Note:** The [Bars Forward Type](#)^[195] should only be used for visual reference. It is not possible for a trading system to generate alerts in real-time (*or request orders automatically if it's running in Auto-Trade mode*) for any condition that uses a variable or value that has been shifted behind the current market price (*i.e. a negative Bars Forward value*).

A good example demonstrating the use of the [Bars Forward Type](#)^[195] is found in VT Trader's [Moving Average](#)^[585] indicator. Its *Horizontal Shift* [input variable](#)^[195] uses the [Bars Forward Type](#)^[195] allowing you to visually shift the moving average's plot forward ahead of the current market price. Another good example demonstrating the use of the [Bars Forward Type](#)^[195] is the [Chaos Alligator Indicator](#)^[453].

3.12.1.4 Output Variable(s) Tab

To best utilize the **Output Variable(s)** tab, it's necessary to first understand what *output variables* are and how they are used in VT Trader's [scripting language](#)^[329].

What are *output variables* and how do I use them?

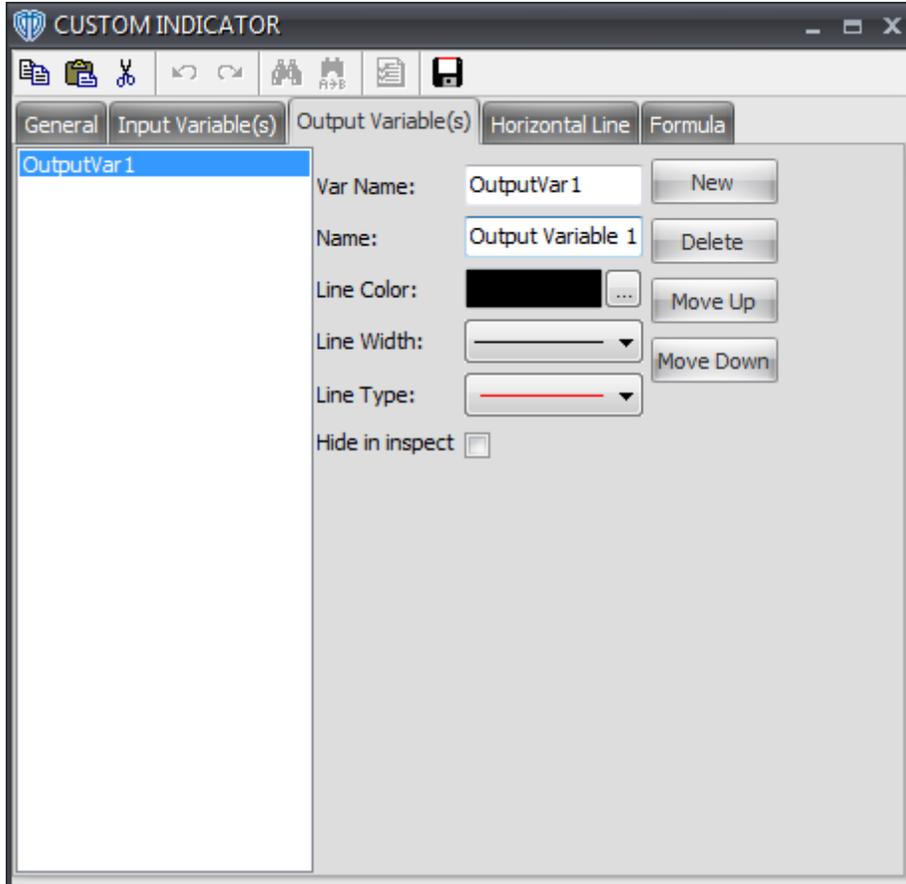
Simply defined, an output variable is the resulting calculated value of a statement in the formula script. Output variables are often, but not always, the final calculation of an indicator.

What is the Output Variable(s) Tab?

Most indicators and trading systems include multiple output variables, some variables' values you might need to be able to visually examine and others you might not. You can use the [Indicator Editor's](#)^[184] **Output Variable(s)** tab to define only those output variables used in the formula script that you need to see the resulting values of in a chart window and in the [Data Inspection](#)^[154] window. You can define as many output variables in the **Output Variable(s)** tab as necessary.

For example, the [Relative Strength Index \(RSI\)](#)^[656] indicator included with VT Trader defines only one

specific output variable: *(RSI)* (*Var Name = RSIndex*). This output variable makes it possible to visually inspect its resulting calculations in a chart window (*according to the indicator's [Placement](#)^[192] selection*) and in the [Data Inspection](#)^[154] window (*according to its **Name** and shown next to the indicator's [Data Inspection Alias](#)^[192]*).



Clicking the [**New**] button creates a new output variable. Clicking the [**Delete**] button deletes the selected output variable. Clicking the [**Move Up**] or [**Move Down**] button moves the output variable's respective position up or down in the tab's variable list as well as up or down in the [Data Inspection](#)^[154] window (*relative to the indicator's other output variables shown in that window*).

Explanations of Input Variable(s) Tab's Items

Var Name

The **Var Name** makes it possible to refer to the output variable and its calculated value within the formula script. The **Var Name** is not case-sensitive; for example, using *Output_Variable* is the same as using *output_variable*. It may include only letters and numbers. Use of the underscore (_) character is also allowed. It may not include any spaces or begin with a number. An output variable's **Var Name** must not be the same name as any other existing output variable, [existing function](#)^[334] or [reserved function](#)^[400], [constant](#)^[333], or [predefined data array](#)^[334]. Additionally, no [output variables](#)^[200] should have the same **Var Name(s)** as any [input variables](#)^[193] **Name(s)** within the same formula script.

Name

The **Name** is the text shown in the [Data Inspection](#)^[154] window to identify the output variable; it is shown next to the indicator's [Data Inspection Alias](#)^[192]. This text should be descriptive enough that it is easy to understand what information the output variable is providing.

Line Color

The **Line Color** defines the output variable's default line color while the indicator is attached to the chart window. It is also the color used to show the output variable's **Name** and calculated value in the [Data Inspection](#)^[154] window (*if the "Use Colors for Output Variables" option is enabled for that window*). The **Line Color** can be changed using the indicator's properties window when you add the indicator to the chart window (*or change the indicator's properties while it is attached to the chart window*).

Line Width

The **Line Width** defines the output variable's default line width while the indicator is attached to the chart window. The **Line Width** may be changed using the indicator's properties window when you add the indicator to the chart window (*or change the indicator's properties while it is attached to the chart window*).

Line Style

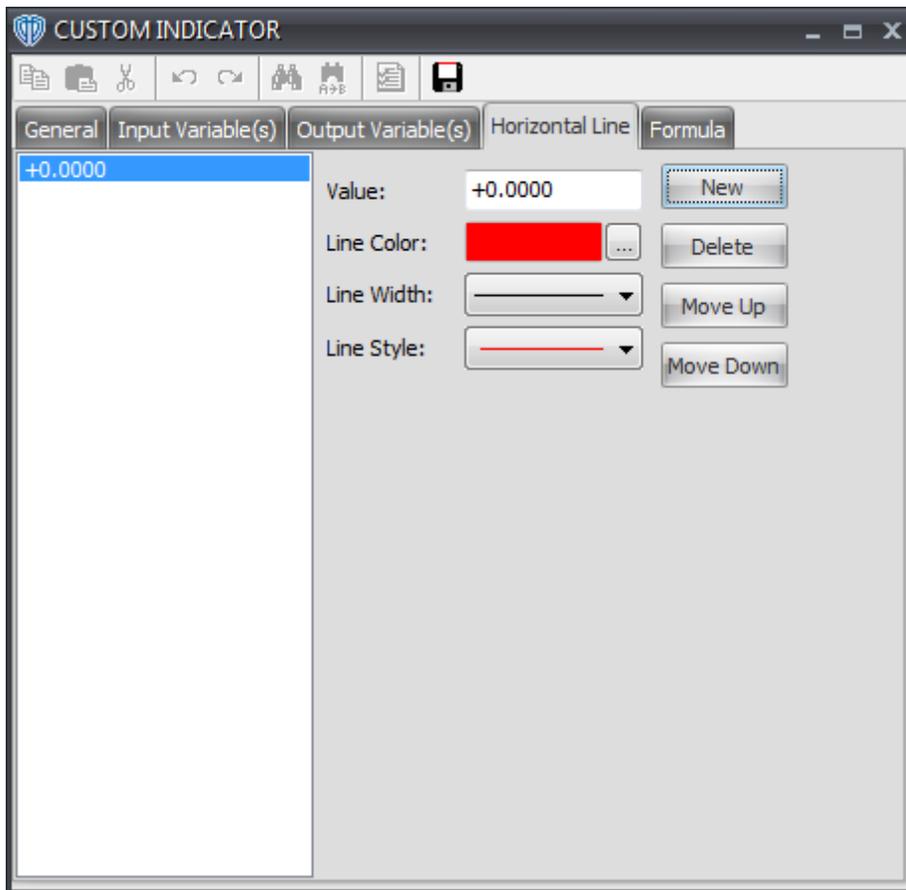
The **Line Style** defines the output variable's default line style while the indicator is attached to the chart window. This color may be changed using the indicator's properties window when you add the indicator to the chart window (*or change the indicator's properties while it is attached to the chart window*). The **Line Style** can be changed using the indicator's properties window when you add the indicator to the chart window (*or change the indicator's properties while it is attached to the chart window*).

Hide in Inspect

While *enabled*, the output variable's **Name** and corresponding value is not shown in the [Data Inspection](#)^[154] window. *Enabling* this option is useful if you want to see the output variable's value in the chart window, but you do not need (*or want*) to see it in the [Data Inspection](#)^[154] window.

3.12.1.5 Horizontal Line(s) Tab

The [Indicator Editor's](#)^[184] **Horizontal Line(s)** tab defines any horizontal levels and their default properties used in the indicator. You may create as many horizontal lines as is necessary. As a general rule, the **Horizontal Line(s)** tab proves most useful for indicators designed to be shown in separate frames in the chart window. However, horizontal lines can be included in and/or applied to any indicator. For example, the [Relative Strength Index \(RSI\)](#)^[658] indicator included with VT Trader defines 3 default horizontal lines: +30.00000, +50.00000, and +70.00000.



Clicking the [**New**] button creates a new horizontal line. Clicking the [**Delete**] button deletes the selected horizontal line. Clicking the [**Move Up**] or [**Move Down**] button moves the selected horizontal line's position up or down respectively in the list.

Explanations of Horizontal Line Tab's Items

Value

The **Value** defines the horizontal line's default placement while the indicator is attached to the chart window. The **Value** may be positive or negative number rounded out to 5 decimal places.

Line Color

The **Line Color** defines the horizontal line's default color while the indicator is attached to the chart window. The **Line Color** can be changed using the indicator's properties window when you add the indicator to the chart window (*or change the indicator's properties while it is attached to the chart window*).

Line Width

The **Line Width** defines the horizontal line's default width while the indicator is attached to the chart window. The **Line Width** may be changed using the indicator's properties window when you add the

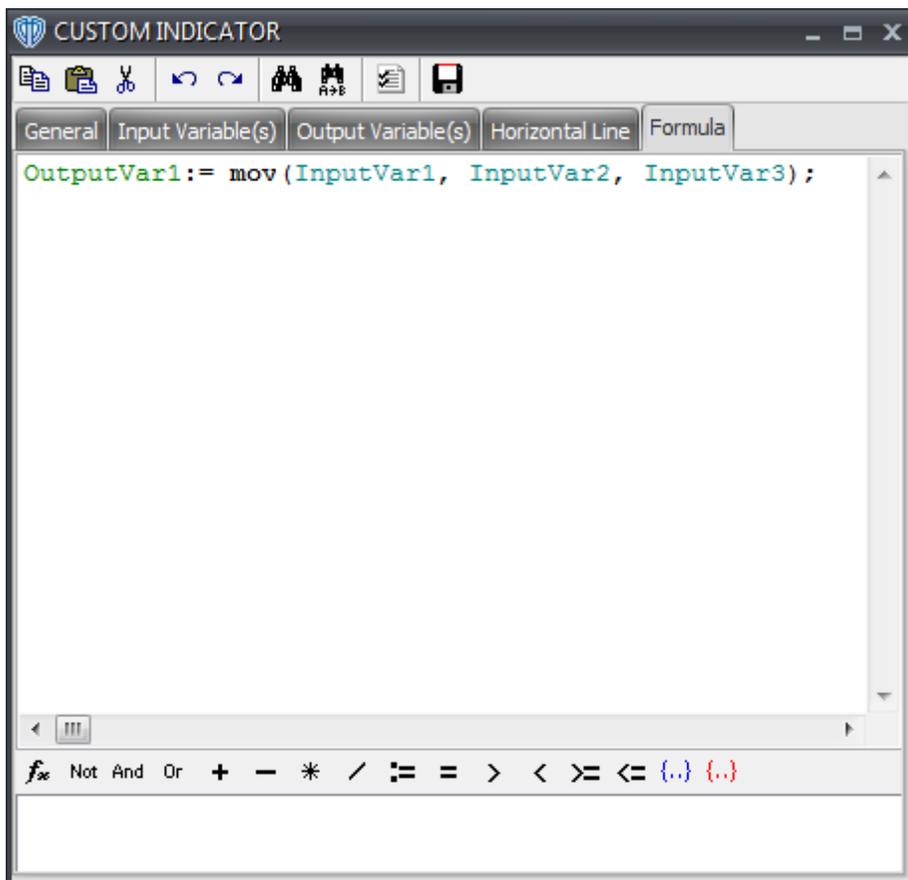
indicator to the chart window (or change the indicator's properties while it is attached to the chart window).

Line Style

The **Line Style** defines the horizontal line's default style while the indicator is attached to the chart window. The **Line Style** can be changed using the indicator's properties window when you add the indicator to the chart window (or change the indicator's properties while it is attached to the chart window).

3.12.1.6 Formula Tab

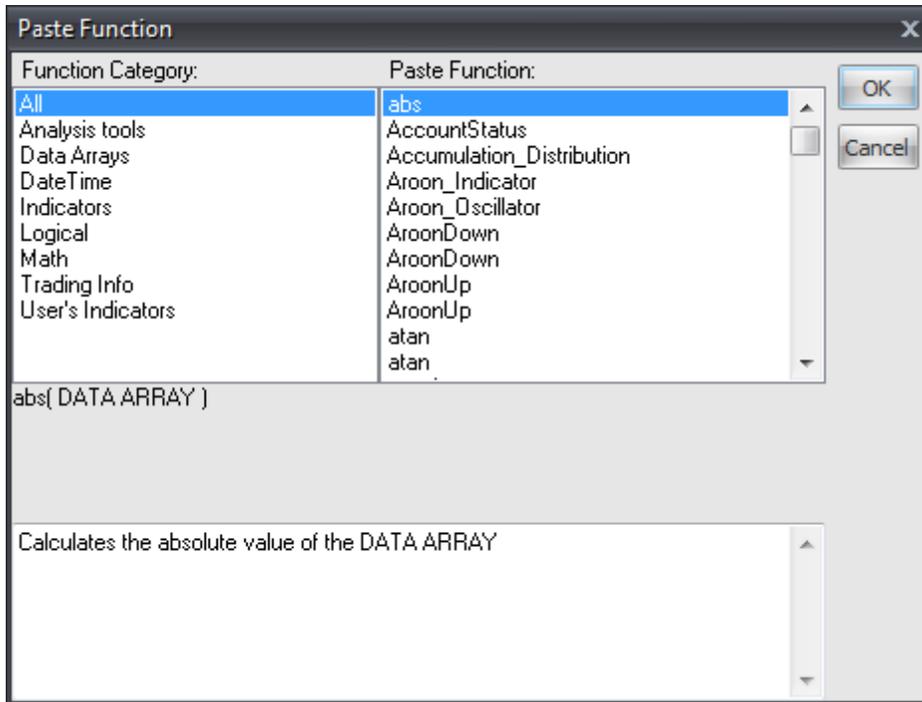
The [Indicator Editor's](#)^[184] **Formula** tab defines the VT Trader [scripting language's](#)^[329] statements, expressions, conditions, variables, etc. used in the calculation(s) of the resulting indicator. The [Formula Editor Toolbar](#)^[204] and [Paste Function window](#)^[205] (continue reading below) are available to help aid in the construction of your formula script. It is also recommended that you *enable* the [Code Parameters](#)^[187] and [Code Completion](#)^[191] features.



The **Formula Editor Toolbar** allows you to quickly [comment](#)^[330] (or *uncomment*) text, insert any of the [scripting language's](#)^[329] [punctuators](#)^[331] and [operators](#)^[331] into the formula script, and open the **Paste Function** window.



The **Paste Function** window includes a full categorical listing of all of the available functions for use in your formula script. These lists include all of the [scripting language's](#) [functions](#) as well as the [Function Name Aliases](#) of the standard VT Trader indicators and any of your custom indicators. The **Paste Function** window also specifies the selected function's format and its arguments (*if any*). Lastly, a full description of each function is also provided. Selecting a function from this window pastes it into your formula script in the **Formula** tab.

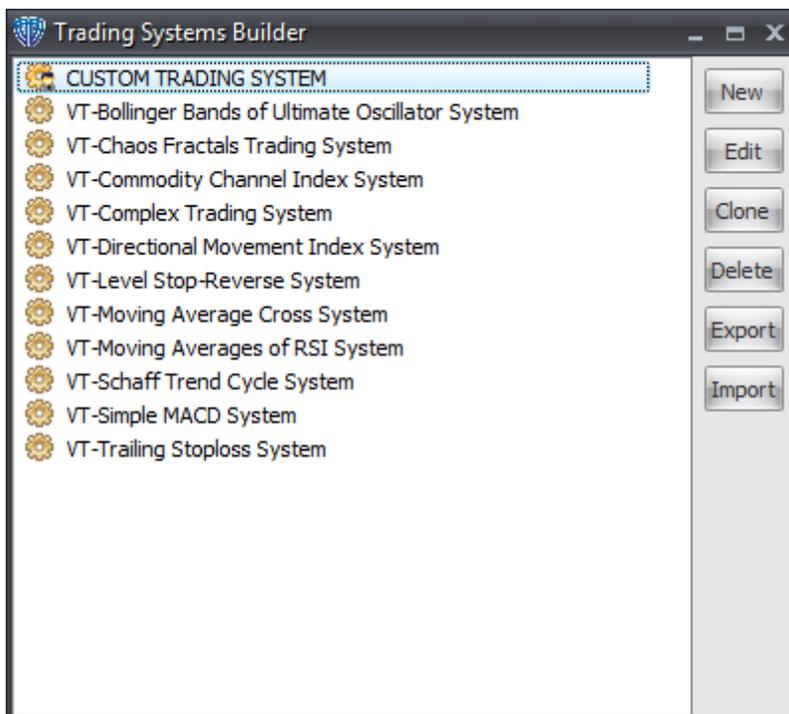


3.13 Trading Systems Builder

A trading system, simply defined, consists of a concise set of non-emotional, objective rules based on measurable factors that are used to describe when to buy and sell a trade instrument. A trading system can generate various types of alerts based on pre-defined conditions and request automated trading actions *** to be taken on those conditions.

***** Please note:** Certain rules and restrictions apply to any trading system started in *Auto-Trade* mode. It is **STRONGLY** recommended that you take a few minutes to read through the *Auto-Trading FAQ* by [clicking here](#). Please do not attempt to use any trading system in VT Trader in *Auto-Trade* mode until you are absolutely certain that you fully understand the rules and restrictions that govern trading systems' auto-trading functionality.

The **Trading Systems Builder** is a unique and significant component in VT Trader. You can create *new* trading systems and: *edit*, *clone*, *delete*, *import*, and *export* existing trading systems using it. Icons directly to the left of each trading system's name help you differentiate the VT Trader sample trading systems from your custom trading systems. VT Trader sample trading systems are identified with a gear (*or sprocket*) icon. Custom trading systems are identified by a gear+person icon.



The **Trading Systems Builder** window contains the following commands:

New

This command begins the creation of a new custom trading system by opening an [Trading System Editor](#)^[207] window.

Edit

This command allows you to make changes to the selected trading system by opening it in an [Trading System Editor](#)^[207] window.

Clone

This command creates a copy of the selected trading system and adds it to the trading system list with (2) appended to the trading system name (*to distinguish the copy from the original trading system*).

Delete

This command moves the selected trading system to the Windows® Recycle Bin for deletion. If this command is *disabled*, you must first edit the trading system by removing the check mark next to the *Protect from deletion* option in the [General Tab](#)^[214] of its [Trading System Editor](#)^[207] window.

Export

This command exports the selected trading system so that it can be saved in a designated directory on your computer. Trading systems are saved with a .vttrs file extension. An exported trading system can be imported into VT Trader using the **Import** command.

Import

This command imports a trading system file that was previously exported from VT Trader with a .vtrs file extension. Importing a trading system adds it to the trading system list using the text in the *Name* field in the [General Tab](#)^[214] of its [Trading System Editor](#)^[207] window. If a trading system with the same *Name* already exists in VT Trader a (2) will be appended to the imported trading system's name to help distinguish it from the existing trading system.

3.13.1 Trading System Editor Window

You can create new, custom trading systems or edit existing trading systems by using **Trading System Editor** window. The window caption shows the *name* of the trading system being created or edited. For ease of use, the **Trading System Editor** window consists of the [Trading System Editor Toolbar](#)^[184] and several separate tabs containing the various properties of the trading system.

To learn more about each of the **Trading System Editor** tabs, please click on its name below:

- [General Tab](#)^[214]
- [Input Variable\(s\) Tab](#)^[216]
- [Output Variable\(s\) Tab](#)^[221]
- [Formula Tab](#)^[233]

3.13.1.1 Trading System Editor Toolbar

The **Trading System Editor Toolbar** provides you quick, easy access to a variety of very useful editing-related commands.



Explanations of Trading System Editor Toolbar Commands

Copy

This command copies the selected text to the PC's clipboard for later pasting.

Paste

This command inserts the contents of PC's clipboard into the active text box.

Cut

This command cuts (*removes*) the selected text from the active text box and copies it to the PC's

clipboard for later pasting.

Undo

This command reverses the previous action such as deleting a line of code in the Formula tab.

Redo

This command reverses the previous *Undo* action.

Search

This command finds the partial word or whole word being searched for. For example, searching for *H* would find all occurrences of *H* and *High* in the formula code. You can also specify the search direction (*up or down*). The search begins at the current cursor location and searches in the specified direction. Each time an occurrence of the search word is found the window scrolls to the text's location in the formula code and highlights it. Clicking the [**Find Next**] button continues searching for more occurrences of the search word. When the search reaches the ending or beginning of the formula code an additional dialog window is shown that asks if you want to continue searching from that location.

Replace

This command extends the *Search* command's functionality by adding *Replace* and *Replace All* commands. The *Replace* command find the partial word or whole word being searched for and replaces it with the specified text. For example, searching for *High* in the formula code and replacing the next occurrence with *Low* is accomplished by clicking the [**Replace**] button; replacing all occurrences of *High* with *Low* using only one action is accomplished by clicking the [**Replace All**] button. The search and replace begins at the current cursor location and searches in the specified direction. Each time an occurrence of the search word is found the window scrolls to the text's location in the formula code, highlights it, and replaces it. Clicking the [**Find Next**] button continues searching for more occurrences of the search word. When the search reaches the ending or beginning of the formula code an additional dialog window is shown that asks if you want to continue searching from that location.

Editor Options

This command opens the [Editor Options](#)^[209] window.

Save

This command saves any changes made to the trading system.

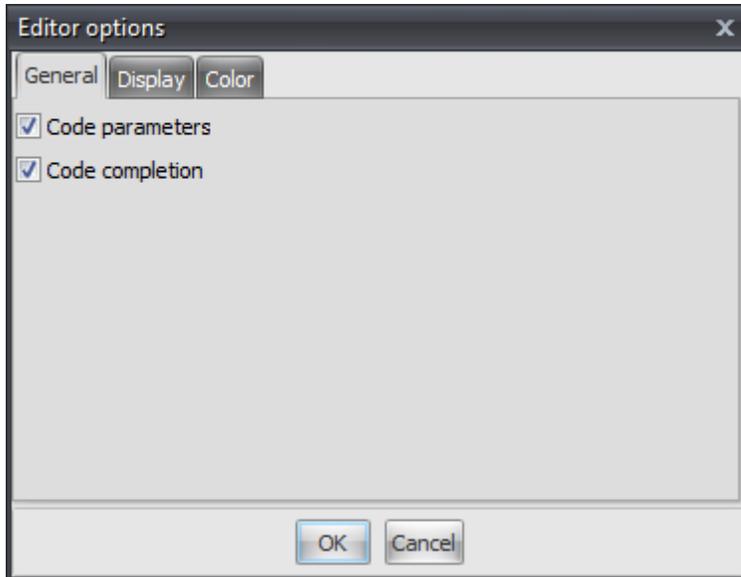
Close

This command closes and exits the [Trading System Editor](#)^[207] window. If the trading system has unsaved changes, you will be prompted to save the trading system before being able to close the window.

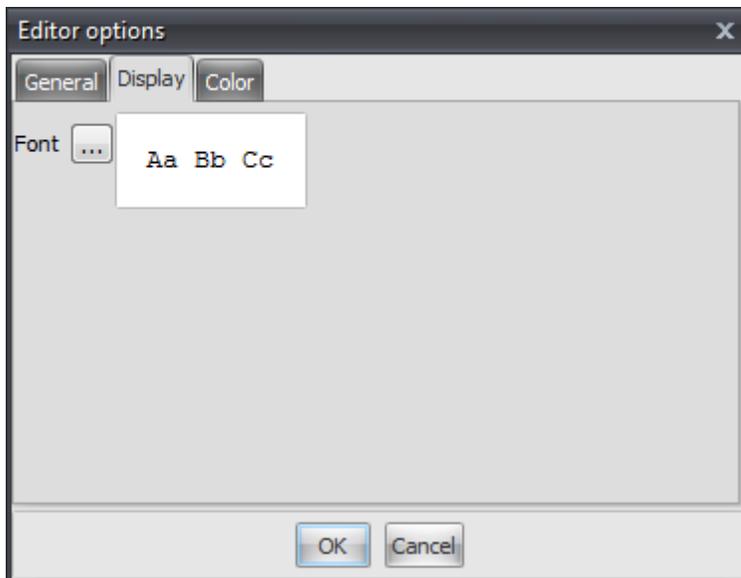
3.13.1.1.1 Editor Options

The **Editor Options** window defines the options and properties used by the [Trading System Editor](#)^[207]. This window is divided into 3 tabs: **General**, **Display**, and **Color**.

In the **General** tab, you can *enable* or *disable* the *Code Parameters* and/or *Code Completion* features used while typing text in the [Trading System Editor's](#)^[207] Formula tab. Please click on these links to learn more about the [Code Parameters](#)^[210] and [Code Completion](#)^[213] features.

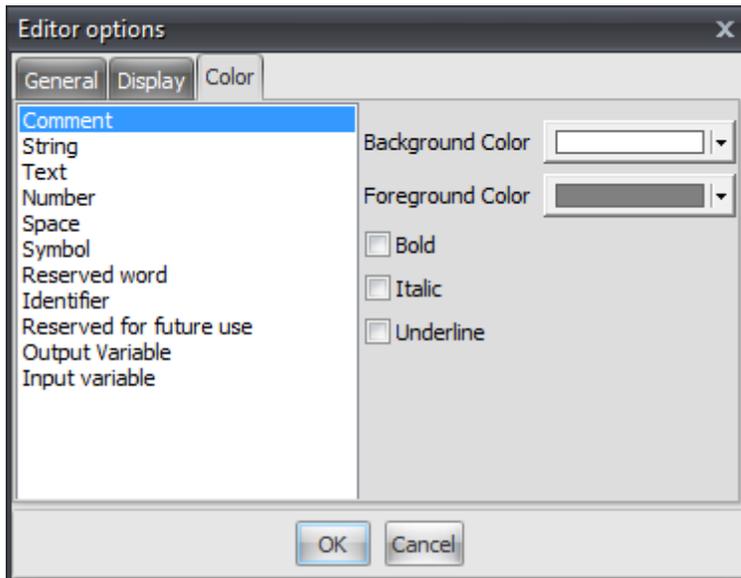


In the **Display** tab, you can define the font type used while typing text in the [Trading System Editor's](#)^[207] Formula tab.



In the **Color** tab, you can define the font colors and attributes used while typing text in the [Trading System Editor's](#)^[207] Formula tab. Each type of text item can its own *Background Color*, *Foreground*

Color, and *Font Attributes* assigned to it.

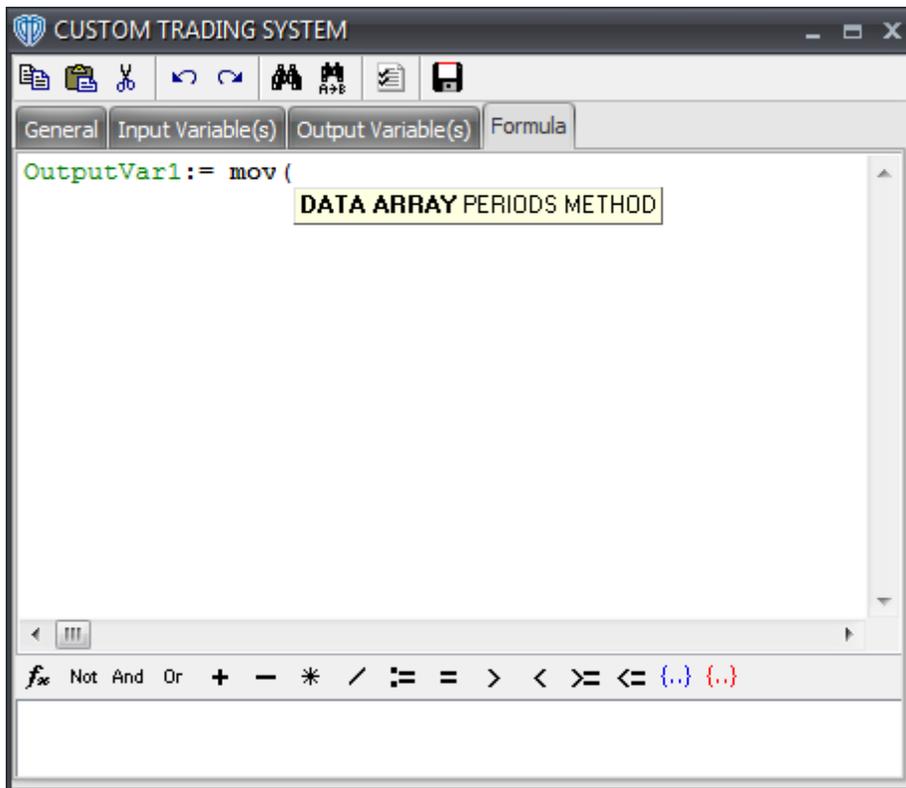


Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the **Editor Options** window without saving your changes.

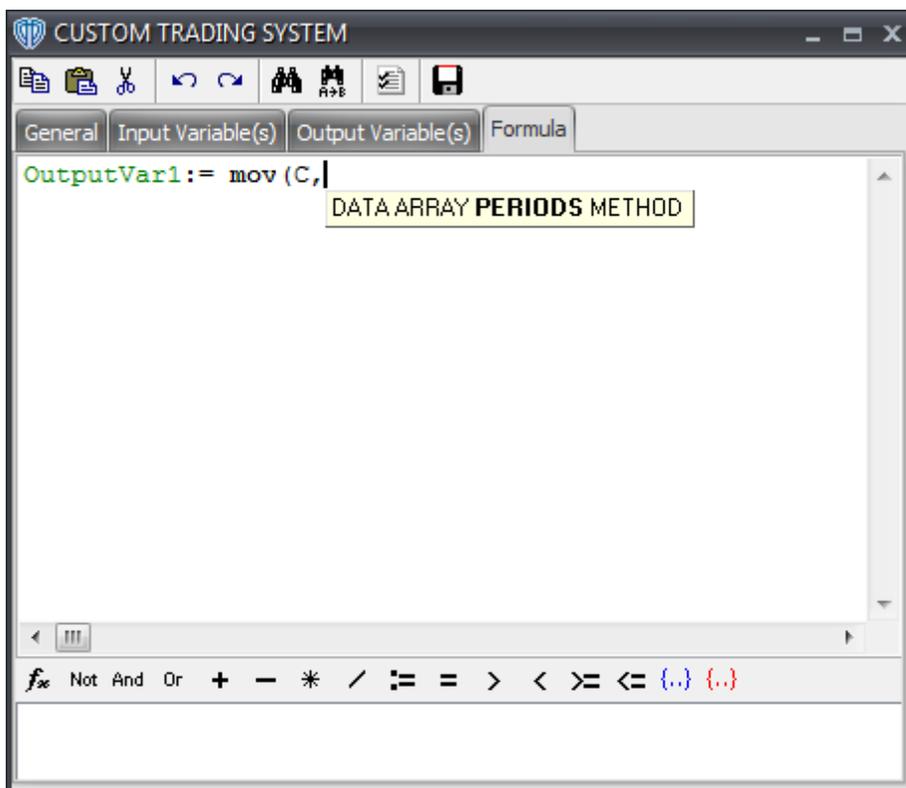
3.13.1.1.1.1 Code Parameters

The **Code Parameters** feature shows a "hint" as you are typing the name of a [function](#)^[329]. The **Code Parameters** hint dialog shows which, if any, input types that [function](#)^[329] requires and the order in which those parameters should be provided to the [function](#)^[329].

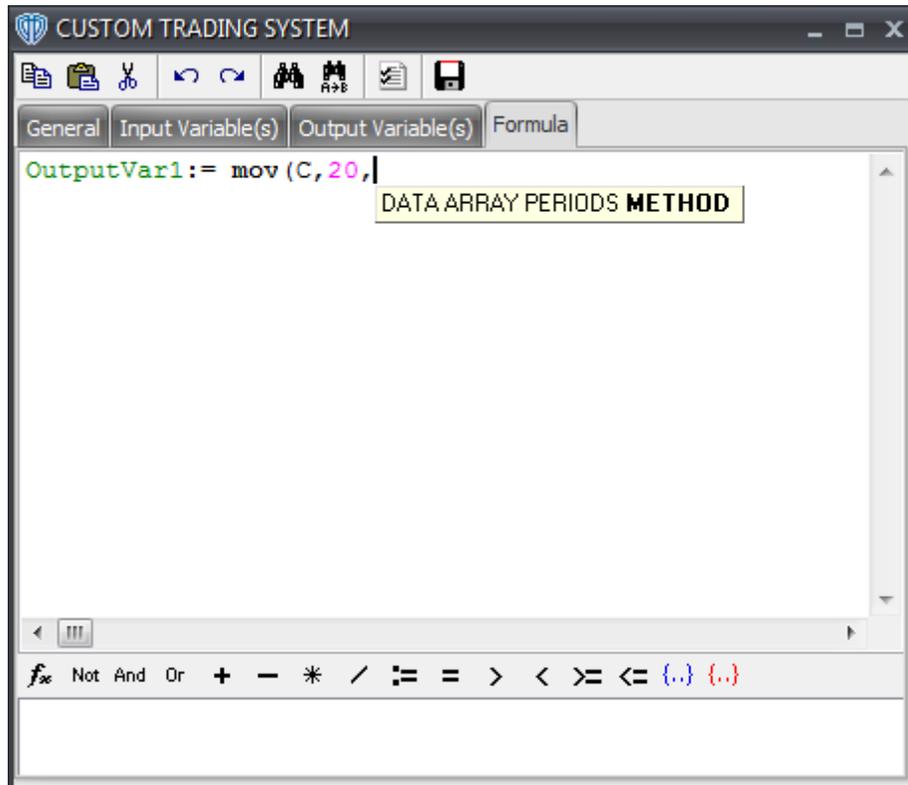
Using the **mov()** (*moving average*) function as an example, once you have typed "mov(" the **Code Parameters** hint dialog shows [DATA ARRAY, PERIODS, METHOD].



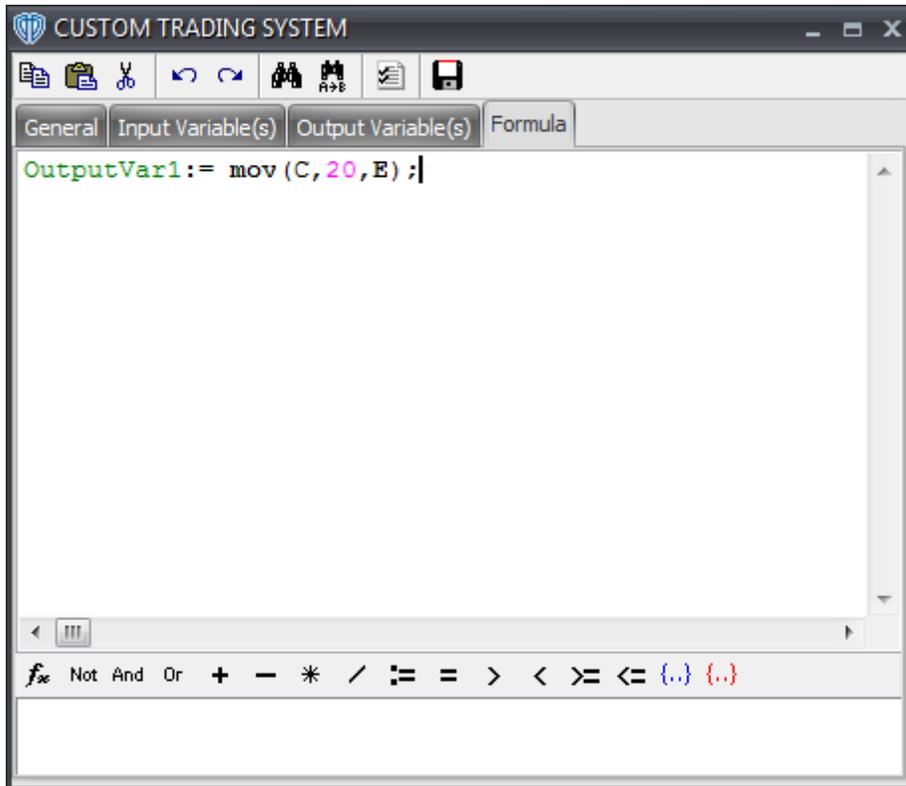
As you type each parameter, the next required parameter is indicated in **Bold**.



Continuing...



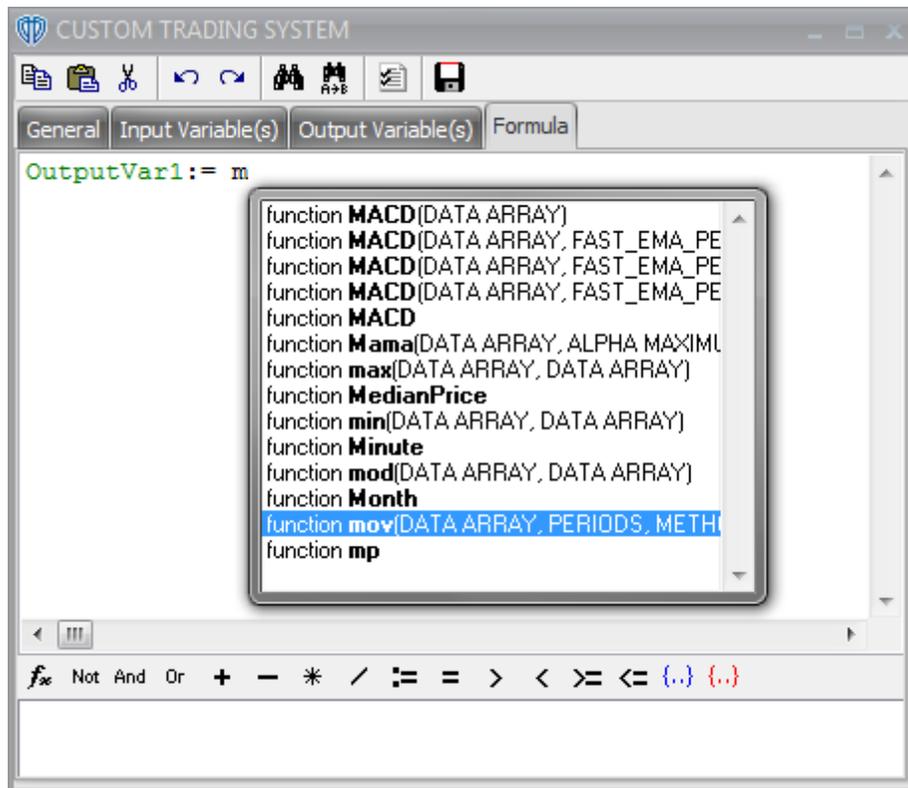
The hint dialog remains visible until the last required parameter has been typed then disappears allowing you to continue writing your formula.



3.13.1.1.1.2 Code Completion

The **Code Completion** feature is activated when you press the *CTRL + SPACEBAR* keys on your keyboard. It shows a list of available [functions](#) (or *data arrays*) in a selection menu for you to choose from while you are typing your formula. The **Code Completion** feature is best used in conjunction with the **Code Parameters** feature.

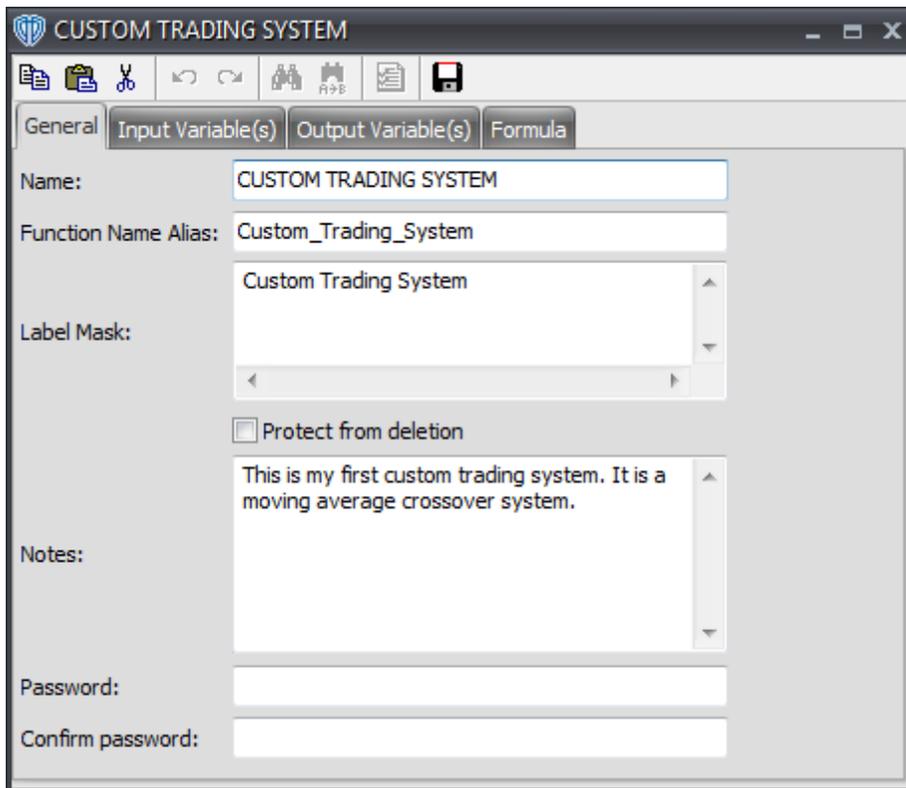
For example, let's assume that you want to use the **mov()** (*moving average*) function, but you cannot remember the function's full name. Once you have typed "m" you press the *CTRL + SPACEBAR* keys to activate the **Code Complete** feature for assistance. The Code Complete feature shows a list of every function that starts with the letter "m".



Once you have made your selection, it is inserted into the formula. The **Code Completion** dialog then disappears allowing you to continue writing your formula.

3.13.1.2 General Tab

The [Trading System Editor's](#) **General** tab defines the indicator's basic attributes.



Explanations of General Tab's Items

Name

The **Name** identifies the trading system throughout VT Trader. The trading system's **Name** is used in the [Trading Systems Builder](#)^[205], [Indicator Editor](#)^[207] window, [Trading Systems Quick List](#)^[236], and in the Add Trading System window shown when attaching an trading system to a chart window.

Function Name Alias

The **Function Name Alias** is used as the actual file name for the trading system when it is saved. It is not case-sensitive; for example, using `vt_RSI_Trading_System` is the same as using `vt_rsi_trading_system`. The **Function Name Alias** may include only letters and numbers. Use of the underscore (`_`) character is also allowed. It may not include any spaces or begin with a number. If an existing trading system with the same **Function Name Alias** is found on your PC VT Trader shows a warning dialog notifying you of the conflict when you attempt to save the trading system. You must resolve the naming conflict before you will be able to save the trading system.

Label Mask

The **Label Mask** multiple-line text box can be used to help identify the trading system while it is attached to a chart window. It is possible to include the name of the trading system, the values of input variables, the current value of output variables, and/or any other desired text in the trading system's label. The **Label Mask** can show multiple lines of text; you can use the *Enter (or Return)* key to separate the information into multiple lines of text.

To show the value of an input variable in the trading system's label it is necessary to type the input variable's name (as defined by the **Name** in the [Input Variable\(s\) tab](#)^[216]) between % characters. To include the value of an output variable in the indicator's label it is necessary to type the output variable's name (as defined by the **Var Name** in the [Output Variable\(s\) tab](#)^[221]) between % characters.

Protect from Deletion

The **Protect from deletion** option prevents accidental deletion of the indicator. This option is *enabled* by default when a new indicator is created. It is not possible to delete the indicator from the [Indicators Builder](#)^[182] while the **Protect from deletion** option is *enabled* (the **[Delete]** button is disabled while the indicator is selected). Disabling the **Protect from deletion** option by removing the check mark next to it allows the indicator to be deleted.

Notes

The **Notes** provides additional information relating to the trading system. This may be any kind of information considered useful. Typically, a description of the trading system as well as suggested methods of use and references to the appropriate documentation will be provided in the **Notes**.

Password

You may supply a **Password** (a phrase or combination of letters and numbers) to keep the trading system's formula and main properties confidential thus protecting it from accidental or purposeful editing. The **Password** must be confirmed in the **Confirm Password** text box before it can be applied. If a **Password** has been supplied when someone tries to edit the trading system he/she will be prompted to provide it. If the **Password** is not typed correctly, it will not be possible to edit the trading system.

Confirm Password

The **Password** must be successfully retyped in the **Confirm Password** text box before it can be applied.

3.13.1.3 Input Variable(s) Tab

To best utilize the [Trading System Editor's](#)^[207] **Input Variable(s)** tab, it's necessary to understand what *input variables* are and how they are used in VT Trader's scripting language.

What are *input variables* and how do I use them?

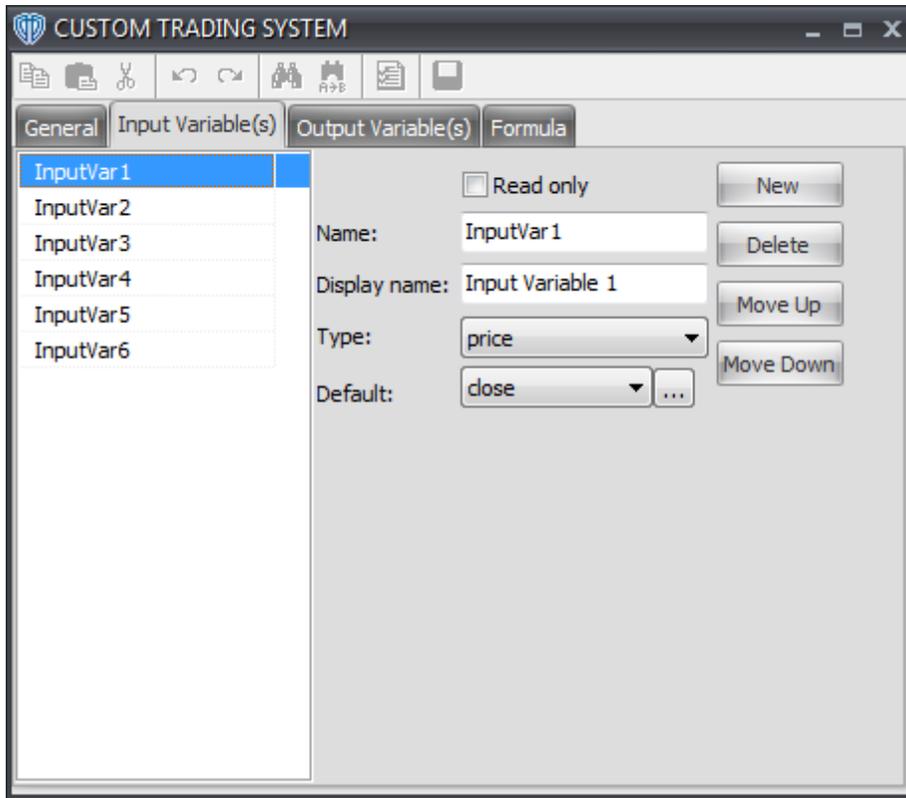
Simply defined, an input variable is a value that you provide to the formula script. VT Trader's scripting language uses the input variables' values while evaluating expressions and/or performing calculations. Input variables (and their *Default values*) are included in the Trading Systems Properties window. This properties window is used to modify the trading system's properties while it is attached to a chart window.

Input variables are often used to allow you to change the values of a function's arguments, or perform actions such as selecting, enabling, or disabling (via *enumeration lists*) specific parameters or conditions used by an indicator or trading system without the need to edit its formula script. You provide

these values to the formula script from the trading system's properties window when you add it to the chart window (or change its properties while it is attached to the chart window).

What is the Input Variable(s) Tab?

The [Trading System Editor's](#) **Input Variable(s)** tab defines any input variables used in the formula script. You can create as many new input variables as necessary.



Clicking the [**New**] button creates a new input variable. Clicking the [**Delete**] button deletes the selected input variable. Clicking the [**Move Up**] or [**Move Down**] button moves the input variable's respective position up or down in the tab's variable list as well as up or down in the trading system's properties window.

Explanations of Input Variable(s) Tab's Items

Read Only

While *enabled*, the input variable's value in the trading system's properties window will be a read-only value that cannot be changed. *Enabling* this option is useful if you want to see the input variable's **Display Name** and **Default** value in the properties window, but you do not need to be able to change its value (or you do not want others to be able to change it).

Name

The **Name** makes it possible to refer to the input variable and its value from within the formula script. The **Name** is not case-sensitive; for example, using *Periods* is the same as using *periods*. It may include only letters and numbers. Use of the underscore (_) character is also allowed. It may not include any spaces or begin with a number. An input variable's **Name** must not be the same name as any other existing input variable, [existing function](#)^[334] or [reserved function](#)^[400], [constant](#)^[333], or [predefined data array](#)^[334]. Additionally, no [input variables](#)^[216] should have the same **Name** as any [output variables](#)^[221] **Var Name(s)** within the same formula script.

Display Name

The **Display Name** is the text shown in the trading system's properties window to identify the input variable. This text should be descriptive enough that it is easy to understand what the input variable is and what **Type** of value you need to provide when you are attaching the trading system to the chart window (*or changing its properties while it is attached to the chart window*).

Type

An input variable must be defined as a certain **Type** of variable. The **Type** value defines what type of data can be used as the input variable's **Default** value. The variable's **Type** selection is also used by the formula script; **Type** defines what type of data the formula script should expect to process when the input variable's value is passed into the scripting engine. An input variable can provide the formula script with any any of the following types of data: *integer*, *integer (with bounds)*, *float*, *float (with bounds)*, *price*, *MA type*, *Enumeration*, and *Bars Forward*. Please [click here](#)^[218] to learn more about each input variable **Type**.

Default

The **Default** value is the initial value of the input variable shown in the trading system's properties window; however, this value can be changed as needed (*assuming the input variable's **Read-Only** option is disabled*). The **Default** value is provided to the formula script along with the input variable's **Type**. The formula script uses this value while evaluating any expressions and/or performing any calculations that require the input variable's value.

Min Bounds

The **Min Bounds** value defines the lowest value that can be used for the **Default** value. **Min Bounds** is only available if the *integer (with bounds)*, *float (with bounds)*, or *Bars Forward* variable **Type** is selected.

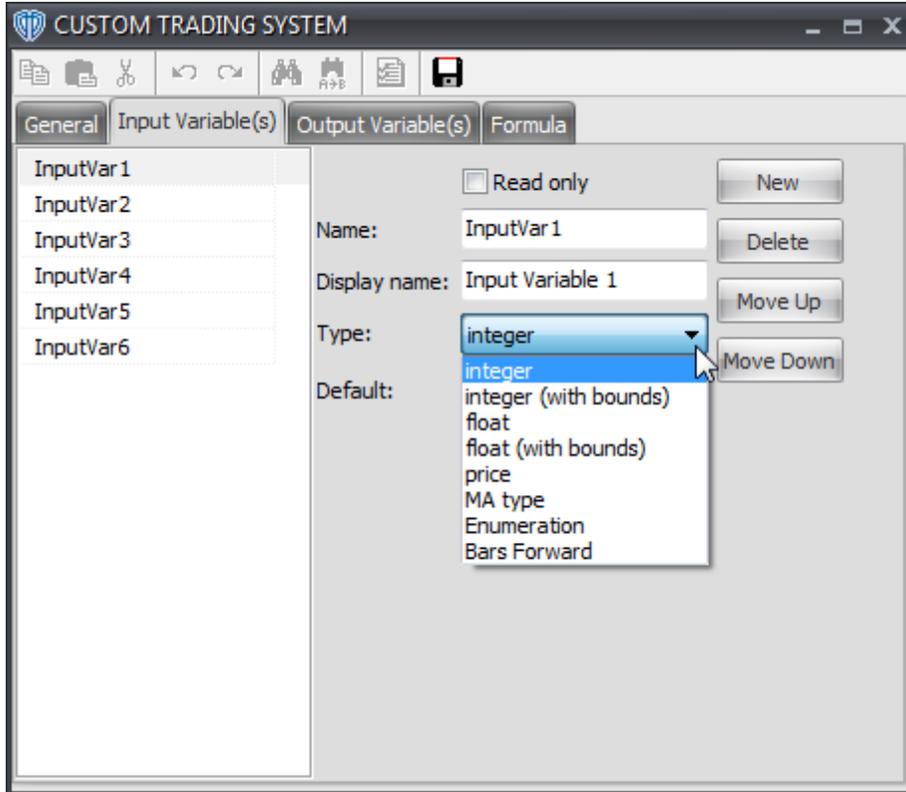
Max Bounds

The **Max Bounds** value defines the highest value that can be used for the **Default** value. **Max Bounds** is only available if the *integer (with bounds)*, *float (with bounds)*, or *Bars Forward* variable **Type** is selected.

3.13.1.3.1 Type

An input variable must be defined as a certain [Type](#)^[216] of variable. The [Type](#)^[216] of the variable defines what type of data can be used as the input variable's [Default](#)^[216] value. The variable's [Type](#)^[216] selection is also used by the formula script; [Type](#)^[216] defines what type of data the formula script should expect to process when the input variable's value is passed into the scripting engine.

An input variable can provide the formula script with any any of the following types of data: *integer*, *integer (with bounds)*, *float*, *float (with bounds)*, *price*, *MA type*, *Enumeration*, and *Bars Forward*. Please continue reading to learn more about each input variable [Type](#)^[216].



Explanations of the Types of Input Variables

Integer

An input variable of the **Integer** [Type](#)^[216] can be any positive or negative whole number (... , -2, -1, 0, 1, 2, ..., and so on...).

Integer (with bounds)

An input variable of the **Integer (with bounds)** [Type](#)^[216] can be any positive or negative whole number between the defined [Min. Bounds](#)^[216] and [Max. Bounds](#)^[216] values.

Float

An input variable of the **Float** [Type](#)^[216] can be any positive or negative number rounded out to 5 decimal places.

Float (with bounds)

An input variable of the **Float (with bounds)** [Type](#)^[216] can be any positive or negative number

rounded out to 5 decimal places between the defined [Min. Bounds](#) and [Max. Bounds](#) values.

Price

An input variable of the **Price Type** can be any of the [predefined data arrays](#): *close, open, low, high, Median Price, Typical Price, Indicator (the value of an Indicator already attached to the [chart window](#)), Volume, haOpen, haClose, haLow, or haHigh; "ha" values are price values associated with the Heikin-Ashi Candlestick Chart Type).*

MA Type

An input variable of the **MA Type** can be any of the available moving average [constants](#): *Simple, Weighted, Exponential, Sine Weighted, Triangular, End Point, or Volume-Adjusted.* The **MA Type** selection is often used in conjunction with the built-in *moving average function [mov\(\)](#)* or when it is desirable to apply a type of data smoothing (*averaging*) to the data array being analyzed.

Enumeration

An input variable of the **Enumeration Type** can be any of the predefined values added to a enumeration (*selection*) list. Before an enumeration list can be used, it must be populated. The enumeration list can be populated (*or edited*) by clicking the [...] button shown directly to the right of the [Default](#) value's text box while the **Enumeration Type** is selected. An enumeration list item may include only letters and numbers. Use of the underscore (_) character is also allowed. It may not include any spaces or begin with a number.

Important Note: Each item in the selection menu is assigned an internal list position number that corresponds to their location in the list; the first item (*top*) in the enumeration list is assigned the position number 0, the second item is assigned 1, the third item is assigned 2, etc. You must use the list item's number (*not its actual name shown in the enumeration list*) in the formula script to when constructing your expressions and conditions.

For example, let's assume that you have an indicator that includes a moving average and a moving average of the moving average. Let's also assume that you would like to create some logic that allows you to show (*or hide*) the moving average of the moving average. You can accomplish this by using an **Enumeration Type** [input variable](#) called *MaDisplay* (*its [Name](#); "Display MA of MA?" will be its [Display Name](#))* that includes two items in the list (*from top-down*): *No, Yes.* The VT Trader formula script written in the [Formula tab](#) could potentially look like this:

```
{5-period simple moving average of close prices}

MA := mov(C,5,S);

{If MaDisplay is "Yes" (which has an assigned list position number of
1),
calculate and show a 5-period MA of the 5-period MA of close prices}

MA_of_MA := if(DisplayMA=1, mov(MA,5,S), NULL);
```

In this example, *MA* and *MA_of_MA* would be [output variables](#) (*Indicator Output option enabled*) defined in the [Output Variable\(s\) tab](#).

Another good example demonstrating the use of an enumeration list is found in VT Trader's [Rate of Change \(ROC\)](#) indicator. Its *Calculation Method* [input variable](#) uses an enumeration list

allowing you to specify if the [ROC](#)^[648] is calculated in *Points* or *Percent*.

Bars Forward

An input variable of the **Bars Forward Type**^[216] can be any positive or negative whole number between the defined [Min. Bounds](#)^[216] and [Max. Bounds](#)^[216] values. The **Bars Forward Type**^[216] is used in conjunction with the scripting language's [ref\(\)](#)^[377] function to **visually** shift the resulting calculation plot forward ahead of the current market or backwards behind the current market price by the number of bars specified. **Important Note:** The **Bars Forward Type**^[216] should only be used for visual reference. It is not possible for a trading system to generate alerts in real-time (*or request orders automatically if it's running in Auto-Trade mode*) for any condition that uses a variable or value that has been shifted behind the current market price (*i.e. a negative Bars Forward value*).

A good example demonstrating the use of the **Bars Forward Type**^[216] is found in VT Trader's [Moving Average](#)^[585] indicator. Its *Horizontal Shift input variable*^[216] uses the **Bars Forward Type**^[216] allowing you to visually shift the moving average's plot forward ahead of the current market price. Another good example demonstrating the use of the **Bars Forward Type**^[216] is the [Chaos Alligator Indicator](#)^[453].

3.13.1.4 Output Variable(s) Tab

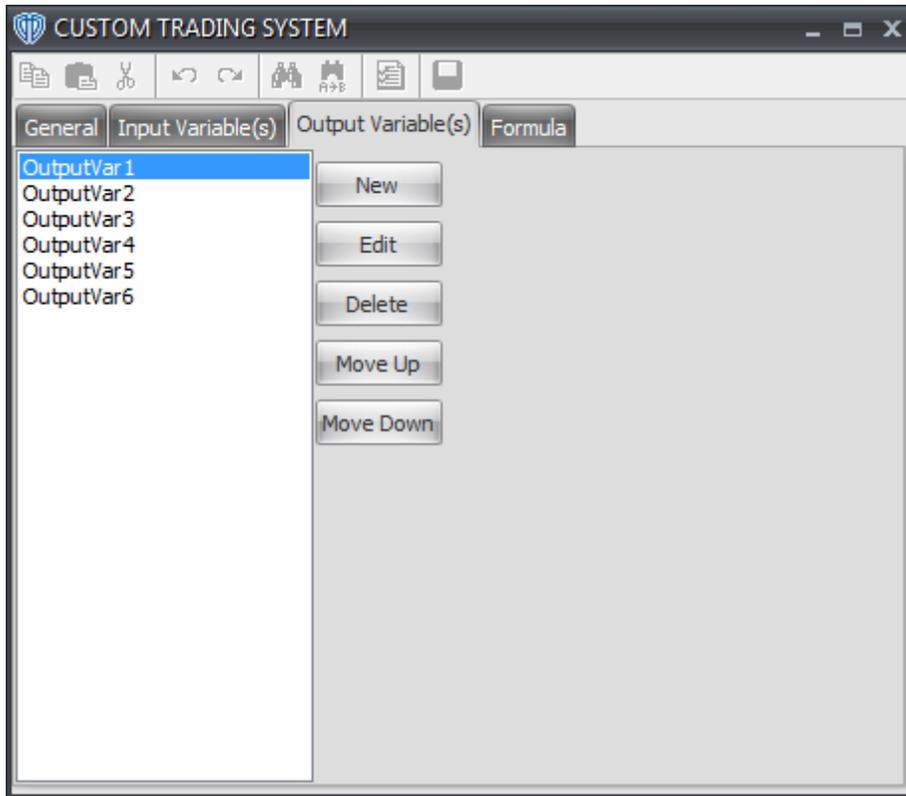
To best utilize the **Output Variable(s)** tab, it's necessary to first understand what *output variables* are and how they are used in VT Trader's scripting language.

What are *output variables* and how do I use them?

Simply defined, an output variable is the resulting calculated value of a statement in the formula script. In an indicator, output variables are often, but not always, the final calculation of an indicator. However, in a trading system, an output variable can have one or more types of final outputs.

What is the Output Variable(s) Tab?

Most trading systems include multiple output variables, some variables' values you might need to be able to visually examine and others you might not. You can use the [Trading System Editor's](#)^[207] **Output Variable(s)** tab (*and its Variable Editor window*) to define only those output variables used in the formula script that are used to alert you to your specified trading conditions and/or that you need to see the resulting values of in a chart window and in the [Data Inspection](#)^[154] window. You can define as many output variables in the **Output Variable(s)** tab as necessary.



Clicking the [**New**] button creates a new input variable. Clicking the [**Delete**] button deletes the selected input variable. Clicking the [**Move Up**] or [**Move Down**] button moves the input variable's respective position up or down in the tab's variable list as well as up or down in the trading system's properties window.

The **Output Variable(s)** tab contains the following command buttons:

New

This command creates a new output variable.

Edit

This command opens the [Output Variable Editor](#)^[223] window. Please click here to learn more about the [Output Variable Editor](#)^[223] window.

Delete

This command deletes the selected output variable.

Move Up / Move Down

This command moves the output variable's respective position up or down in the tab's variable list as well as up or down in the [Data Inspection](#)^[154] window (*relative to the trading system's other output variables shown in that window*).

3.13.1.4.1 Output Variable Editor Window

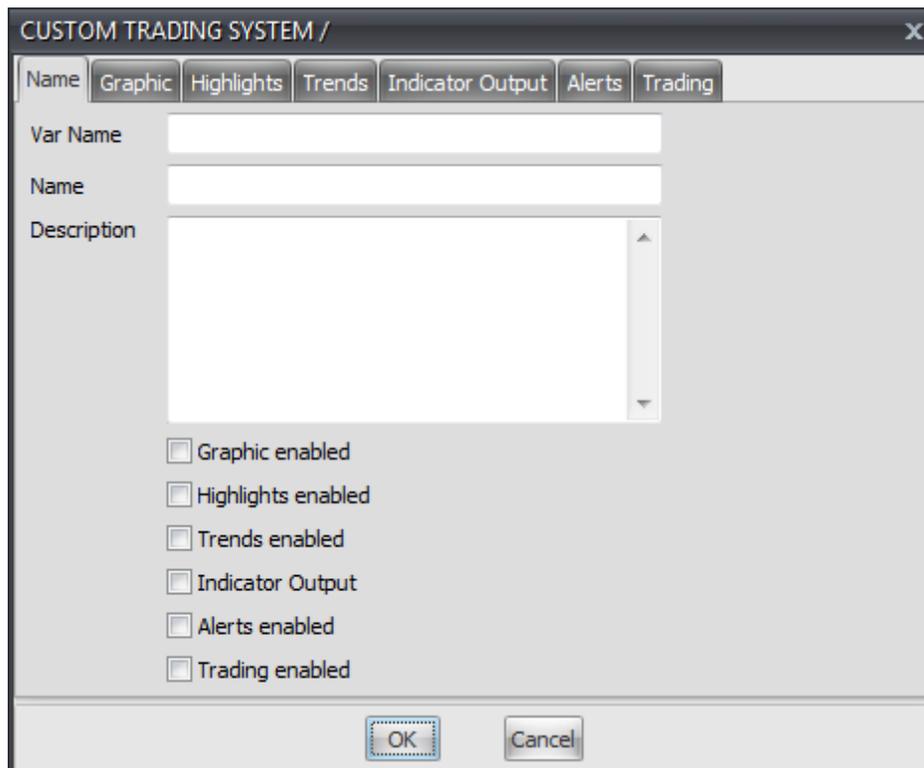
The **Output Variable Editor** window is opened by clicking the **[New]** button or **[Edit]** button in the [Output Variable\(s\)](#)^[221] tab of the [Trading System Editor](#)^[207] window. You can define or edit the default properties of the selected output variable from this window. The **Output Variable Editor** window's caption shows the *Name* of the trading system followed by the *Name* of the output variable being created or edited. For ease of use, the **Output Variable Editor** window divided into several separate tabs containing the output variable's various properties.

To learn more about each of the **Output Variable Editor** window's tabs, please click on its name below:

- [Name Tab](#)^[223]
- [Graphic Tab](#)^[225]
- [Highlights Tab](#)^[227]
- [Trends Tab](#)^[227]
- [Indicator Output Tab](#)^[229]
- [Alerts](#)^[230]
- [Trading](#)^[232]

3.13.1.4.1.1 Name Tab

The [Output Variable Editor's](#)^[223] **Name** tab defines the output variable's basic attributes and the type(s) of output the variable provides.



Clicking the **[OK]** button saves your changes. Clicking the **[Cancel]** button closes the [Output Variable Editor](#) window without saving your changes.

Explanations of Name Tab's Items

Var Name

The **Var Name** makes it possible to refer to the output variable and its value from within the formula script. The **Var Name** is not case-sensitive; for example, using `Buy_Signal` is the same as using `buy_signal`. It may include only letters and numbers. Use of the underscore (`_`) character is also allowed. It may not include any spaces or begin with a number. An output variable's **Var Name** must not be the same name as any other existing output variable, [existing function](#) or [reserved function](#), [constant](#), or [predefined data array](#). Additionally, no [output variables](#) should have the same **Var Name(s)** as any [input variables](#) **Name(s)** within the same formula script.

Name

The **Name** identifies the output variable in the [Data Inspection](#) window while the trading system is attached to the [chart window](#).

Description

The **Description** provides additional information relating to the output variable. This may be any kind of information considered useful. Typically, this is a description of the output variable (*i.e. what it is used for or what data it provides*).

Graphic Enabled

This option shows a graphic in the price frame of the [chart window](#) in real-time, with each new incoming price tick, each time the [output variable's](#) conditions are fulfilled according to the formula script. The graphic is also shown throughout the historical charting data for each bar (*or candle*) when the [output variable's](#) conditions were fulfilled at the closing of that bar (*or candle*). The [Output Variable Editor's](#) [Graphic](#) tab defines the default properties of the graphic.

Highlights Enabled

This option highlights (*i.e. changes the color*) of the bar (*or candle*) in the price frame of the [chart window](#) in real-time, with each new incoming price tick, each time the [output variable's](#) conditions are fulfilled according to the formula script. The highlights are also shown throughout the historical charting data for each bar (*or candle*) when the [output variable's](#) conditions were fulfilled at the closing of that bar (*or candle*). The [Output Variable Editor's](#) [Highlights](#) tab defines the default properties of the highlight.

Trends Enabled

This option shows an additional "trends frame" at the bottom of the [chart window](#) that changes color in real-time, with each new incoming price tick, each time the [output variable's](#) conditions are fulfilled according to the formula script. The "trends frame" is also shown throughout the historical charting data for each bar (*or candle*) when the [output variable's](#) conditions were fulfilled at the closing of that bar (*or candle*). The [Output Variable Editor's](#) [Trends](#) tab defines the

default properties of the "trend frame". Note: If more than one [output variable](#)^[221] is **Trends Enabled**, all of the [output variables](#)^[221] share the "trends frame".

Indicator Output

This option shows the [output variable's](#)^[221] value in the chart window. The [output variable's](#)^[221] value recalculates in real-time, with each new incoming price tick, according to the formula script. The [output variable's](#)^[221] value is also shown throughout the historical charting data for each bar (*or candle*) based on its value at the closing of that bar (*or candle*) each time the [output variable's](#)^[221] conditions are fulfilled according to the formula script.

Enabling this option is often used to include the indicator(s) that the trading system's conditions are based on directly in the trading system's formula script instead of having to attach the indicator(s) to the [chart window](#)^[121] separately for review. It can also be useful when trying to troubleshoot a trading system's formula script and you need to be able to quickly determine what the output variable's value is for each bar (*or candle*).

Alerts Enabled

This option shows a text message in the [Trading Activity](#)^[174] window (*or in the Trading Systems Alerts window if the "Show Trading Systems Alerts*^[68]*" option is defined as "In Trading Systems Alerts Window"*) and plays an audio sound file in real-time, with each new incoming price tick, each time the [output variable's](#)^[221] conditions are fulfilled according to the formula script. The [Output Variable Editor's](#)^[223] [Alerts](#)^[230] tab defines the default message and/or audio sound file of the alert.

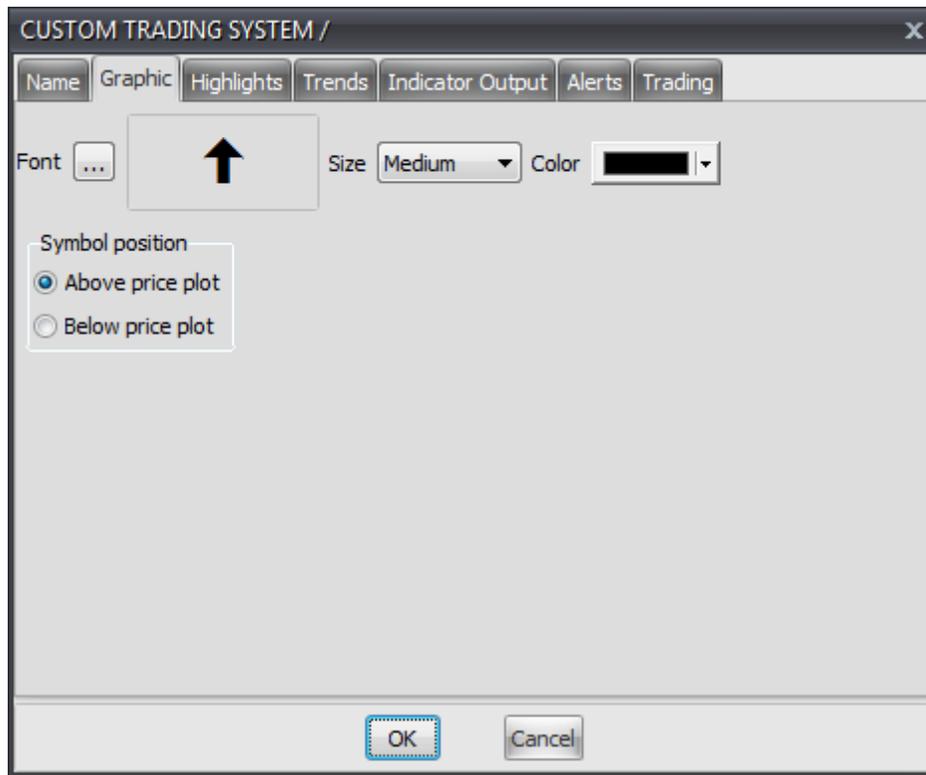
Trading Enabled

This option automatically requests an order each time the [output variable's](#)^[221] conditions are fulfilled according to the formula script if the trading system is running in *Auto-Trade* mode. The [Output Variable Editor's](#)^[223] [Trading](#)^[232] tab defines the default automated trading properties of the [output variable](#)^[221].

Important Note(s): It is extremely important that you properly define the [output variable's](#)^[221] automated trading properties in [Trading](#)^[232] tab before attempting to run the trading system in *Auto-Trade* mode. It is also strongly recommended that you read through the [Auto-Trading FAQ for Trading Systems](#)^[148] page in this manual for some additional, important information about using trading systems for automated trading purposes.

3.13.1.4.1.2 Graphic Tab

The [Output Variable Editor's](#)^[223] **Graphic** tab defines the default graphic properties for the [output variable](#)^[221] if its *Graphic Enabled* option is *enabled* in the [Name](#)^[223] tab. The graphic is shown in the price frame of the [chart window](#)^[121] in real-time, with each new incoming price tick, each time the [output variable's](#)^[221] conditions are fulfilled according to the formula script. It is also shown throughout the historical charting data for each bar (*or candle*) when the [output variable's](#)^[221] conditions were fulfilled at the closing of that bar (*or candle*).



Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the [Output Variable Editor](#)^[223] window without saving your changes.

Explanations of Graphic Tab's Items

Font

Font defines the graphic's default symbol while the trading system is attached to the [chart window](#)^[121]. The available choices are the same as those items in the [Symbols tool](#)^[246].

Size

Size defines the graphic's default color while the trading system is attached to the [chart window](#)^[121]. The available choices are: *Small*, *Medium*, and *Large*.

Color

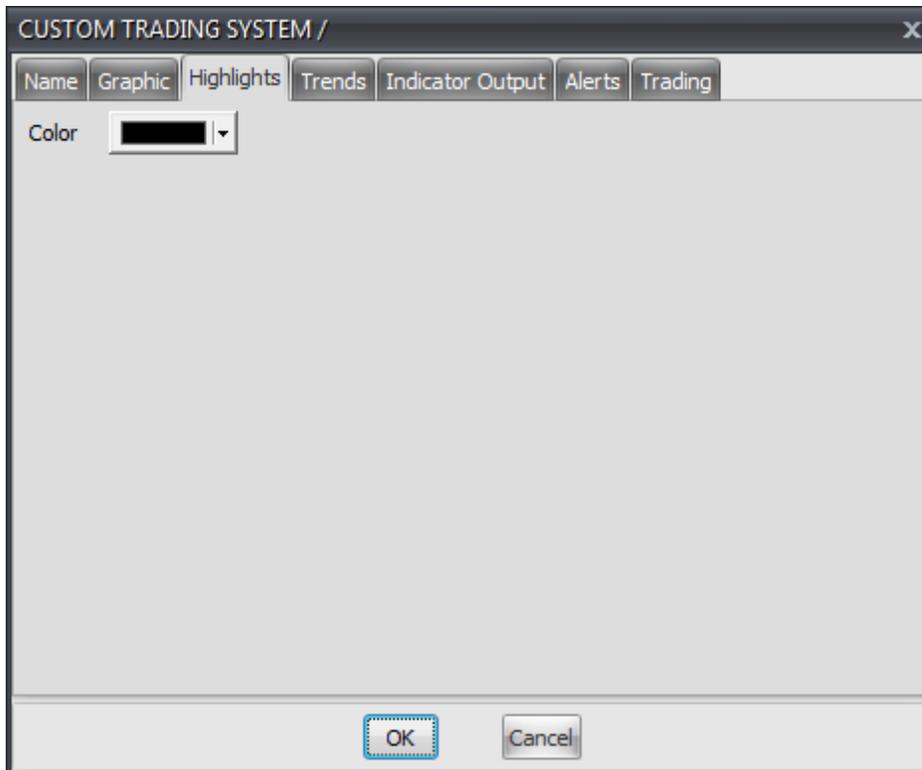
Color defines the graphic's default color while the trading system is attached to the [chart window](#)^[121]. It is also the color used to show the [output variable's](#)^[221] **Name** and calculated value in the [Data Inspection](#)^[154] window (if the "Use Colors for Output Variables" option is enabled for that window).

Symbol Position

You can choose to show the graphic above or below the bar (or candle) in the price frame of the [chart window](#)^[121] using the **Symbol Position** options.

3.13.1.4.1.3 Highlights Tab

The [Output Variable Editor's](#) **Highlights** tab defines the default bar (or candle) highlighting properties for the [output variable](#) if its *Highlights Enabled* option is *enabled* in the [Name](#) tab. *Highlights* change the color of the bar (or candle) in the price frame of the [chart window](#) in real-time, with each new incoming price tick, each time the [output variable's](#) conditions are fulfilled according to the formula script. The *highlights* are also shown throughout the historical charting data for each bar (or candle) when the [output variable's](#) conditions were fulfilled at the closing of that bar (or candle).



Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the [Output Variable Editor](#) window without saving your changes.

Explanations of Highlights Tab's Items

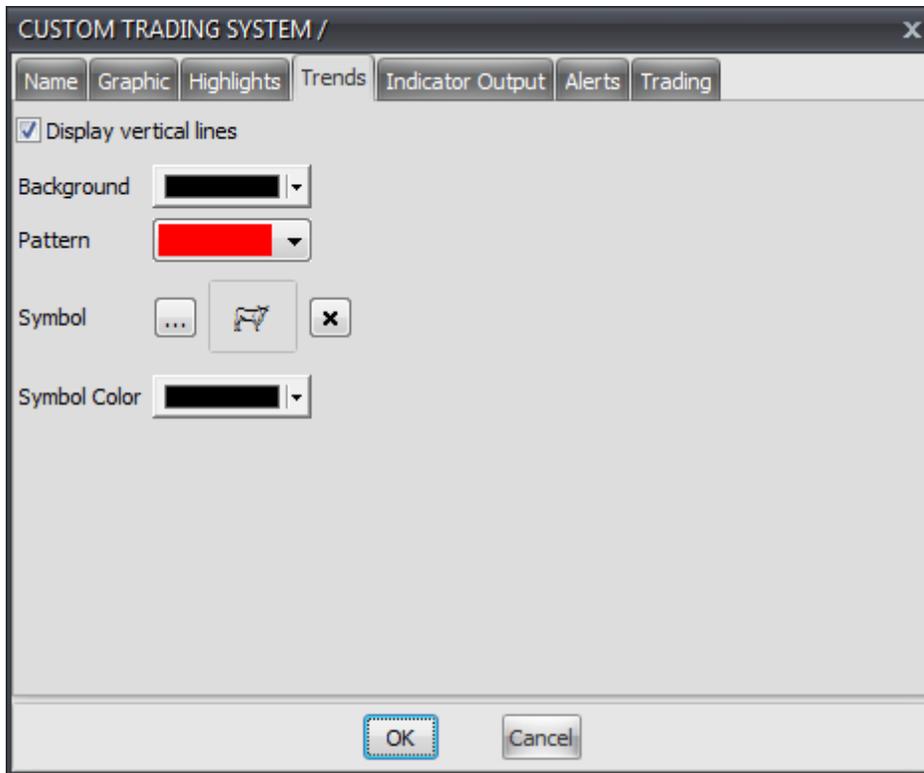
Color

Color defines the graphic's default default bar (or candle) highlighting color while the trading system is attached to the [chart window](#).

3.13.1.4.1.4 Trends Tab

The [Output Variable Editor's](#) **Trends** tab defines the default trends properties for the [output variable](#) if its *Trends Enabled* option is *enabled* in the [Name](#) tab. The *trends frame* is shown at the bottom of the [chart window](#). It changes color in real-time, with each new incoming price tick, each

time the [output variable's](#)^[221] conditions are fulfilled according to the formula script. The *trends frame* is also shown throughout the historical charting data for each bar (*or candle*) when the [output variable's](#)^[221] conditions were fulfilled at the closing of that bar (*or candle*).



Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the [Output Variable Editor](#)^[223] window without saving your changes.

Explanations of Trends Tab's Items

Display Vertical Lines

This option shows a vertical line in the [chart window](#)^[121] at the first bar (*or candle*) and the last bar (*or candle*) that fulfills the [output variable's](#)^[221] conditions according to the formula script while the trading system is attached to the [chart window](#)^[121].

Background

Background defines the trends frame's default color while the trading system is attached to the [chart window](#)^[121].

Pattern

Pattern defines the default pattern for the **Background** color in the trends frame while the trading system is attached to the [chart window](#)^[121].

Symbol

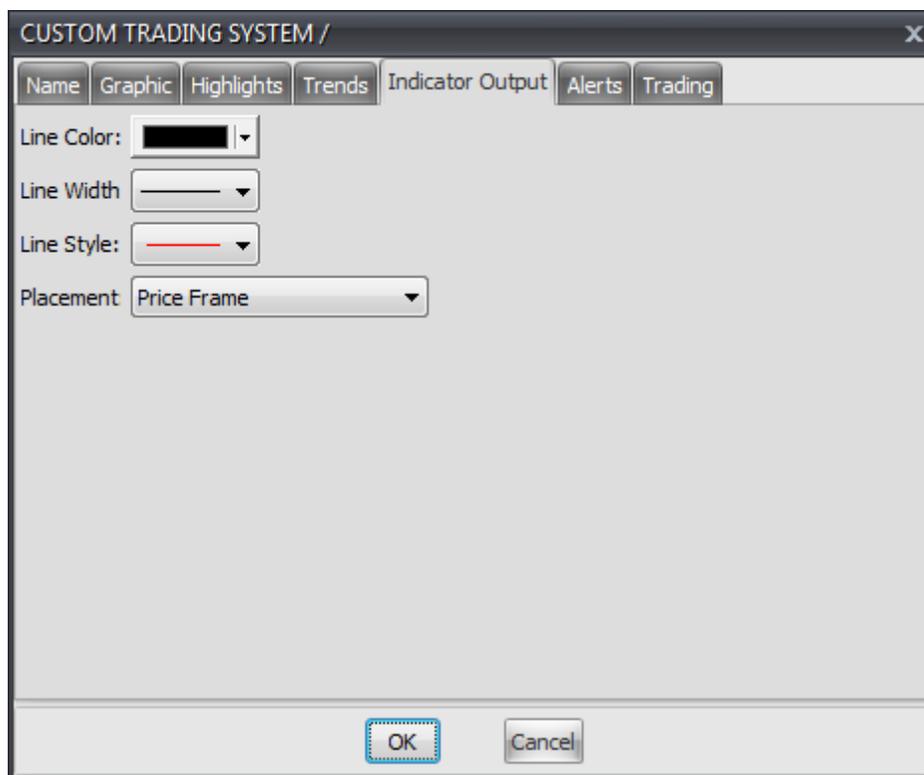
Symbol defines the trends frame's default symbol while the trading system is attached to the [chart window](#)^[121]. The available choices are the same as those items in the [Symbols tool](#)^[246].

Symbol Color

Symbol Color defines the trends frame graphic's default color while the trading system is attached to the [chart window](#)^[121].

3.13.1.4.1.5 Indicator Output Tab

The [Output Variable Editor's](#)^[223] **Indicator Output** tab defines the default properties for the [output variable](#)^[221] if its *Indicator Output Enabled* option is *enabled* in the [Name](#)^[223] tab. The **Indicator Output** is the [output variable's](#)^[221] value shown in the [chart window](#)^[121]. The [output variable's](#)^[221] value recalculates in real-time, with each new incoming price tick, according to the formula script. The [output variable's](#)^[221] value is also shown throughout the historical charting data for each bar (*or candle*) based on its value at the closing of that bar (*or candle*) each time the [output variable's](#)^[221] conditions are fulfilled according to the formula script.



Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the [Output Variable Editor](#)^[223] window without saving your changes.

Explanations of Indicator Output Tab's Items

Line Color

The **Line Color** defines the [output variable's](#)^[221] default line color while the trading system is attached to the [chart window](#)^[121]. It is also the color used to show the [output variable's](#)^[221] **Name** and calculated value in the [Data Inspection](#)^[154] window (*if the "Use Colors for Output Variables" option is enabled for that window*).

Line Width

The **Line Width** defines the [output variable's](#)^[221] default line width while the trading system is attached to the [chart window](#)^[121].

Line Style

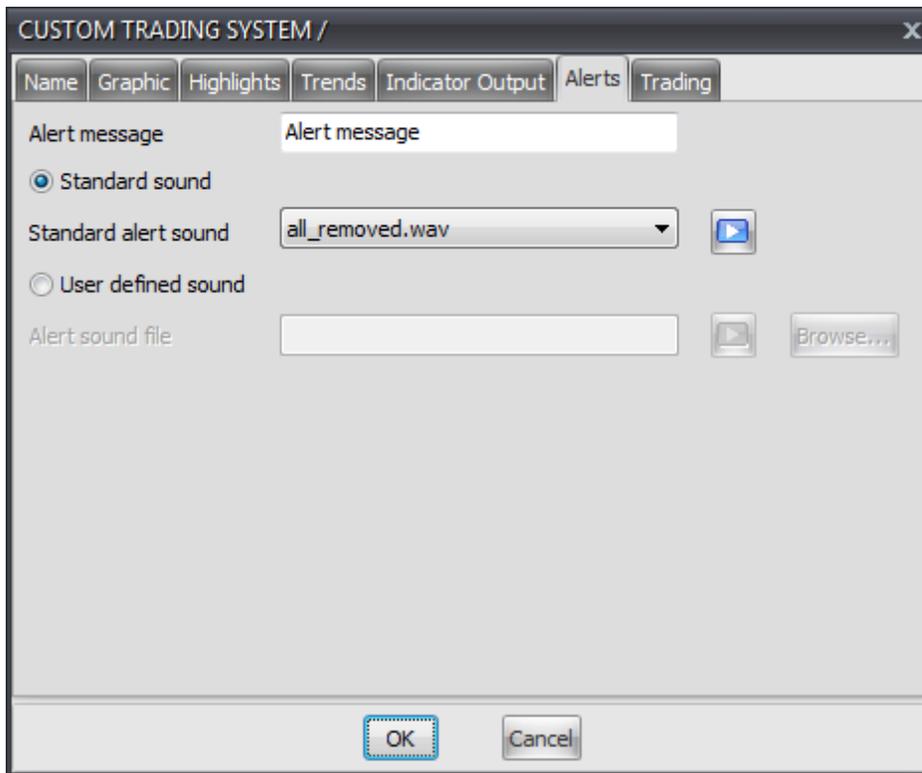
The **Line Style** defines the [output variable's](#)^[221] default line style while the trading system is attached to the [chart window](#)^[121]. This color may be changed using the indicator's properties window when you add the indicator to the [chart window](#)^[121] (*or change the indicator's properties while it is attached to the chart window*).

Placement

Placement defines the default frame in which the [output variable's](#)^[221] value is shown. The available choices are: *Price Frame, Additional Frame 1, Additional Frame 2, Additional Frame 3, Additional Frame 4, and Additional Frame 5*. It is acceptable to show more than [output variable](#)^[221] in the same frame; typically, an indicator and its related overbought and oversold levels will be shown in the same frame, for example.

3.13.1.4.1.6 Alerts Tab

The [Output Variable Editor's](#)^[223] **Alerts** tab defines the default alert properties for the [output variable](#)^[221] if its *Alerts Enabled* option is *enabled* in the [Name](#)^[223] tab. An **Alert** shows a text message in the [Trading Activity](#)^[174] window (*or in the Trading Systems Alerts window if the "Show Trading Systems Alerts*^[68]*" option is defined as "In Trading Systems Alerts Window"*) and plays an audio sound file in real-time, with each new incoming price tick, each time the [output variable's](#)^[221] conditions are fulfilled according to the formula script.



Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the [Output Variable Editor](#) window without saving your changes.

Explanations of Alerts Tab's Items

Alert Message

The **Alert Message** is the text message that shows in the [Trading Activity](#) window (or in the *Trading Systems Alerts* window if the "[Show Trading Systems Alerts](#)" option is defined as "In *Trading Systems Alerts* Window"). Leaving this text empty effectively *disables* the text message alert.

Standard Sound / User Defined Sound

These options let you choose if you will be using a standard VT Trader sound file or a custom sound file for the alert.

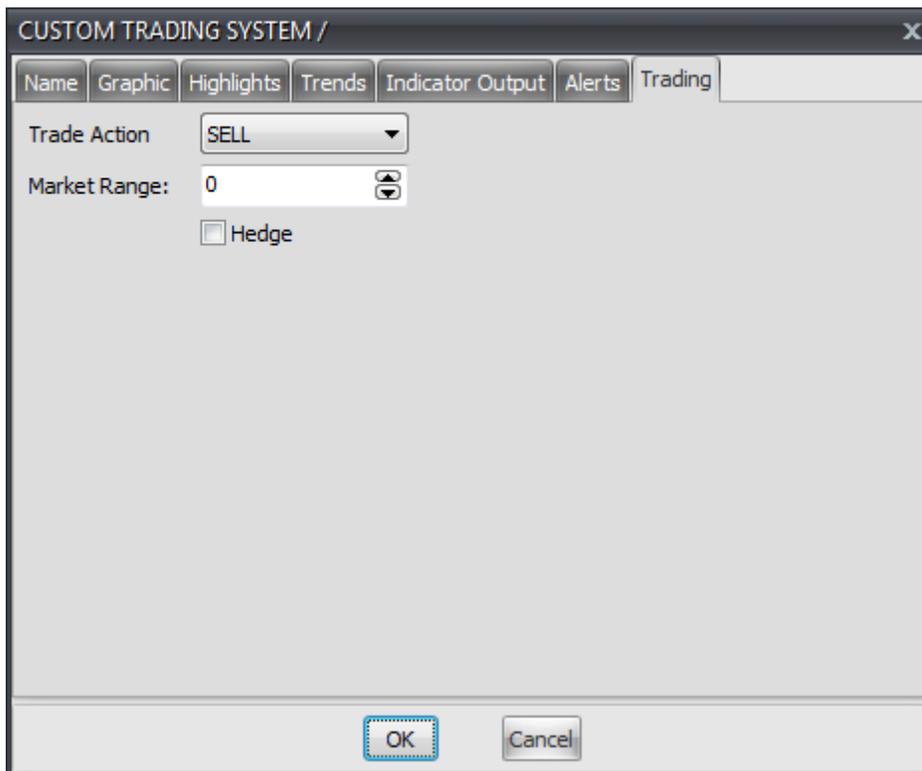
Standard Alert Sound / Alert Sound File

These options define your choice of a predefined VT Trader sound files or any custom .wav sound file on your computer to use. You can hear a sample of the sound file you have chosen by clicking the *Play* button ([>]).

3.13.1.4.1.7 Trading Tab

The [Output Variable Editor's](#)^[223] **Trading** tab defines the default automated trading properties for the [output variable](#)^[221] if its *Trading Enabled* option is *enabled* in the [Name](#)^[223] tab. The properties in this tab are only used by the trading system while it is running in *Auto-Trade* mode.

Important Note(s): It is important to ensure that you define the properties in this tab for every [Trading Enabled](#)^[223] [output variable](#)^[221] included in the trading system otherwise the trading system might not function as expected while running in *Auto-Trade* mode. It is also strongly recommended that you read through the [Auto-Trading FAQ for Trading Systems](#)^[1148] page in this manual for some additional, important information about using trading systems for automated trading purposes.



Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the [Output Variable Editor](#)^[223] window without saving your changes.

Explanations of Highlights Tab's Items

Trade Action

The **Trade Action** defines the type of order that is automatically requested each time the [output variable's](#)^[221] conditions are fulfilled according to the formula script while the trading system is running in *Auto-Trade* mode. The available choices are: *Buy (market order)* and *Sell (market order)*.

Market Range

The **Market Range** automatically approves requotes within a maximum range of pips (0-99) from the quoted price. For example, if **Market Range** is set to 10, requotes within ten pips of the requested price will be processed without requiring your confirmation. **Important Note:** Automated trading systems do not have the ability to respond to requote requests (*only you can accept and confirm them*) so it is very important that you define the largest **Market Range** value you are comfortable with to avoid potential automated trading problems due to one or more requote request(s).

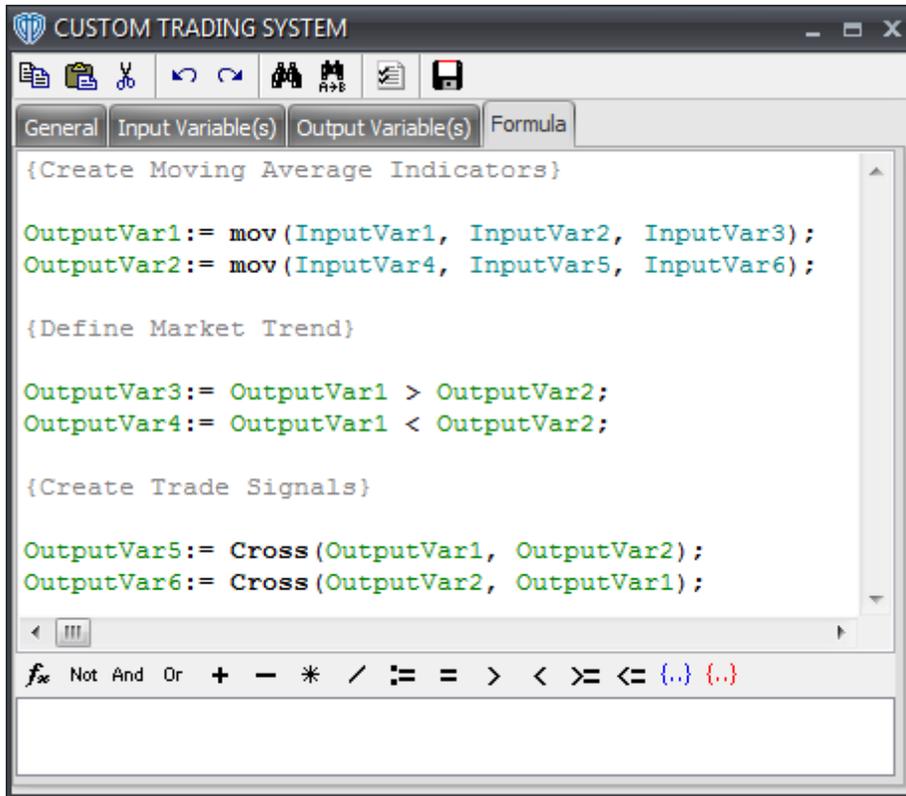
Hedge

The **Hedge** option defines the order that is automatically requested each time the [output variable's](#) ^[22] conditions are fulfilled according to the formula script while the trading system is running in *Auto-Trade* mode as a *hedged* order. The hedge option allows the order request to open a new position without closing an existing, opposite open position. * Note: This command is only available if your broker supports this functionality.

For example, if the account being used by the trading system running in *Auto-Trade* mode has an open *Buy* position and the trading system requests a *Sell* market order, the *Buy* position will not be closed out. The *Buy* position remains open and a new *Sell* position is created. With the **Hedge** option enabled, the *Sell* market order request, in this example, would be used to offset the open *Buy* position by its *Amount* (in Lots).

3.13.1.5 Formula Tab

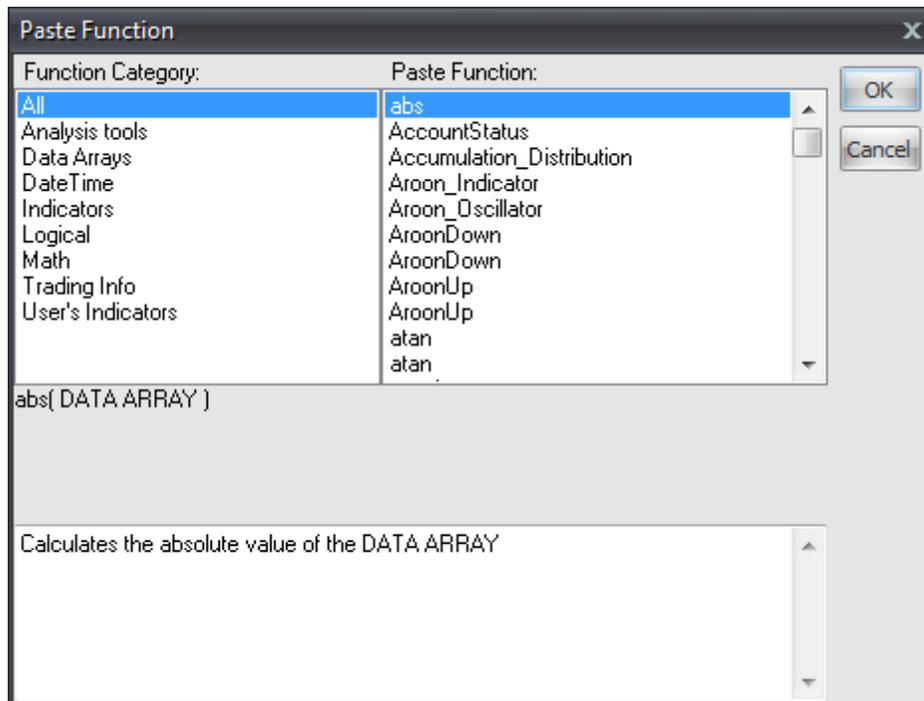
The [Trading System Editor's](#) ^[20] **Formula** tab defines the VT Trader [scripting language's](#) ^[32] statements, expressions, conditions, variables, etc. used in the calculation(s) of the resulting trading system. The [Formula Editor Toolbar](#) ^[23] and [Paste Function window](#) ^[23] (*continue reading below*) are available to help aid in the construction of your formula script. It is also recommended that you *enable* the [Code Parameters](#) ^[21] and [Code Completion](#) ^[21] features.



The **Formula Editor Toolbar** allows you to quickly [comment](#)^[330] (or *uncomment*) text, insert any of the [scripting language's](#)^[329] [punctuators](#)^[331] and [operators](#)^[331] into the formula script, and open the **Paste Function** window.



The **Paste Function** window includes a full categorical listing of all of the available functions for use in your formula script. These lists include all of the [scripting language's](#)^[329] [functions](#)^[334] as well as the [Function Name Aliases](#)^[192] of the standard VT Trader indicators and any of your custom indicators. The **Paste Function** window also specifies the selected function's format and its arguments (*if any*). Lastly, a full description of each function is also provided. Selecting a function from this window pastes it into your formula script in the **Formula** tab.

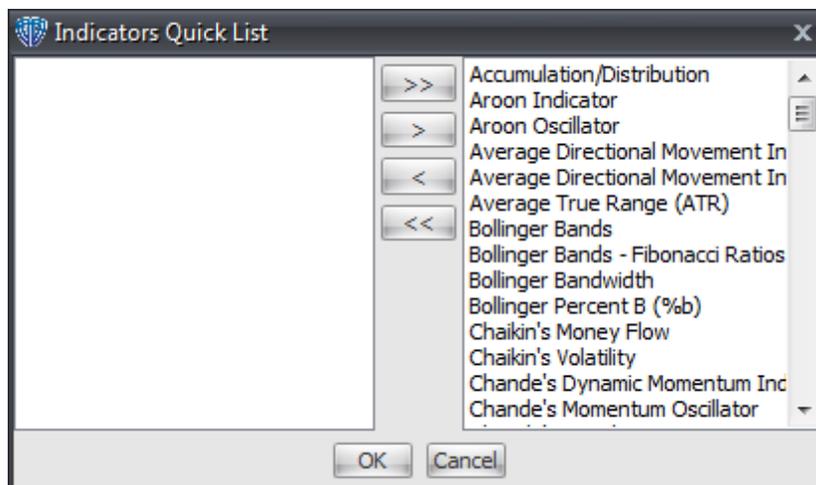


3.14 Quick Lists

3.14.1 Configure Indicators Quick List

The **Indicators Quick List** is a list of indicators that you can customize to include only the indicators you choose. The **Indicators Quick List** is accessible using *Ribbon>Technical Analysis>Indicators>Indicators Quick List* ▼ as well as via any chart window's contextual menu.

By default, all standard VT Trader indicators and all custom indicators are included in the **Indicators Quick List**. You will need to use the **Indicators Quick List Configuration** window to customize this list. You can open this window using the *Configure Quick List* command in the *Ribbon>Technical Analysis>Indicators>Indicators Quick List* ▼ selection menu.



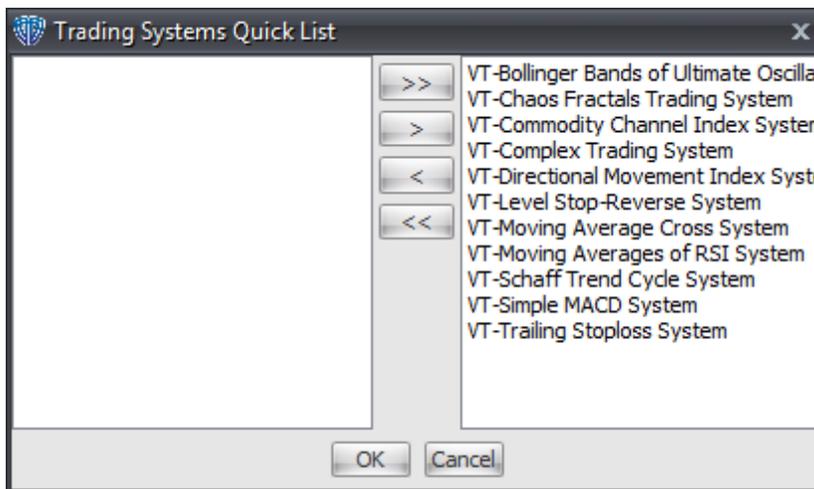
The **Indicators Quick List** window is divided into left and right panes with 4 buttons between them. The right pane is the list of indicators currently included in the **Indicator Quick List**. Clicking the [>] button moves the selected indicator into the **Indicators Quick List** while clicking the [>>] button moves all of the available indicators in VT Trader into the **Indicators Quick List**. Clicking the [<] button removes the selected indicator from the **Indicators Quick List** while clicking the [<<] button removes all of the indicators from the **Indicators Quick List**.

Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the **Indicators Quick List Configuration** window without saving your changes.

3.14.2 Configure Trading Systems Quick List

The **Trading Systems Quick List** is a list of trading systems that you can customize to include only the trading systems your choose. The **Trading Systems Quick List** is accessible using *Ribbon>Technical Analysis>Trading Systems>Trading Systems Quick List* ▼ as well as via any chart window's contextual menu.

By default, all standard VT Trader trading systems and all custom trading systems are included in the **Trading Systems Quick List**. You will need to use the **Trading Systems Quick List Configuration** window to customize this list. You can open this window using the *Configure Quick List* command in the *Ribbon>Technical Analysis>Indicators>Trading Systems Quick List* ▼ selection menu.



The **Trading Systems Quick List** window is divided into left and right panes with 4 buttons between them. The right pane is the list of trading systems currently included in the **Trading Systems Quick List**. Clicking the [>] button moves the selected trading system into the **Trading Systems Quick List** while clicking the [>>] button moves all of the available trading systems in VT Trader into the **Trading Systems Quick List**. Clicking the [<] button removes the selected trading system from the **Trading Systems Quick List** while clicking the [<<] button removes all of the trading systems from the **Trading Systems Quick List**.

Clicking the [OK] button saves your changes. Clicking the [Cancel] button closes the **Trading Systems**

Quick List Configuration window without saving your changes.

Drawing Tools

Part



4 Drawing Tools

Using one or more of VT Trader's advanced drawing tools, you can perform detailed technical analysis on any instrument you desire. Please select a tool from the categorized list below to learn more about it.

Data Analysis Tools

- [Copy Prices](#)^[241]
- [Cross Hair](#)^[240]
- [Comments](#)^[243]
- [Symbols](#)^[246]

Line Tools

- [Vertical Line](#)^[250]
- [Horizontal Line](#)^[253]
- [Trend Line](#)^[256]
- [Trend Line by Angle](#)^[259]
- [Linear Regression Line](#)^[263]

Channel Tools

- [Standard Deviation Channel](#)^[265]
- [Standard Error Channel](#)^[269]
- [Raff Regression Channel](#)^[272]
- [Equidistant Channel](#)^[276]
- [Andrew's Pitchfork](#)^[279]

Fibonacci Tools

- [Fibonacci Retracements](#)^[293]
- [Fibonacci Time Extensions](#)^[301]
- [Fibonacci Channel](#)^[305]
- [Fibonacci Fan](#)^[309]
- [Fibonacci Arc](#)^[313]

Gann Tools

- [Gann Line](#)^[317]
- [Gann Fan](#)^[321]
- [Gann Grid](#)^[324]

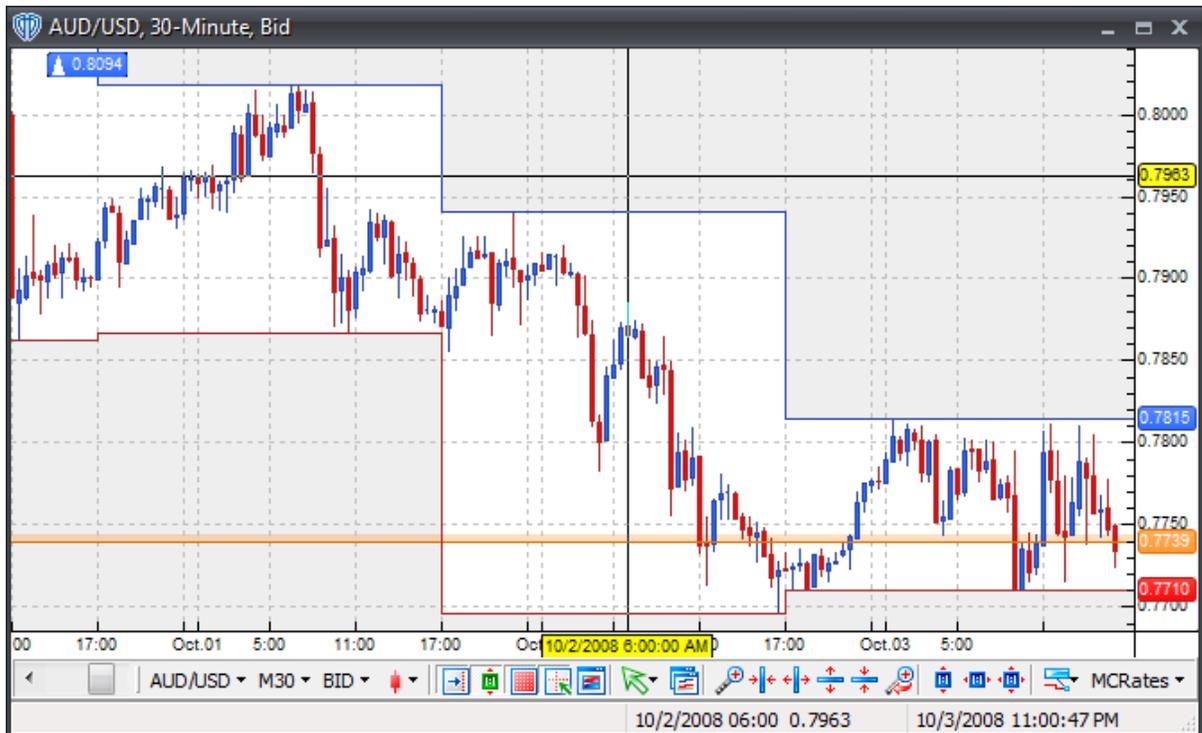
Shape Drawing Tools

- [Ellipse](#)^[282]
- [Rectangle](#)^[286]
- [Triangle](#)^[290]

4.1 Data Analysis

4.1.1 Cross Hair Tool

You can easily identify a specific date, time, and price point in the chart using the **Cross Hair** tool. You can show the **Cross Hair** tool in any chart by first making that chart the active window and then using the *Ribbon -> Chart menu -> Show/Hide group -> Cross Hair command*. You can also use the Chart Properties window (or Chart Template Properties window). As you move your cursor around in the chart, the **Cross Hair** tool becomes visible.



The **Cross Hair** tool also includes a built-in function called "Measuring". The "Measuring" function automatically measures (*counts*) the number of bars and number of pips between two locations in the active chart window. The measuring label shows data in the format: # of bars / # of pips / price level of cursor.

To utilize this feature, first position the cross hair cursor at one location in the chart window and then click and hold down the left mouse button. With the left mouse button held down, move the cursor to a second location in the chart window. As the cursor is being moved around in the chart window, a new measuring line and label is shown. This new label updates in real-time displaying the # of bars and the # of pips between the cursor's originating location and its current location in the chart.



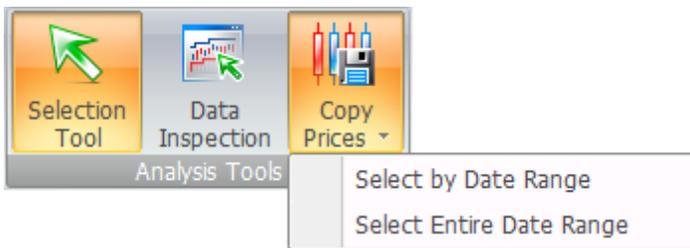
Note: While the **Cross Hair** tool is *enabled*, the ability to drag and scroll the chart window left and right using the left mouse button works differently. The measuring function can be temporarily *disabled* by double-clicking the left mouse button. The cursor will change from a *cross* to an *arrow* and once it's moving it will change to a *hand*. In this mode, you may scroll the chart by clicking and holding down the left mouse button while moving the cursor left or right within the chart window. The measuring function can be reactivated by double-clicking the left mouse button again; doing so will change the cursor back to an *arrow* and ultimately back to the *cross* once it's been moved.

Appearance Customizations

Cross Hair appearance customizations can be made for a single chart window by using the chart window's [Chart Properties](#)^[131] window. Appearance customizations can also be made using a *chart template's Chart Template Properties* window.

4.1.2 Copy Prices Tool

To copy price data (*i.e.* each price bar's closing date/time, open/high/low/close prices, and volume) from the active chart window you must select the **Copy Prices** tool. There is two ways to copy the price data: *Select by Date Range* and *Select Entire Date Range*.

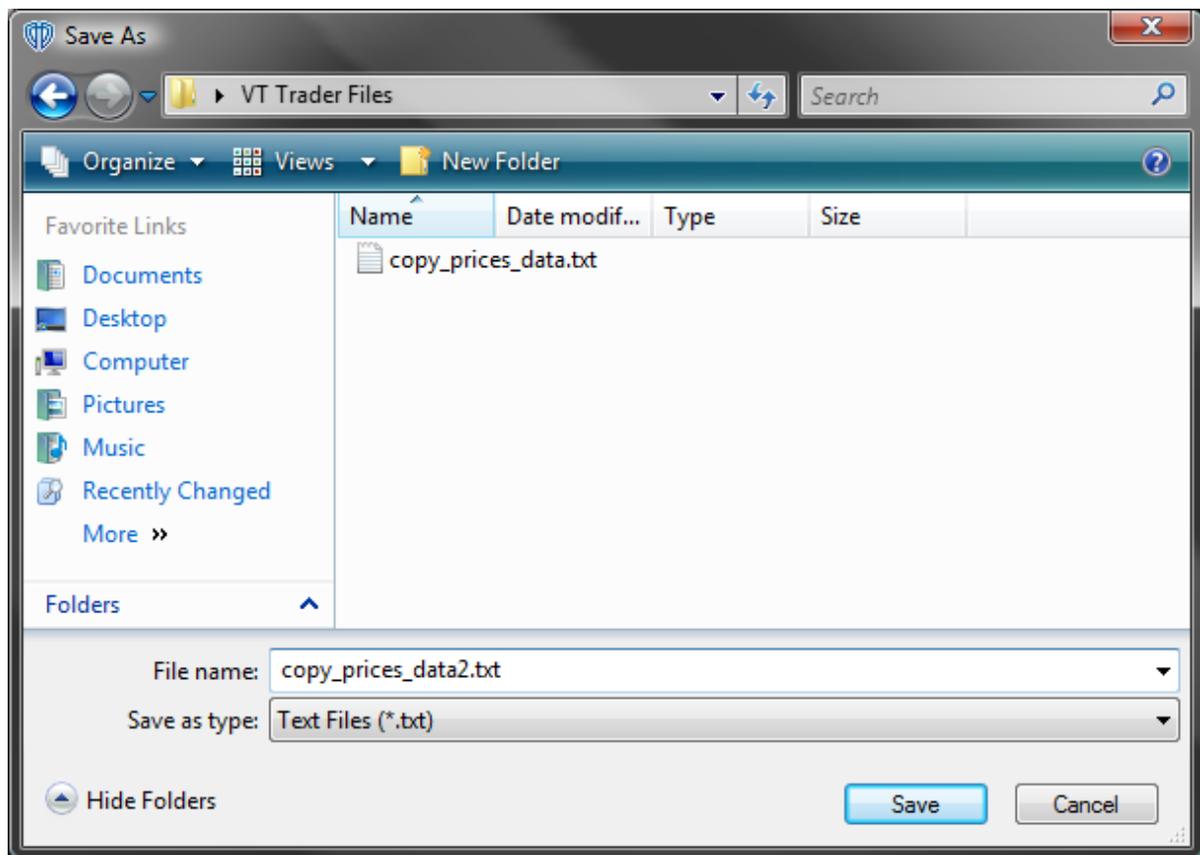


If you choose *Select Entire Date Range*, all of the price data loaded into the active chart window is copied to the computer's clipboard and a *Save As* dialog window opens. To save the price data as a new text file (.txt), you must choose a name for your file and a location on the computer to save it and then click the **[Save]** button.

If you choose *Select by Date Range*, you must specify the date range of the price data that you want to save. To do this you must position the cursor at the starting location of the date range in the active chart window, click and hold down the left mouse button, and move the cursor to the ending location of the date range. Releasing the left mouse button finalizes your selection.

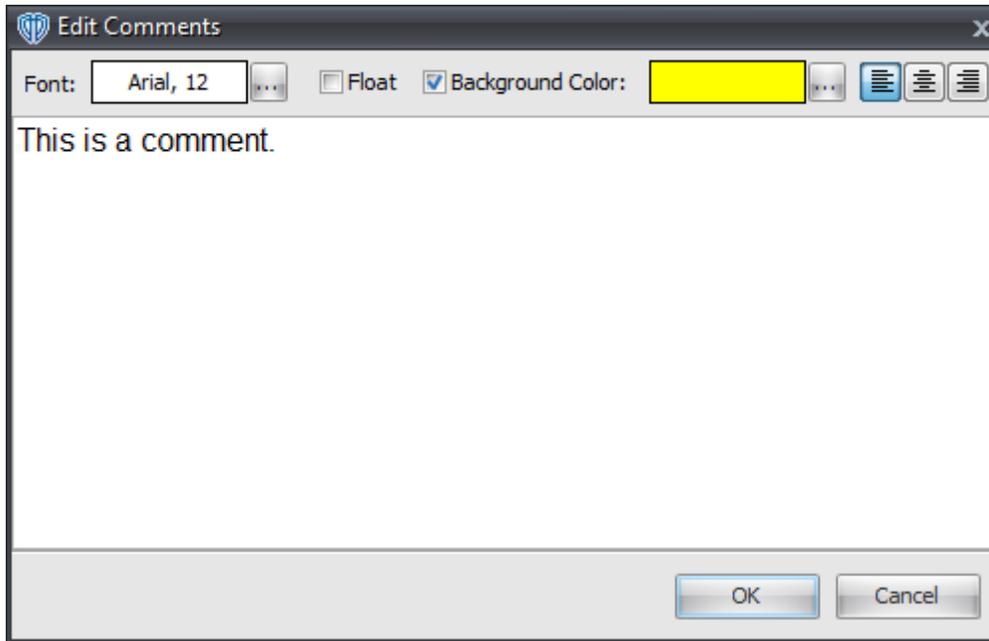


Upon releasing the left mouse button, the price data from the selected date range is copied to the computer's clipboard and a *Save As* dialog opens. To save the price data as a new text file (.txt), you must choose a name for your file and a location on the computer to save it and then click the **[Save]** button.



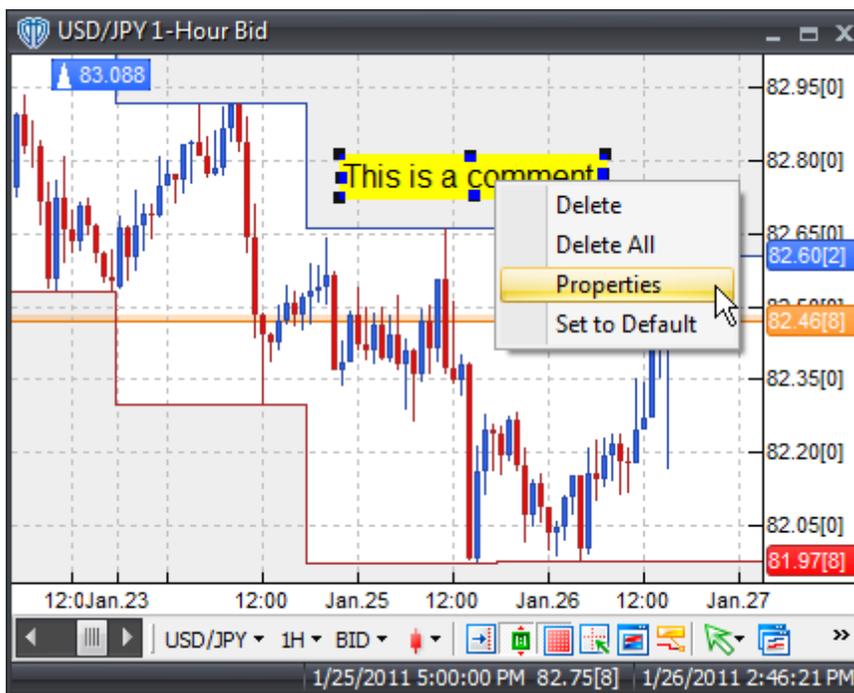
4.1.3 Comments Tool

To type a **comment** in the active chart window you must select the **Comments** tool. With the **comments** tool selected, you must place the cursor over a location in the active chart window to type the **comment**. Once a location is chosen you must click the left mouse button to show the **Edit Comments** window.



Once shown, you can adjust the initial properties of the **comment** including the font attributes, text color, background color, and positioning (*i.e.* *Float*) for the new comments. You may also type the initial text at this time. Note: If the *Float* option is *enabled*, you will be able to move the chart data round underneath the comment while the comment "floats" above it. If the *Float* option is *disabled*, the comment will remain "fixed" in the exact location you that you place it in respective to the chart data.

After typing your **comment**, it is shown in the active chart window using the properties chosen in the **Edit Comments** window (*shown below with the [contextual menu](#)^[245] active*)...

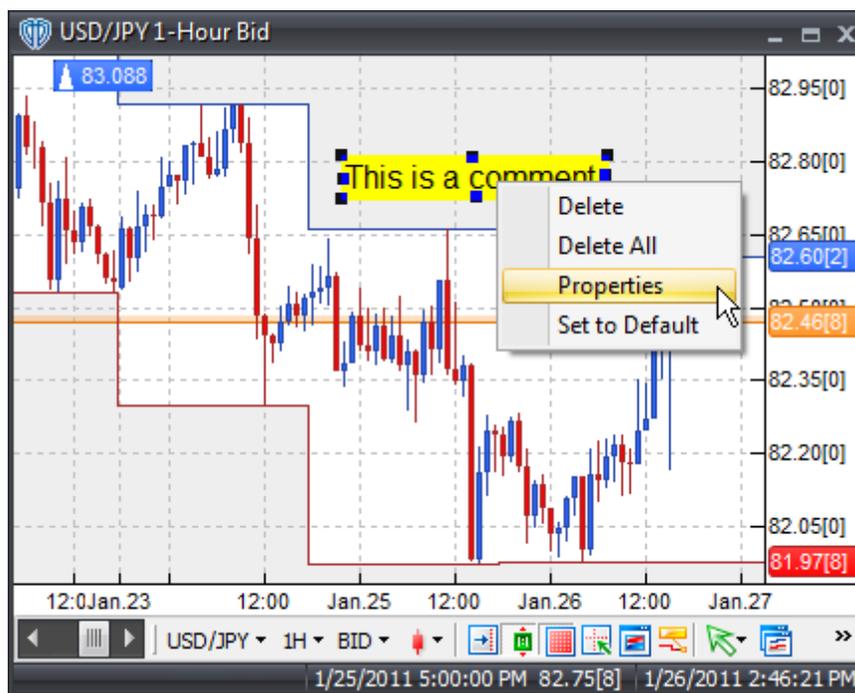


To reposition the **comment**, you should click the left mouse button while the cursor is hovering over it and with the left mouse button held down, drag the **comment** to its new location. Release the left mouse button to finalize the new location of the **comment**.

The **comment** can also be rotated. To rotate the **comment** you must first select it by clicking once with the left mouse button while the cursor is hovering over it. Next, the cursor must be positioned over one of the boxes around the outside edge of the **comment box** (*the mouse cursor will change when positioned correctly*). Click and hold down the left mouse button to rotate the **comment**. The **comment box** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the rotation.

You may click the right mouse button while the cursor is hovering over the **comment** to access the [contextual menu](#)^[245] for additional functionality.

4.1.3.1 Contextual Menu



A **Comment's contextual menu** contains the following commands:

Delete

This command deletes the selected comment from the active chart window.

Delete All

This command deletes all comments from the active chart window.

Properties

This command opens the comment's [properties](#) window.

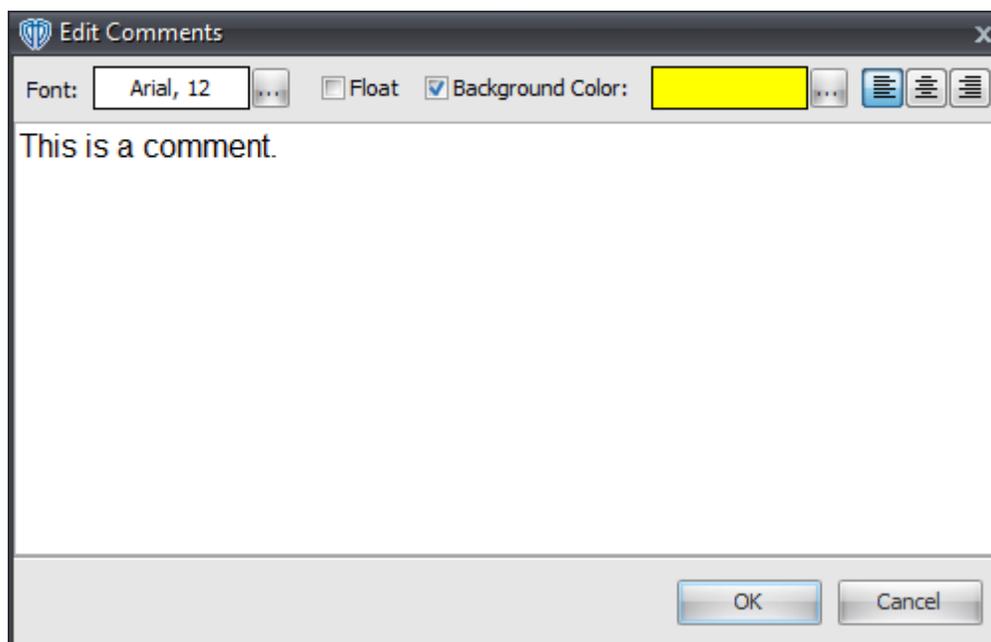
Set to Default

This command resets any custom properties currently used by the comment back to their default values.

4.1.3.2 Properties

Using the **Comments** properties window, you can:

- Change the font attributes and text justification
- Change the background color of the comments box
- Change the method that is used to apply the comment to the chart window (*i.e. float*)
- Change the comment's text



4.1.4 Symbols Tool

You can use the **Symbol** tool to draw symbols (*a.k.a. pictures or graphics*) in the active chart window.



Once you've used the **Symbol** tool to select your symbol, you must position your cursor over your desired location in the active chart window and click the left mouse button to draw the symbol.

Appearance Customizations

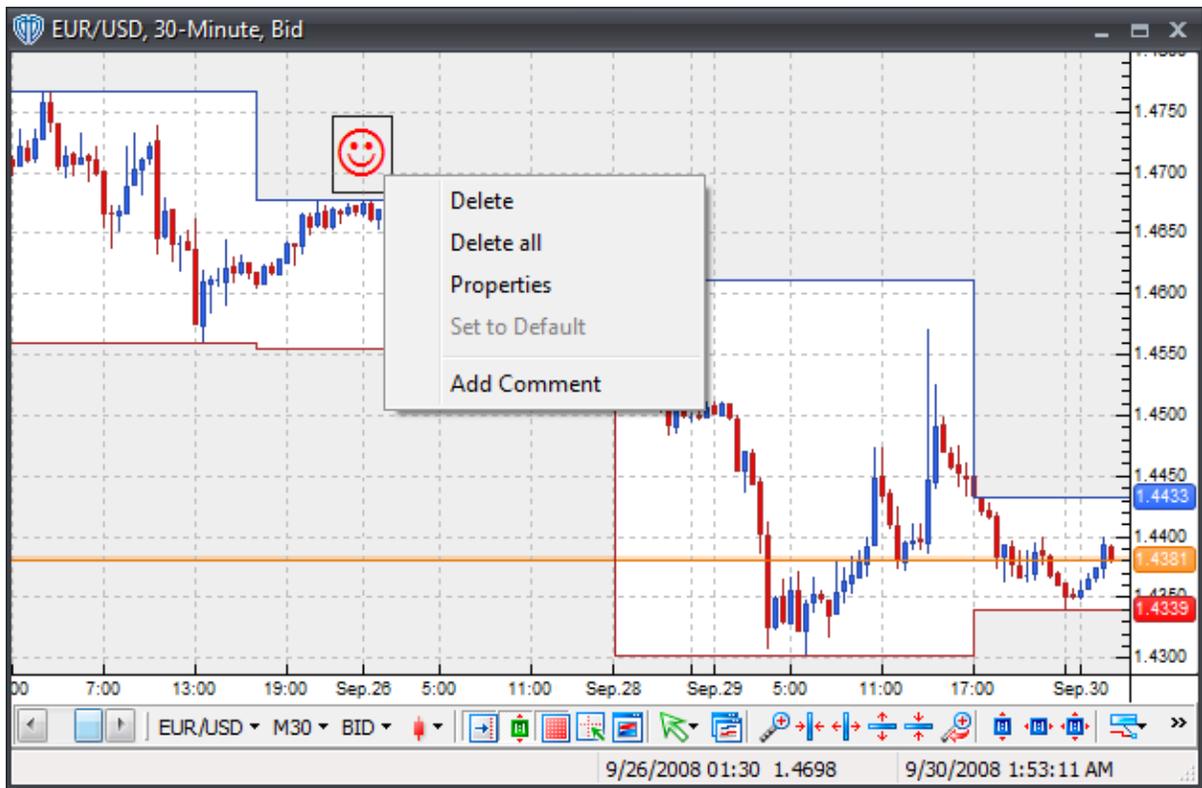
Each symbol can be moved and/or customized at your discretion.

To move a symbol, click the left mouse button while the cursor is positioned over it and with the left mouse button held down, drag the symbol to its new location. Releasing the left mouse button finalizes the symbol's new location.

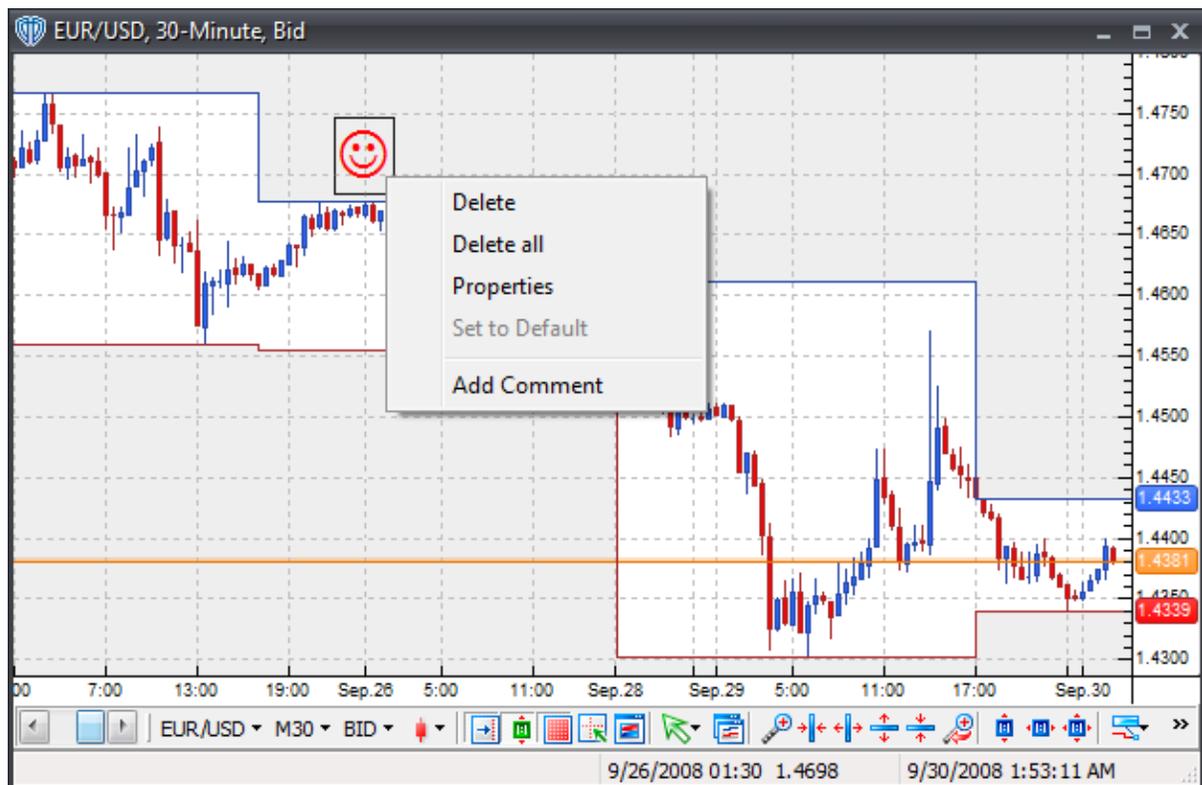
All symbols are initially drawn using the **Symbol** tool's default properties. However, various appearance customizations can be made using a symbol's [properties](#)^[250].

Contextual Menu

A symbol's [contextual menu](#)^[249] provides you with additional symbol-specific functionality and access to its [properties](#)^[250]. To activate the [contextual menu](#)^[249], click the right mouse button while the cursor is positioned over the symbol.



4.1.4.1 Contextual Menu



A **Symbol's contextual menu** contains the following commands:

Delete

This command deletes the selected symbol from the active chart window.

Delete All

This command deletes all symbols from the active chart window.

Properties

This command opens the symbol's [properties](#)^[250] window.

Set to Default

This command resets any custom properties currently used by the symbol back to their default values.

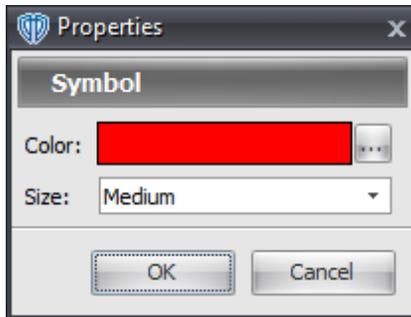
Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected symbol.

4.1.4.2 Properties

Using the **Symbol Properties** window you can:

- Change the color of the symbol
- Change the size of the symbol



4.2 Lines

4.2.1 Vertical Lines

To draw a **vertical line** in the active chart window you must select the **Vertical Line** tool. With the **Vertical Line** tool selected, you must position the cursor over a location in the active chart window to draw the **vertical line**. Once a location is chosen you must click the left mouse to draw the line in the chart window.



Once the **vertical line** is drawn in the chart window you can change its [properties](#)^[253] (by using the [contextual menu](#)^[252]) or reposition it.

To reposition the **vertical line**, you should click the left mouse button while the cursor is hovering over it and with the left mouse button held down, drag the line to its new location. Release the left mouse button to finalize the new location of the **vertical line**.

You may click the right mouse button while the cursor is hovering over the **vertical line** to access its [contextual menu](#)^[252] for additional functionality.

4.2.1.1 Contextual Menu



A **Vertical Line's contextual menu** contains the following commands:

Delete

This command deletes the selected vertical line from the active chart window.

Delete All

This command deletes all vertical lines from the active chart window.

Properties

This command opens the vertical line's [properties](#) ^[253] window.

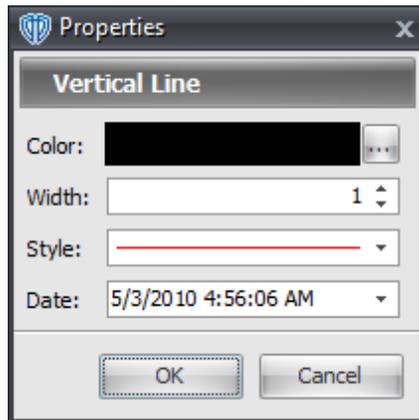
Set to Default

This command resets any custom properties currently used by the vertical line back to their default values.

4.2.1.2 Properties

Using the **Vertical Line's** properties, you can:

- Change the color, width, and style of the vertical line
- Change the value (*date/time*) of the vertical line



4.2.2 Horizontal Lines

To draw a **horizontal line** in the active chart window you must select the **Horizontal Line** tool. With the **Horizontal Line** tool selected, you must position the cursor over a location in the active chart window to draw the **horizontal line**. Once a location is chosen you must click the left mouse to draw the line in the chart window.

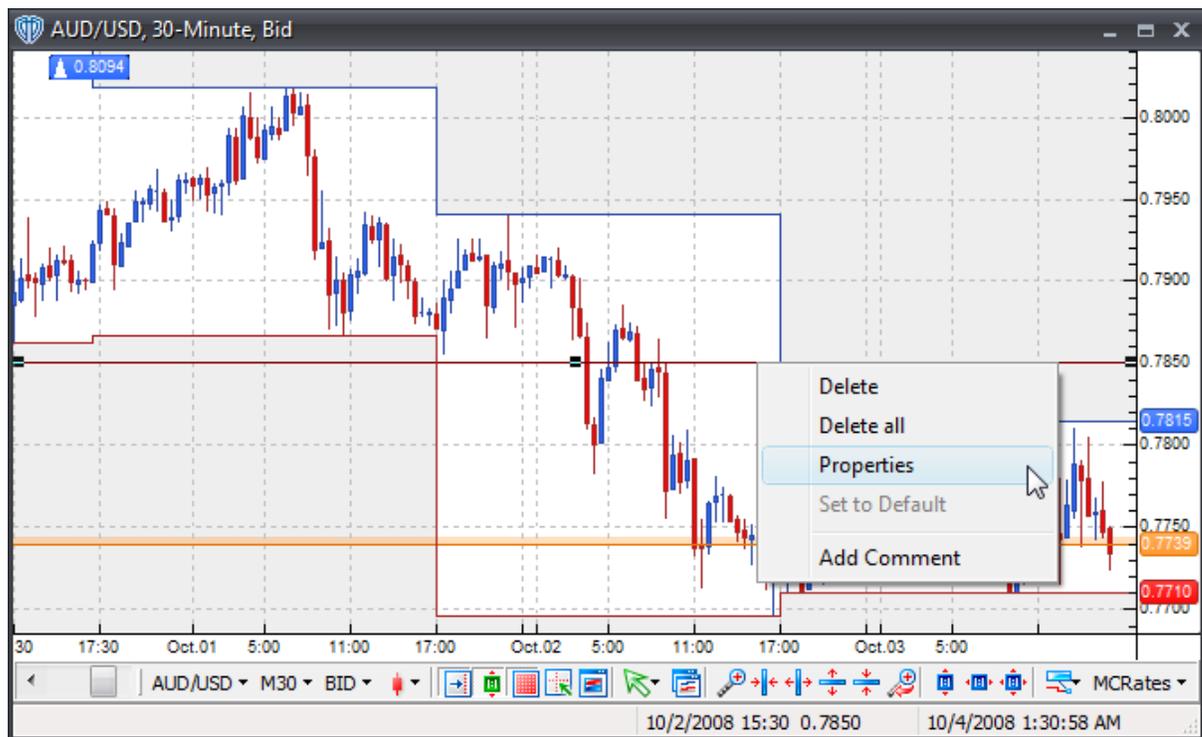


Once the **horizontal line** is drawn in the chart window you can change its [properties](#)^[256] (by using the [contextual menu](#)^[255]) or reposition it.

To reposition the **horizontal line**, you should click the left mouse button while the cursor is hovering over it and with the left mouse button held down, drag the line to its new location. Release the left mouse button to finalize the new location of the **horizontal line**.

You may click the right mouse button while the cursor is hovering over the **horizontal line** to access its [contextual menu](#)^[255] for additional functionality.

4.2.2.1 Contextual Menu



A **Horizontal Line's contextual menu** contains the following commands:

Delete

This command deletes the selected horizontal line from the active chart window.

Delete All

This command deletes all horizontal lines from the active chart window.

Properties

This command opens the horizontal line's [properties](#)^[256] window.

Set to Default

This command resets any custom properties currently used by the horizontal line back to their default values.

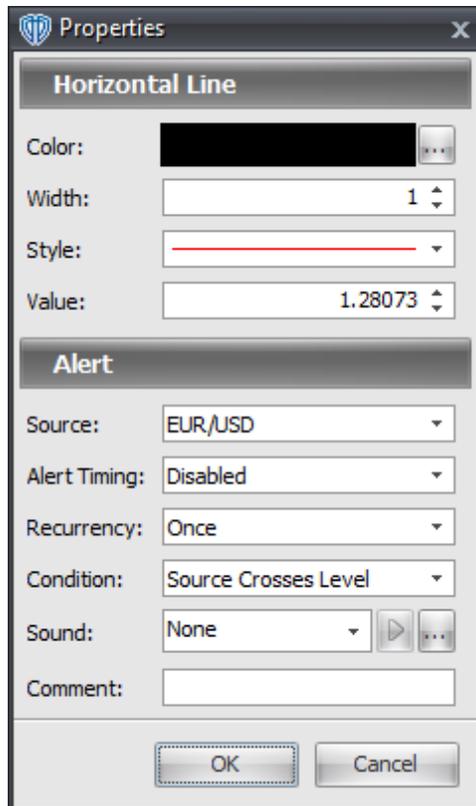
Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected horizontal line.

4.2.2.2 Properties

Using the **Horizontal Line's** properties, you can:

- Change the color, width, and style of the horizontal line
- Change the value (*price*) of the horizontal line
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the horizontal line is breached



4.2.3 Trend Lines

To draw a **trend line** in the active chart window you must select the **Trend Line** tool. With the **Trend Line** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **trend line**. This is typically from a low or high point in price. Once a starting position is selected you must click and hold down the left mouse button while drawing the **trend line** on the chart.



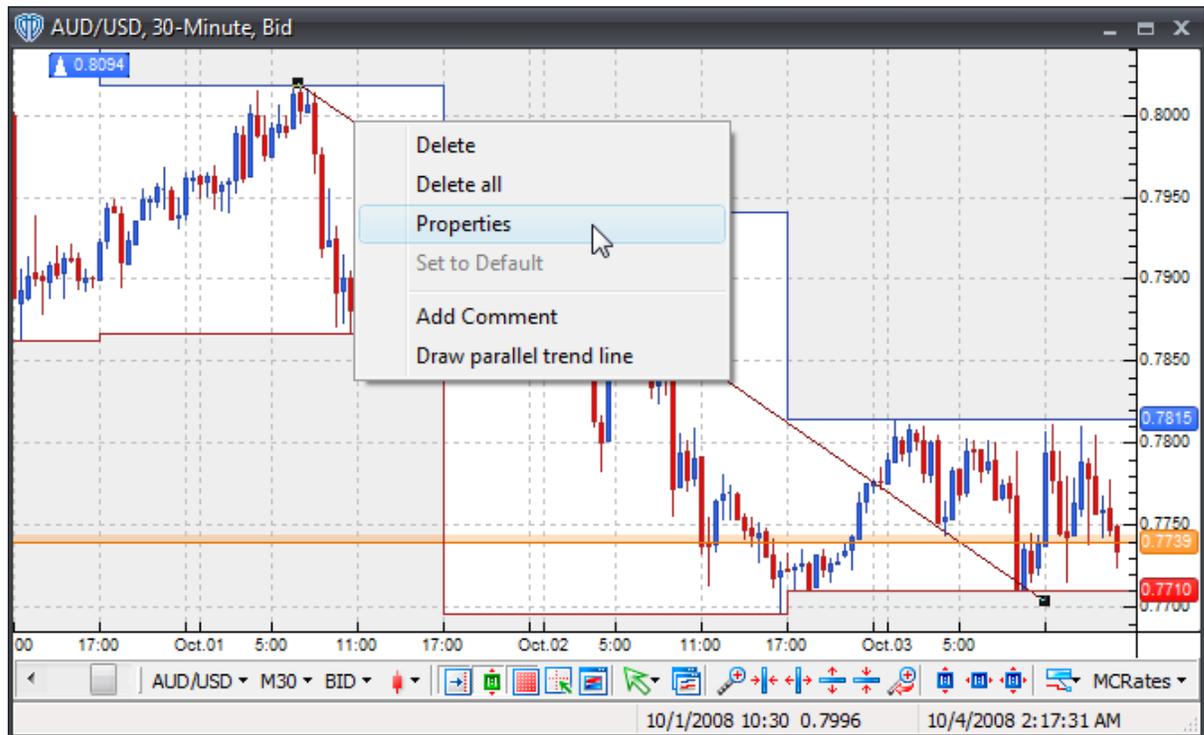
Once drawn on the chart, you can change the [properties](#)^[259] of the **trend line** (by using the [contextual menu](#)^[258]), reposition it, or change the begin/end points used for [calculations](#)^[259].

To reposition the **trend line**, you should click the left mouse button while the cursor is hovering over it and with the left mouse button held down, drag the line to its new location. Release the left mouse button to finalize the new location of the **trend line**.

To recalculate where the **trend line** begins or ends, you must select the **trend line** by positioning the cursor over it and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the line; click and hold down the left mouse button to drag the calculation point of the **trend line** to its new location. The **trend line** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points. You may also use the [Properties](#)^[259] option of the [contextual menu](#)^[258] to manually change the begin or end point using specific price and date/time values.

You may click the right mouse button while the cursor is hovering over the **trend line** to access its [contextual menu](#)^[258] for additional functionality.

4.2.3.1 Contextual Menu



A **Trend Line's contextual menu** contains the following commands:

Delete

This command deletes the selected trend line from the active chart window.

Delete All

This command deletes all trend lines from the active chart window.

Properties

This command opens the trend line's [properties](#)^[259] window.

Set to Default

This command resets any custom properties currently used by the trend line back to their default values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected trend line.

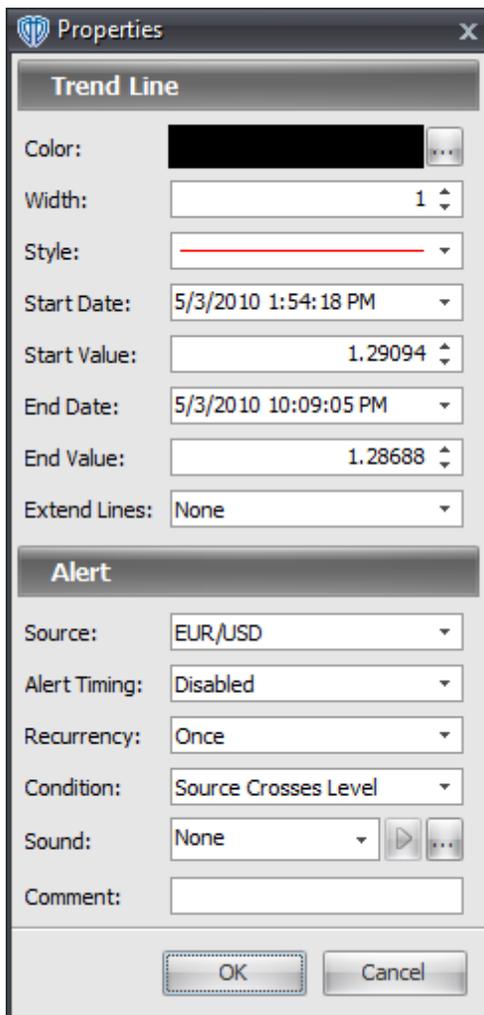
Draw Parallel Trend Line

This command creates an exact duplicate of the selected trend line.

4.2.3.2 Properties

Using the **Trend Line's** properties, you can:

- Change the color, width, and style of the trend line
- Change the beginning and ending values (*price/date/time*) of the trend line
- Extend the trend line from its beginning/ending points
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the trend line is breached

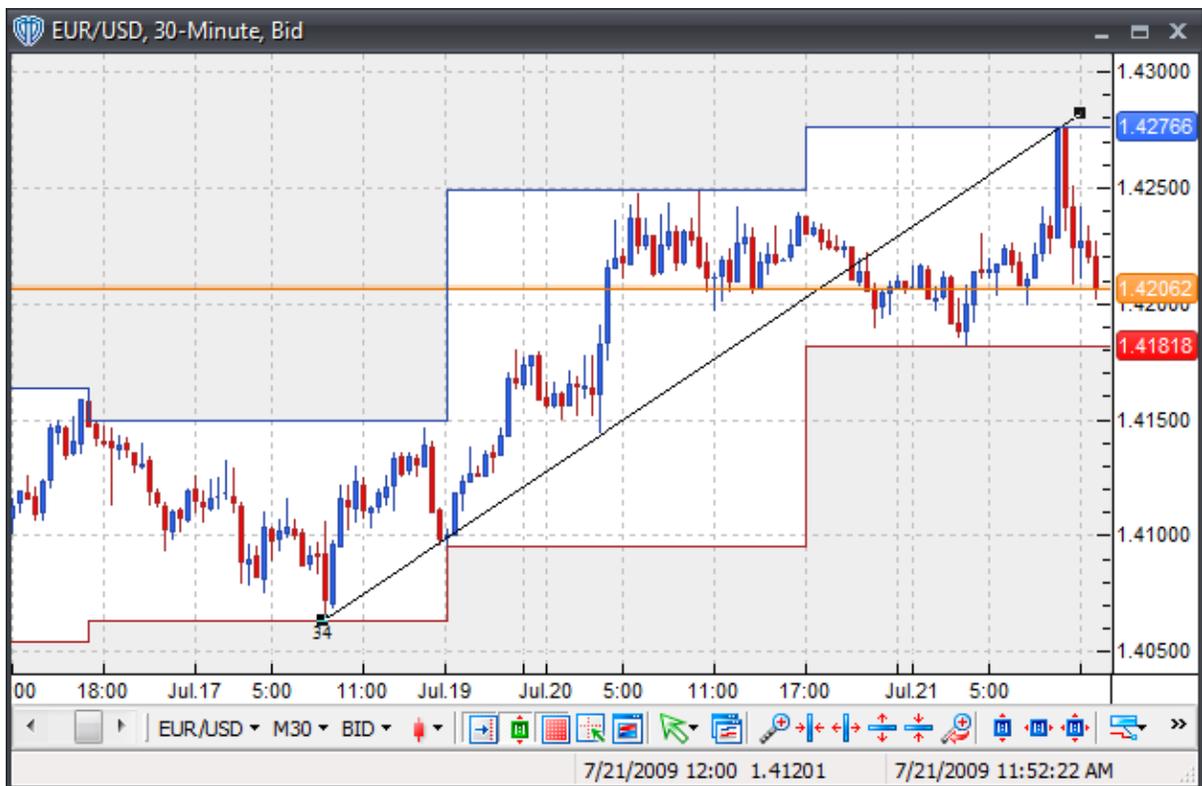


4.2.4 Trend Lines by Angle

The **Trend Line by Angle** tool works in a similar fashion as the [Trend Line](#) ²⁵⁶ tool, except there is

one major difference. The **Trend Line by Angle** is drawn relative to the computer screen. For example, if you were to use a protractor to draw a line at 45 degrees on the screen, the line should rise by one inch for each inch it extends (*runs*) to the right. This 45 degree angle also could be expressed as a slope of 1. We say the angle it is relative to the computer screen because we are discussing inches, not prices, on the screen. Regardless of how many bars are loaded or what the x-axis and y-axis of the chart are set to, a 45 degree angle will slope up and to the right at 45 degrees relative to the computer screen.

To draw a **trend line by angle** in the active chart window you must select the **Trend Line by Angle** tool. With the **Trend Line by Angle** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **trend line**. This is typically from a low or high point in price. Once a starting position is selected you must click and hold down the left mouse button while drawing the **trend line by angle** on the chart.



Once drawn on the chart, you can change the [properties](#) ^[262] of the **trend line by angle** (by using the [contextual menu](#) ^[261]), reposition it, or change the begin/end points used for [calculations](#) ^[262].

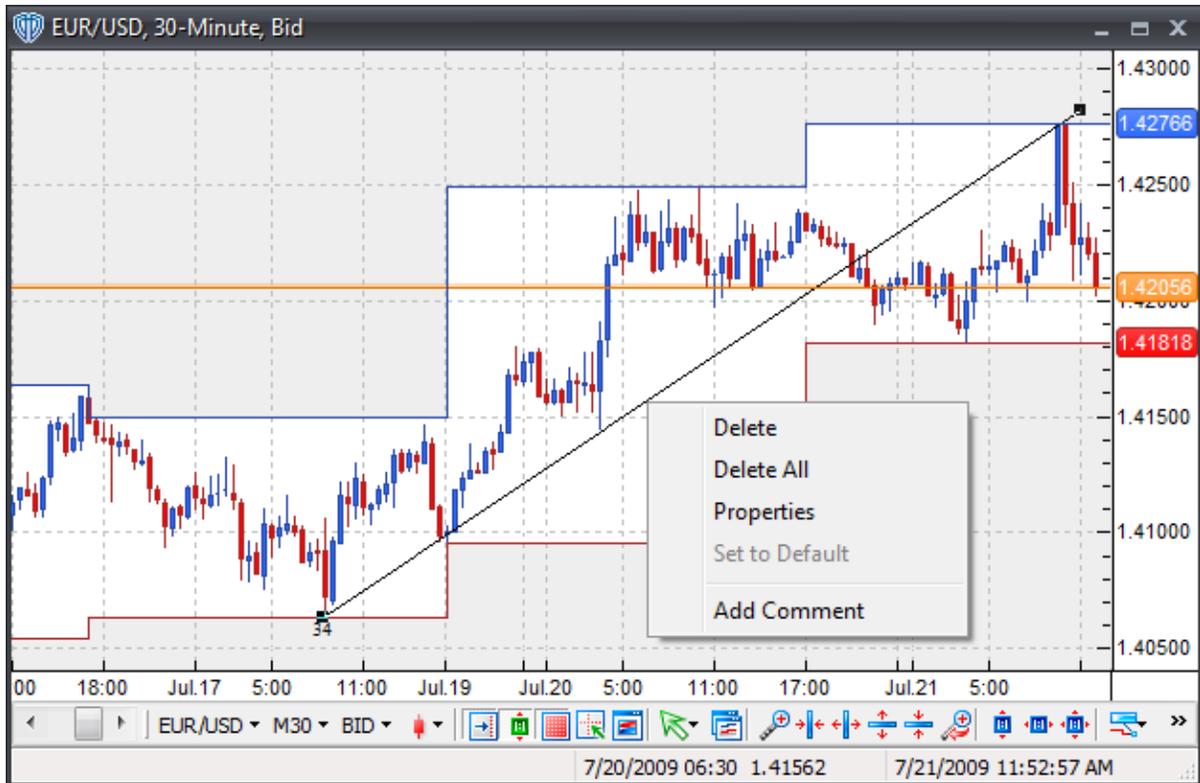
To reposition the **trend line**, you should click the left mouse button while the cursor is hovering over it and with the left mouse button held down, drag the line to its new location. Release the left mouse button to finalize the new location of the **trend line**.

To recalculate where the **trend line** begins or ends, you must select the **trend line by angle** by positioning the cursor over it and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the line; click and hold down the left mouse button to drag the calculation point of the **trend line by angle** to its new location. The **trend line by angle** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points. You may also use the [Properties](#) ^[262] option of the

[contextual menu](#)^[261] to manually change the begin or end point using specific price and date/time values.

You may click the right mouse button while the cursor is hovering over the **trend line by angle** to access its [contextual menu](#)^[261] for additional functionality.

4.2.4.1 Contextual Menu



A **Trend Line (by Angle)**'s contextual menu contains the following commands:

Delete

This command deletes the selected trend line (by angle) from the active chart window.

Delete All

This command deletes all trend lines (by angle) from the active chart window.

Properties

This command opens the trend line (by angle)'s [properties](#)^[262] window.

Set to Default

This command resets any custom properties currently used by the trend line back to their default

values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected trend line (by angle).

4.2.4.2 Properties

Using the **Trend Line By Angle's** properties, you can:

- Change the color, width, and style of the trend line
- Change the beginning and ending values (*price/date/time*) of the trend line
- Extend the trend line from its beginning/ending points
- Change the trend line's font attributes
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the trend line is breached

The screenshot shows a 'Properties' dialog box with a title bar containing a shield icon and the text 'Properties'. The dialog is divided into two main sections: 'Trend Line By Angle' and 'Alert'.
Trend Line By Angle Section:
- Color: A black color swatch with a small '...' button to its right.
- Width: A text box containing '1' with up and down arrow buttons.
- Style: A dropdown menu showing a red line segment.
- Start Date: A date/time dropdown showing '4/30/2010 12:00:29 PM'.
- Start Value: A text box containing '1.29178' with up and down arrow buttons.
- End Date: A date/time dropdown showing '5/3/2010 2:19:51 AM'.
- End Value: A text box containing '1.29597' with up and down arrow buttons.
- Extend Lines: A dropdown menu showing 'None'.
- Font: A text box containing 'Arial, 8' with a small '...' button to its right.
Alert Section:
- Source: A dropdown menu showing 'EUR/USD'.
- Alert Timing: A dropdown menu showing 'Disabled'.
- Recurrency: A dropdown menu showing 'Once'.
- Condition: A dropdown menu showing 'Source Crosses Level'.
- Sound: A dropdown menu showing 'None', a play button, and a small '...' button.
- Comment: An empty text box.
At the bottom of the dialog are 'OK' and 'Cancel' buttons.

4.2.5 Linear Regression Lines

To draw a **linear regression line** in the active chart window you must select the **Linear Regression Line** tool. With the **Linear Regression Line** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **linear regression line**. This is typically from a low or high point in price. Once a starting position is selected you must click and hold down the left mouse button while drawing the **linear regression line** on the chart.



Once drawn on the chart, you can change the [properties](#)^[265] of the **linear regression line** (by using the [contextual menu](#)^[264]), reposition it, or change the begin/end points used for [calculations](#)^[265].

To reposition the **linear regression line**, you should click the left mouse button while the cursor is hovering over it and with the left mouse button held down, drag the line to its new location. Release the left mouse button to finalize the new location of the **linear regression line**.

To recalculate where the **linear regression line** begins or ends, you must select the **linear regression line** by positioning the cursor over it and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the line; Click and hold down the left mouse button to drag the calculation point of the **linear regression line** to its new location. The **linear regression line** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You may click the right mouse button while the cursor is hovering over the **linear regression line** to

access its [contextual menu](#)^[264] for additional functionality.

4.2.5.1 Contextual Menu



A **Linear Regression Line's contextual menu** contains the following commands:

Delete

This command deletes the selected linear regression line from the active chart window.

Delete All

This command deletes all linear regression lines from the active chart window.

Properties

This command opens the linear regression line's [properties](#)^[265] window.

Set to Default

This command resets any custom properties currently used by the linear regression line back to their default values.

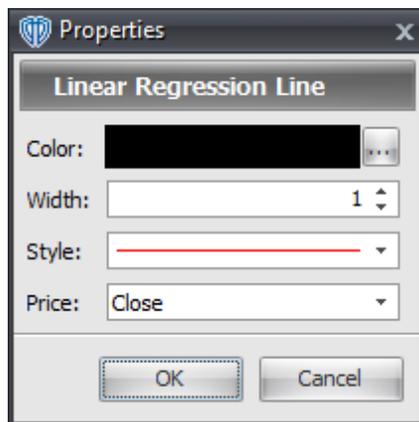
Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected linear regression line.

4.2.5.2 Properties

Using the **Linear Regression Line's** properties, you can:

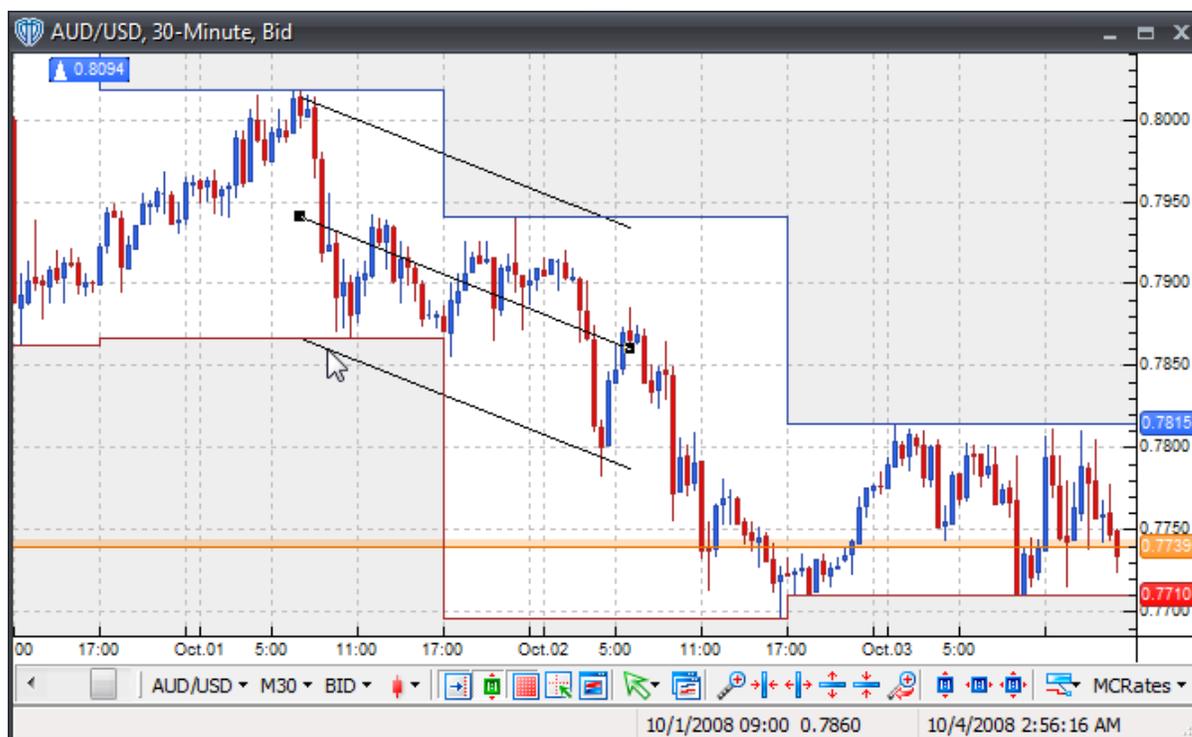
- Change the color, width, and style of the regression line
- Change the data series that the regression line is based on



4.3 Channels

4.3.1 Standard Deviation Channels

To draw a **standard deviation channel** in the active chart window you must select the **Standard Deviation Channel** tool. With the **Standard Deviation Channel** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **standard deviation channel**. Once a starting position is selected you must click and hold down the left mouse button while drawing the **standard deviation channel** on the chart.



Once drawn on the chart, you can change the [properties](#)^[268] of the **standard deviation channel** (by using the [contextual menu](#)^[267]), reposition it, or change the begin/end points used for [calculations](#)^[267].

To reposition the **standard deviation channel**, you should click the left mouse button while the cursor is hovering over one of its lines and with the left mouse button held down, drag the channel to its new location. Release the left mouse button to finalize the new location of the **standard deviation channel**.

To recalculate where the **standard deviation channel** begins or ends, you must select the **standard deviation channel** by positioning the cursor over one of its lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the middle line; Click and hold down the left mouse button to drag the calculation point of the **standard deviation channel** to its new location. The **standard deviation channel** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You may click the right mouse button while the cursor is hovering over the **standard deviation channel** to access its [contextual menu](#)^[267] for additional functionality.

4.3.1.1 Contextual Menu



A **Standard Deviation Channel's contextual menu** contains the following commands:

Delete

This command deletes the selected standard deviation channel from the active chart window.

Delete All

This command deletes all standard deviation channels from the active chart window.

Properties

This command opens the standard deviation channel's [properties](#)^[268] window.

Set to Default

This command resets any custom properties currently used by the standard deviation channel back to their default values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected standard deviation channel.

4.3.1.2 Properties

Using the **Standard Deviation Channel's** properties, you can:

- Change the color, width, and style of the channel lines
- Change the beginning and ending values (*price/date/time*) of the channel's middle line
- Extend the channel from its beginning/ending points
- Change the data series that the channel is based on
- Change the number of standard errors used to calculate the channel
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the channel lines are breached

The screenshot shows a dialog box titled "Properties" with a close button (X) in the top right corner. The dialog is divided into two main sections: "Standard Deviation Channel" and "Alert".

Standard Deviation Channel Section:

- Color:** A color selection box showing a black color.
- Width:** A numeric input field with the value "1" and up/down arrows.
- Style:** A dropdown menu showing a red line style.
- Start Date:** A date and time selector showing "5/4/2010 10:00:54 AM".
- Start Value:** A numeric input field with the value "1.30679" and up/down arrows.
- End Date:** A date and time selector showing "5/3/2010 10:00:25 PM".
- End Value:** A numeric input field with the value "1.32288" and up/down arrows.
- Extend Lines:** A dropdown menu showing "Right".
- Price:** A dropdown menu showing "Close".
- Deviation:** A numeric input field with the value "2.00000" and up/down arrows.

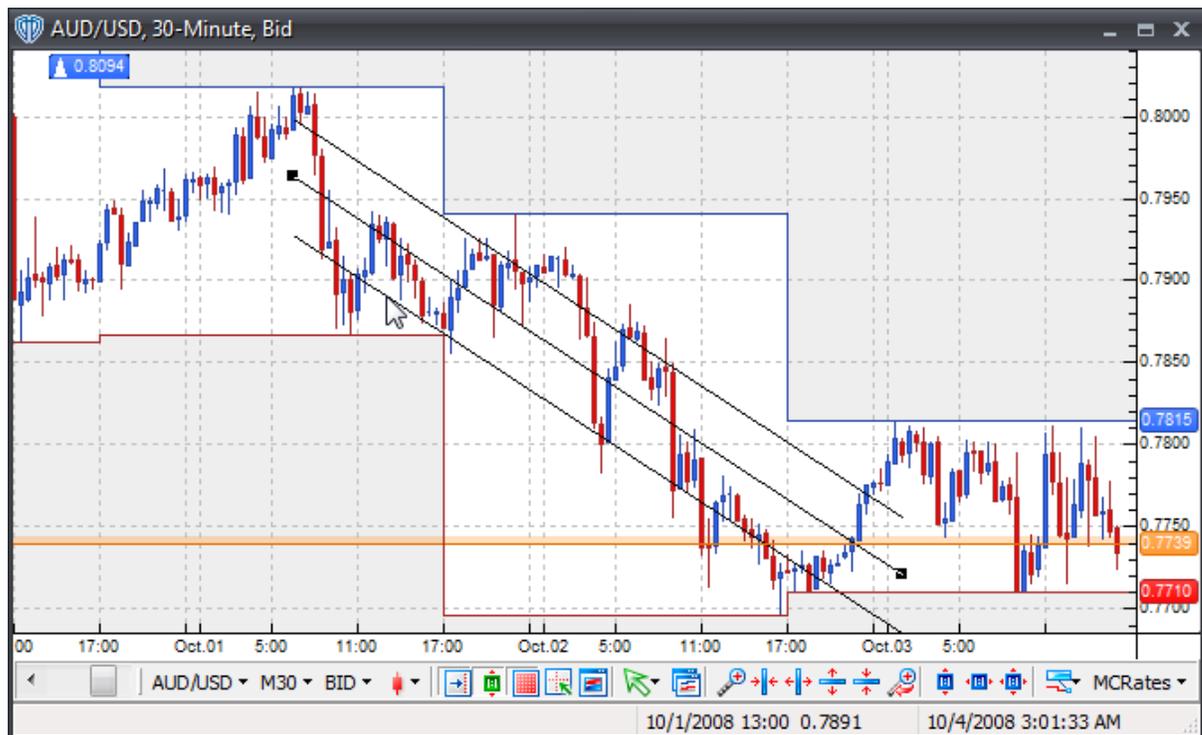
Alert Section:

- Source:** A dropdown menu showing "EUR/USD".
- Alert Timing:** A dropdown menu showing "Disabled".
- Recurrency:** A dropdown menu showing "Once".
- Condition:** A dropdown menu showing "Source Crosses Level".
- Sound:** A dropdown menu showing "None" with a play button and a color selection box.
- Comment:** An empty text input field.

At the bottom of the dialog are "OK" and "Cancel" buttons.

4.3.2 Standard Error Channels

To draw a **standard error channel** in the active chart window you must select the **Standard Error Channel** tool. With the **Standard Error Channel** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **standard error channel**. Once a starting position is selected you must click and hold down the left mouse button while drawing the **standard error channel** on the chart.



Once drawn on the chart, you can change the [properties](#)^[271] of the **standard error channel** (by using the [contextual menu](#)^[270]), reposition it, or change the begin/end points used for [calculations](#)^[271].

To reposition the **standard error channel**, you should click the left mouse button while the cursor is hovering over one of its lines and with the left mouse button held down, drag the channel to its new location. Release the left mouse button to finalize the new location of the **standard error channel**.

To recalculate where the **standard error channel** begins or ends, you must select the **standard error channel** by positioning the cursor over one of its lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the middle line; Click and hold down the left mouse button to drag the calculation point of the **standard error channel** to its new location. The **standard error channel** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You may click the right mouse button while the cursor is hovering over the **standard error channel** to access its [contextual menu](#)^[270] for additional functionality.

4.3.2.1 Contextual Menu



A **Standard Error Channel's contextual menu** contains the following commands:

Delete

This command deletes the selected standard error channel from the active chart window.

Delete All

This command deletes all standard error channels from the active chart window.

Properties

This command opens the standard error channel's [properties](#) ^[271] window.

Set to Default

This command resets any custom properties currently used by the standard error channel back to their default values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected standard error channel.

4.3.2.2 Properties

Using the **Standard Error Channel's** properties, you can:

- Change the color, width, and style of the channel lines
- Change the beginning and ending values (*price/date/time*) of the channel's middle line
- Extend the channel from its beginning/ending points
- Change the data series that the channel is based on
- Change the number of standard errors used to calculate the channel
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the channel lines are breached

The image shows a 'Properties' dialog box with two sections: 'Standard Error Channel' and 'Alert'. The 'Standard Error Channel' section includes fields for Color (orange), Width (1), Style (solid red line), Start Date (5/5/2010 2:56:31 AM), Start Value (1.29345), End Date (5/4/2010 6:58:36 AM), End Value (1.30755), Extend Lines (Right), Price (Close), and Standard Error (2.00000). The 'Alert' section includes fields for Source (EUR/USD), Alert Timing (Disabled), Recurrency (Once), Condition (Source Crosses Level), Sound (None), and a Comment field. At the bottom are 'OK' and 'Cancel' buttons.

Standard Error Channel	
Color:	Orange
Width:	1
Style:	Solid Red Line
Start Date:	5/5/2010 2:56:31 AM
Start Value:	1.29345
End Date:	5/4/2010 6:58:36 AM
End Value:	1.30755
Extend Lines:	Right
Price:	Close
Standard Error:	2.00000

Alert	
Source:	EUR/USD
Alert Timing:	Disabled
Recurrency:	Once
Condition:	Source Crosses Level
Sound:	None
Comment:	

4.3.3 Raff Regression Channels

To draw a **Raff regression channel** in the active chart window you must select the **Raff Regression Channel** tool. With the **Raff Regression Channel** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **Raff regression channel**. Once a starting position is selected you must click and hold down the left mouse button while drawing the **Raff regression channel** on the chart.



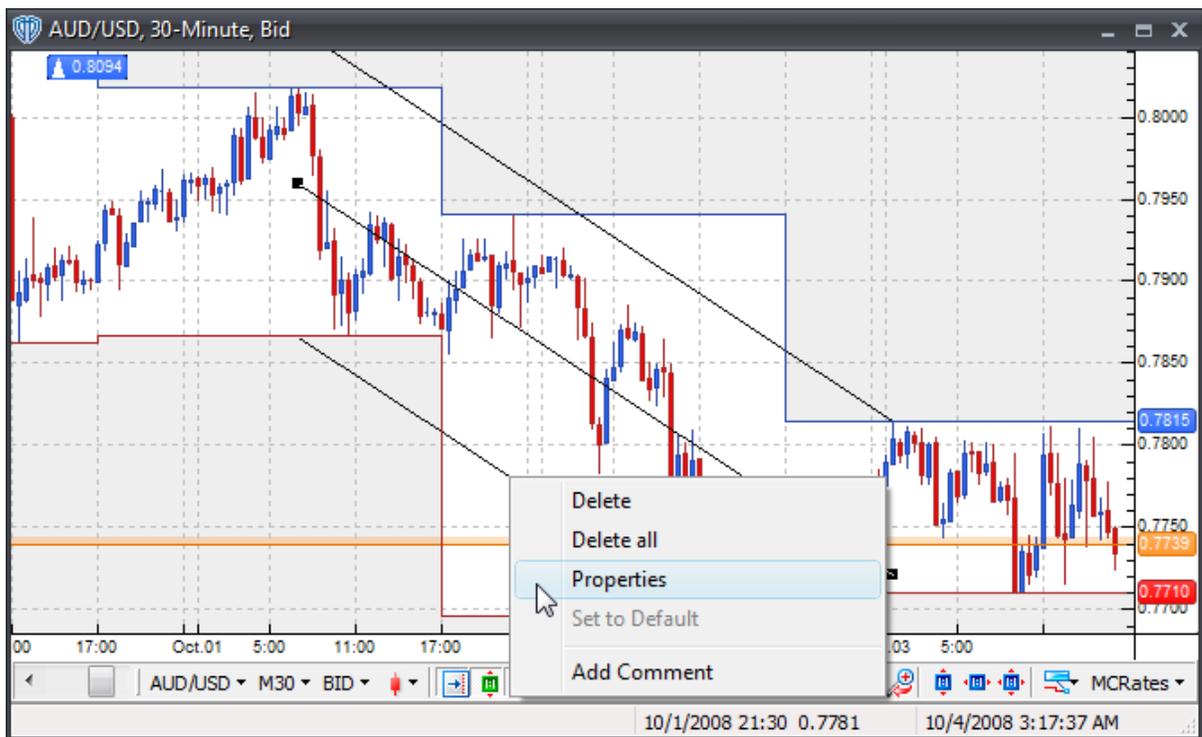
Once drawn on the chart, you can change the [properties](#)^[275] of the **Raff regression channel** (by using the [contextual menu](#)^[274]), reposition it, or change the begin/end points used for [calculations](#)^[275].

To reposition the **Raff regression channel**, you should click the left mouse button while the cursor is hovering over one of its lines and with the left mouse button held down, drag the channel to its new location. Release the left mouse button to finalize the new location of the **Raff regression channel**.

To recalculate where the **Raff regression channel** begins or ends, you must select the **Raff regression channel** by positioning the cursor over one of its lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the middle line; Click and hold down the left mouse button to drag the calculation point of the **Raff regression channel** to its new location. The **Raff regression channel** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You may click the right mouse button while the cursor is hovering over the **Raff regression channel** to access its [contextual menu](#)^[274] for additional functionality.

4.3.3.1 Contextual Menu



A **Raff Regression Channel's contextual menu** contains the following commands:

Delete

This command deletes the selected Raff regression channel from the active chart window.

Delete All

This command deletes all Raff regression channels from the active chart window.

Properties

This command opens the Raff regression channel's [properties](#)^[275] window.

Set to Default

This command resets any custom properties currently used by the Raff regression channel back to their default values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected Raff regression channel.

4.3.3.2 Properties

Using the **Raff Regression Channel's** properties, you can:

- Change the color, width, and style of the channel lines
- Change the beginning and ending values (*price/date/time*) of the channel's middle line
- Extend the channel from its beginning/ending points
- Change the data series that the channel is based on
- Change the number of standard errors used to calculate the channel
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the channel lines are breached

The screenshot shows a 'Properties' dialog box for a 'Raff Regression Channel'. The dialog is divided into two main sections: 'Raff Regression Channel' and 'Alert'. The 'Raff Regression Channel' section includes fields for Color (a dark red color swatch), Width (a spinner set to 1), Style (a dropdown menu showing a solid red line), Start Date (5/4/2010 3:56:19 AM), Start Value (1.31697), End Date (5/3/2010 10:00:25 PM), End Value (1.32124), Extend Lines (Right), and Price (Close). The 'Alert' section includes fields for Source (EUR/USD), Alert Timing (Disabled), Recurrency (Once), Condition (Source Crosses Level), Sound (None), and a Comment field. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

4.3.4 Equidistant Channels

To draw an **equidistant channel** in the active chart window you must select the **Equidistant Channel Channel** tool. With the **Equidistant Channel** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **equidistant channel**. Once a starting position is selected you must click and hold down the left mouse button while drawing the **equidistant channel** on the chart.



Once drawn on the chart, you can change the [properties](#)^[278] of the **equidistant channel** (by using the [contextual menu](#)^[277]), reposition it, or change the begin/end points used for [calculations](#)^[278].

To reposition the **equidistant channel**, you should click the left mouse button while the cursor is hovering over the lower channel line and with the left mouse button held down, drag the channel to its new location. Release the left mouse button to finalize the new location of the **equidistant channel**.

To recalculate where the **equidistant channel** begins or ends, you must select the **equidistant channel** by positioning the cursor over the lower channel line and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the line; Click and hold down the left mouse button to drag the calculation point of the **equidistant channel** to its new location. The **equidistant channel** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points. you may also use the [Properties](#)^[278] option of the [contextual menu](#)^[277] to manually change the begin or end point using specific price and date/time values. Lastly, the upper channel line may be moved to increase or decrease the width of the channel. With the **equidistant channel** selected, you should click the left mouse button while the cursor is hovering over the upper channel line and with the left mouse button held down, drag the upper channel line to its new location. Release the left mouse button to finalize the new location of the upper channel line.

You may click the right mouse button while the cursor is hovering over the **equidistant channel** to access its [contextual menu](#)^[277] for additional functionality.

4.3.4.1 Contextual Menu



A **Equidistant Channel's contextual menu** contains the following commands:

Delete

This command deletes the selected equidistant channel from the active chart window.

Delete All

This command deletes all equidistant channels from the active chart window.

Properties

This command opens the equidistant channel's [properties](#)^[278] window.

Set to Default

This command resets any custom properties currently used by the equidistant channel back to their default values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected equidistant channel.

4.3.4.2 Properties

Using the **Raff Regression Channel's** properties, you can:

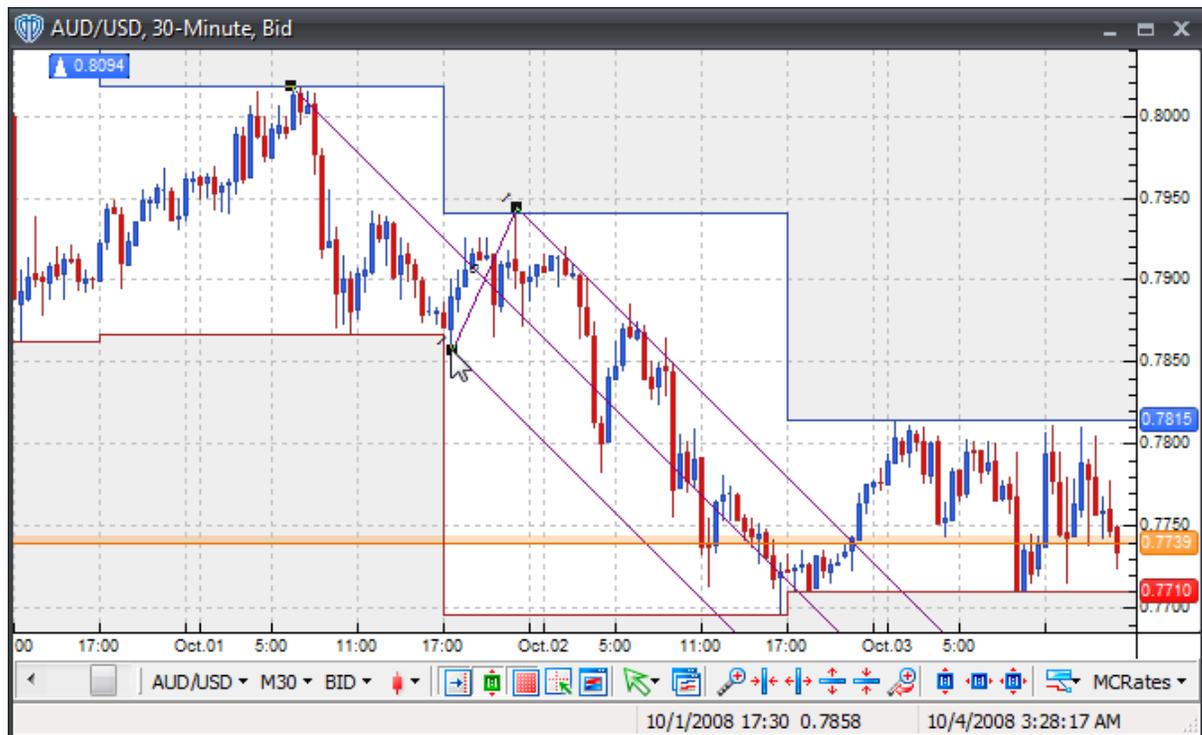
- Change the color, width, and style of the channel lines
- Change the beginning and ending values (*price/date/time*) of the channel's primary trend line
- Extend the channel from its beginning/ending points
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the channel lines are breached

The screenshot shows a 'Properties' dialog box with a title bar containing a shield icon and the text 'Properties'. The dialog is divided into two main sections: 'Equidistant Channel' and 'Alert'.
Equidistant Channel Section:
- Color: A black color swatch with a small '...' button to its right.
- Width: A text box containing '1' with up and down arrow buttons.
- Style: A dropdown menu showing a red line segment.
- Start Date: A dropdown menu showing '5/3/2010 2:29:01 PM'.
- Start Value: A text box containing '1.28478' with up and down arrow buttons.
- End Date: A dropdown menu showing '5/4/2010 12:36:40 AM'.
- End Value: A text box containing '1.29094' with up and down arrow buttons.
- Extend Lines: A dropdown menu showing 'None'.
Alert Section:
- Source: A dropdown menu showing 'EUR/USD'.
- Alert Timing: A dropdown menu showing 'Disabled'.
- Recurrency: A dropdown menu showing 'Once'.
- Condition: A dropdown menu showing 'Source Crosses Level'.
- Sound: A dropdown menu showing 'None' with a play button and a small '...' button to its right.
- Comment: An empty text box.
At the bottom of the dialog are 'OK' and 'Cancel' buttons.

4.3.5 Andrews' Pitchforks

Originally developed by Dr. Alan Andrews, the **Andrews' Pitchfork** (*a.k.a. median line studies*) is typically constructed of three parallel trend lines used to identify potential support and resistance levels (*additional tines can be specified; please refer to the tool's [properties](#)^[281] for details*). These trend lines are created using three different reference points which are typically sequential peaks and troughs. The first trend line (*the median or middle line*) begins at the left-most reference point (*either a peak or trough*) and equally divides the distance between the two right-most reference points. This median line is usually referred to as the pitchfork handle. The second and third trend lines are drawn parallel to the first trend line, beginning at the two right-most reference points (*a trough and a peak*). The second and third trend lines are usually referred to as the pitchfork tines (*or prongs*).

To draw an **Andrews' pitchfork** in the active chart window you must select the **Andrews' Pitchfork** tool. With the **Andrews' Pitchfork** tool selected, you must position the cursor over a location in the active chart window to start the calculation of the **Andrews' pitchfork**. Once a starting position is selected you must click and hold down the left mouse button while drawing the **Andrews' pitchfork** on the chart. **Please note:** Correctly drawing or positioning the **Andrews' pitchfork** initially in the active chart window will be very difficult, if not impossible, due to the tool's drawing behavior. It is strongly recommended that the **Andrews' pitchfork** simply be placed on the chart in a way that, when selected, all three reference points (*identified as small black boxes, see screenshot below*) will be visible. Once the **Andrews' pitchfork** has been drawn in active chart window, you may then easily reposition each reference point accordingly.



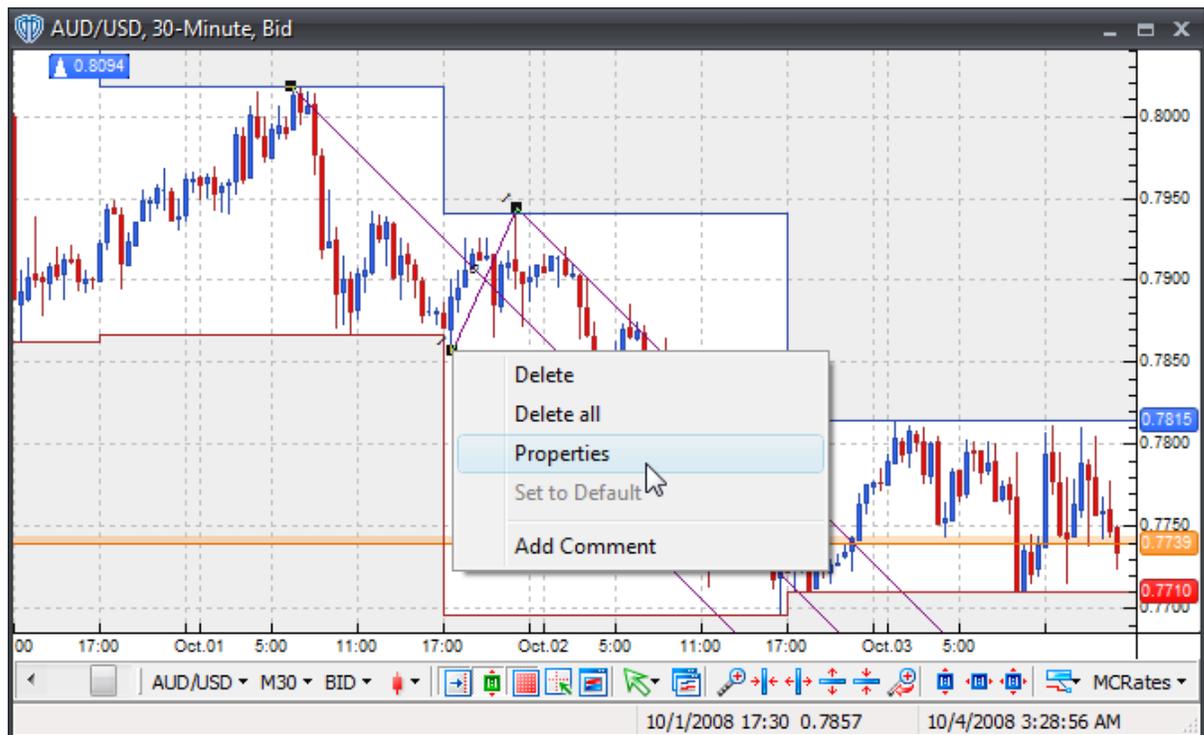
Once drawn on the chart, you can change the [properties](#)^[281] of the **Andrews' pitchfork** (*by using the [contextual menu](#)^[280]*), reposition it, or change the reference points used for [calculations](#)^[281].

To reposition the **Andrews' pitchfork**, you should click the left mouse button while the cursor is hovering over any of the trend lines and with the left mouse button held down, drag the pitchfork to its new location. Release the left mouse button to finalize the new location of the **Andrews' pitchfork**.

To recalculate the **Andrews' pitchfork's** reference points, you must select the **Andrews' pitchfork** by positioning the cursor over any of the trend lines and clicking the left mouse button once. Next, position the cursor over the box at the beginning of any trend line to be changed; Click and hold down the left mouse button to drag the reference point of the **Andrews' pitchfork** to its new location. The **Andrews' pitchfork** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new reference points.

You may click the right mouse button while the cursor is hovering over the **Andrews' pitchfork** to access its [contextual menu](#)^[280] for additional functionality.

4.3.5.1 Contextual Menu



An **Andrew's Pitchfork's contextual menu** contains the following commands:

Delete

This command deletes the selected Andrew's pitchfork from the active chart window.

Properties

This command opens the Andrew's pitchfork's [properties](#)^[281] window.

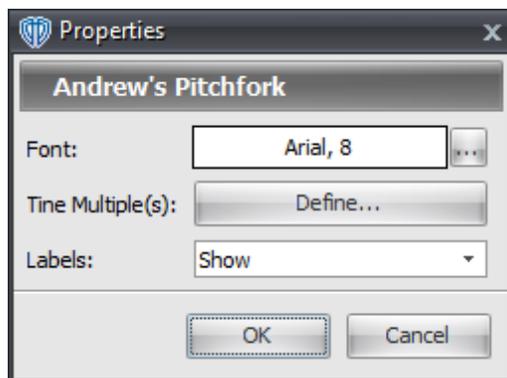
Set to Default

This command resets any custom properties currently used by the Andrew's pitchfork back to their default values.

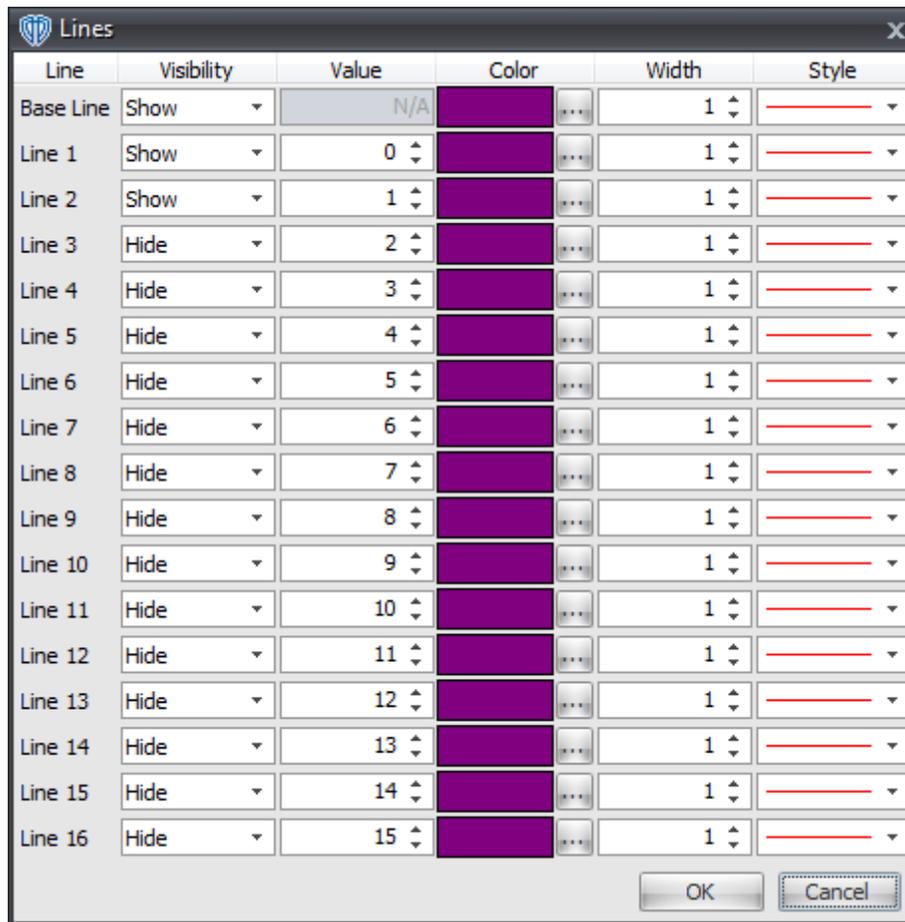
4.3.5.2 Properties

Using the **Andrew's Pitchfork's** properties, you can:

- Customize the tines (by clicking the **[Define]** button)
- Choose to *show* or *hide* the tine labels
- Change the tine labels' font attributes



By clicking the **[Define]** button, you can *show* or *hide* up to 16 custom tines (each with their own color, width, and style). Each additional tine represents a multiple of the distance from the median (or middle) line to the standard tines (tines with a multiple equal to 1).



4.4 Shapes

4.4.1 Ellipses

To draw an ellipse in the active chart window you must select the **Ellipse** tool. With the **Ellipse** tool selected, position the cursor over a location in the active chart window to draw the ellipse. Once a location is chosen, click and hold down the left mouse button to draw the shape in the chart window.



Once drawn on the chart, you can change the [properties](#)^[285] of the ellipse (by using the [contextual menu](#)^[283]), reposition it, or change its selection points.

To reposition the ellipse, click the left mouse button while the cursor is hovering anywhere inside the shape and with the left mouse button held down, drag the ellipse to its new location. Release the left mouse button to finalize the new location of the ellipse.

To recalculate the area that the ellipse covers, select the ellipse by positioning the cursor anywhere inside the shape and clicking the left mouse button once. Next, position the cursor over any of the selection points around the shape's border and then click and hold down the left mouse button to drag the selection point to its new location. The ellipse will redraw as the cursor is moved. Release the left mouse button to finalize the redrawing according to the new selection point(s).

You can click the right mouse button while the cursor is positioned anywhere inside the shape to access its [contextual menu](#)^[283] for additional functionality.

4.4.1.1 Contextual Menu

The contextual menu of an [Ellipse](#)^[282] can be accessed by clicking the right mouse button while the cursor is positioned anywhere in the shape.



An **Ellipse's contextual menu** contains the following commands:

Delete

This command deletes the selected ellipse from the active chart window.

Delete All

This command deletes all ellipses from the active chart window.

Properties

This command opens the ellipse's [properties](#) ^[285] window.

Set to Default

This command resets any custom properties currently used by the ellipse back to their default values.

Symmetric by Min

This command resizes the ellipse into a circle based on the smallest distance between 2 opposing selection points.

Symmetric by Max

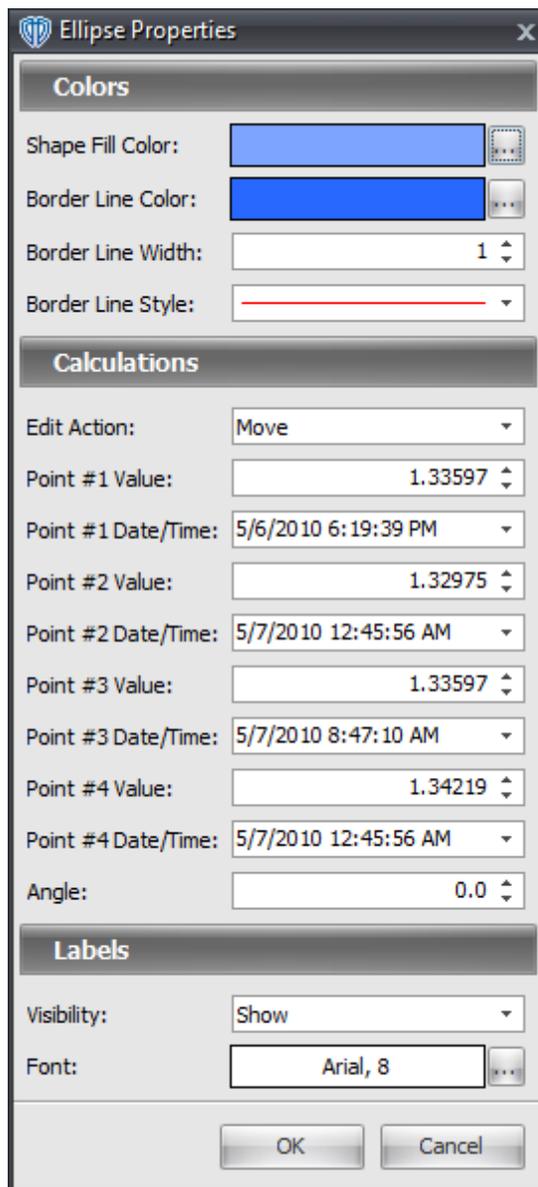
This command resizes the ellipse into a circle based on the largest distance between 2 opposing selection points.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected ellipse.

4.4.1.2 Properties

Selecting the *Properties* option from an ellipse's contextual menu opens the **Ellipse Properties** window.



From the *Colors* section, you can change the color of the ellipse, the ellipse's border, and the border's

line style.

From the *Calculations* section, you can change the coordinates of the ellipse's selection points. You can also change the drawing action the ellipse uses to redraw when one or more of its selection points are changed. If the *Move* option is selected, the ellipse will change its location in the chart window while maintaining its original size; if the *Resize* option is selected, the ellipse will change its size while maintaining its current location in the chart window. You can also rotate the shape by changing the *Angle (from Horizontal)* value.

From the *Labels* section, you can *show* or *hide* the ellipse's selection point labels. You can also change the font attributes of the labels.

4.4.2 Rectangles

To draw a rectangle in the active chart window you must select the **Rectangle** tool. With the **Rectangle** tool selected, position the cursor over a location in the active chart window to draw the rectangle. Once a location is chosen, click and hold down the left mouse button to draw the shape in the chart window.



Once drawn on the chart, you can change the [properties](#)^[288] of the rectangle (by using the [contextual menu](#)^[287]), reposition it, or change its drawing points.

To reposition the rectangle, click the left mouse button while the cursor is hovering anywhere inside the shape and with the left mouse button held down, drag the rectangle to its new location. Release the left mouse button to finalize the new location of the rectangle.

To recalculate the area that the rectangle covers, select the rectangle by positioning the cursor anywhere inside the shape and clicking the left mouse button once. Next, position the cursor over one of the drawing points around the shape's border; click and hold down the left mouse button to drag the drawing point to its new location. The rectangle will redraw as the cursor is moved. Release the left mouse button to finalize the redrawing according to the new drawing points.

You can click the right mouse button while the cursor is positioned anywhere inside the shape to access its [contextual menu](#)^[287] for additional functionality.

4.4.2.1 Contextual Menu

The contextual menu of a [Rectangle](#)^[286] can be accessed by clicking the right mouse button while the cursor is positioned anywhere in the shape.



A **Rectangle's contextual menu** contains the following commands:

Delete

This command deletes the selected rectangle from the active chart window.

Delete All

This command deletes all rectangles from the active chart window.

Properties

This command opens the rectangle's [properties](#) ^[288] window.

Set to Default

This command resets any custom properties currently used by the rectangle back to their default values.

Symmetric by Min

This command resizes the rectangle into a circle based on the smallest distance between 2 opposing selection points.

Symmetric by Max

This command resizes the rectangle into a circle based on the largest distance between 2 opposing selection points.

Add Comment

This command adds a [comment](#) ^[243] and associates it specifically with the selected rectangle.

4.4.2.2 Properties

Selecting the *Properties* option from a rectangle's contextual menu opens the **Rectangle Properties** window.

Rectangle Properties

Colors

Shape Fill Color:

Border Line Color:

Border Line Width:

Border Line Style:

Calculations

Edit Action:

Point #1 Value:

Point #1 Date/Time:

Point #2 Value:

Point #2 Date/Time:

Point #3 Value:

Point #3 Date/Time:

Point #4 Value:

Point #4 Date/Time:

Angle:

Labels

Visibility:

Font:

OK Cancel

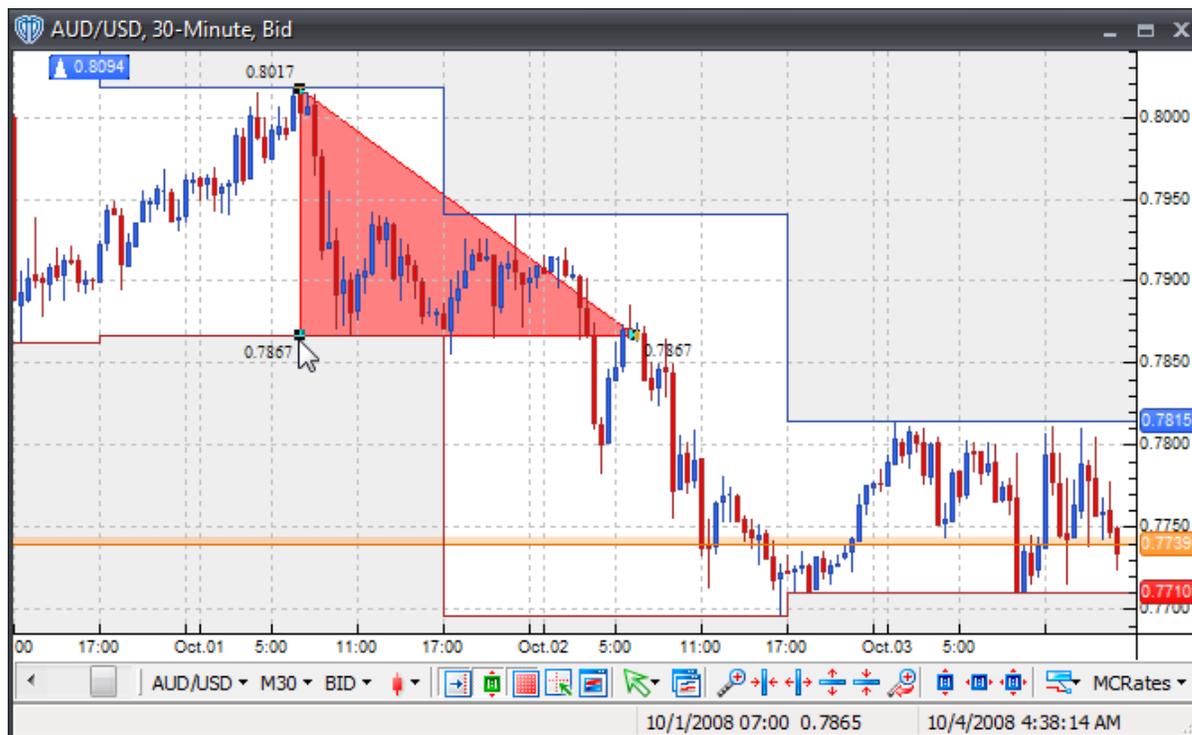
From the *Colors* section, you can change the color of the rectangle, the rectangle's border, and the border's line style.

From the *Calculations* section, you can change the coordinates of the rectangle's selection points. You can also change the drawing action the rectangle uses to redraw when one or more of its selection points are changed. If the *Move* option is selected, the rectangle will change its location in the chart window while maintaining its original size; if the *Resize* option is selected, the rectangle will change its size while maintaining its current location in the chart window. You can also rotate the shape by changing the *Angle (from Horizontal)* value.

From the *Labels* section, you can *show* or *hide* the rectangle's selection point labels. You can also change the font attributes of the labels.

4.4.3 Triangles

To draw a triangle in the active chart window you must select the **Triangle** tool. With the **Triangle** tool selected, position the cursor over a location in the active chart window to draw the triangle. Once a location is chosen, click and hold down the left mouse button to draw the shape in the chart window.



Once drawn on the chart, you can change the [properties](#)^[292] of the triangle (by using the [contextual menu](#)^[291]), reposition it, or change its drawing points.

To reposition the triangle, click the left mouse button while the cursor is hovering anywhere inside the shape and with the left mouse button held down, drag the rectangle to its new location. Release the left mouse button to finalize the new location of the triangle.

To recalculate the area that the triangle covers, select the rectangle by positioning the cursor anywhere inside the shape and clicking the left mouse button once. Next, position the cursor over one of the drawing points around the shape's border; click and hold down the left mouse button to drag the drawing point to its new location. The triangle will redraw as the cursor is moved. Release the left mouse button to finalize the redrawing according to the new drawing points.

You can click the right mouse button while the cursor is positioned anywhere inside the shape to access its [contextual menu](#)^[291] for additional functionality.

4.4.3.1 Contextual Menu

The contextual menu of a [Triangle](#)²⁹⁰ can be accessed by clicking the right mouse button while the cursor is positioned anywhere in the shape.



A **Triangle's contextual menu** contains the following commands:

Delete

This command deletes the selected triangle from the active chart window.

Delete All

This command deletes all triangles from the active chart window.

Properties

This command opens the triangle's [properties](#)²⁹² window.

Set to Default

This command resets any custom properties currently used by the triangle back to their default values.

Add Comment

This command adds a [comment](#)²⁴³ and associates it specifically with the selected triangle.

4.4.3.2 Properties

Selecting the *Properties* option from a triangle's contextual menu opens the **Triangle Properties** window.

The screenshot shows the 'Triangle Properties' dialog box with the following settings:

- Colors:**
 - Shape Fill Color: Red
 - Border Line Color: Red
 - Border Line Width: 1
 - Border Line Style: Solid
- Calculations:**
 - Edit Action: Move
 - Point #1 Value: 1.32282
 - Point #1 Date/Time: 5/6/2010 6:53:36 PM
 - Point #2 Value: 1.31192
 - Point #2 Date/Time: 5/7/2010 2:20:41 PM
 - Point #3 Value: 1.31192
 - Point #3 Date/Time: 5/6/2010 6:53:36 PM
 - Angle: 0.0
- Labels:**
 - Visibility: Show
 - Font: Arial, 8

From the *Colors* section, you can change the color of the triangle, the triangle's border, and the border's line style.

From the *Calculations* section, you can change the coordinates of the triangle's selection points. You can also change the drawing action the triangle uses to redraw when one or more of its selection points are changed. If the *Move* option is selected, the triangle will change its location in the chart window while maintaining its original size; if the *Resize* option is selected, the rectangle will change its size while

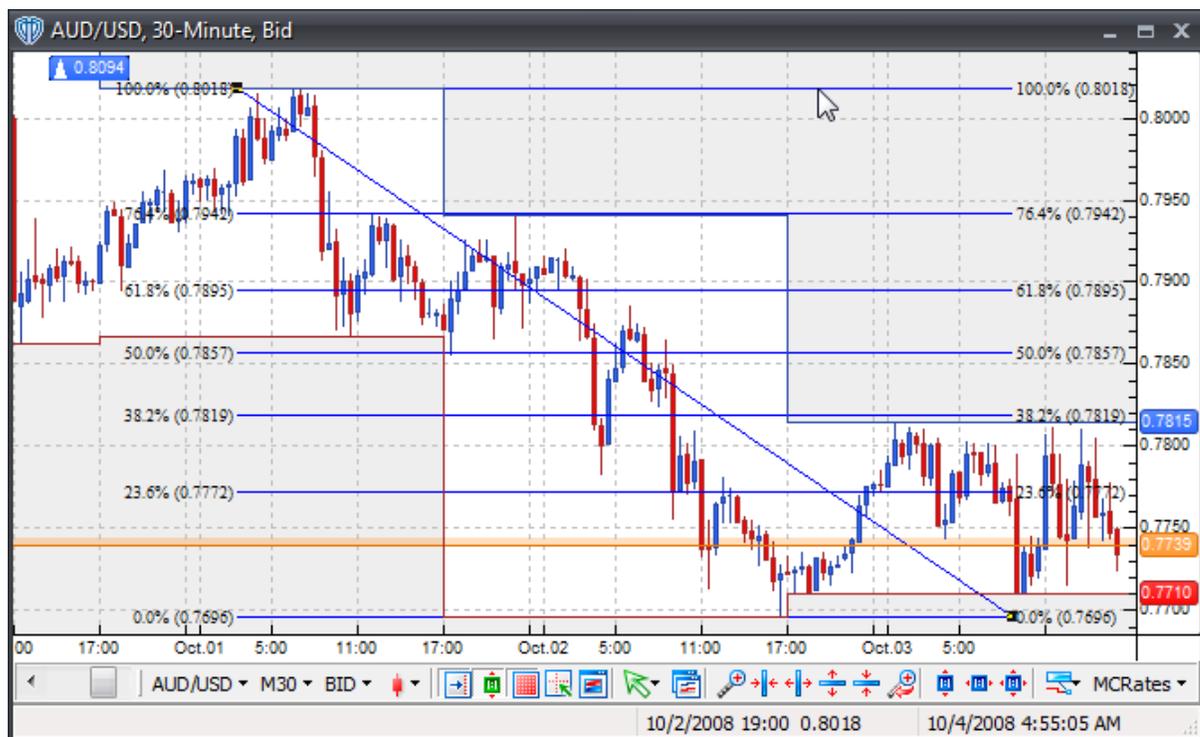
maintaining its current location in the chart window. You can also rotate the shape by changing the *Angle (from Horizontal)* value.

From the *Labels* section, you can *show* or *hide* the triangle's selection point labels. You can also change the font attributes of the labels.

4.5 Fibonacci

4.5.1 Fibonacci Retracements

To draw **Fibonacci Retracements** in the active chart window you must select the **Fibonacci Retracements** tool. With the **Fibonacci Retracements** tool selected, position the cursor over a location in the active chart window to draw the **Fibonacci Retracements**. Once a location is chosen, click and hold down the left mouse button to draw the lines in the chart window.



Once drawn on the chart, you can change the [properties](#)^[295] of the **Fibonacci Retracements** (by using the [contextual menu](#)^[294]), reposition them, or change the begin/end points used for [calculations](#)^[295].

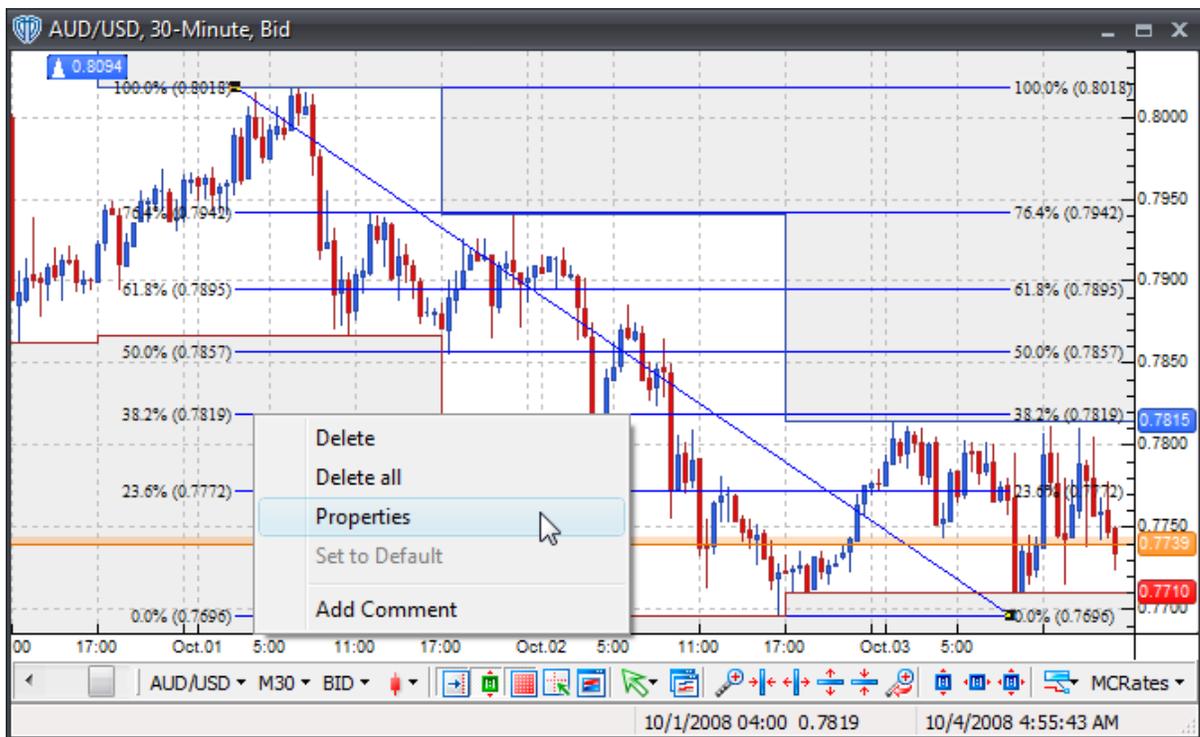
To reposition the **Fibonacci Retracements**, click the left mouse button while the cursor is hovering over any of the lines and with the left mouse button held down, drag the lines to their new location. Release the left mouse button to finalize the new location of the **Fibonacci Retracements**.

To recalculate where the **Fibonacci Retracements** begins or ends, select the **Fibonacci Retracements** by positioning the cursor over any of the lines and clicking the left mouse button once.

Next, position the cursor over either the box at the beginning or the ending of the underlying trend line; Click and hold down the left mouse button to drag the calculation point of the **Fibonacci Retracements** to its new location. The **Fibonacci Retracements** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You can click the right mouse button while the cursor is hovering over any of the **Fibonacci Retracements** to access its [contextual menu](#)^[303] for additional functionality.

4.5.1.1 Contextual Menu



A **Fibonacci Retracements**'s **contextual menu** contains the following commands:

Delete

This command deletes the selected Fibonacci retracements from the active chart window.

Delete All

This command deletes all Fibonacci retracements from the active chart window.

Properties

This command opens the Fibonacci retracement's [properties](#)^[295] window.

Set to Default

This command resets any custom properties currently used by the Fibonacci retracements back to their default values.

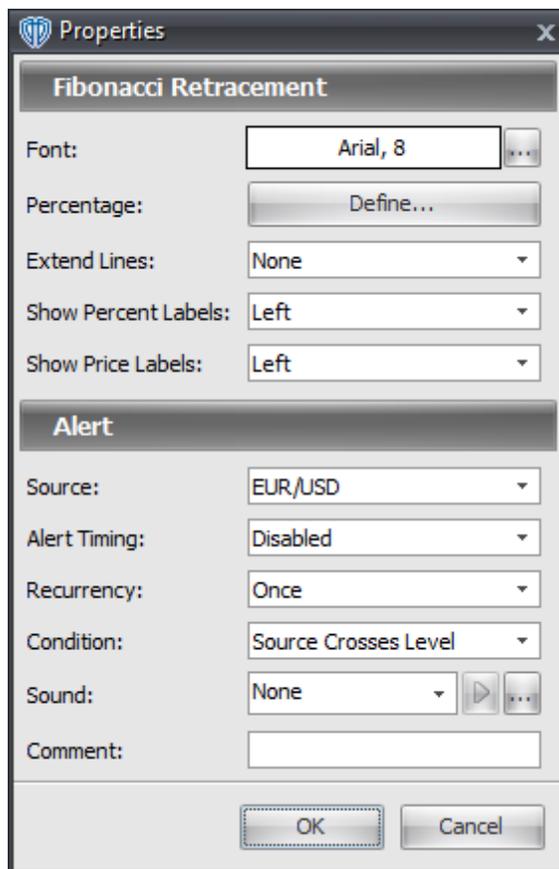
Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected Fibonacci retracements.

4.5.1.2 Properties

Using the **Fibonacci Retracement's** properties, you can:

- Customize the Fibonacci lines (*by clicking the **[Define]** button*)
- Extend the Fibonacci lines beyond their base line's beginning/ending points
- Choose to *show (left, right, or left+right) or hide the Percent and/or Price* line labels
- Change the line labels' font attributes
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when any Fibonacci line is breached

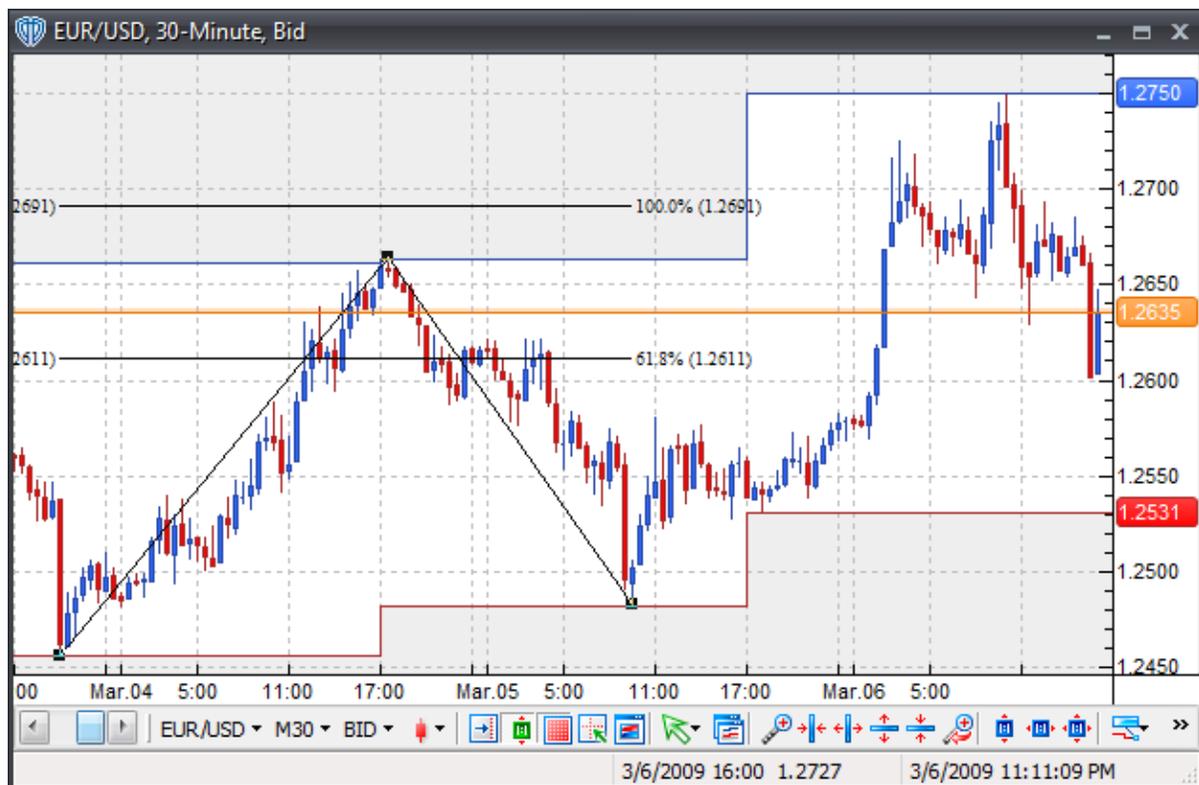


By clicking the **Define** button, you can *show* or *hide* up to 16 custom Fibonacci lines (each with their own color, width, and style).

Line	Visibility	Value	Color	Width	Style
Base Line	Show	N/A	Blue	1	Red
Line 1	Show	0	Blue	1	Red
Line 2	Show	23.6	Blue	1	Red
Line 3	Show	38.2	Blue	1	Red
Line 4	Show	50	Blue	1	Red
Line 5	Show	61.8	Blue	1	Red
Line 6	Show	76.4	Blue	1	Red
Line 7	Hide	78.6	Blue	1	Red
Line 8	Show	100	Blue	1	Red
Line 9	Hide	123.6	Blue	1	Red
Line 10	Hide	138.2	Blue	1	Red
Line 11	Hide	150	Blue	1	Red
Line 12	Hide	161.8	Blue	1	Red
Line 13	Hide	176.4	Blue	1	Red
Line 14	Hide	178.6	Blue	1	Red
Line 15	Hide	200	Blue	1	Red
Line 16	Hide	223.6	Blue	1	Red

4.5.2 Fibonacci Expansions

To draw **Fibonacci Expansions** in the active chart window you must select the **Fibonacci Expansions** tool. With the **Fibonacci Expansions** tool selected, position the cursor over a location in the active chart window to draw the **Fibonacci Expansions**. Once a location is chosen, click and hold down the left mouse button to draw the lines in the chart window. This will draw the underlying A->B line. The underlying B->C line will be auto-drawn to a 50% retracement level of the underlying A->B trend line.



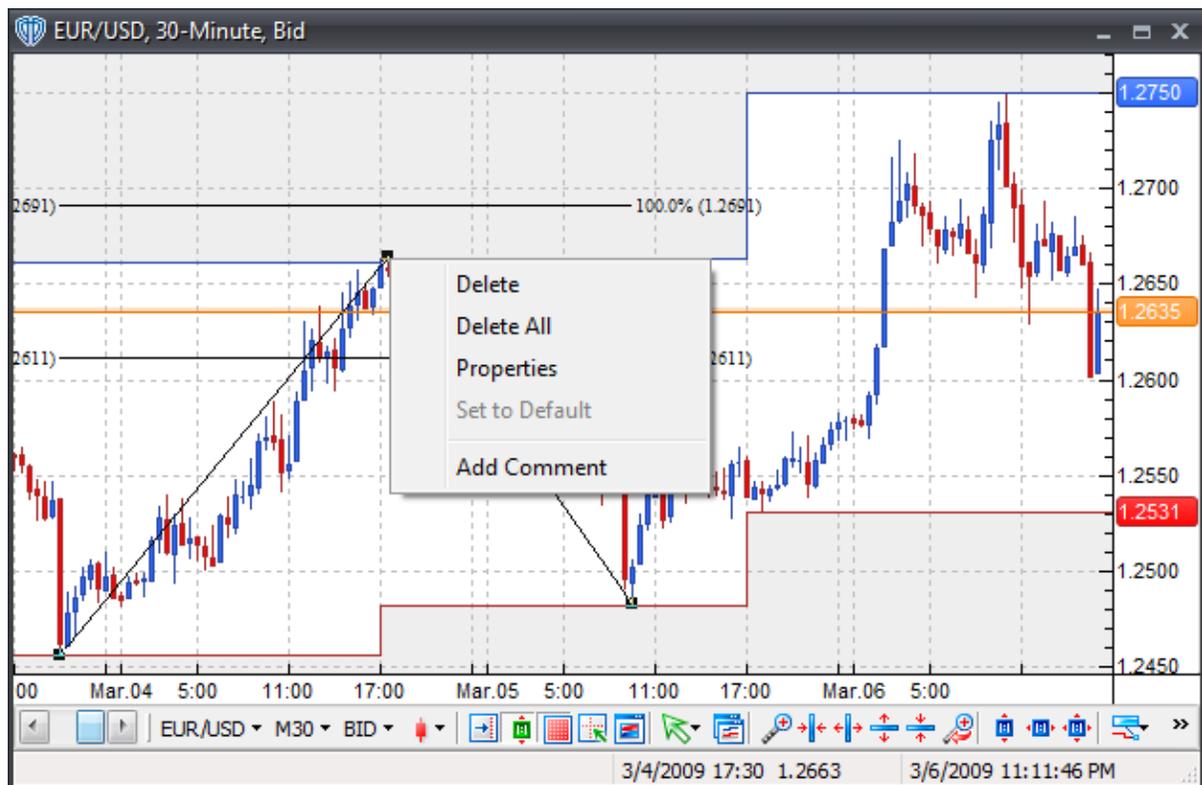
Once drawn on the chart, you can change the [properties](#)^[300] of the **Fibonacci Expansions** (by using the [contextual menu](#)^[299]), reposition them, or change the begin/end points used for [calculations](#)^[300].

To reposition the **Fibonacci Expansions**, click the left mouse button while the cursor is hovering over any of the lines and with the left mouse button held down, drag the lines to their new location. Release the left mouse button to finalize the new location of the **Fibonacci Expansions**.

To recalculate where the **Fibonacci Expansions** begins or ends, select the **Fibonacci Expansions** by positioning the cursor over any of the lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the underlying A->B trend line or B->C trend line; Click and hold down the left mouse button to drag the calculation point of the **Fibonacci Expansions** to its new location. The **Fibonacci Expansions** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You can click the right mouse button while the cursor is hovering over any of the **Fibonacci Expansions** to access its [contextual menu](#)^[299] for additional functionality.

4.5.2.1 Contextual Menu



A **Fibonacci Expansion's contextual menu** contains the following commands:

Delete

This command deletes the selected Fibonacci expansions from the active chart window.

Delete All

This command deletes all Fibonacci expansions from the active chart window.

Properties

This command opens the Fibonacci expansion's [properties](#)^[300] window.

Set to Default

This command resets any custom properties currently used by the Fibonacci expansions back to their default values.

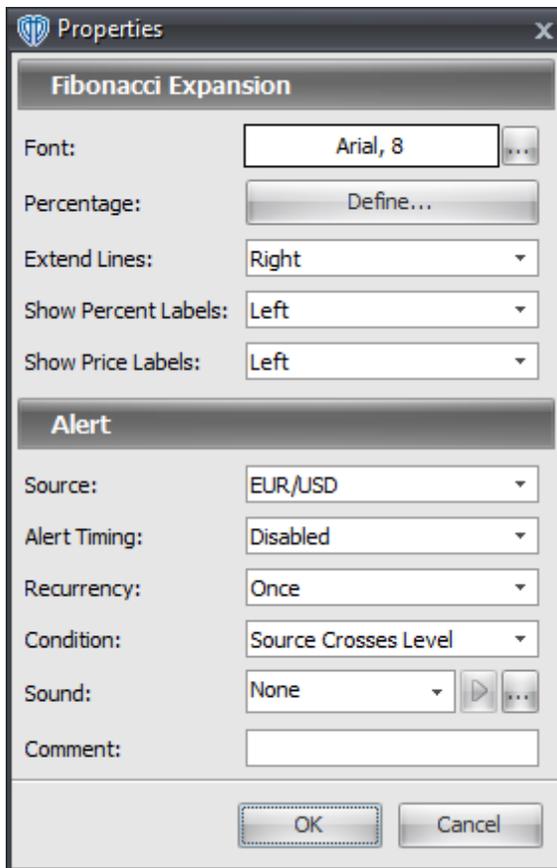
Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected Fibonacci expansions.

4.5.2.2 Properties

Using the **Fibonacci Expansion's** properties, you can:

- Customize the Fibonacci lines (*by clicking the **[Define]** button*)
- Extend the Fibonacci lines beyond their base line's beginning/ending points
- Choose to *show (left, right, or left+right) or hide* the *Percent* and/or *Price* line labels
- Change the line labels' font attributes
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when any Fibonacci line is breached

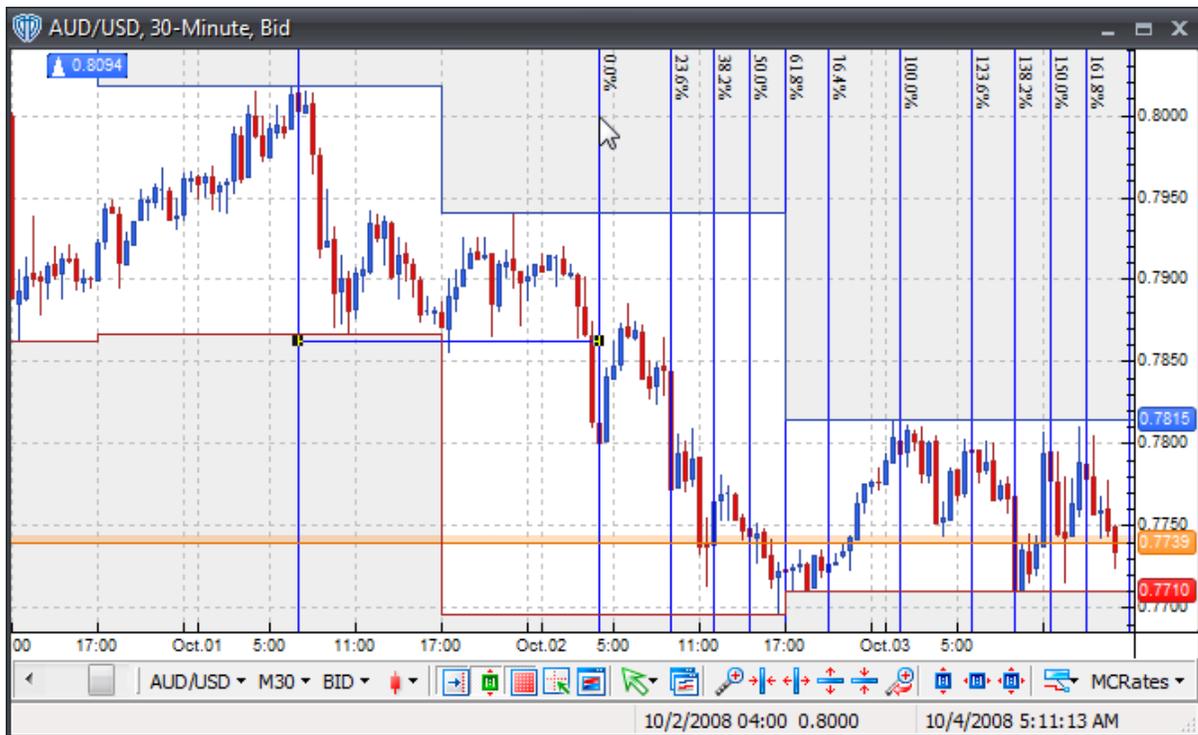


By clicking the **[Define]** button, you can *show or hide* up to 16 custom Fibonacci lines (*each with their own color, width, and style*).

Line	Visibility	Value	Color	Width	Style
Base Line	Show	N/A		1	
Line 1	Show	0		1	
Line 2	Hide	23.6		1	
Line 3	Show	38.2		1	
Line 4	Show	50		1	
Line 5	Show	61.8		1	
Line 6	Show	76.4		1	
Line 7	Hide	78.6		1	
Line 8	Show	100		1	
Line 9	Hide	123.6		1	
Line 10	Hide	138.2		1	
Line 11	Show	150		1	
Line 12	Show	161.8		1	
Line 13	Hide	176.4		1	
Line 14	Hide	178.6		1	
Line 15	Hide	200		1	
Line 16	Hide	223.6		1	

4.5.3 Fibonacci Time Extensions

To draw **vertical Fibonacci lines** in the active chart window you must select the **Fibonacci Time Extension** tool. With the **Fibonacci Time Extension** tool selected, position the cursor over a location in the active chart window to draw the **Fibonacci Time Extensions**. Once a location is chosen, click and hold down the left mouse button to draw the lines in the chart window.



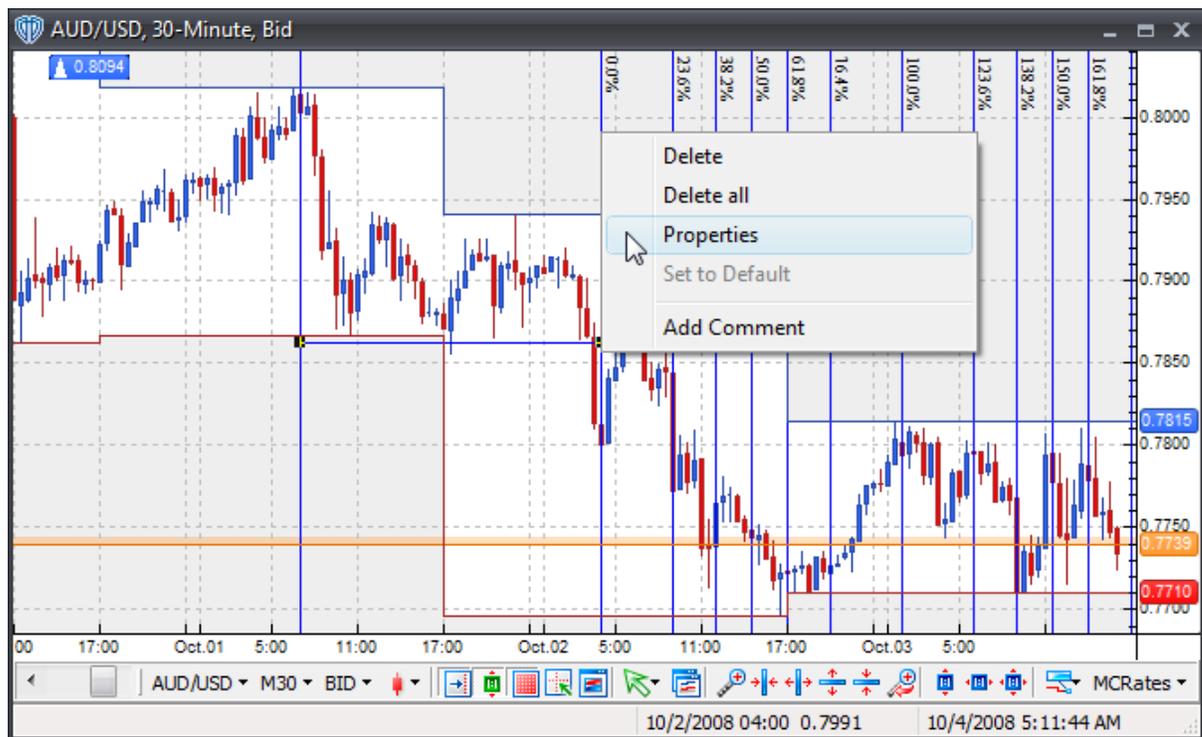
Once drawn on the chart, you can change the [properties](#)^[304] of the **Fibonacci Time Extensions** (by using the [contextual menu](#)^[303]), reposition them, or change the begin/end points used for [calculations](#)^[304].

To reposition the **Fibonacci Time Extensions**, click the left mouse button while the cursor is hovering over any of the lines and with the left mouse button held down, drag the lines to their new location. Release the left mouse button to finalize the new location of the **Fibonacci Time Extensions**.

To recalculate where the **Fibonacci Time Extensions** begin or end, select the **Fibonacci Time Extensions** by positioning the cursor over any of the lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the underlying trend line; Click and hold down the left mouse button to drag the calculation point of the **Fibonacci Time Extensions** to its new location. The **Fibonacci Time Extensions** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You can click the right mouse button while the cursor is hovering over any of the **Fibonacci Time Extensions** to access its [contextual menu](#)^[303] for additional functionality.

4.5.3.1 Contextual Menu



A **Fibonacci Time Extension's contextual menu** contains the following commands:

Delete

This command deletes the selected Fibonacci time extensions from the active chart window.

Delete All

This command deletes all Fibonacci time extensions from the active chart window.

Properties

This command opens the Fibonacci time extension's [properties](#)^[304] window.

Set to Default

This command resets any custom properties currently used by the Fibonacci time extensions back to their default values.

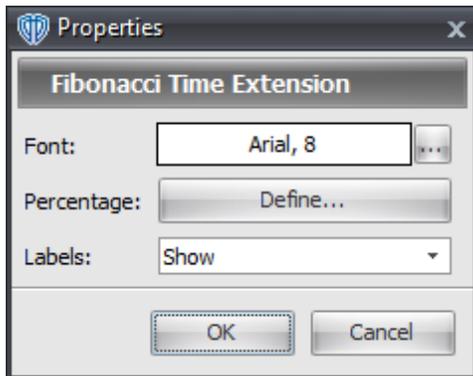
Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected Fibonacci time extensions.

4.5.3.2 Properties

Using the **Fibonacci Time Extension's** properties, you can:

- Customize the Fibonacci lines (*by clicking the **[Define]** button*)
- Choose to *show or hide* the *Percent* line labels
- Change the line labels' font attributes



By clicking the **[Define]** button, you can *show or hide* up to 16 custom Fibonacci lines (*each with their own color, width, and style*).

Line	Visibility	Value	Color	Width	Style
Base Line	Show	N/A		1	
Line 1	Show	0		1	
Line 2	Show	23.6		1	
Line 3	Show	38.2		1	
Line 4	Show	50		1	
Line 5	Show	61.8		1	
Line 6	Show	76.4		1	
Line 7	Hide	78.6		1	
Line 8	Show	100		1	
Line 9	Show	123.6		1	
Line 10	Show	138.2		1	
Line 11	Show	150		1	
Line 12	Show	161.8		1	
Line 13	Hide	176.4		1	
Line 14	Hide	178.6		1	
Line 15	Hide	200		1	
Line 16	Hide	223.6		1	

4.5.4 Fibonacci Channels

To draw a **Fibonacci Channel** in the active chart window you must select the **Fibonacci Channel** tool. With the **Fibonacci Channel** tool selected, position the cursor over a location in the active chart window to draw the **Fibonacci Channel**. Once a location is chosen, click and hold down the left mouse button to draw the lines in the chart window.



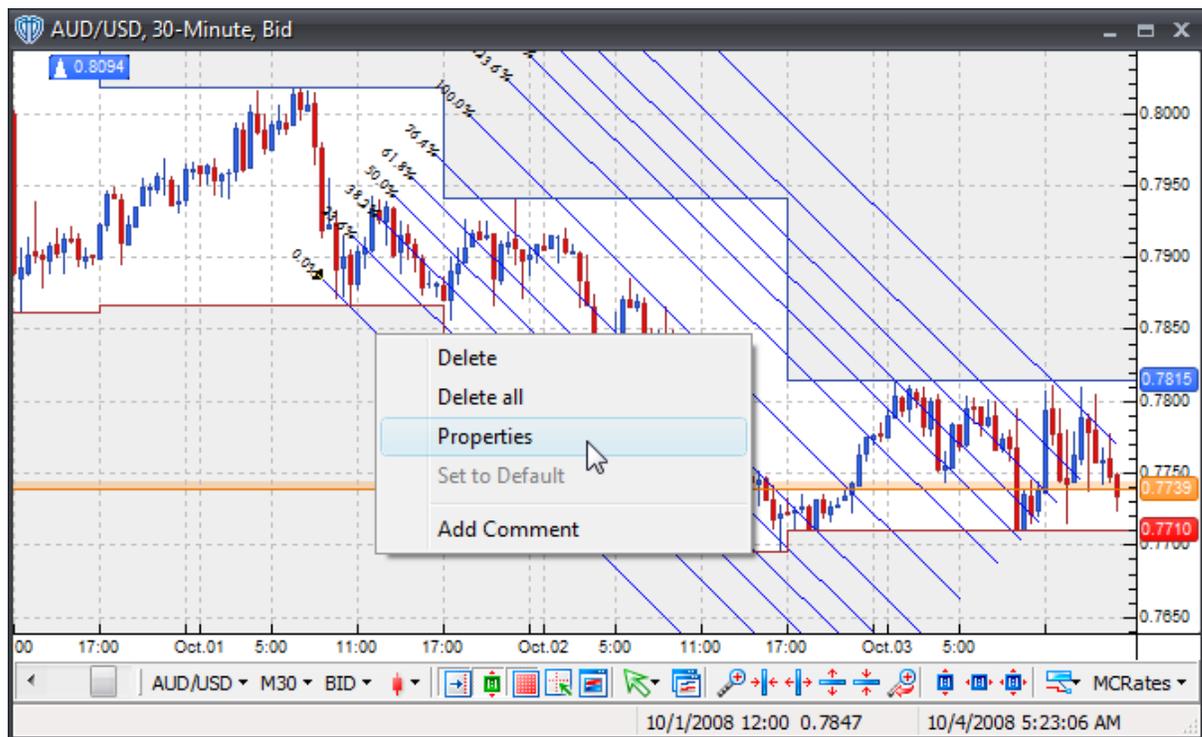
Once drawn on the chart, you can change the [properties](#)^[308] of the **Fibonacci Channel** (by using the [contextual menu](#)^[307]), reposition it, or change the begin/end points used for [calculations](#)^[308].

To reposition the **Fibonacci Channel**, click the left mouse button while the cursor is hovering over any of the lines and with the left mouse button held down, drag the lines to their new location. Release the left mouse button to finalize the new location of the **Fibonacci Channel**.

To recalculate where the **Fibonacci Channel** begins or ends, select the **Fibonacci Channel** by positioning the cursor over any of the lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the underlying trend line; Click and hold down the left mouse button to drag the calculation point of the **Fibonacci Channel** to its new location. The **Fibonacci Channel** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You can click the right mouse button while the cursor is hovering over any of the **Fibonacci Channel** lines to access its [contextual menu](#)^[307] for additional functionality.

4.5.4.1 Contextual Menu



A **Fibonacci Channel's contextual menu** contains the following commands:

Delete

This command deletes the selected Fibonacci channel from the active chart window.

Delete All

This command deletes all Fibonacci channels from the active chart window.

Properties

This command opens the Fibonacci channel's [properties](#)^[308] window.

Set to Default

This command resets any custom properties currently used by the Fibonacci channel back to their default values.

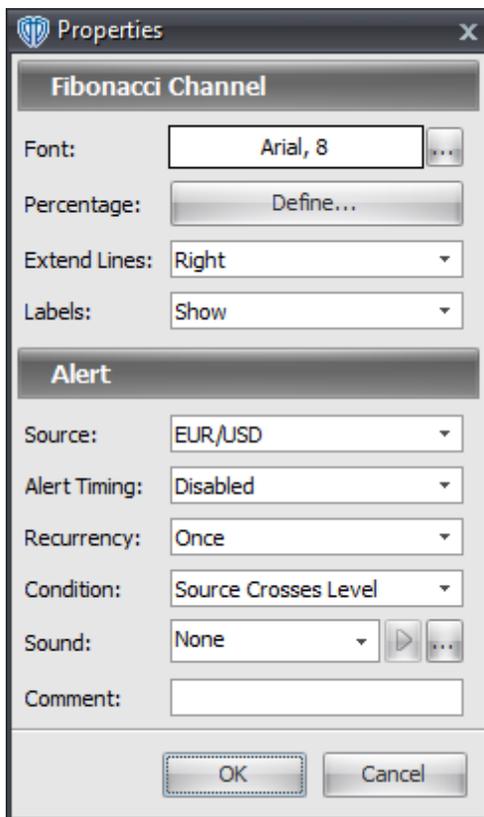
Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected Fibonacci channel.

4.5.4.2 Properties

Using the **Fibonacci Channel's** properties, you can:

- Customize the Fibonacci lines (*by clicking the **[Define]** button*)
- Extend the Fibonacci lines beyond their base line's beginning/ending points
- Choose to *show or hide* the *Percent* line labels
- Change the line labels' font attributes
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when any Fibonacci line is breached



By clicking the **[Define]** button, you can *show or hide* up to 16 custom Fibonacci lines (*each with their own color, width, and style*).

Line	Visibility	Value	Color	Width	Style
Base Line	Show	N/A	Blue	1	Red
Line 1	Show	0	Blue	1	Red
Line 2	Show	23.6	Blue	1	Red
Line 3	Show	38.2	Blue	1	Red
Line 4	Show	50	Blue	1	Red
Line 5	Show	61.8	Blue	1	Red
Line 6	Show	76.4	Blue	1	Red
Line 7	Hide	78.6	Blue	1	Red
Line 8	Show	100	Blue	1	Red
Line 9	Hide	123.6	Blue	1	Red
Line 10	Hide	138.2	Blue	1	Red
Line 11	Hide	150	Blue	1	Red
Line 12	Hide	161.8	Blue	1	Red
Line 13	Hide	176.4	Blue	1	Red
Line 14	Hide	178.6	Blue	1	Red
Line 15	Hide	200	Blue	1	Red
Line 16	Hide	223.6	Blue	1	Red

4.5.5 Fibonacci Fans

To draw a **Fibonacci Fan** in the active chart window you must select the **Fibonacci Fan** tool. With the **Fibonacci Fan** tool selected, position the cursor over a location in the active chart window to draw the **Fibonacci Fan**. Once a location is chosen, click and hold down the left mouse button to draw the lines in the chart window.



Once drawn on the chart, you can change the [properties](#)^[312] of the **Fibonacci Fan** (by using the [contextual menu](#)^[311]), reposition it, or change the begin/end points used for [calculations](#)^[312].

To reposition the **Fibonacci Fan**, click the left mouse button while the cursor is hovering over one of its lines and with the left mouse button held down, drag the fan to its new location. Release the left mouse button to finalize the new location of the **Fibonacci Fan**.

To recalculate where the **Fibonacci Fan** begins or ends, select the **Fibonacci Fan** by positioning the cursor over one of its lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the underlying trend line; Click and hold down the left mouse button to drag the calculation point of the **Fibonacci Fan** to its new location. The **Fibonacci Fan** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You can click the right mouse button while the cursor is hovering over the **Fibonacci Fan** to access its [contextual menu](#)^[311] for additional functionality.

4.5.5.1 Contextual Menu



A **Fibonacci Fan's contextual menu** contains the following commands:

Delete

This command deletes the selected Fibonacci fan from the active chart window.

Delete All

This command deletes all Fibonacci fans from the active chart window.

Properties

This command opens the Fibonacci fan's [properties](#)³¹² window.

Set to Default

This command resets any custom properties currently used by the Fibonacci fan back to their default values.

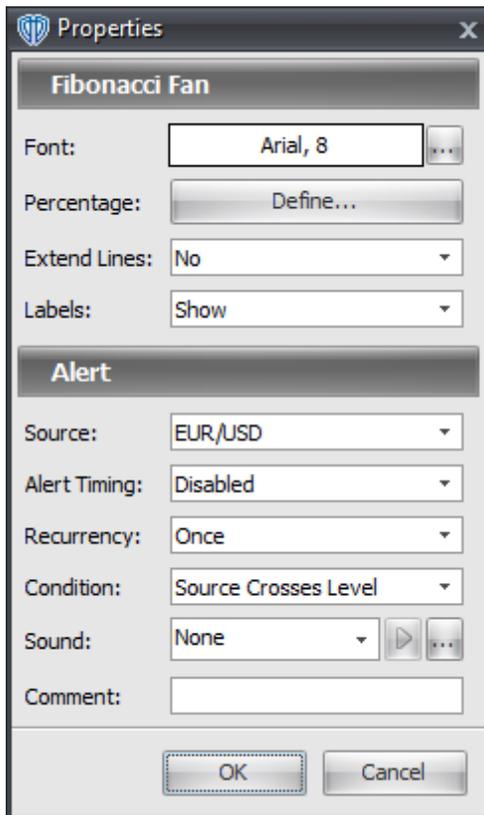
Add Comment

This command adds a [comment](#)²⁴³ and associates it specifically with the selected Fibonacci fan.

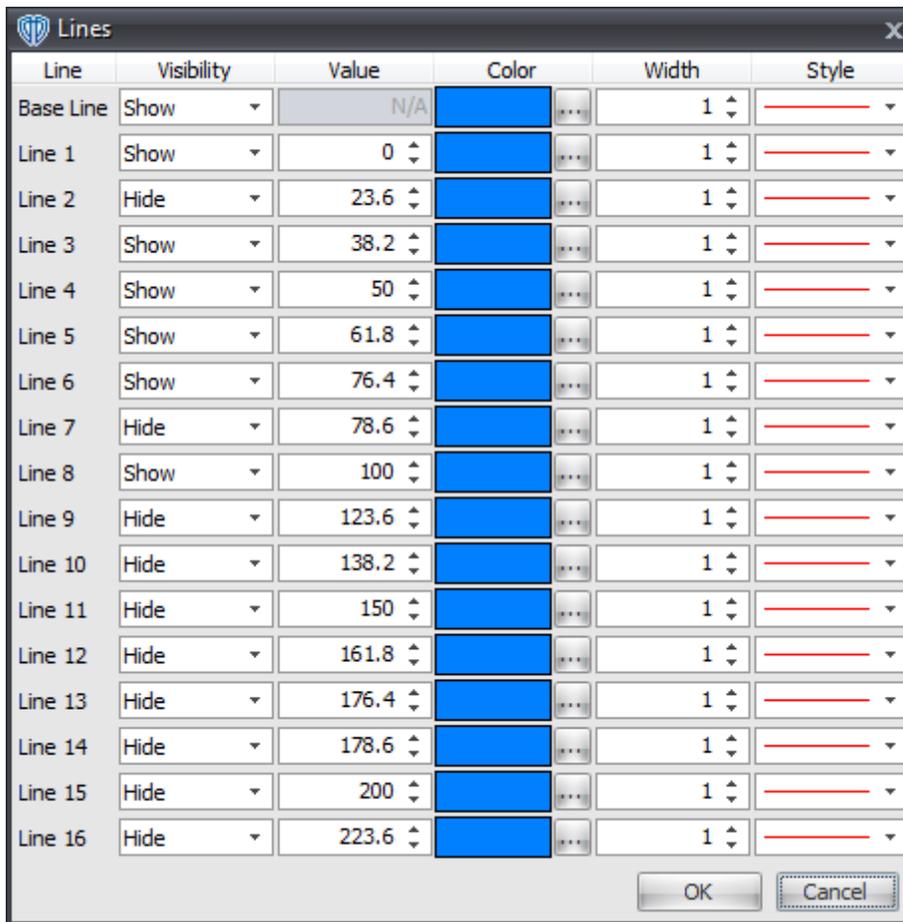
4.5.5.2 Properties

Using the **Fibonacci Fan's** properties, you can:

- Customize the Fibonacci lines (*by clicking the **[Define]** button*)
- Extend the Fibonacci lines beyond their base line's beginning/ending points
- Choose to *show or hide* the *Percent* line labels
- Change the line labels' font attributes
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when any Fibonacci line is breached



By clicking the **[Define]** button, you can *show or hide* up to 16 custom Fibonacci lines (*each with their own color, width, and style*).



Line	Visibility	Value	Color	Width	Style
Base Line	Show	N/A	Blue	1	Red
Line 1	Show	0	Blue	1	Red
Line 2	Hide	23.6	Blue	1	Red
Line 3	Show	38.2	Blue	1	Red
Line 4	Show	50	Blue	1	Red
Line 5	Show	61.8	Blue	1	Red
Line 6	Show	76.4	Blue	1	Red
Line 7	Hide	78.6	Blue	1	Red
Line 8	Show	100	Blue	1	Red
Line 9	Hide	123.6	Blue	1	Red
Line 10	Hide	138.2	Blue	1	Red
Line 11	Hide	150	Blue	1	Red
Line 12	Hide	161.8	Blue	1	Red
Line 13	Hide	176.4	Blue	1	Red
Line 14	Hide	178.6	Blue	1	Red
Line 15	Hide	200	Blue	1	Red
Line 16	Hide	223.6	Blue	1	Red

4.5.6 Fibonacci Arcs

To draw a **Fibonacci Arc** in the active chart window you must select the **Fibonacci Arc** tool. With the **Fibonacci Arc** tool selected, position the cursor over a location in the active chart window to draw the **Fibonacci Arc**. Once a location is chosen, click and hold down the left mouse button to draw the lines in the chart window.



Once drawn on the chart, you can change the [properties](#)^[316] of the **Fibonacci Arc** (by using the [contextual menu](#)^[315]), reposition it, or change the begin/end points used for [calculations](#)^[316].

To reposition the **Fibonacci Arc**, click the left mouse button while the cursor is hovering over one of its lines and with the left mouse button held down, drag the arc to its new location. Release the left mouse button to finalize the new location of the **Fibonacci Arc**.

To recalculate where the **Fibonacci Arc** begins or ends, select the **Fibonacci Arc** by positioning the cursor over one of its lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or the ending of the underlying trend line; Click and hold down the left mouse button to drag the calculation point of the **Fibonacci Arc** to its new location. The **Fibonacci Arc** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

You click the right mouse button while the cursor is hovering over the **Fibonacci Arc** to access its [contextual menu](#)^[315] for additional functionality.

4.5.6.1 Contextual Menu



A **Fibonacci Arc's contextual menu** contains the following commands:

Delete

This command deletes the selected Fibonacci arc from the active chart window.

Delete All

This command deletes all Fibonacci arcs from the active chart window.

Properties

This command opens the Fibonacci arc's [properties](#)³¹⁶ window.

Set to Default

This command resets any custom properties currently used by the Fibonacci arc back to their default values.

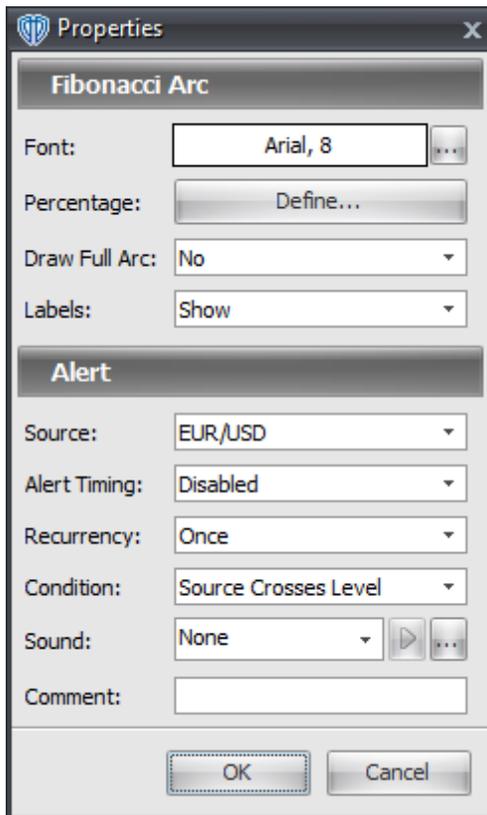
Add Comment

This command adds a [comment](#)²⁴³ and associates it specifically with the selected Fibonacci arc.

4.5.6.2 Properties

Using the **Fibonacci Arc's** properties, you can:

- Customize the Fibonacci lines (*by clicking the **[Define]** button*)
- Extend the Fibonacci lines beyond their base line's beginning/ending points into a full arc
- Choose to *show or hide* the *Percent* line labels
- Change the line labels' font attributes
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when any Fibonacci line is breached



By clicking the **[Define]** button, you can *show or hide* up to 16 custom Fibonacci lines (*each with their own color, width, and style*).

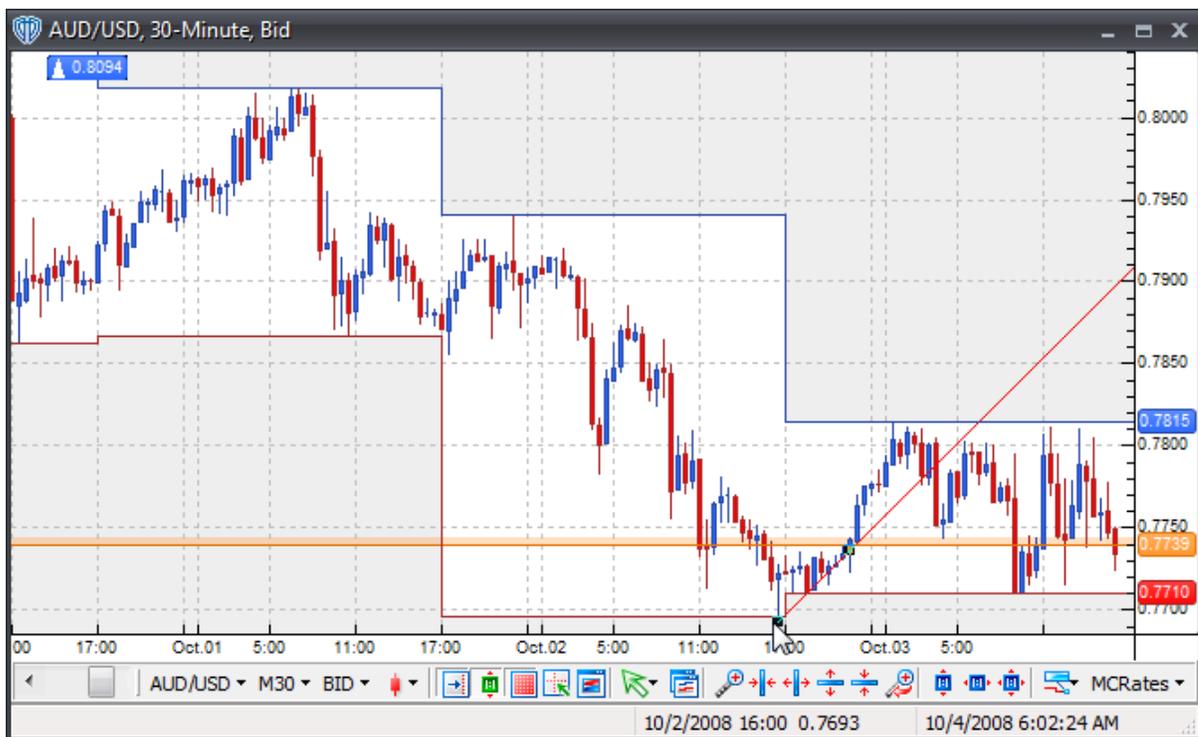
Line	Visibility	Value	Color	Width	Style
Base Line	Show	N/A	Blue	1	Red
Line 1	Hide	0	Blue	1	Red
Line 2	Show	23.6	Blue	1	Red
Line 3	Show	38.2	Blue	1	Red
Line 4	Show	50	Blue	1	Red
Line 5	Show	61.8	Blue	1	Red
Line 6	Show	76.4	Blue	1	Red
Line 7	Hide	78.6	Blue	1	Red
Line 8	Show	100	Blue	1	Red
Line 9	Show	123.6	Blue	1	Red
Line 10	Show	138.2	Blue	1	Red
Line 11	Show	150	Blue	1	Red
Line 12	Show	161.8	Blue	1	Red
Line 13	Hide	176.4	Blue	1	Red
Line 14	Hide	178.6	Blue	1	Red
Line 15	Hide	200	Blue	1	Red
Line 16	Hide	223.6	Blue	1	Red

4.6 Gann

4.6.1 Gann Lines

To draw a **Gann line** in the active chart window you must select the **Gann Line** tool. With the **Gann Line** tool selected, position the cursor over a location in the active chart window to start the calculation of the **Gann line**. This is typically from a low or high point in price. Once a starting position is selected, click the left mouse button to draw the **Gann** on the chart. The **Gann line** will initially be drawn at an exact 45 degree angle.

The **Gann line** at 45 degrees is commonly referred to as the 1x1 ratio; 1 unit of time is equal to a 1 unit rise (or decline) in the instrument's measure of price. In Forex, the smallest unit of price is called a *pip*.



Once drawn on the chart, you can change the [properties](#)^[320] of the **Gann line** (by using the [contextual menu](#)^[319]), reposition it, or change the begin/end points used for [calculations](#)^[323].

To reposition the **Gann line**, you should click the left mouse button while the cursor is hovering over it and with the left mouse button held down, drag the line to its new location. Release the left mouse button to finalize the new location of the **Gann line**.

To recalculate where the **Gann line** begins or ends, select the **Gann line** by positioning the cursor over it and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or in the middle of the line (see *screenshot above*); Click and hold down the left mouse button to drag the calculation point of the **Gann line** to its new location. The **Gann line** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

As an alternate method of recalculation, you can manually adjust the [beginning point and/or rise and run values used for calculation](#)^[320] of the **Gann line** by clicking the right mouse button once while the cursor is hovering over the line and selecting *Properties* from the [contextual menu](#)^[319].

You can click the right mouse button while the cursor is hovering over the **Gann line** to access its [contextual menu](#)^[319] for additional functionality.

4.6.1.1 Contextual Menu



A **Gann Line's contextual menu** contains the following commands:

Delete

This command deletes the selected Gann line from the active chart window.

Delete All

This command deletes all Gann lines from the active chart window.

Properties

This command opens the Gann line's [properties](#)^[320] window.

Set to Default

This command resets any custom properties currently used by the Gann line back to their default values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected Gann line.

4.6.1.2 Properties

Using the **Gann Line's** properties, you can:

- Change the color, width, and style of the Gann line
- Change the run of the line (*the # of bars between the beginning and ending points used for calculation*)
- Change the rise of the line (*the # of pips between the beginning and ending points used for calculation*)
- Change the beginning values (*price/date/time*) of the Gann line
- Extend the Gann line from its beginning point
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when the Gann line is breached

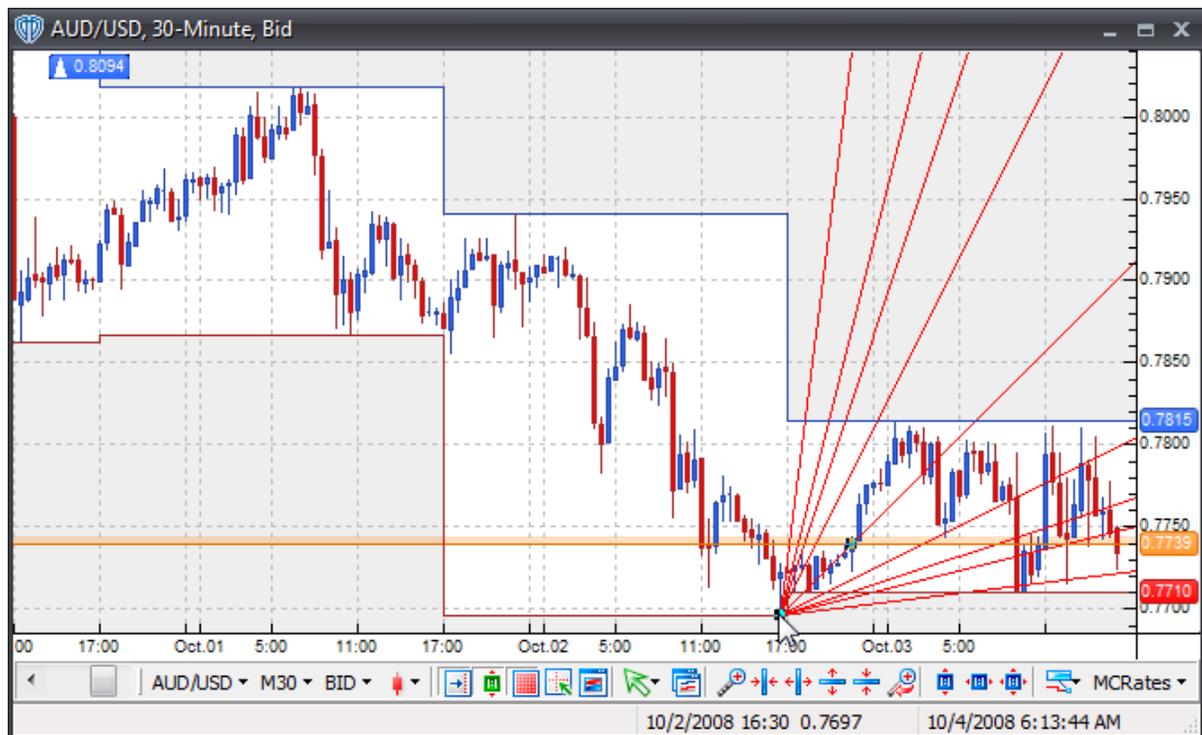
The screenshot shows the 'Properties' dialog box for a Gann Line. The dialog is titled 'Properties' and has a close button (X). It is divided into two sections: 'Gann Line' and 'Alert'. The 'Gann Line' section includes fields for Color (green), Width (1), Style (solid red line), Run (10), Rise (0.00965), Start Date (5/3/2010 2:00:00 AM), Start Value (1.27961), and Extend Begin (No). The 'Alert' section includes fields for Source (EUR/USD), Alert Timing (Disabled), Recurrency (Once), Condition (Source Crosses Level), Sound (None), and a Comment field. At the bottom are 'OK' and 'Cancel' buttons.

4.6.2 Gann Fans

To draw a **Gann Fan** in the active chart window you must select the **Gann Fan** tool. With the **Gann Fan** tool selected, position the cursor over a location in the active chart window to draw the **Gann Fan**. Once a location is chosen, click the left mouse button to draw the **Gann Fan** in the chart window. The **Gann fan** will initially be drawn with the middle (*base*) line at an exact 45 degree angle.

The **Gann** line at 45 degrees is commonly referred to as the 1x1 ratio; 1 unit of time is equal to a 1 unit rise (*or decline*) in the instrument's measure of price. In Forex, the smallest unit of price is called a *pip*. Other important lines used to construct the **Gann fan** (*from top to bottom*) are:

- 1x8 - 82.5 degrees
- 1x4 - 75 degrees
- 1x3 - 71.25 degrees
- 1x2 - 63.75 degrees
- 1x1 - 45 degrees** (*base line - most important according to Gann!*)
- 2x1 - 26.25 degrees
- 3x1 - 18.75 degrees
- 4x1 - 15 degrees
- 8x1 - 7.5 degrees



Once drawn on the chart, you can change the [properties](#) ^[323] of the **Gann Fan** (*by using the [contextual menu](#)* ^[322]), reposition it, or change the begin/end points used for [calculations](#) ^[320].

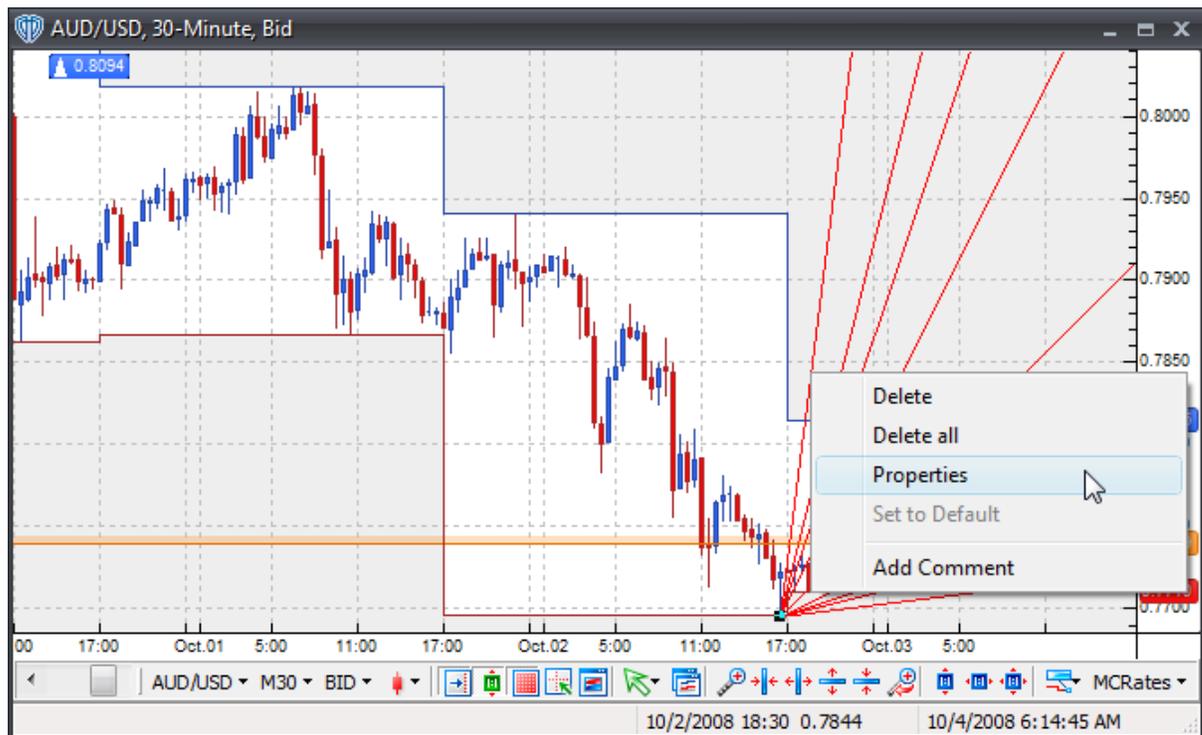
To reposition the **Gann Fan**, click the left mouse button while the cursor is hovering over one of its lines and with the left mouse button held down, drag the fan to its new location. Release the left mouse button to finalize the new location of the **Gann Fan**.

To recalculate where the **Gann Fan** begins or ends, select the **Gann Fan** by positioning the cursor over one of its lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or along the 1x1 line; Click and hold down the left mouse button to drag the calculation point of the **Gann Fan** to its new location. The **Gann Fan** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

As an alternate method of recalculation, you can manually adjust the [beginning point and/or rise and run values used for calculation](#)^[323] of the **Gann fan** by clicking the right mouse button while the cursor is hovering over any of its lines and selecting *Properties* from the [contextual menu](#)^[322].

You can click the right mouse button while the cursor is hovering over the **Gann Fan** to access its [contextual menu](#)^[322] for additional functionality.

4.6.2.1 Contextual Menu



A **Gann Fan's contextual menu** contains the following commands:

Delete

This command deletes the selected Gann fan from the active chart window.

Delete All

This command deletes all Gann fans from the active chart window.

Properties

This command opens the Gann fan's [properties](#) ^[323] window.

Set to Default

This command resets any custom properties currently used by the Gann fan back to their default values.

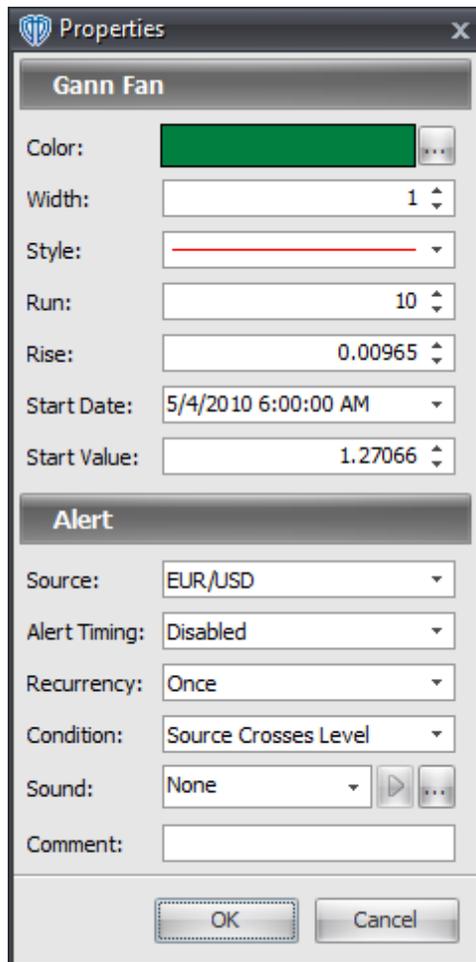
Add Comment

This command adds a [comment](#) ^[243] and associates it specifically with the selected Gann fan.

4.6.2.2 Properties

Using the **Gann Fan's** properties, you can:

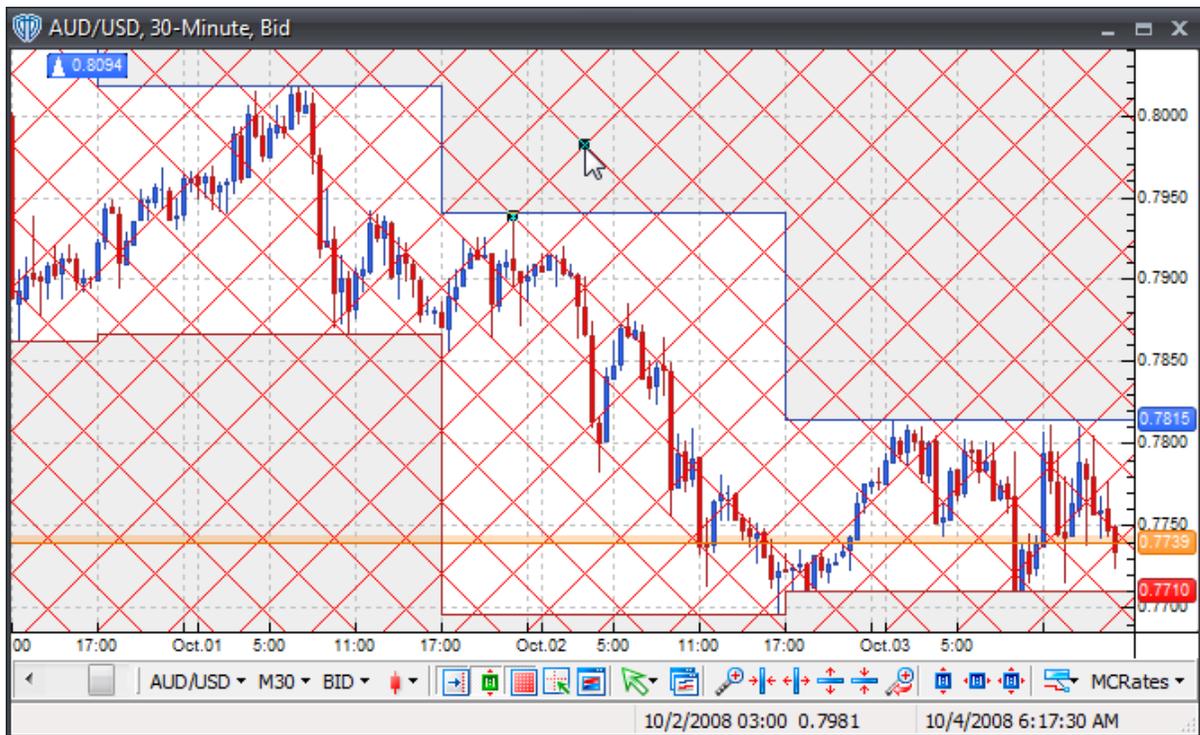
- Change the color, width, and style of the Gann lines
- Change the run of the Gann fan's base line (*the # of bars between the beginning and ending points used for calculation*)
- Change the rise of the Gann fan's base line (*the # of pips between the beginning and ending points used for calculation*)
- Change the beginning values (*price/date/time*) of the Gann fan's base line
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when any Gann line is breached



4.6.3 Gann Grids

To draw a **Gann Grid** in the active chart window you must select the **Gann Grid** tool. With the **Gann Grid** tool selected, position the cursor over a location in the active chart window to draw the **Gann Grid**. Once a location is chosen, click the left mouse button to draw the **Gann Grid** in the chart window. The **Gann Grid** will initially be drawn with the middle (*base*) line at an exact 45 degree angle.

The **Gann** line at 45 degrees is commonly referred to as the 1x1 ratio; 1 unit of time is equal to a 1 unit rise (*or decline*) in the instrument's measure of price. In Forex, the smallest unit of price is called a *pip*. The 1x1 ratio 45 degree line is considered to be the most important line for measuring the price trend according to Gann.



Once drawn on the chart, you can change the [properties](#)^[327] of the **Gann Grid** (by using the [contextual menu](#)^[326]), reposition it, or change the begin/end points used for [calculations](#)^[327].

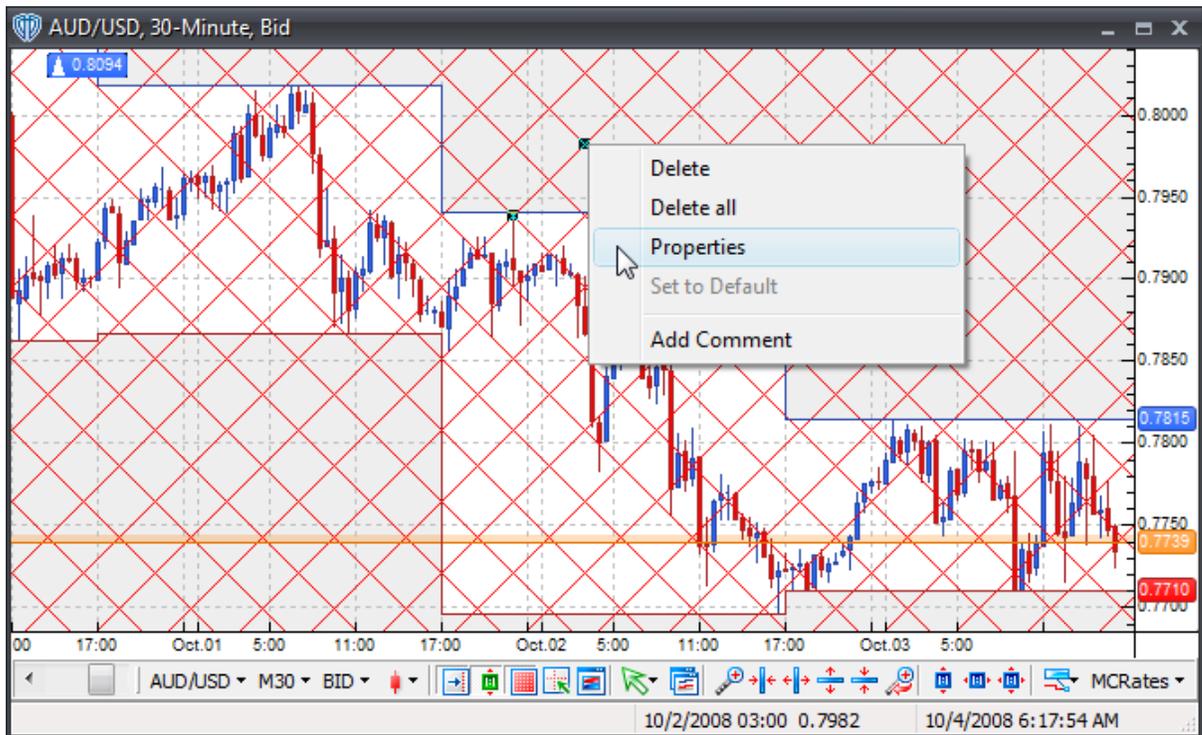
To reposition the **Gann Grid**, click the left mouse button while the cursor is hovering over one of its lines and with the left mouse button held down, drag the fan to its new location. Release the left mouse button to finalize the new location of the **Gann Grid**.

To recalculate where the **Gann Grid** begins or ends, select the **Gann Grid** by positioning the cursor over one of its lines and clicking the left mouse button once. Next, position the cursor over either the box at the beginning or along the 1x1 line; Click and hold down the left mouse button to drag the calculation point of the **Gann Grid** to its new location. The **Gann Grid** will redraw as the cursor is moved around within the chart window. Release the left mouse button to finalize the redrawing according to the new begin/end points.

As an alternate method of recalculation, you can manually adjust the [beginning point and/or rise and run values used for calculation](#)^[327] of the **Gann Grid** by clicking the right mouse button while the cursor is hovering over any of its lines and selecting *Properties* from the [contextual menu](#)^[326].

You can click the right mouse button while the cursor is hovering over the **Gann Grid** to access its [contextual menu](#)^[326] for additional functionality.

4.6.3.1 Contextual Menu



A **Gann Grid's contextual menu** contains the following commands:

Delete

This command deletes the selected Gann grid from the active chart window.

Delete All

This command deletes all Gann grids from the active chart window.

Properties

This command opens the Gann grid's [properties](#)^[327] window.

Set to Default

This command resets any custom properties currently used by the Gann grid back to their default values.

Add Comment

This command adds a [comment](#)^[243] and associates it specifically with the selected Gann grid.

4.6.3.2 Properties

Using the **Gann Grid's** properties, you can:

- Change the color, width, and style of the Gann lines
- Change the run of the Gann grid's base line (*the # of bars between the beginning and ending points used for calculation*)
- Change the rise of the Gann grid's base line (*the # of pips between the beginning and ending points used for calculation*)
- Change the beginning values (*price/date/time*) of the Gann grid's base line
- Choose to be alerted (*in real-time and/or when the bar closes*) if/when any Gann line is breached

Properties

Gann Grid

Color:

Width:

Style:

Run:

Rise:

Start Date:

Start Value:

Alert

Source:

Alert Timing:

Recurrency:

Condition:

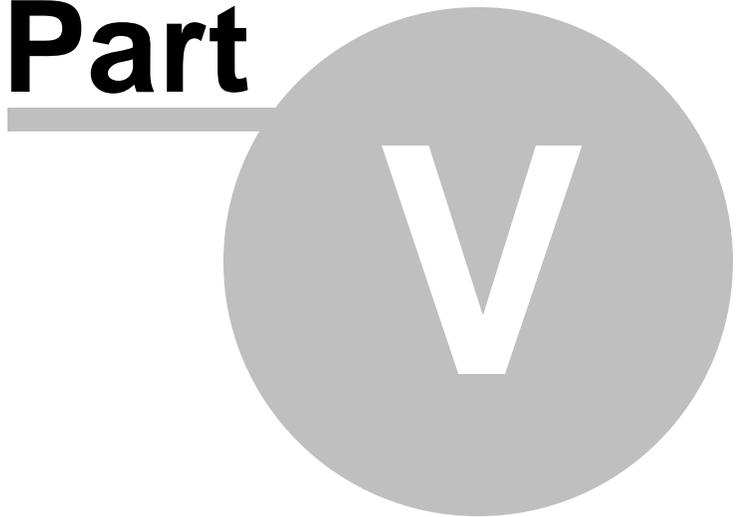
Sound:

Comment:

OK Cancel

VT Trader Scripting Language

Part



5 VT Trader Scripting Language

VT Trader's scripting language is simple, yet powerful. It enables you to create (*and/or edit*) custom indicators and trading systems using the [Indicators Builder](#)^[182] and/or [Trading Systems Builder](#)^[205]. It's extremely important that you take the time necessary to thoroughly read through this section of the help manual. It explains VT Trader's scripting language's basic structure and syntax, lexical elements, and instruction processing rules.

VT Trader's Scripting Language Structure

An indicator and/or trading system built with VT Trader's scripting language is constructed using one or more statements. Each statement consists of an output variable, the variable assignment (`:=`), followed by one or more logical expressions containing any combination of various [input variables](#)^[195], [output variables](#)^[200], other [scripting language elements](#)^[330] (*see below*), and ending with the statement terminator (`;`).

VT Trader's scripting language evaluates each statement in a formula script one time for each bar loaded into the chart window and continues to evaluate each statement one time per each new, incoming price tick. Statements in a formula script are evaluated starting from the first (*top*) statement and ending with the last (*bottom*) statement.

Important Notes:

* Each statement must be terminated by semicolon (`;`). Multiple lines of code will be treated as a single statement until the terminating semicolon (*allowing you to break apart long blocks of code into separate lines in the editor to increase your code's readability and clarity*).

* Variable names are not case-sensitive; for example, using *Periods* is the same as using *periods*. Variable names may include only letters and numbers. Use of the underscore (`_`) character is also allowed. Variable names may not include any spaces or begin with a number. Variables must not be the same name as any [existing function](#)^[334] or [reserved function](#)^[400], [constant](#)^[333], or [predefined data array](#)^[334]. Additionally, no [output variables](#)^[200] should have the same name as any [input variables](#)^[195] within the same formula script.

* When using fractional integers (*integers with decimal places*), if the whole number portion of the fractional integer is 0, the 0 must be included in the formula. For example, `.0030` is *incorrect*. `0.0030` is *correct*; if the initial 0 is not included VT Trader will not recognize and evaluate the fractional integer correctly.

Correct Statement Examples:

```
OutputVariable := Mov( C,12,E ) > Mov( C,26,E ) ;
OutputVariable1 := Mov( C,12,E ) ;
_OutputVariable := 26 ;
_OutputVariable_2 := (Mov( C,12,E ) > Mov( C,26,E )) AND C > ref(C,-1) ;
OutputVariable := abs(Mov( C,12,E ) - Mov( C,26,E )) > 0.0010 ;
```

Incorrect Statement Examples:

```

OutputVariable 1 = Mov( C,12,E ) > Mov( C,26,E ) ; {the variable's name
and the variable's assignment punctuator is incorrect}
2OutputVariable := Mov( C,12,E ) {the variable's name is incorrect and
the statement terminator is missing}
Close = 26 ; {Close is a predefined data array and the variable's
assignment punctuator is incorrect}
InputVariable := InputVariable ; {the output variable and input variable
cannot have same name}
OutputVariable := abs(Mov( C,12,E ) - Mov( C,26,E )) > .0010 ; {the
fractional integer .0010 must be specified as 0.0010}

```

VT Trader's Scripting Language Elements

The following elements help form the basis of VT Trader's scripting language:

- [Comments](#)^[330]
- [Punctuators \(Separators\)](#)^[331]
- [Operators](#)^[331]
- [Constants](#)^[333]
- [Pre-Defined Data Arrays](#)^[334]
- [Functions \(Identifiers\) - Alphabetical List](#)^[334]
- [Functions \(Identifiers\) - Reserved For Future Use](#)^[400]

To learn more about a particular element, please click on its name.

5.1 Comments

Comments are pieces of text used to annotate a formula script. **Comments** are for the programmer's use only; they are stripped from the source code before parsing.

VT Trader's scripting language supports two types of **comments**.

Multiple-line Comments are any sequence of characters placed inside a set of balanced brackets (*{ and }*). The comment terminates at the first occurrence of right bracket " } " following the initial left bracket " { ". *{ }* can also be used to define only certain text within a single line as a comment as well. However, comments delineated with a set of balanced brackets cannot be nested.

Single-line Comments are any sequence of characters placed after two adjacent slashes (*//*) in any position within a line of code and extending until the next new line. Comments delineated by two adjacent slashes (*//*) within a single line can be nested within comments delineated by a set of balanced brackets (*{ and }*). Comments delineated by two adjacent slashes (*//*) cannot be the last line of code in the formula script.

5.2 Punctuators

Punctuators (a.k.a. **Separators**) are used to maintain the basic syntax of VT Trader's scripting language. The available **punctuators** and their descriptions are defined in the table below.

PUNCTUATOR	DESCRIPTION
:=	Colon grouped with Equal sign; Variable Assignment
;	Semi-colon; Statement Terminator
,	Comma; Separates the parameters of a function argument list
()	Parentheses; Used to override normal order of precedence, group or isolate conditional expressions, and indicate function calls and function parameters

5.3 Operators

VT Trader's scripting language provides several **operators** that allow you to manipulate [functions](#)^[334] and values to create more complex expressions. The different types of **operators** available are:

- [Mathematical Operators](#)^[331]
- [Relational Operators](#)^[332]
- [Logical Operators](#)^[332]

Operators are always evaluated in a specific order. This order is called an *order of precedence*. Each type of operator has its own *order of precedence* within its group and each group has an overall *order of precedence*. The exact order of the overall *order of precedence* is [Logical Operators](#)^[332], then [Relational Operators](#)^[332], and lastly [Mathematical Operators](#)^[331].

Parentheses are always evaluated first so they can be used to control the operation precedence. This allows the user to bypass part of the *order of precedence* to perform the calculations within the parentheses first. However, the *order of precedence* is still enforced within the parentheses. If there are multiple sets of parentheses in use, operations within the innermost parentheses are evaluated first.

5.3.1 Mathematical Operators

Mathematical operators are used to perform specific mathematical computations. The available **mathematical operators** and their descriptions are defined in the table below.

SYMBOL	DESCRIPTION
+	Addition
-	Subtraction
*	Multiplication
/	Division

SYMBOL	DESCRIPTION
()	Parentheses

Mathematical operators are always evaluated in a specific order. The exact order is **P**arentheses, **M**ultiplication, **D**ivision, **A**ddition, and then **S**ubtraction. A common English expression used to remember this order is: **P**lease **M**y **D**ear **A**unt **S**ally.

Since parentheses are evaluated first, they can be used to control the operation precedence. This allows you to bypass part of the *order of precedence* to perform the calculations within the parentheses first. However, the *order of precedence* is still enforced within the parentheses.

If there is more than one instance of a particular type of mathematical operation (*i.e. more than one multiplication operation*) within a set of parentheses the respective operations are evaluated from left to right.

If there are multiple sets of parentheses in use, operations within the innermost parentheses are evaluated first.

5.3.2 Relational Operators

Relational operators are used to perform standard comparisons. The result of a comparison will always be **True** or **False** (*1 or 0 respectively*). The available **relational operators** are:

SYMBOL	DESCRIPTION
>	Greater Than
<	Less Than
>=	Greater Than or Equal To
<=	Less Than or Equal To
=	Equal To
<>	Not Equal To

Relational operators are always evaluated from left to right because they all have the same precedence. Parentheses can be used to further control the *order of precedence* when necessary.

5.3.3 Logical Operators

Logical operators (*a.k.a. Booleans*) are used to combine two true/false expressions. There are 3 **logical operators** available in VT Trader's scripting language: **AND**, **OR**, and **NOT**

AND is used when the result of both true/false expressions must be true.

OR is used when the result of either one or both of the two true/false expressions must be true.

NOT is used when you want the opposite value (*True or False*) of an expression.

The tables below define the resulting values when using **AND** and **OR**.

EXPRESSION 1	EXPRESSION 2	AND RESULT
True	True	True
True	False	False
False	True	False
False	False	False

EXPRESSION 1	EXPRESSION 2	OR RESULT
True	True	True
True	False	True
False	True	True
False	False	False

When using multiple **AND's**, **OR's**, and **NOT's** they are always evaluated in the order they appear, from left to right, because they all have the same precedence. Parentheses can be used to further control the *order of precedence* when necessary.

5.4 Constants

A **constant** is an predefined fixed value (*or programming calculation*) in VT Trader's scripting language that cannot be altered. The available **constants** and their descriptions are defined in the tables below.

GLOBAL	DESCRIPTION
Pi	3.1415926535897932385
NULL	Not Defined; Empty Variable

MOVING AVERAGE (MOV()) FUNCTION	DESCRIPTION
S	Simple moving average
W	Weighted moving average
E	Exponential moving average
SW	Sine Weighted moving average
TRI	Triangle moving average
EP	End Point moving average
VOL	Volume-Adjusted moving average

RATE OF CHANGE (ROC()) FUNCTION	DESCRIPTION
Points	Calculate ROC() ^[376] using points (<i>pips</i>) difference
Percent	Calculate ROC() ^[376] using percentage difference

5.5 Predefined Data Arrays

The following **Predefined Data Arrays** have been provided in VT Trader's scripting language. The **Predefined Data Arrays** can be referenced in [Functions](#)^[334] using either their *Full Name* or *Abbreviation*. Please note that data arrays are not case-sensitive (*i.e.*: *Open* is the same as *open*).

FULL NAME	ABBREVIATION	DESCRIPTION
Close	C	Close price
Open	O	Open price
High	H	High price
Low	L	Low price
Median Price	MP or MP()	$(High + Low) / 2$
Typical Price	TP or TP()	$(High + Low + Close) / 3$
Weighted Close	WC or WC()	$((Close * 2) + High + Low) / 4$
haClose	haC	Heikin-Ashi Close price
haOpen	haO	Heikin-Ashi Open price
haHigh	haH	Heikin-Ashi High price
haLow	haL	Heikin-Ashi Low price
Volume	V	# of incoming price ticks during bar
Prev	Prev	See PREV ^[374] function

5.6 Functions

At a basic level, **functions** are nothing more than a predefined, self-contained set of calculations that can be used in comparisons and calculations. Each **function** has a specified name and returns a value based on its underlying calculation routine. VT Trader's scripting language includes a large number of built-in **functions** ranging from simple price calculations and indicators to specifically-designed **functions** used in conjunction with technical analysis.

The following alphabetical list of functions are available for use in VT Trader's scripting language:

A

[Absolute Value](#)^[338]
[Arc Tangent](#)^[339]
[Aroon Down](#)^[339]
[Aroon Up](#)^[340]
[Average True Range](#)^[340]

B

[Bar Count](#)^[341]
[Bar Index](#)^[341]
[Bars Since](#)^[342]
[Bollinger Band](#)^[343]
[Bollinger Band Bottom](#)^[342]
[Bollinger Band Top](#)^[342]
[Buy Position Count](#)^[344]

C

[Ceiling](#)^[344]
[Commodity Channel Index](#)^[345]
[Cosine](#)^[346]
[Cross](#)^[346]
[Cumulate](#)^[348]

D

[Day Of Month](#)^[348]
[Day Of Week](#)^[349]
[Detrended Price Oscillator](#)^[349]

E

[Error](#)^[350]
[Event Count](#)^[351]
[Exponent](#)^[354]

F

[Floor](#)^[355]
[Fraction](#)^[355]

G

[Gap Down](#)^[356]
[Gap Up](#)^[356]

H

[Highest](#)^[357]
[Highest Bars Ago](#)^[357]
[Highest High Value](#)^[358]
[Highest High Value Bars Ago](#)^[359]
[Highest Since](#)^[359]
[Highest Since Bars Ago](#)^[360]

I

[If \(\)](#)^[360]
[Inside](#)^[362]
[Integer](#)^[362]
[IsDefined](#)^[362]
[IsUndefined](#)^[363]

L

[Linear Regression Indicator](#)^[363]
[Linear Regression Slope](#)^[364]
[Logarithm](#)^[364]
[Lowest](#)^[364]
[Lowest Bars Ago](#)^[364]
[Lowest Low Value](#)^[365]
[Lowest Low Value Bars Ago](#)^[366]
[Lowest Since](#)^[366]
[Lowest Since Bars Ago](#)^[367]

M

[Mama](#)^[367]
[Maximum](#)^[368]
[Median Price](#)^[368]
[Midpoint](#)^[369]
[Minimum](#)^[369]
[Minute](#)^[369]
[Modulus](#)^[370]
[Month](#)^[370]
[Moving Average](#)^[371]

N

[Negative](#)^[371]

O

[Outside](#)^[371]

P

[Parabolic SAR](#)^[372]
[Peak Value](#)^[373]
[Position Count](#)^[373]
[Power](#)^[373]

[Precision](#)^[374]

R

[Rally](#)^[376]

[Random](#)^[376]

[Rate of Change](#)^[376]

[Reaction](#)^[377]

[Reference](#)^[377]

[Relative Strength Index \(RSI\)](#)^[379]

[Round](#)^[379]

S

[Sell Position Count](#)^[379]

[Signal Flag](#)^[380]

[Signal Hold](#)^[382]

[Signal Remove](#)^[384]

[Signal Remove Span](#)^[387]

[Sine](#)^[389]

[Square Root](#)^[389]

[Standard Deviation](#)^[389]

[Standard Error](#)^[390]

[Stochastic Momentum Index](#)^[390]

[Stochastic Oscillator](#)^[391]

[Summation](#)^[392]

[Symbol Digits](#)^[392]

[Symbol Point](#)^[394]

T

[Typical Price](#)^[397]

U

[Ultimate Oscillator](#)^[397]

V

[Value When](#)^[398]

[Vertical Horizontal Filter](#)^[398]

W

[Weighted Close](#)^[399]

[Williams %R](#)^[399]

Y

[Year](#)^[400]

Z



5.6.1 Absolute Value

Absolute Value

abs (DATA ARRAY)

The function calculates the *Absolute Value* of the *DATA ARRAY*.



The formula `abs (-12)` will return +12;
The formula `abs (12)` will also return +12.

5.6.2 Account Status

Account Status

* This function is not and never has been officially supported

** It is strongly recommended to use any of the `PositionCount()`, `BuyPositionCount()`, and/or `SellPositionCount()` functions instead of the `AccountStatus()` function.

AccountStatus ()

This function returns one of four possible constants for any given tick (*i.e. incoming price*):

No_Position_Active, **Buy_Position_Active**, **Sell_Position_Active**, or **Both_Position_Active**. For this reason, it is strongly advised that `AccountStatus()` not be used in trading systems that operate on the premise of "always in the market" (*i.e. when one position gets closed another position gets immediately opened in the opposing direction, etc.*).

No_Position_Active = This constant indicates that there are no open buy or sell positions in the instrument the trading system is attached to based on the trading system's assigned account.

Buy_Position_Active = This constant indicates that there is at least one open buy position in the instrument the trading system is attached to based on the trading system's assigned account.

Sell_Position_Active = This constant indicates that there is at least one open sell position in the instrument the trading system is attached to based on the trading system's assigned account.

Both_Position_Active = This constant indicates that there is at least one open buy position and at least one open sell position in the instrument the trading system is attached to based on the trading system's assigned account.



```
OpenBuy:= AccountStatus()=No_Position_Active AND cross(C,mov(C,10,S));
CloseBuy:= AccountStatus()=Buy_Position_Active AND cross(mov(C,10,S),C);
```

* Please note, in this example (*assuming OpenBuy and CloseBuy are logical variables and the trading*

system this code is included in is running in Auto-Trade mode), in order for AccountStatus() to function properly OpenBuy and CloseBuy cannot both equal true on the same price tick; if such a thing were to happen then only OpenBuy would be able to equal true and be able to execute its associated automated trading request because it is evaluated in the code before CloseBuy. If CloseBuy needed to execute its associated automated trading order on the same tick as OpenBuy it would not be able to because AccountStatus() cannot return No_Position_Active and Buy_Position_Active at the same time for that same tick.

5.6.3 Arc Tangent

Arc Tangent

atan (Y DATA ARRAY, X DATA ARRAY)

The function returns the *Arc Tangent* of Y/X.
The value is returned in degrees from 0 to 359.9.

Also acceptable is...

atan (DATA ARRAY)

The function returns the *Arc Tangent* of DATA ARRAY.
The value is returned in radians from -Pi/2 to Pi/2.

For translation to degrees in a range of -90 to +90 it is necessary to use:

```
Out := ATAN(DATA ARRAY) * 180/Pi;
{where Pi is global constant 3.1415926535897932385}
```

5.6.4 Aroon Down

Aroon Down

AroonDown (DATA ARRAY, PERIODS)

Calculates the *Aroon Down* component of the Aroon Indicator. Use of the DATA ARRAY parameter is only necessary if the user wishes to substitute a DATA ARRAY other than the Low price for the calculations. Otherwise, it is acceptable to use the **AroonDown()** function without including it such as:

AroonDown (PERIODS)



The function **AroonDown (DATA ARRAY, PERIODS)** calculates the *Aroon Down* component of the Aroon Indicator by formula:

```
{Aroon Down component of the Aroon Indicator}
_AroonDown := ((PERIODS - LLVBars(DATA ARRAY, PERIODS+1)) / PERIODS) * 100;
{end}
```

The function `AroonDown(Low, 14)` calculates the *Aroon Down* component of the Aroon Indicator over 14 periods.

5.6.5 Aroon Up

Aroon Up

AroonUp (DATA ARRAY, PERIODS)

Calculates the *Aroon Up* component of the Aroon Indicator. Use of the *DATA ARRAY* parameter is only necessary if the user wishes to substitute a *DATA ARRAY* other than the *High* price for the calculations. Otherwise, it is acceptable to use the `AroonUp()` function without including it such as:

AroonUp (PERIODS)



The function `AroonUp(DATA ARRAY, PERIODS)` calculates the *Aroon Up* component of the Aroon Indicator by formula:

```
{Aroon Down component of the Aroon Indicator}
_AroonUp := ((PERIODS - HHVBars(DATA ARRAY, PERIODS+1)) / PERIODS) * 100;
{end}
```

The function `AroonUp(High, 14)` calculates the *Aroon Up* component of the Aroon Indicator over 14 periods.

5.6.6 Average True Range

Average True Range

atr (PERIODS)

This function calculates the predefined *Average True Range (ATR)* indicator.



The function `ATR(PERIODS)` calculates the *Average True Range (ATR)* indicator by formula:

```
{Average True Range (ATR)}
TH:= If(Ref(Close,-1) > High, Ref(Close,-1), High);
TL:= If(Ref(Close,-1) < Low, Ref(Close,-1), Low);
TR:= TH-TL;
_ATR:= mov(TR, PERIODS, S);
{end}
```

The formula `atr(20)` calculates the *Average True Range (ATR)* indicator over 20 *periods*.

5.6.7 Bar Count

Bar Count

BarCount()

This function returns the total number of bars loaded in the chart previous to (*and including*) any given bar. Stated more simply, this function assigns a numerical value to each bar in the chart starting with the first (*left most*) bar and assigning it the number 1 and then incrementing the count by +1 for each additional bar loaded in the chart.



By example, the formula:

```
Out := BarCount();
```

can also be written as...

```
Out := cum(1);
```

However, the `BarCount()` function processes much faster than `cum(1)` when included in an indicator or trading system since it is an internal function.

5.6.8 Bar Index

Bar Index

BarIndex()

`BarIndex()` returns **zero-based** bar numbers. This function returns the total number of bars loaded in the chart previous to (*and including*) any given bar. Stated more simply, this function assigns a numerical value to each bar in the chart starting with the first (*left most*) bar and assigning it the number 0 and then incrementing the count by +1 for each additional bar loaded in the chart.



By example, the formula:

```
Out := BarIndex();
```

can also be written as...

```
Out := cum(1) - 1;
```

or...

```
Out := if (prev(null)=null, 0, ref (BarCount(), -1));
```

However, the `BarIndex()` function processes much faster than `cum(1)-1` when included in an indicator or trading system since it is an internal function.

5.6.9 Bars Since

Bars Since

BarsSince (DATA ARRAY)

This function calculates the number of bars (*time periods*) that have passed since *DATA ARRAY* was *true*.



The formula `BarsSince (RSI (14) > 50)` will return the value equal to the number of periods (*bars*) that have passed since the 14-period RSI was greater than 50. The value is calculated using all data loaded in the chart.

5.6.10 Bollinger Bands (Bottom Band)

Bollinger Bands (Bottom Band)

BBandBot (DATA ARRAY, PERIODS, METHOD, DEVIATIONS)

This function calculates the *Bottom Bollinger Band* component of the Bollinger Bands indicator of *DATA ARRAY* using *METHOD* calculation method and shifted downwards *DEVIATIONS* standard deviations.

Valid methods are *SIMPLE*, *WEIGHTED*, *EXPONENTIAL*, *SINE WEIGHTED*, *TRIANGLE*, *END POINT*, and *VOLUME-ADJUSTED* (Abbreviated respectively as *S*, *W*, *E*, *SW*, *TRI*, *EP*, and *VOL*).



The formula `BBandBot (close, 20, s, 2)` calculates the *Bottom Bollinger Band* of Close prices over 20 *PERIODS* using the *SIMPLE* method and shifted 2 *DEVIATIONS* downwards.

5.6.11 Bollinger Bands (Top Band)

Bollinger Bands (Top Band)

BBandTop (DATA ARRAY, PERIODS, METHOD, DEVIATIONS)

This function calculates the *Top Bollinger Band* component of the Bollinger Bands indicator of *DATA ARRAY* using *METHOD* calculation method and shifted upwards *DEVIATIONS* standard deviations.

Valid methods are *SIMPLE*, *WEIGHTED*, *EXPONENTIAL*, *SINE WEIGHTED*, *TRIANGLE*, *END POINT*, and *VOLUME-ADJUSTED* (Abbreviated respectively as *S*, *W*, *E*, *SW*, *TRI*, *EP*, and *VOL*).



The formula `BBandTop(close, 20, s, 2)` calculates the *Top Bollinger Band* of *Close* prices over 20 *PERIODS* using the *SIMPLE* method and shifted 2 *DEVIATIONS* upwards.

5.6.12 Bollinger Bands

Bollinger Bands

BBands (*DATA_ARRAY*, *PERIODS*, *METHOD*, *DEVIATIONS*, *SWITCH*)

This function calculates the [Bottom Bollinger Band](#)^[342] and [Top Bollinger Band](#)^[342] components of the Bollinger Bands indicator of *DATA ARRAY* using *METHOD* calculation method and shifted upwards or downwards *DEVIATIONS* standard deviations based on *SWITCH*.

Valid *METHODs* are *SIMPLE*, *WEIGHTED*, *EXPONENTIAL*, *SINE WEIGHTED*, *TRIANGLE*, *END POINT*, and *VOLUME-ADJUSTED* (Abbreviated respectively as *S*, *W*, *E*, *SW*, *TRI*, *EP*, and *VOL*).

SWITCH=0 calculates the Top Bollinger Band. *SWITCH=1* calculates the Bottom Bollinger Band.



The function `BBands(DATA_ARRAY, PERIODS, METHOD, DEVIATIONS, 0)` calculates the [Top Bollinger Band](#)^[342] component of the Bollinger Bands indicator.

```
TopBollingerBand := BBands(DATA_ARRAY, PERIODS, METHOD, DEVIATIONS, 0);
```

The function `BBands(DATA_ARRAY, PERIODS, METHOD, DEVIATIONS, 1)` calculates the [Bottom Bollinger Band](#)^[342] component of the Bollinger Bands indicator.

```
BottomBollingerBand := BBands(DATA_ARRAY, PERIODS, METHOD, DEVIATIONS, 1);
```



The formula `BBands(Close, 20, s, 2, 0)` calculates a the [Top Bollinger Band](#)^[342] of the *Close* prices over 20 *periods* using the *Simple method* shifted 2 *deviations* upwards.

The formula `BBands(Close, 20, s, 2, 1)` calculates a the [Bottom Bollinger Band](#)^[342] of the *Close* prices over 20 *periods* using the *Simple method* shifted 2 *deviations* downwards.



The top and bottom Bollinger Bands can be calculated using the **BBands()** function as such:

```
{Bollinger Bands}

{The middle band is a n-period simple moving average}
MiddleBollingerBand:= mov(Close, PERIODS, S);

{Calculates the Bottom Bollinger Band and Top Bollinger Band components}
TopBollingerBand:= BBands(Close, 20, S, 2, 0);
BottomBollingerBand:= BBands(Close, 20, S, 2, 1);

{end}
```

It is also acceptable to use the **stdev()** function to calculate the top and bottom Bollinger Bands as such:

```
{Bollinger Bands}

{The middle band is a n-period simple moving average}
MiddleBollingerBand:= mov(Close, PERIODS, S);

{Calculates the Bottom Bollinger Band and Top Bollinger Band components}
TopBollingerBand:= MiddleBollingerBand + ( 2 * stdev(Close,PERIODS));
BottomBollingerBand:= MiddleBollingerBand - ( 2 * stdev(Close,PERIODS));

{end}
```

5.6.13 Buy Position Count

Buy Position Count

BuyPositionCount ()

This function returns the number of open buy positions in the instrument that the trading system is attached to based on the trading system's assigned account. This function's output is updated one time per incoming price tick.

5.6.14 Ceiling

Ceiling

ceiling (DATA ARRAY)

Calculates the lowest integer that is greater than *DATA ARRAY*.



The formula `ceiling(9.2)` returns 10.
 The formula `ceiling(-9.2)` returns -9.

5.6.15 Commodity Channel Index

Commodity Channel Index (CCI)

cci (*DATA ARRAY*, *PERIODS*)

Calculates the *PERIODS* Commodity Channel Index (CCI) of *DATA ARRAY*. This function calculates the predefined CCI indicator according to Donald Lambert's original formula logic. Use of the *DATA ARRAY* parameter is only necessary if the user wishes to substitute a *DATA ARRAY* other than *Typical Price* (*TP()*) for the calculations. Otherwise, it is acceptable to use the **cci()** function without including it such as:

cci (*PERIODS*)



The function **CCI**(*DATA ARRAY*, *PERIODS*) calculates a 20-Periods CCI Indicator by formula:

```
{ Typical Price }
vTp := (H + L + C) / 3;
```

```
{ Simple Moving Average of the Typical Price }
vTpma := Mov(vTp, 20, S);
```

```
{Due to VTrader's lack of loop structures in its
programming language, the loop statement to find
Mean Deviation must be written out explicitly}
```

```
{ Mean Deviation }
vMd20 := (Abs(vTpma - vTp)
+ Abs(vTpma - Ref(vTp, -1))
+ Abs(vTpma - Ref(vTp, -2))
+ Abs(vTpma - Ref(vTp, -3))
+ Abs(vTpma - Ref(vTp, -4))
+ Abs(vTpma - Ref(vTp, -5))
+ Abs(vTpma - Ref(vTp, -6))
+ Abs(vTpma - Ref(vTp, -7))
+ Abs(vTpma - Ref(vTp, -8))
+ Abs(vTpma - Ref(vTp, -9))
+ Abs(vTpma - Ref(vTp, -10))
+ Abs(vTpma - Ref(vTp, -11))
+ Abs(vTpma - Ref(vTp, -12))
+ Abs(vTpma - Ref(vTp, -13))
+ Abs(vTpma - Ref(vTp, -14))
+ Abs(vTpma - Ref(vTp, -15))
```

```

+ Abs(vTpma - Ref(vTp, -16))
+ Abs(vTpma - Ref(vTp, -17))
+ Abs(vTpma - Ref(vTp, -18))
+ Abs(vTpma - Ref(vTp, -19)) / 20;

{ CCI value and output CCI on chart }
vCCI := (vTp - vTpma) / (0.015 * vMd20);

```

5.6.16 Cosine

Cosine

cos(DATA ARRAY)

This function calculates the *Cosine* of *DATA ARRAY*. It assumes the *DATA ARRAY* value is given in degrees.



The formula **cos**(0) returns 1.
The formula **cos**(Close) returns the *Cosine* of the *Close* price in degrees.

5.6.17 Cross

Cross

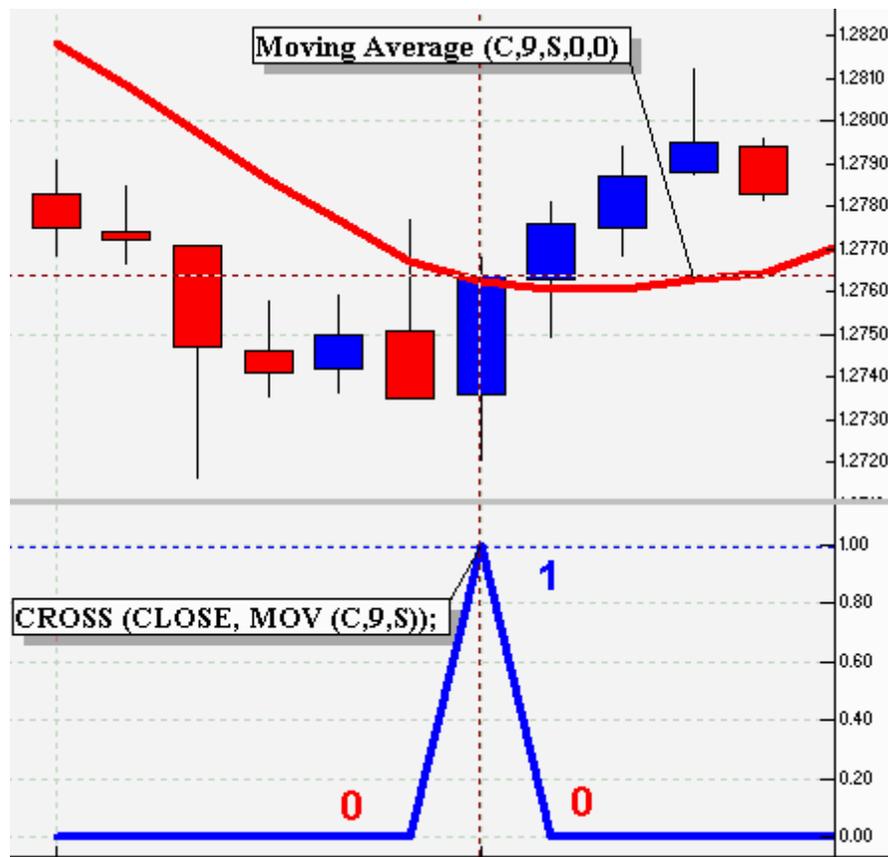
cross(DATA_ARRAY_1, DATA_ARRAY_2)

Returns +1 when *DATA_ARRAY_1* crosses above *DATA_ARRAY_2*. Otherwise, 0 is returned. If it is required to know when *DATA_ARRAY_1* crosses below *DATA_ARRAY_2*, use the formula:

cross(DATA_ARRAY_2, DATA_ARRAY_1)



The formula **cross**(Close, mov(Close, 9, S)) returns +1 only for the specific bar interval when the *Close* price crosses above the Moving Average. For all other bars – if and until the next crossover in this direction (above) the formula **cross**(Close, mov(Close, 9, S)) returns 0.



To monitor when the *Close* price crosses below the Moving Average, the formula `CROSS (MOV (Close, 9, S), Close)` should be used. It returns +1 only for the specific bar interval when the *Close* price crosses below the Moving Average. For all other bars – if and until the next crossover in this direction (below) the formula `CROSS (MOV (Close, 9, S), Close)` returns 0.



The main difference in using the `CROSS ()` function versus making comparisons using [Relational Operators](#)^[332] (such as `>` or `<`, etc.) is that the condition being evaluated using [Relational Operators](#)^[332] returns +1 as long as the condition remains *true*.

For example, the formula `Close > MOV (Close, 9, S)` is *true* (shown as the thick blue line in the screenshot below) and returns +1 for every bar that the condition remains *true*. For all other bars when the formula `Close > MOV (Close, 9, S)` condition is *false*, 0 is returned.



5.6.18 Cumulate

Cumulate

`cum (DATA ARRAY)`

Calculates a *Cumulative Sum* of *DATA ARRAY* beginning from the first period in the chart.



The formula `cum (1)` calculates an indicator that rises one point for each bar since the beginning of the chart.

The formula `cum (Close)` calculates the cumulative total of all closing prices from the beginning of the chart.

5.6.19 Day Of Month

Day Of Month

`DayOfMonth ()`

Plots the numerical day of the month.



If today was *July 15th*, 15 would be plotted.

5.6.20 Day Of Week

Day Of Week

DayOfWeek ()

Plots a numerical value corresponding to each day of the week.

1 = Monday
2 = Tuesday
3 = Wednesday
4 = Thursday
5 = Friday
6 = Saturday
7 = Sunday

Each new days begins at 00:00 Eastern Standard Time (*12:00 A.M. Midnight*).



For example, to create a simple indicator that will plot +1 for each price bar shown during Monday use the formula:

```
TodayIsMonday := DayOfWeek () = 1 ;
```

Also acceptable is:

```
TodayIsMonday := if (DayOfWeek () = 1, 1, 0) ;  
{Note: if a condition will always evaluate to true (1) or false (0)  
it is not necessary to use the If() function - it is assumed.}
```

5.6.21 Detrended Price Oscillator

Detrended Price Oscillator

dpo (PERIODS)

This function calculates the predefined *Detrended Price Oscillator*.



The function `dpo` (PERIODS) calculates the *Detrended Price Oscillator* by formula:

```
{Detrended Price Oscillator}
_DPO:= Close - ref(mov(Close,PERIODS,S),-(PERIODS/2+1));
{end}
```

5.6.22 Error

Error

error (CONDITION, ' MESSAGE ')

This function executes an immediate program stop. **VT Trader** shows a popup window containing the *MESSAGE* (in signal quote marks) if *CONDITION* is *true*. The Indicator Label also shows a "red circled, exclamation point" icon (see screenshot below) next to it until the condition creating the **Error** has been resolved.



As an example, create a simple indicator with the following formula:

```
_Error:= error(1<3,'1 is less than 3');
```

The result of attempting to add this indicator to a chart can be seen in the screenshots below...





5.6.23 Event Count

Event Count

EventCount ('Logical Variable')

This function calculates the number of *true* states of the *Logical Variable* only from the moment the trading system is started in **Auto-Trade Mode** until such time as it is stopped. The main purpose of the `EventCount ()` function is to allow the user to better manage the number of automated trading actions taken by the trading system with respect to each of its *Logical Variables* in use.

A *Logical Variable* is defined as any [output variable](#)^[227] within a trading system that has a checkmark next to the [Trading enabled](#)^[223] option in its respective [Name tab](#)^[223]. A *Logical Variable* can exist only in two states - true (1) or false (0). For example, if a certain condition determines the *Logical Variable* 'A' such as:

```
A:= cross(Close,mov(Close,13,S));
```

Then `EventCount ('A')` will calculate the number of times the *Close* price crosses above the *Moving Average* starting from the point in time when the trading system was started in **Auto-Trade Mode**.



Please note the following:

- 1) After the trading system's **Auto-Trade Mode** has been stopped the value of *EventCount*

('Logical Variable') resets to 0.

- 2) If **VT Trader** experiences a temporary disconnection and then reconnects, the value of *EventCount* ('Logical Variable') is saved and restored to its previous value before the disconnection happened.
- 3) If **VT Trader** experiences an abrupt exit or shutdown (such as a loss of power, PC crash, PC reboot, etc.) and **VT Trader** was not properly shutdown, the value of *EventCount* ('Logical Variable') will be reset to 0 after **VT Trader** is restarted, the trading system re-attached to the chart, and then restarted in **Auto-Trade Mode**.



It's easiest to understand how **EventCount** () functions by working step-by-step through a practical implementation of its functionality.

In the screenshot below two conditions have been specified...

```
Long:= cross(Close,mov(Close,13,S); {Shown as Blue Arrow graphic}
Short:= cross(mov(Close,13,S),Close); {Shown as Red Arrow graphic}
* (please refer to the cross\(\)346 function if you require clarification on how it works)
```



Next, define the *Logical Variables* responsible for opening and closing market order BUY trades...

* Refer to the [Trading tab](#)²³² for each respective *Logical Variable* to ensure proper setup for requesting the correct automated trading market order type (*BUY* or *SELL*).

```
OpenBuy:= Long and (EventCount('OpenBuy') = EventCount('CloseBuy'));
```

```
CloseBuy:= Short and (EventCount('OpenBuy') > EventCount('CloseBuy'));
```

Let's assume `OpenBuy` will be used to request a BUY market order to initiate a long position in the market, while `CloseBuy` will be used to request a SELL market order to close the existing long position originally initiated by `OpenBuy`. When the trading system is started in **Auto-Trade Mode** `EventCount('OpenBuy')` and `EventCount('CloseBuy')` are equal to 0.

The value of *Logical Variable* '`OpenBuy`' will become equal to +1 if the condition defined for the `Long` variable is *true* and the number of actions for `EventCount('OpenBuy')` in the `OpenBuy` condition is equal to the number of actions for `EventCount('CloseBuy')` in the `CloseBuy` condition.

The value of *Logical Variable* '`CloseBuy`' will become equal to +1 if the condition defined for the `Short` variable is *true* and the number of actions for `EventCount('OpenBuy')` in the `OpenBuy` condition is greater than the number of actions for `EventCount('CloseBuy')` in the `CloseBuy` condition. If the `EventCount('OpenBuy')` value is greater than the `EventCount('CloseBuy')` value it is assumed that a long trade was initiated previously by `OpenBuy` and it is necessary to initiate a SELL market order to close the existing long trade.

Lastly, define the *Logical Variables* responsible for opening and closing market order SELL trades...

* Refer to the [Trading tab](#)²³² for each respective *Logical Variable* to ensure it's setup to properly request the correct automated trading order type.

```
OpenSell:= Short and (EventCount('OpenSell') = EventCount('CloseSell'));
CloseSell:= Long and (EventCount('OpenSell') > EventCount('CloseSell'));
```

Let's assume `OpenSell` will be used to request a SELL market order to initiate a short position in the market, while `CloseSell` will be used to request a BUY market order to close the existing short position originally initiated by `OpenSell`. When the trading system is started in **Auto-Trade Mode** `EventCount('OpenSell')` and `EventCount('CloseSell')` are equal to 0.

The value of *Logical Variable* '`OpenSell`' will become equal to +1 if the condition defined for the `Short` variable is *true* and the number of actions for `EventCount('OpenSell')` in the `OpenSell` condition is equal to the number of actions for `EventCount('CloseSell')` in the `CloseSell` condition.

The value of *Logical Variable* '`CloseSell`' will become equal to +1 if the condition defined for the `Long` variable is *true* and the number of actions for `EventCount('OpenSell')` in the `OpenSell` condition is greater than the number of actions for `EventCount('CloseSell')` in the `CloseSell` condition. If the `EventCount('OpenSell')` value is greater than the `EventCount('CloseSell')` value it is assumed that a short trade was initiated previously by `OpenSell` and it is necessary to initiate a BUY market order to close the existing short trade.



It's recommended that when constructing a trading system using *Logical Variables* for auto-trading functionality to follow a simple trading system template:

```
{START SAMPLE TRADING SYSTEM TEMPLATE}

{Preliminary calculations for the trading system...
this would include indicators that will be used, etc.}
```

```

{We'll create 2 moving averages for this sample trading system}

Output1:= close;
Output2:= mov(close,13,S);

{Define the conditions for Long and Short trading signals}
{Again, we'll build from our sample output variables
to create a simple price & moving average crossover system}

Long:= Cross(Output1,Output2);
Short:= Cross(Output2,Output1);

{Define Logical Output Variables for Auto-Trading functionality}
{OpenBuy and CloseBuy control opening and closing BUY trades}

OpenBuy:= Long and (EventCount('OpenBuy') = EventCount('CloseBuy'));
CloseBuy:= Short and (EventCount('OpenBuy') > EventCount('CloseBuy'));

{OpenSell and CloseSell control opening and closing SELL trades}

OpenSell:= Short and (EventCount('OpenSell') = EventCount('CloseSell'));
CloseSell:= Long and (EventCount('OpenSell') > EventCount('CloseSell'));

{END SAMPLE TRADING SYSTEM TEMPLATE}

```

5.6.24 Exponent

Exponent

exp (DATA ARRAY)

This function calculates **e** raised to the *DATA ARRAY* power.

Exponent is the same as the *Exponential Function* $o = e^x$.

The constant **e** is the base of the [natural logarithm](#)^[364]. With the possible exception of [Pi](#)^[333], **e** is the most important constant in mathematics.

e = 2.7183 in **VT Trader**; however, **e**'s actual value =
2.718281828459045235360287471352662497757 ...



The formula `exp(1)` returns 2.7183.
This formula `exp(5)` returns 148.4132.

5.6.25 FAMA

FAMA

Fama (DATA ARRAY, ALPHA MAXIMUM LIMIT, ALPHA MINIMUM LIMIT)

This function calculates the predefined *Following Adaptive Moving Average* (developed by John Ehlers) of *DATA ARRAY*. According to John Ehler's literature, the *alpha* value in **FAMA** is allowed to range between a maximum and a minimum value. The suggested *ALPHA MAXIMUM LIMIT* = 0.5 and the suggested *ALPHA MINIMUM LIMIT* = 0.05.

The *Following Adaptive Moving Average* is actually a *MESA Adaptive Moving Average* calculated using one-half the alpha value of [MAMA](#)^[367]. This allows the *Following Adaptive Moving Average* to have steps in time synchronization with the *MESA Adaptive Moving Average (MAMA)*, but with less vertical movement.



The formula `fama(Close, 0.5, 0.05)` calculates the *Following Adaptive Moving Average* applied to *Close* prices using the suggested default values.

5.6.26 Floor

Floor

floor (DATA ARRAY)

This function calculates the highest integer that is less than *DATA ARRAY*.



The formula `floor(17.8)` returns 17.
The formula `floor(-17.8)` returns -18.

5.6.27 Fraction

Fraction

frac (DATA ARRAY)

Eliminates the integer portion of *DATA ARRAY* and returns the fractional part.



The formula `frac(12.7)` returns 0.7.
The formula `frac(-12.7)` returns -0.7.

5.6.28 Gap Down

Gap Down

GapDown ()

Returns a +1 value on the current bar of the instrument when its price *Gaps Down*. Otherwise, 0 is returned.



A **Gap Down** occurs if previous *Low* value is greater than the current *High* value.



5.6.29 Gap Up

Gap Up

GapUp ()

Returns a +1 value on the current bar of the instrument when its price *Gaps Up*. Otherwise, 0 is returned.



A **Gap Up** occurs if previous *High* value is less than the current *Low* value.



5.6.30 Highest

Highest

highest (DATA ARRAY)

This function calculates the highest value in the *DATA ARRAY* since the first value loaded in the chart.



The formula `highest(Close)` returns the highest *Close* price since the first value loaded in the chart.

5.6.31 Highest Bars Ago

Highest Bars Ago

HighestBars (DATA ARRAY)

This function calculates the number of periods that have passed since the *DATA ARRAY*'s highest value. This includes all data loaded in the chart.



The formula `HighestBars(Close)` returns the number of periods that have passed since the *Close* price reached its highest value.

5.6.32 Highest High Value

Highest High Value

hhv (*DATA ARRAY*, *PERIODS*)

This function calculates the highest value in the *DATA ARRAY* over the preceding *PERIODS*. It's important to note that *PERIODS* includes the current period.



The formula `hhv(Close, 5)` returns the highest *Close* price over the preceding five periods.

A common request for using this function is determining a price channel breakout. Because `hhv()` includes the current period's value in its calculations, in order to create a condition to determine a channel breakout using the previous *n-PERIODS* to create the channel the `ref()` function must be used. The `ref()` function allows the comparison of the current period's *DATA ARRAY* value to its value *n-PERIODS* ago. In this case, we need to reference 1 bar ago.

For example: Let's create a 10-periods *High* price channel and a simple indicator that will plot +1 when the current *Close* price crosses above the price channel and plot 0 at any other time.

```
{Create a price channel using the previous 10 bars,
not including the current bar}
HighPriceChannelLevel := ref(hhv(High, 10), -1);

{Create the condition to determine when the current
bar's Close price crosses above the HighPriceChannelLevel}
ChannelBreakOutUp := Cross(Close, HighPriceChannelLevel);
```

The results of the formula code above can be seen in the screenshot below. The 10-periods *High* price channel is the thick blue line in the price frame and the result of the condition in the `ChannelBreakOutUp` variable can be viewed in the additional frame below price frame. A blue arrow graphic has been shown under the price bar when the breakout occurred.



5.6.33 Highest High Value Bars Ago

Highest High Value Bars Ago

hhvbars (DATA ARRAY, PERIODS)

This function calculates the number of periods (*bars*) that have passed since *DATA ARRAY* reached its *PERIODS* period peak.



The formula `hhvbars(Close, 55)` returns the number of periods (*bars*) that have passed since the *Close* price reached its 55-period peak.

5.6.34 Highest Since

Highest Since

HighestSince (Nth, EXPRESSION, DATA ARRAY)

This function returns the highest value of *DATA ARRAY* since the *Nth* most recent occurrence of *EXPRESSION* being *true*.

This includes all data loaded in the chart.



The formula `HighestSince(2, Cross(Close,mov(Close,13,S)), Close)` returns highest value of the *Close* price since the second most recent occurrence of the *Close* price crossing above the 13-periods simple moving average.

5.6.35 Highest Since Bars Ago

Highest Since Bars Ago

HighestSinceBars (Nth, EXPRESSION, DATA ARRAY)

This function returns the number of periods that have passed from the highest value of *DATA ARRAY* since the *Nth* most recent occurrence of *EXPRESSION* being *true*.

This includes all data loaded in the chart.



The formula `HighestSinceBars(2, Cross(Close,mov(Close,13,S)), Close)` returns the number of periods that have passed since the highest value of the *Close* price since the second most recent occurrence of the *Close* price crossing above the 13-periods simple moving average.

5.6.36 Hour

Hour

hour ()

This function returns to the number of hours that have passed during the day using a 24-hour clock that starts each day at 00:00 (12:00 A.M. Midnight Eastern Standard Time).



If the current time is recorded as 10:17:27, the `hour ()` function will return 10.

5.6.37 IF()

If

if (DATA ARRAY > >= < <= <> = DATA ARRAY, THEN DATA ARRAY, ELSE DATA ARRAY)

`IF ()` is a conditional function that returns the second parameter (*THEN*) if the conditional expression

defined by the first parameter is true. Otherwise, the third parameter is returned (*ELSE*).



The formula `if(1 < 2, 3, 5)` will always return the value 3.

For example, the formula `if(Close > mov(Close, 9, S), 1, 0)` is *true* (shown as the thick blue line in the screenshot below) and returns +1 for every bar that the condition remains *true*. For all other bars when the formula `Close > mov(Close, 9, S)` condition is *false*, 0 is returned.



If it is implied that the resulting variable can only assume the value of *true* (1) or *false* (0), then the formula:

```
Variable:= if(Close > mov(Close,9,S), 1, 0);
```

... may be written as ...

```
Variable:= Close > mov(Close,9,S);
```

... where Variable may be equal only to 0 or 1.

5.6.38 Inside

Inside

inside ()

This function returns a +1 value whenever an *Inside* period occurs. It will continue to return this same +1 value until a [Rally](#)^[376], [Reaction](#)^[377], or [Outside](#)^[371] period occurs. For any period when **Inside** () is not equal to +1 it returns 0.



An *Inside* period occurs when the current *High* value is less than or equal to the previous [Rally](#)^[376] or [Reaction](#)^[377] value's *High* and the current *Low* is greater than or equal to the previous [Rally](#)^[376] or [Reaction](#)^[377] value's *Low*. A range is determined by the first *Inside* value and is only broken by a [Rally](#)^[376], [Reaction](#)^[377], or [Outside](#)^[371] value.

5.6.39 Integer

Integer

int (DATA ARRAY)

This function removes the fractional portion of *DATA ARRAY* and returns the *integer* part.



The formula `int (12.7)` returns 12.
The formula `int (-17.8)` returns -17.

5.6.40 IsDefined

IsDefined

IsDefined (DATA ARRAY)

This function returns 1 if all data necessary to calculate *DATA ARRAY* is available, otherwise it returns 0.



The formula `IsDefined(MA)` defined in the `Out` variable shown below:

```
MA := mov(C, 20, S);
Out := IsDefined(MA);
```

Returns 0 for the first 19 bars loading into the chart and then returns 1 beginning with the 20th bar and

for all future bars.

5.6.41 IsUndefined

IsUndefined

IsUndefined (DATA ARRAY)

This function returns 0 if all data necessary to calculate *DATA ARRAY* is available, otherwise it returns 1.



The formula `IsUndefined(MA)` defined in the `Out` variable shown below:

```
MA := mov(C, 20, S);
Out := IsUndefined(MA);
```

Returns 1 for the first 19 bars loading into the chart and then returns 0 beginning with the 20th bar and for all future bars.

5.6.42 Linear Regression Indicator

Linear Regression Indicator

linreg (DATA ARRAY, PERIODS)

This function calculates the predefined *Linear Regression Indicator*.



The function `LinReg(DATA ARRAY, PERIODS)` calculates the *Linear Regression Indicator* by formula:

```
{Linear Regression Indicator}
```

```
_LinReg := (PERIODS * Sum(Cum(1)*DATA ARRAY, PERIODS) - Sum(Cum(1), PERIODS)
* Sum(DATA ARRAY, PERIODS)) /
(PERIODS * Sum(Power(Cum(1), 2), PERIODS) - Power(Sum(Cum(1),
PERIODS), 2)) * Cum(1) +
(Mov(DATA ARRAY, PERIODS, S) - Mov(Cum(1), PERIODS, S) * (PERIODS*Sum
(Cum(1)*DATA ARRAY, PERIODS) -
Sum(Cum(1), PERIODS) * Sum(DATA ARRAY, PERIODS)) / (PERIODS * Sum(
Power(Cum(1), 2), PERIODS) -
Power(Sum(Cum(1), PERIODS), 2))));
```

{end}

The formula `Linreg(Close, 50)` calculates a 50-periods *Linear Regression indicator* of *Close* prices.

5.6.43 Linear Regression Slope

Linear Regression Slope

linregslope (DATA ARRAY, PERIODS)

This function calculates the predefined *Linear Regression Slope* indicator.



The formula `LinRegSlope(Close, 50)` calculates a 50-periods *Linear Regression Slope* of *Close* prices.

5.6.44 Logarithm

Logarithm (natural)

log (DATA ARRAY)

Calculates the natural logarithm of *DATA ARRAY*.



The formula `log(1)` will return 0.

The formula `log(12)` will return 2.4849.

5.6.45 Lowest

Lowest

lowest (DATA ARRAY)

This function calculates the lowest value in *DATA ARRAY* since the first value loaded in the chart.



The formula `lowest(Close)` returns the lowest *Close* price value since the first value loaded in the chart.

5.6.46 Lowest Bars Ago

Lowest Bars Ago

LowestBars (DATA ARRAY)

This function calculates the number of periods that have passed since the *DATA ARRAY*'s lowest value. This includes all data loaded in the chart.



The formula `LowestBars(Close)` returns the number of periods that have passed since the *Close* price reached its lowest value.

5.6.47 Lowest Low Value**Lowest Low Value****llv (DATA ARRAY, PERIODS)**

This function calculates the lowest value in the *DATA ARRAY* over the preceding *PERIODS*. It's important to note that *PERIODS* includes the current period.



The formula `llv(Close,5)` returns the lowest *Close* price over the preceding five periods.

A common request for using this function is determining a price channel breakout. Because `llv()` includes the current period's value in its calculations, in order to create a condition to determine a channel breakout using the previous *n-PERIODS* to create the channel the `ref()` function must be used. The `ref()` function allows the comparison of the current period's *DATA ARRAY* value to its value *n-PERIODS* ago. In this case, we need to reference 1 bar ago.

For example: Let's create a 10-periods *Lowprice* channel and a simple indicator that will plot +1 when the current *Close* price crosses below the price channel and plot 0 at any other time.

```
{Create a price channel using the previous 10 bars,
not including the current bar}
LowPriceChannelLevel:= ref(llv(Low,10),-1);

{Create the condition to determine when the current
bar's Close price crosses above the HighPriceChannelLevel}
ChannelBreakOutDown:= Cross(LowPriceChannelLevel,Close);
```

The results of the formula code above can be seen in the screenshot below. The 10-periods *Lowprice* channel is the thick red line in the price frame and the result of the condition in the `ChannelBreakOutDown` variable can be viewed in the additional frame below price frame. A red arrow graphic has been shown above the price bar when the breakout occurred.



5.6.48 Lowest Low Value Bars Ago

Lowest Low Value Bars Ago

llvbars (DATA ARRAY, PERIODS)

This function calculates the number of periods (*bars*) that have passed since *DATA ARRAY* reached its *PERIODS* period trough.



The formula `llvbars(Close, 55)` returns the number of periods (*bars*) that have passed since the *Close* price reached its 55-period trough.

5.6.49 Lowest Since

Lowest Since

LowestSince (Nth, EXPRESSION, DATA ARRAY)

This function returns the lowest value of *DATA ARRAY* since the *Nth* most recent occurrence of *EXPRESSION* being *true*.

This includes all data loaded in the chart.



The formula `LowestSince(2, Cross(Close, mov(Close, 13, S)), Close)` returns lowest value of the *Close* price since the second most recent occurrence of the *Close* price crossing above the 13-periods simple moving average.

5.6.50 Lowest Since Bars Ago

Lowest Since Bars Ago

LowestSinceBars (Nth, EXPRESSION, DATA ARRAY)

This function returns the number of periods that have passed from the lowest value of *DATA ARRAY* since the *Nth* most recent occurrence of *EXPRESSION* being *true*.

This includes all data loaded in the chart.



The formula `LowestSinceBars(2, Cross(Close, mov(Close, 13, S)), Close)` returns the number of periods that have passed since the lowest value of the *Close* price since the second most recent occurrence of the *Close* price crossing above the 13-periods simple moving average.

5.6.51 MACD

MACD

MACD (DATA_ARRAY, FAST_EMA_PERIODS, SLOW_EMA_PERIODS, SIGNAL_EMA_PERIODS)

This function returns the histogram portion of the Moving Average Convergence/Divergence (*MACD*) indicator. All parameters are optional; if a particular parameter is not defined in the **MACD()** function its default value will be applied.

The **MACD()** function's default parameter values are as follows:

```
DATA_ARRAY = Close
FAST_EMA_PERIODS = 12
SLOW_EMA_PERIODS = 26
SIGNAL_EMA_PERIODS = 9
```

5.6.52 MAMA

MAMA

Mama (DATA ARRAY, ALPHA MAXIMUM LIMIT, ALPHA MINIMUM LIMIT)

This function calculates the predefined *MESA Adaptive Moving Average* (developed by John Ehlers) of *DATA ARRAY*. According to John Ehler's literature, the *alpha* value in **MAMA** is allowed to range between a maximum and a minimum value. The suggested *ALPHA MAXIMUM LIMIT* = 0.5 and the suggested *ALPHA MINIMUM LIMIT* = 0.05.



The formula `mama(Close, 0.5, 0.05)` calculates the *MESA Adaptive Moving Average* applied to *Close* prices using the suggested default values.

5.6.53 Maximum**Maximum**

max (DATA_ARRAY_1, DATA_ARRAY_2)

This function returns the largest value of two parameters (*DATA_ARRAY_1* and *DATA_ARRAY_2*).



The formula `max(Close, mov(Close, 13, E))` returns the greater of the *Close* price or the *13-periods exponential moving average*.

The formula `max(-17, 13)` always returns 13.

5.6.54 Median Price**Median Price**

mp ()

This function calculates the predefined *Median Price* indicator.



The *Median Price* is calculated by adding the High price and the Low price together and then dividing by two. The result is the average, or median, price.

The function `mp()` calculates the *Median Price* by formula:

```
{Median Price Indicator}
_MedianPrice:= (High + Low) / 2;
{end}
```

5.6.55 Midpoint

Midpoint

mid (DATA ARRAY, PERIODS)

Returns the *midpoint* of the *DATA ARRAY* over the specified *PERIODS*. The midpoint is the value halfway between the highest and lowest *DATA ARRAY* values during the specified *PERIODS*.



The function `mid(DATA ARRAY, PERIODS)` is calculated by formula:

```
{Midpoint}
_Midpoint := llv(DATA ARRAY, PERIODS) + ((hmv(DATA ARRAY, PERIODS) - llv(DATA
ARRAY, PERIODS)) / 2);
{end}
```



The formula `mid(Close, 7)` is equivalent to `llv(Close, 7) + ((hmv(Close, 7) - llv(Close, 7)) / 2)`.

5.6.56 Minimum

Minimum

min (DATA_ARRAY_1, DATA_ARRAY_2)

This function returns the smallest value of two parameters (*DATA_ARRAY_1* and *DATA_ARRAY_2*).



The formula `min(Close, mov(Close, 13, E))` returns the smaller of the *Close* price or the *13-periods exponential moving average*.

The formula `min(-17, 13)` always returns -17.

5.6.57 Minute

Minute

minute ()

This function returns the value of the minute in a two-digit format.



If a bar had the date/time stamp of 02/17/2006, 13:44:00 (*Feb. 17th, 2006, 1:44 P.M. EST*), the `minute` () function would return 44.

5.6.58 Modulus

Modulus

mod (*DATA ARRAY_1*, *DATA ARRAY_2*)

Calculates the remainder (*i.e. the fractional portion*) of *DATA ARRAY_1* divided by *DATA ARRAY_2*. A division by zero produces a NULL result.



The formula `mod(10, 3)` returns 1.0.

The formula `mod(-10.7, 3)` returns -1.7.

The same can be written as: $-10.7 - (\text{int}(-10.7 / 3) * 3)$.

The function `mod(DATA_ARRAY_1, DATA_ARRAY_2)` calculates by formula:

```
{Modulus}
```

```
_mod := DATA_ARRAY_1 - (int(DATA_ARRAY_1 / DATA_ARRAY_2) * DATA_ARRAY_2);
```

```
{end}
```

5.6.59 Month

Month

month ()

This function returns the value of the month of the year.



If a bar had the date/time stamp of 02/17/2006, 13:44:00 (*Feb. 17th, 2006, 1:44 P.M. EST*), the `month` () function would return 02.

5.6.60 Moving Average

Moving Average

mov (DATA ARRAY, PERIODS, METHOD)

This function calculates a *PERIODS* moving average of *DATA ARRAY* using *METHOD* calculation method.

Valid *METHODS* are:

S = Simple
W = Weighted
E = Exponential
SW = Sine Weighted
TRI = Triangular
EP = End Point
VOL = Volume-Adjusted



The formula `mov(Close, 25, E)` returns the value of a 25-Period Exponential Moving Average of the Close prices.

5.6.61 Negative

Negative

neg (DATA ARRAY)

This function calculates the negative value of *DATA ARRAY*.



The formula `neg(10)` returns -10.
The formula `neg(-17)` returns +17.

5.6.62 Outside

Outside

outside ()

This function returns a +1 value whenever an *Outside* period occurs. It will continue to return this same +1 value until a [Rally](#)^[376], [Reaction](#)^[377], or [Inside](#)^[362] period occurs. For any period when `outside ()` is not equal to +1 it returns 0.



An *Outside* period occurs when the current *High* value is greater than the previous [Rally](#)^[376] or [Reaction](#)^[377] value's *High* and the current *Low* is less than the previous [Rally](#)^[376] or [Reaction](#)^[377] value's *Low*. A range is determined by the first *Outside* value and is only broken by a [Rally](#)^[376], [Reaction](#)^[377], or [Inside](#)^[362] value.

5.6.63 Parabolic SAR

Parabolic SAR

sar (STEP, MAXIMUM)

This function calculates the predefined *Parabolic SAR Indicator*.

Optionally, the user may choose to define the DATA ARRAY's used to calculate the Parabolic SAR indicator. This is useful, for example, when the user wishes to construct the Parabolic SAR using any data series other than price. The extended function format is:

sar (DATA ARRAY, DATA ARRAY HIGH, DATA ARRAY LOW, STEP, MAXIMUM)

Please Note: When using the extended **sar ()** function, the user must specify all 3 **DATA ARRAY's** or none of the **DATA ARRAY's**.



STEP - As the price makes new *Highs* and *Lows* the *Parabolic SAR* rises and declines according to the *STEP* size. For example: If the price makes new *Highs* for three consecutive bars, then the *SAR Step* increases by 0.02 each bar (i.e.: 0.02 to 0.04 to 0.06, etc.). The *SAR Step* size of 0.02 is recommended in most cases.

MAXIMUM - The *Maximum* value is the largest value the *SAR Step* can achieve. The *SAR Maximum* of 0.20 is recommended in most cases.



The formula **sar (0.02, 0.20)** calculates the *Parabolic SAR Indicator* with *STEP*=0.02 and *MAXIMUM*=0.20.

The formula **sar (0.02, 0.20)** is equivalent to **sar (Close, High, Low, 0.02, 0.20)**.

5.6.64 Peak Bars

Peak Bars

PeakBars (Nth, DATA ARRAY, % MINIMUM CHANGE)

Plots the number of bars that have passed from the *Nth peak*. N=1 would return the number of bars that have passed since the most recent *peak*. N=2 would return the number of bars that have passed since the 2nd most recent *peak*. Etc.

5.6.65 Peak Value

Peak Value

peak (Nth, DATA ARRAY, % MINIMUM CHANGE)

This function returns the value of *DATA ARRAY Nth* peak(s) ago. N=1 would return the value of the most recent *peak*. N=2 would return the value of the 2nd most recent *peak*, etc. The **% MINIMUM CHANGE** parameter determines how much greater the new `peak()` value must be in comparison to the previous `peak()` value before a new *peak* value is returned.



The formula `Peak(1, Rsi(14), 10)` returns the most recent `peak()` value of `Rsi(14)` if there has been at least a 10% change from the previous peak value.

5.6.66 Position Count

Position Count

PositionCount ()

This function returns the total cumulative number of open buy and sell positions in the instrument that the trading system is attached to based on the trading system's assigned account. This function's output is updated one time per incoming price tick. For this reason, it is strongly advised that `PositionCount()` not be used in trading systems that operate on the premise of "always in the market" (*i. e. when one position gets closed another position gets immediately opened in the opposing direction, etc.*).

5.6.67 Power

Power

power (DATA ARRAY, POWER)

This function calculates *DATA ARRAY* raised to the *POWER* power.

A negative *DATA ARRAY* value raised to a non-integer *POWER* returns a *NULL* value.



The formula `power(10,3)` returns *1000*.

The formula `power(-10,3)` returns *-1000*.

The formula `power(-10,3.5)` returns *NULL*.

5.6.68 Precision

Precision

***prec* (DATA ARRAY, PRECISION)**

This function truncates *DATA ARRAY* to *PRECISION* decimal places.



The formula `prec(10.56789, 2)` returns *10.560*.

The formula `prec(10.56789, 3)` returns *10.5670*.

The formula `prec(10.56789, 4)` returns *10.56780*.

Small binary rounding errors may cause some minor distortion in the decimal portion of any number stored in a computer.

5.6.69 Prev

Previous

Prev

Prev()

***prev* (DATA ARRAY)**

Prev makes it possible to refer from the formula to its own prior calculations on a previous bar. *Prev* can be used as *Prev* and *Prev()* constants and as function *Prev*(**DATA ARRAY**). It is essential to understand the peculiarities of *PREV*, *PREV*(0), and *PREV*(**DATA ARRAY**) and use them correctly when necessary.

Prev and *Prev()* return into the current calculations of the variable its calculations on a previous bar or *NULL* if the previous data is not defined or is missing. The output from these functions is synonymous with `ref(DATA ARRAY, -1)`.

Prev(**DATA ARRAY**) returns into the current calculations of the variable its calculations on the previous bar or the value of **DATA ARRAY** if the previous data is not defined or missing.



IMPORTANT NOTE: The use of `Prev`, `Prev()`, or `Prev(DATA ARRAY)` in fairly complex calculations may significantly delay the calculation of an indicator. Their use should be avoided whenever possible!



Examples for use of the `PREV` function:

The calculation of the *On Balance Volume* indicator demonstrates the use of the `PREV` constant:

```
{On Balance Volume}
_OBV:= (If(C>Ref(C,-1), 1, If(C<Ref(C,-1), -1, 0)) * VOLUME) + PREV;
```

The *On Balance Volume* indicator may also be calculated without the use of the `PREV` constant by using the `cum(DATA ARRAY)` function instead:

```
{On Balance Volume}
FactorOBV:= If(C>Ref(C,-1), 1, If(C<Ref(C,-1), -1, 0)) * VOLUME;
_OBV:= cum(FactorOBV);
```



This simple formula divides $(High + Low + Close)$ by 3 and then adds this value to the previous value of $((High + Low + Close) / 3)$ calculated on the previous bar of the price chart.

```
OUT:= ((High + Low + Close) / 3) + PREV(0);
```



The next example shows the `Prev`, `Prev()` and their `Prev(NULL)` analogy. However, this example deals more with the characteristics of `NULL`. In the absence of the previous data `Prev` and `Prev()` both return `NULL` (*nothing, not even zero*) so any further operations with `NULL` logically make no sense. Whatever mathematical operations with the `NULL` take place: multiplication, addition, etc. - the result will always be the same - `NULL`.

Using the following code(s) to illustrate:

```
OUT:= ((High + Low + Close) / 3) + PREV;
OUT:= ((High + Low + Close) / 3) + PREV();
```

These formulas on the first bar can be interpreted as:

```
OUT {on the first bar of loaded data}:= ((High + Low + Close) / 3) + NULL
{=NULL};
```

... and on the next bar...

```
OUT := NULL + NULL {=NULL};
```

... The indicator exists, but all of its values are equal to `NULL`. Therefore, the values will not be shown on the chart.

5.6.70 Rally

Rally

rally ()

This function returns a +1 value whenever a *Rally* period occurs. It will continue to return this same +1 value until a [Reaction](#)^[377], [Inside](#)^[362], or [Outside](#)^[371] period occurs. For any period when `rally ()` is not equal to +1 it returns 0.



A *Rally* period occurs when the current *High* is greater than the previous *Rally* or [Reaction](#)^[377] value's *High* and the current *Low* is greater than or equal to the previous *Rally* or [Reaction](#)^[377] value's *Low*.

5.6.71 Random

Random

random (DATA ARRAY)

This function returns a random value within the range of $X \geq 0$ and $X < 1$.



5.6.72 Rate of Change

Rate of Change

roc (DATA ARRAY, PERIODS, DIFF_METHOD)

Calculates the *PERIODS* Rate of Change (ROC) of *DATA ARRAY* expressed as *DIFF_METHOD*. Valid *DIFF_METHOD*'s are *PERCENT* and *POINTS*.



The formula `roc(Close, 12, PERCENT)` returns the 12-period *Percent Rate of Change* of the *Close*

prices.

The function `roc(DATA ARRAY, PERIODS, PERCENT)` calculates the *Rate of Change (ROC)* Indicator by formula:

```
{Rate-Of-Change -> roc(DATA ARRAY, PERIODS, PERCENT)}
_ROC:= ((DATA ARRAY - ref(DATA ARRAY, - PERIODS)) / ref(DATA ARRAY, -
PERIODS)) * 100;
{end}
```

The function `roc(DATA ARRAY, PERIODS, POINTS)` calculates the *Rate of Change (ROC)* Indicator by formula:

```
{Rate-Of-Change -> roc(DATA ARRAY, PERIODS, POINTS)}
_ROC:= DATA ARRAY - ref(DATA ARRAY, - PERIODS);
{end}
```

5.6.73 Reaction

Reaction

reaction ()

This function returns a +1 value whenever a *Reaction* period occurs. It will continue to return this same +1 value until a [Rally](#)^[376], [Inside](#)^[362], or [Outside](#)^[371] period occurs. For any period when `Reaction ()` is not equal to +1 it returns 0.



A *Reaction* period occurs when the current *High* is less than or equal to the previous *Rally* or [Reaction](#)^[377] value's *High* and the current *Low* is less than the previous [Rally](#)^[376] or *Reaction* value's *Low*.

5.6.74 Reference

Reference

ref (DATA ARRAY, -PERIODS, DEFAULT VALUE)

References a previous or subsequent element in a *DATA ARRAY*. Use of the *DEFAULT VALUE* parameter is only necessary if the user wishes to substitute a value other than 0 for the beginning calculation assigned to the left-most bar loaded in the chart window. Otherwise, it is acceptable to the `ref ()` function without including it such as:

ref (DATA ARRAY, -PERIODS)



A negative *PERIODS* value references *N* periods ago. Therefore, the formula `ref(Close, -12)` returns the *Close* price 12 periods ago. Thus, the 12-period price [Rate-Of-Change](#)^[376] (expressed in *points*) can be written as `Close-ref(Close, -12)`. It is also allowable to use the `ref()` function to reference previous value of a calculated *DATA ARRAY* such as the [Relative Strength Index \(RSI\)](#)^[379] indicator. The resulting formula `ref(RSI(14), -12)` returns the 14-period *RSI* value 12 periods ago.

A positive *PERIODS* value references *N* periods ahead. Therefore, the formula `ref(Close, +12)` returns the *Close* price 12 periods ahead (using the + sign is not necessary for positive integers). Using the `ref()` function in the manner effectively shifts the resulting variable's data plot to the left *N* periods ago in the chart window. It should also be noted that while it is allowable to use the `ref()` function to reference *N* periods ahead values using a *DATA ARRAY* that does not need to be calculated (such as raw price data: *Close, Open, High, Low, haClose, haOpen, haHigh, and haLow*), it is **not** allowable to use with a *DATA ARRAY* that must be calculated (such as the [Relative Strength Index \(RSI\)](#)^[379] indicator). Therefore, the formula `ref(RSI(14), +12)` is **not** allowed and the result will always return `NULL`.

However, any resulting *DATA ARRAY* (such as the [Relative Strength Index \(RSI\)](#)^[379] indicator) that uses price to derive calculations can be recoded to effectively simulate the `ref(RSI(14), +12)` functionality and resulting variable's data plot by first calculating the raw price data using the `ref()` function to reference the element *N* periods ahead.



By example:

{Normal RSI Code}

```
rsi_r:= (Close - ref(Close,-1));
rsi_rs:= Wilders(if(rsi_r>0,rsi_r,0),tpr) / Wilders(if(rsi_r<0,Abs(rsi_r),0),tpr);
RSIndex:= 100-(100/(1+rsi_rs));
```

{Restructured Code Allowing RSI to Shift
N Periods to the Left in the Chart Window}

```
prc:= ref(Close,+12);
rsi_r:= (prc - ref(prc,-1));
rsi_rs:= Wilders(if(rsi_r>0,rsi_r,0),tpr) / Wilders(if(rsi_r<0,Abs(rsi_r),0),tpr);
RSIndex:= 100-(100/(1+rsi_rs));
```

The restructured code is the equivalent to `ref(RSIndex, +12)` under the prior **VT Trader** programming language structure (*versions 1.7.5 and previous*). The restructured code works equally well under the previous and the new **VT Trader** programming language structure (*VT Trader 1.7.6 and beyond*).

5.6.75 Relative Strength Index

Relative Strength Index (RSI)

rsi (DATA ARRAY, PERIODS)

Calculates the predefined *Relative Strength Index (RSI)* Indicator. The *DATA ARRAY* argument is optional; `rsi()` will use the *Close* price as the default if it is not included. **Please Note:** The optional *DATA ARRAY* parameter is currently not available for use.



The formula `RSI(Close, 14)` calculates the RSI Indicator of the 14-periods *Close* prices.

The formula `RSI(14)` calculates the RSI Indicator of the 14-periods *Close* prices.

The formula `RSI(Low, 14)` calculates the RSI Indicator of the 14-periods *Low* prices.

The function *RSI (DATA ARRAY, PERIODS)* calculates the RSI Indicator by formula:

```
{Relative Strength Index -> RSI(DATA ARRAY, PERIODS)}
```

```
rsi_r:= (DATA ARRAY - ref(DATA ARRAY, -1));
rsi_rs:= Wilders(if(rsi_r>0, rsi_r, 0), PERIODS) / Wilders(if(rsi_r<0, Abs
(rsi_r), 0), PERIODS);
_RSI:= 100-(100/(1+rsi_rs));
```

```
{end}
```

5.6.76 Round

Round

round (DATA ARRAY)

This function rounds *DATA ARRAY* to the nearest integer.



The formula `round(+12.5)` returns +13.

The formula `round(-12.5)` returns -13.

The formula `round(-12.4)` returns -12.

5.6.77 Sell Position Count

Sell Position Count

SellPositionCount ()

This function returns the number of open sell positions in the instrument that the trading system is attached to based on the trading system's assigned account. This function's output is updated one time per incoming price tick.

5.6.78 Signal Flag

Signal Flag

SignalFlag (DATA_ARRAY_1, DATA_ARRAY_2)

This function works as a flip/flop device; it returns 1 from the first occurrence of a "true" value in DATA ARRAY 1 until the first occurrence of a "true" value in DATA ARRAY 2 which resets the state back to zero until next first occurrence of a "true" value is detected in DATA ARRAY 1 ... etc.

The function **SignalFlag**(DATA_ARRAY_1, DATA_ARRAY_2) is identical to **If**(DATA_ARRAY_1, 1, **If**(DATA_ARRAY_2, 0, **PREV**(0)))

However, the **SignalFlag**() function processes much faster than **If**(DATA_ARRAY_1, 1, **If**(DATA_ARRAY_2, 0, **PREV**(0))) when included in an indicator or trading system since it is an internal function.



By Example (for practical application of function):

Let's assume the user has decided to use the Close price crossing above its 20-period simple moving average as a simple entry condition to alert a possible Buy trade. Let's also assume that the user wishes to show a simulated stoploss level on the chart for this simulated trade entry and create a simple exit condition to alert when the Close price has crossed below the simulated stoploss level.

The formula logic to create this simple system is shown below (if the use of any functions in the formula below is unclear, please refer to their respective documentation):

```
StoplossValue:= 30; {this would typically be a user-defined Input variable}
```

```
{Create the simulated Buy trade entry; ActiveBuyTrade
is checked to ensure no simulated trade is active;
0 = No Buy Trade Open, 1 = Buy Trade Currently Open}
{Displayed as blue Up Arrow graphic in price frame}
Buy:= ActiveBuyTrade=0 and Cross(Close,mov(C,20,S));
```

```
{Create a simulated entry price for the Buy trade;
this uses the Close price of the bar when the simulated
Buy trade is entered}
{Displayed as small, red dots in the price frame}
BuyPrice:= valuewhen(1,Buy,Close);
```

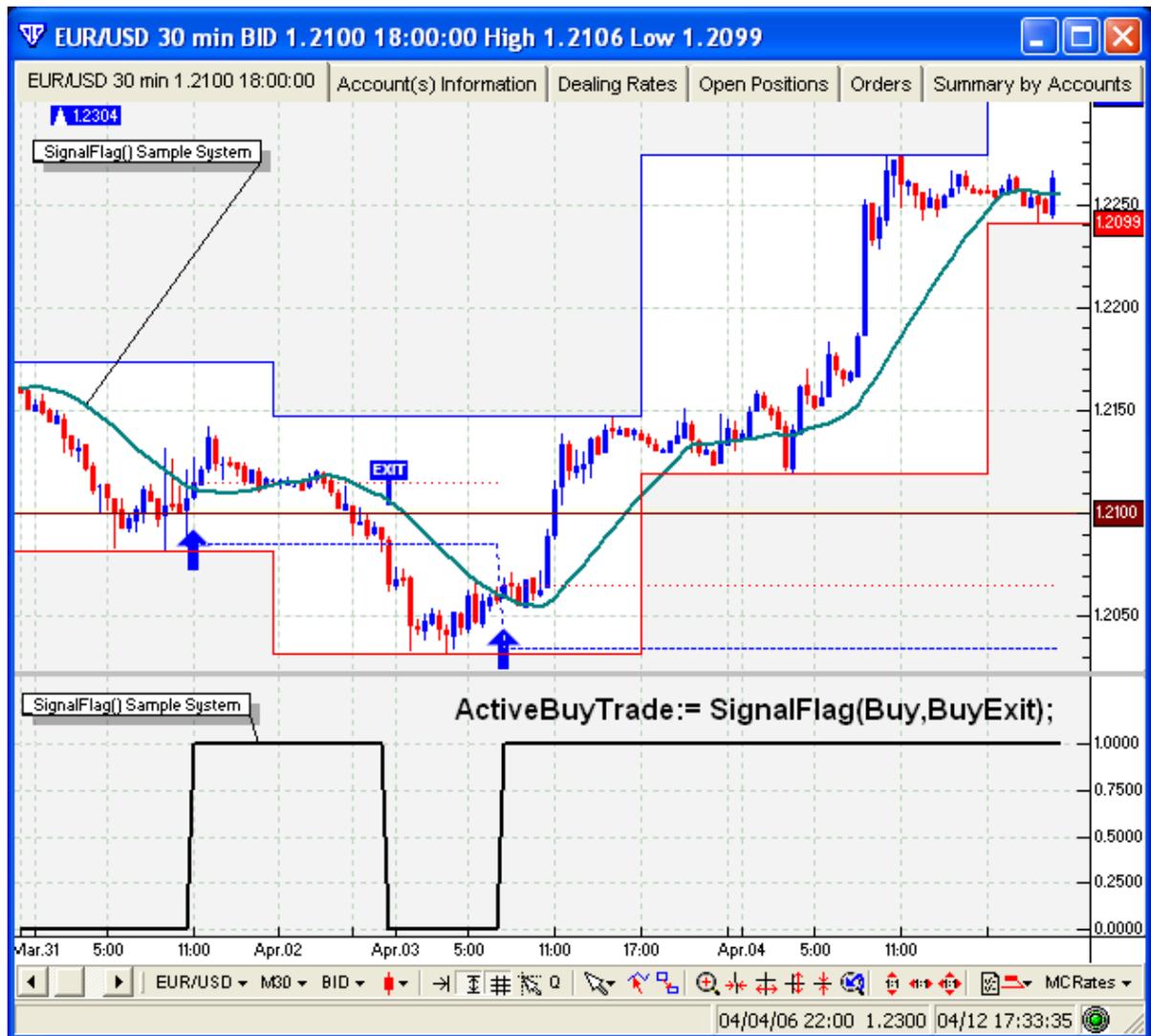
```
{Create the simulated stoploss level}
{Displayed as thin, dashed blue line in price frame}
BuyStop:= BuyPrice - (StoplossValue * SymbolPoint());
```

```
{Create the simulated Buy trade exit; ActiveBuyTrade
is checked to ensure a simulated trade is active;
0 = No Buy Trade Open, 1 = Buy Trade Currently Open}
{Displayed as blue Exit graphic in price frame}
BuyExit:= ActiveBuyTrade=1 and Cross(BuyStop,Close);

{Determine current simulated trade condition;
this is necessary to ensure the simulated stoploss
level stays associated with the proper simulated
entry point on the chart}
{ActiveBuyTrade can only be 0 or 1; It is set equal
to 1 when the Buy condition is true; the 1 (true)
value is maintained until BuyExit condition is true,
which resets it to zero and the process begins again.}
{Displayed as thicker black line in Additional Frame 1}
ActiveBuyTrade:= SignalFlag(Buy,BuyExit);
```



The end result of the formula logic above (using the [Trading System Builder](#)^[205] to create this logic as a simple alert system) can be seen in the screenshot below.



5.6.79 Signal Hold

Signal Hold

SignalHold (DATA ARRAY, PERIODS)

This function holds a "true" value of *DATA ARRAY* for the specified number of *PERIODS*. This "true" value is held "true" over the number of *PERIODS* specified even if a "false" value is generated. It should be noted that this function starts (or resets) *PERIODS* using the most recent "true" value of *DATA ARRAY*.



The `signalHold()` function is best explained by a visual example. In the screenshot below there are two additional frames below the price frame. Visible in the price frame are two moving averages. Each of the two additional frames corresponds to a visual representation of an output variable evaluating a specific condition. Since each variable's value is based on a conditional statement, the output of each variable can only be either +1 (*true*) or 0 (*false*).

The formula used to create the output variables shown in the screenshot below is as follows:

```
{Plots +1 for each bar when 10-period simple MA
crosses above the 30-period simple MA,
otherwise it plots 0}
{Additional Frame 1 - Blue line}
Buy:= Cross(Close,10,S),mov(Close,30,S));

{Plots +1 on the first bar when Buy is true,
then holds the +1 value until PERIODS (10 bars)
has passed, then plots 0 again until the
next occurrence of Buy being true}
{Additional Frame 2 - Dark Blue line}
BuySignalHold:= signalHold(Buy,10);
```

The end result of the formula logic above (*using the [Trading System Builder](#)^[205] to create this logic as a simple trading system*) can be seen in the screenshot below.



5.6.80 Signal Remove

Signal Remove

SignalRemove (DATA_ARRAY_1, DATA_ARRAY_2)

This function removes excessive (*redundant*) "true" values. It returns +1 on the first occurrence of a "true" value in *DATA_ARRAY_1* and then returns 0 until after at least one "true" occurrence of *DATA_ARRAY_2* even if there are additional "true" value occurrences in *DATA_ARRAY_1*.



The `SignalRemove()` function is best explained by a visual example. In the screenshot below there are four additional frames below the price frame. Visible in the price frame are two moving averages with vertical black lines marking the bars when the moving averages cross above and below each other. Each of the four additional frames corresponds to a visual representation of an output variable evaluating a specific condition. Since each variable's value is based on a conditional statement, the output of each variable can only be either +1 (*true*) or 0 (*false*).

The formula used to create the output variables shown in the screenshot below is as follows:

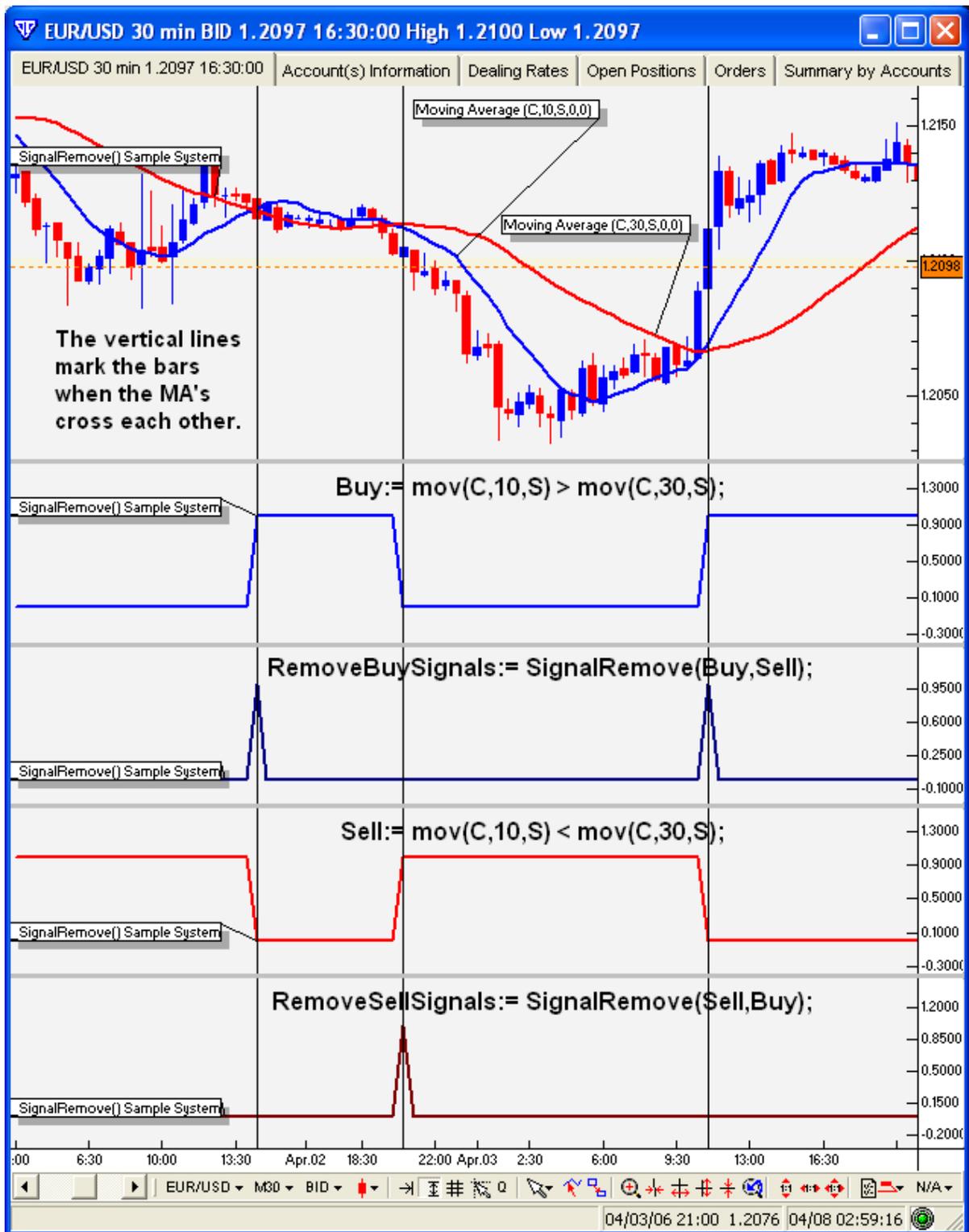
```
{Plots +1 for every bar when 10-period simple MA
is greater than the 30-period simple MA,
otherwise it plots 0}
{Additional Frame 1 - Blue line}
Buy:= mov(Close,10,S) > mov(Close,30,S);

{Plots +1 for every bar when 10-period simple MA
is less than the 30-period simple MA,
otherwise it plots 0}
(Additional Frame 3 - Red line)
Sell:= mov(Close,10,S) < mov(Close,30,S);

{Plots +1 on the first bar when Buy is true,
then plots 0 for each additional bar until after
Sell is true for at least one bar, then plots +1
again on the next first occurrence of Buy being true}
{Additional Frame 2 - Dark Blue line}
RemoveBuySignals:= SignalRemove(Buy,Sell);

{Plots +1 on the first bar when Sell is true,
then plots 0 for each additional bar until after
Buy is true for at least one bar, then plots +1
again on the next first occurrence of Sell being true}
{Additional Frame 4 - Dark Red line}
RemoveSellSignals:= SignalRemove(Sell,Buy);
```

The end result of the formula logic above (*using the [Trading System Builder](#)^[205] to create this logic as a simple trading system*) can be seen in the screenshot below.



5.6.81 Signal Remove Span

Signal Remove Span

SignalRemoveSpan (DATA ARRAY, PERIODS)

This function removes excessive (*redundant*) "true" values that span *PERIODS* since initial "true" value. The first non-zero bar passes through then all subsequent non-zero bars are ignored (*zero is returned*) until *PERIODS* have passed since initial signal; From then on a new "true" value may pass through. In other words, it returns +1 on the first occurrence of a "true" value in *DATA ARRAY* and then returns 0 until after *PERIODS* have passed since initial signal.



The `SignalRemoveSpan()` function is best explained by a visual example. In the screenshot below there are four additional frames below the price frame. Visible in the price frame are two moving averages. Each of the four additional frames corresponds to a visual representation of an output variable evaluating a specific condition. Since each variable's value is based on a conditional statement, the output of each variable can only be either +1 (*true*) or 0 (*false*).

The formula used to create the output variables shown in the screenshot below is as follows:

```
{Plots +1 for every bar when 10-period simple MA
is greater than the 30-period simple MA,
otherwise it plots 0}
{Additional Frame 1 - Blue line}
Buy:= mov(Close,10,S) > mov(Close,30,S);
```

```
{Plots +1 for every bar when 10-period simple MA
is less than the 30-period simple MA,
otherwise it plots 0}
(Additional Frame 3 - Red line)
Sell:= mov(Close,10,S) < mov(Close,30,S);
```

```
{Plots +1 on the first bar when Buy is true,
then plots 0 for each additional bar until after
PERIODS has passed, then plots +1 again on the
next first occurrence of Buy being true}
{Additional Frame 2 - Dark Blue line}
RemoveBuySignals:= SignalRemoveSpan(Buy,10);
```

```
{Plots +1 on the first bar when Sell is true,
then plots 0 for each additional bar until after
PERIODS has passed, then plots +1 again on the
next first occurrence of Sell being true}
{Additional Frame 4 - Dark Red line}
RemoveSellSignals:= SignalRemoveSpan(Sell,10);
```

The end result of the formula logic above (*using the [Trading System Builder](#)^[205] to create this logic as a simple trading system*) can be seen in the screenshot below.



5.6.82 Sine

Sine

sin (*DATA ARRAY*)

sin() returns the sine of *DATA ARRAY*.

This function assumes that the *DATA ARRAY* values are in degrees.



A sine wave can be plotted using formula **sin**(**cum**(7)). Increasing the value in this formula (*i.e.*:7) will increase the frequency of the sine wave.

5.6.83 Square Root

Square Root

sqrt (*DATA ARRAY*)

The function calculates the *Square Root* of *DATA ARRAY*.

The *Square Root* of a negative *DATA ARRAY* always returns a NULL result.



The formula **sqrt**(16) returns 4.

The formula **sqrt**(-16) returns NULL.

5.6.84 Standard Deviation

Standard Deviation

stdev (*DATA ARRAY*, *PERIODS*, *TYPE*, *DATA ARRAY 2*)

This function calculates the predefined *Standard Deviation Indicator* of *DATA ARRAY* for the specified *PERIODS*. *TYPE* and *DATA ARRAY 2* are optional parameters. Valid *TYPE*'s are *simple*, *weighted*, *exponential*, *sine weighted*, *triangle*, *end point*, and *volume-adjusted* (Abbreviated respectively as *S*, *W*, *E*, *SW*, *TRI*, *EP*, and *VOL*).

For example,

stdev(Close, 4, Simple, Close) = **stdev**(C, 4)

stdev(Close, 4, Simple) = **stdev**(C, 4) {DataArray = dataArray2}



The formula `stdev(Close, 21)` calculates *Standard Deviation of Close prices over 21-periods*.

A 4-periods *Standard Deviation Indicator* can be written by first assigning a 4-periods Simple Moving Average to the variable named `4PeriodMA` and then summing the squares of the differences between the Moving Average and the Close prices on each of the preceding four periods. Finally, calculate the square root of this total.

```
{A 4-period Standard Deviation Indicator}

4PeriodMA:= Mov(Close, 4, S);
_StDev:= Sqrt((Power(4PeriodMA-Close, 2)+Power((4PeriodMA)-Ref(Close, -1), 2)
+
      Power((4PeriodMA)-Ref(Close, -2), 2)+Power((4PeriodMA)-Ref(Close, -3
), 2))/4);
```

5.6.85 Standard Error

Standard Error

ste (DATA ARRAY, PERIODS)

This function calculates the predefined *Standard Error of DATA ARRAY* for the specified *PERIODS*.



The formula `ste(Close, 21)` calculates the *Standard Error of Close prices over 21-periods*.

5.6.86 Stochastic Momentum Index

Stochastic Momentum Index

stochmomentum (PERIODS, SMOOTHING, DOUBLE SMOOTHING)

This function calculates the predefined *Stochastic Momentum Index*.



The formula `stochmomentum(PERIODS, SMOOTHING, DOUBLE SMOOTHING)` calculates the *Stochastic Momentum Index* by formula:

```
{Stochastic Momentum Index}

_StochMomentum:= 100 * (Mov(Mov(Close - (0.5 * (hhv(High, PERIODS) + llv
(Low, PERIODS))), SMOOTHING, E), DOUBLE SMOOTHING, E) / (0.5 * Mov(Mov(hhv
```

```
(High,PERIODS) - llv(Low,PERIODS), SMOOTHING,E),DOUBLE SMOOTHING,E));
{end}
```

The following formula calculates a `stochmomentum(13,25,2)` *Stochastic Momentum Index*:

```
{Stochastic Momentum Index -> stochmomentum(13,25,2)}
_StochMomentum:= 100 * (Mov(Mov(Close - (0.5 * (hhv(High,13) + llv(Low,13)
))),25,E),2,E) / (0.5 * Mov(Mov(hhv(High,13) - llv(Low,13),25,E),2,E));
{end}
```

5.6.87 Stochastic Oscillator

Stochastic Oscillator

stoch (%K PERIODS, %K SLOWING)

This function calculates the predefined *Stochastic Oscillator*.



The function `stoch(%K PERIODS,%K SLOWING)` calculates the %K *Stochastic Oscillator* by formula:

```
{%K Stochastic Oscillator}
_K_Stoch:= (sum(Close - llv(Low,%K PERIODS),%K SLOWING) / sum(hhv(High,%K
PERIODS) - llv(Low,%K PERIODS),%K SLOWING)) * 100;
{end}
```

This next formula calculates a *N*-period %D of the %K in the preceding formula `stoch(%K PERIODS,%K SLOWING)`.

```
{%D Stochastic Oscillator}
_D_Stoch:= Mov(sum(Close - llv(Low,%K PERIODS),%K SLOWING) / sum(hhv(High,%K
PERIODS) - llv(Low,%K PERIODS),%K SLOWING)) * 100,%D PERIODS,S);
{end}
```

... Or...

```
{%D Stochastic Oscillator}
_D_Stoch:= Mov(stoch(%K PERIODS,%K SLOWING),%D PERIODS,S);
{end}
```



The formula `stoch(5,3)` returns the value of a 5-period %K slowed 3-periods.

The following formula calculates a 5-period %K *Stochastic Oscillator* with 3-period slowing:

```
{%K Stochastic Oscillator}
_K_Stoch:= (sum(Close - llv(Low,5),3) / sum(hhv(High,5) - llv(Low,5),3)) *
100;
{end}
```

This next formula calculates a 3-period %D of the %K in the preceding formula.

```
{%D Stochastic Oscillator}
_D_Stoch:= Mov((sum(Close - llv(Low,5),3) / sum(hhv(High,5) - llv(Low,5),3
)) * 100),3,S);
{end}
```

... Or...

```
{%D Stochastic Oscillator}
_D_Stoch:= Mov(stoch(5,3),3,S);
{end}
```

5.6.88 Summation

Summation

sum (DATA ARRAY, PERIODS)

This function calculates a *Cumulative Sum* of DATA ARRAY for the specified PERIODS (including the current period).



The formula `sum(Close,12)` returns the sum of the preceding 12 Close prices.

A 12-periods Simple Moving Average could be written as:

```
MA:= sum(Close,12) / 12;
```

5.6.89 Symbol Digits

Symbol Digits

SymbolDigits ()

This function returns a whole integer value as it corresponds to the number of digits to the right of the decimal point for the current symbol loaded in the chart window.

For currency pairs with prices quoted out to four decimal places (such as EURUSD), `symbolDigits()` returns 4. For currency pairs with prices quoted out to two decimal places (such as USDJPY), `symbolDigits()` returns 2.



By Example (for practical application of function):

Let's assume the user has decided to use the Close price crossing above its 20-period simple moving average as a simple entry condition to alert a possible Buy trade. Let's also assume that the user wishes to show a simulated stoploss level on the chart for this simulated trade entry and create a simple exit condition to alert when the Close price has crossed below the simulated stoploss level.

The formula logic to create this simple system is shown below (if the use of any functions in the formula below is unclear, please refer to their respective documentation):

```

StoplossValue:= 30; {this would typically be a user-defined Input variable}

{Convert the whole integer StoplossValue variable value
to a pip value that is comparable to the current symbol's
price scale}
CurrencyStoplossValue:= if(SymbolDigits()==4, StoplossValue * 0.0001,
                          if(SymbolDigits()==2, StoplossValue * 0.01,
                              0));

{Create the simulated Buy trade entry; ActiveBuyTrade
is checked to ensure no simulated trade is active;
0 = No Buy Trade Open, 1 = Buy Trade Currently Open}
{Displayed as blue Up Arrow graphic in price frame}
Buy:= ActiveBuyTrade=0 and Cross(Close,mov(C,20,S));

{Create a simulated entry price for the Buy trade;
this uses the Close price of the bar when the simulated
Buy trade is entered}
BuyPrice:= valuewhen(1,Buy,Close);

{Create the simulated stoploss level}
{Displayed as thin, dotted blue line in price frame}
BuyStop:= BuyPrice - CurrencyStoplossValue;

{Create the simulated Buy trade exit; ActiveBuyTrade
is checked to ensure a simulated trade is active;
0 = No Buy Trade Open, 1 = Buy Trade Currently Open}
{Displayed as blue Exit graphic in price frame}
BuyExit:= ActiveBuyTrade=1 and Cross(BuyStop,Close);

{Determine current simulated trade condition;
this is necessary to ensure the simulated stoploss
level stays associated with the proper simulated
entry point on the chart}
{ActiveBuyTrade can only be 0 or 1; It is set equal
to 1 when the Buy condition is true; the 1 (true)
value is maintained until BuyExit condition is true,
which resets it to zero and the process begins again.}
{Displayed as thicker black line in Additional Frame 1}

```

```
ActiveBuyTrade := SignalFlag(Buy, BuyExit);
```



The end result of the formula logic above (using the [Trading System Builder](#)^[205] to create this logic as a simple alert system) can be seen in the screenshot below.



5.6.90 Symbol Point

Symbol Point

SymbolPoint ()

This function returns the point (*pip*) value for the current symbol loaded in the chart window. For reference, a "pip" is the smallest increment of movement for any currency pair in the spot FOREX

market.

For currency pairs with prices quoted out to four decimal places a pip is equal to 0.0001. For example, in EURUSD a movement of 1.2231 to 1.2232 is equal to one pip (0.0001).

For currency pairs with prices quoted out to only two decimal places a pip is equal to 0.01 (or 0.0100). For example, in USDJPY a movement of 118.28 to 118.29 is equal to one pip (0.01).



By Example (for practical application of function):

Let's assume the user has decided to use the Close price crossing above its 20-period simple moving average as a simple entry condition to alert a possible Buy trade. Let's also assume that the user wishes to show a simulated stoploss level on the chart for this simulated trade entry and create a simple exit condition to alert when the Close price has crossed below the simulated stoploss level.

The formula logic to create this simple system is shown below (if the use of any functions in the formula below is unclear, please refer to their respective documentation):

```

StoplossValue:= 30; {this would typically be a user-defined Input variable}

{Create the simulated Buy trade entry; ActiveBuyTrade
is checked to ensure no simulated trade is active;
0 = No Buy Trade Open, 1 = Buy Trade Currently Open}
{Displayed as blue Up Arrow graphic in price frame}
Buy:= ActiveBuyTrade=0 and Cross(Close,mov(C,20,S));

{Create a simulated entry price for the Buy trade;
this uses the Close price of the bar when the simulated
Buy trade is entered}
BuyPrice:= valuewhen(1,Buy,Close);

{Create the simulated stoploss level}
{Displayed as thin, dotted blue line in price frame}
BuyStop:= BuyPrice - (StoplossValue * SymbolPoint());

{Create the simulated Buy trade exit; ActiveBuyTrade
is checked to ensure a simulated trade is active;
0 = No Buy Trade Open, 1 = Buy Trade Currently Open}
{Displayed as blue Exit graphic in price frame}
BuyExit:= ActiveBuyTrade=1 and Cross(BuyStop,Close);

{Determine current simulated trade condition;
this is necessary to ensure the simulated stoploss
level stays associated with the proper simulated
entry point on the chart}
{ActiveBuyTrade can only be 0 or 1; It is set equal
to 1 when the Buy condition is true; the 1 (true)
value is maintained until BuyExit condition is true,
which resets it to zero and the process begins again.}
{Displayed as thicker black line in Additional Frame 1}

```

```
ActiveBuyTrade := SignalFlag(Buy, BuyExit);
```



The end result of the formula logic above (using the [Trading System Builder](#)^[205] to create this logic as a simple alert system) can be seen in the screenshot below.



5.6.91 Trough Value

Trough Value

trough (*Nth*, *DATA ARRAY*, % *MINIMUM CHANGE*)

This function returns the value of *DATA ARRAY* *Nth* trough(s) ago. *N=1* would return the value of the most recent *trough*. *N=2* would return the value of the 2nd most recent *trough*, etc. The % **MINIMUM CHANGE** parameter determines how much greater the new **trough**() value must be in comparison to

the previous `tough()` value before a new *tough* value is returned.



The formula `Trough(1, Rsi(14), 10)` returns the most recent `tough()` value of `Rsi(14)` if there has been at least a 10% change from the previous *tough* value.

5.6.92 Trough Bars

Trough Bars

TroughBars(Nth, DATA ARRAY, % MINIMUM CHANGE)

Plots the number of bars that have passed from the *Nth* *tough*. *N=1* would return the number of bars that have passed since the most recent *tough*. *N=2* would return the number of bars that have passed since the 2nd most recent *tough*. Etc.

5.6.93 Typical Price

Typical Price

tp()

This function calculates the predefined *Typical Price* Indicator.



The function `tp()` calculates the *Typical Price* by formula:

```
{Typical Price Indicator}
_TypicalPrice:= (High + Low + Close) / 3;
{end}
```

5.6.94 Ultimate Oscillator

Ultimate Oscillator

ult(CYCLE1, CYCLE2, CYCLE3)

This function calculates the predefined *Ultimate Oscillator Indicator* using the three cycle lengths supplied as parameters.



The formula `ult(7,14,28)` calculates the default *Ultimate Oscillator* Indicator.

The function `ult(CYCLE1, CYCLE2, CYCLE3)` calculates the *Ultimate Oscillator Indicator* by formula:

```
{Ultimate Oscillator Indicator}
```

```
_Ult:= (((((Sum((Max((C-L), (C-Ref(L, -1))))), CYCLE1)) / (Sum((Max(Max((H-L),
H-Ref(L, -1)), Max((Ref(H, -1)-L), (Ref(H, -1)-Ref(L, -1))))), CYCLE1))) * 4) + ((Sum
((Max((C-L), (C-Ref(L, -1))))), CYCLE2)) / (Sum((Max(Max((H-L), H-Ref(L, -1)),
Max((Ref(H, -1)-L), (Ref(H, -1)-Ref(L, -1))))), CYCLE2))) * 2) + ((Sum((Max((C-L),
(C-Ref(L, -1))))), CYCLE3)) / (Sum((Max(Max((H-L), H-Ref(L, -1)), Max((Ref(H, -1)
)-L), (Ref(H, -1)-Ref(L, -1))))), CYCLE3))) / CYCLE1) * 100;
```

```
{end}
```

5.6.95 Value When

Value When

valuewhen (*Nth*, *EXPRESSION*, *DATA ARRAY*)

This function returns the value of the *DATA ARRAY* when the *EXPRESSION* was true on the *Nth* most recent occurrence. This includes all data loaded in the chart.



The formula `valuewhen(2, cross(close, mov(close, 13, S), rsi(14))` returns the value of the 14-periods RSI on the 2nd most recent occurrence of the Close price crossing above its 13-periods moving average.

5.6.96 Vertical Horizontal Filter

Vertical Horizontal Filter

vhf (*DATA ARRAY*, *PERIODS*)

Calculates the predefined Vertical Horizontal Filter of *DATA ARRAY* over the specified *PERIODS*.



The formula `vhf(Close, 28)` calculates the Vertical Horizontal Filter of *Close* prices over the specified *28-periods*.

5.6.97 Weighted Close

Weighted Close

wc ()

The **wc** () function calculates the predefined *Weighted Close Indicator*.



The *Weighted Close Indicator* is calculated by multiplying the *Close* by two, adding the *High* and the *Low* together, and then dividing by four. The result is the average price for the period with extra weight given to the *Close* price.

The function **wc** () calculates the *Weighted Close Indicator* by formula:

```
{Weighted Close Indicator}
_WC:= ((Close * 2) + High + Low) / 4;
{end}
```

5.6.98 Wilder's Smoothing

Wilders Smoothing

wilders (DATA ARRAY, PERIODS)

The **wilders** () function calculates the predefined *Wilder's Smoothing*.



The function **wilders** (DATA ARRAY, PERIODS) calculates the *Wilder's Smoothing* by formula:

```
{Wilder's Smoothing Indicator}
_Wilders:= Mov(DATA ARRAY, (PERIODS * 2) - 1, E);
{end}
```

The formula **wilders** (Close, 8) is equivalent to **Mov** (Close, 8*2-1, E) or **Mov** (Close, 15, E).

5.6.99 Williams' %R

Williams' %R

willr (PERIODS)

This function calculates the predefined *Williams' %R* indicator.



The function `willr()` calculates the *Williams' %R Indicator* by formula:

```
{Williams' %R Indicator}
Willr:= ((hhv(High,PERIODS) - Close) / (hhv(High, PERIODS) - llv(Low,
PERIODS))) * -100;
{end}
```

Notice that the formula is inverted by multiplying it by *-100*. *Williams' %R* is plotted on an upside down scale with *0* at the top and *-100* at the bottom. Values ranging from *0* to *-20%* indicate overbought levels while values ranging from *-80* to *-100%* indicate oversold levels.

5.6.100 Year

Year

year ()

This function returns the value of the year in a four-digit format.



If a bar had the date/time stamp of 02/17/2006, 13:44:00 (*Feb. 17th, 2006, 1:44 P.M. EST*), the `year ()` function would return 2006.

5.6.101 Zli

Zli

zli (DATA ARRAY, PERIODS, GAIN LIMIT)

Calculates the *PERIODS* zero-lag indicator of *DATA ARRAY* with the specified *GAIN LIMIT* value. Valid *GAIN LIMIT* values are any positive integer.

The Zero-Lag Indicator was described in the article, "*Zero Lag (Well Almost)*" by John Ehlers and Ric Way published in the November 2010 edition of *Technical Analysis of Stocks and Commodities* magazine.

5.7 Functions (Reserved for Future Use)

Functions (Reserved for Future Use) cannot be used in the construction of custom indicators and trading systems. The following **Functions (Identifiers)** are currently reserved for future use in VT Trader's scripting language.

AD
ADX
ADXR

ALERT
ASWING
BBANDLINES
BUYP
CCIE
CMF
CO
CORREL
CSI
DELTA
DEMA
DI
DIVERGENCE
DMI
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PROJBANDTOP
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Technical Indicators

Part



6 Technical Indicators

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6.1 Aroon Indicator

Overview

The Aroon indicator was developed by Tushar Chande in 1995. The Aroon indicator attempts to determine if a trading instrument is trending or not as well as define how strong the trend is. Since Chande designed this indicator to reveal the beginning of a new trend he named it "Aroon" which means "Dawn's Early Light" in Sanskrit.



Interpretation

The Aroon indicator is constructed with two lines - Aroon(Up) and Aroon(Down). Aroon(up) is the amount of time (on a percentage basis) that has elapsed between the start of the time period and the point at which the highest price during that time period occurred. If the trading instrument is setting a new low for the given time period, Aroon(up) will be zero. However, if the trading instrument closes higher than it has during the rest of the time period, Aroon(up) will be +100. For each subsequent period that passes without another new high, Aroon(up) moves down by an amount equal to $(1 / \# \text{ of periods}) \times 100$.

Technically, the formula for Aroon(up) is:

$$\left[\frac{(\# \text{ of periods}) - (\# \text{ of periods since highest high during that time})}{(\# \text{ of periods})} \right] \times 100$$

For example, consider plotting a 10-period Aroon(up) line on a daily chart. If the highest price for the past ten days occurred 6 days ago (4 days since the start of the time period), Aroon(up) for today would be equal to $((10-6)/10) \times 100 = 40$. If the lowest price in that same period happened yesterday (i.e. on day 9), Aroon(down) for today would be 90.

Aroon(down) is calculated in just the opposite manner, looking for new lows instead of new highs. When a new low is set, Aroon(down) is equal to +100. If the stock is setting a new high for the given time period, Aroon(down) will be zero. And so on...

The formula for Aroon(down) is:

$$\left[\frac{(\# \text{ of periods}) - (\# \text{ of periods since lowest low during that time})}{(\# \text{ of periods})} \right] \times 100$$

Chande states that when Aroon(up) and Aroon(down) are in close proximity to each other and descending lower that the market is consolidating and no strong trend is evident. Aroon(up) dipping below 50 indicates that the current trend's upward momentum is gone. Similarly, Aroon(down) dipping below 50 indicates that the current trend's downward momentum is gone. Values above 70 indicate a strong trend in the same direction as the Aroon (up or down). Values below 30 indicate a strong trend in the opposite direction.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Aroon Indicator
Function Name Alias: vt_Aroon
Label Mask:
    Aroon Up (%Periods%) = %_AroonUp%
    Aroon Down (%Periods%) = %_AroonDown%
Placement: New Frame
Data Inspection Alias: Aroon Indicator
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Periods
Display Name: Periods
Type: integer
Default: 14
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
```

Var Name: `_AroonUp`
Name: (Aroon Up)
Line Color: dark blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: `_AroonDown`
Name: (Aroon Down)
Line Color: dark blue
Line Width: thin
Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +70.0000
Color: red
Width: thin
Type: dashed

[New] button...

Value: +50.0000
Color: gray
Width: thin
Type: dashed

[New] button...

Value: +30.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
_AroonUp:= ((Periods-HHVBars(H,Periods+1))/Periods)*100;  
_AroonDown:= ((Periods-LLVBars(L,Periods+1))/Periods)*100;
```

7. Click the "Save" icon to finish building the Aroon indicator.

6.2 Aroon Oscillator

Overview

The Aroon Oscillator is derived from the Aroon Indicator. The Aroon Oscillator is constructed by subtracting Aroon(down) from Aroon(up). Since Aroon(up) and Aroon(down) oscillate between 0 and +100, the Aroon Oscillator oscillates between -100 and +100.



Interpretation

The Aroon Oscillator indicates an upward trend when it is above zero and a downward trend when it is below zero. The farther away the oscillator is from the zero line, the stronger the trend.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Aroon Oscillator
Function Name Alias: vt_AroonOsc
Label Mask: Aroon Oscillator (%Periods%) = %_AroonOsc%
Placement: New Frame
Data Inspection Alias: Aroon Oscillator
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Periods
Display Name: Periods
Type: integer
Default: 14
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: _AroonOsc
Name: (Osc)
Line Color: dark blue
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
Value: +50.0000
Color: red
Width: thin
Type: dashed
```

```
[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

```
[New] button...
Value: -50.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
_AroonUp:= ((Periods-HHVBars(H,Periods+1))/Periods)*100;
_AroonDown:= ((Periods-LLVBars(L,Periods+1))/Periods)*100;
_AroonOsc:= _AroonUp - _AroonDown;
```

7. Click the "Save" icon to finish building the Aroon Oscillator.

6.3 Average Directional Movement Index (ADX)

Overview

The Average Directional Movement Index (ADX) is a momentum indicator developed by J. Welles Wilder and described in his book "New Concepts in Technical Trading Systems", written in 1978. The ADX is constructed from two other Wilders' indicators: the Positive Directional indicator (+DI) and the Negative Directional Indicator (-DI). The +DI and -DI indicators are commonly referred to as the Directional Movement Index. Combining the +/-DI and applying a Wilders() smoothing filter results in the final ADX

value.



Interpretation

The ADX's main purpose is to measure the strength of market trends on a 0-100 scale; the higher the ADX value the stronger the trend. It should be noted that while the direction of price is important to the ADX's calculation, the ADX itself is not a directional indicator. Values above 40 indicate very strong trending while values below 20 indicate non-trending or ranging market conditions.

Traders typically use the ADX as a filter along with other indicators to create a more concrete trading methodology. Many traders view ADX turning up from below 20 as an early signal of a new emerging trend while, conversely, a declining ADX turning down from above 40 as deterioration of the current trend. Wilder suggests using the ADX as part of a system that includes the +DI and -DI indicators; please refer to the Directional Movement System indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Average Directional Movement Index (ADX)
Function Name Alias: vt_ADX
Label Mask: ADX (%Pr%,%SmPr%) = %_ADX%
```

Placement: New Frame
Data Inspection Alias: ADX

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
Name: Pr
Display Name: DX Periods
Type: integer
Default: 14

[New] button...
Name: SmPr
Display Name: ADX Smoothing Periods
Type: integer
Default: 14

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: _ADX
Name: (ADX)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
Value: +20.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
TH:= if(Ref(C,-1)>H,Ref(C,-1),H);
TL:= if(Ref(C,-1)<L,Ref(C,-1),L);
TR:= TH-TL;

PlusDM:= if(H>Ref(H,-1) AND L>=Ref(L,-1), H-Ref(H,-1),
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)>Ref(L,-1)-L, H-
           Ref(H,-1),
           0));

PlusDI:= 100 * Wilders(PlusDM,Pr)/Wilders(Tr,Pr);

MinusDM:= if(L<Ref(L,-1) AND H<=Ref(H,-1), Ref(L,-1)-L,
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)<Ref(L,-1)-L,
           Ref(L,-1)-L,
           0));

MinusDI:= 100 * Wilders(MinusDM,Pr)/Wilders(Tr,Pr);
```

```

DIDif:= Abs(PlusDI-MinusDI);
DISum:= PlusDI + MinusDI;

ADX:= 100 * Wilders(DIDif/DISum,SmPr);
    
```

7. Click the "Save" icon to finish building the Average Directional Movement Index (ADX).

6.4 Average Directional Movement Index Rating (ADXR)

Overview

The Average Directional Movement Index Rating (ADXR) indicator is an attempt to quantify the momentum change of the ADX indicator. It was developed by J. Welles Wilder and described in his book "New Concepts in Technical Trading Systems", written in 1978. The ADXR is constructed adding the current ADX value and an ADX value n-Periods ago and then dividing that sum by two. This additional smoothing step causes the ADXR to be slightly less responsive to changes in the trend than the ADX. According to Wilder, this smoothing step was used to help compensate for the variance of excessive tops and bottoms.



Interpretation

The ADXR is used in much the same way as the ADX; the higher the ADXR value the stronger the trend. Values above 40 indicate very strong trending while values below 20 indicate non-trending or ranging market conditions.

Wilder suggests using the ADXR (or ADX) as part of a system that includes the +DI and -DI indicators; please refer to the Directional Movement System indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Average Average Directional Movement Index Rating (ADXR)
Function Name Alias: vt_ADXR
Label Mask: ADXR (%Pr%,%SmPeriods%) = %_ADXR%
Placement: New Frame
Data Inspection Alias: ADXR
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: DX Periods
Type: integer
Default: 14
```

[New] button...

```
Name: SmPeriods
Display Name: ADXR Smoothing Periods
Type: integer
Default: 14
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: _ADXR
Name: (ADXR)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +20.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```

TH:= if(Ref(C,-1)>H,Ref(C,-1),H);
TL:= if(Ref(C,-1)<L,Ref(C,-1),L);
TR:= TH-TL;

PlusDM:= if(H>Ref(H,-1) AND L>=Ref(L,-1), H-Ref(H,-1),
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)>Ref(L,-1)-L, H-
           Ref(H,-1),
           0));

PlusDI:= 100 * Wilders(PlusDM,Pr)/Wilders(Tr,Pr);

MinusDM:= if(L<Ref(L,-1) AND H<=Ref(H,-1), Ref(L,-1)-L,
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)<Ref(L,-1)-L,
           Ref(L,-1)-L,
           0));

MinusDI:= 100 * Wilders(MinusDM,Pr)/Wilders(Tr,Pr);

DIDif:= Abs(PlusDI-MinusDI);
DISum:= PlusDI + MinusDI;

ADXFinal:= 100 * Wilders(DIDif/DISum,SmPeriods);
_ADXR:= (ADXFinal + Ref(ADXFinal,1-SmPeriods)) / 2;

```

7. Click the "Save" icon to finish building the Average Directional Movement Index Rating (ADXR).

6.5 Average True Range (ATR)

Overview

Introduced by Welles Wilder in his book "New Concepts in Technical Trading Systems" (1978), the Average True Range (ATR) is a measure of a trading instrument's volatility. It measures the degree of price movement, not the direction or duration of the price movement. The True Range is first calculated using the is the greatest of the following:

- Difference between the current high and the current low
- Difference between the previous closing price and the current high
- Difference between the previous closing price and the current low

The Average True Range is then formulated by adding smoothing to the True Range. The True Range can be smoothed using a variety of techniques to create the final Average True Range indicator such as Wilders' Smoothing function or a simple moving average (which are the two most common smoothing methods used).



Interpretation

Wilder stated that high ATR values often indicated market bottoms after a sell-off, while low ATR values typically indicated extended periods of sideways price movement (such as those found at tops and after consolidation periods). The Average True Range can be interpreted using the same techniques that are used with the other volatility indicators.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Average True Range (ATR)
Function Name Alias: vt_ATR
Label Mask: ATR (%tPr%,%stp%) = %_ATR%
Placement: New Frame
Data Inspection Alias: Average True Range
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: tPr
Display Name: Periods
```

```
Type: integer
Default: 14
```

[New] button...

```
Name: stp
Display Name: Smoothing Type
Type: Enumeration
Default: click [...] button, [New] button, then create the following
entries:
Wilders
Simple_Moving_Average
... then, click [OK] button
Default: Wilders
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: _ATR
Name: (ATR)
Line Color: dark green
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following variables:

```
This indicator requires no horizontal levels.
```

6. In the **Formula** tab, copy and paste the following formula:

```
TH:= if(Ref(C,-1) > H,Ref(C,-1),H);
TL:= if(Ref(C,-1) < L,Ref(C,-1),L);
TR:= TH-TL;
_ATR:= if(stp=0, Wilders(TR,tPr), mov(TR,tPr,S));
```

7. Click the "Save" icon to finish building the Average True Range (ATR) indicator.

6.6 Balance of Power

Overview

The Balance of Power (BOP) indicator was described by Igor Livshin in the August 2001 edition of *Technical Analysis of Stocks and Commodities* magazine. Livshin explains that, "The balance of power (BOP) indicator measures the strength of the bulls vs. bears by assessing the ability of each to push price to an extreme level." The Balance of Power indicator is calculated by the formula:

$$\text{BOP} = (\text{Close price} - \text{Open price}) / (\text{High price} - \text{Low price})$$

The resulting Balance of Power value is then typically smoothed by a moving average.



Interpretation

There are three basic techniques for using the Balance of Power indicator to generate trading signals.

Trend Direction: When the BOP is rising, prices are in an upwards trend. When the BOP is declining, prices are in a downwards trend. BOP / Zero crossovers may also be useful. When the BOP crosses above zero a buy signal is given. Alternatively, when the BOP crosses below zero a sell signal is given.

Divergence: Looking for divergences between the BOP and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (aka: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the BOP
- Bearish Divergence = Higher highs in price and lower highs in the BOP

Hidden Divergence (aka: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in BOP and higher lows in price
- Bearish Divergence = Higher highs in BOP and lower highs in price

Overbought/Oversold Conditions: The BOP can be used to identify potential overbought and oversold conditions in price movements thereby providing an early warning for potential trend reversals. These conditions are generated by observing where the BOP clusters its tops and bottoms and setting its

overbought and oversold levels around those values.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Balance of Power
Function Name Alias: vt_BOP
Label Mask: Balance of Power (%SmPer%,%SmType%) = %BOP%
Placement: New Frame
Data Inspection Alias: Balance of Power
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: SmPer
Display Name: Smoothing Periods
Type: integer (with bounds)
Default: 14
Min. Bounds: 1
Max. Bounds: 9999
```

```
[New] button...
Name: SmType
Display Name: Smoothing Type
Type: MA type
Default: Exponential
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: BOP
Name: (BOP)
Line Color: black
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following variables:

```
[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
BOP := Mov((C-O)/(H-L), SmPer, SmType);
```

7. Click the "Save" icon to finish building the Balance of Power indicator.

6.7 Bollinger Bands

Overview

Bollinger Bands were developed by John Bollinger and introduced in the late 1980's. Bollinger Bands serve these primary functions:

- To provide a relative definition of high and low
- To identify periods of high and low volatility
- To identify periods when prices are at extreme levels

They do this by using standard deviation as a measure of volatility. Since standard deviation is a measure of volatility, the bands are self-adjusting; they widen during periods of higher volatility and contract during periods of lower volatility. Bollinger Bands consist of 3 bands designed to encompass the majority of a trading instrument's price action. The middle band is a basis for the intermediate-term trend, typically a 20-periods simple moving average, which also serves as the base for the upper and lower bands. The upper band's and lower band's distance from the middle band is determined by volatility. Typically, the upper band is plotted +2 standard deviations above the middle band while the lower band is plotted -2 standard deviations below the middle band.



Interpretation

Bollinger Bands are usually calculated using the trading instrument's prices, but they can also be calculated using other indicators as their base. These comments refer to bands based on prices. Mr. Bollinger notes the following characteristics of Bollinger Bands.

- Sharp price changes tend to occur after the bands tighten as volatility lessens (a.k.a. "the Squeeze")
- When prices move outside the bands a continuation of the current trend is implied
- Bottoms and tops made outside the bands followed by bottoms and tops made inside the bands call for reversals in the trend
- A move that originates at one band tends to go all the way to the other band

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Bollinger Bands
Function Name Alias: vt_BBands
Label Mask:
    Bollinger Bands (%Pr%,%tPr%,%ma%,%D%)
    MB = %MB%, UB = %UB%, LB = %LB%
Placement: Price Frame
Data Inspection Alias: Bollinger Bands
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Price
Type: price
Default: Close
```

[New] button...

```
Name: tPr
Display Name: Periods
Type: integer
Default: 20
```

[New] button...

```
Name: ma
Display Name: MA Type
Type: MA Type
Default: Simple
```

[New] button...

```
Name: D
```

Display Name: Standard Deviations
Type: float
Default: 2.0000

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: MB
Name: (Middle Band)
Line Color: dark green
Line Width: thin
Line Type: dashed

[New] button...
Var Name: UB
Name: (Upper Band)
Line Color: dark green
Line Width: thin
Line Type: solid

[New] button...
Var Name: LB
Name: (Lower Band)
Line Color: dark green
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
MB:= Mov(Pr,tPr,ma);  
UB:= BLines(Pr,mov(Pr,tPr,ma),tPr,D,0);  
LB:= BLines(Pr,mov(Pr,tPr,ma),tPr,D,1);
```

7. Click the "Save" icon to finish building the Bollinger Bands indicator.

6.8 Bollinger Bands - Fibonacci Ratios

Overview

The Fibonacci Bollinger Bands indicator is based on the same principles as the standard Bollinger Bands indicator developed by John Bollinger. The Fibonacci Bollinger Bands indicator bases its upper and lower bands on volatility just like the Bollinger Bands indicator does, but instead of using standard deviation as the measure of volatility, a Wilders Smoothed ATR is used in its place.

The middle band is a moving average used to establish the intermediate-term trend. The 3 upper bands are constructed by using the Wilders Smoothed ATR and multiplying it by each of the Fibonacci factors (1.6180, 2.6180, and 4.2360) and then adding the results to the middle band. The 3 lower bands are constructed in the same manner as the upper bands except their results are subtracted from the middle band.



Interpretation

The Fibonacci Bollinger Bands indicator may provide good clues to price reversals when used in conjunction with other technical analysis methods or indicators.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Bollinger Bands - Fibonacci Ratios
Function Name Alias: vt_BBandsFibs
Label Mask:
    Bollinger Bands - Fibonacci (%pr%,%periods%,%mat%,%factor1%,%
    factor2%,%factor3%)
    MB = %MidPoint%, UB1 = %UpperBand1%, UB2 = %UpperBand2%, UB3 = %
    UpperBand3%
```

```
LB1 = %LowerBand1%, LB2 = %LowerBand2%, LB3 = %LowerBand3%  
Placement: Price Frame  
Data Inspection Alias: Bollinger Bands - Fibonacci
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr  
Display Name: Price  
Type: price  
Default: Close
```

[New] button...

```
Name: Periods  
Display Name: Periods  
Type: integer  
Default: 20
```

[New] button...

```
Name: mat  
Display Name: MA Type  
Type: MA Type  
Default: Simple
```

[New] button...

```
Name: Factor1  
Display Name: Fibonacci Ratio 1  
Type: float (with bounds)  
Default: 1.6180  
Max Bounds: 1.0000  
Min Bounds: 13.0000
```

[New] button...

```
Name: Factor1  
Display Name: Fibonacci Ratio 2  
Type: float (with bounds)  
Default: 2.6180  
Max Bounds: 1.0000  
Min Bounds: 13.0000
```

[New] button...

```
Name: Factor1  
Display Name: Fibonacci Ratio 3  
Type: float (with bounds)  
Default: 4.2360  
Max Bounds: 1.0000  
Min Bounds: 13.0000
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: UpperBand3  
Name: (Upper Band 3)
```

Line Color: dark green
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: UpperBand2
Name: (Upper Band 2)
Line Color: green
Line Width: thin
Line Type: solid

[New] button...

Var Name: UpperBand1
Name: (Upper Band 1)
Line Color: light green
Line Width: thin
Line Type: dashed

[New] button...

Var Name: MidPoint
Name: (Middle Band)
Line Color: blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: LowerBand3
Name: (Lower Band 3)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: LowerBand2
Name: (Lower Band 2)
Line Color: green
Line Width: thin
Line Type: solid

[New] button...

Var Name: LowerBand1
Name: (Lower Band 1)
Line Color: light green
Line Width: thin
Line Type: dashed

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
TH:=If(Ref(C,-1) > H,Ref(C,-1),H);
```

```
TL:=If(Ref(C,-1) < L,Ref(C,-1),L);
TR:=TH-TL;
TRA:= Wilders(TR,Periods);

MidPoint:= Mov(pr,Periods,mat);

UpperBand3:= MidPoint + (factor3 * TRa);
UpperBand2:= MidPoint + (factor2 * TRa);
UpperBand1:= MidPoint + (factor1 * TRa);

LowerBand1:= MidPoint - (factor1 * TRa);
LowerBand2:= MidPoint - (factor2 * TRa);
LowerBand3:= MidPoint - (factor3 * TRa);
```

7. Click the "Save" icon to finish building the Fibonacci Bollinger Bands indicator.

6.9 Bollinger Bandwidth

Overview

Bollinger Bandwidth is an important indicator derived from John Bollinger's original Bollinger Bands indicator. Bandwidth is a relative measure of the width of the Bollinger Bands.

The Bollinger Bandwidth equation can be constructed as:

$$\text{Bandwidth} = (\text{Bollinger Upper Band} - \text{Bollinger Lower Band}) / \text{Bollinger Middle Band}$$

Volatility is high when the Bollinger Bands are farther apart and low when the Bollinger Bands are closer together. Based on the assumption that price (and volatility) generally operates in cycles - periods of low volatility inevitably followed by periods of high volatility and so on and so forth - traders can learn to take advantage of these cycles.



Interpretation

The Bollinger Bandwidth is particularly useful in helping traders identify "the Squeeze". Bollinger states that Bollinger Bands "are driven by volatility, and the Squeeze is a pure reflection of that volatility". The Squeeze is similar to "the calm before the storm". The Squeeze is identified when the Bandwidth is at its lowest low value within n-periods.

Trading signals can be generated based on the breakout of price (and volatility) following the Squeeze.

The most difficult part of trading breakout signals is determining the direction of the price breakout. Bollinger suggests using other indicators like the Relative Strength Index (RSI) and a volume-based indicator such as Accumulation/Distribution for confirmation combined with the Squeeze setup.

Bollinger also suggests looking for positive and negative divergence between indicators and price as an indication of the potential breakout direction. Positive divergence (indicators rising while price is declining or remaining neutral) is often considered a bullish sign while negative divergence (indicators declining while price is rising) is considered a bearish sign.

Lastly, traders should be on the lookout for "false breakouts" (a.k.a. "Head Fakes" by Bollinger). Price often breaks out in one direction immediately following the Squeeze causing many traders to think the breakout will continue in that direction, only to quickly reverse and make the true, more significant breakout in the opposite direction. Traders acting quickly on the initial breakout (and perhaps without confirmation from other indicators) often get caught on the wrong side of the price action, while those traders expecting a "false breakout" can quickly close out their original position (if they have one open) and enter a trade in the direction of the reversal.

Implementation

Reference lines for “The Bulge” (*blue line - the highest Bandwidth value within the previous n-periods*) and “The Squeeze” (*red line - lowest Bandwidth value within the previous n-periods*) have been included.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Bollinger Bandwidth
Function Name Alias: vt_Bandwidth
Label Mask:
    Bollinger Bandwidth (%Pr%,%tPr%,%ma%,%D%,%bulgeper%,%squeezeper%)
    Bw = %Bandwidth%, Bulge = %Bulge%, Squeeze = %Squeeze%
Placement: New Frame
Data Inspection Alias: Bollinger Bandwidth
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Bollinger Bands Price
Type: price
Default: Close
```

[New] button...

```
Name: tPr
Display Name: Bollinger Bands Periods
Type: integer
Default: 20
```

[New] button...

```
Name: ma
Display Name: Bollinger Bands MA Type
Type: MA Type
Default: Simple
```

[New] button...

```
Name: D
Display Name: Bollinger Bands Standard Deviations
Type: float
Default: 2.0000
```

[New] button...

```
Name: bulgeper
Display Name: Bandwidth Bulge Periods
Type: Integer
```

Default: 150

[New] button...

Name: squeezeper

Display Name: Bandwidth Squeeze Periods

Type: Interger

Default: 150

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: Bandwidth

Name: (Bandwidth)

Line Color: purple

Line Width: thin

Line Type: solid

[New] button...

Var Name: Bulge

Name: (The Bulge)

Line Color: blue

Line Width: thin

Line Type: dashed

[New] button...

Var Name: Squeeze

Name: (The Squeeze)

Line Color: red

Line Width: thin

Line Type: dashed

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
MB:= Mov(Pr,tPr,ma);
```

```
UB:= BLines(Pr,mov(Pr,tPr,ma),tPr,D,0);
```

```
LB:= BLines(Pr,mov(Pr,tPr,ma),tPr,D,1);
```

```
Bandwidth:= (UB-LB)/MB;
```

```
Bulge:= hhv(Bandwidth,bulgeper);
```

```
Squeeze:= llv(Bandwidth,squeezeper);
```

7. Click the "Save" icon to finish building the Bollinger Bandwidth indicator.

6.10 Bollinger Percent B (%b)

Overview

Bollinger Percent B (%b) is an important indicator derived from John Bollinger's original Bollinger Bands indicator. %b depicts the location of the most recent close price in relation to the Bollinger Bands as well as to what degree it is above or below any of the bands.

The Bollinger Percent B equation can be constructed as:

$$\text{Percent B} = ((\text{Close} - \text{Bollinger Lower Band}) / (\text{Bollinger Upper Band} - \text{Bollinger Lower Band})) * 100$$



Interpretation

If the close price is equal to the upper Bollinger Band, %b will be 100 (percent). If the close price is equal to the lower Bollinger Band, %b will be 0.0. A %b value of 50 means the close price is equal to the middle Bollinger Band.

Furthermore, readings above 100 and below 0 indicate that the close price is outside of the Bollinger Bands by a corresponding percentage or the Bollinger Bandwidth. A %b value of 125 means that the close price is above the upper Bollinger Band by 25% of the Bandwidth while a %b value of -25 means that the close price is below the lower Bollinger Band by 25% of the Bandwidth.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Bollinger Percent B (%b)
Function Name Alias: vt_PercentB
Label Mask: Bollinger %%b (%Pr%,%tPr%,%ma%,%D%) = %B%
Placement: New Frame
Data Inspection Alias: Bollinger %b
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Bollinger Bands Price
Type: price
Default: Close
```

[New] button...

```
Name: tPr
Display Name: Bollinger Bands Periods
Type: integer
Default: 20
```

[New] button...

```
Name: ma
Display Name: Bollinger Bands MA Type
Type: MA Type
Default: Simple
```

[New] button...

```
Name: D
Display Name: Bollinger Bands Standard Deviations
Type: float
Default: 2.0000
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: B
Name: (%b)
Line Color: dark green
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +100.0000
Color: red
```

Width: thin
Type: dashed

[New] button...
Value: +50.0000
Color: red
Width: thin
Type: dashed

[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
MB:= Mov(Pr,tPr,ma);  
UB:= BLines(Pr,mov(Pr,tPr,ma),tPr,D,0);  
LB:= BLines(Pr,mov(Pr,tPr,ma),tPr,D,1);  
  
B:= ((Pr-LB)/(UB-LB))*100;
```

7. Click the "Save" icon to finish building the Bollinger Percent B indicator.

6.11 Chaikin's Volatility

Overview

Developed by Marc Chaikin, the Chaikin Volatility indicator quantifies volatility as the widening of the range between high and low prices by comparing the spread between the instrument's high and low prices over n-periods. Chaikin's Volatility indicator is created by first calculating an exponential moving average of the difference between the High and Low price for each period over n-periods (typically 10 periods) and then by calculating the percentage change in the exponential moving average over n-periods (also typically 10 periods).



Interpretation

There are two basic methods to interpret Chaikin's measure of volatility.

Method 1: Assume that market tops are generally accompanied by increased volatility while the late stages of market bottoms are generally accompanied by decreased volatility.

Method 2: Assume that a shorter term increase in the Volatility indicator indicates an approaching market bottom while a longer term decrease in the volatility indicator indicates an approaching market top.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chaikin's Volatility
Function Name Alias: vt_CVOL
Label Mask: Chaikin's Volatility (%hlper%,%rocper%) = %CVOL%
Placement: New Frame
Data Inspection Alias: Chaikin's Volatility
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: hlper
Display Name: High-Low Average Periods
Type: integer
Default: 10

[New] button...

Name: rocper
Display Name: Rate of Change Periods
Type: integer
Default: 10

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: CVOL
Name: (Volatility)
Line Color: purple
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
HLAverage:= Mov( (H-L) ,hlper ,E) ;  
HLAverageChange:= Ref( HLAverage , -rocper) ;  
CVOL:= ((HLAverage - HLAverageChange) / HLAverageChange) * 100 ;
```

7. Click the "Save" icon to finish building Chaikin's Volatility indicator.

6.12 Chande's Dynamic Momentum Index

Overview

The Dynamic Momentum Index (DMI) was developed by Tushar Chande and Stanley Kroll. The indicator is described in detail in their book "The New Technical Trader".



Interpretation

Chande's DMI is very similar to Welles Wilder's Relative Strength Index (RSI), however, there is one very important difference. Unlike the RSI which uses a fixed number of periods, the Dynamic Momentum Index uses a variable amount of periods as market volatility changes. The number of periods the DMI uses decreases as market volatility increases thereby allowing the indicator to be more responsive to price changes.

The Dynamic Momentum Index can be interpreted in much the same way as the more traditional RSI as an overbought and oversold indicator. Readings above 70 are considered to be overbought while readings under 30 are considered to be oversold.

Implementation

The DMI indicator has 2 indicator plots available. The default data plot is the Dynamic Momentum Index indicator itself. The secondary data plot is the dynamic periods. The dynamic periods data plot shows what periods length is being used for any given bar loaded in the chart.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chande's Dynamic Momentum Index
Function Name Alias: vt_ChandeDMI
Label Mask:
    Chande's DMI (%price%,%stdevPeriods%,%stdevmaper%,%stdevmat%,%
    DmiPeriods%,%DmiLowerLimit%/DmiUpperLimit%)
    %plot% = %IndicatorPlot%
Placement: New Frame
Data Inspection Alias: Chande's DMI
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Price
Display Name: Price
Type: price
Default: Close
```

[New] button...

```
Name: stdevPeriods
Display Name: Standard Deviation Periods
Type: integer
Default: 5
```

[New] button...

```
Name: stdevmaper
Display Name: MA of Standard Deviation Periods
Type: integer
Default: 10
```

[New] button...

```
Name: stdevmat
Display Name: MA of Standard Deviation Type
Type: MA Type
Default: Simple
```

[New] button...

```
Name: DmiPeriods
Display Name: Dynamic Momentum Index Periods
Type: integer
Default: 14
```

[New] button...

```
Name: DmiLowerLimit
Display Name: Dynamic Periods Lower Bounds
Type: integer
Default: 3
```

[New] button...

```
Name: DmiUpperLimit
Display Name: Dynamic Periods Upper Bounds
Type: integer
```

Default: 30

[New] button...

Name: plot

Display Name: Display DMI or Periods Length

Type: Enumeration

Default: click [...] button, **[New]** button, then create the following entries:

Dynamic_Momentum_Index

Dynamic_Periods_Length

... then, click **[OK]** button

Default: Dynamic_Momentum_Index

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: IndicatorPlot

Name: (DMI)

Line Color: blue

Line Width: slightly thicker

Line Type: solid line

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +70.0000

Color: red

Width: thin

Type: dashed

[New] button...

Value: +50.0000

Color: gray

Width: thin

Type: dashed

[New] button...

Value: +30.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
Vi:= Stdev(price,stdevPeriods) / Mov(Stdev(price,stdevPeriods),
stdevmaper,stdevmat);
Td:= Int(DmiPeriods/Vi);
Td:= if(Td>DmiUpperLimit,DmiUpperLimit,if(Td<DmiLowerLimit,
DmiLowerLimit,Td));

rsi_r:= (price - ref(price,-1));
rsi_rs:= Wilders(if(rsi_r>0,rsi_r,0),Td) / Wilders(if(rsi_r<0,Abs
(rsi_r),0),Td);
```

```

DMIIndex:= 100-(100/(1+rsi_rs));

IndicatorPlot:= if(plot=0,DMIIndex,Td);

```

7. Click the "Save" icon to finish building Chande's DMI indicator.

6.13 Chande's Momentum Oscillator (CMO)

Overview

The Chande Momentum Oscillator (CMO) was developed by Tushar Chande and explained in the book "The New Technical Trader" by Tushar Chande and Stanley Kroll. The CMO was designed to calculate what Chande refers to as "pure momentum". The CMO is similar to, yet unique from, other momentum-oriented indicators such as the RSI, Stochastic, and Rate-of-Change.

The CMO uses data for both up days and down days in the numerator, thereby directly measuring momentum. The calculations are performed on unsmoothed data. This allows for short-term extreme movements to be less hidden. However, smoothing can be applied to the CMO if desired. The scale is bound between +100 and -100 thus allowing the user to clearly see changes in net momentum using the 0 level as a balance point.



Interpretation

The Chande Momentum Oscillator can be used to measure several conditions:

Identifying Overbought/oversold Conditions: Looking for extreme overbought or oversold conditions is the primary method of interpreting the CMO. As a general rule, Mr. Chande quantifies an overbought level at +50 and the oversold level at -50. At +50, up-day momentum is three times the down-day momentum; At -50, down-day momentum is three times the up-day momentum. These levels essentially correspond to the common 70/30 levels used with the RSI indicator.

Using a CMO Trigger Line: Trade entry and exit rules can be created by plotting a moving average of the CMO as a "trigger" line. For example, using the default 20-period CMO, a 9-period moving average may serve as a good trigger line. Buy when the CMO crosses above the 9-period trigger line; sell when it crosses below it.

Trendiness: The CMO can also be used to measure the degree of trendiness an instrument exhibits. Higher CMO values correspond to betting trendiness while lower values of CMO indicate a possible trading range.

Divergence: Although not specifically mentioned in Chande's book, looking for divergence between the CMO and the instrument's price may also be a viable strategy as it often is with other similar momentum-oriented indicators.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chande's Momentum Oscillator
Function Name Alias: vt_CMO
Label Mask: Chande's Momentum Osc. (%Price%,%Periods%) = %ChMomOcs%
Placement: New Frame
Data Inspection Alias: Chande's Momentum Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Price
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: Periods
Display Name: Periods
Type: integer
Default: 14
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: ChMomOcs

Name: (CMO)

Line Color: dark blue

Line Width: thin

Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +50.0000

Color: red

Width: thin

Type: dashed

[New] button...

Value: +0.0000

Color: black

Width: thin

Type: dashed

[New] button...

Value: -50.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
UpDay:= Sum((Price-Ref(Price,-1))*(Price>Ref(Price,-1)),Periods);  
DownDay:= Sum((Ref(Price,-1)-Price)*(Price<Ref(Price,-1)),Periods);  
ChMomOcs:= 100 * ((UpDay-DownDay)/(UpDay+DownDay));
```

7. Click the "Save" icon to finish building Chandes' Momentum Oscillator indicator.

6.14 Chande's QStick

Overview

The Chande QStick was developed by Tushar Chande to help identify market trends. It is a moving average of the difference between the opening and closing prices.



Interpretation

Signals can be generated by identifying peaks and troughs, zero line crossings, and/or divergences between the QStick and the instrument's price.

Implementation

The indicator is shown as a bi-color histogram to make identifying peaks, troughs, and zero line crossings easier.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chande's QStick
Function Name Alias: vt_ChandeQS
Label Mask:
    Chande's QStick (%periods%,%mat%)
    Up = %CQS_Up%, Down = %CQS_Down%
Placement: New Frame
```

Data Inspection Alias: Chande's QStick

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: periods
Display Name: QStick Periods
Type: integer
Default: 8

[New] button...

Name: mat
Display Name: QStick Type
Type: MA Type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: CQS_Up
Name: (CQS-Up)
Line Color: green
Line Width: thin
Line Type: histogram

[New] button...

Var Name: CQS_Down
Name: (CQS-Down)
Line Color: red
Line Width: thin
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
CQS:= mov((C-O),periods,mat);  
CQS_Up:= if(CQS>ref(CQS,-1),CQS,CQS);  
CQS_Down:= if(CQS<ref(CQS,-1),CQS,null);
```

7. Click the "Save" icon to finish building Chande's QStick indicator.

6.15 Chande's Range Action Verification Index (RAVI)

Overview

Developed by Tushar Chande, The Range Action Verification Index (RAVI) indicator is used to help identify whether the market is trending (similar to the ADX).



Interpretation

If the RAVI is over 3% the market is said to be trending.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's [New] button
2. In the **General** tab, type the following text for each field:

```
Name: Chande's Range Action Verification Index
Function Name Alias: vt_RAVI
Label Mask: Chande's RAVI (%pr%,%ShortMA%,%LongMA%) = %RAVI%
Placement: New Frame
Data Inspection Alias: Chande's RAVI
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Pr

Display Name: Price

Type: price

Default: close

[New] button...

Name: ShortMA

Display Name: Short Periods

Type: integer

Default: 7

[New] button...

Name: LongMA

Display Name: Long Periods

Type: integer

Default: 65

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: RAVI

Name: (RAVI)

Line Color: dark green

Line Width: slightly thicker

Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +3.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
RAVI:= abs(1000*(mov(pr,ShortMA,S)-mov(pr,LongMA,S))/mov(pr,LongMA,S));
```

7. Click the "Save" icon to finish building Chande's RAVI indicator.

6.16 Chande's TrendScore

Overview

Chande's TrendScore indicator was described by Tushar Chande in the September 1993 edition of Stock & Commodities magazine. The TrendScore attempts to make a quantitative and qualitative determination of the direction and strength of a market trend by comparing the current close price to previous close prices over the last 20 periods.



Interpretation

The TrendScore indicator oscillates between +10 and -10. A +10 reading indicates a strong uptrend is underway. A -10 reading indicates a strong downtrend is underway. Readings above 0 suggest an upward trend of varying strength and readings below 0 suggest a downward trend of varying strength.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Chande's TrendScore
Function Name Alias: vt_ChandeTS
Label Mask: Chande's TrendScore (%price%) = %TrendScore%
Placement: New Frame
Data Inspection Alias: Chande's TrendScore
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
 Name: Price
 Display Name: Price
 Type: price
 Default: close

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
 Var Name: TrendScore
 Name: (TrendScore)
 Line Color: dark green
 Line Width: slightly thicker
 Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
 Value: +0.0000
 Color: black
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
TrendScore:= If(price>=Ref(price,-11),1,-1) + If(price>=Ref(price,-
12),1,-1) +
                If(price>=Ref(price,-13),1,-1) + If(price>=Ref(price,-
14),1,-1) +
                If(price>=Ref(price,-15),1,-1) + If(price>=Ref(price,-
16),1,-1) +
                If(price>=Ref(price,-17),1,-1) + If(price>=Ref(price,-
18),1,-1) +
                If(price>=Ref(price,-19),1,-1) + If(price>=Ref(price,-
20),1,-1);
```

7. Click the "Save" icon to finish building Chande's TrendScore indicator.

6.17 Chande's Variable Index Dynamic Average (VIDYA)

Overview

Developed by Tushar Chande, the Variable Index Dynamic Average (VIDYA) indicator was described in the March 1992 edition of Stock & Commodities magazine. Chande's VIDYA is a moving average that automatically adjusts its speed based on market volatility. The absolute value of a 9-period Chande Momentum Oscillator is used for the volatility index.



Interpretation

Chande's VIDYA can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chande's Variable Index Dynamic Average (VIDYA)
Function Name Alias: vt_VIDYA
Label Mask: Chande's VIDYA (%Price%, %Periods%,%pds%) = %Vidya%
Placement: Price Frame
Data Inspection Alias: Chande's VIDYA
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Price
Display Name: Price
Type: price
```

Default: Close

[New] button...

Name: Periods
 Display Name: CMO Periods
 Type: integer (with bounds)
 Default: 9
 Min Bounds: 3
 Max Bounds: 9999

[New] button...

Name: pds
 Display Name: VIDYA Periods
 Type: integer (with bounds)
 Default: 20
 Min Bounds: 1
 Max Bounds: 9999

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: Vidya
 Name: (VIDYA)
 Line Color: blue
 Line Width: thin
 Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
UpDay:= Sum((Price-Ref(Price,-1))*(Price>Ref(Price,-1)),Periods);
DownDay:= Sum((Ref(Price,-1)-Price)*(Price<Ref(Price,-1)),Periods);
_CMO:= 100 * ((UpDay-DownDay)/(UpDay+DownDay));
```

```
SC:= 2/(pds+1);
absCMO:= abs(_CMO)/100;
```

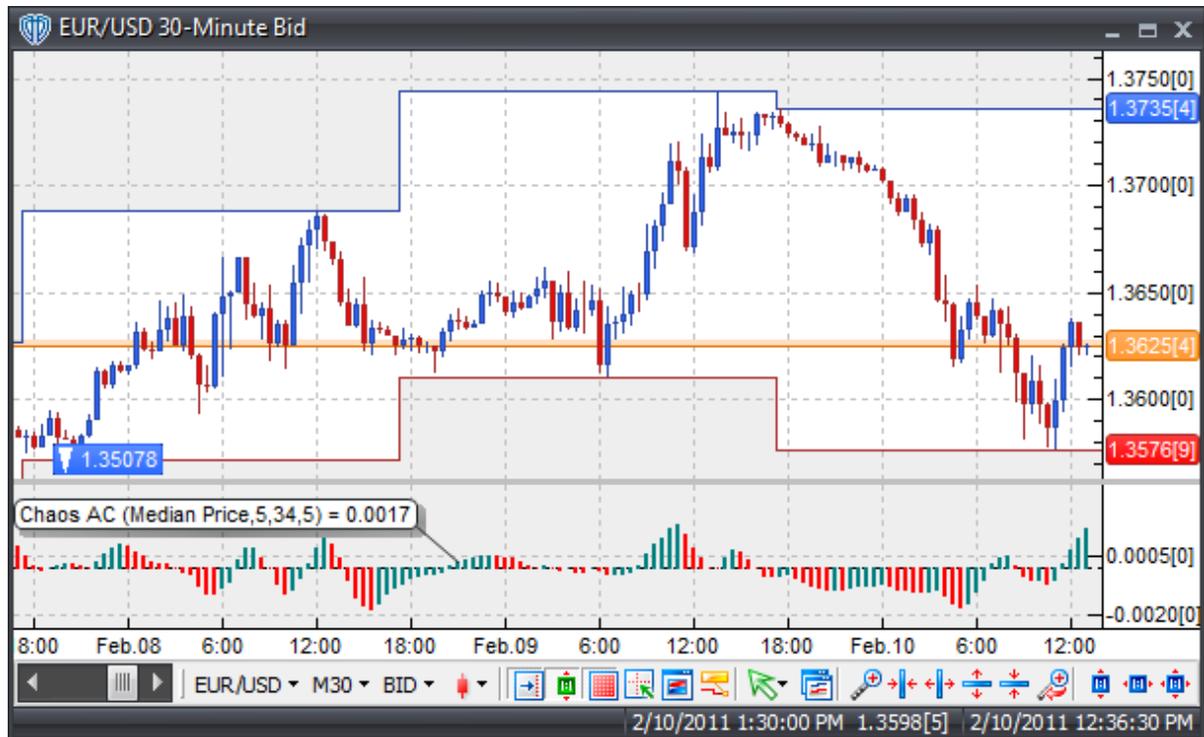
```
Vidya:= If(BarCount()<=(pds+1), Price, (SC*AbsCMO*Price) + (1-
(SC*AbsCMO)) * PREV(Price));
```

7. Click the "Save" icon to finish building Chande's VIDYA indicator.

6.18 Chaos Accelerator Oscillator

Overview

The Chaos Accelerator/Decelerator Oscillator is discussed by Bill M. Williams, PhD in his "Trading Chaos" book(s).



Interpretation

Bill Williams' "Trading Chaos" book(s) describe some basic (and advanced) concepts for trading using the Chaos Accelerator Oscillator as part of a larger, more inclusive Chaos-based trading methodology.

For a full, detailed description of Bill Williams' Chaos trading methods, please refer to:

"Trading Chaos: Applying Expert Techniques to Maximize Your Profits" by Bill M. Williams, PhD (1995)

"New Trading Dimensions: How to Profit from Chaos in Stocks, Bonds, and Commodities" by Bill M. Williams, PhD (1998)

"Trading Chaos: Maximize Profits with Proven Technical Techniques" by Bill M. Williams, PhD (2004)

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

Name: Chaos Accelerator Oscillator
Function Name Alias: vt_ChaosAC
Label Mask: Chaos AC (%Prc%,%ShortMAPer%,%LongMAPer%,%SignalMAPer%) = %ACGreen%
Placement: New Frame
Data Inspection Alias: Chaos AC

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

"Read Only" Enabled
Name: Prc
Display Name: Price
Type: price
Default: Median Price

[New] button...

"Read Only" Enabled
Name: ShortMAPeriods
Display Name: Short MA Periods
Type: integer
Default: 5

[New] button...

"Read Only" Enabled
Name: LongMAPeriods
Display Name: Long MA Periods
Type: integer
Default: 34

[New] button...

"Read Only" Enabled
Name: SignalMAPeriods
Display Name: Signal MA Periods
Type: integer
Default: 5

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: ACGreen
Name: (AC-Green)
Line Color: dark green
Line Width: slightly thicker
Line Type: histogram

[New] button...

Var Name: ACRed
Name: (AC-Red)
Line Color: red
Line Width: slightly thicker
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
AC:= Mov(Prc,5,S) - Mov(Prc,34,S) - Mov(Mov(Prc,5,S) - Mov(Prc,34,S),5,
S);

ACGreen:= If(AC>=Ref(AC,-1), AC, AC);
ACRed:= If(AC<Ref(AC,-1), AC, null);
```

7. Click the "Save" icon to finish building the Chaos Accelerator Oscillator indicator.

6.19 Chaos Alligator Indicator

Overview

The Chaos Alligator Indicator is discussed by Bill M. Williams, PhD in his "Trading Chaos" book(s).



Interpretation

Bill Williams' "Trading Chaos" book(s) describe some basic (and advanced) concepts for trading using the Chaos Alligator Indicator as part of a larger, more inclusive Chaos-based trading methodology.

For a full, detailed description of Bill Williams' Chaos trading methods, please refer to:

"Trading Chaos: Applying Expert Techniques to Maximize Your Profits" by Bill M. Williams, PhD (1995)

"New Trading Dimensions: How to Profit from Chaos in Stocks, Bonds, and Commodities" by Bill M. Williams, PhD (1998)

"Trading Chaos: Maximize Profits with Proven Technical Techniques" by Bill M. Williams, PhD (2004)

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chaos Alligator Indicator
Function Name Alias: vt_ChaosAlligator
Label Mask:
    Chaos Alligator (%Prc%,%LipPer%,%TeethPer%,%JawPer%)
    Lip = %Lip%, Jaw = %Jaw%, Teeth = %Teeth%
Placement: Price Frame
Data Inspection Alias: Chaos Alligator
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
"Read Only" Enabled
Name: Prc
Display Name: Price
Type: price
Default: Median Price
```

```
[New] button...
"Read Only" Enabled
Name: LipPer
Display Name: Lip Periods
Type: integer
Default: 5
```

```
[New] button...
"Read Only" Enabled
Name: ShLp
Display Name: Lip Horizontal Shift
```

Type: Bars Forward
Default: 3
Min Bounds: 3
Max Bounds: 3

[New] button...
"Read Only" Enabled
Name: TeethPer
Display Name: Teeth Periods
Type: integer
Default: 8

[New] button...
"Read Only" Enabled
Name: ShTth
Display Name: Teeth Horizontal Shift
Type: Bars Forward
Default: 5
Min Bounds: 5
Max Bounds: 5

[New] button...
"Read Only" Enabled
Name: JawPer
Display Name: Jaw Periods
Type: integer
Default: 13

[New] button...
"Read Only" Enabled
Name: ShJw
Display Name: Jaw Horizontal Shift
Type: Bars Forward
Default: 8
Min Bounds: 8
Max Bounds: 8

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: Lip
Name: (Lip)
Line Color: green
Line Width: thin
Line Type: solid

[New] button...
Var Name: Teeth
Name: (Teeth)
Line Color: red
Line Width: thin
Line Type: solid

[New] button...

Var Name: Jaw

Name: (Jaw)

Line Color: blue

Line Width: thin

Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
Lip:= Ref(Wilders(Prc,LipPer),-ShLp);
Teeth:= Ref(Wilders(Prc,TeethPer),-ShTth);
Jaw:= Ref(Wilders(Prc,JawPer),-ShJw);
```

7. Click the "Save" icon to finish building the Chaos Alligator Indicator.

6.20 Chaos Awesome Oscillator

Overview

The Chaos Awesome Oscillator is discussed by Bill M. Williams, PhD in his "Trading Chaos" book(s).



Interpretation

Bill Williams' "Trading Chaos" book(s) describe some basic (and advanced) concepts for trading using the Chaos Awesome Oscillator as part of a larger, more inclusive Chaos-based trading methodology.

For a full, detailed description of Bill Williams' Chaos trading methods, please refer to:

"Trading Chaos: Applying Expert Techniques to Maximize Your Profits" by Bill M. Williams, PhD (1995)

"New Trading Dimensions: How to Profit from Chaos in Stocks, Bonds, and Commodities" by Bill M. Williams, PhD (1998)

"Trading Chaos: Maximize Profits with Proven Technical Techniques" by Bill M. Williams, PhD (2004)

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chaos Awesome Oscillator
Function Name Alias: vt_ChaosAO
Label Mask:
    Chaos AO (%Prc%,%ShortMAPer%,%LongMAPer%,%SignalMAPer%)
    AO = %AOGreen%, AO-Signal = %SL%
Placement: New Frame
Data Inspection Alias: Chaos AO
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

"Read Only" Enabled

Name: Prc

Display Name: Price

Type: price

Default: Median Price

[New] button...

"Read Only" Enabled

Name: ShortMAPeriods

Display Name: Short MA Periods

Type: integer

Default: 5

[New] button...

"Read Only" Enabled

Name: LongMAPeriods

Display Name: Long MA Periods
Type: integer
Default: 34

[New] button...

"Read Only" Enabled
Name: SignalMAPeriods
Display Name: Signal MA Periods
Type: integer
Default: 5

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: AOGreen
Name: (AO-Green)
Line Color: dark green
Line Width: slightly thicker
Line Type: histogram

[New] button...

Var Name: AORed
Name: (AO-Red)
Line Color: red
Line Width: slightly thicker
Line Type: histogram

[New] button...

Var Name: SL
Name: (AO-Signal Line)
Line Color: blue
Line Width: thin
Line Type: dashed

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
AO:= Mov(Prc,5,S) - Mov(Prc,34,S);  
SL:= Mov(AO,5,S);  
  
AOGreen:= if(AO>=Ref(AO,-1), AO, AO);  
AORed:= if(AO<Ref(AO,-1), AO, null);
```

7. Click the "Save" icon to finish building the Chaos Awesome Oscillator indicator.

6.21 Chaos Fractals

Overview

The concept of Fractals was discussed by Bill M. Williams, PhD in his book "Trading with Chaos". According to Williams, an "up fractal" is defined as a middle bar with two lower highs on each side of it. A "down fractal" is defined as a middle bar with two higher lows on each side of it.



Interpretation

Bill Williams' book "Trading Chaos" described some basic (and advanced) concepts for trading using fractals as part of a larger, more inclusive Chaos-based trading methodology.

One simple method of utilizing fractals to initiate trades is to take trade based on the direction of a price breakout above/below the most recent fractal. If price breaks above the most recent UpFractal - enter long; If price breaks below the most recent DownFractal - enter short. Protective stops should be placed below the lowest low of the most recent Down Fractal or 2nd most recent DownFractal for long trades and above the highest high of the most recent UpFractal or 2nd most recent UpFractal for short trades.

For a full, detailed description of Bill Williams' Chaos trading methods, please refer to "Trading Chaos: Applying Expert Techniques to Maximize Your Profits" by Bill M. Williams, PhD (Wiley - 1995)

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chaos Fractals
Function Name Alias: vt_ChaosFractals
Label Mask:
    Chaos Up-Fractal = %UpFractal%
    Chaos Down-Fractal = %DownFractal%
Placement: Price Frame
Data Inspection Alias: Chaos Fractals
```

3. In the **Input Variable(s)** tab, create the following variables:

```
This indicator requires no input variables.
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: UpFractal
Name: (Up Fractal)
Line Color: blue
Line Width: thin
Line Type: dots
```

[New] button...

```
Var Name: DownFractal
Name: (Down Fractal)
Line Color: red
Line Width: thin
Line Type: dots
```

[New] button...

```
Var Name: Display_UpFractal
Name: (HHV of Up Fractal)
Line Color: dark blue
Line Width: thick
Line Type: dots
```

[New] button...

```
Var Name: Display_DownFractal
Name: (LLV of Down Fractal)
Line Color: dark red
Line Width: thick
Line Type: dots
```

5. In the **Horizontal Line** tab, create the following variables:

```
This indicator requires no horizontal levels.
```

6. In the **Formula** tab, copy and paste the following formula:

```
{Generate Fractal Levels}

High1:= Ref(H,-4);
High2:= Ref(H,-3);
High3:= Ref(H,-2);
High4:= Ref(H,-1);
High5:= H;

Low1:= Ref(L,-4);
Low2:= Ref(L,-3);
Low3:= Ref(L,-2);
Low4:= Ref(L,-1);
Low5:= L;

UpFractal:= valuewhen(1,High3>high1 and High3>High2 and High3>High4 and
High3>High5,High3);
DownFractal:= valuewhen(1,Low3<Low1 and Low3<Low2 and Low3<Low4 and
Low3<Low5,Low3);

{Mark Highest High Bar of UpFractal}
{Mark Lowest Low Bar of DownFractal}
{This section is FOR DISPLAY USE ONLY!}

Display_High1:= Ref(H,-2);
Display_High2:= Ref(H,-1);
Display_High3:= Ref(H,0);
Display_High4:= Ref(H,1);
Display_High5:= Ref(H,2);

Display_Low1:= Ref(L,-2);
Display_Low2:= Ref(L,-1);
Display_Low3:= Ref(L,0);
Display_Low4:= Ref(L,1);
Display_Low5:= Ref(L,2);

Display_UpFractal:= If(Display_High3>Display_High1 and
Display_High3>Display_High2 and
Display_High3>Display_High4 and
Display_High3>Display_High5,
Display_High3,
null);

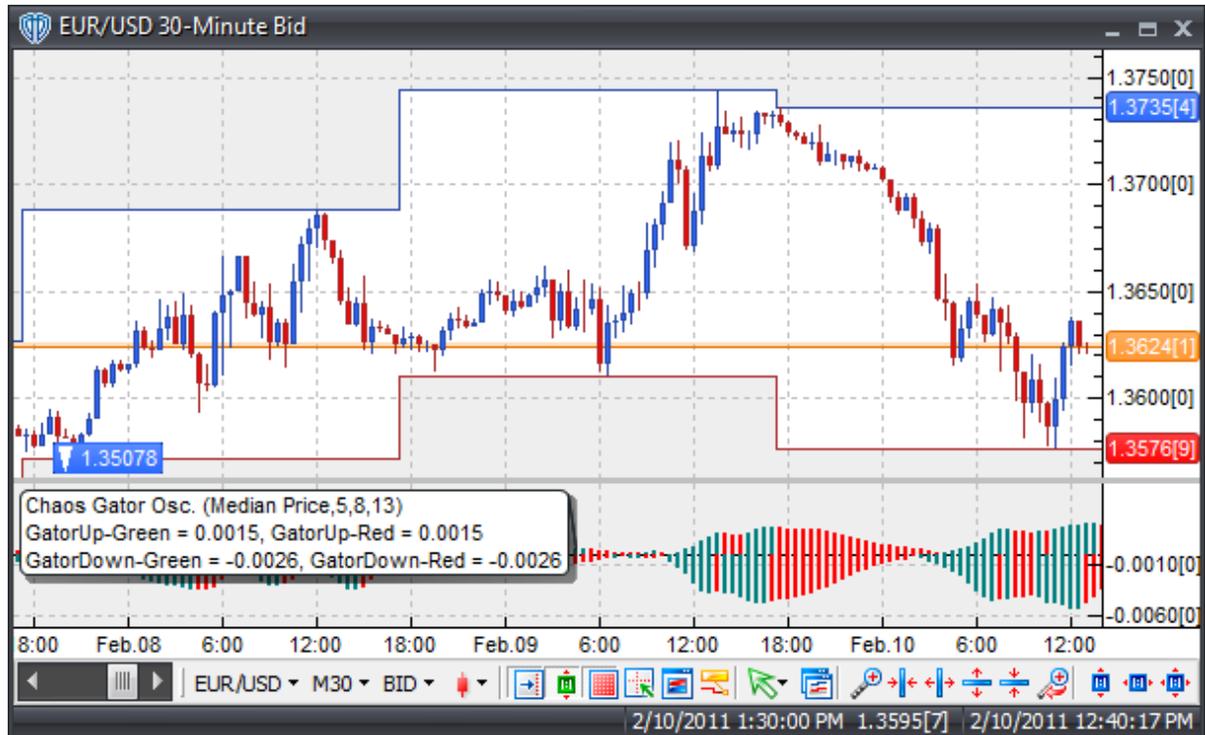
Display_DownFractal:= If(Display_Low3<Display_Low1 and
Display_Low3<Display_Low2 and
Display_Low3<Display_Low4 and
Display_Low3<Display_Low5,
Display_Low3,
null);
```

7. Click the "Save" icon to finish building the Chaos Fractals indicator.

6.22 Chaos Gator Oscillator

Overview

The Chaos Gator Oscillator is discussed by Bill M. Williams, PhD in his "Trading Chaos" book(s).



Interpretation

Bill Williams' "Trading Chaos" book(s) describe some basic (and advanced) concepts for trading using the Chaos Gator Oscillator as part of a larger, more inclusive Chaos-based trading methodology.

For a full, detailed description of Bill Williams' Chaos trading methods, please refer to:

"Trading Chaos: Applying Expert Techniques to Maximize Your Profits" by Bill M. Williams, PhD (1995)

"New Trading Dimensions: How to Profit from Chaos in Stocks, Bonds, and Commodities" by Bill M. Williams, PhD (1998)

"Trading Chaos: Maximize Profits with Proven Technical Techniques" by Bill M. Williams, PhD (2004)

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Chaos Gator Oscillator
Function Name Alias: vt_ChaosGator
Label Mask:
    Chaos Gator Osc. (%Prc%,%LipPer%,%TeethPer%,%JawPer%)
    GatorUp-Green = %GatorUpGr%, GatorUp-Red = %GatorUpRed%
    GatorDown-Green = %GatorDnGr%, GatorDown-Red = %GatorDnRed%
Placement: New Frame
Data Inspection Alias: Chaos Gator Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
"Read Only" Enabled
Name: Prc
Display Name: Price
Type: price
Default: Median Price
```

```
[New] button...
"Read Only" Enabled
Name: LipPer
Display Name: Lip Periods
Type: integer
Default: 5
```

```
[New] button...
"Read Only" Enabled
Name: ShLp
Display Name: Lip Horizontal Shift
Type: Bars Forward
Default: 3
Min Bounds: 3
Max Bounds: 3
```

```
[New] button...
"Read Only" Enabled
Name: TeethPer
Display Name: Teeth Periods
Type: integer
Default: 8
```

```
[New] button...
"Read Only" Enabled
Name: ShTth
Display Name: Teeth Horizontal Shift
Type: Bars Forward
```

Default: 5
Min Bounds: 5
Max Bounds: 5

[New] button...
"Read Only" Enabled
Name: JawPer
Display Name: Jaw Periods
Type: integer
Default: 13

[New] button...
"Read Only" Enabled
Name: ShJw
Display Name: Jaw Horizontal Shift
Type: Bars Forward
Default: 8
Min Bounds: 8
Max Bounds: 8

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: GatorUpGr
Name: (Gator Up - Green)
Line Color: dark green
Line Width: slightly thicker
Line Type: histogram

[New] button...
Var Name: GatorUpRed
Name: (Gator Up - Red)
Line Color: red
Line Width: slightly thicker
Line Type: histogram

[New] button...
Var Name: GatorDnGr
Name: (Gator Down - Green)
Line Color: dark green
Line Width: slightly thicker
Line Type: histogram

[New] button...
Var Name: GatorDnRed
Name: (Gator Down - Red)
Line Color: red
Line Width: slightly thicker
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +0.0000  
Color: black  
Width: thin  
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
Lip:= Ref(Wilders(Prc,LipPer),-ShLp);  
Teeth:= Ref(Wilders(Prc,TeethPer),-ShTth);  
Jaw:= Ref(Wilders(Prc,JawPer),-ShJw);  
  
GatorUp:= if(Teeth>Jaw,Teeth-Jaw,Jaw-Teeth);  
GatorDn:= if(Jaw<Lip,Jaw-Lip,Lip-Jaw);  
  
GatorUpGr:= If(GatorUp>=Ref(GatorUp,-1),GatorUp,GatorUp);  
GatorUpRed:= If(GatorUp<Ref(GatorUp,-1),GatorUp,null);  
GatorDnGr:= If(GatorDn<=Ref(GatorDn,-1),GatorDn,GatorDn);  
GatorDnRed:= If(GatorDn>Ref(GatorDn,-1),GatorDn,null);
```

7. Click the "Save" icon to finish building the Chaos Gator Oscillator.

6.23 Choppiness Index

Overview

Developed by E.W. Dreiss, the Choppiness Index was designed to be a simple yet practical way to help a trader determine if the market prices are trending or consolidating. It is similar to the ADX (which is also designed to evaluate the strength of a trend and determine if the market is trending or consolidating), however, Dreiss considers the Choppiness Index the superior of the two indicators.

The Choppiness Index uses a scale between 0 and 100. It also typically uses upper and lower bands at 61.8 and 38.2 respectively. The Choppiness Index is constructed by first calculating the true range for each period and summing those values over n-periods. Second, it calculates the highest high value and lowest low value over n-periods and calculates their difference. Third, it divides the sum of the true ranges and calculates the base-10 logarithm of the value. Finally, it divides this value by the base-10 logarithm of n-periods and multiplies the results by 100.



Interpretation

The Choppiness Index does not determine in which direction the market is moving. Its basic premise is that the more heavily the market is trending over the last n-periods the closer to zero the Choppiness Index will be and the more heavily the market is consolidating (i.e. moving sideways or becoming "choppy") over the last n-periods the closer to 100 the Choppiness Index will be.

Choppiness Index values above 61.8 indicate that the market is likely "choppy" (i.e. moving sideways and consolidating). Higher values typically occur during/after a strong consolidation phase. Higher values could also be interpreted as a warning sign of potential upcoming breakouts after significant consolidation has occurred.

Choppiness Index values below 38.2 indicate that the market is likely trending. Lower values typically occur during/after a strong trending phase. Lower values could also be interpreted as a warning sign of potential upcoming consolidation and choppiness after a strong trend phase has occurred.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

Name: Choppiness Index
Function Name Alias: vt_ChopIndex

Label Mask: Choppiness Index (%periods%) = %ChopIndex%
Placement: New Frame
Data Inspection Alias: Choppiness Index

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
Name: periods
Display Name: Periods
Type: integer (with bounds)
Default: 14

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: ChopIndex
Name: (CI)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

[New] button...
Value: +61.8000
Color: red
Width: thin
Type: dashed

[New] button...
Value: +38.2000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
ChopIndex:= ((Log(Sum(Atr(1),periods)/(HHV(H,periods)-LLV(L,periods)))/  
Log(10)) / (Log(periods)/Log(10))) * 100;
```

7. Click the "Save" icon to finish building the Choppiness Index.

6.24 Commodity Channel Index (CCI)

Overview

Developed by Donald Lambert, the Commodity Channel Index (CCI) measures the variation of a security's price from its statistical mean. High values show that prices are unusually high compared to

average prices whereas low values indicate that prices are unusually low. Contrary to its name, the CCI can be used effectively on any type of trading instrument, not just commodities.

The Commodity Channel Index (CCI) is calculated by first determining the difference between the mean price of a commodity and the average of the means over the time period chosen (where Mean is the exact middle between 2 extremes - MidPrice). This difference is then compared to the average difference over the time period (this factors in the commodity's own inherent volatility). The result is then multiplied by a constant that is designed to adjust the CCI so that it fits into a "normal" trading range of +/-100.



Interpretation

The CCI is a versatile indicator capable of producing a wide array of buy and sell signals. However, there are three basic methods of interpreting the CCI: looking for divergences, trend line breaks, and as an overbought/oversold indicator.

A divergence occurs when the instrument's prices are making new highs while the CCI is failing to surpass its previous highs or when the instrument's prices are making new lows while the CCI is failing to surpass its previous lows. These classic divergences are usually followed by a correction in the instrument's price.

Trend line breaks can also be used to generate signals. Trend lines can be drawn connecting the peaks and troughs of the CCI. From oversold levels, an advance above -100 and trend line breakout could be considered bullish. From overbought levels, a decline below +100 and a trend line break could be considered bearish.

The CCI typically oscillates between ± 100 . To use the CCI as an overbought/oversold indicator, readings above +100 imply an overbought condition (and a pending price correction) while readings below -100

imply an oversold condition (and a pending rally).

Implementation

VT Trader includes 2 different methods of calculation for the Commodity Channel Index. Both are similar in design, but plot slightly different values.

The first method of calculation is the MetaStock formula equivalent.

```
Diff:= TP()-Mov(TP(),Pr,S);
AveDiff:= Mov(Abs(Diff),Pr,S);
EquationComp:= Diff/AveDiff;
AdjCon:= 66.66667{equivelant=2/3tds};
MS_CCI:= EquationComp*AdjCon;
```

The second method of calculation is Donald Lambert's original formula calculation. For scaling purposes, Lambert set the constant at 0.015 to ensure that approximately 70 to 80 percent of CCI values would fall between -100 and +100. The percentage of CCI values that fall between +100 and -100 will depend on the number of periods used. A shorter CCI will be more volatile with a smaller percentage of values between +100 and -100. Conversely, the more periods used to calculate the CCI, the higher the percentage of values between +100 and -100.

```
DL_CCI:= CCI(TP(),Pr);
```

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Commodity Channel Index (CCI)
Function Name Alias: vt_CCI
Label Mask: CCI (%Pr%,%FormulaChoice%) = %CCIndex%
Placement: New Frame
Data Inspection Alias: CCI
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: CCI Periods
Type: integer
Default: 14
```

[New] button...

```
Name: FormulaChoice
Display Name: CCI Formula Calc Method
Type: Enumeration
```

Default: click [...] button, [New] button, then create the following entries:

```
MetaStock_Equivalent_Formula
Donald_Lambert_Formula
... then, click [OK] button
Default: Donald_Lambert_Formula
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: CCIndex
Name: (CCI)
Line Color: dark blue
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +100.0000
Color: red
Width: thin
Type: dashed
```

[New] button...

```
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

[New] button...

```
Value: -100.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
{MetaStock Equivalent Calculation}

Diff:= TP()-Mov(TP(),Pr,S);
AveDiff:= Mov(Abs(Diff),Pr,S);
EquationComp:= Diff/AveDiff;
AdjCon:= 66.666667;
MS_CCI:= EquationComp * AdjCon;

{Donald Lambert's Original Formula}

DL_CCI:= CCI(TP(),Pr);

{Display CCI Based on User's Choice}

CCIndex:= if(FormulaChoice=0,MS_CCI,DL_CCI);
```

7. Click the "Save" icon to finish building the Commodity Channel Index (CCI) indicator.

6.25 Coppock Curve

Overview

The Coppock Curve was developed by Edwin Sedgwick Coppock in 1962 and featured in the November 1994 issue of *Technical Analysis of Stocks & Commodities*, in the article "The Coppock Curve", written by Elliot Middleton:

"We are creatures of habit. We judge the world relative to what we have experienced. If we're shopping for a mortgage and rates have been in the teens (as they were in the early 1980s) and then drop to 10%, we are elated. If, however, they've been at 8% and then rise to 10%, we are disappointed. It all depends on our perspective. The principle of adaptation-level applies to how we judge our income levels, stock prices and virtually every other variable in our lives. Psychologically, relativity prevails..."

-- Taken from *Stocks & Commodities*, V. 12:11 (459-462): *The Coppock Curve* by Elliott Middleton



Interpretation

The moving average is the simplest form of adaptation-level. The Coppock Curve Indicator is a longer term oscillator based on adaptation-levels, but in a different way. Oscillators usually begin by calculating a % change of current price from some previous price, where the previous price is the reference point (adaptation-level).

Edwin Coppock reasoned that the market participants' emotional state could be quantified by summing up the % changes over the recent past to get a general sense of the market's longer term momentum.

For example: If we compare prices relative to a year ago and we see that this month the market is up 15% over a year ago, last month it was up 12.5% over a year ago, and 10%, 7.5% and 5% respectively the months before that, then we may gauge that the market is gaining momentum.

Basic signals can be generated using the Coppock Curve by trading reversals from extreme levels. Looking for divergence and trend line breaks may also be useful.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Coppock Curve
Function Name Alias: vt_Coppock
Label Mask: Coppock Curve (%ROC_per%,%ma1_per%,%ma2_per%) = %CC%
Placement: New Frame
Data Inspection Alias: Coppock Curve
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: ROC_per
Display Name: ROC Periods
Type: integer
Default: 250
```

```
[New] button...
Name: ma1_per
Display Name: MA1 Periods
Type: integer
Default: 22
```

```
[New] button...
Name: ma2_per
Display Name: MA2 Periods
Type: integer
Default: 150
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: CC
Name: (CC)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
CC:= (Mov(Roc(Mov(C,ma1_per,S),ROC_per,Percent),ma2_per,E))/100;
```

7. Click the "Save" icon to finish building the Coppock Curve indicator.

6.26 Darvas Box

Overview

The Darvas Box Theory was created by Nicolas Darvas and described in his first book, "How I Made \$2,000,000 In the Stock Market" (1986, Lyle Stuart Kensington Publishing, New York).

The "Darvas Box" is a very simplistic basic element of Darvas's trading methodology. Coupling this indicator with his strict discipline, uncanny market insights, and risk management, Darvas amassed a fortune of over \$2.2 million dollars starting with an account of only \$10,000. This was in 1959 and would be equivalent to over \$20 million dollars today.



Interpretation

One method of using the Darvas Box to signal trades is based on a simple breakout strategy of the Darvas Box lines. If price breaks the top box, trade long; if price breaks below the bottom box, trade short.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Darvas Box
Function Name Alias: vt_DarvasBox
Label Mask:
    Darvas Box (%Periods%)
    Box Top = %TopBox%
    Box Bottom = %BottomBox%
Placement: Price Frame
Data Inspection Alias: Darvas Box
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Periods
Display Name: Periods
Type: integer
Default: 100

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: TopBox
Name: (Top)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: BottomBox
Name: (Bottom)
Line Color: red
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
_TopBox:= If(Ref(H,-3)>=Ref(HHV(H,Periods),-4) AND Ref(H,-2)<Ref(H,-3)
AND Ref(H,-1)<Ref(H,-3) AND H<Ref(H,-3),Ref(H,-3),PREV(0));
_BottomBox:= If(Ref(H,-3)>=Ref(HHV(H,Periods),-4) AND Ref(H,-2)<Ref(H,-
3) AND Ref(H,-1)<Ref(H,-3) AND H<Ref(H,-3),LLV(L,4),PREV(0));

TopBox:= If(_TopBox<>0,_TopBox,NULL);
BottomBox:= If(_BottomBox<>0,_BottomBox,NULL);
```

7. Click the "Save" icon to finish building the Darvas Box indicator.

6.27 DeMark's DeMarker I

Overview

The TD DeMarker I is designed to overcome the common shortcomings of traditional overbought / oversold indicators. The DeMarker I helps identify potential price bottoms and tops by making price comparisons from one bar to the next and measuring the level of price demand.



Interpretation

The TD DeMarker I can be interpreted in many of the same ways as other overbought / oversold indicators such as RSI.

Divergence: Looking for divergences between the TD DeMarker and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the TD DeMarker; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the TD DeMarker. These types of divergence are often indications of an impending reversal.

Overbought/Oversold Conditions: The TD DeMarker can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the TD DeMarker being greater than or equal to the 70% level while an oversold condition is generally described as the TD DeMarker being less than or equal to the 30% level. Trades can be generated when the TD DeMarker crosses these levels. When the TD DeMarker crosses above 30 a buy signal is given. Alternatively, when the TD DeMarker crosses below 70 a sell signal is given.

Support/Resistance and "Failure Swings": The TD DeMarker shows, sometimes more clearly than price itself, levels of support and resistance. Failure swings (a.k.a. support/resistance breakouts) occur when the TD DeMarker surpasses a previous high (peak) or falls below a recent low (trough).

TD DeMarker / 50-level Crossover: When the TD DeMarker crosses above 50 a buy signal is given. Alternatively, when the TD DeMarker crosses below 50 a sell signal is given.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: DeMark's DeMarker I
Function Name Alias: vt_TDDMI
Label Mask: DeMark's DeMarker I (%periods%) = %DeMarker%
Placement: New Frame
Data Inspection Alias: DeMark's DeMarker I
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Periods
Display Name: Periods
Type: integer
Default: 13
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: DeMarker
Name: (DeMarker I)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
Value: +70.0000
Color: red
Width: thin
Type: dashed
```

```
[New] button...
Value: +30.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

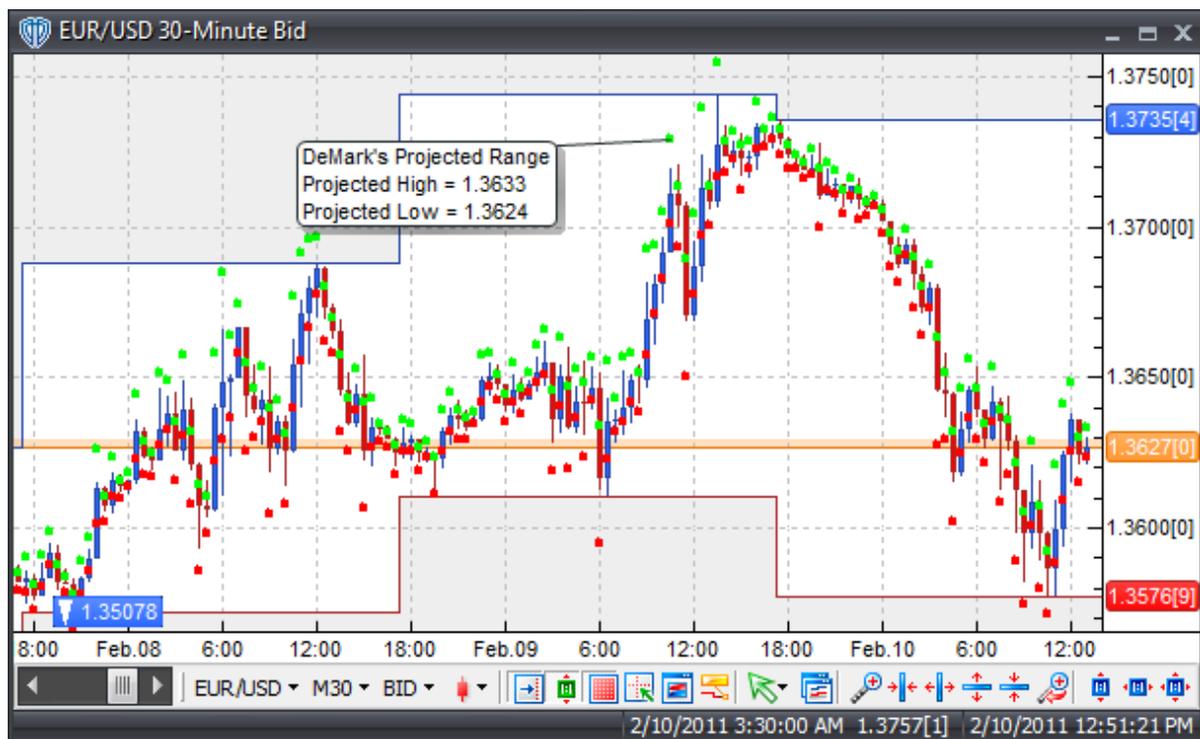
```
highm:= if(H>Ref(H,-1),H-Ref(H,-1),0);
lowm:= if(L<Ref(L,-1),Ref(L,-1)-L,0);
DeMarker:= 100 * Sum(highm,periods) / (Sum(lowm,periods) + Sum(highm,
periods));
```

7. Click the "Save" icon to finish building DeMark's DeMarker I indicator.

6.28 DeMark's Projected Range

Overview

The TD Projected Range indicator, developed by Tom Demark, attempts to identify benchmark expectations for the next bar's potential high and low prices. The range projection is based on the relationship of the open to close prices of the most recent period.



Interpretation

If the next bar opens within the projected range, you may anticipate that prices should remain within that range. If the next bar opens above the projected high you may anticipate that the market will continue in an uptrend; if the bar opens below the projected low you may anticipate that the market will continue in a downtrend.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: DeMark's Projected Range
Function Name Alias: vt_TDPR
Label Mask:
    DeMark's Projected Range
    Projected High = %PH%
    Projected Low = %PL%
Placement: Price Frame
Data Inspection Alias: DeMark's Projected Range
```

3. In the **Input Variable(s)** tab, create the following variables:

```
This indicator requires no input variables.
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: PH
Name: (Projected High)
Line Color: green
Line Width: slightly thicker
Line Type: dots
```

```
[New] button...
Var Name: PL
Name: (Projected Low)
Line Color: red
Line Width: slightly thicker
Line Type: dots
```

5. In the **Horizontal Line** tab, create the following variables:

```
This indicator requires no horizontal levels.
```

6. In the **Formula** tab, copy and paste the following formula:

```
TDH1:=(H+C+2*L)/2-L;
TDH2:=(2*H+L+C)/2-L;
TDH3:=(H+L+2*C)/2-L;
TDL1:=(H+C+2*L)/2-H;
TDL2:=(2*H+L+C)/2-H;
TDL3:=(H+L+2*C)/2-H;

PH:= If((C<0),TDH1,If((C>0),TDH2,If((C=0),TDH3,0)));
PL:= If((C<0),TDL1,If((C>0),TDL2,If((C=0),TDL3,0)));
```

7. Click the "Save" icon to finish building DeMark's Projected Range indicator.

6.29 DeMark's Range Expansion Index (REI)

Overview

The TD Range Expansion Index was created by Tom DeMark and described in, "DeMark on Day Trading Options" written by T.R. DeMark and T.R. Demark, Jr. (McGraw Hill, 1999).

The TD REI is a market-timing oscillator that attempts to overcome problems with exponentially calculated oscillators, such as the MACD, by being arithmetically calculated.



Interpretation

The TD REI typically produces values of -100 to +100; Readings of +45 or higher indicates overbought conditions while readings -45 or lower indicate oversold conditions. DeMark advises against trading in extreme overbought or oversold conditions indicated by six or more bars above or below the 45 thresholds.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

Name: DeMark's Range Expansion Index
Function Name Alias: vt_TDREI
Label Mask: DeMark's REI (%Periods%) = %TDREI%
Placement: New Frame
Data Inspection Alias: DeMark's REI

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
Name: Periods
Display Name: Periods
Type: integer
Default: 5

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: TDREI
Name: (TDREI)
Line Color: yellow-green
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
Value: +45.0000
Color: red
Width: thin
Type: dashed

[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed

[New] button...
Value: -45.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
HighMom:= H - Ref(H,-2);  
LowMom:= L - Ref(L,-2);  
  
TD1:= (H>=Ref(L,-5) OR H>=Ref(L,-6));  
TD2:= (Ref(H,-2)>=Ref(C,-7) OR Ref(H,-2)>=Ref(C,-8));  
TD3:= (L<=Ref(H,-5) OR L<=Ref(H,-6));  
TD4:= (Ref(L,-2)<=Ref(C,-7) OR Ref(L,-2)<=Ref(C,-8));
```

```

TD5 := (TD1 OR TD2) AND (TD3 OR TD4);

TD6 := If(TD5, HighMom + LowMom, 0);
TD7 := Abs(HighMom) + Abs(LowMom);

TDREI := 100 * Sum(TD6, Periods) / Sum(TD7, Periods);

```

- Click the "Save" icon to finish building DeMark's Range Expansion Index (REI) indicator.

6.30 Detrended Price Oscillator (DPO)

Overview

The Detrended Price Oscillator (DPO), described in Steven Achelis' book "Technical Analysis A-Z", attempts to eliminate the trend in prices by filtering out cycles longer than its moving average. It accomplishes this by comparing the current price to a moving of price $(n/2)+1$ periods ago. By detrending prices, shorter-term cycles are more easily identified allowing for a quicker determination of potential overbought and oversold levels.



Interpretation

The Detrended Price Oscillator can be used in a variety of ways:

Identifying Overbought/oversold Conditions: Identifying common overbought and oversold values based on observation of past behavior of the DPO, trade long when the DPO crosses below and then back above the oversold value and trade short when the DPO crosses above and then back below the overbought value.

Going with the trend: The DPO can also be used to signal long trades when the DPO crosses above the zero line and short trades when it crosses below the zero line.

Divergence: Look for divergence between the DPO and the instrument's price; bullish divergence occurs when the DPO makes a higher low while price makes a lower low; bearish divergence occurs when the DPO makes a lower high while the price makes a higher high.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Detrended Price Oscillator (DPO)
Function Name Alias: vt_DPO
Label Mask: DPO (%price%,%periods%) = %DPOsc%
Placement: New Frame
Data Inspection Alias: DPO
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Price
Display Name: Price
Type: price
Default: close
```

```
[New] button...
Name: Periods
Display Name: Periods
Type: integer
Default: 20
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: DPOsc
Name: (Osc)
Line Color: blue
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
DPOsc:= price - Ref(mov(price,periods,S),-(periods/2+1));
```

7. Click the "Save" icon to finish building the Detrended Price Oscillator indicator.

6.31 Directional Movement Index

Overview

The Directional Movement Index (DX) was developed by J. Welles Wilder and described in his book "New Concepts In Technical Trading Systems", written in 1978. The DX consists of two parts: the Positive Directional Index (+DI) and the Negative Directional Index (-DI). The DX's main purpose is to help identify equilibrium points in the price movement by measuring true directional movement. The +DI line measures positive (upward) movement while the -DI measures negative (downward) movement.



Interpretation

Below are a few common methods for generating trading signals using the Directional Movement Index.

+DI/-DI Crossovers: When the +DI line crosses above the -DI line a buy signal is initiated (indicating that positive price direction is greater than negative price direction). Conversely, when the -DI line crosses above the +DI line a sell signal is initiated (indicating that negative price direction is greater than positive price direction). When using the DMI crossover method to generate trading signals, Wilder stresses the use of an additional "extreme point rule". The extreme price rule states that when the +DI/-DI crossover occurs, the extreme point will become the high or low of that bar. Before entering a trade based on the direction of the +DI/-DI crossover, the price must first break above the high (for a buy) or break below the low (for a sell) and remain above/below those respective levels for several bars before initiating a new trade or exiting a existing trade. The "extreme point rule" is useful in reducing the number of whipsaws and false breakouts a trader may encounter if trading based on +DI/-DI crossovers alone.

Directional Movement System: Wilder typically suggests to use the DX as a filter along with other indicators (such as the ADX or ADX(R)) to create a more concrete trading methodology. Wilder suggests using the DMI as part of a system that includes the ADX indicator. (See the Directional Movement System indicator for additional details)

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Directional Movement Index
Function Name Alias: vt_DMI
Label Mask:
    Directional Movement Index (%Pr%)
    +DI = %PlusDI%, -D = %MinusDI%
Placement: New Frame
Data Inspection Alias: DMI
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Pr
Display Name: Periods
Type: integer
Default: 14
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: PlusDI
Name: (+DI)
```

```
Line Color: blue
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: MinusDI
Name: (-DI)
Line Color: red
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +20.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
TH:= if(Ref(C,-1)>H,Ref(C,-1),H);
TL:= if(Ref(C,-1)<L,Ref(C,-1),L);
TR:= TH-TL;

PlusDM:= if(H>Ref(H,-1) AND L>=Ref(L,-1), H-Ref(H,-1),
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)>Ref(L,-1)-L, H-
           Ref(H,-1),
           0));

PlusDI:= 100 * Wilders(PlusDM,Pr)/Wilders(Tr,Pr);

MinusDM:= if(L<Ref(L,-1) AND H<=Ref(H,-1), Ref(L,-1)-L,
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)<Ref(L,-1)-L,
           Ref(L,-1)-L,
           0));

MinusDI:= 100 * Wilders(MinusDM,Pr)/Wilders(Tr,Pr);
```

7. Click the "Save" icon to finish building the Directional Movement Index (DMI) indicator.

6.32 Directional Movement System

Overview

The Directional Movement System is a complex indicator developed by J. Welles Wilder and described in his book "New Concepts In Technical Trading Systems", written in 1978. The Directional Movement

System consists of the ADX (or ADX(R)) and the Directional Movement Index indicators.



Interpretation

Through the use of the ADX (or ADX(R)) and Directional Movement Index indicators, a concrete trading methodology can be constructed. For example, one variation of the rules for trading using the Directional Movement System as defined by Dr. Alexander Elder in "Trading For A Living" is as follows:

Buy Entry: ADX (or ADXR) rises while +DI and ADX (or ADXR) are above -DI; or ADX (or ADXR) turns upwards from below +DI and -DI

Buy Exit: +DI crosses below -DI; or ADX turns downwards from above +DI and -DI

Sell Entry: ADX (or ADXR) rises while -DI and ADX (or ADXR) are above +DI; or ADX (or ADXR) turns upwards from below +DI and -DI

Sell Exit: -DI crosses below +DI; or ADX (or ADXR) turns downwards from above +DI and -DI

No trades are entered while ADX (or ADXR) is below both +DI and -DI; this indicates what's commonly referred to as a "lifeless" market. The longer that ADX (or ADXR) remains below the +DI and -DI the stronger the next emerging trend will likely be. Dr. Elder also recommends waiting to enter new trades until after the ADX (or ADXR) rises a minimum of 4 steps from its low (i.e.: if the ADX low was 16 it must rise to at least 20) indicating that that it has clearly turned upwards from its bottom.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>

Indicator Builder window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Directional Movement System
Function Name Alias: vt_DMSystem
Label Mask:
    Directional Movement System (%Pr%,%SmPr%,%cT%)
    +DI = %PlusDI%, -DI = %MinusDI%, ADX = %Final_ADX%
Placement: New Frame
Data Inspection Alias: Directional Movement System
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: DX Periods
Type: integer
Default: 14
```

[New] button...

```
Name: SmPr
Display Name: ADX/ADXR Smoothing Periods
Type: integer
Default: 14
```

[New] button...

```
Name: cT
Display Name: Display ADX or ADXR?
Type: Enumeration
Default: click [...] button, [New] button, then create the following
entries:
ADX
ADXR
... then, click [OK] button
Default: ADX
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: PlusDI
Name: (+DI)
Line Color: blue
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: MinusDI
Name: (-DI)
Line Color: red
Line Width: thin
Line Type: solid
```

[New] button...

Var Name: Final_ADX
 Name: (ADX)
 Line Color: dark green
 Line Width: slightly thicker
 Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +20.0000
 Color: red
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```

TH:= if(Ref(C,-1)>H,Ref(C,-1),H);
TL:= if(Ref(C,-1)<L,Ref(C,-1),L);
TR:= TH-TL;

PlusDM:= if(H>Ref(H,-1) AND L>=Ref(L,-1), H-Ref(H,-1),
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)>Ref(L,-1)-L, H-
           Ref(H,-1),
           0));

PlusDI:= 100 * Wilders(PlusDM,Pr)/Wilders(Tr,Pr);

MinusDM:= if(L<Ref(L,-1) AND H<=Ref(H,-1), Ref(L,-1)-L,
           if(H>Ref(H,-1) AND L<Ref(L,-1) AND H-Ref(H,-1)<Ref(L,-1)-L,
           Ref(L,-1)-L,
           0));

MinusDI:= 100 * Wilders(MinusDM,Pr)/Wilders(Tr,Pr);

DIDif:= Abs(PlusDI-MinusDI);
DISum:= PlusDI + MinusDI;

_ADX:= 100 * Wilders(DIDif/DISum,SmPr);
_ADXR:= (_ADX + Ref(_ADX,1-SmPr)) / 2;

Final_ADX:= if(cT=0,_ADX,_ADXR);

```

7. Click the "Save" icon to finish building the Directional Movement System indicator.

6.33 Disparity Index

Overview

Developed by Steve Nison and described in his book entitled "Beyond Candlesticks", the Disparity Index compares the market price to an n-periods moving average of market prices and calculates a percentage-based oscillator.

When the Disparity Index is at 0, the current market price is the same as the n-periods moving average value. When the Disparity Index is below 0, the current market price is below the n-periods moving average by that percentage amount. When the Display Index is above 0, the current market price is above the n-periods moving average by that percentage amount.

The Disparity Index is calculated by subtracting an n-periods moving average of market prices from the current market price, dividing that value by the n-periods moving average, and then multiplying the result by 100.



Interpretation

The Disparity Index is a very versatile indicator and can be used with several different techniques to generate trading signals.

Disparity Index / Zero Level Crossover: A buy signal occurs when the Disparity Index crosses above zero and a sell signal occurs when the Disparity Index crosses below zero.

Divergence: Looking for divergences between the Disparity Index and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (aka: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the Disparity Index
- Bearish Divergence = Higher highs in price and lower highs in the Disparity Index

Hidden Divergence (aka: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in Disparity Index and higher lows in price
- Bearish Divergence = Higher highs in Disparity Index and lower highs in price

Overbought/Oversold Conditions: The Disparity Index can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the Disparity Index being greater than or equal to its upper bound level while an oversold condition is generally described as the Disparity Index being less than or equal to its lower bound level. The Disparity Index's upper and lower bounds values must be carefully determined after studying how the index reacts to the instrument's price movements that it is being used to evaluate. Trades can be generated when the Disparity Index crosses these levels. A buy signal occurs when the Disparity Index declines below its lower bound and then rises above that level. A sell signal occurs when the Disparity Index rises above its upper bound and then declines below that level.

Nison also recommends combining the Disparity Index with candlesticks patterns such as harami cross patterns, koma's (a.k.a. spinning tops or small real body candles) and doji's.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Disparity Index
Function Name Alias: vt_DisparityIndex
Label Mask: Disparity Index (%price%,%periods%,%matype%) = %
DisparityIndex%
Placement: New Frame
Data Inspection Alias: Disparity Index
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: price
Display Name: Price
Type: price
Default: Close
```

```
[New] button...
Name: periods
```

Display Name: Periods
Type: integer (with bounds)
Default: 13
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: matype
Display Name: MA Type
Type: MA type
Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: DisparityIndex
Name: (Index)
Line Color: dark green
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
DisparityIndex:= (price-mov(price,periods,matype))/mov(price,periods,matype)*100;
```

7. Click the "Save" icon to finish building the Disparity Index indicator.

6.34 Donchian Channel

Overview

The Donchian Channel is a very simple trend-following indicator developed by Richard Donchian. It plots the highest high and lowest low over the last period time intervals.



Interpretation

When the market is trending, signals can be derived from this indicator based on the following basic rules:

1. When price closes above the Donchian Channel, buy long and cover short positions.
2. When price closes below the Donchian Channel, sell short and liquidate long positions.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Donchian Channel
Function Name Alias: vt_DC
Label Mask:
    Donchian Channel (%Pds%)
    DU = %DU%, DM = %DM%, DL = %DL%
Placement: New Frame
Data Inspection Alias: Donchian Channel
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Pds

Display Name: Periods

Type: integer

Default: 20

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: DU

Name: (Donchian-Upper)

Line Color: blue

Line Width: thin

Line Type: solid

[New] button...

Var Name: DL

Name: (Donchian-Lower)

Line Color: red

Line Width: thin

Line Type: solid

[New] button...

Var Name: DM

Name: (Donchian-Middle)

Line Color: dark green

Line Width: thin

Line Type: dashed

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
DU:= HHV(Ref(H,-1),Pds);
```

```
DL:= LLV(Ref(L,-1),Pds);
```

```
DM:= (DU+DL)/2;
```

7. Click the "Save" icon to finish building the Donchian Channel indicator.

6.35 Double Exponential Moving Average (DEMA)

Overview

Developed by Patrick Mulloy and introduced in the February 1994 issue of Technical Analysis of Stocks & Commodities magazine, this trend indicator is an acronym standing for "Double Exponential Moving

Average". DEMA was designed to lessen the lag of a regular exponential moving average. It is a composite of a single exponential MA and a double exponential MA that produces less lag than its two components individually; it is NOT a moving average of a moving average.



Interpretation

The DEMA can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Double Exponential Moving Average (DEMA)
Function Name Alias: vt_DEMA
Label Mask: DEMA (%pr%,%len%,%mat%) = %_Dema%
Placement: Price Frame
Data Inspection Alias: DEMA
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: pr
Display Name: MA Price
Type: price
Default: close

[New] button...

Name: len
Display Name: MA Periods
Type: integer
Default: 20

[New] button...

Name: mat
Display Name: MA Type
Type: MA Type
Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: _Dema
Name: (Dema)
Line Color: orange
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
_Dema:= 2 * mov(pr,len,mat) - mov(mov(pr,len,mat),len,mat);
```

7. Click the "Save" icon to finish building the Double Exponential Moving Average (DEMA) indicator.

6.36 Double Stochastic Oscillator

Overview

The Double Stochastic Oscillator is a deviation from the Stochastic Oscillators developed by George C. Lane in the 1950's. The Double Stochastic Oscillator can be interpreted in the same manner as other Stochastic Oscillators. Like the original Stochastic Oscillators, it is a momentum indicator designed to show the relation of the current close price relative to the high/low range over a given number of periods using a scale of 0-100. It is based on the assumption that in a rising market the price(s) will close near the high of the range and in a declining market the price(s) will close near the low of the range.

The Double Stochastic Oscillator is plotted as 2 lines: %K and %D. %K is the main (fast) line and %D is the signal (slow) line.

The Double Stochastic Oscillator is calculated by the formula:

$$\text{Fast \%K} = ((\text{Today's Close} - \text{Lowest Low in \%K Periods}) / (\text{Highest High in \%K Periods} - \text{Lowest Low in \%K Periods})) * 100$$

$$\text{Slowing \%K} = \text{N-period moving average of Fast \%K}$$

$$\text{Double \%K} = ((\text{Today's Slowing \%K} - \text{Lowest Low Slowing \%K in \%K Periods}) / (\text{Highest High Slowing \%K in \%K Periods} - \text{Lowest Low Slowing \%K in \%K Periods})) * 100$$

$$\text{Double Slowing \%K} = \text{N-period moving average of Double \%K}$$

$$\%D = \text{3-period simple moving average of Double Slowing \%K}$$



Interpretation

There are three basic techniques for using the Double Stochastic Oscillator to generate trading signals.

Crossovers: 1) %K line / %D line Crossover: A buy signal occurs When the %K line crosses above the %D line and a sell signal occurs when the %K line crosses below the %D line. 2) %K line / 50-level Crossover: When the %K line crosses above 50 a buy signal is given. Alternatively, when the %K line crosses below 50 a sell signal is given.

Divergence: Looking for divergences between the Double Stochastic Oscillator and price can prove to be

very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the Double Stochastic Oscillator; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the Double Stochastic Oscillator.

Overbought/Oversold Conditions: The Double Stochastic Oscillator can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the Double Stochastic Oscillator being greater than or equal to the 80% level while an oversold condition is generally described as the Double Stochastic Oscillator being less than or equal to the 20% level. Trades can be generated when the Double Stochastic Oscillator crosses these levels. A buy signal occurs when the Double Stochastic Oscillator declines below 20% and then rises above that level. A sell signal occurs when the Double Stochastic Oscillator rises above 80% and then declines below that level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Double Stochastic Oscillator
Function Name Alias: vt_DoubleStochOsc
Label Mask:
    Double Stochastic Osc. (%K%,%Sl%,%Mt%,%D%,%MtD%)
    DSO = %DSt%, Signal = %DStD%
Placement: New Frame
Data Inspection Alias: Double Stochastic Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: K
Display Name: %K Periods
Type: integer
Default: 10
```

[New] button...

```
Name: Sl
Display Name: %K Slowing Periods
Type: integer
Default: 3
```

[New] button...

```
Name: Mt
Display Name: %K Slowing Method
Type: MA Type
Default: Simple
```

[New] button...

```
Name: D
Display Name: %D Periods
Type: integer
```

Default: 3

[New] button...

Name: MtD

Display Name: %D Method

Type: MA Type

Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: DSt

Name: (DSO)

Line Color: dark blue

Line Width: thin

Line Type: solid

[New] button...

Var Name: DStD

Name: (DSO Signal)

Line Color: dark blue

Line Width: thin

Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +80.0000

Color: red

Width: thin

Type: dashed

[New] button...

Value: +20.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
St:= Mov(((C-LLV(L,K))/(HHV(H,K)-LLV(L,K)))*100,S1,Mt);  
DSt:= Mov(((St-LLV(St,K))/(HHV(St,K)-LLV(St,K)))*100,S1,Mt);  
DStD:= Mov(DSt,D,MtD);
```

7. Click the "Save" icon to finish building the Double Stochastic Oscillator indicator.

6.37 Ehlers Fisher Transform

Overview

Introduced by John Ehlers, the Fisher Transform is based on the article "Using the Fisher Transform" in the November 2002 issue of Stocks and Commodities Magazine.

It was designed to clearly define major price reversals with its rapid response time and sharp, distinct turning points. It is based on the assumption that prices do not have a Gaussian probability density function (PDF) (bell-shaped curve movement), but that by normalizing price and applying the Fisher Transform you could create a nearly Gaussian PDF.



Interpretation

Signals can be generated with pinpoint precision, according to Ehlers, by the crossover points of the Fisher and its signal line.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Ehlers Fisher Transform
Function Name Alias: vt_Fisher
Label Mask:
```

```
Ehlers Fisher Transform (%pr%,%prd%)
Fisher = %fisher%, Signal = %signal%
Placement: New Frame
Data Inspection Alias: Ehlers Fisher Transform
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: prd
Display Name: Periods
Type: integer
Default: 10
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: fisher
Name: (Fisher)
Line Color: red
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: signal
Name: (Signal Line)
Line Color: yellow
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
maxh:= HHV(pr,prd);
minl:= LLV(pr,prd);
val1:= 0.33 * 2 * ((pr-minl)/(maxh-minl)-0.5) + 0.67 * PREV(0);
val2:= If(val1>0.99,0.999,If(val1<-0.99,-0.999,val1));
fisher:= 0.5 * Log((1+val2)/(1-val2)) + 0.5 * PREV(0);
signal:= ref(fisher,-1);
```

7. Click the "Save" icon to finish building Ehlers Fisher Transform indicator.

6.38 Ehlers Laguerre Relative Strength Index

Overview

The Laguerre Relative Strength Index was introduced by John Ehlers in his book "Cybernetic Analysis for Stocks and Futures". It uses a 4-Element Laguerre filter to provide a "time warp" such that the low frequency components are delayed much more than the high frequency components. This enables much smoother filters to be created using shorter amounts of data.



Interpretation

A typical use of the Laguerre RSI is to buy after it crosses back over the 20% level and sell after it crosses back down through the 80% level.

Implementation

This implementation of the Laguerre RSI has been normalized to a scale of 0-100 rather than the original 0-1 scale.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Ehlers Laguerre Relative Strength Index
Function Name Alias: vt_LgRSI
Label Mask: Ehlers Laguerre RSI (%prc%,%df%) = %LRSI%
Placement: New Frame
Data Inspection Alias: Ehlers Laguerre RSI
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: prc
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: df
Display Name: Damping Factor
Type: float (with bounds)
Default: 0.5000
Min Bounds: 0.5000
Max Bounds: 0.8500
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: LRSI
Name: (LRSI)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +80.0000
Color: red
Width: thin
Type: dashed
```

[New] button...

```
Value: +20.0000
Color: red
Width: thin
```

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```

g:= df;
L0:= ((1-g)*prc) + (g*PREV(0));
L1:= (-g*L0) + Ref(L0,-1) + (g*PREV(0));
L2:= (-g*L1) + Ref(L1,-1) + (g*PREV(0));
L3:= (-g*L2) + Ref(L2,-1) + (g*PREV(0));

cu:= If(L0>L1, L0-L1,0) + If(L1>L2, L1-L2,0) + If(L2>L3, L2-L3,0);
cd:= If(L0<L1, L1-L0,0) + If(L1<L2, L2-L1,0) + If(L2<L3, L3-L2,0);

temp:= If(cu+cd=0,-1,cu+cd);
LRSI:= If(temp=-1,0,100*cu/temp);

```

7. Click the "Save" icon to finish building Ehlers Laguerre Relative Strength Index indicator.

6.39 Ehlers MESA Adaptive Moving Average (MAMA and FAMA)

Overview

Excerpted from the article entitled "Mesa Adaptive Moving Averages" by John F. Ehlers in the Sept. 2001 edition of Technical Analysis of Stocks and Commodities magazine...

"The MESA Adaptive Moving Average (MAMA) adapts to price movement based on the rate of change of phase as measured by the Hilbert Transform Discriminator (Technical Analysis of Stocks and Commodities magazine, December 2000). This method features a fast attack average and a slow decay average so that composite average rapidly ratchets behind price changes and holds the average value until the next ratchet occurs."

For a more detailed description of the MESA Adaptive Moving Average, please refer to the aforementioned article.



Interpretation

Ehlert's MESA Adaptive Moving Average can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Additionally, the crossing of the MAMA and FAMA lines can be used to generate Buy and Sell signals. When the MAMA crosses above the FAMA a buy signal is given. Alternatively, when the MAMA crosses below the FAMA a sell signal is given.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Ehlert's MESA Adaptive Moving Average (MAMA and FAMA)
Function Name Alias: vt_MESA
Label Mask:
    Ehlert's MESA (%Price%,%FastLimit%,%SlowLimit%)
    MAMA = %_MAMA%, FAMA = %_FAMA%
Placement: Price Frame
Data Inspection Alias: MESA Adaptive MA
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Price

Display Name: Price

Type: price

Default: Median Price

[New] button...

Name: FastLimit

Display Name: Fast Limit

Type: float

Default: 0.5000

[New] button...

Name: SlowLimit

Display Name: Slow Limit

Type: float

Default: 0.0500

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...Var Name: `_MAMA`

Name: (MAMA)

Line Color: dark green

Line Width: slightly thicker

Line Type: solid

[New] button...Var Name: `_FAMA`

Name: (FAMA)

Line Color: dark red

Line Width: slightly thicker

Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
_MAMA:= Mama(Price,FastLimit,SlowLimit);
```

```
_FAMA:= Fama(Price,FastLimit,SlowLimit);
```

7. Click the "Save" icon to finish building Ehlers MESA Adaptive Moving Average indicator.

6.40 Ehlers Relative Vigor Index (RVI)

Overview

The Relative Vigor Index (RVI) was described in the January 2002 edition of *Technical Analysis of Stocks and Commodities* magazine in an article titled, "Something Old, Something New - Relative Vigor Index (RVI)" by John Ehlers. The RVI merges the older concepts of technical analysis with modern digital signal processing theory and filters to create a practical and useful indicator.

The basic principle behind the RVI is simple - prices tend to close higher than they open in up-trending markets and close lower than they open in down-trending markets. The energy (vigor) of the move is thereby established by where the prices end up at the close. The RVI is essentially based on the measure of the average difference between the close and open, normalized to the average daily trading range. The end result is a responsive oscillator with crisp turning points that is basically in phase with the cyclic component of market prices.



Interpretation

The Relative Vigor Index is a unique indicator. The basic method of interpreting the RVI is to use the crossovers of the RVI and the RVI Signal Line. A buy signal occurs when the RVI crosses above the RVI Signal Line and a sell signal occurs when the RVI crosses below the RVI Signal Line.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Ehlers Relative Vigor Index
Function Name Alias: vt_RVI
Label Mask:
    Ehlers Relative Vigor Index (%periods%)
    RVI = %_rvi%, Signal = %_rvisig%
Placement: New Frame
Data Inspection Alias: Relative Vigor Index
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: periods
Display Name: Periods
Type: integer
Default: 10
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: _rvi
Name: (RVI)
Line Color: blue
Line Width: thin
Line Type: solid
```

```
[New] button...
Var Name: _rvisig
Name: (RVI Signal Line)
Line Color: red
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following variables:

```
This indicator requires no horizontal levels.
```

6. In the **Formula** tab, copy and paste the following formula:

```
value1:= ((C-O)+(2*Ref(C-O,-1))+(2*Ref(C-O,-2))+Ref(C-O,-3))/6;
value2:= ((H-L)+(2*Ref(H-L,-1))+(2*Ref(H-L,-2))+Ref(H-L,-3))/6;

{Avoid Divide By Zero Error}

denom:= If(Sum(value2,periods)=0,0.0001,Sum(value2,periods));

{Plot Indicator to Chart}

_rvi:= Sum(value1,periods)/denom;
_rvisig:= (_rvi+Ref(2*_rvi,-1)+Ref(2*_rvi,-2)+Ref(_rvi,-3))/6;
```

7. Click the "Save" icon to finish building Ehlers Relative Vigor Index indicator.

6.41 Elder-Ray Bear Power

Overview

Developed by Dr. Alexander Elder in 1989 and described in his book "Trading for a Living", the Elder-Ray indicator consists of three components: Bear Power, Bull Power, and a 13-periods exponential moving average.

Bull Power is calculated by subtracting a 13-periods exponential moving average from the High price.

Bear Power is calculated by subtracting a 13-periods exponential moving average from the Low price of the bar.

The High price of any bar represents the maximum power of the bulls and the Low price of any bar represents the maximum power of the bears. Elder refers to the exponential moving average as the average consensus of price value. Therefore, Bull Power represents the ability of the bulls to raise prices above the average consensus of value and Bear Power represents the ability of the bears to push prices below the average consensus of value.



Interpretation

According to the Elder, Bull Power should normally remain positive and Bear Power should normally remain negative. However, if Bull Power turns negative it means that the bears have gained control of the market and if Bear Power turns positive it means that the bulls have gained control. You should not buy when Bear Power is positive and you should not sell when Bull Power is negative.

Elder suggests using the exponential moving average's slope to determine the market trend direction. He describes the best buy signals as being when bullish divergence occurs between Bear Power and price (i.e. lower lows in price and higher lows in Bear Power) and the best sell signals as being when bearish divergence occurs between Bull Power and price (i.e. higher highs in price and lower highs in Bull Power).

Elder described four basic conditions for buying and selling using only the Elder-Ray method, but also recommended combining it with the Triple Screen method.

Buying Conditions:

(Essential)

1. Prices are trending upwards according to the 13-periods exponential moving average
2. Bear Power is negative, but rising

(Optional)

3. The latest Bull Power peak is higher than its previous peak
4. Bear Power is rising from a bullish divergence

Selling Conditions:

(Essential)

1. Prices are trending downwards according to the 13-periods exponential moving average
2. Bull Power is positive, but declining

(Optional)

3. The latest Bear Power trough is lower than its previous trough
4. Bull Power is declining from a bearish divergence

Elder mentions that if you want to increase your position, you should:

- Increase your long position whenever Bear Power declines below zero and then rises back into positive territory.
- Increase your short position whenever Bull Power rises above zero and then falls back into negative territory.

Elder's Triple Screen method suggests identifying the price trend on a higher chart interval (like Weekly charts) and applying the Elder-Ray on a lower chart interval (like Daily charts). Signals are taken according to the Elder-Ray, but only in the direction of the price trend in the higher chart interval. A Trailing Buy Stop and Trailing Sell Stop technique can then be used to pinpoint entry points. For example, if the weekly trend is up and the daily oscillator is declining Elder suggests placing a buy stop order 1 point above the previous bar's High. If the market reverses you will be stopped in long. However, if the market continues to decline, you must adjust your buy stop order so that it is always 1 point above the previous bar's High. The buy stop order remains active until it is either triggered or the weekly trend

reverses (at which time you would cancel your order). If the weekly trend is down and the daily oscillator is rising Elder suggests placing a sell stop order 1 point below the previous bar's Low. If the market reverses you will be stopped in short. However, if the market continues to rise, you must adjust your sell stop order so that it is always 1 point below the previous bar's Low. The sell stop order remains active until it is either triggered or the weekly trend reverses (at which time you would cancel your order).

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Elder-Ray Bear Power
Function Name Alias: vt_ElderRayBearPwr
Label Mask: Elder-Ray Bear Power (%LDA%,%MaPrice%,%MaPeriods%,%MaType%) = %BearPower
Placement: New Frame
Data Inspection Alias: Elder-Ray Bear Power
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: LDA
Display Name: Low Price
Type: Price
Default: Low
```

[New] button...

```
Name: MaPrice
Display Name: MA Price
Type: Price
Default: Close
```

[New] button...

```
Name: MaPeriods
Display Name: MA Periods
Type: integer (with bounds)
Default: 13
Min. Bounds: 1
Max. Bounds: 9999
```

[New] button...

```
Name: MaType
Display Name: MA Type
Type: MA type
Default: Exponential
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: BearPower
```

```
Name: (Bear Pwr)
Line Color: red
Line Width: slightly thicker
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following variables:

```
[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
BearPower:= LDA - Mov(MaPrice, MaPeriods, MaType);
```

7. Click the "Save" icon to finish building the Elder-Ray Bear Power indicator.

6.42 Elder-Ray Bull Power

Overview

Developed by Dr. Alexander Elder in 1989 and described in his book "Trading for a Living", the Elder-Ray indicator consists of three components: Bear Power, Bull Power, and a 13-periods exponential moving average.

Bull Power is calculated by subtracting a 13-periods exponential moving average from the High price.

Bear Power is calculated by subtracting a 13-periods exponential moving average from the Low price of the bar.

The High price of any bar represents the maximum power of the bulls and the Low price of any bar represents the maximum power of the bears. Elder refers to the exponential moving average as the average consensus of price value. Therefore, Bull Power represents the ability of the bulls to raise prices above the average consensus of value and Bear Power represents the ability of the bears to push prices below the average consensus of value.



Interpretation

According to the Elder, Bull Power should normally remain positive and Bear Power should normally remain negative. However, if Bull Power turns negative it means that the bears have gained control of the market and if Bear Power turns positive it means that the bulls have gained control. You should not buy when Bear Power is positive and you should not sell when Bull Power is negative.

Elder suggests using the exponential moving average's slope to determine the market trend direction. He describes the best buy signals as being when bullish divergence occurs between Bear Power and price (i.e. lower lows in price and higher lows in Bear Power) and the best sell signals as being when bearish divergence occurs between Bull Power and price (i.e. higher highs in price and lower highs in Bull Power).

Elder described four basic conditions for buying and selling using only the Elder-Ray method, but also recommended combining it with the Triple Screen method.

Buying Conditions:

(Essential)

1. Prices are trending upwards according to the 13-periods exponential moving average
2. Bear Power is negative, but rising

(Optional)

3. The latest Bull Power peak is higher than its previous peak
4. Bear Power is rising from a bullish divergence

Selling Conditions:

(Essential)

1. Prices are trending downwards according to the 13-periods exponential moving average
2. Bull Power is positive, but declining

(Optional)

3. The latest Bear Power trough is lower than its previous trough
4. Bull Power is declining from a bearish divergence

Elder mentions that if you want to increase your position, you should:

- Increase your long position whenever Bear Power declines below zero and then rises back into positive territory.
- Increase your short position whenever Bull Power rises above zero and then falls back into negative territory.

Elder's Triple Screen method suggests identifying the price trend on a higher chart interval (like Weekly charts) and applying the Elder-Ray on a lower chart interval (like Daily charts). Signals are taken according to the Elder-Ray, but only in the direction of the price trend in the higher chart interval. A Trailing Buy Stop and Trailing Sell Stop technique can then be used to pinpoint entry points. For example, if the weekly trend is up and the daily oscillator is declining Elder suggests placing a buy stop order 1 point above the previous bar's High. If the market reverses you will be stopped in long. However, if the market continues to decline, you must adjust your buy stop order so that it is always 1 point above the previous bar's High. The buy stop order remains active until it is either triggered or the weekly trend reverses (at which time you would cancel your order). If the weekly trend is down and the daily oscillator is rising Elder suggests placing a sell stop order 1 point below the previous bar's Low. If the market reverses you will be stopped in short. However, if the market continues to rise, you must adjust your sell stop order so that it is always 1 point below the previous bar's Low. The sell stop order remains active until it is either triggered or the weekly trend reverses (at which time you would cancel your order).

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Elder-Ray Bull Power
Function Name Alias: vt_ElderRayBullPwr
Label Mask: Elder-Ray Bull Power (%HDA%,%MaPrice%,%MaPeriods%,%MaType%) = %BullPow
Placement: New Frame
Data Inspection Alias: Elder-Ray Bull Power
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: HDA
```

Display Name: High Price
Type: Price
Default: High

[New] button...

Name: MaPrice
Display Name: MA Price
Type: Price
Default: Close

[New] button...

Name: MaPeriods
Display Name: MA Periods
Type: integer (with bounds)
Default: 13
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: MaType
Display Name: MA Type
Type: MA type
Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: BullPower
Name: (Bull Pwr)
Line Color: light green
Line Width: slightly thicker
Line Type: histogram

5. In the **Horizontal Line** tab, create the following variables:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
BullPower:= HDA - Mov(MaPrice, MaPeriods, MaType);
```

7. Click the "Save" icon to finish building the Elder-Ray Bull Power indicator.

6.43 Elliot Oscillator

Overview

Elliot Wave Theory is named after Ralph Nelson Elliot. It was inspired by the Dow Theory and by observations found throughout nature; Fibonacci numbers provide the mathematical foundation. Each of the cycles defined by Elliot are comprised of a total wave count that falls within the Fibonacci number sequence. From this information, Elliot concluded that the movements of the financial markets could be predicted by identifying this naturally repetitive series of waves.

After Elliot's passing, much research and advancement was done on Elliot Wave Theory during the 1950's - 1970's by Hamilton Bolton, Robert Prechter, and A.J. Frost. However, the basic concepts of Elliot Wave Theory are outlined below:

- Action is followed by reaction
- The basic Elliot Wave pattern consists of 8 waves which are often labeled as 1, 2, 3, 4, 5, a, b, c
- There are 5 waves in the direction of the main trend followed by 3 corrective waves (a.k.a. "5-3" count); Waves 1, 3, and 5 are called "impulse" waves while waves 2 and 4 are called "corrective" waves; Waves 1-5 can be either up or down; Waves a, b, and c correct the main trend and always travel in the opposite direction of waves 1 - 5.
- A 5-3 count completes a cycle; this completed count then becomes 2 subdivisions of the next higher 5-3 wave; The cycles are as follows: The largest wave count is called the Grand Supercycle which consists of Supercycles which consist of Cycles. This process continues into Primary, Intermediate, Minute, Minuette, and Sub-minuette wave cycles.
- The underlying 5-3 pattern remains constant, but the time frame required to complete the pattern may vary

However, there is an inherent weakness of the Elliott Wave Theory - its predictive nature is very dependent on an accurate wave count. Determining where one wave starts and another wave ends can be extremely subjective.

Enter the Elliot Oscillator indicator.

In an effort to keep better track of the complicated and very subjective Elliot Wave counts the Elliot Oscillator measures the Rate of change of one wave compared to the Rate of Change of another wave.

The Elliot Oscillator is simply the difference of a 5-periods simple moving average and a 34-periods simple moving average shown as a histogram that oscillates above/below a zero line.



Interpretation

The most important Elliot Oscillator concepts are:

- The highest/lowest value of the oscillator identifies a potential bullish/bearish wave 3
- Wave 4 almost always pulls back to or crosses over the zero line in the opposite direction of the main trend
- Wave 5 usually makes a new high or low price for the swing, but often diverges from the Elliot Oscillator; if Wave 5 makes a new high/low price, but doesn't diverge from the indicator, alternate analysis may conclude that the wave was not wave 5, but instead an extended wave 3.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's [New] button

2. In the **General** tab, type the following text for each field:

```
Name: Elliot Oscillator
Function Name Alias: vt_ElliotOsc
Label Mask: Elliot Oscillator (%Price%,%ShortMA%,%LongMA%,%Mat%) = %
ElloSc%
Placement: New Frame
```

Data Inspection Alias: Elliot Oscillator

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Price
Display Name: Price
Type: price
Default: Median Price

[New] button...

Name: ShortMA
Display Name: Short MA Periods
Type: integer
Default: 5

[New] button...

Name: LongMA
Display Name: Long MA Periods
Type: integer
Default: 34

[New] button...

Name: Mat
Display Name: MA Type
Type: MA Type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: ElloOsc
Name: (EO)
Line Color: red
Line Width: thin
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
ElloOsc:= Mov(Price,ShortMA,Mat)-Mov(Price,LongMA,Mat);
```

7. Click the "Save" icon to finish building the Elliot Oscillator indicator.

6.44 Gann HiLo Activator

Overview

The Gann HiLo Activator was first introduced by Robert Krausz in the Feb. 1998 issue of Stocks & Commodities Magazine. Further information about this indicator was gathered from Robert Krausz's Fibonacci Trader Journal (Volume 1, Issue 2).

The Gann HiLo Activator is basically a simple moving average of the previous 3 periods' highs or lows plotted based in relation to the HiLo Activator. When price is above the HiLo Activator it can be used as a buy stop (uses the previous period's lows for calculations) and when price is below the HiLo Activator it can be used as a sell stop (using the previous period's highs for calculation).



Interpretation

The Gann HiLo Activator is meant to be used in conjunction with the Gann Swing and Gann Trend indicators to form a trading system methodology commonly referred to as the "New Gann Swing Chartist Plan". Within this methodology the Gann HiLo Activator can be used as an entry trigger and stoploss point.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Gann HiLo Activator
Function Name Alias: vt_GannHiLo
Label Mask: Gann HiLo Activator (%Lb%) = %HiLo%
Placement: Price Frame
Data Inspection Alias: Gann HiLo Activator
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Lb
Display Name: Lookback Periods
Type: integer
Default: 3
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: HiLo
Name: (HiLo)
Line Color: blue
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following variables:

```
This indicator requires no horizontal levels.
```

6. In the **Formula** tab, copy and paste the following formula:

```
HLd:=If(C>Ref(Mov(H,Lb,S),-1),1,If(C<Ref(Mov(L,Lb,S),-1),-1,0));
HLv:=ValueWhen(1,HLd<>0,HLd);
HiLo:=If(HLv=-1,Mov(H,Lb,S),Mov(L,Lb,S));
```

7. Click the "Save" icon to finish building the Gann HiLo Activator indicator.

6.45 Gann Swing Oscillator

Overview

The Gann Swing Oscillator has been adapted from Robert Krausz's book, "A W.D. Gann Treasure Discovered".



Interpretation

The Gann Swing Oscillator helps define market swings. A market swing up is defined by 2 higher highs while a market swing low is defined by 2 lower lows. An up-swing is indicated by a +1 value of the oscillator while a down-swing is indicated by a -1 value.

The Gann Swing Oscillator is meant to be used in conjunction with the Gann HiLo Activator and Gann Trend indicators to form a trading system methodology commonly referred to as the "New Gann Swing Chartist Plan". Within this methodology the Gann Swing Oscillator is used to help determine market direction for trading only with the current market trend.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Gann Swing Oscillator
Function Name Alias: vt_GannSwing
Label Mask: Gann Swing Osc. = %TD1%
Placement: New Frame
Data Inspection Alias: Gann Swing Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

This indicator requires no input variables.

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: TD1

Name: (Osc)

Line Color: purple

Line Width: slightly thicker

Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

{Market swing is defined as: Up = 2 higher highs, Down = 2 lower lows}

```
Us:= BarsSince(Sum(H>Ref(H,-1),2)=2);
```

```
Ds:= BarsSince(Sum(L<Ref(L,-1),2)=2);
```

```
Hc:= HighestSince(1,Us=0,H);
```

```
Lc:= LowestSince(1,Ds=0,L);
```

```
Sd1:= If(Us=0, If((L<>Lc) AND (Ref(L,-1)<>Lc), 1, 0), If(Ds=0, If  
((H<>Hc) AND (Ref(H,-1)<>Hc), -1, 0), 0));
```

```
Sd2:= If(Sd1=1,If(Ref(BarsSince(Sd1=1),-1) > Ref(BarsSince(Sd1=-1),-1),  
1, 0), If(Sd1=-1, If(Ref(BarsSince(Sd1=1),-1) < Ref(BarsSince(Sd1=-1),-  
1), -1, 0), 0));
```

```
TD1:= ValueWhen(1,Sd2<>0,Sd2);
```

7. Click the "Save" icon to finish building the Gann Swing Oscillator indicator.

6.46 Gann Trend Oscillator

Overview

The Gann Trend Oscillator has been adapted from Robert Krausz's book, "A W.D. Gann Treasure Discovered".



Interpretation

The Gann Trend Oscillator helps define overall market trend direction. An up-trending market is defined by a +1 value of the oscillator while a down-trending market is indicated by a -1 value.

The Gann Trend Oscillator is meant to be used in conjunction with the Gann HiLo Activator and Gann Swing indicators to form a trading system methodology commonly referred to as the "New Gann Swing Chartist Plan". Within this methodology the Gann Trend Oscillator is used to determine the overall trend direction of the market.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Gann Trend Oscillator
Function Name Alias: vt_GannTrend
Label Mask: Gann Trend Osc. = %Tdv%
Placement: New Frame
Data Inspection Alias: Gann Trend Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

This indicator requires no input variables.

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: Tdv

Name: (Osc)

Line Color: dark green

Line Width: slightly thicker

Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

{Market swing is defined as: Up = 2 higher highs, Down = 2 lower lows}

```
Us:= BarsSince(Sum(H>Ref(H,-1),2)=2);
```

```
Ds:= BarsSince(Sum(L<Ref(L,-1),2)=2);
```

```
Hc:= HighestSince(1,Us=0,H);
```

```
Lc:= LowestSince(1,Ds=0,L);
```

```
Sd1:= If(Us=0, If((L<>Lc) AND (Ref(L,-1)<>Lc), 1, 0), If(Ds=0, If  
((H<>Hc) AND (Ref(H,-1)<>Hc), -1, 0), 0));
```

```
Sd2:= If(Sd1=1, If(Ref(BarsSince(Sd1=1),-1) > Ref(BarsSince(Sd1=-1),-1),  
1, 0), If(Sd1=-1, If(Ref(BarsSince(Sd1=1),-1) < Ref(BarsSince(Sd1=-1),-  
1), -1, 0), 0));
```

```
TD1:= ValueWhen(1,Sd2<>0,Sd2);
```

{Swing Direction}

```
Sd:= TD1;
```

{Swing Change High}

```
Sch:= If(Sd=1 AND Ref(sd,-1)=-1, 1, 0);
```

{Swing Change Low}

```
Scl:= If(Sd=-1 AND Ref(Sd,-1)=1, 1, 0);
```

{Peak Value}

```
Pv:= If(Scl=1, HighestSince(1,Sch=1,H), 0);
```

{Trough Value}

```
Tv:= If(Sch=1, LowestSince(1,Scl=1,L), 0);
```

{Trend Direction}

```
Td:= If(H>ValueWhen(1,Pv>0,Pv), 1, If(L<ValueWhen(1,Tv>0,Tv), -1, 0));
```

```
{UpTrend=1 | DownTrend =-1}
```

```
Tdv:= ValueWhen(1,Td<>0,Td);
```

7. Click the "Save" icon to finish building the Gann Trend Oscillator indicator.

6.47 Hull Moving Average (HMA)

Overview

The Hull Moving Average (HMA), developed by Alan Hull, is an extremely fast and smooth moving average. In fact, the HMA almost eliminates lag altogether and manages to improve smoothing at the same time.



Interpretation

The Hull Moving Average can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Hull Moving Average
Function Name Alias: vt_HMA
Label Mask: Hull MA (%price%,%length%,%method%) = %HMA%
Placement: Price Frame
Data Inspection Alias: Hull MA
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: price
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: length
Display Name: Periods
Type: integer
Default: 20
```

[New] button...

```
Name: method
Display Name: Type
Type: MA Type
Default: Weighted
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: HMA
Name: (HMA)
Line Color: purple
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
halvedLength:= if((ceiling(length/2) - (length/2) <= 0.5), ceiling
(length/2), floor(length/2));
sqrRootLength:= if((ceiling(sqrt(length)) - sqrt(length) <= 0.5),
ceiling(sqrt(length)), floor(sqrt(length)));
```

```
Value1:= 2 * mov(price,halvedLength,method);  
Value2:= mov(price,length,method);  
HMA:= mov((Value1-Value2),sqrRootLength,method);
```

7. Click the "Save" icon to finish building the Hull Moving Average indicator.

6.48 Ichimoku Kinko Huo

Overview

The Ichimoku Kinko Hyo Japanese charting technique was developed before World War II by a Japanese newspaper writer with the pen name of Ichimoku Sanjin. The word Ichimoku can be translated to mean "a glance" or "one look". Kinko translates into "equilibrium" or "balance", and Hyo is the Japanese word for "chart". Thus, Ichimoku Kinko Hyo simply means, "a glance at an equilibrium chart". Ichimoku charts attempt to identify the probably direction of price and help the trader to determine the most suitable times to enter and/or exit the market.

The Ichimoku chart consists of five lines constructed using only the midpoints of previous highs and lows. The five lines are calculated as follows:

- 1) Tenkan-Sen = Conversion Line = (Highest High + Lowest Low) / 2, for the past 9 periods
- 2) Kijun-Sen = Base Line = (Highest High + Lowest Low) / 2, for the past 26 periods
- 3) Chikou Span = Lagging Span = Today's closing price plotted 26 periods behind
- 4) Senkou Span A = Leading Span A = (Tenkan-Sen + Kijun-Sen) / 2, plotted 26 periods ahead
- 5) Senkou Span B = Leading Span B = (Highest High + Lowest Low) / 2, for the past 52 periods, plotted 26 periods ahead

The Kumo (or clouds) is the area between Senkou Span A and Senkou Span B.



Interpretation

A bullish signal is issued when the Tenkan-Sen crosses the Kijun-Sen from below. A bearish signal is issued when the Tenkan-Sen crosses the Kijun-Sen from above. However, there are different levels of strength for the buy and sell signals of an Ichimoku chart.

If a bullish crossover signal occurs above the Kumo (or clouds), it is considered a very strong buy signal. In contrast, a bearish crossover signal that occurs below the Kumo is considered a very strong sell signal.

If a bullish or bearish crossover signal takes place within the Kumo (or clouds) it's considered an average or medium strength buy or sell signal.

A bullish crossover that occurs below the Kumo (or clouds) is considered a weak buy signal while a bearish crossover that occurs above the Kumo is considered a weak sell signal.

Additionally, support and resistance levels can be predicted by the presence of Kumo (or clouds). The Kumo can also be used to help identify the prevailing trend of the market. If the price is above the Kumo, the prevailing trend is said to be up; if the price is below the Kumo, the prevailing trend is said to be down.

Lastly, the Chikou Span (or Lagging Span) can also be used to determine the strength of the buy or sell signal. If the Chikou Span is below the closing price for 26 periods ago and a sell signal is issued, then the strength is to the downside, otherwise it is considered a weak sell signal. Conversely, if there is a buy signal and the Chikou Span is above the price for 26 periods ago, then the strength is to the upside, otherwise it can be considered a weak buy signal.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Ichimoku Kinko Huo
Function Name Alias: vt_Ichimoku
Label Mask:
    Ichimoku Kinko Huo (%TSpr%,%KSPr%,%SSBPr%)
    TS = %TS%, KS = %KS%, CS = %CS%
    SSA = %SSA%, SSB = %SSB%
Placement: Price Frame
Data Inspection Alias: Ichimoku Kinko Huo
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: TSpr
Display Name: Tenkan-Sen
Type: integer
Default: 9
```

[New] button...

```
Name: KSPr
Display Name: Kijun-Sen
Type: Bars Forward
Default: 26
Min Bounds: 0
Max Bounds: 9999
```

[New] button...

```
Name: SSBPr
Display Name: Senkou Span B
Type: integer
Default: 52
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: SSA
Name: (Senkou Span A)
Line Color: dark blue
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: SSB
Name: (Senkou Span B)
Line Color: black
```

Line Width: thin
Line Type: solid

[New] button...

Var Name: TS
Name: (Tenkan-Sen)
Line Color: red
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: KS
Name: (Kijun-Sen)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: CS
Name: (Chinkou Span)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: KumoUp
Name: (Kumo Up)
Line Color: light blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: Kumo_Up
Name: (Kumo Up)
Line Color: light blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: KumoDown
Name: (Kumo Down)
Line Color: pink
Line Width: thin
Line Type: solid

[New] button...

Var Name: Kumo_Down
Name: (Kumo Down)
Line Color: pink
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
{Tenkan-Sen}
TS:= (HHV(H,TSpr)+LLV(L,TSpr))/2;

{Kijun-Sen}
KS:= (HHV(H,KSpr)+LLV(L,KSpr))/2;

{Senkou Span A}
SSA:= Ref((ts+ks)/2,-(KSpr-1));

{Senkou Span B}
SSB:= Ref((HHV(H,SSBPr)+LLV(L,SSBPr))/2,-(KSpr-1));

{Chinkou Span}
CS:= Ref(C,(KSpr-1));

{Paint the Clouds}

KumoUp:=if(ssa>ssb,if(prev=ref(ssb,-1),ssa,ssb),null);
Kumo_Up:=if(ssa>ssb,if(prev=ref(ssa,-1),ssb,ssa),null);

KumoDown:=if(ssa<ssb,if(prev=ref(ssb,-1),ssa,ssb),null);
Kumo_Down:=if(ssa<ssb,if(prev=ref(ssa,-1),ssb,ssa),null);
```

7. Click the "Save" icon to finish building the Ichimoku Kinko Huo indicator.

6.49 Inertia

Overview

The Inertia indicator was developed by Donald Dorsey and first appeared in the September 1995 issue of *Technical Analysis of Stocks & Commodities* magazine.

Dorsey chose the name "Inertia" because of his interpretation of a trend. He claimed that a trend is the outward result of inertia; thus it takes more energy for a market to reverse direction than to continue in the same direction. Therefore, a trend is a measurement of market inertia.

In physics, Inertia is defined in terms of mass and direction of motion. Using standard technical

analysis, the direction of motion is easily defined. However, mass is not so easily defined. Dorsey claimed that volatility may be the simplest and most accurate measurement of inertia. This theory led him to use the Relative Volatility Index (RVI) as the basis for a trend indicator. Inertia is a RVI smoothed by a linear regression indicator.



Interpretation

The Inertia indicator is relatively simple to interpret. If the Inertia indicator is above 50, positive inertia is indicated thereby defining the long-term trend as up while the indicator remains above 50. If the Inertia indicator is below 50, negative inertia is indicated thereby defining the long-term trend is down while the indicator remains below 50.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Inertia
Function Name Alias: vt_Inertia
Label Mask: Inertia (%periods%,%mt%) = %_Inertia%
Placement: New Frame
Data Inspection Alias: Inertia
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
 Name: Periods
 Display Name: Smoothing Periods
 Type: integer
 Default: 20

[New] button...
 Name: mt
 Display Name: Smoothing Type
 Type: MA Type
 Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
 Var Name: _Inertia
 Name: (Inertia)
 Line Color: dark green
 Line Width: slightly thicker
 Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
 Value: +50.0000
 Color: red
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
_Inertia:= Mov(((100 * Mov(If(H>Ref(H,-1),Stdev(H,10),0),14,E) /
(Mov(If(H>Ref(H,-1),Stdev(H,10),0),14,E) +
Mov(If(H<Ref(H,-1),Stdev(H,10),0),14,E)) +
100 * Mov(If(L>Ref(L,-1),Stdev(L,10),0),14,E) /
(Mov(If(L>Ref(L,-1),Stdev(L,10),0),14,E) +
Mov(If(L<Ref(L,-1),Stdev(L,10),0),14,E)))) / 2),periods,mt);
```

7. Click the "Save" icon to finish building the Inertia indicator.

6.50 Kase CD

Overview

The Kase CD is the derivative of the Kase Peak Oscillator. It is calculated in much the same way as the

MACD histogram is calculated from a moving average oscillator. That is, it is the difference between the Kase Peak Oscillator and the average of the Kase Peak Oscillator. However, because its basis is statistical, it generates cleaner crossover signals and more reliable divergences.



Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Kase CD
Function Name Alias: vt_KaseCD
Label Mask:
    Kase CD (%Per1%)
    KCD-Green = %Green%
    KCD-Red = %Red%
Placement: New Frame
Data Inspection Alias: Kase CD
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Per1
Display Name: Periods
Type: integer
Default: 8
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: LN
 Name: (LN)
 Line Color: yellow
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: Red
 Name: (Red KCD Histogram)
 Line Color: red
 Line Width: thin
 Line Type: histogram

[New] button...

Var Name: Green
 Name: (Green KCD Histogram)
 Line Color: green
 Line Width: thin
 Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
 Color: black
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
RWH:=(H-Ref(L,-Per1))/(ATR(Per1)*Sqrt(Per1));
RWL:=(Ref(H,-Per1)-L)/(ATR(Per1)*Sqrt(Per1));
Pk:= Mov(Mov((RWH-RWL),3,W),3,S);
KCD:= PK-Mov(PK,8,S);
MN:= Mov(KCD,Per1,S);
SD:= Stdev(KCD,Per1);
Val1:= If(MN+(1.33*SD)>2.08,MN+(1.33*SD),2.08);
Val2:= If(MN-(1.33*SD)<-1.92,MN-(1.33*SD),-1.92);
LN:= If(Ref(KCD,-1)>=0 AND KCD>0,Val1,If(Ref(KCD,-1)<=0 AND KCD<0,
Val2,0));
Red:= If(Ref(KCD,-1)>KCD,KCD,0);
Green:= If(KCD>Ref(KCD,-1),KCD,0);
```

7. Click the "Save" icon to finish building the Kase CD indicator.

6.51 Kase DevStop II

Overview

The Kase DevStop indicator is described in Cynthia Kase's "Trading with the Odds". The KDS calculates an average range and 3 standard deviations of the range.



Interpretation

The DevStop is used to determine realistic exit points for trades based on volatility, the variance of volatility, and volatility skew. The 4 lines are defined as a Warning Line and Standard Deviations of 1, 2 and 3. This allows traders to take profit or cut losses at levels at which the probability of a trade remaining profitable is low, without taking more of a loss or cutting profits any sooner than necessary.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Kase DevStop II
Function Name Alias: vt_KaseDS
```

Label Mask:
Kase DevStop II (%Per1%)
Warning = %Val1%
1 StDev = %Val2%
2 StDevs = %Val3%
3 StDevs = %Val4%
Placement: Price Frame
Data Inspection Alias: Kase DevStop II

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
Name: Perl
Display Name: Periods
Type: integer (with bounds)
Default: 30
Min Bounds: 2
Max Bounds: 100

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: Val1
Name: (Warning Line)
Line Color: yellow
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: Val2
Name: (1 Deviation)
Line Color: red
Line Width: thin
Line Type: solid

[New] button...
Var Name: Val3
Name: (2 Deviations)
Line Color: red
Line Width: thin
Line Type: solid

[New] button...
Var Name: (3 Deviations)
Name: Val4
Line Color: red
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
RWH:=(H-Ref(L,-Per1))/(ATR(Per1)*Sqrt(Per1));
RWL:=(Ref(H,-Per1)-L)/(ATR(Per1)*Sqrt(Per1));

Pk:=Mov(RWH-RWL,3,W);
AVTR:=Mov(HHV(H,2)-LLV(L,2),20,S);
SD:=Stdev(HHV(H,2)-LLV(L,2),20);
Val4:=If(Pk>0,HHV(H-AVTR-3*SD,20),LLV(L+AVTR+3*SD,20));
Val3:=If(Pk>0,HHV(H-AVTR-2*SD,20),LLV(L+AVTR+2*SD,20));
Val2:=If(Pk>0,HHV(H-AVTR-SD,20),LLV(L+AVTR+SD,20));
Val1:=If(Pk>0,HHV(H-AVTR,20),LLV(L+AVTR,20));
```

7. Click the "Save" icon to finish building the Kase DevStop II indicator.

6.52 Kase Peak Oscillator

Overview

The Kase Peak Oscillator is used similarly to traditional oscillators, but is derived from a statistical evaluation of trend that evaluates over 50 different trend lengths. It is capable of automatically adapting to cycle length and volatility changes.



Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Kase Peak Oscillator
Function Name Alias: vt_KasePO
Label Mask:
    Kase Peak Oscillator (%Per1%)
    KPO-Green = %Green%
    KPO-Red = %Red%
    LN = %LN%
Placement: New Frame
Data Inspection Alias: Kase Peak Oscillator
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Perl
Display Name: Periods
Type: integer
Default: 30
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: LN
Name: (LN)
Line Color: yellow
Line Width: slightly thicker
Line Type: solid
```

```
[New] button...
Var Name: Red
Name: (Red KPO Histogram)
Line Color: red
Line Width: thin
Line Type: histogram
```

```
[New] button...
Var Name: Green
Name: (Green KPO Histogram)
Line Color: green
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
```

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
RWH:= (H-Ref(L,-Per1))/(ATR(Per1)*Sqrt(Per1));  
RWL:= (Ref(H,-Per1)-L)/(ATR(Per1)*Sqrt(Per1));  
Pk:= Mov(RWH-RWL,3,W);  
MN:= Mov(Pk,Per1,S);  
SD:= Stdev(Pk,Per1);  
Val1:= If(MN+(1.33*SD)>2.08,MN+(1.33*SD),2.08);  
Val2:= If(MN-(1.33*SD)<-1.92,MN-(1.33*SD),-1.92);  
LN:= If(Ref(Pk,-1)>=0 AND Pk>0,Val1,If(Ref(Pk,-1)<=0 AND Pk<0,Val2,0));  
Red:= If(Ref(Pk,-1)>Pk,Pk,0);  
Green:= If(Pk>Ref(Pk,-1),Pk,0);
```

7. Click the "Save" icon to finish building the Kase Peak Oscillator indicator.

6.53 Kaufman's Adaptive Moving Average (KAMA)

Overview

Developed by Perry Kaufman, this indicator is a moving average that automatically adjusts its speed based on market volatility.



Interpretation

The KAMA can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Kaufman's Adaptive Moving Average (KAMA)
Function Name Alias: vt_KAMA
Label Mask: Kaufman's AMA (%Pr%,%periods%,%fsp%,%ssp%) = %Kama%
Placement: Price Frame
Data Inspection Alias: Kaufman's AMA
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Price
Display Name: Price
Type: price
Default: Close
```

[New] button...

Name: Periods
 Display Name: Periods
 Type: integer
 Default: 20

[New] button...

Name: fsp
 Display Name: Fast Smoothing Constant
 Type: integer (with bounds)
 Default: 2
 Min Bounds: 2
 Max Bounds: 300

[New] button...

Name: ssp
 Display Name: Slow Smoothing Constant
 Type: integer (with bounds)
 Default: 30
 Min Bounds: 2
 Max Bounds: 300

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: Kama
 Name: (Kama)
 Line Color: red
 Line Width: thin
 Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal levels.

6. In the **Formula** tab, copy and paste the following formula:

```
Direction:= Pr - ref(Pr,-periods);
Volatility:= sum(abs(roc(Pr,1,Points)),periods);
Volatility:= if(Volatility>0, Volatility, 0.0001);
ER:= abs(Direction/Volatility);
FastSC:= 2/(fsp + 1);
SlowSC:= 2/(ssp + 1);
SSC:= ER * (FastSC - SlowSC) + SlowSC;
Constant:= power(SSC,2);
Kama:= If(BarCount()<=periods, Pr, PREV(0) + constant * (Pr - PREV(0)));
```

7. Click the "Save" icon to finish building Kaufman's Adaptive Moving Average indicator.

6.54 Kaufman's Efficiency Ratio

Overview

Developed by Perry Kaufman and described in his book entitled “New Trading Systems and Methods”, the Efficiency Ratio is a measure of relative market speed to volatility. It is often used as a filter to help avoid “choppy” or flat markets and help identify smoother market trends.

The Efficiency Ratio is calculated by dividing the net change in price movement over n-periods by the sum of all bar-to-bar price changes (taken as absolute values) over those same n-periods.



Interpretation

The smoother the market is trending the greater the Efficiency Ratio. Efficiency Ratio readings around zero indicate a lot of inefficiency and “choppiness” in the market movements.

For example, the Efficiency Ratio will read +100 for an instrument that is up-trending with perfect efficiency and -100 for an instrument that is down-trending with perfect efficiency. Obviously, it is virtually impossible for an instrument to have a perfect efficiency ratio since any adverse movement against the prevailing trend direction during the time period being evaluated would decrease the efficiency ratio.

Efficiency Ratio values above +30 generally indicate a smoother uptrend while values below -30 generally indicate a smoother downtrend. However, it's important that you experiment with these values to determine the most appropriate levels for the instrument(s) being evaluated and the trading methodology being used.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Kaufman's Efficiency Ratio
Function Name Alias: vt_Efficiency
Label Mask: Kaufman's Efficiency Ratio (%prc%,%periods%) = %KER%
Placement: New Frame
Data Inspection Alias: Efficiency Ratio
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: prc
Display Name: Price
Type: Price
Default: Close
```

[New] button...

```
Name: Periods
Display Name: Periods
Type: integer (with bounds)
Default: 20
Min. Bounds: 1
Max. Bounds: 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: KER
Name: (KER)
Line Color: dark yellow-gold
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following variables:

[New] button...

```
Value: +30.0000
Color: red
Width: thin
Type: dashed
```

[New] button...

```
Value: +0.0000
Color: black
Width: thin
```

Type: dashed

[New] button...

Value: -30.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
Speed:= prc-Ref(prc,-periods);  
Volatility:= Sum(Abs(prc-Ref(prc,-1)),periods);  
KER:= Speed/Volatility*100;
```

7. Click the "Save" icon to finish building Kaufman's Efficiency Ratio indicator.

6.55 Keltner Bands (Based on ATR)

Overview

Originally developed by Chester W. Keltner and first introduced in his 1960 book "How to Make Money in Commodities", Keltner Channels help identify market trends using a rather simple volatility channel. The original Keltner Channels formulas were later modified by Linda B. Raschke. To differentiate Raschke's modified indicator from the original Keltner Channels, VT Trader refers it as Keltner ATR Bands.

Raschke replaced the original price-range simple moving average channels with bands based on an average true range (ATR) measure of volatility. Raschke's modified Keltner Channels (Bands) are similar to Bollinger Bands except that Bollinger Bands use a standard deviation method to determine volatility.

The Keltner Bands indicator is an n-period exponential moving average of the closing price. The bands are created by adding (for the upper band) and subtracting (for the lower band) an (n-period simple moving average of an n-period ATR) * an ATR multiplier.



Interpretation

The modified Keltner ATR Bands can be traded in much the same methods as Bollinger Bands.

- When prices move outside the bands a continuation of the current trend is implied
- Bottoms and tops made outside the bands followed by bottoms and tops made inside the bands call for reversals in the trend
- A move that originates at one band tends to go all the way to the other band

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Keltner Bands (Based on ATR)
Function Name Alias: vt_KeltnerBandsATR
Label Mask:
    Keltner Bands (Based on ATR) (%Pds1%,%Pds2%,%Mult%)
    EMA = %MidKB%, UB = %UpperKB%, LB = %LowerKB%
Placement: Price Frame
Data Inspection Alias: Keltner ATR Bands
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Pds1
Display Name: EMA Periods
Type: integer
Default: 20

[New] button...

Name: Pds2
Display Name: ATR Periods
Type: integer
Default: 10

[New] button...

Name: Mult
Display Name: ATR Multiple
Type: float (with bounds)
Default: 2.5000
Min Bounds: 1.0000
Max Bounds:= 10.0000

4. In the Output Variable(s) tab, create the following variables:**[New] button...**

Var Name: MidKB
Name: (Middle EMA)
Line Color: dark blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: UpperKB
Name: (Upper Band)
Line Color: purple
Line Width: thin
Line Type: solid

[New] button...

Var Name: LowerKB
Name: (Lower Band)
Line Color: purple
Line Width: thin
Line Type: solid

5. In the Horizontal Line tab, create the following variables:

This indicator requires no horizontal levels.

6. In the Formula tab, copy and paste the following formula:

```
TH:= if(Ref(C,-1) > H,Ref(C,-1),H);  
TL:= if(Ref(C,-1) < L,Ref(C,-1),L);  
TR:= TH-TL;
```

```

MidKB:= Mov(C,pds1,E);
Diff:= Mov(TR,pds2,S)*Mult;
UpperKB:= Mov(C,pds1,E)+Diff;
LowerKB:= Mov(C,pds1,E)-Diff;

```

- Click the "Save" icon to finish building the Keltner ATR Bands indicator.

6.56 Keltner Channels

Overview

Originally developed by Chester W. Keltner and first introduced in his 1960 book "How to Make Money in Commodities", Keltner Channels help identify market trends using a rather simple volatility channel.

Keltner Channels consist of a middle moving average and two channel lines. The middle line of the Keltner Channels indicator is an n-period simple moving average of typical price. The channel lines are created by adding (for the upper channel line) and subtracting (for the lower channel line) an n-period simple moving average of the High/Low range.



Interpretation

Keltner's trading strategy regards price breaking above the upper channel line as a strong bullish (buy) signal. Conversely, price breaking below the lower channel line is considered a strong bearish (sell) signal.

It's also mentioned that sometimes other confirming indicators such as the RSI or MACD should be used along with Keltner's own "Minor Trend Rule".

The "Minor Trend Rule" is a method for using the daily trend as a trading guide. Comparing today's prices with yesterday's prices, Keltner defines a downtrend by an absence of new highs and an uptrend by the failure of price to make new lows. Essentially, the "Minor Trend Rule" is a simple breakout method that buys on new highs (today's high > yesterday's high) and sells on new lows (today's low is < yesterday's low).

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Keltner Channels
Function Name Alias: vt_KeltnerChannels
Label Mask:
    Keltner Channels (%Pr%)
    SMA = %MidKC%, UC = %UpperKC%, LC = %LowerKC%
Placement: Price Frame
Data Inspection Alias: Keltner Channels
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Pr
Display Name: SMA Periods
Type: integer
Default: 10
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: MidKB
Name: (Middle SMA)
Line Color: dark blue
Line Width: thin
Line Type: dashed
```

```
[New] button...
Var Name: UpperKB
Name: (Upper Band)
Line Color: purple
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: LowerKB  
Name: (Lower Band)  
Line Color: purple  
Line Width: thin  
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following variables:

```
This indicator requires no horizontal levels.
```

6. In the **Formula** tab, copy and paste the following formula:

```
MidKC:= Mov(TP(),Pr,S);  
UpperKC:= MidKC + Mov((H-L),Pr,S);  
LowerKC:= MidKC - Mov((H-L),Pr,S);
```

7. Click the "Save" icon to finish building the Keltner Channels indicator.

6.57 Kurtosis Indicator

Overview

The Kurtosis Indicator is used to help determine market sentiment.

The Kurtosis Indicator is calculated in three parts.

The Kurtosis portion is calculated by the formula:

$K = n\text{-periods momentum} - n\text{-periods momentum of 1 bar ago}$ (current bar's momentum value minus the previous bar's momentum value)

The Fast Kurtosis portion is calculated by the formula:

$FK = n\text{-periods moving average of } K$

The Fast/Slow Kurtosis portion is calculated by the formula:

$FSK = n\text{-periods moving average of } FK$



Interpretation

A buy signal occurs when the Kurtosis indicator crosses above zero and a sell signal occurs when the Kurtosis indicator crosses below zero.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Kurtosis Indicator
Function Name Alias: vt_Kurtosis
Label Mask: Kurtosis (%kprc%,%kper%,%fkper%,%fkmat%,%fskper%,%fskmat%) = %fsk%
Placement: New Frame
Data Inspection Alias: Kurtosis
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: kprc
Display Name: Price
Type: Price
Default: Close
```

[New] button...

Name: kper
Display Name: Periods
Type: integer (with bounds)
Default: 3
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: fkper
Display Name: Smoothing Periods
Type: integer (with bounds)
Default: 66
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: fkmat
Display Name: Smoothing Type
Type: MA type
Default: Exponential

[New] button...

Name: fskper
Display Name: Double Smoothing Periods
Type: integer (with bounds)
Default: 3
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: fskmat
Display Name: Double Smoothing Type
Type: MA type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: fsk
Name: (FSK)
Line Color: light blue
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```

mom:= kprc - Ref(kprc,-kper);
k:= mom - Ref(mom,-1);
fk:= Mov(k,fkper,fkmat);
fsk:= Mov(fk,fskper,fskmat);

```

7. Click the "Save" icon to finish building the Kurtosis indicator.

6.58 Linear Regression Acceleration

Overview

The Linear Regression Acceleration indicator calculates the change in the regression line's normalized slope on the current bar from its normalized slope from the previous bar. The normalized acceleration value is then plotted for each bar loaded in the chart.



Interpretation

The Linear Regression Acceleration indicator calculates the change in normalized slope of the regression line from one bar to the next for each bar loaded in the chart. (See the Linear Regression

Slope indicator for additional details about regression slope)

If the normalized acceleration is 0.20, then the regression line's normalized slope is rising at a rate of 0.20 per bar. Similarly, a normalized slope of -0.55 would indicate that the regression line's normalized slope is declining at the rate of 0.55 per bar. For example, if the current bar's normalized slope value is 0.45 and the previous bar's normalized slope value is 0.37, then the normalized acceleration of the current bar would be calculated as $0.45 - 0.37 = 0.08$.

PLEASE NOTE: It's important to understand that a positive acceleration value does not equate to a positive slope value; it simply means the slope is increasing. A negative acceleration value does not equate to a negative slope value; it simply means the slope is decreasing.

Implementation

The Linear Regression Acceleration indicator allows for price selection, regression periods, smoothing of RAW price before applying the regression and selection of smoothing type. The resulting regression slope indicator is shown as a bi-color histogram that oscillates above and below 0. A reference line is set at the 0 level. A rising slope (greater than its previous value 1 bar ago) is shown in the UpSlope color, while a declining slope (lower than its previous value 1 bar ago) is shown in the DownSlope color.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Linear Regression Acceleration
Function Name Alias: vt_LinRegAccel
Label Mask: Linear Reg. Accel. (%RegPeriods%,%Price%,%SmoothPeriods%,%SmoothType%) = %PlusAcceleration%
Placement: New Frame
Data Inspection Alias: Linear Reg. Accel.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: RegPeriods
Display Name: Regression Periods
Type: integer
Default: 13
```

[New] button...

```
Name: Price
Display Name: Regression Price
Type: Price
Default: close
```

[New] button...

Name: SmoothPeriods
Display Name: Pre-Smoothing Price Periods
Type: integer
Default: 1

[New] button...

Name: SmoothType
Display Name: Pre-Smoothing MA Type
Type: MA Type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: PlusAcceleration
Name: (Plus Acceleration)
Line Color: blue
Line Width: thin
Line Type: histogram

[New] button...

Var Name: MinusAcceleration
Name: (Minus Acceleration)
Line Color: red
Line Width: thin
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
SmoothData:= mov(Price,SmoothPeriods,SmoothType);  
Slope:= (linregslope(smoothdata,RegPeriods))*100/Price;  
Acceleration:= Slope - ref(Slope,-1);  
PlusAcceleration:= if(Acceleration>=ref(Acceleration,-1),Acceleration,  
Acceleration);  
MinusAcceleration:= if(Acceleration<ref(Acceleration,-1),Acceleration,  
null);
```

7. Click the "Save" icon to finish building the Linear Regression Acceleration indicator.

6.59 Linear Regression Indicator

Overview

The Linear Regression Indicator plots the trend of a market instrument's price over a specified length of time. The trend is determined by calculating a Linear Regression Trend Line using the "least squares fit" method. This method helps to minimum distance between the data points and a Linear Regression Trend Line.

Unlike the straight Linear Regression Trend Line, the Linear Regression indicator plots the ending values of multiple Linear Regression trend lines. Any point along the Linear Regression Indicator will be equal to the ending value of a Linear Regression Trend line, but the result looks like a Moving Average.

However, unlike a Moving Average, the Linear Regression Indicator does not exhibit as much delay since it is fitting a line to data points rather than averaging them. The Linear Regression Indicator is actually a forecast of the tomorrow's price plotted today. When prices are persistently higher or lower than the forecasted price, expect them to quickly return to more realistic levels. In other words, the Linear Regression Indicator shows where prices "should" be trading on a statistical basis and any excessive deviation from the regression line is likely to be short-lived.



Interpretation

The Linear Regression Indicator can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Implementation

The Linear Regression Indicator allows for price selection, regression periods, smoothing of RAW price before applying the regression and selection of smoothing type. It's presented as a bi-color indicator. A rising regression line (greater than its previous value 1 bar ago) is shown in the UpLine color, while a declining line (lower than its previous value 1 bar ago) is shown in the DownLine color.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Linear Regression Indicator
Function Name Alias: vt_LinReg
Label Mask: Linear Regression (%RegPeriods%,%Price%,%SmoothPeriods%,%
SmoothType%) = %UpLine%
Placement: Price Frame
Data Inspection Alias: Linear Regression
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: RegPeriods
Display Name: Regression Periods
Type: integer
Default: 13
```

[New] button...

```
Name: Price
Display Name: Price
Type: Price
Default: close
```

[New] button...

```
Name: SmoothPeriods
Display Name: Pre-Smoothing Price Periods
Type: integer
Default: 1
```

[New] button...

```
Name: SmoothType
Display Name: Pre-Smoothing MA Type
Type: MA Type
Default: Simple
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: UpLine
Name: (Upward Line)
Line Color: blue
Line Width: slightly thicker
Line Type: solid
```

[New] button...

```
Var Name: DownLine
Name: (Downward Line)
Line Color: red
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following variables:

```
This indicator requires no horizontal levels.
```

6. In the **Formula** tab, copy and paste the following formula:

```
SmoothData:= mov(Price,SmoothPeriods,SmoothType);
Line:= linreg(SmoothData,RegPeriods);
UpLine:= if(Line>=ref(Line,-1),Line,Line);
DownLine:= if(Line<ref(Line,-1),Line,null);
```

7. Click the "Save" icon to finish building the Linear Regression Indicator.

6.60 Linear Regression Slope

Overview

The Linear Regression Slope indicator calculates the slope value of theoretical regression lines which involve that bar and the previous n-1 bars (n = regression periods) for each bar loaded in the chart. (See the Linear Regression Indicator for additional details about regression lines). The slope values are then normalized by multiplying the raw slope values by 100 and then dividing by the price (raw slope * 100 / price).



Interpretation

The normalization of the slope values is important when comparing markets that trade within different price ranges. The normalized slope value basically shows the percent change in price per bar of the regression (best fit) line. If the normalized slope is 0.20, then the regression line is rising at a rate of 0.20% per bar. Similarly, a normalized slope of -0.55 would indicate that the regression line is declining at the rate of 0.55% per bar.

Implementation

The Linear Regression Slope indicator allows for price selection, regression periods, smoothing of RAW price before applying the regression and selection of smoothing type. The resulting regression slope indicator is shown as a bi-color histogram that oscillates above and below 0. A reference line is set at the 0 level. A rising slope (greater than its previous value 1 bar ago) is shown in the UpSlope color, while a declining slope (lower than its previous value 1 bar ago) is shown in the DownSlope color.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

Name: Linear Regression Slope
Function Name Alias: vt_LinRegSlope
Label Mask: Linear Reg. Slope (%RegPeriods%,%Price%,%SmoothPeriods%,%SmoothType%) = %UpSlope%
Placement: New Frame
Data Inspection Alias: Linear Reg. Slope

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: RegPeriods
Display Name: Regression Periods
Type: integer
Default: 13

[New] button...

Name: Price
Display Name: Regression Price
Type: Price
Default: close

[New] button...

Name: SmoothPeriods
Display Name: Pre-Smoothing Price Periods
Type: integer
Default: 1

[New] button...

Name: SmoothType
Display Name: Pre-Smoothing MA Type
Type: MA Type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: UpSlope
Name: (Upward Slope)
Line Color: blue
Line Width: thin
Line Type: histogram

[New] button...

Var Name: DownSlope
Name: (Downward Slope)
Line Color: red
Line Width: thin
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000

```
Color: black  
Width: thin  
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
SmoothData:= mov(Price,SmoothPeriods,SmoothType);  
Slope:= (linregslope(smoothdata,RegPeriods))*100/Price;  
UpSlope:= if(Slope>=ref(Slope,-1),Slope,Slope);  
DownSlope:= if(Slope<ref(Slope,-1),Slope,null);
```

7. Click the "Save" icon to finish building the Linear Regression Slope indicator.

6.61 MACD

Overview

Developed by Gerald Appel, publisher of "Systems & Forecasts", the Moving Average Convergence/Divergence (MACD) indicator is one of the simplest, most reliable, and most commonly used indicators available. The MACD is a momentum oscillator with some trend-following characteristics.

The most popular construction of the MACD first calculates the difference between two moving averages and plots that as the "Fast" line; a second "Signal" (trigger) line is then calculated from the resulting "Fast" line and plotted in the same frame as the "Fast" line. The "standard" MACD values for the "Fast" line are a 12-period exponential moving average and a 26-period exponential moving average and a 9-period exponential moving average for the "Signal" line.



Interpretation

The MACD is widely used as a trend-following indicator and tends to work most effectively when measuring wide-swinging market movements. There are three basic techniques for using the MACD to generate trading signals.

Crossovers: 1) Fast line/Signal line Crossover: A buy signal occurs when the Fast line crosses above the Signal line and a sell signal occurs when the Fast line crosses below the Signal line. 2) Fast line / Zero-Level Crossover: When the Fast line crosses above zero a buy signal is given. Alternatively, when the Fast line crosses below zero a sell signal is given.

Divergence: Looking for divergences between the MACD and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (aka: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the MACD
- Bearish Divergence = Higher highs in price and lower highs in the MACD

Hidden Divergence (aka: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in MACD and higher lows in price
- Bearish Divergence = Higher highs in MACD and lower highs in price

Overbought/Oversold Conditions: The MACD can be used to identify potential overbought and oversold conditions in price movements. These conditions are generated by comparing the distance between the

shorter moving average and the longer moving average; if the shorter moving average separates dramatically from the longer moving average it may be an indication that price is over-extending and will soon return to more realistic levels.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Moving Average Convergence/Divergence (MACD)
Function Name Alias: vt_MACD
Label Mask:
    MACD (%FastPeriods%,%SlowPeriods%,%SigPeriods%)
    Fast = %Fast%
    Signal = %Signal%
Placement: New Frame
Data Inspection Alias: MACD
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: FastPrice
Display Name: Fast MA Price
Type: price
Default: close
```

[New] button...

```
Name: FastPeriods
Display Name: Fast MA Periods
Type: float
Default: 12.0000
```

[New] button...

```
Name: FastType
Display Name: Fast MA Type
Type: MA Type
Default: Exponential
```

[New] button...

```
Name: SlowPrice
Display Name: Slow MA Price
Type: price
Default: close
```

[New] button...

```
Name: SlowPeriods
Display Name: Slow MA Periods
Type: float
Default: 26.0000
```

[New] button...

Name: SlowType
Display Name: Slow MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: SigPeriods
Display Name: Signal MA Periods
Type: float
Default: 9.0000

[New] button...

Name: SigType
Display Name: Signal MA Type
Type: MA Type
Default: Exponential

4. In the Output Variable(s) tab, create the following variables:**[New] button...**

Var Name: Fast
Name: (Fast Line)
Line Color: blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: Signal
Name: (Signal Line)
Line Color: red
Line Width: thin
Line Type: solid

[New] button...

Var Name: OsMA
Name: (Histogram)
Line Color: dark green
Line Width: thin
Line Type: histogram

5. In the Horizontal Line tab, create the following lines:**[New] button...**

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the Formula tab, copy and paste the following formula:

Fast:= Mov(FastPrice,FastPeriods,FastType) - Mov(SlowPrice,SlowPeriods,

```

SlowType);
Signal:= Mov(Fast,SigPeriods,SigType);
OsMA:= Fast-Signal;
    
```

7. Click the "Save" icon to finish building the MACD indicator.

6.62 MACD-Histogram

Overview

Developed by Gerald Appel, publisher of "Systems & Forecasts", the Moving Average Convergence/Divergence (MACD) indicator is one of the simplest, most reliable, and most commonly used indicators available. The MACD is a momentum oscillator with some trend-following characteristics.

The most popular construction of the MACD first calculates the difference between two moving averages and plots that as the "Fast" line; a second "Signal" (trigger) line is then calculated from the resulting "Fast" line and plotted in the same frame as the "Fast" line. The "standard" MACD values for the "Fast" line are a 12-period exponential moving average and a 26-period exponential moving average and a 9-period exponential moving average for the "Signal" line.



Interpretation

The MACD is widely used as a trend-following indicator and tends to work most effectively when measuring wide-swinging market movements. There are three basic techniques for using the MACD to generate trading signals.

Histogram / Zero-Level Crossover: When the MACD Histogram crosses above zero a buy signal is given. Alternatively, when the MACD Histogram crosses below zero a sell signal is given.

Divergence: Looking for divergences between the MACD Histogram and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (aka: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the MACD Histogram
- Bearish Divergence = Higher highs in price and lower highs in the MACD Histogram

Hidden Divergence (aka: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in MACD Histogram and higher lows in price
- Bearish Divergence = Higher highs in MACD Histogram and lower highs in price

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Moving Average Convergence/Divergence (MACD) - Histogram
Function Name Alias: vt_MACDHist
Label Mask: MACD Histogram (%FastPeriods%,%SlowPeriods%,%SigPeriods%) = %OsMA%
Placement: New Frame
Data Inspection Alias: MACD Histogram
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: FastPrice
Display Name: Fast MA Price
Type: price
Default: close
```

[New] button...

```
Name: FastPeriods
Display Name: Fast MA Periods
Type: float
Default: 12.0000
```

[New] button...

Name: FastType
Display Name: Fast MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: SlowPrice
Display Name: Slow MA Price
Type: price
Default: close

[New] button...

Name: SlowPeriods
Display Name: Slow MA Periods
Type: float
Default: 26.0000

[New] button...

Name: SlowType
Display Name: Slow MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: SigPeriods
Display Name: Signal MA Periods
Type: float
Default: 9.0000

[New] button...

Name: SigType
Display Name: Signal MA Type
Type: MA Type
Default: Exponential

4. In the Output Variable(s) tab, create the following variables:**[New] button...**

Var Name: OsMA
Name: (Histogram)
Line Color: dark green
Line Width: thin
Line Type: histogram

5. In the Horizontal Line tab, create the following lines:**[New] button...**

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
Fast:= Mov(FastPrice,FastPeriods,FastType) - Mov(SlowPrice,SlowPeriods,
SlowType);
Signal:= Mov(Fast,SigPeriods,SigType);
OsMA:= Fast-Signal;
```

7. Click the "Save" icon to finish building the MACD-Histogram indicator.

6.63 MACD-Line

Overview

Developed by Gerald Appel, publisher of "Systems & Forecasts", the Moving Average Convergence/Divergence (MACD) indicator is one of the simplest, most reliable, and most commonly used indicators available. The MACD is a momentum oscillator with some trend-following characteristics.

The most popular construction of the MACD first calculates the difference between two moving averages and plots that as the "Fast" line; a second "Signal" (trigger) line is then calculated from the resulting "Fast" line and plotted in the same frame as the "Fast" line. The "standard" MACD values for the "Fast" line are a 12-period exponential moving average and a 26-period exponential moving average and a 9-period exponential moving average for the "Signal" line.



Interpretation

The MACD is widely used as a trend-following indicator and tends to work most effectively when measuring wide-swinging market movements. There are three basic techniques for using the MACD to generate trading signals.

Crossovers: 1) Fast line/Signal line Crossover: A buy signal occurs when the Fast line crosses above the Signal line and a sell signal occurs when the Fast line crosses below the Signal line. 2) Fast line / Zero-Level Crossover: When the Fast line crosses above zero a buy signal is given. Alternatively, when the Fast line crosses below zero a sell signal is given.

Divergence: Looking for divergences between the MACD and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (aka: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the MACD
- Bearish Divergence = Higher highs in price and lower highs in the MACD

Hidden Divergence (aka: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in MACD and higher lows in price
- Bearish Divergence = Higher highs in MACD and lower highs in price

Overbought/Oversold Conditions: The MACD can be used to identify potential overbought and oversold conditions in price movements. These conditions are generated by comparing the distance between the shorter moving average and the longer moving average; if the shorter moving average separates dramatically from the longer moving average it may be an indication that price is over-extending and will soon return to more realistic levels.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Moving Average Convergence/Divergence (MACD) - Line
Function Name Alias: vt_MACDLine
Label Mask:
    MACD Line (%FastPeriods%,%SlowPeriods%,%SigPeriods%)
    Fast = %Fast%
    Signal = %Signal%
Placement: New Frame
Data Inspection Alias: MACD Line
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: FastPrice
Display Name: Fast MA Price
Type: price
Default: close

[New] button...

Name: FastPeriods
Display Name: Fast MA Periods
Type: float
Default: 12.0000

[New] button...

Name: FastType
Display Name: Fast MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: SlowPrice
Display Name: Slow MA Price
Type: price
Default: close

[New] button...

Name: SlowPeriods
Display Name: Slow MA Periods
Type: float
Default: 26.0000

[New] button...

Name: SlowType
Display Name: Slow MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: SigPeriods
Display Name: Signal MA Periods
Type: float
Default: 9.0000

[New] button...

Name: SigType
Display Name: Signal MA Type
Type: MA Type
Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: Fast

```
Name: (Fast Line)
Line Color: blue
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: Signal
Name: (Signal Line)
Line Color: red
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
Fast:= Mov(FastPrice,FastPeriods,FastType) - Mov(SlowPrice,SlowPeriods,
SlowType);
Signal:= Mov(Fast,SigPeriods,SigType);
```

7. Click the "Save" icon to finish building the MACD-Line indicator.

6.64 Mass Index

Overview

Developed by Donald Dorsey and described in his article entitled "The Mass Index" in the June 1992 issue of *Technical Analysis of Stocks & Commodities* magazine, the Mass Index indicator was designed to warn of upcoming trend reversals. It does this by measuring the narrowing and widening of the average range between the high and low prices. As the price range widens the Mass Index increases and as the price range narrows the Mass Index decreases.

The Mass Index is created by calculating an n-periods moving summation (average) of the ratio of two moving averages. The first moving average is divided by a second moving average (which is actually a moving average of the first moving average). The moving averages ratio is then summed over n-periods to calculate the final Mass Index.



Interpretation

According to Dorsey, the “reversal bulge” pattern is the most method of generating potential trading opportunities. A “reversal bulge” occurs when the Mass Index rises above 27 and then declines back below 26.5.

It should be noted that the Mass Index does not indicate market direction. Dorsey suggests using an additional moving average of price to help determine the market direction and classify the “reversal bulge” pattern as a potential buy or sell signal.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Mass Index
Function Name Alias: vt_MassIndex
Label Mask: Mass Index (%maperiods%,%matype%,%sumperiods%) = %MassIndex%
Placement: New Frame
Data Inspection Alias: Mass Index
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: maperiods
Display Name: MA Periods
Type: integer (with bounds)
Default: 9
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: matype
Display Name: MA Type
Type: MA type
Default: Exponential

[New] button...

Name: sumperiods
Display Name: Summation Periods
Type: integer (with bounds)
Default: 25
Min. Bounds: 1
Max. Bounds: 9999

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: MassIndex
Name: (Mass)
Line Color: purple
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

[New] button...

Value: +27.0000
Color: dark red
Width: thin
Type: dashed

[New] button...

Value: +26.5000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
MA1:= Mov( (H-L), maperiods, matype);  
MA2:= Mov(MA1, maperiods, matype);  
MassIndex:= Sum(MA1/MA2, sumperiods);
```

7. Click the "Save" icon to finish building the Mass Index indicator.

6.65 McClellan Histogram

Overview

The McClellan Histogram is a visual representation of the McClellan Oscillator and its signal line. This difference is plotted as a histogram, making zero-line crossovers and divergences more easily identifiable.



Interpretation

The McClellan Histogram is momentum indicator. As such, it can be traded in much the same way as the MACD indicator. There are two basic techniques for using the McClellan Histogram to generate trading signals.

Histogram / Zero-Level Crossover: When the histogram crosses above zero a buy signal is given. Alternatively, when the histogram crosses below zero a sell signal is given.

Divergence: Looking for divergences between the McClellan Histogram and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (a.k.a.: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the McClellan Histogram
- Bearish Divergence = Higher highs in price and lower highs in the McClellan Histogram

Hidden Divergence (a.k.a.: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in McClellan Histogram and higher lows in price
- Bearish Divergence = Higher highs in McClellan Histogram and lower highs in price

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: McClellan Histogram
Function Name Alias: vt_McClellanHist
Label Mask: McClellan Histogram (%Pr%,%Sh%,%Lg%,%Sig%,%mat%) = %McClHist
%
Placement: New Frame
Data Inspection Alias: McClellan Histogram
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: Sh
Display Name: Short MA Periods
Type: integer
Default: 19
```

[New] button...

```
Name: Lg
Display Name: Long MA Periods
Type: integer
Default: 39
```

[New] button...

```
Name: sig
Display Name: Signal MA Periods
Type: integer
Default: 9
```

[New] button...

```
Name: mat
```

Display Name: MA Type
Type: MA Type
Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: McClHist
Name: (Histogram)
Line Color: red
Line Width: thin
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
McClOsc:= Mov(Pr,Sh,mat) - Mov(Pr,Lg,mat);  
McClHist:= McClOsc - Mov(McClOsc,Sig,mat);
```

7. Click the "Save" icon to finish building the McClellan Histogram indicator.

6.66 McClellan Oscillator

Overview

The McClellan Oscillator, developed by Sherman and Marian McClellan, is a market breadth indicator that is based on the smoothed difference between the numbers of advancing/declining statistics. In depth coverage of the McClellan Oscillator is provided in their book "Patterns for Profit".



Interpretation

The McClellan Oscillator is momentum indicator. As such, it can be traded in much the same way as the MACD indicator. There are three basic techniques for using the McClellan Oscillator to generate trading signals.

Oscillator / Zero-Level Crossover: When the oscillator crosses above zero a buy signal is given. Alternatively, when the oscillator crosses below zero a sell signal is given.

Divergence: Looking for divergences between the McClellan Oscillator and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (a.k.a.: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the McClellan Histogram
- Bearish Divergence = Higher highs in price and lower highs in the McClellan Histogram

Hidden Divergence (a.k.a.: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in McClellan Histogram and higher lows in price
- Bearish Divergence = Higher highs in McClellan Histogram and lower highs in price

Overbought/Oversold Conditions: The McClellan Oscillator can also be used to identify potential overbought and oversold conditions in price movements. These conditions are generated by comparing the distance between the shorter moving average and the longer moving average. If the shorter moving average separates dramatically from the longer moving average it may be an indication that price is over-

extending and will soon return to more realistic levels.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: McClellan Oscillator
Function Name Alias: vt_McClellanOsc
Label Mask: McClellan Osc. (%Pr%,%Sh%,%Lg%,%mat%) = %McClOsc%
Placement: New Frame
Data Inspection Alias: McClellan Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: Sh
Display Name: Short MA Periods
Type: integer
Default: 19
```

[New] button...

```
Name: Lg
Display Name: Long MA Periods
Type: integer
Default: 39
```

[New] button...

```
Name: mat
Display Name: MA Type
Type: MA Type
Default: Exponential
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: McClOsc
Name: (Osc)
Line Color: blue
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
 Value: +0.0000
 Color: black
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
McClosc:= Mov(Pr,Sh,mat) - Mov(Pr,Lg,mat);
```

7. Click the "Save" icon to finish building the McClellan Oscillator indicator.

6.67 McClellan Summation Index

Overview

The McClellan Summation Index, developed by Sherman and Marian McClellan, is a long-term version of their McClellan Oscillator that is better suited to help identify potential major trend reversals.

The McClellan Oscillator is a market breadth indicator that is based on the smoothed difference between the numbers of advancing/declining statistics. In depth coverage of the McClellan Oscillator is provided in their book "Patterns for Profit".



Interpretation

The Summation Index is interpreted in much the way same as the McClellan Oscillator is. Please refer to the McClellan Oscillator's Notes for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: McClellan Summation Index
Function Name Alias: vt_McClellanSumIndex
Label Mask: McClellan Sum. Index (%Pr%,%Sh%,%Lg%,%mat%) = %McClSumIndex%

Placement: New Frame
Data Inspection Alias: McClellan Sum. Index
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: Sh
Display Name: Short MA Periods
Type: integer
Default: 19
```

[New] button...

```
Name: Lg
Display Name: Long MA Periods
Type: integer
Default: 39
```

[New] button...

```
Name: mat
Display Name: MA Type
Type: MA Type
Default: Exponential
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: McClSumIndex
Name: (Sum Index)
Line Color: dark blue
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
McClSumIndex:= Cum(Mov(Pr,Sh,mat)-Mov(Pr,Lg,mat));
```

7. Click the "Save" icon to finish building the McClellan Summation Index indicator.

6.68 McGinley Dynamic

Overview

Developed by John McGinley in 1990 and published in the Market Technicians Association's Journal Of Technical Analysis 1997, the McGinley Dynamic attempts to overcome the problems of more traditional simple and exponential moving averages by automatically adjusting itself relative to speed of the market. This allows the McGinley Dynamic to follow prices move closely in fast and slow moving markets while better avoiding price separation and whipsaws. The McGinley Dynamic is calculated by the formula:

$$\text{Dynamic} = D1 + (\text{Price} - D1) / (N * (\text{Price}/D1)^4)$$

Where:

D1 = previous value of Dynamic

N = smoothing factor (periods)



Interpretation

McGinley believes that moving averages (and his Dynamic) should be used as smoothing mechanisms rather than as trading systems or signal generators. However, the McGinley Dynamic can also be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: McGinley Dynamic
Function Name Alias: vt_McGinleyDynamic
Label Mask: McGinley Dynamic (%prc%,%periods%) = %McGDynamic%
Placement: Price Frame
Data Inspection Alias: McGinley Dynamic
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: prc
Display Name: Price
```

Type: Price
Default: Close

[New] button...
Name: periods
Display Name: Periods
Type: integer (with bounds)
Default: 12
Min. Bounds: 1
Max. Bounds: 9999

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: McGDynamic
Name: (Dynamic)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
McGDynamic:= Prev(prc)+(prc-Prev(prc))/(periods*Power(prc/Prev(prc),4));
```

7. Click the "Save" icon to finish building the McGinley Dynamic indicator.

6.69 Momentum

Overview

The momentum indicator is one of the simplest equations available in modern technical analysis. Momentum is a measure of price change velocity calculated as the difference between the current bar's price and the price a selected number of bars ago. Basically, it represents the rate of change of the trading instrument's price over those specified time periods. The faster prices rise, the larger the increase in momentum. The faster prices decline, the larger the decrease in momentum. As the price movement begins to slow the momentum will also slow and return to a more median level.



Interpretation

The Momentum indicator is a versatile indicator capable of producing a wide array of buy and sell signals. However, there are three basic methods of interpreting the Momentum indicator:

Zero-Level Crossovers: A buy signal occurs when Momentum crosses above zero and a sell signal occurs when momentum crosses below zero.

Extreme Overbought/Oversold Levels: To use Momentum as an overbought/oversold indicator, the user must identify potential overbought and oversold levels based on previous indicator readings; When choosing the overbought and oversold levels the user should ensure that at least two-thirds of previous Momentum values fall between the overbought and oversold levels. Readings above the overbought level imply an overbought condition (and a pending price correction) while readings below the oversold level imply an oversold condition (and a pending rally).

Trend Line Breakouts: Trend lines can be drawn connecting the peaks and troughs of the Momentum indicator. Often momentum begins to turn before price thereby making it a leading indicator. Momentum readings breaking above a declining trend line warns of a possible bullish reversal while momentum readings breaking below a rising trend line warns of a possible bearish reversal.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Momentum
Function Name Alias: vt_MOM
Label Mask: Momentum (%Pr%,%tPr%) = %Mom%
Placement: New Frame
Data Inspection Alias: Momentum
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: tPr
Display Name: Periods
Type: integer
Default: 10
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: Mom
Name: (Momentum)
Line Color: blue
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
Mom:= Pr - Ref(Pr,-tPr);
```

7. Click the "Save" icon to finish building the Momentum indicator.

6.70 Moving Average

Overview

A Moving Average is an indicator that calculates the average value of prices (or any specified data series) over a period of predetermined period of time.

VT Trader supports seven popular types of moving averages: simple, weighted, exponential, sine weighted, triangular, end point, and volume-adjusted. Moving averages can be calculated on any data series including a trading instrument's open, high, low, close, volume, or even another indicator.

The only significant difference between the various types of moving averages is the weight assigned to the most recent data. Simple moving averages apply equal weight to the prices. Exponential and weighted averages apply more weight to recent prices. Triangular averages apply more weight to prices in the middle of the time period.



Interpretation

The most popular method of interpreting a moving average is to compare the relationship between a moving average of the price with the price itself. A buy signal is generated when the price rises above its moving average and a sell signal is generated when the price falls below its moving average.

Also popular are various types of moving average crossover systems. Such systems often include two or more moving averages crossing above/below each other and perhaps even utilizing other indicators as additional entry and exit confirmation signals. The combinations of conditions for these types of systems are almost limitless!

Moving averages can also be calculated and plotted on indicators. The interpretation of an indicator's moving average is similar to the interpretation of the price's moving average: when the indicator rises

above its moving average, it signifies a continued upward movement by the indicator; when the indicator falls below its moving average, it signifies a continued downward movement by the indicator.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Moving Average
Function Name Alias: vt_MOV
Label Mask: Moving Average (%Pr%,%tPr%,%mt%,%VShift%,%HShift%) = %MA%
Placement: Price Frame
Data Inspection Alias: Moving Average
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: tPr
Display Name: Periods
Type: integer
Default: 13
```

[New] button...

```
Name: mt
Display Name: MA Type
Type: MA Type
Default: Simple
```

[New] button...

```
Name: VShift
Display Name: Vertical Shift %
Type: float (with bounds)
Default: 0.0000
Min Bounds: -9999.0000
Max Bounds:= 9999.0000
```

[New] button...

```
Name: HShift
Display Name: Horizontal Shift
Type: Bars Forward
Default: 0
Min Bounds: 0
Max Bounds:= 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...  
Var Name: MA  
Name: (MA)  
Line Color: red  
Line Width: thin  
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
This indicator requires no horizontal lines.
```

6. In the **Formula** tab, copy and paste the following formula:

```
DataBars:= Ref(Pr,-HShift);  
tmpMV:= Mov(DataBars,tPr,mt);  
MA:= tmpMV+((tmpMV*VShift)/100);
```

7. Click the "Save" icon to finish building the Moving Average indicator.

6.71 Moving Average Envelope

Overview

The Moving Average Envelope indicator creates upper and lower channel lines plotted an equidistant % (or number of pips) above and below the moving average.



Interpretation

While several different trading rules are available, the simplest approach uses price penetrating the upper channel to initiate long positions and price penetrating the lower channel initiate short positions.

An alternative to the above methods when the market is more range bound is to use price touching the upper channel to go short price touching the lower channel to go long.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Moving Average Envelope
Function Name Alias: vt_MaEnv
Label Mask:
    Moving Average Envelope (%Pr%,%tPr%,%mt%,%VShift%,%HShift%,%prcnt%,%
    pips%)
    Upper = %UC%, Lower = %LC%, MA = %DisplayMA%
Placement: Price Frame
Data Inspection Alias: MA Envelope
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Pr
Display Name: MA Price
Type: price
Default: close

[New] button...

Name: tPr
Display Name: MA Periods
Type: integer
Default: 13

[New] button...

Name: mt
Display Name: MA Type
Type: MA Type
Default: Simple

[New] button...

Name: VShift
Display Name: MA Vertical Shift %
Type: float (with bounds)
Default: 0.0000
Min Bounds: -9999.0000
Max Bounds:= 9999.0000

[New] button...

Name: HShift
Display Name: MA Horizontal Shift
Type: Bars Forward
Default: 0
Min Bounds: 0
Max Bounds:= 9999

[New] button...

Name: HShift
Display Name: MA Horizontal Shift
Type: Bars Forward
Default: 0
Min Bounds: 0
Max Bounds:= 9999

[New] button...

Name: EType
Display Name: Type of MA Envelope
Type: Enumeration
Default: click [...] button, **[New]** button, then create the following entries:
 Percentage_Based
 Pip_Based
... then, click **[OK]** button
Default: Percentage_Based

[New] button...

Name: prcnt
Display Name: MA Envelope % (if % Based)
Type: float
Default: 0.1000

[New] button...

Name: pips
Display Name: MA Envelope Pips (if Pip Based)
Type: integer
Default: 20

[New] button...

Name: ShowMA
Display Name: Display Center MA?
Type: Enumeration
Default: click [...] button, **[New]** button, then create the following entries:
 No
 Yes
... then, click **[OK]** button
Default: Yes

4. In the Output Variable(s) tab, create the following variables:**[New] button...**

Var Name: UC
Name: (Upper Channel)
Line Color: dark blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: DisplayMA
Name: (Moving Average)
Line Color: dark green
Line Width: thin
Line Type: dashed

[New] button...

Var Name: LC
Name: (Lower Channel)
Line Color: dark blue
Line Width: thin
Line Type: solid

5. In the Horizontal Line tab, create the following lines:

This indicator requires no horizontal lines.

6. In the Formula tab, copy and paste the following formula:

```

DataBars:= Ref(Pr,-HShift);
tmpMV:= Mov(DataBars,tPr,mt);
MA:= tmpMV+((tmpMV*VShift)/100);
UC:= if(EType=0, MA + (MA * (prcnt/100)), MA + (Pips*SymbolPoint()));
LC:= if(EType=0, MA - (MA * (prcnt/100)), MA - (Pips*SymbolPoint()));
DisplayMA:= if(ShowMA=1, MA, null);

```

7. Click the "Save" icon to finish building the Moving Average Envelope indicator.

6.72 Moving Averages of RSI

Overview

The Moving Averages (MA's) of RSI indicator consists of a Relative Strength Index (RSI) indicator and two moving averages or the RSI (fast and slow). The Fast MA of RSI and Slow MA of RSI are constructed by calculating different n-periods moving averages of RSI.



Interpretation

There are several different methods in which the MA's of RSI indicator can be used to generate trading signals. Here are few of the more common techniques:

Crossovers: 1) RSI / Fast MA or Slow MA Crossover: A buy signal occurs when the RSI crosses above the Fast MA or Slow MA and a sell signal occurs when RSI crosses below the Fast MA or Slow MA. 2) RSI / 50-level Crossover: When the RSI crosses above 50 a buy signal is given. Alternatively, when the RSI crosses below 50 a sell signal is given. 3) Fast MA / Slow MA Crossover: A buy signal occurs when the Fast MA crosses above the Slow MA and a sell signal occurs when Fast MA crosses below the Slow MA.

Divergence: Looking for divergences between the MA's of RSI indicator and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the RSI or the MA's of RSI; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the RSI or the MA's of RSI.

Overbought/Oversold Conditions: Much like the original RSI (and other oscillators), the MA's of RSI indicator can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the RSI or the MA's of RSI being greater than or equal to the 70% level while an oversold condition is generally described as the RSI or MA's of RSI being less than or equal to the 30% level. Trades can be generated when any of the MA's of RSI outputs (RSI, Fast MA or Slow MA) crosses these levels. When the RSI, Fast MA or Slow MA crosses above 30 a buy signal is given. Alternatively, when the RSI, Fast MA or Slow MA crosses below 70 a sell signal is given.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Moving Averages of Relative Strength Index (MA's of RSI)
Function Name Alias: vt_MARSIndex
Label Mask:
    MA's of RSI (%pr%,%tpr%,%MA1pr%,%MA1type%,%MA2pr%,%MA2type%)
    RSI = %RS%, Fast MA = %FastMA%, Slow MA = %SlowMA%
Placement: New Frame
Data Inspection Alias: MA's of RSI
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: pr
Display Name: RSI Price
Type: price
Default: close
```

[New] button...

```
Name: tpr
Display Name: RSI Periods
Type: integer
Default: 14
```

[New] button...

Name: MA1pr
Display Name: Fast MA Periods
Type: integer
Default: 10

[New] button...

Name: MA1type
Display Name: Fast MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: MA2pr
Display Name: Slow MA Periods
Type: integer
Default: 30

[New] button...

Name: MA2type
Display Name: Slow MA Type
Type: MA Type
Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: RS
Name: (RSI)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: FastMA
Name: (Fast MA)
Line Color: blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: SlowMA
Name: (Slow MA)
Line Color: red
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +70.0000
Color: red
Width: thin
Type: dashed

[New] button...

Value: +50.0000

Color: gray

Width: thin

Type: dashed

[New] button...

Value: +30.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
{Relative Strength Index}

rsi_r:= (pr - ref(pr,-1));
rsi_rs:= Wilders(if(rsi_r>0,rsi_r,0),tpr) / Wilders(if(rsi_r<0,Abs
(rsi_r),0),tpr);
RS:= 100-(100/(1+rsi_rs));

{Moving Averages of Relative Strength Index}

FastMA:= mov(RS,MA1pr,MA1type);
SlowMA:= mov(RS,MA2pr,MA2type);
```

7. Click the "Save" icon to finish building the MA's of RSI indicator.

6.73 Moving Slope Rate of Change

Overview

The Moving Slope Rate of Change (MSROC) Indicator is discussed in the Two Moving Function Hybrids article written by William Rafter in the September 2005 issue of Technical Analysis of Stocks and Commodities magazine.

The MSROC is created by first calculating the linear regression slope over n-periods using the least squares fit method and then calculating the ROC of that regression line. Because of the use of the linear regression slope rather than raw price, it is smoother and more responsive than the Rate of Change (ROC) indicator.



Interpretation

Trading opportunities can be derived from the MSROC crossing above and below the zero line.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Moving Slope Rate of Change
Function Name Alias: vt_MSROC
Label Mask: Moving Slope ROC (%prc%,%periods%) = %MSROC%
Placement: New Frame
Data Inspection Alias: Moving Slope ROC
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Prc
Display Name: Price
Type: price
Default: close
```

[New] button...

Name: periods

Display Name: Periods

Type: integer

Default: 25

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: MSROC

Name: (MSROC)

Line Color: purple

Line Width: slightly thicker

Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000

Color: black

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
LinRegLine:= LinRegSlope(Prc,periods);  
MSROC:= ROC(LinRegLine,periods,Points);
```

7. Click the "Save" icon to finish building the Moving Slope Rate of Change indicator.

6.74 Parabolic SAR

Overview

The Parabolic Time/Price System, developed by Welles Wilder, is used to set trailing price stops and is usually referred to as the "SAR" (stop-and-reversal). This indicator is explained thoroughly in Wilder's book, "New Concepts in Technical Trading Systems".



Interpretation

The Parabolic SAR provides excellent exit points. It is suggested to close long positions when the price falls below the SAR and close short positions when the price rises above the SAR.

If the price is above the SAR, the SAR will move up every day, regardless of the direction the price is moving. The amount the SAR moves up depends on the amount that prices move. If the price is below the SAR, the SAR will move down every day, regardless of the direction the price is moving. The amount the SAR moves up or down depends on the amount that prices move.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Parabolic SAR
Function Name Alias: vt_SAR
Label Mask: Parabolic SAR (%Step%,%Maximum%) = %SR%
Placement: Price Frame
Data Inspection Alias: Parabolic SAR
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
Name: Step
Display Name: Step
Type: float (with bounds)
Default: 0.0200
Min Bounds: 0.0010
Max Bounds: 0.1000

[New] button...
Name: Maximum
Display Name: Maximum
Type: float (with bounds)
Default: 0.2000
Min Bounds: 0.0100
Max Bounds: 1.0000

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: SR
Name: (PSAR)
Line Color: dark blue
Line Width: thin
Line Type: dots

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
SR:= SAR(Step,Maximum);
```

7. Click the "Save" icon to finish building the Parabolic SAR indicator.

6.75 Percentage Price Oscillator

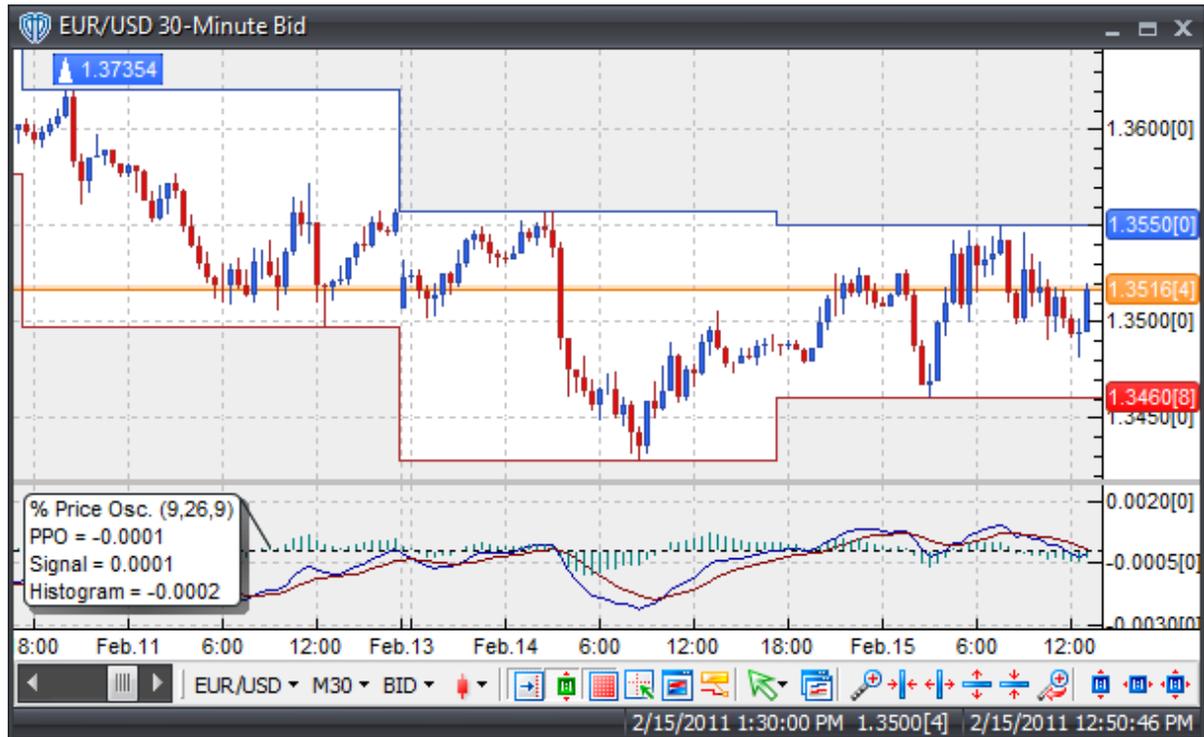
Overview

The Percentage Price Oscillator (PPO) is a momentum oscillator with some trend-following characteristics. It expresses the difference between two moving averages as a percentage value that quantifies where the fast moving average is in relation to the slow moving average. The Percentage Price Oscillator is very similar to the Moving Average Convergence/Divergence (MACD), except the MACD expresses the difference of two moving averages as an absolute value. Expressing the difference as a percentage value makes it easier to compare trading instruments with difference prices.

The PPO is calculated by the formula:

$$\text{PPO} = (\text{fast moving average} - \text{slow moving average}) / \text{slow moving average}$$

Sometimes an additional “signal” (trigger) line is then calculated from the PPO. The signal line is a moving average of the PPO. An additional histogram may also be calculated. The histogram is calculated as the difference between the PPO and its signal line.



Interpretation

The Percentage Price Oscillator is widely used as a trend-following indicator and tends to work most effectively when measuring wide-swinging market movements. There are three basic techniques for using the PPO to generate trading signals.

PPO / Zero-Level Crossover: When the PPO crosses above zero a buy signal is given. Alternatively, when the PPO crosses below zero a sell signal is given.

PPO / Signal line Crossover: A buy signal occurs when the PPO crosses above its Signal line and a sell signal occurs when the PPO crosses below its Signal line.

Divergence: Looking for divergences between the PPO and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (aka: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the PPO
- Bearish Divergence = Higher highs in price and lower highs in the PPO

Hidden Divergence (aka: Reverse, Continuation, or Trend Divergence)

- Bullish Divergence = Lower lows in PPO and higher lows in price
- Bearish Divergence = Higher highs in PPO and lower highs in price

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Percentage Price Oscillator (PPO)
Function Name Alias: vt_PPO
Label Mask:
    %% Price Osc. (%FmaPeriods%,%SmaPeriods%,%SigMaPeriods%)
    PPO = %PPO%
    Signal = %PPO_Signal%
Placement: New Frame
Data Inspection Alias: % Price Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: FmaPrice
Display Name: Fast MA Price
Type: price
Default: close
```

[New] button...

```
Name: FmaPeriods
Display Name: Fast MA Periods
Default: 9
Min. Bounds: 1
Max. Bounds: 9999
```

[New] button...

```
Name: FmaType
Display Name: Fast MA Type
Type: MA Type
Default: Exponential
```

[New] button...

```
Name: SmaPrice
Display Name: Slow MA Price
Type: price
Default: close
```

[New] button...

```
Name: SmaPeriods
```

Display Name: Slow MA Periods
Default: 26
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: SmaType
Display Name: Slow MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: SigMaPeriods
Display Name: Signal MA Periods
Type: integer (with bounds)
Default: 9
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: SigMaType
Display Name: Signal MA Type
Type: MA Type
Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: PPO
Name: (PPO)
Line Color: dark blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: PPO_Signal
Name: (Signal)
Line Color: dark red
Line Width: thin
Line Type: solid

[New] button...

Var Name: PPO_Histogram
Name: (Histogram)
Line Color: dark green
Line Width: thin
Line Type: histogram

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
Color: black

```
Width: thin  
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
FastMa:= Mov(FmaPrice,FmaPeriods,FmaType);  
SlowMa:= Mov(SmaPrice,SmaPeriods,SmaType);  
PPO:= (FastMa-SlowMa)/SlowMa;  
PPO_Signal:= Mov(PPO,SigMaPeriods,SigMaType);  
PPO_Histogram:= PPO - PPO_Signal;
```

7. Click the "Save" icon to finish building the Percentage Price Oscillator indicator.

6.76 Pivot Points - 24-Hour Cycle

Overview

Pivot points consist of a central pivot level surrounded by three support levels below it and three resistance levels above it. Pivot points were originally used by floor traders on equity and futures exchanges because they provided a quick way for those traders to get a general idea of how the market was moving during the course of the day using only a few simple calculations. However, over time pivot points have also proved exceptionally useful in other markets as well.

One of the reasons that pivot points are now so popular is because they are considered a "leading" (or *predictive*) indicator rather than a lagging indicator. All that is required to calculate the pivot points for the upcoming (*current*) trading day is the previous day's high, low, and close prices. For 24-hour markets like Forex, each broker determines when the trading day closes for their clients; however, 4:00PM ET or 5:00PM ET are common as a daily closing time (*except on Friday when some brokers may end trading earlier*).

The 24-hour cycle pivot points in this indicator are calculated according to the following formulas:

$$\text{Pivot Point for Current 24-Hour Cycle} = (\text{High}(\text{Previous 24-Hour Cycle}) + \text{Low}(\text{Previous 24-Hour Cycle}) + \text{Close}(\text{Previous 24-Hour Cycle})) / 3$$

The central pivot point can then be used to calculate the support and resistance levels as follows:

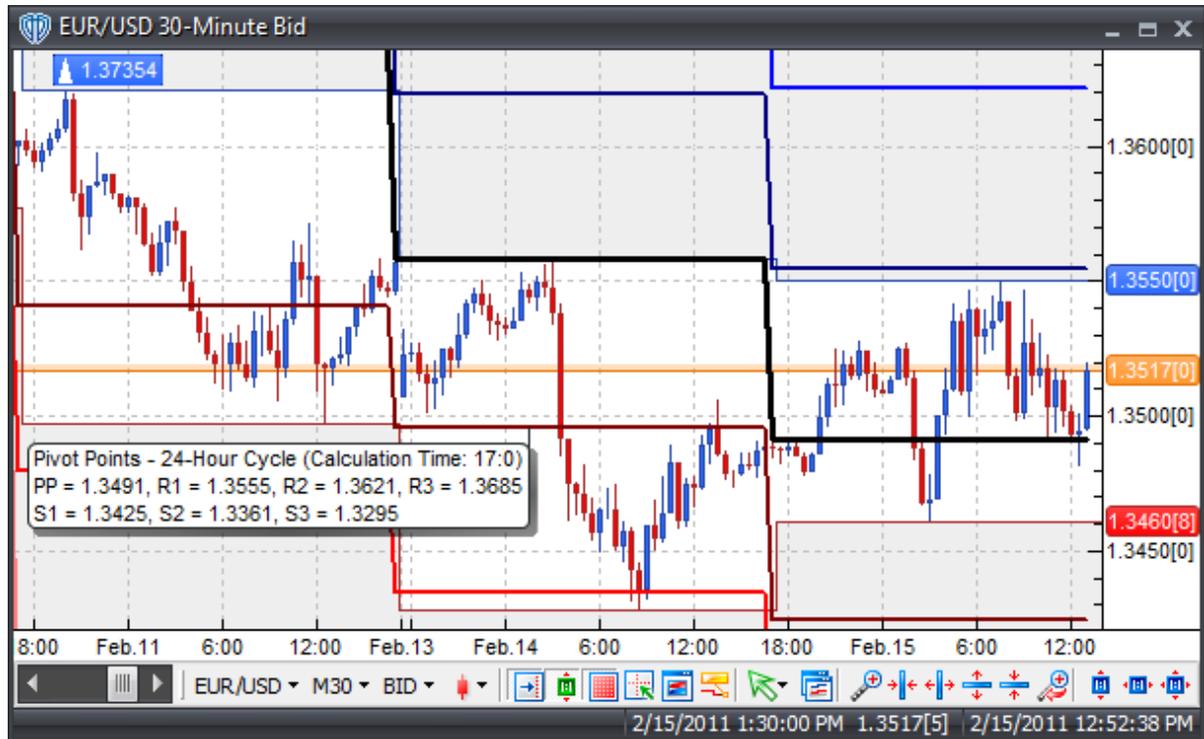
$$\text{Resistance 1} = (2 * \text{Pivot Point}) - \text{Low}(\text{Previous 24-Hour Cycle})$$
$$\text{Support 1} = (2 * \text{Pivot Point}) - \text{High}(\text{Previous 24-Hour Cycle})$$
$$\text{Resistance 2} = (\text{Pivot Point} - \text{Support 1}) + \text{Resistance 1}$$
$$\text{Support 2} = \text{Pivot Point} - (\text{Resistance 1} - \text{Support 1})$$
$$\text{Resistance 3} = (\text{Pivot Point} - \text{Support 2}) + \text{Resistance 2}$$
$$\text{Support 3} = \text{Pivot Point} - (\text{Resistance 2} - \text{Support 2})$$

VT Trader also includes support and resistance mid-levels that are calculated as follows:

Resistance Mid-Level 1 = (Pivot Point + Resistance 1) / 2
 Support Mid-Level 1 = (Pivot Point + Support 1) / 2

Resistance Mid-Level 2 = (Resistance 1 + Resistance 2) / 2
 Support Mid-Level 2 = (Support 1 + Support 2) / 2

Resistance Mid-Level 3 = (Resistance 2 + Resistance 3) / 2
 Support Mid-Level 3 = (Support 2 + Support 3) / 2



Interpretation

Pivot point levels can be used in many different ways. Here are a few of the most common methods for utilizing them.

Trend Direction Determined by Pivot Point: Combined with other technical analysis techniques such as overbought/oversold oscillators, volatility measurements, etc., the central pivot point may be useful in determining the general trending direction of the market. Trades are only taken in the direction of the trend. Buy trades occur only when the price is above the central pivot point and sell trades occur only when the price is below the central pivot point.

Price Breakouts: When trading price breakouts, a buy signal occurs when the price breaks up through the central pivot point or one of the resistance levels (*typically Resistance 1*). A sell signal occurs when price breaks down through the central pivot point or one of the support levels (*typically Support 1*).

Price Reversals: When trading price reversals, a buy signal occurs when the price moves towards a support level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction. A sell signal occurs when the price moves towards a resistance

level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction.

Stop loss and/or Limit Profit Values Determined by Support/Resistance Levels: The central pivot point and its support and resistance levels may be potentially helpful in determining suitable stop loss and/or limit profit placements. For example, if trading a long breakout above the Resistance 1 level it may be reasonable to position a stop loss order just below the central pivot point and one or more limit profit(s) orders at the Resistance 2 and/or Resistance 3 levels.

Implementation

This Pivot Points indicator calculates the pivot points using a 24-hour cycle that resets at the specified predetermined time each day. The *Calculation Time (Hour/Minute)* is defined using a 24-hour clock (*AM/PM is not used*). For example, setting the *Calculation Hour* equal to 9 and the *Calculation Minute* to 00 recalculates the pivot points each day at 9:00 AM while setting the *Calculation Hour* equal to 17 and the *Calculation Minute* to 30 recalculates the pivot points each day at 5:30PM.

Please Note: This indicator will not function properly on the following chart intervals: *Tick, Daily, Weekly, or Monthly*. It is not possible for VT Trader to load enough tick data into a *Tick* chart interval for the indicator to properly calculate the pivot points and the calculations performed are not designed (*nor can they be reprogrammed*) to function in the *Daily, Weekly, or Monthly* chart intervals.

If the pivot points are not shown in the chart window once the indicator is attached, you may need to increase the number of bars that VT Trader loads into its charts. As minimum amounts, VT Trader should load 3,000+ bars into its charts if you intend to attach this Pivot Points indicator to any *1-Minute* interval charts or 750+ bars if you intend to attach it to any *5-Minute* or higher intraday interval charts.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Pivot Points - 24-Hour Cycle
Function Name Alias: vt_PPI
Label Mask:
    Pivot Points - 24-Hour Cycle (Calculation Time: %CalculationHour%:%
    CalculationMinute%)
    PP = %PivotPoint%, R1 = %Resistance1%, R2 = %Resistance2%, R3 = %
    Resistance3%
    S1 = %Support1%, S2 = %Support2%, S3 = %Support3%
Placement: Price Frame
Data Inspection Alias: Pivot Points - 24-Hour Cycle
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: CalculationHour
```

Display Name: Calculation Hour
Type: integer
Default: 17

[New] button...

Name: CalculationMinute
Display Name: Calculation Minute
Type: integer
Default: 0

[New] button...

Name: ShowMidLevels
Display Name: Show Mid-Levels?
Type: Enumeration
Default: click [...] button, **[New]** button, then create the following entries:
 No
 Yes
... then, click **[OK]** button
Default: No

4. In the **Output Variable(s) tab**, create the following variables:

[New] button...

Var Name: Resistance3
Name: (R3)
Line Color: light blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: ResistanceMidLevel3
Name: (R3 ML)
Line Color: light blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Resistance2
Name: (R2)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: ResistanceMidLevel2
Name: (R2 ML)
Line Color: blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Resistancel

Name: (R1)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: ResistanceMidLevel1
Name: (R1 ML)
Line Color: dark blue
Line Width: thin
Line Type: dashed

[New] button...
Var Name: PivotPoint
Name: (Pivot Point)
Line Color: black
Line Width: very thick
Line Type: solid

[New] button...
Var Name: SupportMidLevel1
Name: (S1 ML)
Line Color: dark red
Line Width: thin
Line Type: dashed

[New] button...
Var Name: Support1
Name: (S1)
Line Color: dark red
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: SupportMidLevel2
Name: (S2 ML)
Line Color: red
Line Width: thin
Line Type: dashed

[New] button...
Var Name: Support2
Name: (S2)
Line Color: red
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: SupportMidLevel3
Name: (S3 ML)
Line Color: light red
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Support3
 Name: (S3)
 Line Color: light red
 Line Width: slightly thicker
 Line Type: solid

5. In the **Horizontal Line tab**, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula tab**, copy and paste the following formula:

```

_Hour:= Hour();
_Minute:= Minute();

CalculationTime:= Cross((_Hour=CalculationHour AND
_Minute>=CalculationMinute),0.5);

CalculateLookBackPeriods:= Barssince(CalculationTime=1);
LookBackPeriods:= valuewhen(1, Cross(0.5,CalculateLookBackperiods), ref
(CalculateLookBackPeriods,-1));

_H:= valuewhen(1,CalculationTime=1,ref(HHV(H,LookBackPeriods),-1));
_L:= valuewhen(1,CalculationTime=1,ref(LLV(L,LookBackPeriods),-1));
_C:= valuewhen(1,CalculationTime=1,C);

PivotPoint:= (_H+_L+_C)/3;

Resistance1:= 2 * PivotPoint - _L;
Resistance2:= PivotPoint + (_H-_L);
Resistance3:= 2 * PivotPoint + (_H-2*_L);

Support1:= 2 * PivotPoint - _H;
Support2:= PivotPoint - (_H-_L);
Support3:= 2 * PivotPoint - (2*_H-_L);

ResistanceMidLevel1:= if(ShowMidLevels=1, (PivotPoint+Resistance1)/2,
null);
ResistanceMidLevel2:= if(ShowMidLevels=1, (Resistance1+Resistance2)/2,
null);
ResistanceMidLevel3:= if(ShowMidLevels=1, (Resistance2+Resistance3)/2,
null);

SupportMidLevel1:= if(ShowMidLevels=1, (PivotPoint+Support1)/2, null);
SupportMidLevel2:= if(ShowMidLevels=1, (Support1+Support2)/2, null);
SupportMidLevel3:= if(ShowMidLevels=1, (Support2+Support3)/2, null);

```

7. Click the "Save" icon to finish building the Pivot Points - 24-Hour Cycle indicator.

6.77 Pivot Points - 24-Hour Cycle - Fibonacci Ratios

Overview

Pivot points consist of a central pivot level surrounded by three support levels below it and three resistance levels above it. This pivot points indicator replaces the traditional formulas used to calculate the support and resistance levels with Fibonacci-based formulas. Pivot points (*calculated using the traditional formulas*) were originally used by floor traders on equity and futures exchanges because they provided a quick way for those traders to get a general idea of how the market was moving during the course of the day using only a few simple calculations. However, over time pivot points have also proved exceptionally useful in other markets as well.

One of the reasons that pivot points are now so popular is because they are considered a "leading" (*or predictive*) indicator rather than a lagging indicator. All that is required to calculate the pivot points for the upcoming (*current*) trading day is the previous day's high, low, and close prices. For 24-hour markets like Forex, each broker determines when the trading day closes for their clients; however, 4:00PM ET or 5:00PM ET are common as a daily closing time (*except on Friday when some brokers may end trading earlier*).

The 24-hour cycle pivot points in this indicator are calculated according to the following formulas:

Pivot Point for Current 24-Hour Cycle = (High(Previous 24-Hour Cycle) + Low(Previous 24-Hour Cycle) + Close(Previous 24-Hour Cycle)) / 3

With the central pivot point level already calculated, the support and resistance levels are determined by calculating the previous cycle's high/low price range along with several Fibonacci-based percentages of that price range and then adding those % values to (*for resistance levels*) or subtracting those % values from (*for support levels*) the central pivot point. The support levels' and resistance levels' formulas are as follows:

Resistance 1 = Pivot Point + ((High(Previous 24-Hour Cycle) - Low(Previous 24-Hour Cycle)) * 0.382)
Support 1 = Pivot Point - ((High(Previous 24-Hour Cycle) - Low(Previous 24-Hour Cycle)) * 0.382)

Resistance 2 = Pivot Point + ((High(Previous 24-Hour Cycle) - Low(Previous 24-Hour Cycle)) * 0.618)
Support 2 = Pivot Point - ((High(Previous 24-Hour Cycle) - Low(Previous 24-Hour Cycle)) * 0.618)

Resistance 3 = Pivot Point + ((High(Previous 24-Hour Cycle) - Low(Previous 24-Hour Cycle)) * 1.000)
Support 3 = Pivot Point - ((High(Previous 24-Hour Cycle) - Low(Previous 24-Hour Cycle)) * 1.000)



Interpretation

Pivot point levels can be used in many different ways. Here are a few of the most common methods for utilizing them.

Trend Direction Determined by Pivot Point: Combined with other technical analysis techniques such as overbought/oversold oscillators, volatility measurements, etc., the central pivot point may be useful in determining the general trending direction of the market. Trades are only taken in the direction of the trend. Buy trades occur only when the price is above the central pivot point and sell trades occur only when the price is below the central pivot point.

Price Breakouts: When trading price breakouts, a buy signal occurs when the price breaks up through the central pivot point or one of the resistance levels (*typically Resistance 1*). A sell signal occurs when price breaks down through the central pivot point or one of the support levels (*typically Support 1*).

Price Reversals: When trading price reversals, a buy signal occurs when the price moves towards a support level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction. A sell signal occurs when the price moves towards a resistance level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction.

Stop loss and/or Limit Profit Values Determined by Support/Resistance Levels: The central pivot point and its support and resistance levels may be potentially helpful in determining suitable stop loss and/or limit profit placements. For example, if trading a long breakout above the Resistance 1 level it may be reasonable to position a stop loss order just below the central pivot point and one or more limit profit(s) orders at the Resistance 2 and/or Resistance 3 levels.

Implementation

This Pivot Points indicator calculates the pivot points using a 24-hour cycle that resets at the specified predetermined time each day. The *Calculation Time (Hour/Minute)* is defined using a 24-hour clock (*AM/PM is not used*). For example, setting the *Calculation Hour* equal to 9 and the *Calculation Minute* to 00 recalculates the pivot points each day at 9:00 AM while setting the *Calculation Hour* equal to 17 and the *Calculation Minute* to 30 recalculates the pivot points each day at 5:30PM.

Please Note: This indicator will not function properly on the following chart intervals: *Tick*, *Daily*, *Weekly*, or *Monthly*. It is not possible for VT Trader to load enough tick data into a *Tick* chart interval for the indicator to properly calculate the pivot points and the calculations performed are not designed (*nor can they be reprogrammed*) to function in the *Daily*, *Weekly*, or *Monthly* chart intervals.

If the pivot points are not shown in the chart window once the indicator is attached, you may need to increase the number of bars that VT Trader loads into its charts. As minimum amounts, VT Trader should load 3,000+ bars into its charts if you intend to attach this Pivot Points indicator to any *1-Minute* interval charts or 750+ bars if you intend to attach it to any *5-Minute* or higher intraday interval charts.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Pivot Points - 24-Hour Cycle - Fibonacci Ratios
Function Name Alias: vt_PPIFibs
Label Mask:
    Pivot Points - 24-Hour Cycle - Fibonacci Ratios (Calculation Time: %
    CalculationHour%:%CalculationMinute%)
    PP = %PivotPoint%, R1 = %Resistance1%, R2 = %Resistance2%, R3 = %
    Resistance3%
    S1 = %Support1%, S2 = %Support2%, S3 = %Support3%
Placement: Price Frame
Data Inspection Alias: Pivot Points - 24-Hour Cycle - Fibonacci
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: CalculationHour
Display Name: Calculation Hour
Type: integer
Default: 17
```

[New] button...

```
Name: CalculationMinute
Display Name: Calculation Minute
Type: integer
Default: 0
```

4. In the **Output Variable(s) tab**, create the following variables:

[New] button...

Var Name: Resistance3
Name: (R3)
Line Color: light blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: Resistance2
Name: (R2)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: Resistancel
Name: (R1)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: PivotPoint
Name: (Pivot Point)
Line Color: black
Line Width: very thick
Line Type: solid

[New] button...

Var Name: Support1
Name: (S1)
Line Color: dark red
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: Support2
Name: (S2)
Line Color: red
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: Support3
Name: (S3)
Line Color: light red
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line tab**, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula tab**, copy and paste the following formula:

```

_Hour:= Hour();
_Minute:= Minute();

CalculationTime:= Cross((_Hour=CalculationHour AND
_Minute>=CalculationMinute),0.5);

CalculateLookBackPeriods:= Barssince(CalculationTime=1);
LookBackPeriods:= valuewhen(1, Cross(0.5,CalculateLookBackperiods), ref
(CalculateLookBackPeriods,-1));

_H:= valuewhen(1,CalculationTime=1,ref(HHV(H,LookBackPeriods),-1));
_L:= valuewhen(1,CalculationTime=1,ref(LLV(L,LookBackPeriods),-1));
_C:= valuewhen(1,CalculationTime=1,C);

PivotPoint:= (_H+_L+_C)/3;

Resistance1:= PivotPoint + ((_H-_L) * 0.382);
Resistance2:= PivotPoint + ((_H-_L) * 0.618);
Resistance3:= PivotPoint + ((_H-_L) * 1.000);

Support1:= PivotPoint - ((_H-_L) * 0.382);
Support2:= PivotPoint - ((_H-_L) * 0.618);
Support3:= PivotPoint - ((_H-_L) * 1.000);

```

7. Click the "Save" icon to finish building the Pivot Points - 24-Hour Cycle - Fibonacci Ratios indicator.

6.78 Pivot Points - Monthly Cycle

Overview

Pivot points consist of a central pivot level surrounded by three support levels below it and three resistance levels above it. Pivot points were originally used by floor traders on equity and futures exchanges because they provided a quick way for those traders to get a general idea of how the market was moving during the course of the day using only a few simple calculations. However, over time pivot points have also proved exceptionally useful in other markets as well.

One of the reasons that pivot points are now so popular is because they are considered a "leading" (or *predictive*) indicator rather than a lagging indicator. All that is required to calculate the pivot points for the upcoming (*current*) trading month is the previous month's high, low, and close prices.

The monthly cycle pivot points in this indicator are calculated according to the following formulas:

Pivot Point for Current Monthly Cycle = (High(Previous Monthly Cycle) + Low(Previous Monthly Cycle) + Close(Previous Monthly Cycle)) / 3

The central pivot point can then be used to calculate the support and resistance levels as follows:

Resistance 1 = (2 * Pivot Point) - Low(Previous Monthly Cycle)
Support 1 = (2 * Pivot Point) - High(Previous Monthly Cycle)

Resistance 2 = (Pivot Point - Support 1) + Resistance 1
Support 2 = Pivot Point - (Resistance 1 - Support 1)

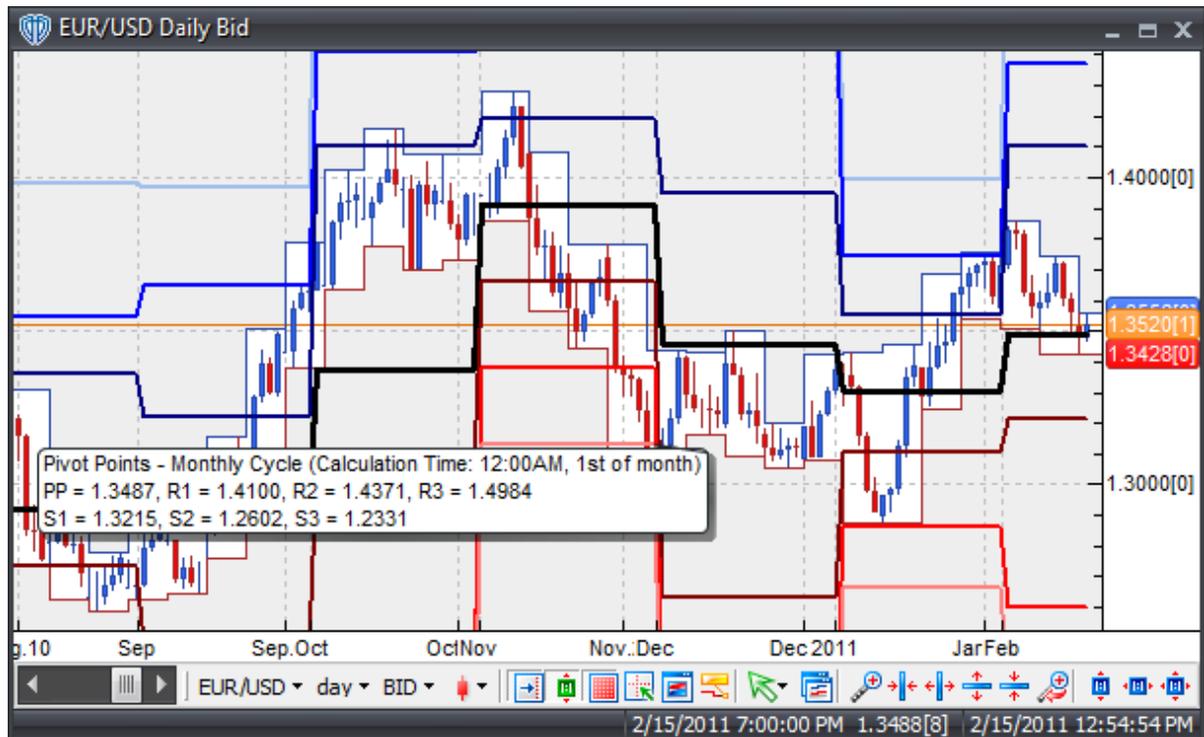
Resistance 3 = (Pivot Point - Support 2) + Resistance 2
Support 3 = Pivot Point - (Resistance 2 - Support 2)

VT Trader also includes support and resistance mid-levels that are calculated as follows:

Resistance Mid-Level 1 = (Pivot Point + Resistance 1) / 2
Support Mid-Level 1 = (Pivot Point + Support 1) / 2

Resistance Mid-Level 2 = (Resistance 1 + Resistance 2) / 2
Support Mid-Level 2 = (Support 1 + Support 2) / 2

Resistance Mid-Level 3 = (Resistance 2 + Resistance 3) / 2
Support Mid-Level 3 = (Support 2 + Support 3) / 2



Interpretation

Pivot point levels can be used in many different ways. Here are a few of the most common methods for utilizing them.

Trend Direction Determined by Pivot Point: Combined with other technical analysis techniques such as overbought/oversold oscillators, volatility measurements, etc., the central pivot point may be useful in determining the general trending direction of the market. Trades are only taken in the direction of the trend. Buy trades occur only when the price is above the central pivot point and sell trades occur only when the price is below the central pivot point.

Price Breakouts: When trading price breakouts, a buy signal occurs when the price breaks up through the central pivot point or one of the resistance levels (*typically Resistance 1*). A sell signal occurs when price breaks down through the central pivot point or one of the support levels (*typically Support 1*).

Price Reversals: When trading price reversals, a buy signal occurs when the price moves towards a support level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction. A sell signal occurs when the price moves towards a resistance level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction.

Stop loss and/or Limit Profit Values Determined by Support/Resistance Levels: The central pivot point and its support and resistance levels may be potentially helpful in determining suitable stop loss and/or limit profit placements. For example, if trading a long breakout above the Resistance 1 level it may be reasonable to position a stop loss order just below the central pivot point and one or more limit profit(s) orders at the Resistance 2 and/or Resistance 3 levels.

Implementation

This Pivot Points indicator calculates the pivot points using a monthly cycle that resets at 12:00 AM on the first day of each month.

Please Note: This indicator will not function properly on any chart interval lower than the 30-Minute chart interval. It is not possible for VT Trader to load enough data into those lower chart intervals for the indicator to properly calculate the pivot points. This indicator will also not function properly on a Monthly chart interval. The calculations performed are not designed (*nor can they be reprogrammed*) to function in the *Monthly* chart interval.

If the pivot points are not shown in the chart window once the indicator is attached, you may need to increase the number of bars that VT Trader loads into its charts. As minimum amounts, VT Trader should load 5,000+ bars into its charts if you intend to attach this Pivot Points indicator to any *30-Minute* or higher interval charts.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

Name: Pivot Points - Monthly Cycle

Function Name Alias: vt_PPIMonthly
Label Mask:
Pivot Points - Monthly Cycle (Calculation Time: 12:00AM, 1st of month)
PP = %PivotPoint%, R1 = %Resistance1%, R2 = %Resistance2%, R3 = %Resistance3%
S1 = %Support1%, S2 = %Support2%, S3 = %Support3%
Placement: Price Frame
Data Inspection Alias: Pivot Points - Monthly Cycle

3. In the **Input Variable(s) tab**, create the following variables:

[New] button...
Name: ShowMidLevels
Display Name: Show Mid-Levels?
Type: Enumeration
Default: click [...] button, **[New]** button, then create the following entries:
No
Yes
... then, click **[OK]** button
Default: No

4. In the **Output Variable(s) tab**, create the following variables:

[New] button...
Var Name: Resistance3
Name: (R3)
Line Color: light blue
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: ResistanceMidLevel3
Name: (R3 ML)
Line Color: light blue
Line Width: thin
Line Type: dashed

[New] button...
Var Name: Resistance2
Name: (R2)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: ResistanceMidLevel2
Name: (R2 ML)
Line Color: blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Resistancel
Name: (R1)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: ResistanceMidLevel1
Name: (R1 ML)
Line Color: dark blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: PivotPoint
Name: (Pivot Point)
Line Color: black
Line Width: very thick
Line Type: solid

[New] button...

Var Name: SupportMidLevel1
Name: (S1 ML)
Line Color: dark red
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Support1
Name: (S1)
Line Color: dark red
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: SupportMidLevel2
Name: (S2 ML)
Line Color: red
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Support2
Name: (S2)
Line Color: red
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: SupportMidLevel3
Name: (S3 ML)
Line Color: light red

Line Width: thin
Line Type: dashed

[New] button...

Var Name: Support3
Name: (S3)
Line Color: light red
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line tab**, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula tab**, copy and paste the following formula:

```

_Hour:= Hour();
_Minute:= Minute();

CalculationTime:= Cross(Month()<>ref(Month,-1),0.5);

CalculateLookBackPeriods:= Barssince(CalculationTime=1);
LookBackPeriods:= valuewhen(1, Cross(0.5,CalculateLookBackperiods), ref
(CalculateLookBackPeriods,-1));

_H:= valuewhen(1,CalculationTime=1,ref(HHV(H,LookBackPeriods),-1));
_L:= valuewhen(1,CalculationTime=1,ref(LLV(L,LookBackPeriods),-1));
_C:= valuewhen(1,CalculationTime=1,C);

PivotPoint:= (_H+_L+_C)/3;

Resistance1:= 2 * PivotPoint - _L;
Resistance2:= PivotPoint + (_H-_L);
Resistance3:= 2 * PivotPoint + (_H-2*_L);

Support1:= 2 * PivotPoint - _H;
Support2:= PivotPoint - (_H-_L);
Support3:= 2 * PivotPoint - (2*_H-_L);

ResistanceMidLevel1:= if(ShowMidLevels=1, (PivotPoint+Resistance1)/2,
null);
ResistanceMidLevel2:= if(ShowMidLevels=1, (Resistance1+Resistance2)/2,
null);
ResistanceMidLevel3:= if(ShowMidLevels=1, (Resistance2+Resistance3)/2,
null);

SupportMidLevel1:= if(ShowMidLevels=1, (PivotPoint+Support1)/2, null);
SupportMidLevel2:= if(ShowMidLevels=1, (Support1+Support2)/2, null);
SupportMidLevel3:= if(ShowMidLevels=1, (Support2+Support3)/2, null);

```

7. Click the "Save" icon to finish building the Pivot Points - Monthly Cycle indicator.

6.79 Pivot Points - Monthly Cycle - Fibonacci Ratios

Overview

Pivot points consist of a central pivot level surrounded by three support levels below it and three resistance levels above it. This pivot points indicator replaces the traditional formulas used to calculate the support and resistance levels with Fibonacci-based formulas. Pivot points (*calculated using the traditional formulas*) were originally used by floor traders on equity and futures exchanges because they provided a quick way for those traders to get a general idea of how the market was moving during the course of the day using only a few simple calculations. However, over time pivot points have also proved exceptionally useful in other markets as well.

One of the reasons that pivot points are now so popular is because they are considered a "leading" (*or predictive*) indicator rather than a lagging indicator. All that is required to calculate the pivot points for the upcoming (*current*) trading month is the previous month's high, low, and close prices.

The monthly cycle pivot points in this indicator are calculated according to the following formulas:

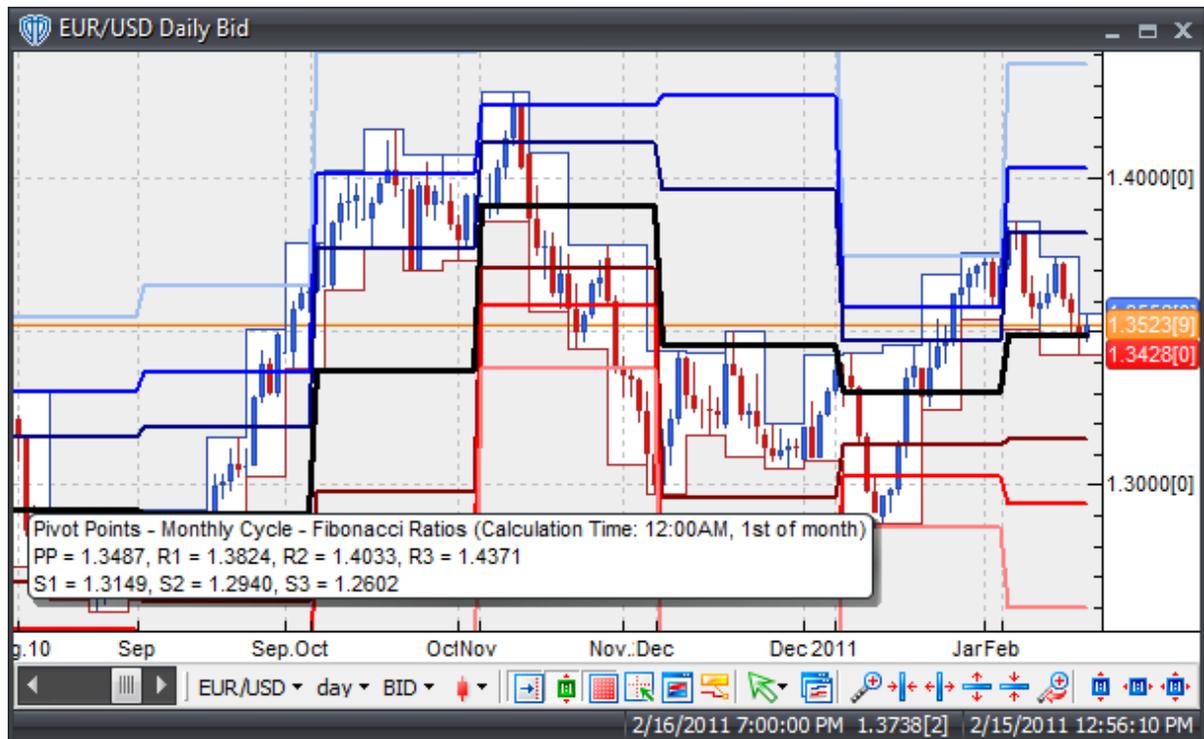
Pivot Point for Current Monthly Cycle = (High(Previous Monthly Cycle) + Low(Previous Monthly Cycle) + Close(Previous Monthly Cycle)) / 3

With the central pivot point level already calculated, the support and resistance levels are determined by calculating the previous cycle's high/low price range along with several Fibonacci-based percentages of that price range and then adding those % values to (*for resistance levels*) or subtracting those % values from (*for support levels*) the central pivot point. The support levels' and resistance levels' formulas are as follows:

Resistance 1 = Pivot Point + ((High(Previous Monthly Cycle) - Low(Previous Monthly Cycle)) * 0.382)
Support 1 = Pivot Point - ((High(Previous Monthly Cycle) - Low(Previous Monthly Cycle)) * 0.382)

Resistance 2 = Pivot Point + ((High(Previous Monthly Cycle) - Low(Previous Monthly Cycle)) * 0.618)
Support 2 = Pivot Point - ((High(Previous Monthly Cycle) - Low(Previous Monthly Cycle)) * 0.618)

Resistance 3 = Pivot Point + ((High(Previous Monthly Cycle) - Low(Previous Monthly Cycle)) * 1.000)
Support 3 = Pivot Point - ((High(Previous Monthly Cycle) - Low(Previous Monthly Cycle)) * 1.000)



Interpretation

Pivot point levels can be used in many different ways. Here are a few of the most common methods for utilizing them.

Trend Direction Determined by Pivot Point: Combined with other technical analysis techniques such as overbought/oversold oscillators, volatility measurements, etc., the central pivot point may be useful in determining the general trending direction of the market. Trades are only taken in the direction of the trend. Buy trades occur only when the price is above the central pivot point and sell trades occur only when the price is below the central pivot point.

Price Breakouts: When trading price breakouts, a buy signal occurs when the price breaks up through the central pivot point or one of the resistance levels (*typically Resistance 1*). A sell signal occurs when price breaks down through the central pivot point or one of the support levels (*typically Support 1*).

Price Reversals: When trading price reversals, a buy signal occurs when the price moves towards a support level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction. A sell signal occurs when the price moves towards a resistance level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction.

Stop loss and/or Limit Profit Values Determined by Support/Resistance Levels: The central pivot point and its support and resistance levels may be potentially helpful in determining suitable stop loss and/or limit profit placements. For example, if trading a long breakout above the Resistance 1 level it may be reasonable to position a stop loss order just below the central pivot point and one or more limit profit(s) orders at the Resistance 2 and/or Resistance 3 levels.

Implementation

This Pivot Points indicator calculates the pivot points using a monthly cycle that resets at 12:00 AM on the first day of each month.

Please Note: This indicator will not function properly on any chart interval lower than the 30-Minute chart interval. It is not possible for VT Trader to load enough data into those lower chart intervals for the indicator to properly calculate the pivot points. This indicator will also not function properly on a Monthly chart interval. The calculations performed are not designed (*nor can they be reprogrammed*) to function in the *Monthly* chart interval.

If the pivot points are not shown in the chart window once the indicator is attached, you may need to increase the number of bars that VT Trader loads into its charts. As minimum amounts, VT Trader should load 5,000+ bars into its charts if you intend to attach this Pivot Points indicator to any *30-Minute* or higher interval charts.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Pivot Points - Monthly Cycle - Fibonacci Ratios
Function Name Alias: vt_PPIMonthlyFibs
Label Mask:
    Pivot Points - Monthly Cycle - Fibonacci Ratios (Calculation Time:
    12:00AM, 1st of month)
    PP = %PivotPoint%, R1 = %Resistance1%, R2 = %Resistance2%, R3 = %
    Resistance3%
    S1 = %Support1%, S2 = %Support2%, S3 = %Support3%
Placement: Price Frame
Data Inspection Alias: Pivot Points - Monthly Cycle - Fibonacci
```

3. In the **Input Variable(s)** tab, create the following variables:

```
This indicator requires no input variables.
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: Resistance3
Name: (R3)
Line Color: light blue
Line Width: slightly thicker
Line Type: solid
```

```
[New] button...
Var Name: Resistance2
```

Name: (R2)
 Line Color: blue
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: Resistancel
 Name: (R1)
 Line Color: dark blue
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: PivotPoint
 Name: (Pivot Point)
 Line Color: black
 Line Width: very thick
 Line Type: solid

[New] button...

Var Name: Support1
 Name: (S1)
 Line Color: dark red
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: Support2
 Name: (S2)
 Line Color: red
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: Support3
 Name: (S3)
 Line Color: light red
 Line Width: slightly thicker
 Line Type: solid

5. In the **Horizontal Line tab**, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula tab**, copy and paste the following formula:

```
_Hour:= Hour();
_Minute:= Minute();

CalculationTime:= Cross(Month(<>ref(Month,-1),0.5);

CalculateLookBackPeriods:= Barssince(CalculationTime=1);
LookBackPeriods:= valuewhen(1, Cross(0.5,CalculateLookBackperiods), ref
```

```

(CalculateLookBackPeriods,-1));

_H:= valuewhen(1,CalculationTime=1,ref(HHV(H,LookBackPeriods),-1));
_L:= valuewhen(1,CalculationTime=1,ref(LLV(L,LookBackPeriods),-1));
_C:= valuewhen(1,CalculationTime=1,C);

PivotPoint:= (_H+_L+_C)/3;

Resistance1:= PivotPoint + ((_H-_L) * 0.382);
Resistance2:= PivotPoint + ((_H-_L) * 0.618);
Resistance3:= PivotPoint + ((_H-_L) * 1.000);

Support1:= PivotPoint - ((_H-_L) * 0.382);
Support2:= PivotPoint - ((_H-_L) * 0.618);
Support3:= PivotPoint - ((_H-_L) * 1.000);

```

7. Click the "Save" icon to finish building the Pivot Points - Monthly Cycle - Fibonacci Ratios indicator.

6.80 Pivot Points - Weekly Cycle

Overview

Pivot points consist of a central pivot level surrounded by three support levels below it and three resistance levels above it. Pivot points were originally used by floor traders on equity and futures exchanges because they provided a quick way for those traders to get a general idea of how the market was moving during the course of the day using only a few simple calculations. However, over time pivot points have also proved exceptionally useful in other markets as well.

One of the reasons that pivot points are now so popular is because they are considered a "leading" (or *predictive*) indicator rather than a lagging indicator. All that is required to calculate the pivot points for the upcoming (*current*) trading week is the previous week's high, low, and close prices. For 24-hour markets like Forex, each broker determines when the trading week closes for their clients; however, Friday at 4:00PM ET or 5:00PM ET is common as a weekly closing day/time. 12:00AM ET on Monday is also a common weekly closing day/time.

The weekly cycle pivot points in this indicator are calculated according to the following formulas:

Pivot Point for Current Weekly Cycle = (High(Previous Weekly Cycle) + Low(Previous Weekly Cycle) + Close(Previous Weekly Cycle)) / 3

The central pivot point can then be used to calculate the support and resistance levels as follows:

Resistance 1 = (2 * Pivot Point) - Low(Previous Weekly Cycle)

Support 1 = (2 * Pivot Point) - High(Previous Weekly Cycle)

Resistance 2 = (Pivot Point - Support 1) + Resistance 1

Support 2 = Pivot Point - (Resistance 1 - Support 1)

Resistance 3 = (Pivot Point - Support 2) + Resistance 2
 Support 3 = Pivot Point - (Resistance 2 - Support 2)

VT Trader also includes support and resistance mid-levels that are calculated as follows:

Resistance Mid-Level 1 = (Pivot Point + Resistance 1) / 2
 Support Mid-Level 1 = (Pivot Point + Support 1) / 2

Resistance Mid-Level 2 = (Resistance 1 + Resistance 2) / 2
 Support Mid-Level 2 = (Support 1 + Support 2) / 2

Resistance Mid-Level 3 = (Resistance 2 + Resistance 3) / 2
 Support Mid-Level 3 = (Support 2 + Support 3) / 2



Interpretation

Pivot point levels can be used in many different ways. Here are a few of the most common methods for utilizing them.

Trend Direction Determined by Pivot Point: Combined with other technical analysis techniques such as overbought/oversold oscillators, volatility measurements, etc., the central pivot point may be useful in determining the general trending direction of the market. Trades are only taken in the direction of the trend. Buy trades occur only when the price is above the central pivot point and sell trades occur only when the price is below the central pivot point.

Price Breakouts: When trading price breakouts, a buy signal occurs when the price breaks up through

the central pivot point or one of the resistance levels (*typically Resistance 1*). A sell signal occurs when price breaks down through the central pivot point or one of the support levels (*typically Support 1*).

Price Reversals: When trading price reversals, a buy signal occurs when the price moves towards a support level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction. A sell signal occurs when the price moves towards a resistance level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction.

Stop loss and/or Limit Profit Values Determined by Support/Resistance Levels: The central pivot point and its support and resistance levels may be potentially helpful in determining suitable stop loss and/or limit profit placements. For example, if trading a long breakout above the Resistance 1 level it may be reasonable to position a stop loss order just below the central pivot point and one or more limit profit(s) orders at the Resistance 2 and/or Resistance 3 levels.

Implementation

This Pivot Points indicator calculates the pivot points using a weekly cycle that resets at the specified predetermined day of the week and time of that day. The *Calculation Time (Hour/Minute)* is defined using a 24-hour clock (*AM/PM is not used*). For example, setting the *Calculation Hour* equal to 9 and the *Calculation Minute* to 00 recalculates the pivot points each day at 9:00 AM while setting the *Calculation Hour* equal to 17 and the *Calculation Minute* to 30 recalculates the pivot points on the specified day at 5:30PM.

Please Note: This indicator will not function properly on the following chart intervals: *Tick*, *1-Minute*, *Weekly*, or *Monthly*. It is not possible for VT Trader to load enough data into a *Tick* or *1-Minute* chart interval for the indicator to properly calculate the pivot points and the calculations performed are not designed (*nor can they be reprogrammed*) to function in the *Weekly* or *Monthly* chart intervals.

If the pivot points are not shown in the chart window once the indicator is attached, you may need to increase the number of bars that VT Trader loads into its charts. As minimum amounts, VT Trader should load 3,500+ bars into its charts if you intend to attach this Pivot Points indicator to any *5-Minute* interval charts or 2,000+ bars if you intend to attach it to any *10-Minute* or higher interval charts.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Pivot Points - Weekly Cycle
Function Name Alias: vt_PPIWeekly
Label Mask:
    Pivot Points - Weekly Cycle (Calculation Time: %CalculationDay%, %
    CalculationHour%:%CalculationMinute%)
    PP = %PivotPoint%, R1 = %Resistance1%, R2 = %Resistance2%, R3 = %
    Resistance3%
    S1 = %Support1%, S2 = %Support2%, S3 = %Support3%
```

Placement: Price Frame
Data Inspection Alias: Pivot Points - Weekly Cycle

3. In the **Input Variable(s) tab**, create the following variables:

[New] button...

Name: CalculationDay
Display Name: Calculation Day
Type: Enumeration
Default: click [...] button, **[New]** button, then create the following entries:
 Sunday
 Monday
 Tuesday
 Wednesday
 Thursday
 Friday
... then, click **[OK]** button
Default: Monday

[New] button...

Name: CalculationHour
Display Name: Calculation Hour
Type: integer
Default: 0

[New] button...

Name: CalculationMinute
Display Name: Calculation Minute
Type: integer
Default: 0

[New] button...

Name: ShowMidLevels
Display Name: Show Mid-Levels?
Type: Enumeration
Default: click [...] button, **[New]** button, then create the following entries:
 No
 Yes
... then, click **[OK]** button
Default: No

4. In the **Output Variable(s) tab**, create the following variables:

[New] button...

Var Name: Resistance3
Name: (R3)
Line Color: light blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: ResistanceMidLevel3
Name: (R3 ML)
Line Color: light blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Resistance2
Name: (R2)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: ResistanceMidLevel2
Name: (R2 ML)
Line Color: blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Resistancel
Name: (R1)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: ResistanceMidLevel1
Name: (R1 ML)
Line Color: dark blue
Line Width: thin
Line Type: dashed

[New] button...

Var Name: PivotPoint
Name: (Pivot Point)
Line Color: black
Line Width: very thick
Line Type: solid

[New] button...

Var Name: SupportMidLevel1
Name: (S1 ML)
Line Color: dark red
Line Width: thin
Line Type: dashed

[New] button...

Var Name: Support1
Name: (S1)
Line Color: dark red
Line Width: slightly thicker

Line Type: solid

[New] button...

Var Name: SupportMidLevel2
 Name: (S2 ML)
 Line Color: red
 Line Width: thin
 Line Type: dashed

[New] button...

Var Name: Support2
 Name: (S2)
 Line Color: red
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: SupportMidLevel3
 Name: (S3 ML)
 Line Color: light red
 Line Width: thin
 Line Type: dashed

[New] button...

Var Name: Support3
 Name: (S3)
 Line Color: light red
 Line Width: slightly thicker
 Line Type: solid

5. In the **Horizontal Line tab**, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula tab**, copy and paste the following formula:

```
_DayOfWeek:= DayOfWeek();
_Hour:= Hour();
_Minute:= Minute();

CalculationTime:= Cross((_DayOfWeek=CalculationDay AND
_Hour>=CalculationHour AND _Minute>=CalculationMinute),0.5);

CalculateLookBackPeriods:= Barssince(CalculationTime=1);
LookBackPeriods:= valuewhen(1, Cross(0.5,CalculateLookBackperiods), ref
(CalculateLookBackPeriods,-1));

_H:= valuewhen(1,CalculationTime=1,ref(HHV(H,LookBackPeriods),-1));
_L:= valuewhen(1,CalculationTime=1,ref(LLV(L,LookBackPeriods),-1));
_C:= valuewhen(1,CalculationTime=1,C);

PivotPoint:= (_H+_L+_C)/3;
```

```

Resistance1:= 2 * PivotPoint - _L;
Resistance2:= PivotPoint + (_H-_L);
Resistance3:= 2 * PivotPoint + (_H-2*_L);

Support1:= 2 * PivotPoint - _H;
Support2:= PivotPoint - (_H-_L);
Support3:= 2 * PivotPoint - (2*_H-_L);

ResistanceMidLevel1:= if(ShowMidLevels=1, (PivotPoint+Resistance1)/2,
null);
ResistanceMidLevel2:= if(ShowMidLevels=1, (Resistance1+Resistance2)/2,
null);
ResistanceMidLevel3:= if(ShowMidLevels=1, (Resistance2+Resistance3)/2,
null);

SupportMidLevel1:= if(ShowMidLevels=1, (PivotPoint+Support1)/2, null);
SupportMidLevel2:= if(ShowMidLevels=1, (Support1+Support2)/2, null);
SupportMidLevel3:= if(ShowMidLevels=1, (Support2+Support3)/2, null);

```

7. Click the "Save" icon to finish building the Pivot Points - Weekly Cycle indicator.

6.81 Pivot Points - Weekly Cycle - Fibonacci Ratios

Overview

Pivot points consist of a central pivot level surrounded by three support levels below it and three resistance levels above it. Pivot points were originally used by floor traders on equity and futures exchanges because they provided a quick way for those traders to get a general idea of how the market was moving during the course of the day using only a few simple calculations. However, over time pivot points have also proved exceptionally useful in other markets as well.

One of the reasons that pivot points are now so popular is because they are considered a "leading" (or *predictive*) indicator rather than a lagging indicator. All that is required to calculate the pivot points for the upcoming (*current*) trading week is the previous week's high, low, and close prices. For 24-hour markets like Forex, each broker determines when the trading week closes for their clients; however, Friday at 4:00PM ET or 5:00PM ET is common as a weekly closing day/time. 12:00AM ET on Monday is also a common weekly closing day/time.

The weekly cycle pivot points in this indicator are calculated according to the following formulas:

Pivot Point for Current Weekly Cycle = (High(Previous Weekly Cycle) + Low(Previous Weekly Cycle) + Close(Previous Weekly Cycle)) / 3

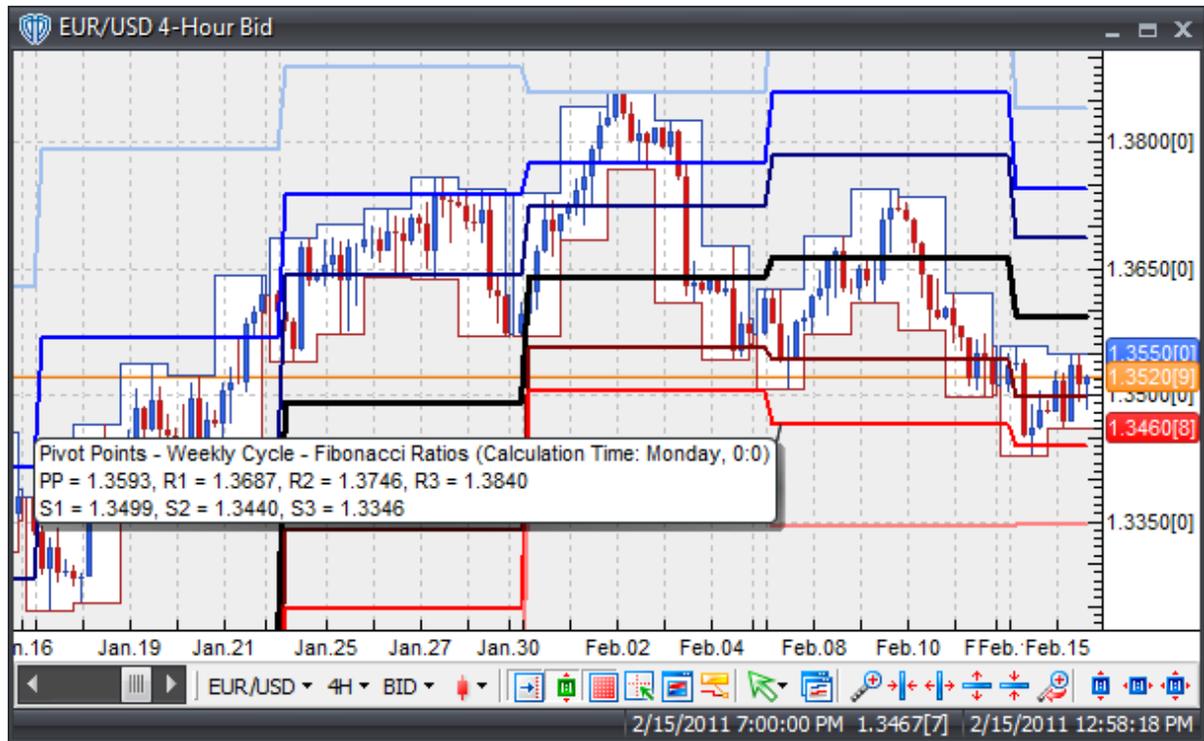
With the central pivot point level already calculated, the support and resistance levels are determined by calculating the previous cycle's high/low price range along with several Fibonacci-based percentages of that price range and then adding those % values to (*for resistance levels*) or subtracting those % values from (*for support levels*) the central pivot point. The support levels' and resistance levels' formulas are as

follows:

Resistance 1 = Pivot Point + ((High(Previous Weekly Cycle) - Low(Previous Weekly Cycle)) * 0.382)
 Support 1 = Pivot Point - ((High(Previous Weekly Cycle) - Low(Previous Weekly Cycle)) * 0.382)

Resistance 2 = Pivot Point + ((High(Previous Weekly Cycle) - Low(Previous Weekly Cycle)) * 0.618)
 Support 2 = Pivot Point - ((High(Previous Weekly Cycle) - Low(Previous Weekly Cycle)) * 0.618)

Resistance 3 = Pivot Point + ((High(Previous Weekly Cycle) - Low(Previous Weekly Cycle)) * 1.000)
 Support 3 = Pivot Point - ((High(Previous Weekly Cycle) - Low(Previous Weekly Cycle)) * 1.000)



Interpretation

Pivot point levels can be used in many different ways. Here are a few of the most common methods for utilizing them.

Trend Direction Determined by Pivot Point: Combined with other technical analysis techniques such as overbought/oversold oscillators, volatility measurements, etc., the central pivot point may be useful in determining the general trending direction of the market. Trades are only taken in the direction of the trend. Buy trades occur only when the price is above the central pivot point and sell trades occur only when the price is below the central pivot point.

Price Breakouts: When trading price breakouts, a buy signal occurs when the price breaks up through the central pivot point or one of the resistance levels (*typically Resistance 1*). A sell signal occurs when price breaks down through the central pivot point or one of the support levels (*typically Support 1*).

Price Reversals: When trading price reversals, a buy signal occurs when the price moves towards a

support level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction. A sell signal occurs when the price moves towards a resistance level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction.

Stop loss and/or Limit Profit Values Determined by Support/Resistance Levels: The central pivot point and its support and resistance levels may be potentially helpful in determining suitable stop loss and/or limit profit placements. For example, if trading a long breakout above the Resistance 1 level it may be reasonable to position a stop loss order just below the central pivot point and one or more limit profit(s) orders at the Resistance 2 and/or Resistance 3 levels.

Implementation

This Pivot Points indicator calculates the pivot points using a weekly cycle that resets at the specified predetermined day of the week and time of that day. The *Calculation Time (Hour/Minute)* is defined using a 24-hour clock (*AM/PM is not used*). For example, setting the *Calculation Hour* equal to 9 and the *Calculation Minute* to 00 recalculates the pivot points each day at 9:00 AM while setting the *Calculation Hour* equal to 17 and the *Calculation Minute* to 30 recalculates the pivot points on the specified day at 5:30PM.

Please Note: This indicator will not function properly on the following chart intervals: *Tick*, *1-Minute*, *Weekly*, or *Monthly*. It is not possible for VT Trader to load enough data into a *Tick* or *1-Minute* chart interval for the indicator to properly calculate the pivot points and the calculations performed are not designed (*nor can they be reprogrammed*) to function in the *Weekly* or *Monthly* chart intervals.

If the pivot points are not shown in the chart window once the indicator is attached, you may need to increase the number of bars that VT Trader loads into its charts. As minimum amounts, VT Trader should load 3,500+ bars into its charts if you intend to attach this Pivot Points indicator to any *5-Minute* interval charts or 2,000+ bars if you intend to attach it to any *10-Minute* or higher interval charts.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Pivot Points - Weekly Cycle - Fibonacci Ratios
Function Name Alias: vt_PPIWeeklyFibs
Label Mask:
    Pivot Points - Weekly Cycle - Fibonacci Ratios (Calculation Time: %
    CalculationDay%, %CalculationHour%:%CalculationMinute%)
    PP = %PivotPoint%, R1 = %Resistance1%, R2 = %Resistance2%, R3 = %
    Resistance3%
    S1 = %Support1%, S2 = %Support2%, S3 = %Support3%
Placement: Price Frame
Data Inspection Alias: Pivot Points - Weekly Cycle - Fibonacci
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: CalculationDay

Display Name: Calculation Day

Type: Enumeration

Default: click [...] button, **[New]** button, then create the following entries:

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

... then, click **[OK]** button

Default: Monday

[New] button...

Name: CalculationHour

Display Name: Calculation Hour

Type: integer

Default: 0

[New] button...

Name: CalculationMinute

Display Name: Calculation Minute

Type: integer

Default: 0

4. In the Output Variable(s) tab, create the following variables:**[New] button...**

Var Name: Resistance3

Name: (R3)

Line Color: light blue

Line Width: slightly thicker

Line Type: solid

[New] button...

Var Name: Resistance2

Name: (R2)

Line Color: blue

Line Width: slightly thicker

Line Type: solid

[New] button...

Var Name: Resistancel

Name: (R1)

Line Color: dark blue

Line Width: slightly thicker

Line Type: solid

[New] button...

Var Name: PivotPoint

Name: (Pivot Point)
 Line Color: black
 Line Width: very thick
 Line Type: solid

[New] button...

Var Name: Support1
 Name: (S1)
 Line Color: dark red
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: Support2
 Name: (S2)
 Line Color: red
 Line Width: slightly thicker
 Line Type: solid

[New] button...

Var Name: Support3
 Name: (S3)
 Line Color: light red
 Line Width: slightly thicker
 Line Type: solid

5. In the **Horizontal Line tab**, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula tab**, copy and paste the following formula:

```
_DayOfWeek:= DayOfWeek();
_Hour:= Hour();
_Minute:= Minute();

CalculationTime:= Cross((_DayOfWeek=CalculationDay AND
_Hour>=CalculationHour AND _Minute>=CalculationMinute),0.5);

CalculateLookBackPeriods:= Barssince(CalculationTime=1);
LookBackPeriods:= valuewhen(1, Cross(0.5,CalculateLookBackperiods), ref
(CalculateLookBackPeriods,-1));

_H:= valuewhen(1,CalculationTime=1,ref(HHV(H,LookBackPeriods),-1));
_L:= valuewhen(1,CalculationTime=1,ref(LLV(L,LookBackPeriods),-1));
_C:= valuewhen(1,CalculationTime=1,C);

PivotPoint:= (_H+_L+_C)/3;

Resistance1:= PivotPoint + ((_H-_L) * 0.382);
Resistance2:= PivotPoint + ((_H-_L) * 0.618);
Resistance3:= PivotPoint + ((_H-_L) * 1.000);
```

```
Support1:= PivotPoint - ((_H-_L) * 0.382);
Support2:= PivotPoint - ((_H-_L) * 0.618);
Support3:= PivotPoint - ((_H-_L) * 1.000);
```

- Click the "Save" icon to finish building the Pivot Points - Weekly Cycle - Fibonacci Ratios indicator.

6.82 Polarized Fractal Efficiency

Overview

The Polarized Fractal Efficiency indicator (PFE) was developed by Hans Hannula. It was introduced in the January 1994 issue of Technical Analysis of Stocks and Commodities magazine. The PFE is used to gauge how trendy or congested price action is.



Interpretation

PFE readings above zero mean that the trend is up; the higher the value the more efficient (trendy) the upward movement is. PFE readings below zero mean that the trend is down; the lower the value the more efficient (trendy) the downward movement is. Readings around zero indicate choppy, less efficient movement.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Polarized Fractal Efficiency
Function Name Alias: vt_PFE
Label Mask: Polarized Fractal Efficiency (%pr%,%length%,%smooth%) = %
_pfe%
Placement: New Frame
Data Inspection Alias: Polarized Fractal Efficiency
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: length
Display Name: Periods
Type: integer
Default: 10
```

[New] button...

```
Name: smooth
Display Name: Smoothing Periods
Type: integer
Default: 5
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: _pfe
Name: (PFE)
Line Color: dark blue
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
_pfe:= Mov(If(pr>Ref(pr,-length),sqrt(Power(Roc(pr,length,Points),2) +
Power(10,2)) /
Sum(Sqrt(Power(Roc(pr,1,Points),2)+1),length),-
Sqrt(Power(Roc(pr,length,Points),2) + Power(10,2)) /
Sum(Sqrt(Power(Roc(pr,1,Points),2)+1),length))*100,smooth,E);
```

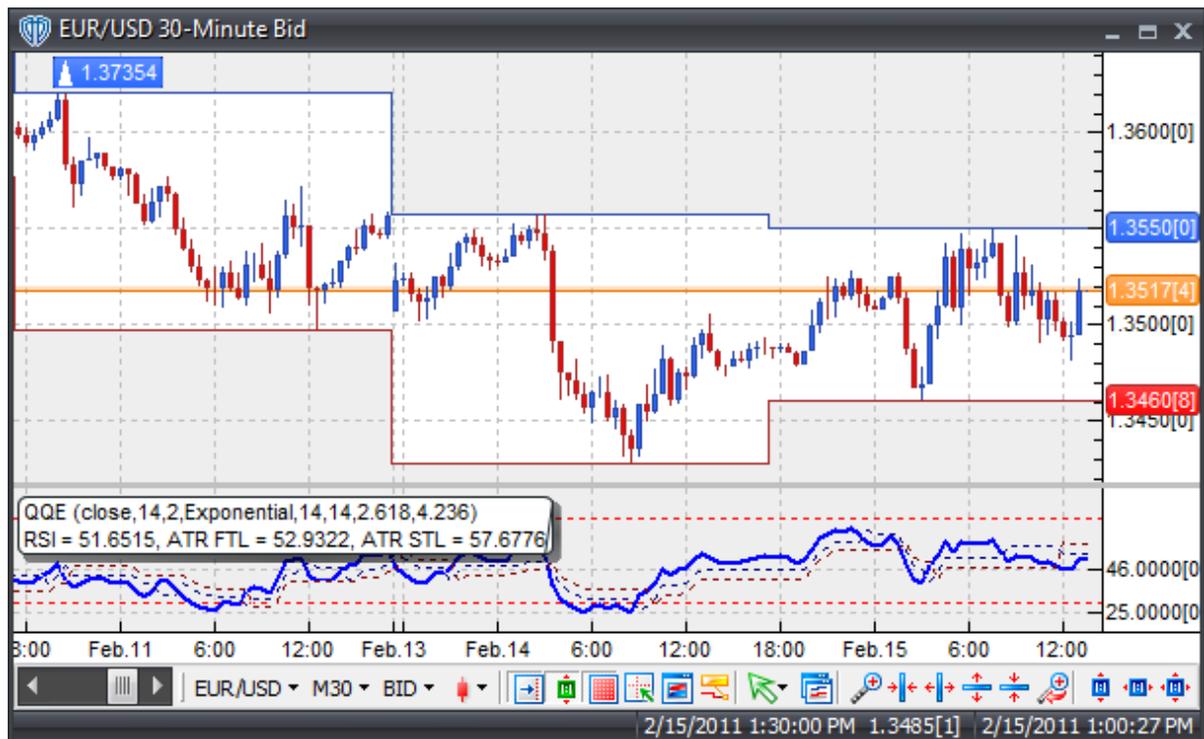
7. Click the "Save" icon to finish building the Polarized Fractal Efficiency indicator.

6.83 Quantitative Qualitative Estimation

Overview

The origin of the Quantitative Qualitative Estimation (QQE) indicator is currently unknown.

The QQE indicator consists of a smoothed Relative Strength Index (RSI) indicator and two volatility-based trailing levels (fast and slow). The Fast Trailing Level (TL) and Slow TL are constructed by calculating the ATR of the smoothed RSI over n-periods and then further smoothing the ATR using an additional n-periods Wilders smoothing function. This smoothed ATR of RSI is then multiplied by the Fast and Slow ATR Multipliers to calculate the final Fast and Slow Trailing Levels.



Interpretation

There are several different methods in which the QQE can be used to generate trading signals. Here are few of the more common techniques:

Crossovers: 1) RSI / Fast ATR TL or Slow ATR TL Crossover: A buy signal occurs when the RSI crosses above the Fast ATR TL or Slow ATR TL and a sell signal occurs when RSI crosses below the Fast ATR TL or Slow ATR TL. 2) RSI / 50-level Crossover: When the RSI crosses above 50 a buy signal is given. Alternatively, when the RSI crosses below 50 a sell signal is given. 3) Fast ATR TL / Slow ATR TL Crossover: A buy signal occurs when the Fast ATR TL crosses above the Slow ATR TL and a sell signal occurs when Fast ATR TL crosses below the Slow ATR TL.

Divergence: Looking for divergences between the QQE indicator and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the QQE; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the QQE.

Overbought/Oversold Conditions: Much like the original RSI (and other oscillators), the QQE indicator can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the QQE being greater than or equal to the 70% level while an oversold condition is generally described as the QQE being less than or equal to the 30% level. Trades can be generated when any of the QQE outputs (RSI, Fast ATR TL or Slow ATR TL) crosses these levels. When the RSI, Fast ATR TL or Slow ATR TL crosses above 30 a buy signal is given. Alternatively, when the RSI, Fast ATR TL or Slow ATR TL crosses below 70 a sell signal is given.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Quantitative Qualitative Estimation
Function Name Alias: vt_QQE
Label Mask:
    QQE (%rsiprice%,%rsiperiods%,%SF%,%ST%,%atrperiods%,%atrsmperiods%,%
    fastatrmult%,%slowatrmult%)
    RSI = %RSIndex%, ATR FTL = %FastAtrRsiTL%, ATR STL = %SlowAtrRsiTL%
Placement: New Frame
Data Inspection Alias: QQE
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: rsiprice
Display Name: RSI Price
Type: price
Default: close
```

[New] button...

Name: rsiperiods
Display Name: RSI Periods
Type: integer
Default: 14

[New] button...

Name: SF
Display Name: RSI Smoothing Periods
Type: integer
Default: 2

[New] button...

Name: ST
Display Name: RSI Smoothing Type
Type: MA Type
Default: Exponential

[New] button...

Name: atrperiods
Display Name: ATR Periods
Type: integer
Default: 14

[New] button...

Name: atrsmperiods
Display Name: Wilders ATR Smoothing Periods
Type: integer
Default: 14

[New] button...

Name: fastatrmult
Display Name: Fast ATR TL Multiplier
Type: float
Default: 2.6180

[New] button...

Name: slowatrmult
Display Name: Slow ATR TL Multiplier
Type: float
Default: 4.2360

4. In the Output Variable(s) tab, create the following variables:**[New] button...**

Var Name: RSIndex
Name: (RSI)
Line Color: blue
Line Width: slightly thicker
Line Type: solid

[New] button...

Var Name: FastAtrRsiTL

Name: (ATR Fast TL)
 Line Color: dark blue
 Line Width: thin
 Line Type: dashed

[New] button...

Var Name: SlowAtrRsiTL
 Name: (ATR Slow TL)
 Line Color: dark red
 Line Width: thin
 Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +70.0000
 Color: red
 Width: thin
 Type: dashed

[New] button...

Value: +30.0000
 Color: red
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
{Smoothed RSI}

rsi_r:= (rsiprice - ref(rsiprice,-1));
rsi_rs:= Wilders(if(rsi_r>0,rsi_r,0),rsiperiods) / Wilders(if(rsi_r<0,
Abs(rsi_r),0),rsiperiods);
RSIndex:= Mov((100-(100/(1+rsi_rs))),SF,ST);

{Smoothed ATR of Smoothed RSI}

TH:= if(Ref(RSIndex,-1)>RSIndex,Ref(RSIndex,-1),RSIndex);
TL:= if(Ref(RSIndex,-1)<RSIndex,Ref(RSIndex,-1),RSIndex);
TR:= TH-TL;
AtrRsi:= Wilders(TR,atrperiods);
SmoothedAtrRsi:= Wilders(AtrRsi,atrsmperiods);

{Fast and Slow ATR Trailing Levels}

DeltaFastAtrRsi:= SmoothedAtrRsi*fastatrmult;

FastAtrRsiTL:= if(BarCount()<=(rsiperiods*2),null,
if(ref(RSIndex,-1)>PREV(0) AND RSIndex>PREV(0),max(PREV
(0),RSIndex-DeltaFastAtrRsi),
if(ref(RSIndex,-1)<PREV(0) AND RSIndex<PREV(0),min(PREV
(0),RSIndex+DeltaFastAtrRsi),
if(Cross(RSIndex,PREV(0)),RSIndex-DeltaFastAtrRsi,
```

```

if(Cross(PREV(0),RSIndex),RSIndex+DeltaFastAtrRsi,
if(RSIndex=PREV(0),PREV(0),PREV(0)))));

```

```
DeltaSlowAtrRsi:= SmoothedAtrRsi*slowatrmult;
```

```

SlowAtrRsiTL:= if(BarCount()<=(rsiperiods*2),null,
if(ref(RSIndex,-1)>PREV(0) AND RSIndex>PREV(0),max(PREV
(0),RSIndex-DeltaSlowAtrRsi),
if(ref(RSIndex,-1)<PREV(0) AND RSIndex<PREV(0),min(PREV
(0),RSIndex+DeltaSlowAtrRsi),
if(Cross(RSIndex,PREV(0)),RSIndex-DeltaSlowAtrRsi,
if(Cross(PREV(0),RSIndex),RSIndex+DeltaSlowAtrRsi,
if(RSIndex=PREV(0),PREV(0),PREV(0))))));

```

7. Click the "Save" icon to finish building the QQE indicator.

6.84 Rainbow Charts

Overview

The Rainbow Charts and Rainbow Oscillator indicators were created by Mel Widner, Ph.D. and originally introduced in the July 1997 issue of Technical Analysis of Stocks and Commodities magazine.

The Rainbow Charts indicator is trend-following indicator. The basis of the Rainbow Charts indicator is a 2-period simple moving average. Recursive smoothing is then applied to the original moving average thereby creating 9 additional moving averages; each new moving average is based on the previous moving average. Through this use of recursive smoothing a full spectrum of trends is created that, when plotted using continuous colors, have the appearance of a rainbow.

The Rainbow Oscillator is also a trend-following indicator that is based on the same calculations used to create the Rainbow Charts. The Rainbow Oscillator is derived from a consensus of the Rainbow Charts trends. It defines the highest high and lowest low of those moving averages to create an oscillator and bandwidth lines based on those calculations.



Interpretation

One simple interpretation of the Rainbow Charts indicator is:

When the market is rising and the trend is up, the least smoothed line is at the top of the Rainbow (the red line) and the most smoothed line is at the bottom of the Rainbow (the violet line). When the market is declining and the trend is down the order of the Rainbow is reversed; the most smoothed line is at the bottom and the least smoothed line is at the top.

As the underlying market price moves up or down, the moving averages follow and cross in sequence as the move continues. Price moves away from the Rainbow are seen as potential trend continuations leading to a greater Rainbow width, while price moves towards (or into) the Rainbow are seen as potential reversals leading to a contraction of the Rainbow width. The depth that price penetrates into the Rainbow can be used to judge the strength of the move.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Rainbow Charts
Function Name Alias: vt_RBCharts
Label Mask:
```

```
Rainbow Charts (%prc%,%periods%,%mat%,%recperiods%,%recmat%)  
Least Smooth MA = %MA%, Smoothest MA = %R9%  
Placement: Price Frame  
Data Inspection Alias: Rainbow Charts
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: prc  
Display Name: Price  
Type: price  
Default: close
```

[New] button...

```
Name: periods  
Display Name: Periods  
Type: integer  
Default: 2
```

[New] button...

```
Name: mat  
Display Name: MA Type  
Type: MA Type  
Default: Simple
```

[New] button...

```
Name: recperiods  
Display Name: Recursive Smoothing Periods  
Type: integer  
Default: 2
```

[New] button...

```
Name: recmat  
Display Name: Recursive Smoothing MA Type  
Type: MA Type  
Default: Simple
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: MA  
Name: (MA - Least Smooth)  
Line Color: red  
Line Width: thin  
Line Type: solid
```

[New] button...

```
Var Name: R1  
Name: (R1)  
Line Color: orange  
Line Width: thin  
Line Type: solid
```

[New] button...

Var Name: R2
Name: (R2)
Line Color: yellow
Line Width: thin
Line Type: solid

[New] button...

Var Name: R3
Name: (R3)
Line Color: light green
Line Width: thin
Line Type: solid

[New] button...

Var Name: R4
Name: (R4)
Line Color: green
Line Width: thin
Line Type: solid

[New] button...

Var Name: R5
Name: (R5)
Line Color: blue-green
Line Width: thin
Line Type: solid

[New] button...

Var Name: R6
Name: (R6)
Line Color: light blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: R7
Name: (R7)
Line Color: medium-light blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: R8
Name: (R8)
Line Color: blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: R9
Name: (R9 - Smoothest)
Line Color: purple

```
Line Width: thin  
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
This indicator requires no horizontal lines.
```

6. In the **Formula** tab, copy and paste the following formula:

```
MA:= Mov(prc,periods,mat);  
r1:= Mov(MA,recperiods,recmat);  
r2:= Mov(r1,recperiods,recmat);  
r3:= Mov(r2,recperiods,recmat);  
r4:= Mov(r3,recperiods,recmat);  
r5:= Mov(r4,recperiods,recmat);  
r6:= Mov(r5,recperiods,recmat);  
r7:= Mov(r6,recperiods,recmat);  
r8:= Mov(r7,recperiods,recmat);  
r9:= Mov(r8,recperiods,recmat);
```

7. Click the "Save" icon to finish building the Rainbow Charts indicator.

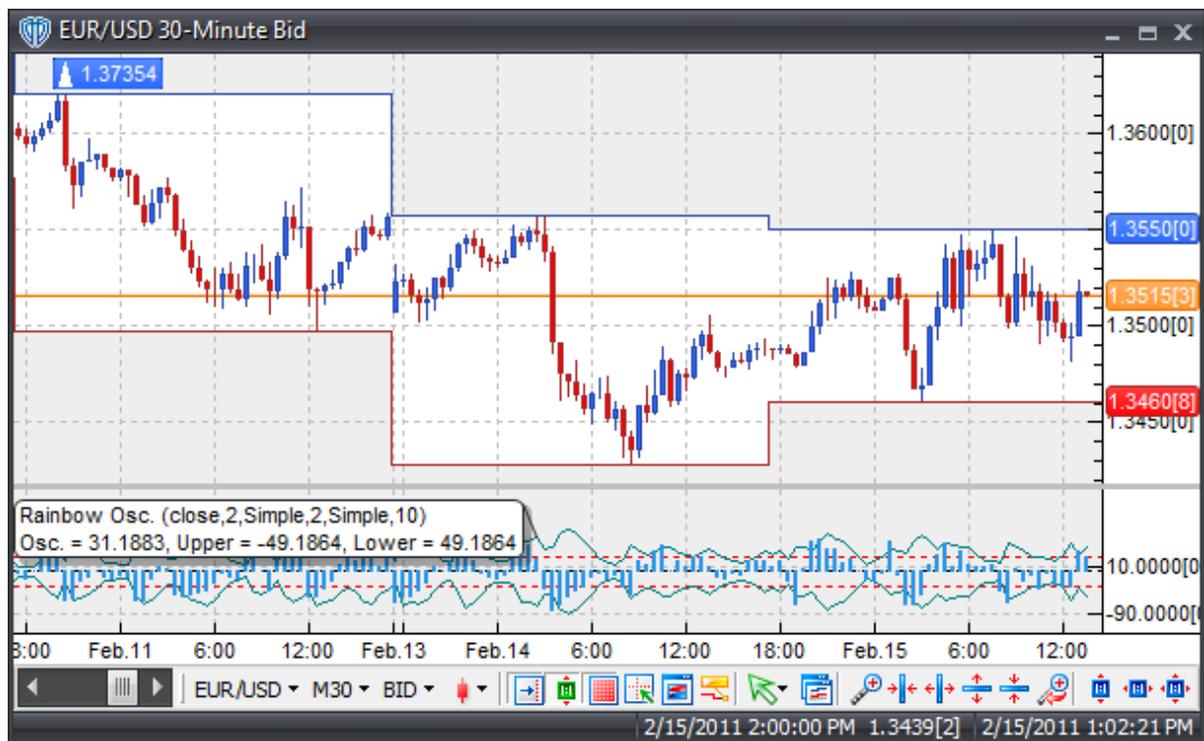
6.85 Rainbow Oscillator

Overview

The Rainbow Charts and Rainbow Oscillator indicators were created by Mel Widner, Ph.D. and originally introduced in the July 1997 issue of Stocks and Commodities magazine.

The Rainbow Charts indicator is trend-following indicator. The basis of the Rainbow Charts indicator is a 2-period simple moving average. Recursive smoothing is then applied to the original moving average thereby creating 9 additional moving averages; each new moving average is based on the previous moving average. Through this use of recursive smoothing a full spectrum of trends is created that, when plotted using continuous colors, have the appearance of a rainbow.

The Rainbow Oscillator is also a trend-following indicator that is based on the same calculations used to create the Rainbow Charts. The Rainbow Oscillator is derived from a consensus of the Rainbow Charts trends. It defines the highest high and lowest low of those moving averages to create an oscillator and bandwidth lines based on those calculations.



Interpretation

One simple interpretation of the Rainbow Charts indicator is:

When the market is rising and the trend is up, the least smoothed line is at the top of the Rainbow (the red line) and the most smoothed line is at the bottom of the Rainbow (the violet line). When the market is declining and the trend is down the order of the Rainbow is reversed; the most smoothed line is at the bottom and the least smoothed line is at the top.

As the underlying market price moves up or down, the moving averages follow and cross in sequence as the move continues. Price moves away from the Rainbow are seen as potential trend continuations leading to a greater Rainbow width, while price moves towards (or into) the Rainbow are seen as potential reversals leading to a contraction of the Rainbow width. The depth that price penetrates into the Rainbow can be used to judge the strength of the move.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Rainbow Oscillator
Function Name Alias: vt_RBoscillator
Label Mask:
```

```
Rainbow Osc. (%prc%,%periods%,%mat%,%recperiods%,%reemat%,%rbop%)  
Osc. = %RBOsc%, Upper = %RBUpperBand%, Lower = %RBLowerBand%  
Placement: New Frame  
Data Inspection Alias: Rainbow Oscillator
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: prc  
Display Name: Rainbow Charts Price  
Type: price  
Default: close
```

[New] button...

```
Name: periods  
Display Name: Rainbow Charts Periods  
Type: integer  
Default: 2
```

[New] button...

```
Name: mat  
Display Name: Rainbow Charts MA Type  
Type: MA Type  
Default: Simple
```

[New] button...

```
Name: recperiods  
Display Name: Rainbow Charts Recursive Smoothing Periods  
Type: integer  
Default: 3
```

[New] button...

```
Name: reemat  
Display Name: Rainbow Charts Recursive Smoothing MA Type  
Type: MA Type  
Default: Simple
```

[New] button...

```
Name: rbop  
Display Name: Rainbow Oscillator Periods  
Type: integer  
Default: 10
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: RBOsc  
Name: (RB Oscillator)  
Line Color: light blue  
Line Width: slightly thicker  
Line Type: histogram
```

[New] button...

```

Var Name: RBLowerBand
Name: (RB Lower Band)
Line Color: dark green
Line Width: thin
Line Type: solid

```

[New] button...

```

Var Name: RBUpperBand
Name: (RB Upper Band)
Line Color: dark green
Line Width: thin
Line Type: solid

```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```

Value: +30.0000
Color: red
Width: thin
Type: dashed

```

[New] button...

```

Value: +0.0000
Color: black
Width: thin
Type: dashed

```

[New] button...

```

Value: -30.0000
Color: red
Width: thin
Type: dashed

```

6. In the **Formula** tab, copy and paste the following formula:

```

MA:= Mov(prc,periods,mat);
r1:= Mov(MA,recperiods,recmat);
r2:= Mov(r1,recperiods,recmat);
r3:= Mov(r2,recperiods,recmat);
r4:= Mov(r3,recperiods,recmat);
r5:= Mov(r4,recperiods,recmat);
r6:= Mov(r5,recperiods,recmat);
r7:= Mov(r6,recperiods,recmat);
r8:= Mov(r7,recperiods,recmat);
r9:= Mov(r8,recperiods,recmat);

RMin:= Min(MA,Min((r1),Min((r2),Min((r3),Min((r4),Min((r5),
Min((r6),Min((r7),Min((r8),r9)))))))));

RMax:= Max(MA,Max((r1),Max((r2),Max((r3),Max((r4),Max((r5),
Max((r6),Max((r7),Max((r8),r9)))))))));

RBLowerBand:= -100 * (RMin-RMax) / (HHV(prc,rbop)-LLV(prc,rbop));

```

```
RBUpperBand:= 100 * (RMin-RMax) / (HHV(prc,rbop)-LLV(prc,rbop));
```

```
RBOsc:= 100 * (prc-((MA+r1+r2+r3+r4+r5+r6+r7+r8+r9)/rbop)) / (HHV(PrC,rbop) - LLV(PrC,rbop));
```

7. Click the "Save" icon to finish building the Rainbow Oscillator indicator.

6.86 Rate of Change (ROC)

Overview

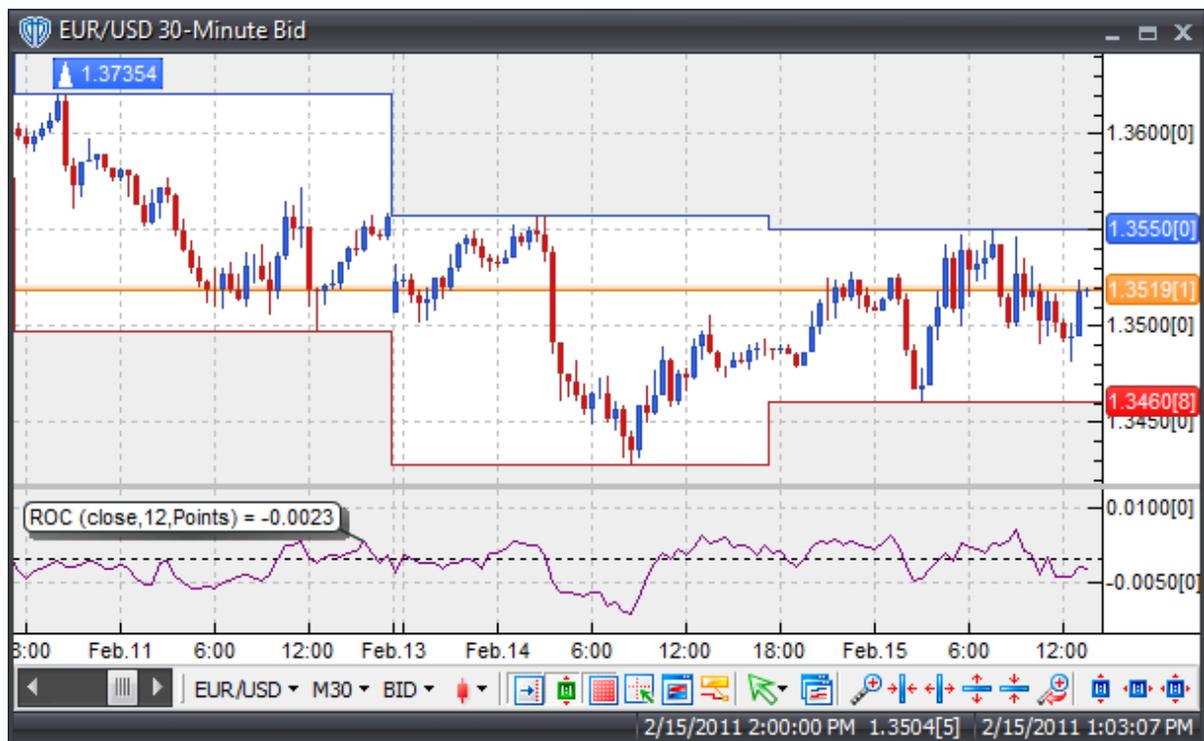
The Rate of Change (ROC) indicator calculates how price has changed within a specified number of time periods by calculating the difference between the current bar's price and the price a selected number of bars ago. The difference is calculated in "Points" or as a "Percentage". The ROC moves in a wave-like fashion (similar to that of price), but it oscillates above and below an equilibrium level set at zero. The ROC rises as prices rise; the ROC declines as prices decline. The greater the change in prices, the greater the change in the ROC indicator.

To calculate the ROC in Points:

ROCPoints = Today's Price - Price n-Periods Ago

To calculate the ROC as a Percentage:

ROCPercentage = ((Today's Price - Price n-Periods Ago) / Price n-Periods Ago) * 100



Interpretation

The ROC indicator is a simple indicator capable of producing a myriad of buy and sell signals. However, there are four basic methods of interpreting the ROC indicator:

Zero-Level Crossovers: A buy signal occurs when the ROC crosses above zero and a sell signal occurs when the ROC crosses below zero.

Overbought/Oversold Levels: To use ROC as an overbought/oversold indicator, generally a few assumptions are made: The higher the ROC readings the more overbought a trading instrument is and the lower the ROC readings the more oversold a trading instrument is. Readings above the overbought level imply an overbought condition (and a pending price correction) while readings below the oversold level imply an oversold condition (and a pending rally). However, it is worth remembering that prices may remain overbought or oversold for extended periods of time. When this happens, it may actually suggest that the trend will continue rather than reverse.

Trend Line Breakouts: Trend lines can be drawn connecting the peaks and troughs of the ROC indicator. Often ROC begins to turn before price thereby making it a leading indicator. ROC readings breaking above a declining trend line warns of a possible bullish reversal while momentum readings breaking below a rising trend line warns of a possible bearish reversal.

Divergence: Looking for divergences between the ROC indicator and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the ROC; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the ROC.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Rate of Change (ROC)
Function Name Alias: vt_ROC
Label Mask: ROC (%Pr%,%tPr%,%CalcMethod%) = %_ROC%
Placement: New Frame
Data Inspection Alias: Rate of Change
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Price
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: tPr
Display Name: Periods
Type: integer
Default: 12
```

[New] button...

```
Name: CalcMethod
Display Name: Calculation Method
Type: Enumeration
Default: click [...] button, [New] button, then create the following
entries:
    Points
    Percent
... then, click [OK] button
Default: Points
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: _ROC
Name: (ROC)
Line Color: purple
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +0.0000
Color: black
```

Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
_ROC:= if( CalcMethod=0, Pr-Ref(Pr, -tPr), ((Pr-Ref(Pr, -tPr))/ref(Pr, -tPr))
*100);
```

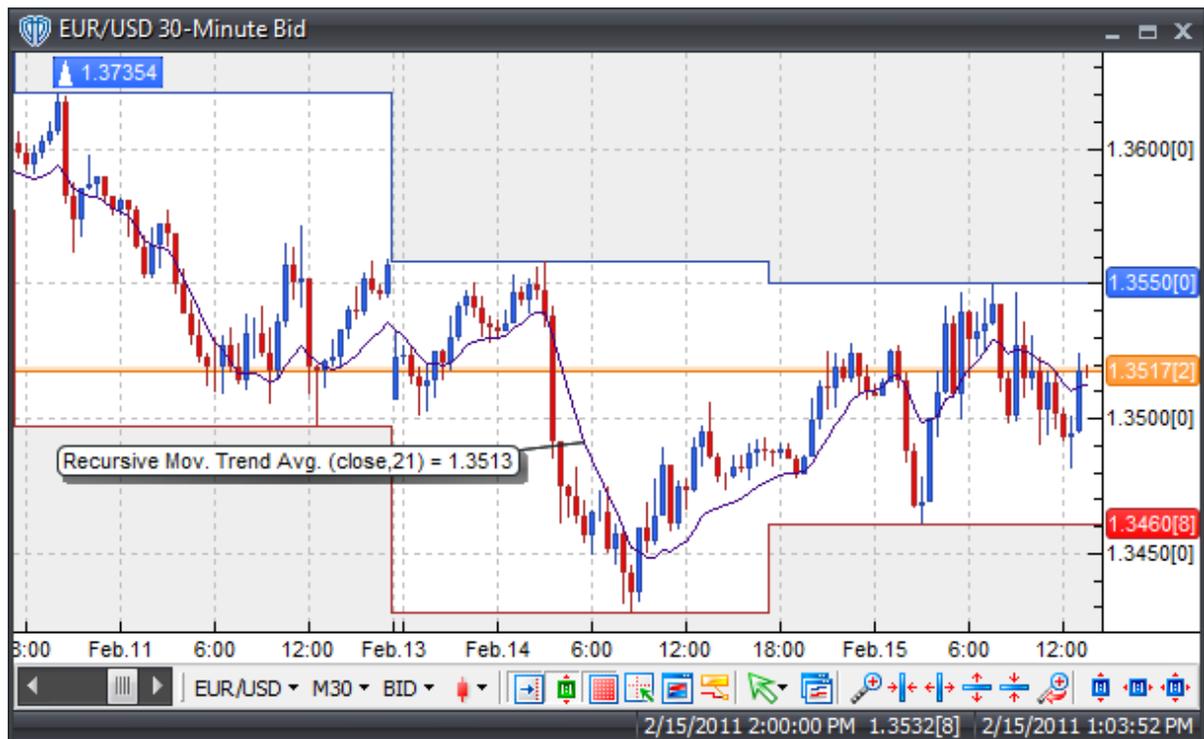
7. Click the "Save" icon to finish building the Rate of Change indicator.

6.87 Recursive Moving Trend Average

Overview

Developed by Dennis Meyers and described in his article entitled "The Japanese Yen, Recursed" published in the December 1998 issue of Technical Analysis of Stocks and Commodities magazine, the Recursive Moving Trend Average is in mathematical terms a "Recursive Moving Polynomial Fit".

Meyers describes this technique as requiring only a small number of past values of the estimated price and the current (today's) price to predict the next (tomorrow's) price whereas the Least Squares Polynomial Fit (which is very computationally intensive) requires large numbers of past price points.



Interpretation

Meyers suggests creating a simple “trend oscillator” which he refers to as the “tocs” which is the difference between the Recursive Moving Trend Average and an Exponential Moving Average of the same n-periods.

He mentions looking for changes in the price series that are above the normal noise fluctuations indicating that a potential uptrend or downtrend has started. This is accomplished by examining the plot of the tosc.

A potential buy signal is generated when the tosc’s value crosses above the “dup” level and a potential sell signal is generated when the tosc’s value crosses below the “-ddn” level.

During Meyer’s testing, the optimum “dup” and “-ddn” levels were calculated using optimization, walk-forward testing, out-of-sample testing, and averaging of all testing results.

For additional information, including the mathematical formulas for the Recursive Moving Trend Average and TOSC, please review Dennis Meyer’s whitepaper entitled “The Japanese Yen, Recursed” published in 1998, which is available from his website.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Recursive Moving Trend Average
Function Name Alias: vt_RMTA
Label Mask: Recursive Mov. Trend Avg. (%Price%,%Periods%) = %RMTA%
Placement: Price Frame
Data Inspection Alias: Recursive Mov. Trend Avg.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Price
Display Name: Price
Type: Price
Default: Close
```

[New] button...

```
Name: Periods
Display Name: Periods
Type: integer (with bounds)
Default: 21
Min. Bounds: 1
Max. Bounds: 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: RMTA

Name: (RMTA)

Line Color: dark blue

Line Width: thin

Line Type: solid

5. In the **Horizontal Line** tab, create the following variables:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
Alpha:= 2/(Periods+1);  
Bot:= (1-Alpha)*(If(BarCount()<Periods,Price,PREV(Price)))+Price;  
RMTA:= (1-Alpha)*(If(BarCount()<Periods,Price,PREV(Price)))+(Alpha*Abs  
(Price+Bot-Ref(Bot,-1)));
```

7. Click the "Save" icon to finish building the Recursive Moving Trend Average indicator.

6.88 Relative Momentum Index

Overview

The Relative Momentum Index was developed by Roger Altman. It was first introduced in the February 1993 issue of *Technical Analysis of Stocks & Commodities* magazine. The RMI is a variation of the RSI indicator. The RMI counts up and down days from the close relative to the close x-days ago (where x is not limited to 1 as is required by the RSI) instead of counting up and down days from close to close as the RSI does.

Note that an RMI with parameters of C, 14, 1 is equivalent to a 14 period RSI of the Close price. This is because the momentum parameter is calculating only a 1-day price change (which the RSI does by default). As the momentum periods are increased the RMI fluctuations become smoother.

Display Name: Price
Type: price
Default: close

[New] button...

Name: rmiper
Display Name: RMI Periods
Type: integer
Default: 14

[New] button...

Name: momper
Display Name: Momentum Periods
Type: integer
Default: 5

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: _RMI
Name: (RMI)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +70.0000
Color: red
Width: thin
Type: dashed

[New] button...

Value: +30.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
Mom:= price - ref(price,-momper);  
Rms:= Wilders(If(Mom>0,Mom,0),rmiper) / Wilders(If(Mom<0,Abs(Mom),0),  
rmiper);  
_RMI:= 100-(100/(1+RMS));
```

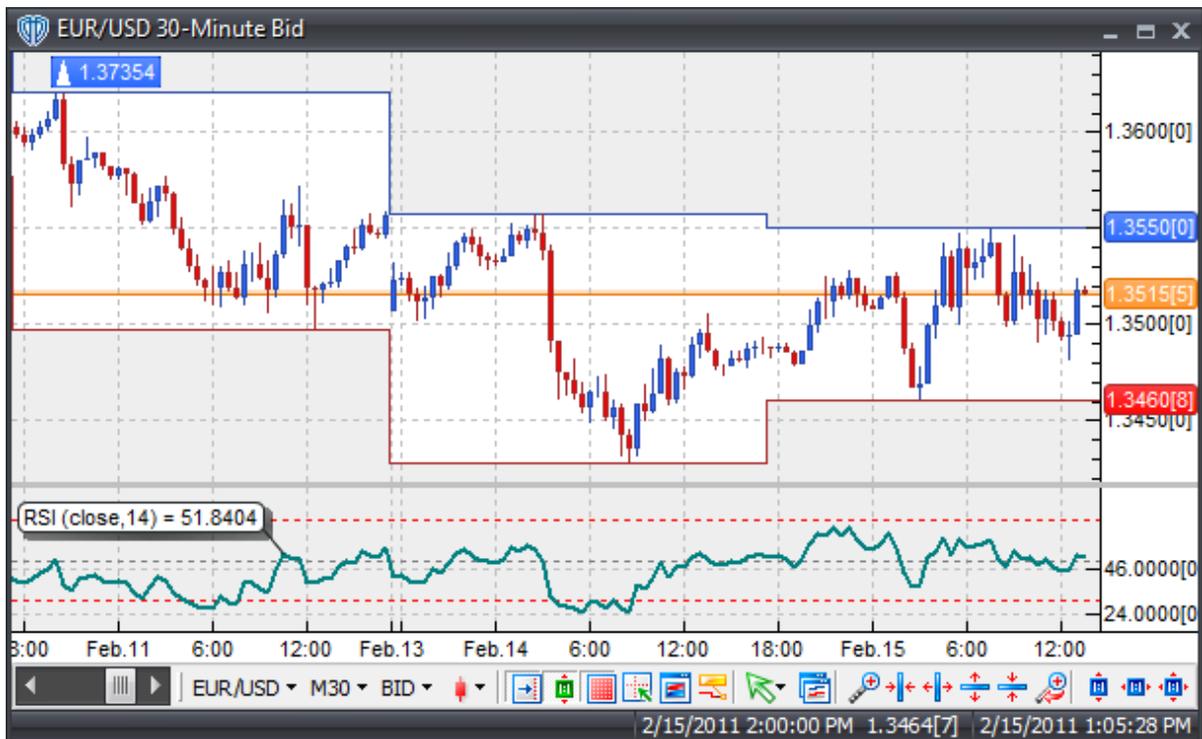
7. Click the "Save" icon to finish building the Relative Momentum Index indicator.

6.89 Relative Strength Index (RSI)

Overview

Developed by J. Wells Wilder and introduced in his 1978 book, “New Concepts in Technical Trading Systems”, the Relative Strength Index (RSI) has become a very popular oscillator and useful momentum oscillator. The RSI compares a trading instrument’s magnitude of recent gains against its magnitude of recent losses and quantifies this information into a value that ranges between 0 and 100.

Often times the name “Relative Strength Index” is slightly confusing or misleading because the RSI does not compare the relative strength of two trading instruments, but rather the internal strength of a single trading instrument. A more appropriate name might have been “Internal Strength Index”, but most traders simply refer to it as “the RSI” in an effort not to confuse it with John Murphy’s “Relative Strength” charts and IBD’s “Relative Strength” rankings.



Interpretation

There are several popular methods of analyzing the RSI, some of which include:

Divergence: Looking for divergences between the RSI and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the RSI; Trade short on Classic Bearish Divergence: Higher highs in

price and lower highs in the RSI. These types of divergence are often indications of an impending reversal.

Overbought/Oversold Conditions: The RSI can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the RSI being greater than or equal to the 70% level while an oversold condition is generally described as the RSI being less than or equal to the 30% level. Trades can be generated when the RSI crosses these levels. When the RSI crosses above 30 a buy signal is given. Alternatively, when the RSI crosses below 70 a sell signal is given.

Support/Resistance and "Failure Swings": The RSI shows, sometimes more clearly than price itself, levels of support and resistance. Failure swings (a.k.a. support/resistance breakouts) occur when the RSI surpasses a previous high (peak) or falls below a recent low (trough).

RSI / 50-level Crossover: When the RSI crosses above 50 a buy signal is given. Alternatively, when the RSI crosses below 50 a sell signal is given.

Chart Formations: The RSI often forms chart patterns such as head and shoulders or triangles that may or may not be visible on the price chart.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Relative Strength Index (RSI)
Function Name Alias: vt_RSI
Label Mask: RSI (%pr%,%tpr%) = %RSIndex%
Placement: New Frame
Data Inspection Alias: RSI
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: tpr
Display Name: Periods
Type: integer
Default: 14
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: RSIndex
```

Name: (RSI)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
Value: +70.0000
Color: red
Width: thin
Type: dashed

[New] button...
Value: +50.0000
Color: gray
Width: thin
Type: dashed

[New] button...
Value: +30.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
rsi_r:= (pr - ref(pr,-1));  
rsi_rs:= Wilders(if(rsi_r>0,rsi_r,0),tpr) / Wilders(if(rsi_r<0,Abs  
(rsi_r),0),tpr);  
RSIndex:= 100-(100/(1+rsi_rs));
```

7. Click the "Save" icon to finish building the Relative Strength Index indicator.

6.90 Relative Volatility Index (RVI)

Overview

The Relative Volatility Index (RVI) was developed by Donald Dorsey. It was originally introduced in the June 1993 issue of Technical Analysis of Stocks and Commodities magazine (TASC). A revision to the indicator was discussed in the September 1995 issue.

The RVI is very similar to the Relative Strength Index (RSI) index except that the RVI measures the direction of volatility using the standard deviation of price changes in its calculations rather than absolute price changes like the RSI does.



Interpretation

The RVI is best used as a confirmation indicator to other momentum and/or trend-following indicators. Dorsey recommended the following rules for using the RVI:

Only act on buy signals when $RVI > 50$.
 Only act on sell signals when $RVI < 50$.

If a buy signal is ignored, enter long if $RVI > 60$.
 If a sell signal is ignored, enter short if $RVI < 40$.

Close a long position if RVI falls below 40.
 Close a short position if RVI rises above 60.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's [New] button

2. In the **General** tab, type the following text for each field:

```
Name: Relative Volatility Index (RVI)
Function Name Alias: vt_RelVolIndex
Label Mask: Relative Volatility Index (RVI) (%pr%,%stdevper%,%tpr%) = %
RVIndex%
```

Placement: New Frame
Data Inspection Alias: Relative Volatility Index

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: pr
Display Name: Price
Type: price
Default: close

[New] button...

Name: stdevper
Display Name: Std. Deviation Periods
Type: integer (with bounds)
Default: 10
Min. Bounds: 1
Max. Bounds: 9999

[New] button...

Name: tpr
Display Name: RVI Periods
Type: integer (with bounds)
Default: 14
Min. Bounds: 1
Max. Bounds: 9999

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: RVIndex
Name: (RVI)
Line Color: purple
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +60.0000
Color: red
Width: thin
Type: dashed

[New] button...

Value: +50.5000
Color: gray
Width: thin
Type: dashed

[New] button...

Value: +40.0000
Color: red

Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

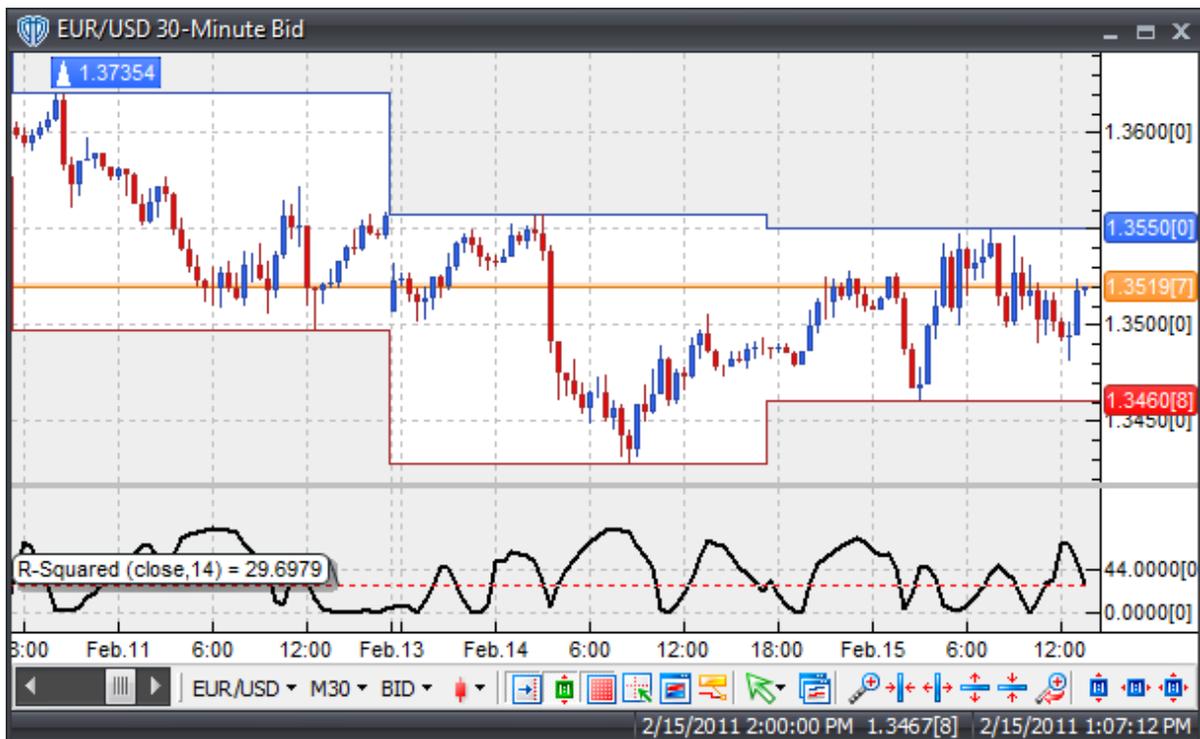
```
rvi_r:= pr - ref(pr,-1);
rvi_rs:= wilders(if(rvi_r>0,stdev(pr,stdevper),0),tpr) / wilders(if
(rvi_r<0,abs(stdev(pr,stdevper)),0),tpr);
RVIndex:= 100-(100/(1+rvi_rs));
```

7. Click the "Save" icon to finish building the Relative Volatility Index indicator.

6.91 R-Squared

Overview

R-Squared is a linear regression method that helps quantify the strength of market trends (i.e. "trendiness of prices). The more closely prices move in a straight line over n-periods (forming a linear relationship), the stronger the trend. R-Squared values represent the percentage of price movement that can be explained by linear regression. For example, if the R-Squared value over 14 periods is at 50% then that means that 50% of the price movement can be explained by linear regression and the remaining 50% is random noise.



Interpretation

To determine if a trend is statistically significant for an n-periods linear regression line a 95% confidence level is required. The 95% confidence level varies based on the number of periods being evaluated. If the R-Squared value is less than its corresponding 95% confidence level for a given n-periods it is generally assumed that no statistically significant trend exists. The table below outlines the recommended number of R-Squared periods and their corresponding 95% confidence levels.

of Periods / R2 Critical Value (95% Confidence)

5 / 77
 10 / 40
 14 / 27
 20 / 20
 25 / 16
 30 / 13
 50 / 8
 60 / 6
 120 / 3

There are many ways to use linear regression and R-Squared to generate potential trading opportunities.

One such method recommends using R-Squared in conjunction with the Linear Regression Slope. R-Squared defines the strength of the trend and the Linear Regression Slope defines the general direction of the trend (positive or negative). Potential trading signals would be generated with respect to the direction of the Linear Regression Slope while the R-Squared remained above its 95% confidence level.

Another method recommends using R-Squared in conjunction with oscillators. Potential trading signals would be generated with respect to the oscillator's overbought and oversold levels while R-Squared remains low (i.e. well below its 95% confidence level) indicating that prices are less "trendy".

For additional information you may wish to refer to Tushar Chande's and Stanley Kroll's book entitled, "The New Technical Trader".

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: R-Squared (R2)
Function Name Alias: vt_R2
Label Mask: R-Squared (%price%,%periods%) = %R2%
Placement: New Frame
Data Inspection Alias: R-Squared
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Price
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: Periods
Display Name: Periods
Type: integer (with bounds)
Default: 14
Min. Bounds: 1
Max. Bounds: 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: R2
Name: (R2)
Line Color: black
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

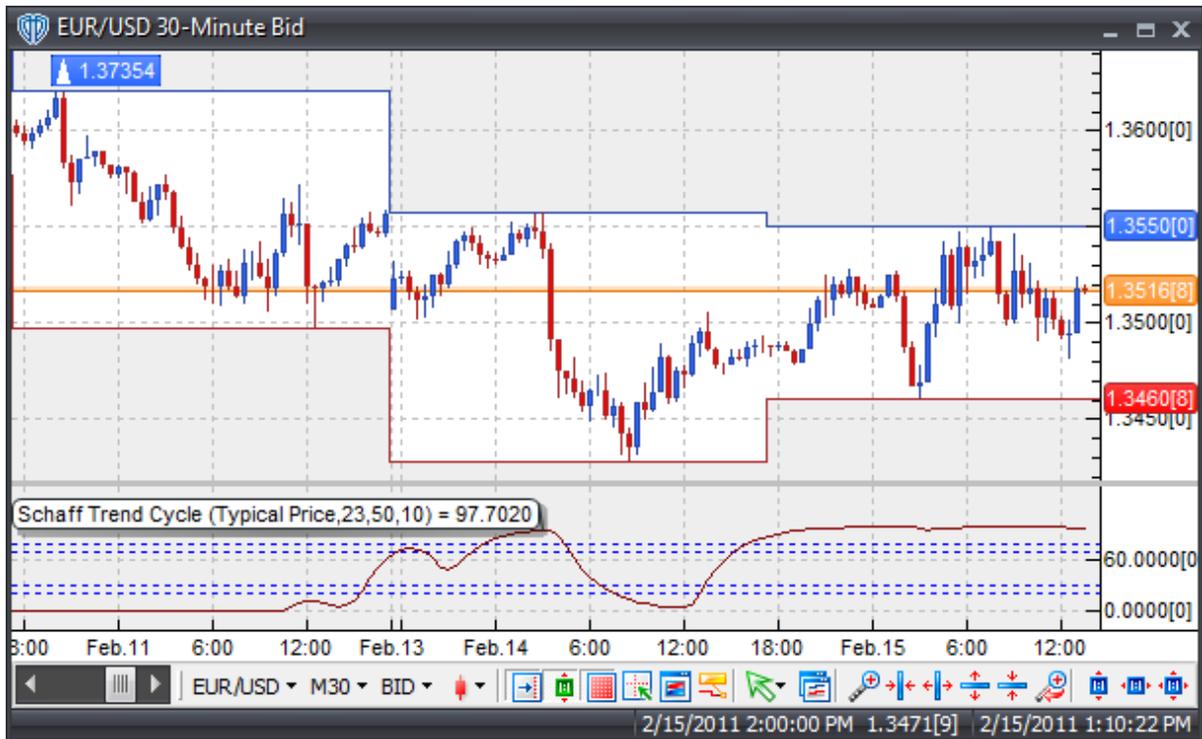
```
t1:= BarCount();
t2:= Price;
N:= Periods;
A:= (N * Sum(Power(t1,2),N) - Power(Sum(t1,N),2));
B:= (N * Sum(Power(t2,2),N) - Power(Sum(t2,N),2));
R1:= (N * Sum(t1*t2,N) - Sum(t1,N) * Sum(t2,N)) / (sqrt(A) * sqrt(B));
R2:= (Power(R1,2)) * 100;
CV:= If(N=5,77,
      If(N=10,40,
        If(N=14,27,
          If(N=20,20,
            If(N=25,16,
              If(N=30,13,
                If(N=50,8,
                  If(N=60,120,
                    If(N=120,3,Null))))))));
```

7. Click the "Save" icon to finish building the R-Squared indicator.

6.92 Schaff Trend Cycle

Overview

Developed by Doug Schaff in the 1990's, the Schaff Trend Cycle bases its method on the fact that trends, like price, exhibit repeating high and low patterns (cycles). This indicator is a modified MACD line run through a modified stochastic algorithm smoothed with Wilders' smoothing to calculate the final STC indicator.



Interpretation

The Schaff Trend Cycle uses three inputs:

- Sh: Shorter-term Exponential Moving Average. Default: 23
- Lg: Longer-term Exponential Moving Average. Default: 50
- Cycle: Set at half the cycle length. Default: 10

The Schaff Trend Cycle helps to identify:

1. Direction a Trend Cycle is moving.
2. Tops and Bottoms within a Trend Cycle.

When the Schaff Trend Cycle Indicator is declining, the trend cycle is falling and prices tend to stabilize or follow the cycle down. When the STC is rising, the trend cycle is rising and prices tend to stabilize or follow the cycle higher.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Schaff Trend Cycle
Function Name Alias: vt_SchaffTC
Label Mask: Schaff Trend Cycle (%price%,%Sh%,%Lg%,%Cycle%) = %STCycle%
Placement: New Frame
Data Inspection Alias: Schaff Trend Cycle
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Price
Display Name: Price
Type: price
Default: Typical Price
```

```
[New] button...
Name: Sh
Display Name: Short-Term Periods
Type: integer
Default: 23
```

```
[New] button...
Name: Lg
Display Name: Long-Term Periods
Type: integer
Default: 50
```

```
[New] button...
Name: Cycle
Display Name: Schaff Cycle Periods
Type: integer
Default: 10
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: STCycle
Name: (STC)
Line Color: dark red
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +80.0000
 Color: blue
 Width: thin
 Type: dashed

[New] button...

Value: +70.0000
 Color: blue
 Width: thin
 Type: dashed

[New] button...

Value: +30.0000
 Color: blue
 Width: thin
 Type: dashed

[New] button...

Value: +20.0000
 Color: blue
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
MCD:= Wilders(price,Sh) - Wilders(price,Lg);
ST:= ((MCD-LLV(MCD,Cycle)) / (HHV(MCD,Cycle)-LLV(MCD,Cycle))) * 100;
STCycle:= Wilders(ST,Cycle/2);
```

7. Click the "Save" icon to finish building the Schaff Trend Cycle indicator.

6.93 Stochastic Momentum Index

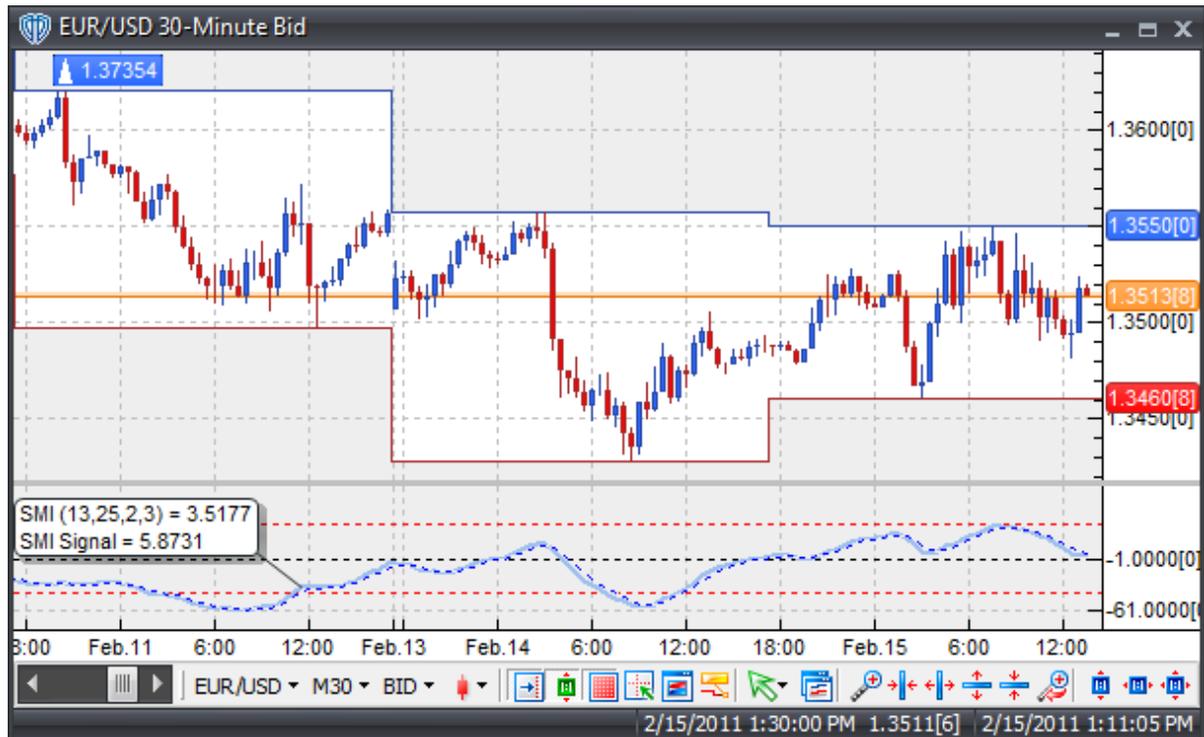
Overview

Created by William Blau, the Stochastic Momentum Index was described in the January 1993 issue of Technical Analysis of Stocks and Commodities magazine.

The SMI is a smoother version of the classic Stochastic Oscillator with an interesting twist. Instead of calculating the distance the current price relative to the recent n-period high/low range, the SMI is calculated by comparing the price to the midpoint average of the n-period high/low range. The raw price differences are then smoothed by a double EMA (an EMA of an EMA of the raw price differences). When the close is greater than the midpoint of the range, the SMI is positive. When the close is less than the midpoint of the range, it is negative.

The result is an oscillator that ranges between +/- 100 and is less erratic than an equal period

Stochastic Oscillator.



Interpretation

Popular methods for interpreting the Stochastic Momentum Index include:

1. **Overbought/Oversold Level Crossovers:** +/- 40 are popular levels. Buy when the SMI falls below the oversold level and then rises above that level; Sell when the SMI rises above the overbought level and then falls below that level.
2. **Signal Line Crossovers:** Buy when the SMI rises above its signal line and sell when the SMI falls below the signal line.
3. **Divergences:** For example, where prices are making a series of new highs and the SMI is failing to surpass its previous highs.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Stochastic Momentum Index
Function Name Alias: vt_SMI
```

Label Mask:
SMI (%lp%,%sm%,%dsmp%,%sig%) = %SMI%
SMI Signal = %SMI_Sig%
Placement: New Frame
Data Inspection Alias: Stochastic Momentum Index

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...
Name: lp
Display Name: Lookback Periods
Type: integer
Default: 13

[New] button...
Name: sm
Display Name: Smoothing Periods
Type: integer
Default: 25

[New] button...
Name: dsmp
Display Name: Double Smoothing Periods
Type: integer
Default: 2

[New] button...
Name: sig
Display Name: Signal Line Periods
Type: integer
Default: 3

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
Var Name: SMI
Name: (SMI)
Line Color: light blue
Line Width: slightly thicker
Line Type: solid

[New] button...
Var Name: SMI_Sig
Name: (SMI Signal Line)
Line Color: blue
Line Width: thin
Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
Value: +40.0000
Color: red

Width: thin
Type: dashed

[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed

[New] button...
Value: -40.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
SMI:= 100 * (Mov(Mov(C-(0.5*(HHV(H,lp)+LLV(L,lp))),sm,E),dsmp,E) /  
(0.5*Mov(Mov(HHV(H,lp)-LLV(L,lp),sm,E),dsmp,E)));  
SMI_Sig:= mov(SMI,sig,E);
```

7. Click the "Save" icon to finish building the Stochastic Momentum Index indicator.

6.94 Stochastic Oscillator (Fast)

Overview

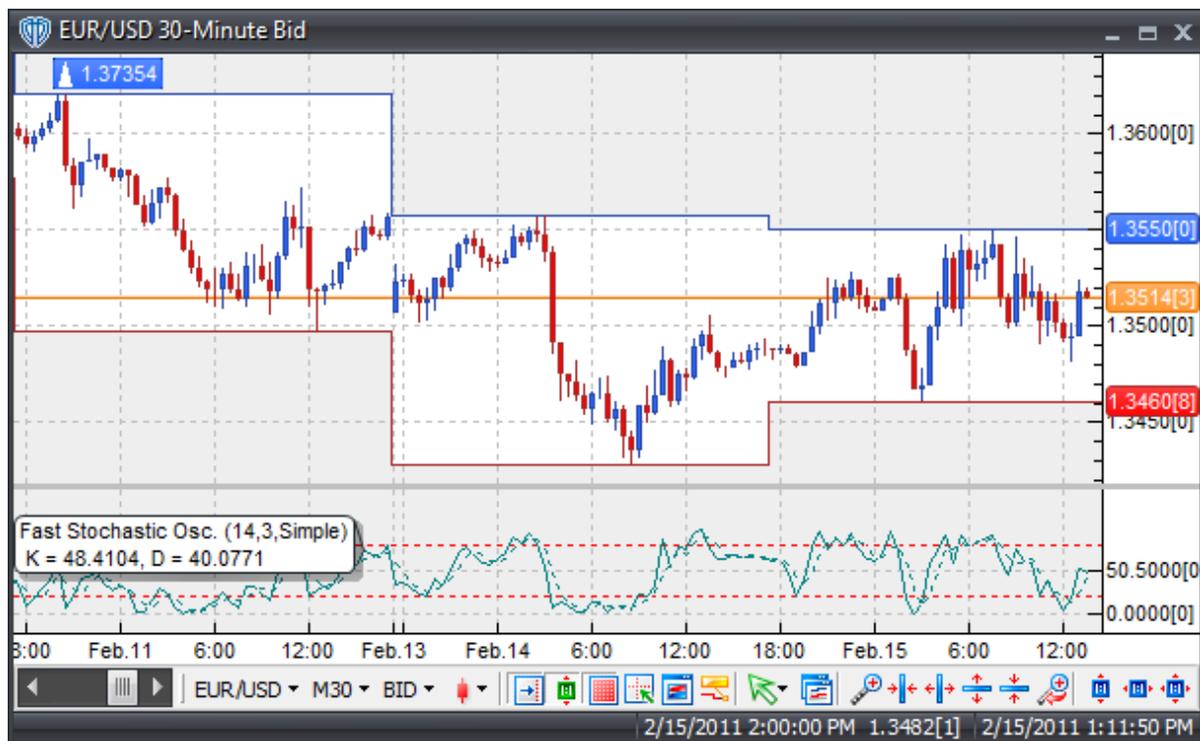
Developed by George C. Lane in the 1950's, the Stochastic Oscillator comes in 3 flavors: Fast, Slow, and Full. The Stochastic Oscillator is a momentum indicator designed to show the relation of the current close price relative to the high/low range over a given number of periods using a scale of 0-100. It is based on the assumption that in a rising market the price(s) will close near the high of the range and in a declining market the price(s) will close near the low of the range.

The Stochastic Oscillators are typically plotted as 2 lines: %K and %D. %K is the main (fast) line and %D is the signal (slow) line.

The Fast Stochastic Oscillator is calculated by the formula:

Fast %K = ((Today's Close - Lowest Low in %K Periods) / (Highest High in %K Periods - Lowest Low in %K Periods)) * 100

%D = 3-period simple moving average of Fast %K



Interpretation

There are three basic techniques for using the various Stochastic Oscillators to generate trading signals.

Crossovers: 1) %K line / %D line Crossover: A buy signal occurs when the %K line crosses above the %D line and a sell signal occurs when the %K line crosses below the %D line. 2) %K line / 50-level Crossover: When the %K line crosses above 50 a buy signal is given. Alternatively, when the %K line crosses below 50 a sell signal is given.

Divergence: Looking for divergences between the Stochastic Oscillator and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the Stochastic Oscillator; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the Stochastic Oscillator.

Overbought/Oversold Conditions: The Stochastic Oscillator can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the Stochastic Oscillator being greater than or equal to the 80% level while an oversold condition is generally described as the Stochastic Oscillator being less than or equal to the 20% level. Trades can be generated when the Stochastic Oscillator crosses these levels. A buy signal occurs when the Stochastic Oscillator declines below 20% and then rises above that level. A sell signal occurs when the Stochastic Oscillator rises above 80% and then declines below that level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>

Indicator Builder window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Stochastic Oscillator (Fast)
Function Name Alias: vt_StochOscFast
Label Mask:
    Fast Stochastic Osc. (%K%,%D%,%Mt%)
    K = %StK%, D = %StD%
Placement: New Frame
Data Inspection Alias: Fast Stochastic Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: K
Display Name: %K Periods
Type: integer (with bounds)
Default: 14
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

```
Name: D
Display Name: %D Periods
Type: integer (with bounds)
Default: 3
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

```
Name: Mt
Display Name: %D Method
Type: MA Type
Default: Simple
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: StK
Name: (%K)
Line Color: dark green
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: StD
Name: (%D)
Line Color: dark green
Line Width: thin
Line Type: dashed
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +80.0000

Color: red

Width: thin

Type: dashed

[New] button...

Value: +20.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
StK:= ((C-LLV(L,K))/(HHV(H,K)-LLV(L,K)))*100;
StD:= Mov(StK,D,Mt);
```

7. Click the "Save" icon to finish building the Fast Stochastic Oscillator indicator.

6.95 Stochastic Oscillator (Full)

Overview

Developed by George C. Lane in the 1950's, the Stochastic Oscillator comes in 3 flavors: Fast, Slow, and Full. The Stochastic Oscillator is a momentum indicator designed to show the relation of the current close price relative to the high/low range over a given number of periods using a scale of 0-100. It is based on the assumption that in a rising market the price(s) will close near the high of the range and in a declining market the price(s) will close near the low of the range.

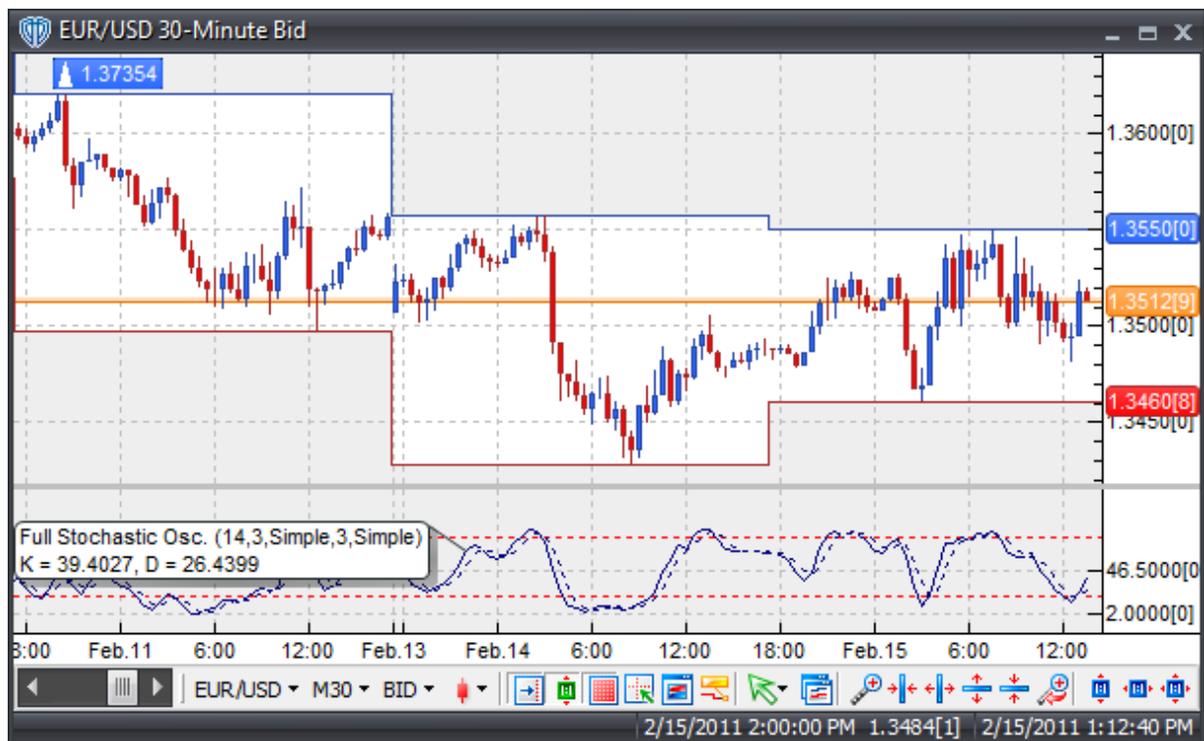
The Stochastic Oscillators are typically plotted as 2 lines: %K and %D. %K is the main (fast) line and %D is the signal (slow) line.

The Full Stochastic Oscillator is calculated by the formula:

Fast %K = ((Today's Close - Lowest Low in %K Periods) / (Highest High in %K Periods - Lowest Low in %K Periods)) * 100

Slowing %K = N-period moving average of Fast %K

%D = N-period simple moving average of Slowing %K



Interpretation

There are three basic techniques for using the various Stochastic Oscillators to generate trading signals.

Crossovers: 1) %K line / %D line Crossover: A buy signal occurs when the %K line crosses above the %D line and a sell signal occurs when the %K line crosses below the %D line. 2) %K line / 50-level Crossover: When the %K line crosses above 50 a buy signal is given. Alternatively, when the %K line crosses below 50 a sell signal is given.

Divergence: Looking for divergences between the Stochastic Oscillator and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the Stochastic Oscillator; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the Stochastic Oscillator.

Overbought/Oversold Conditions: The Stochastic Oscillator can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the Stochastic Oscillator being greater than or equal to the 80% level while an oversold condition is generally described as the Stochastic Oscillator being less than or equal to the 20% level. Trades can be generated when the Stochastic Oscillator crosses these levels. A buy signal occurs when the Stochastic Oscillator declines below 20% and then rises above that level. A sell signal occurs when the Stochastic Oscillator rises above 80% and then declines below that level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>

Indicator Builder window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Stochastic Oscillator (Full)
Function Name Alias: vt_StochOscFull
Label Mask:
    Full Stochastic Osc. (%K%,%Sl%,%MtK%,%D%,%Mt%)
    K = %StDK%, D = %StDD%
Placement: New Frame
Data Inspection Alias: Full Stochastic Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: K
Display Name: %K Periods
Type: integer (with bounds)
Default: 14
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

```
Name: Sl
Display Name: %K Slowing Periods
Type: integer (with bounds)
Default: 3
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

```
Name: MtK
Display Name: %K Slowing Method
Type: MA Type
Default: Simple
```

[New] button...

```
Name: D
Display Name: %D Periods
Type: integer (with bounds)
Default: 3
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

```
Name: Mt
Display Name: %D Method
Type: MA Type
Default: Simple
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: StDK
Name: (%K)
Line Color: dark blue
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: StDD
Name: (%D)
Line Color: dark blue
Line Width: thin
Line Type: dashed
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +80.0000
Color: red
Width: thin
Type: dashed
```

[New] button...

```
Value: +20.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
StK:= ((C-LLV(L,K))/(HHV(H,K)-LLV(L,K)))*100;
StDK:= Mov(StK,S1,MtK);
StDD:= Mov(StDK,D,Mt);
```

7. Click the "Save" icon to finish building the Full Stochastic Oscillator indicator.

6.96 Stochastic Oscillator (Slow)

Overview

Developed by George C. Lane in the 1950's, the Stochastic Oscillator comes in 3 flavors: Fast, Slow, and Full. The Stochastic Oscillator is a momentum indicator designed to show the relation of the current close price relative to the high/low range over a given number of periods using a scale of 0-100. It is based on the assumption that in a rising market the price(s) will close near the high of the range and in a declining market the price(s) will close near the low of the range.

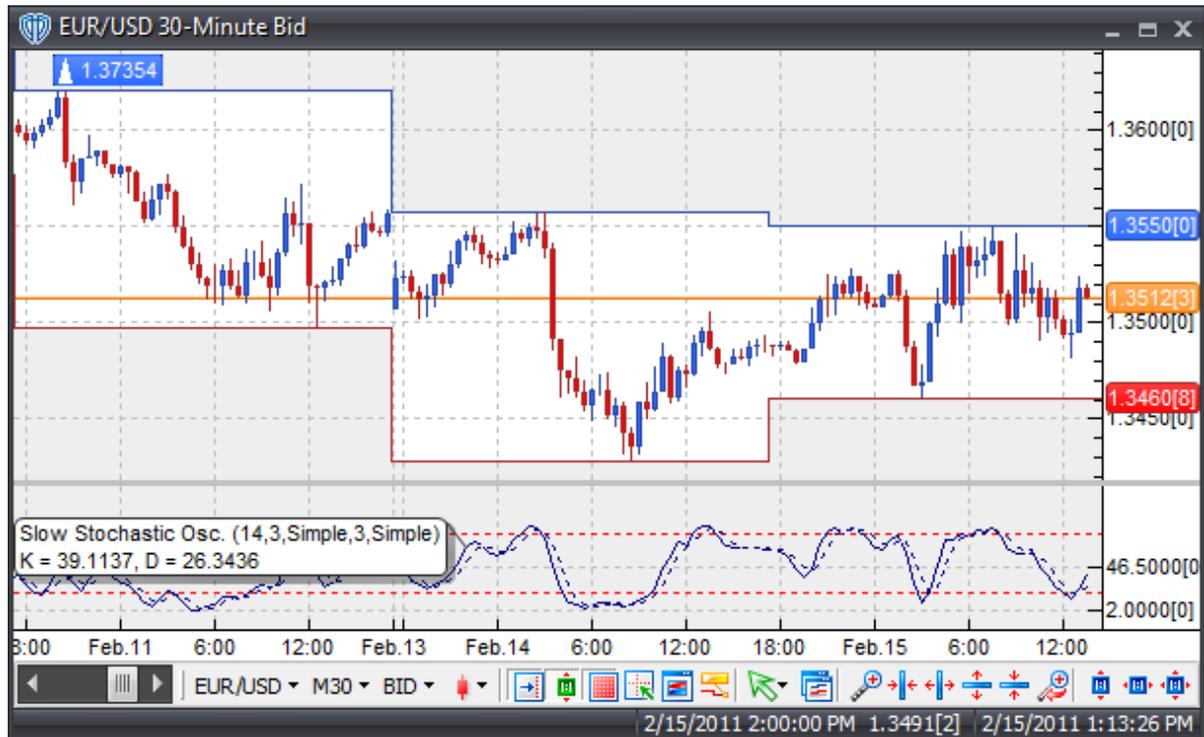
The Stochastic Oscillators are typically plotted as 2 lines: %K and %D. %K is the main (fast) line and %D is the signal (slow) line.

The Slow Stochastic Oscillator is calculated by the formula:

Fast %K = ((Today's Close - Lowest Low in %K Periods) / (Highest High in %K Periods - Lowest Low in %K Periods)) * 100

Slowing %K = 3-period simple moving average of Fast %K

%D = 3-period simple moving average of Slowing %K



Interpretation

There are three basic techniques for using the various Stochastic Oscillators to generate trading signals.

Crossovers: 1) %K line / %D line Crossover: A buy signal occurs when the %K line crosses above the %D line and a sell signal occurs when the %K line crosses below the %D line. 2) %K line / 50-level Crossover: When the %K line crosses above 50 a buy signal is given. Alternatively, when the %K line crosses below 50 a sell signal is given.

Divergence: Looking for divergences between the Stochastic Oscillator and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish Divergence: Lower lows in price and higher lows in the Stochastic Oscillator; Trade short on Classic Bearish Divergence: Higher highs in price and lower highs in the Stochastic Oscillator.

Overbought/Oversold Conditions: The Stochastic Oscillator can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the Stochastic Oscillator being greater than or equal to the 80% level while an oversold condition is generally described as the Stochastic Oscillator being less than or equal to the 20% level. Trades can be generated when the Stochastic Oscillator crosses these levels. A buy signal occurs when the

Stochastic Oscillator declines below 20% and then rises above that level. A sell signal occurs when the Stochastic Oscillator rises above 80% and then declines below that level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Stochastic Oscillator (Slow)
Function Name Alias: vt_StochOscSlow
Label Mask:
    Slow Stochastic Osc. (%K%,%Sl%,%MtK%,%D%,%Mt%)
    K = %StDK%, D = %StDD%
Placement: New Frame
Data Inspection Alias: Slow Stochastic Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: K
Display Name: %K Periods
Type: integer (with bounds)
Default: 14
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

```
Name: Sl
Display Name: %K Slowing Periods
Type: integer (with bounds)
Default: 3
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

```
Name: MtK
Display Name: %K Slowing Method
Type: MA Type
Default: Simple
```

[New] button...

```
Name: D
Display Name: %D Periods
Type: integer (with bounds)
Default: 3
Min Bounds: 1
Max Bounds: 9999
```

[New] button...

Name: Mt
Display Name: %D Method
Type: MA Type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: StDK
Name: (%K)
Line Color: dark blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: StDD
Name: (%D)
Line Color: dark blue
Line Width: thin
Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +80.0000
Color: red
Width: thin
Type: dashed

[New] button...

Value: +20.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
StK:= ((C-LLV(L,K))/(HHV(H,K)-LLV(L,K)))*100;  
StDK:= Mov(StK,S1,MtK);  
StDD:= Mov(StDK,D,Mt);
```

7. Click the "Save" icon to finish building the Slow Stochastic Oscillator.

6.97 Stochastic RSI Oscillator

Overview

Introduced by Tuschar Chande and Stanley Kroll in their December, 1992 Stocks and Commodities article entitled, "Stochastic RSI and Dynamic Momentum Index", the Stochastic RSI Oscillator attempts to combine ideas from two indicators - the Relative Strength Index (RSI) and the Stochastic Oscillator. As its name implies, the Stochastic RSI Oscillator is the RSI run through the stochastic algorithm. The Stochastic RSI Oscillator is a momentum indicator designed to show the relation of the current RSI value relative to its high/low range over a given number of periods using a scale of 0-100.

The Stochastic RSI Oscillator, much like the other stochastic oscillators, is typically plotted as 2 lines: the StochRSI line and %D. The StochRSI is the main (fast) line and %D is the signal (slow) line.

The Stochastic RSI Oscillator is calculated by the formula:

$$\text{StochRSI} = ((\text{Today's RSI} - \text{Lowest RSI Low in \%K Periods}) / (\text{Highest RSI High in \%K Periods} - \text{Lowest RSI Low in \%K Periods})) * 100$$

Slowing StochRSI = 3-period moving average of StochRSI; using a 1-period moving average of StochRSI eliminates this slowing (or smoothing) of the StochRSI

%D = 3-period moving average of Slowing StochRSI



Interpretation

There are three basic techniques for using the Stochastic RSI Oscillator to generate trading signals.

Crossovers: 1) StochRSI / %D line Crossover: A buy signal occurs When the StochRSI crosses above the %D line and a sell signal occurs when the StochRSI crosses below the %D line. 2) StochRSI / 50-level Crossover: When the StochRSI crosses above 50 a buy signal is given. Alternatively, when the

StochRSI crosses below 50 a sell signal is given.

Divergence: Looking for divergences between the Stochastic RSI Oscillator and price can prove to be very effective in identifying potential reversal points in price movement. Trade long on Classic Bullish

Divergence: Lower lows in price and higher lows in the Stochastic RSI Oscillator; Trade short on Classic

Bearish Divergence: Higher highs in price and lower highs in the Stochastic RSI Oscillator.

Overbought/Oversold Conditions: The Stochastic RSI Oscillator can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the Stochastic RSI Oscillator being greater than or equal to the 80% level while an oversold condition is generally described as the Stochastic Oscillator being less than or equal to the 20% level. Trades can be generated when the Stochastic RSI Oscillator crosses these levels. A buy signal occurs when the Stochastic RSI Oscillator declines below 20% and then rises above that level. A sell signal occurs when the Stochastic RSI Oscillator rises above 80% and then declines below that level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Stochastic RSI Oscillator
Function Name Alias: vt_StochRSI
Label Mask: Stochastic RSI Osc. (%rsiprice%,%rsiperiods%,%PerK%,%Sl%,%
mtK%,%PerD%,%mtD%) = %StochRSI%
Placement: New Frame
Data Inspection Alias: Stochastic RSI Osc.
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: rsiprice
Display Name: RSI Price
Type: price
Default: close
```

[New] button...

```
Name: rsiperiods
Display Name: RSI Periods
Type: integer
Default: 14
```

[New] button...

```
Name: PerK
Display Name: Stochastic RSI %K Periods
Type: integer
Default: 14
```

[New] button...

```
Name: Sl
```

Display Name: Stochastic RSI %K Slowing Periods
Type: integer
Default: 1

[New] button...

Name: mtK
Display Name: Stochastic RSI %K Method
Type: MA Type
Default: Simple

[New] button...

Name: PerD
Display Name: Stochastic RSI %D Periods
Type: integer
Default: 3

[New] button...

Name: mtD
Display Name: Stochastic RSI %D Method
Type: MA Type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: StochRSI
Name: (StochRSI)
Line Color: purple
Line Width: thin
Line Type: solid

[New] button...

Var Name: StochRsiD
Name: (StochRSI %D)
Line Color: purple
Line Width: thin
Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +80.0000
Color: red
Width: thin
Type: dashed

[New] button...

Value: +50.0000
Color: gray
Width: thin
Type: dashed

[New] button...

```
Value: +20.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
{Relative Strength Index}

rsi_r:= (rsiprice - ref(rsiprice,-1));
rsi_rs:= Wilders(if(rsi_r>0,rsi_r,0),rsiperiods) / Wilders(if(rsi_r<0,
abs(rsi_r),0),rsiperiods);
RS:= 100-(100/(1+rsi_rs));

{Stochastic RSI Oscillator}

StochRSI:= Mov((((RS-LLV(RS,PerK)) / (HHV(RS,PerK)-LLV(RS,PerK)))*100),
Sl,mtK);
StochRsiD:= mov(StochRSI,PerD,mtD);
```

7. Click the "Save" icon to finish building the Stochastic RSI Oscillator indicator.

6.98 Stoller Average Range Channels (STARC Bands)

Overview

The Stoller Average Range Channels (a.k.a. STARC Bands) indicator was developed by Manning Stoller in the 1980's. Similar to Bollinger Bands, the STARC bands are designed to interpret market volatility using a measure of the Average True Range (ATR). The STARC Bands create a channel above and below a moving average of the instrument's underlying price; the width of the channel expands and contracts depending on the fluctuation in the ATR.

The upper STARC band is calculated by adding a value of the (ATR * ATRMultiplier) to the moving average. The lower STARC band is calculated by subtracting a value of the (ATR * ATR Multiplier) to the moving average.



Interpretation

The STARC Bands are considered to encapsulate the majority of the instrument's price action between the bands allowing the bands to define the normal upper and lower limits of price action. This helps the trader determine higher probability, lower risk trading opportunities using the general assumption that price often returns to its median (the moving average).

- Price action that rises to the upper band offers a lower risk selling opportunity (and a high risk buying opportunity).
- Price action that declines to the lower band offers a lower risk buying opportunity (and a high risk selling opportunity).

These assumptions are not to say that the price action will not go against these rules. In fact, some traders believe that a penetration of the upper or lower STARC band indicates an increased momentum in the direction of the band penetration.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's [New] button

2. In the **General** tab, type the following text for each field:

Name: Stoller Average Range Channels (STARC Bands)
Function Name Alias: vt_STARC

Label Mask:

STARC Bands (%atrperiods%,%atrdev%,%mapr%,%maper%,%mtp%)

Middle = %MiddleBand%, Upper = %UpperBand%, Lower = %LowerBand%

Placement: New Frame

Data Inspection Alias: STARC Bands

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: atrperiods

Display Name: ATR Periods

Type: integer

Default: 15

[New] button...

Name: atrdev

Display Name: ATR Multiplier

Type: float (with bounds)

Default: 2.0000

Max Bounds: 0.1000

Min Bounds: 10.0000

[New] button...

Name: mapr

Display Name: STARC Bands Price

Type: price

Default: Typical Price

[New] button...

Name: maper

Display Name: STARC Bands Periods

Type: integer

Default: 6

[New] button...

Name: mtp

Display Name: STARC Bands Type

Type: MA Type

Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: UpperBand

Name: (Upper Band)

Line Color: purple

Line Width: thin

Line Type: solid

[New] button...

Var Name: MiddleBand

Name: (Middle Band)

Line Color: dark blue

```
Line Width: thin  
Line Type: dashed
```

[New] button...

```
Var Name: LowerBand  
Name: (Lower Band)  
Line Color: purple  
Line Width: thin  
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
ATRRange:= ATR(atrperiods);  
  
UpperBand:= Mov(mapr,maper,mtp) + (atrdev * ATRRange);  
MiddleBand:= Mov(mapr,maper,mtp);  
LowerBand:= Mov(mapr,maper,mtp) - (atrdev * ATRRange);
```

7. Click the "Save" icon to finish building the Stoller Average Range Channels indicator.

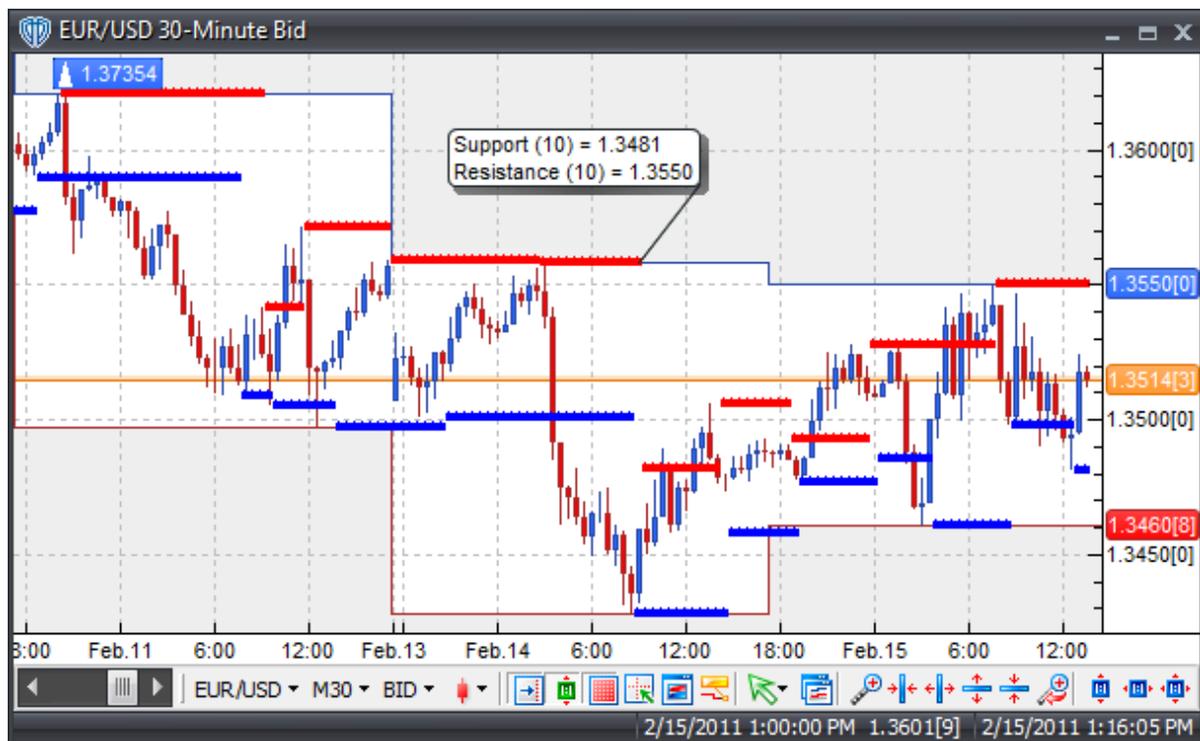
6.99 Support and Resistance

Overview

Support levels indicate the price where the majority of investors believe that prices will move higher, while resistance levels indicate the price at which a majority of investors feel prices will move lower. Prices often tend to "bounce" off of these levels rather than break through them. However, once price has broken through a support or resistance level it is likely to continue moving in that direction until it encounters the next support or resistance level.

An interesting phenomenon of support and resistance levels is that once a support level has been broken it often becomes a new resistance level and, alternatively, when a resistance level is broken it often becomes a new support level.

Another point of interest is that the more often a support or resistance level is "tested" (that is touched and bounced off of by price), the more significance that particular support or resistance level gains.



Interpretation

Support and resistance levels can be calculated using several different methods: trend lines, Fibonacci ratios, pivot point calculations are just a few. VT Trader uses a different method to construct this “Support and Resistance” indicator. Resistance levels are calculated by finding the highest high value over the previous n-periods at each occurrence of the price crossing below an n-periods simple moving average of price. Support levels are calculated by finding the lowest low value over the previous n-periods at each occurrence of the price crossing above an n-periods simple moving average of price.

There are two basic techniques for using the support and resistance levels to generate trading signals.

Price Breakouts: When trading price breakouts, a buy signal occurs when the price breaks up through a resistance level. A sell signal occurs when price breaks down through a support level. When a previous resistance level is broken it has the potential to become a new support level and vice versa. When a previous support level is broken it has the potential to become a new resistance level.

Price Reversals: When trading price reversals, a buy signal occurs when the price moves towards a support level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction. A sell signal occurs when the price moves towards a resistance level, gets very close to it, touches it, or moves only slightly through it, and then reverses and moves back in the opposite direction.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>

Indicator Builder window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Support and Resistance
Function Name Alias: vt_SupRes
Label Mask:
    Support (%LBP%) = %Sup%
    Resistance (%LBP%) = %Res%
Placement: Price Frame
Data Inspection Alias: Support and Resistance
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: LBP
Display Name: Lookback Periods
Type: integer (with bounds)
Default: 10
Min Bounds: 1
Max Bounds: 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: Res
Name: (Resistance)
Line Color: red
Line Width: slightly thicker
Line Type: dots
```

```
[New] button...
Var Name: Sup
Name: (Support)
Line Color: blue
Line Width: slightly thicker
Line Type: dots
```

5. In the **Horizontal Line** tab, create the following lines:

```
This indicator requires no horizontal lines.
```

6. In the **Formula** tab, copy and paste the following formula:

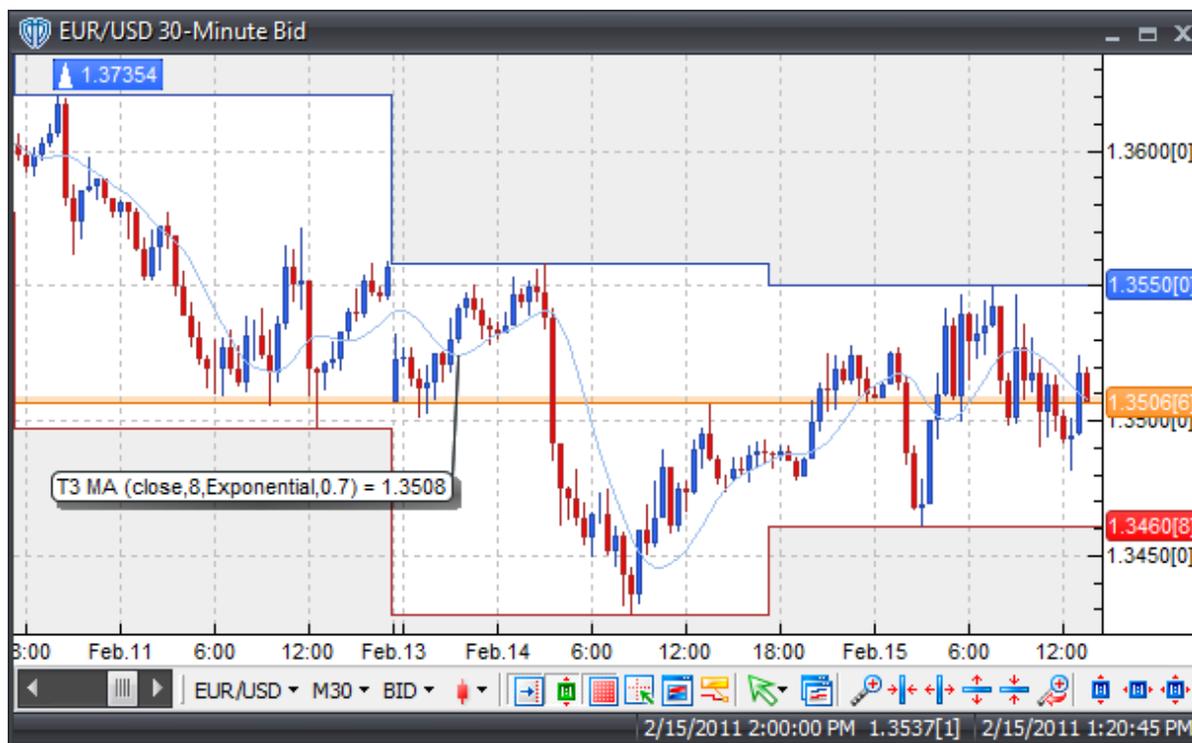
```
Res:= valuewhen(1,Cross(Mov(C,LBP,S),C),HHV(H,LBP));
Sup:= valuewhen(1,Cross(C,Mov(C,LBP,S)),LLV(L,LBP));
```

7. Click the "Save" icon to finish building the Support and Resistance indicator.

6.100 T3 Moving Average

Overview

The T3 Moving Average was described by Tim Tillson in the January 1998 issue of Technical Analysis of Stocks & Commodities article "Smoothing Techniques for More Accurate Signals". The T3 is a significant improvement over traditional moving averages; it's smoother with much less lag. However, it can "overshoot" price as it attempts to re-align itself with current market prices.



Interpretation

The T3 Moving Average can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

Name: T3 Moving Average
Function Name Alias: vt_T3MA

Label Mask: T3 MA (%Pr%,%tPr%,%mt%,%b%) = %T3MA%
Placement: Price Frame
Data Inspection Alias: T3 Moving Average

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: Pr
Display Name: Price
Type: price
Default: close

[New] button...

Name: tPr
Display Name: Periods
Type: integer
Default: 8

[New] button...

Name: mt
Display Name: MA Type
Type: MA Type
Default: Exponential

[New] button...

Name: b
Display Name: Volume Factor
Type: float (with bounds)
Default: 0.7
Min Bounds: 0.0000
Max Bounds: 5.0000

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: T3MA
Name: (T3)
Line Color: light blue
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
e1:= Mov(Pr,tPr,mt);  
e2:= Mov(e1,tPr,mt);  
e3:= Mov(e2,tPr,mt);  
e4:= Mov(e3,tPr,mt);  
e5:= Mov(e4,tPr,mt);  
e6:= Mov(e5,tPr,mt);
```

```

c1:= -b*b*b;
c2:= 3*b*b+3*b*b*b;
c3:= -6*b*b-3*b-3*b*b*b;
c4:= 1+3*b+b*b*b+3*b*b;
T3MA:= c1*e6+c2*e5+c3*e4+c4*e3;

```

7. Click the "Save" icon to finish building Tim Tillson's T3 Moving Average.

6.101 Trailing Stoploss Levels (Volatility-Based)

Overview

The Trailing Stoploss Levels (Volatility-Based) indicator is based from Chande & Kroll's "The New Technical Trader", p.167, 'Volatility-Based Trailing Stops'.

The Trailing Stoploss Levels (Volatility-Based) indicator "trails" (or follows) above and below price based on its position respective to the price. It can be set to trail above or below prices based on volatility. Volatility-related settings are available to allow fine-tuning of the indicator.



Interpretation

Trailing Stoploss levels, either volatility-based or pip-based, have become very popular with traders as a non-emotional exit strategy for their trading methodology. Trailing Stoplosses help to remove the emotion usually involved with exiting trades thereby helping to control risk.

In a long position, the trailing stoploss level trails (or follows) below price and ratchets itself higher as prices rise. Conversely, in a short position, the trailing stoploss level trails (or follows) above price and ratchets itself lower as prices fall. However, if price retreats back towards the trailing stoploss level the trailing stoploss level will remain at its previous level never "backing away" from price thus helping to protect potential profits or limit loss. A long trade exit is signaled when price crosses back below the trailing stoploss level. A short trade exit is signaled when price crosses back above the trailing stoploss level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Trailing Stoploss Levels (Volatility-Based)
Function Name Alias: vt_TSLATR
Label Mask:
    Trailing Stoploss Levels (Volatility) (%Pds1%,%Mult%,%Pds2%)
    Long Stop = %ActualStopLong%, Short Stop = %ActualStopShort%
Placement: Price Frame
Data Inspection Alias: Trailing Stoploss Levels (Volatility)
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Pds1
Display Name: ATR Lookback
Type: integer (with bounds)
Default: 10
Min Bounds: 2
Max Bounds: 9999
```

```
[New] button...
Name: Mult
Display Name: ATR Multiplier
Type: float (with bounds)
Default: 3.0000
Min Bounds: 1.0000
Max Bounds: 20.0000
```

```
[New] button...
Name: Pds2
Display Name: Period Lookback
Type: integer (with bounds)
Default: 20
Min Bounds: 2
```

Max Bounds: 9999

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: ActualStopLong
Name: (Long Stoploss)
Line Color: blue
Line Width: thin
Line Type: dashed
```

[New] button...

```
Var Name: ActualStopShort
Name: (Short Stoploss)
Line Color: red
Line Width: thin
Line Type: dashed
```

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
{Volatility Stop (Long)}

PrelimStopLong:= HHV(H,Pds1) - ATR(Pds1)*Mult;
ActualStopLong:= HHV(PrelimStopLong,Pds2);

{Volatility Stop (Short)}

PrelimStopShort:= LLV(L,Pds1) + ATR(Pds1)*Mult;
ActualStopShort:= LLV(PrelimStopShort,Pds2);
```

7. Click the "Save" icon to finish building the Volatility-Based Trailing Stoploss Levels indicator.

6.102 Trailing Stoploss Reversal Level

Overview

The Trailing Stoploss Reversal Level indicator "trails" (or follows) above or below price depending on its position relative to the price. It can be set to trail above or below prices based on volatility or a user-defined number of pips. Volatility-related settings and Pip-based settings are available to allow the user fine-tuning of the indicator.



Interpretation

Trailing Stoploss levels, either volatility-based or pip-based, have become very popular with traders as a non-emotional exit strategy for their trading methodology. Trailing Stoplosses help to remove the emotion usually involved with exiting trades thereby helping to control risk.

In a long position, the trailing stoploss level trails (or follows) below price and ratchets itself higher as prices rise. Conversely, in a short position, the trailing stoploss level trails (or follows) above price and ratchets itself lower as prices fall. However, if price retreats back towards the trailing stoploss level the trailing stoploss level will remain at its previous level never "backing away" from price thus helping to protect potential profits or limit loss. A long trade exit is signaled when price crosses back below the trailing stoploss level. A short trade exit is signaled when price crosses back above the trailing stoploss level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Trailing Stoploss Reversal Level
Function Name Alias: vt_TSL
Label Mask: Trailing Stoploss Reversal Level (%Mode%,%atrperiods%,%
atrsmperiods%,%atrmult%,%Pips%) = %TSL%
```

Placement: Price Frame
Data Inspection Alias: Trailing Stoploss Level

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: price
Display Name: Price
Type: price
Default: close

[New] button...

Name: Mode
Display Name: Trailing Stoploss Mode
Type: Enumeration
Default: click [...] button, **[New]** button, then create the following entries:
 Volatility
 Pips
... then, click **[OK]** button
Default: Volatility

[New] button...

Name: atrperiods
Display Name: If Volatility, ATR Periods
Type: integer
Default: 14

[New] button...

Name: atrsmperiods
Display Name: If Volatility, Wilders ATR Smoothing Periods
Type: integer
Default: 14

[New] button...

Name: atrmult
Display Name: If Volatility, ATR Multiplier
Type: float
Default: 2.8240

[New] button...

Name: Pips
Display Name: If Pips, # of Pips to Trail
Type: integer
Default: 20

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: TSL
Name: (TSL)
Line Color: red
Line Width: thin

Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
_Pips:= Pips*SymbolPoint();
DeltaStop:= if(Mode=0,Wilders(ATR(atrperiods),atrsmp periods)*atrmult,
_Pips);

TSL:= if(BarCount()>(atrperiods+atrsmp periods),
if(ref(price,-1)>PREV(0) AND price>PREV(0),max(PREV(0),price-
DeltaStop),
if(ref(price,-1)<PREV(0) AND price<PREV(0),min(PREV(0),
price+DeltaStop),
if(Cross(price,PREV(0)),price-DeltaStop,
if(Cross(PREV(0),price),price+DeltaStop,
if(price=PREV(0),PREV(0),PREV(0))))),
NULL);
```

7. Click the "Save" icon to finish building the Trailing Stoploss Reversal Level indicator.

6.103 Trend Continuation Factor

Overview

The Trend Continuation Factor (TCF) was introduced by M. H. Pee. in the article "Trend Continuation Factor". It was designed to help identify the market trend and direction.



Interpretation

Positive values of either the PlusTCF or MinusTCF lines indicate a strong prevailing trend. Positive values of PlusTCF indicate a strong Uptrend, while positive values of MinusTCF indicate a strong Downtrend. Both PlusTCF and MinusTCF cannot be positive at the same time since an uptrend and a downtrend cannot occur simultaneously. However, PlusTCF and MinusTCF can both be negative; this signifies market consolidation (the absence of a prevailing trend).

Typical trading strategies include entering Buy positions when PlusTCF is positive and entering Sell positions when MinusTCF is positive. An alternative trading strategy may include entering trades based on the crossings of PlusTCF and MinusTCF.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Trend Continuation Factor
Function Name Alias: vt_TCF
Label Mask:
    Trend Continuation Factor (%prc%,%periods%)
    PlusTCF = %PlusTCF%, MinusTCF = %MinusTCF%
Placement: New Frame
```

Data Inspection Alias: Trend Continuation Factor

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: prc
Display Name: Price
Type: price
Default: close

[New] button...

Name: periods
Display Name: Periods
Type: integer
Default: 35

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: PlusTCF
Name: (PlusTCF)
Line Color: blue
Line Width: thin
Line Type: solid

[New] button...

Var Name: MinusTCF
Name: (MinusTCF)
Line Color: red
Line Width: thin
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
pc:= If(ROC(prc,1,Points)>0,ROC(prc,1,Points),0);  
nc:= If(ROC(prc,1,Points)<0,Neg(ROC(prc,1,Points)),0);  
ncf:= If(nc=0,0,PREV(0)+nc);  
PlusTCF:= Sum(pc,periods)-Sum(ncf,periods);
```

```
pc:= If(ROC(prc,1,Points)>0,ROC(prc,1,Points),0);  
nc:= If(ROC(prc,1,Points)<0,Neg(ROC(prc,1,Points)),0);  
pcf:= If(pc=0,0,PREV(0)+pc);  
MinusTCF:= Sum(nc,periods)-Sum(pcf,periods);
```

7. Click the "Save" icon to finish building the Trend Continuation Factor indicator.

6.104 Trend Intensity Index (TII)

Overview

Developed by M.H. Pee, the trend intensity index (TII) is used to indicate the strength of a current trend in the market. It was introduced in the June 2002 issue of Technical Analysis of Stocks and Commodities magazine.



Interpretation

TII determines the current strength of a price trend based on deviations of previous prices from a current moving average. The stronger the current trend, the more likely the market will continue moving in its current direction instead of changing course. According to M.H. Pee, values >80 and <20 indicate strong trends.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

Name: Trend Intensity Index (TII)

Function Name Alias: vt_TII
Label Mask: Trend Intensity Index (%Pr%,%Periods%,%mt%) = %tii%
Placement: New Frame
Data Inspection Alias: Trend Intensity Index

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

Name: pr
Display Name: Price
Type: price
Default: close

[New] button...

Name: periods
Display Name: Periods
Type: integer
Default: 30

[New] button...

Name: mt
Display Name: MA Type
Type: MA Type
Default: Simple

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: tii
Name: (tii)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +80.0000
Color: red
Width: thin
Type: dashed

[New] button...

Value: +20.0000
Color: red
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
ma:= Mov(Pr,2*periods,mt);  
sdp:= Sum(If(Pr-ma>0, Pr-ma,0),periods);  
sdm:= Sum(If(ma-Pr>0, ma-Pr,0),periods);
```

```
tii:= (sdp/(sdp + sdm)) * 100;
```

- Click the "Save" icon to finish building the Trend Intensity Index (TII) indicator.

6.105 Trend Oscillator (tosc)

Overview

Developed by Dennis Meyers and described in his article entitled "The Japanese Yen, Recursed" published in the December 1998 issue of Technical Analysis of Stocks and Commodities magazine, the Trend Oscillator (a.k.a. tosc) is calculated by calculating the difference between Meyer's Recursive Moving Trend Average (also described in that same article) and an exponential moving average of the same n-periods.



Interpretation

Meyers mentions looking for changes in the price series that are above the normal noise fluctuations indicating that a potential uptrend or downtrend has started. This is accomplished by examining the plot of the tosc.

A potential buy signal is generated when the tosc's value crosses above the "dup" level and a potential

sell signal is generated when the tosc's value crosses below the “-ddn” level.

During Meyer's testing, the optimum “dup” and “-ddn” levels were calculated using optimization, walk-forward testing, out-of-sample testing, and averaging of all testing results.

For additional information, including the mathematical formulas for the Recursive Moving Trend Average and TOSC, please review Dennis Meyer's whitepaper entitled “The Japanese Yen, Recursed” published in 1998, which is available from his website.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Trend Oscillator (tosc)
Function Name Alias: vt_TOSC
Label Mask: Trend Oscillator (tosc) (%Price%,%Periods%) = %TOSC%
Placement: New Frame
Data Inspection Alias: Trend Oscillator
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Price
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: Periods
Display Name: Periods
Type: integer (with bounds)
Default: 21
Min. Bounds: 1
Max. Bounds: 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: TOSC
Name: (TOSC)
Line Color: dark purple
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +0.0000
```

```
Color: black
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
Alpha:= 2/(Periods+1);
Bot:= (1-Alpha)*(If(BarCount()<Periods,Price,PREV(Price)))+Price;
RMTA:= (1-Alpha)*(If(BarCount()<Periods,Price,PREV(Price)))+(Alpha*Abs
(Price+Bot-Ref(Bot,-1)));
TOSC:= RMTA-Mov(Price,Periods,E);
```

7. Click the "Save" icon to finish building the Trend Oscillator (tosc) indicator.

6.106 Trend Trigger Factor (TTF)

Overview

M.H. Pee's article "Trend Trigger Factor" in the December 2004 issue of Technical Analysis of Stocks and Commodities magazine (TASC) presents the Trend Trigger Factor (TTF) indicator. The TTF is a method of detecting up-trends and down-trends using buy power and sell power calculations derived over the previous n-periods.



Interpretation

Typical uses include creating an always-in-the-market system whereby Sell trades are generated when the TTF crosses down through the 100 level and Buy signals are generated when the TTF crosses up through the -100 level.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Trend Trigger Factor
Function Name Alias: vt_TTF
Label Mask: Trend Trigger Factor (%periods%) = %ttf%
Placement: New Frame
Data Inspection Alias: Trend Trigger Factor
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: periods
Display Name: Periods
Type: integer
Default: 15
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: ttf
Name: (ttf)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
Value: +100.0000
Color: red
Width: thin
Type: dashed
```

```
[New] button...
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

[New] button...

Value: -100.0000

Color: red

Width: thin

Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
bp:= HHV(H,periods)-Ref(LLV(L,periods),-periods);
sp:= Ref(HHV(H,periods),-periods)-LLV(L,periods);
ttf:= ((bp-sp)/(0.5*(bp+sp)))*100;
```

7. Click the "Save" icon to finish building the Trend Trigger Factor (TTF) indicator.

6.107 Triple Exponential Average (TRIX)

Overview

Developed by Jack Hutson, the TRIX indicator is a triple-smoothed oscillator designed to eliminate cycles shorter than the selected indicator period. TRIX oscillates above and below a zero line like many other oscillators. However, it can also be used as a momentum indicator. When being used as a momentum indicator, positive values suggest that momentum may be increasing while negative values suggest that momentum may be decreasing.



Interpretation

Trades can be initiated when the TRIX indicator crosses the zero line. A signal line can also be used to generate trade signals. Divergence between the TRIX and price can also be an effective method of generating trades.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Triple Exponential Average (TRIX)
Function Name Alias: vt_TRIX
Label Mask:
    TRIX (%mapr%,%maper%) = %_TRIX%
    TRIX Signal (%TRIXper%) = %TRIX_Signal%
Placement: New Frame
Data Inspection Alias: Triple Exponential Average
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: mapr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: maper
Display Name: Periods
Type: integer
Default: 15
```

[New] button...

```
Name: TRIXper
Display Name: Signal Line Periods
Type: integer
Default: 9
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: _TRIX
Name: (TRIX)
Line Color: blue
Line Width: thin
```

Line Type: solid

[New] button...

Var Name: TRIX_Signal
Name: (TRIX Signal Line)
Line Color: red
Line Width: thin
Line Type: dashed

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

Value: +0.0000
Color: black
Width: thin
Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
MA1:= mov(mapr,maper,E);  
MA2:= mov(ma1,maper,E);  
MA3:= mov(ma2,maper,E);  
  
_TRIX:= (MA3-ref(MA3,-1))/ref(MA3,-1);  
TRIX_Signal:= mov(_TRIX,TRIXper,E);
```

7. Click the "Save" icon to finish building the TRIX indicator.

6.108 Triple Exponential Moving Average (TEMA)

Overview

Developed by Patrick Mulloy and introduced in the January 1994 issue of *Technical Analysis of Stocks & Commodities* magazine, this trend indicator is an acronym standing for "Triple Exponential Moving Average". TEMA was designed to lessen the lag of a regular exponential moving average. It is a composite of a single exponential MA, a double exponential MA, and a triple exponential MA that produces less lag than any of its three components individually; it is NOT a moving average of a moving average.



Interpretation

The TEMA can be used in place of traditional moving averages. Please refer to the "Moving Average" indicator for additional details.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Triple Exponential Moving Average (TEMA)
Function Name Alias: vt_TEMA
Label Mask: TEMA (%pr%,%len%,%mat%) = %_Tema%
Placement: Price Frame
Data Inspection Alias: TEMA
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: pr
Display Name: MA Price
Type: price
Default: close
```

[New] button...

Name: len

Display Name: MA Periods

Type: integer

Default: 20

[New] button...

Name: mat

Display Name: MA Type

Type: MA Type

Default: Exponential

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

Var Name: _Tema

Name: (Tema)

Line Color: blue

Line Width: thin

Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

This indicator requires no horizontal lines.

6. In the **Formula** tab, copy and paste the following formula:

```
_Tema:= 3 * mov(pr,len,mat) - 3 * mov(mov(pr,len,mat),len,mat) + mov(mov(mov(pr,len,mat),len,mat),len,mat);
```

7. Click the "Save" icon to finish building the Triple Exponential Moving Average (TEMA) indicator.

6.109 True Strength Index

Overview

The True Strength Index (TSI) is a variation of the Relative Strength indicator developed by William Blau. It is a momentum-based indicator that combines the leading characteristic of a differencing momentum calculation with the lagging characteristic of an averaging function to create an indicator that reflects price direction and is more in sync with market turns.



Interpretation

The TSI can be used to determine general trend direction as well as overbought-oversold conditions. There are three basic techniques for using the TSI to generate trading signals.

Crossovers: TSI/Signal line Crossover: A buy signal occurs when the TSI crosses above the Signal line and a sell signal occurs when the TSI crosses below the Signal line.

Divergence: Looking for divergences between the TSI and price can prove to be very effective in identifying potential reversal and/or trend continuation points in price movement. There are several types of divergences:

Classic Divergence (aka: Regular Divergence)

- Bullish Divergence = Lower lows in price and higher lows in the TSI
- Bearish Divergence = Higher highs in price and lower highs in the TSI

Hidden Divergence (aka: Reverse, Continuation, Trend Divergence)

- Bullish Divergence = Lower lows in TSI and higher lows in price
- Bearish Divergence = Higher highs in TSI and lower highs in price

Overbought/Oversold Conditions: The TSI can be used to identify potential overbought and oversold conditions in price movements. An Overbought condition is generally described as the TSI being greater than or equal to the +25 level while an oversold condition is generally described as the TSI being less than or equal to the -25 level. Trades can be generated when the TSI crosses these levels. When the TSI crosses above -25 a buy signal is given. Alternatively, when the TSI crosses below +25 a sell signal is

given.

Support/Resistance and “Failure Swings”: Failure swings (a.k.a. support/resistance breakouts) occur when the TSI surpasses a previous high (peak) or falls below a recent low (trough).

TSI / Zero-level Crossover: When the TSI Histogram crosses above 0 a buy signal is given. Alternatively, when the TSI crosses below 0 a sell signal is given.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: True Strength Index
Function Name Alias: vt_TSI
Label Mask:
    TSI (%Pr%,%R%,%Sm%) = %TSI%
    TSI Signal (%Sigp%) = %Sig%
    TSI Histogram = %Hist%
Placement: New Frame
Data Inspection Alias: True Strength Index
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Pr
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: R
Display Name: Smoothing Periods
Type: integer
Default: 20
```

[New] button...

```
Name: Sm
Display Name: Double Smoothing Periods
Type: integer
Default: 13
```

[New] button...

```
Name: Sigp
Display Name: Signal Line Periods
Type: integer
Default: 7
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: TSI
Name: (TSI)
Line Color: blue
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: Sig
Name: (Signal Line)
Line Color: red
Line Width: thin
Line Type: solid
```

[New] button...

```
Var Name: Hist
Name: (Histogram)
Line Color: dark green
Line Width: thin
Line Type: histogram
```

5. In the **Horizontal Line** tab, create the following lines:

[New] button...

```
Value: +25.0000
Color: red
Width: thin
Type: dashed
```

[New] button...

```
Value: +0.0000
Color: black
Width: thin
Type: dashed
```

[New] button...

```
Value: -25.0000
Color: red
Width: thin
Type: dashed
```

6. In the **Formula** tab, copy and paste the following formula:

```
Num:= 100 * Mov(Mov((Pr-ref(Pr,-1)),R,E),Sm,E);
Den:= Mov(Mov(Abs(Pr-ref(Pr,-1)),R,E),Sm,E);

TSI:= if(Den<>0, Num/Den, 0);
Sig:= mov(tsi,Sigp,E);
Hist:= TSI - Sig;
```

7. Click the "Save" icon to finish building the True Strength Index indicator.

6.110 Ulcer Index

Overview

Developed in 1987 by Peter G. Martin and published in 1989 in the book entitled “The Investor’s Guide to Fidelity Funds: Winning Strategies for Mutual Fund Investors” by Peter G. Martin and Byron B. McCann, the Ulcer Index was mainly used by traders to measure short-term risk associated with trading instruments such as stocks, indices, mutual funds, and/or commodities.

The Ulcer Index defines the riskiness (or “stress”) of a trading instrument by only considering the downside volatility. This differs from other risk indicators such as standard deviation which consider both upside and downside volatility in their calculations. Since the Ulcer Index is based on the notion that only downside volatility is bad and upside volatility is good, it is calculated by measuring the depth and duration (severity) of drawdowns from recent peaks (highs) in price. According to Martin, the Ulcer Index “is the square root of the mean of the squared percentage drops in value”.



Interpretation

High Ulcer Index values correspond to high levels of risk associated with the trading instrument. According to Martin, “the greater a drawdown in value, and the longer it takes to recover to earlier highs, the higher the UI”.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Ulcer Index
Function Name Alias: vt_UlcerIndex
Label Mask: Ulcer Index (%Price%,%Periods%) = %Ulcer%
Placement: New Frame
Data Inspection Alias: Ulcer Index
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: Price
Display Name: Price
Type: price
Default: close
```

[New] button...

```
Name: Periods
Display Name: Periods
Type: integer (with bounds)
Default: 10
Min. Bounds: 1
Max. Bounds: 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...

```
Var Name: Ulcer
Name: (UI)
Line Color: dark red
Line Width: slightly thicker
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
This indicator requires no horizontal lines.
```

6. In the **Formula** tab, copy and paste the following formula:

```
Ulcer:= Sqrt(Sum(Power(100*(HHV(Price,Periods)-Price)/(HHV(Price,
Periods)),2),Periods)/Periods);
```

7. Click the "Save" icon to finish building the Ulcer Index indicator.

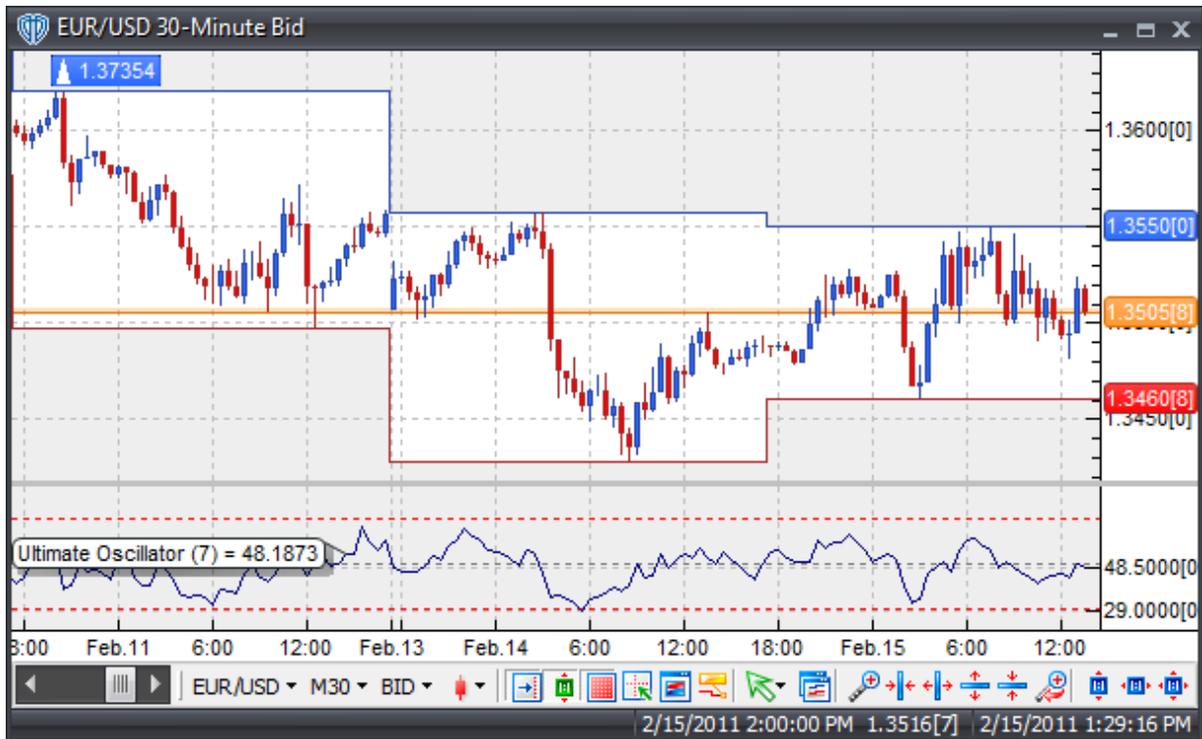
6.111 Ultimate Oscillator

Overview

In the April, 1985 issue of Technical Analysis of Stocks & Commodities magazine Larry Williams stated,

"The trouble for most oscillator workers was, and has continued to be, that while frequently oscillators lead sometimes they lead far too early and, instead of buying a bottom, you are buying falling daggers and getting sliced up. Even the best oscillators consistently give premature buy and sell signals."

The Ultimate Oscillator combines the weighted sums of price action from three different n-periods of time to create an oscillator that ranges from 0 to 100. Values of 70 and above are considered to be overbought while values of 30 and below are considered to be oversold. The time frames typically used for the Ultimate Oscillator are 7 periods (short-term), 14 periods (intermediate-term), and 28 periods (long-term). It's important to note that these time periods overlap each other. In other words, the 28-period time frame encompasses both the 14-period time frame and the 7-period time frame.



Interpretation

Larry Williams defined very specific criteria for generating buy and sell signals using the Ultimate Oscillator.

According to Williams, a buy signal occurs when...

1. There is Bullish divergence between the price and Ultimate Oscillator (price makes lower lows while oscillator makes higher lows)
2. During the divergence the oscillator has fallen below 30
3. The Ultimate Oscillator has risen above its high created during the divergence (i.e. the high between the two lows)

The buy position is closed when the Ultimate Oscillator rises above 70, or rises above 50 and then falls back below 45.

Conversely, a sell signal occurs when...

1. There is Bearish divergence between price and the Ultimate Oscillator (price makes higher highs while oscillator makes lower highs)
2. During the divergence the oscillator has risen above 70
3. The Ultimate Oscillator has fallen below its low created during the divergence (i.e. the low between the two highs)

The sell position is closed when the Ultimate Oscillator falls below 30 or rises back above 65.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Ultimate Oscillator
Function Name Alias: vt_Ultimate
Label Mask: Ultimate Oscillator (%STPeriods%) = %UltimateOscillator%
Placement: New Frame
Data Inspection Alias: Ultimate Oscillator
```

3. In the **Input Variable(s)** tab, create the following variables:

[New] button...

```
Name: STPeriods
Display Name: Short-Term Periods
Type: integer
Default: 7
```

[New] button...

```
"Read Only" Enabled
Name: blank1
Display Name: Medium-Term = 2x Short-Term
Type: Enumeration
Default: NULL
```

[New] button...

```
"Read Only" Enabled
```

Name: blank2
 Display Name: Long-Term = 4x Short-Term
 Type: Enumeration
 Default: NULL

4. In the **Output Variable(s)** tab, create the following variables:

[New] button...
 Var Name: UltimateOscillator
 Name: (UO)
 Line Color: dark blue
 Line Width: thin
 Line Type: solid

5. In the **Horizontal Line** tab, create the following lines:

[New] button...
 Value: +70.0000
 Color: red
 Width: thin
 Type: dashed

[New] button...
 Value: +50.0000
 Color: gray
 Width: thin
 Type: dashed

[New] button...
 Value: +30.0000
 Color: red
 Width: thin
 Type: dashed

6. In the **Formula** tab, copy and paste the following formula:

```
TL:= min(L,ref(C,-1));
BP:= C-TL;
TR:= max((H-L),max((H-ref(C,-1)),ref(C,-1)-L));
BPSum1:= sum(BP,STPeriods);
BPSum2:= sum(BP,(STPeriods*2));
BPSum3:= sum(BP,(STPeriods*4));
TRSum1:= sum(TR,STPeriods);
TRSum2:= sum(TR,(STPeriods*2));
TRSum3:= sum(TR,(STPeriods*4));
RawUO:= 4*(BPSum1/TRSum1)+2*(BPSum2/TRSum2)+(BPSum3/TRSum3);
UltimateOscillator:= (RawUO/(4+2+1))*100;
```

7. Click the "Save" icon to finish building the Ultimate Oscillator indicator.

6.112 Volatility Quality Index

Overview

The Volatility Quality Index was described by Thomas Stridsman in the August 2002 edition of Technical Analysis of Stocks and Commodities magazine.



Interpretation

Unknown.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button
2. In the **General** tab, type the following text for each field:

```
Name: Volatility Quality Index
Function Name Alias: vt_VQI
Label Mask:
  Volatility Quality Index = %SumVQI%
  VQI Short MA (%ShMaPeriods%) = %ShortMa_SumVQI%
```

```
VQI Long MA (%LgMaPeriods%) = %LongMa_SumVQI%  
Placement: New Frame  
Data Inspection Alias: Volatility Quality Index
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...  
Name: ShMaPeriods  
Display Name: Short MA Periods  
Type: integer (with bounds)  
Default: 9  
Min. Bounds: 1  
Max. Bounds: 9999
```

```
[New] button...  
Name: LgMaPeriods  
Display Name: Long MA Periods  
Type: integer (with bounds)  
Default: 200  
Min. Bounds: 1  
Max. Bounds: 9999
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...  
Var Name: SumVQI  
Name: (VQI)  
Line Color: dark green  
Line Width: thin  
Line Type: solid
```

```
[New] button...  
Var Name: ShortMa_SumVQI  
Name: (VQI Short MA)  
Line Color: red  
Line Width: thin  
Line Type: solid
```

```
[New] button...  
Var Name: LongMa_SumVQI  
Name: (VQI Long MA)  
Line Color: yellow  
Line Width: thin  
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
This indicator requires no horizontal lines.
```

6. In the **Formula** tab, copy and paste the following formula:

```
TR:= ATR(1);  
Cl:= Ref(C,-1);
```

```
VQI:= If(TR<>0 AND (H-L)<>0, ((C-C1/TR)+((C-O)/(H-L)))*0.5,Prev(0));
VQI:= Abs(VQI)*((C-C1+(C-O))*0.5);
SumVQI:= Cum(VQI);
ShortMa_SumVQI:= Mov(SumVQI,ShMaPeriods,S);
LongMa_SumVQI:= Mov(SumVQI,LgMaPeriods,S);
```

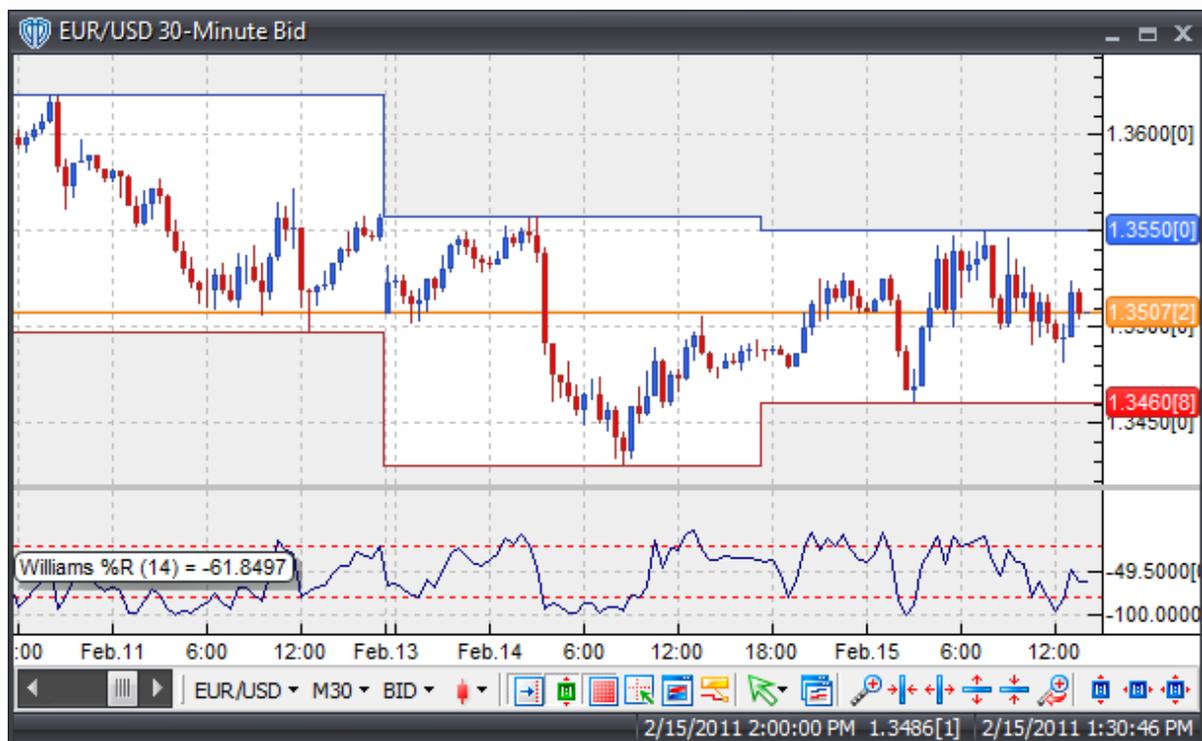
7. Click the "Save" icon to finish building the Volatility Quality Index indicator.

6.113 Williams Percent Range (%R)

Overview

Developed by Larry Williams, the Williams %R (pronounced "percent R") indicator is a momentum oscillator used to measure overbought and oversold levels. It's very similar to the Stochastic Oscillator except that the %R is plotted upside-down on a negative scale from 0 to -100 and has no internal smoothing.

The %R defines the relationship of the close price relative to the High-Low range over n-Periods. The nearer the close price is to the highest high of the range the nearer to zero the reading will be. Alternatively, the nearer the close price is to the lowest low of the range the nearer to -100 the reading will be. If the close price equals the highest high of the range the reading will be 0; if the close price equals the lowest low of the range to reading will be -100.



Interpretation

As an overbought/oversold indicator, Williams %R values from 0 to -20 are considered overbought while values from -80 to -100 are considered oversold. An interesting phenomenon of the %R indicator is its uncanny ability to anticipate a reversal in the underlying trading instrument's price.

Construction

1. Click the **Ribbon>Technical Analysis** menu>**Indicators** group>**Indicator Builder** command>**Indicator Builder** window's **[New]** button

2. In the **General** tab, type the following text for each field:

```
Name: Williams %R
Function Name Alias: vt_WilliamsR
Label Mask: Williams %%R (%Periods%) = %R%
Placement: New Frame
Data Inspection Alias: Williams %R
```

3. In the **Input Variable(s)** tab, create the following variables:

```
[New] button...
Name: Periods
Display Name: Periods
Type: integer
Default: 14
```

4. In the **Output Variable(s)** tab, create the following variables:

```
[New] button...
Var Name: R
Name: (%R)
Line Color: dark blue
Line Width: thin
Line Type: solid
```

5. In the **Horizontal Line** tab, create the following lines:

```
[New] button...
Value: -20.0000
Color: red
Width: thin
Type: dashed
```

```
[New] button...
Value: -80.0000
Color: red
Width: thin
Type: dashed
```

4. In the **Formula** tab, copy and paste the following formula:

```
R:= ((HHV(H,Periods)-C) / (HHV(H,Periods) - LLV(L,Periods))) * -100;
```

5. Click the "Save" icon to finish building the Williams %R indicator.

Trading Systems

Part



7 Trading Systems

A trading system, simply defined, consists of a concise set of non-emotional, objective rules based on measurable factors that are used to describe when to buy and sell a trade instrument. A trading system can generate various types of alerts based on pre-defined conditions and request automated trading actions* to be taken on those conditions.

VT Trader provides clients with several automated trading systems. These trading systems generate alerts based on some of the most common ways that many of VT Trader's standard technical indicators are used or can be used for technical analysis. These trading systems can be generally categorized into: breakout methods, trend/momentum trading methods, and range/counter-trend trading methods.

While fully functional and able to execute automated trades while attached to a chart and running in *Auto-Trade* mode, these trading systems are meant to serve only as examples of some types of systems that can be created using VT Trader's [Trading Systems Builder](#)^[203] and [scripting language](#)^[329]. These trading systems are not to be construed as recommendations for trading strategies nor does Visual Trading Systems LLC or its affiliates have access to or maintain records relating to potential profitability (*a.k.a. backtests*) of the sample automated trading systems. * **Please note:** Certain rules and restrictions apply to any trading system running in *Auto-Trade* mode. It is **STRONGLY** recommended that you take a few minutes to read through the **Automated Trading FAQ for trading systems** by [clicking here](#)^[148].

Below is an alphabetical listing of the automated trading systems. Click on the trading system's name for full details.

[A](#)^[723] [B](#)^[723] [C](#)^[723] [D](#)^[724] [E](#)^[724] [F](#)^[724] [G](#)^[724] [H](#)^[724] [I](#)^[724] [J](#)^[724] [K](#)^[724] [L](#)^[725] [M](#)^[725] [N](#)^[725] [O](#)^[725] [P](#)^[725] [Q](#)^[725] [R](#)^[726] [S](#)^[726] [T](#)^[726] [U](#)^[726] [V](#)^[726] [W](#)^[726] [X](#)^[726] [Y](#)^[727] [Z](#)^[727]

A

[Aroon Oscillator Cross System](#)^[727]

B

[Balance of Power Cross System](#)^[730]
[Bollinger Bands Breakout System](#)^[734]
[Bollinger Bands Reversal System](#)^[738]
[Bull / Bear Heikin-Ashi Candlesticks Reversal System](#)^[742]
[Bull / Bear Japanese Candlesticks Reversal System](#)^[745]

C

[Chande's Dynamic Momentum Index Cross System](#)^[749]
[Chande's Dynamic Momentum Index Reversal System](#)^[753]
[Chande's QStick Cross System](#)^[757]
[Chande's Trend Momentum System](#)^[761]
[Chande's TrendScore Trend Surfing System](#)^[765]
[Chande's VIDYA Cross System](#)^[769]
[Chaos Accelerator Oscillator Cross System](#)^[773]
[Chaos Accelerator Oscillator Reversal System](#)^[777]

[Chaos Awesome Oscillator / Signal Line Cross System](#) ^[781]
[Chaos Awesome Oscillator / Zero Cross System](#) ^[785]
[Chaos Awesome Oscillator Reversal System](#) ^[789]
[Chaos Fractals Breakout System](#) ^[793]
[Chaos Fractals Reversal System](#) ^[797]
[Commodity Channel Index \(CCI\) Complex Cross System](#) ^[801]
[Commodity Channel Index \(CCI\) Cross System](#) ^[805]
[Commodity Channel Index \(CCI\) Reversal System](#) ^[809]
[Complex Trend System #1 \(Fast MA / Slow MA / RSI / MACD\)](#) ^[813]

D

[Darvas Box Breakout System](#) ^[817]
[Detrended Price Oscillator \(DPO\) Cross System](#) ^[821]
[Directional Movement Index "Extreme Price Rule" System](#) ^[825]
[Directional Movement Index Cross System](#) ^[829]
[Disparity Index Cross System](#) ^[833]
[Disparity Index Reversal System](#) ^[837]
[Donchian Channel Breakout System](#) ^[841]
[Double Exponential Moving Average \(DEMA\) Cross System](#) ^[845]
[Double Stochastic Oscillator Cross System](#) ^[849]
[Double Stochastic Oscillator Reversal Cross System](#) ^[852]

E

[Ehlers Fisher Transform Cross System](#) ^[856]
[Ehlers Laguerre Relative Strength Index Cross System](#) ^[860]
[Ehlers Laguerre Relative Strength Index Reversal System](#) ^[864]
[Ehlers MAMA / FAMA Cross System](#) ^[868]
[Ehlers Relative Vigor Index Cross System](#) ^[871]

F

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G

[Gann Basic "Swing Chartist" System](#) ^[875]

H

[Hull Moving Average Cross System](#) ^[879]

I

[Ichimoku Kinko Huo "Strong Signals" System](#) ^[883]
[Inertia Cross System](#) ^[888]

J

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K

[Kase CD Cross System](#)^[891]
[Kase Peak Oscillator Cross System](#)^[895]
[Kaufman's Adaptive Moving Average \(KAMA\) Cross System](#)^[899]
[Kaufman's Efficiency Ratio UpTrend / DownTrend System](#)^[903]
[Keltner Bands Breakout System](#)^[907]
[Keltner Bands Reversal System](#)^[911]
[Keltner Channels Breakout System](#)^[915]
[Keltner Channels Reversal System](#)^[919]
[Kurtosis Cross System](#)^[923]

L

[Linear Regression Cross System](#)^[927]
[Linear Regression Reversal System](#)^[931]
[Linear Regression Slope Cross System](#)^[934]
[Linear Regression Slope High / Low Breakout System](#)^[938]
[Linear Regression Slope Tops / Bottoms Reversal System](#)^[942]

M

[MACD Fast Line / Signal Line Cross System](#)^[946]
[MACD Fast Line / Zero Cross System](#)^[950]
[MACD Histogram High / Low Breakout System](#)^[954]
[MACD Histogram Tops and Bottoms Reversal System](#)^[958]
[McClellan Oscillator Cross System](#)^[962]
[McClellan Summation Index Cross System](#)^[966]
[McGinley Dynamic Cross System](#)^[970]
[Momentum Cross System](#)^[974]
[Moving Average Envelope Breakout System](#)^[978]
[Moving Average Envelope Reversal System](#)^[982]
[Moving Averages Cross System](#)^[986]
[Moving Averages Double Cross System](#)^[991]
[Moving Slope Rate of Change Cross System](#)^[995]

N

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O

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P

[Parabolic SAR Reversal System](#)^[999]
[Percentage Price Oscillator / Signal Line Cross System](#)^[1003]
[Percentage Price Oscillator / Zero Cross System](#)^[1007]
[Percentage Price Oscillator Histogram High / Low Breakout System](#)^[1011]
[Percentage Price Oscillator Histogram Tops / Bottoms Reversal System](#)^[1015]
[Polarized Fractal Efficiency Cross System](#)^[1019]

Q

[Quantitative Qualitative Estimation \(QQE\) Cross System](#) 

R

[Rate of Change \(ROC\) Cross System](#) 
[Relative Momentum Index Cross System](#) 
[Relative Momentum Index Reversal System](#) 
[Relative Strength Index \(RSI\) Cross System](#) 
[Relative Strength Index \(RSI\) Reversal System](#) 
[Relative Volatility Index \(RVI\) Cross System](#) 
[Relative Volatility Index \(RVI\) Reversal System](#) 
[RSI Bollinger Bands Breakout System](#) 
[RSI Bollinger Bands Reversal System](#) 
[RSI Moving Averages Cross System](#) 

S

[Schaff Trend Cycle Double Reversal System](#) 
[Schaff Trend Cycle Reversal System](#) 
[Slow Stochastic Oscillator Cross System](#) 
[Slow Stochastic Oscillator Reversal Cross System](#) 
[STARC Bands Reversal System](#) 
[Stochastic Momentum Index Cross System](#) 

T

[T3 Moving Average Cross System](#) 
[Trailing Stoploss Reversal Level Cross System](#) 
[Trend Continuation Factor Cross System](#) 
[Trend Continuation Factor Strong Trend System](#) 
[Trend Trigger Factor \(TTF\) Reversal System](#) 
[Triple Exponential Average \(TRIX\) Cross System](#) 
[Triple Exponential Moving Average \(TEMA\) Cross System](#) 
[True Strength Index Cross System](#) 

U

[Ultimate Oscillator / Signal Line Cross System](#) 
[Ultimate Oscillator Cross System](#) 
[Ultimate Oscillator Reversal System](#) 

V

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W

[Williams Percent Range \(%R\) Cross System](#) 
[Williams Percent Range \(%R\) Reversal System](#) 

X

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Y

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Z

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RISK DISCLAIMER

Past performance is not indicative of future results. Trading foreign exchange and futures on margin carries a high level of risk, and may not be suitable for all investors. The high degree of leverage can work against you as well as for you. Before deciding to invest in foreign exchange or futures you should carefully consider your investment objectives, level of experience, and risk appetite. The possibility exists that you could sustain a loss of some or all of your initial investment and therefore you should not invest money that you cannot afford to lose. You should be aware of all the risks associated with foreign exchange and futures trading, and seek advice from an independent financial advisor if you have any doubts.

The materials presented in this manual are solely for informational purposes. No offer or solicitation to buy or sell currencies or commodities, or any type of investment or trading advice or strategy, is made, given or in any manner endorsed by Visual Trading Systems LLC or its affiliates. You are fully responsible for any investment or trading decisions you make, and such decisions should be based solely on your evaluation of your financial circumstances, investment or trading objectives, risk tolerance and liquidity needs.

7.1 Aroon Oscillator Cross System

Overview

The **Aroon Oscillator Cross System** uses the Aroon Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Aroon Oscillator crosses above zero.

A *Short* signal is generated when the Aroon Oscillator crosses below zero.

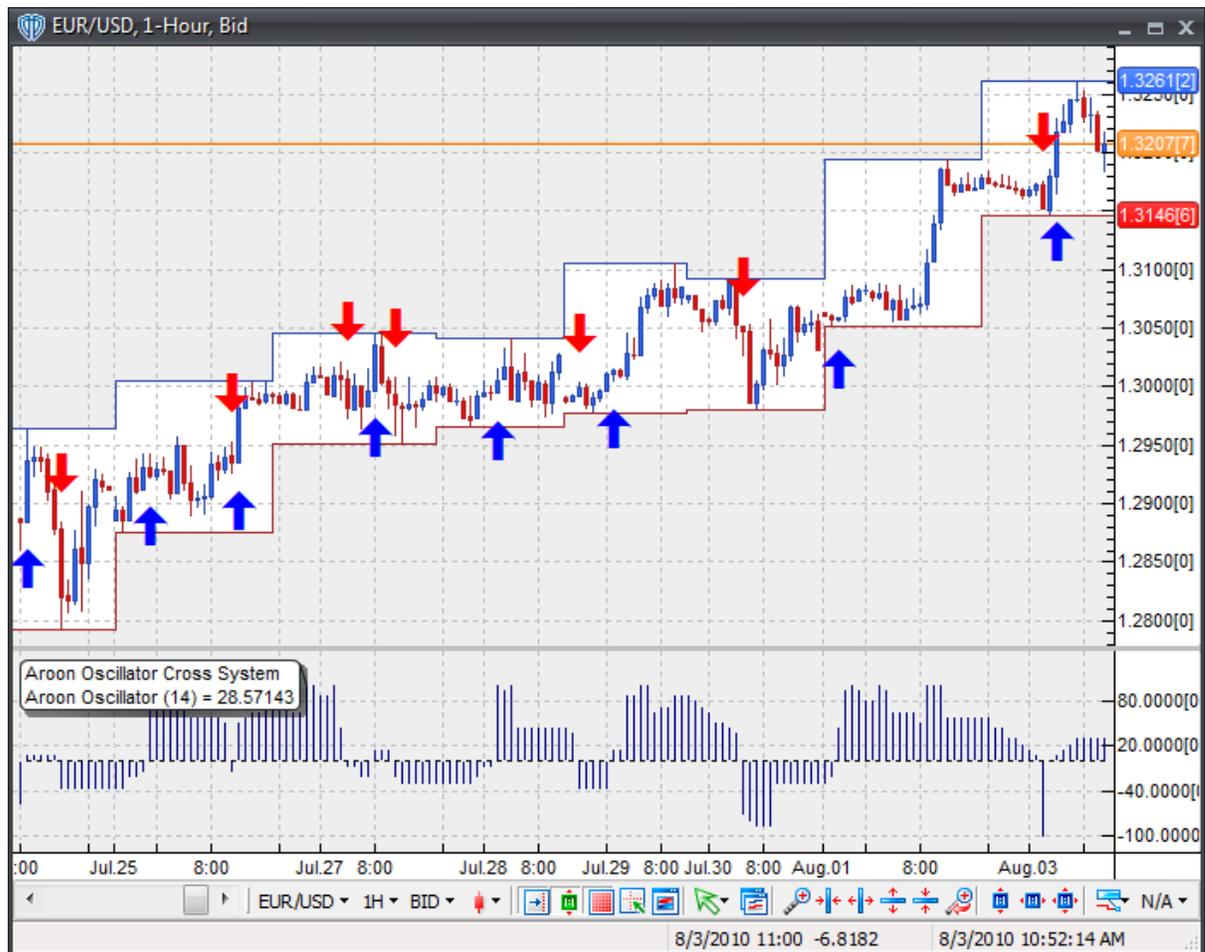
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Aroon Oscillator Cross System** consists of the following output variables and display parameters:

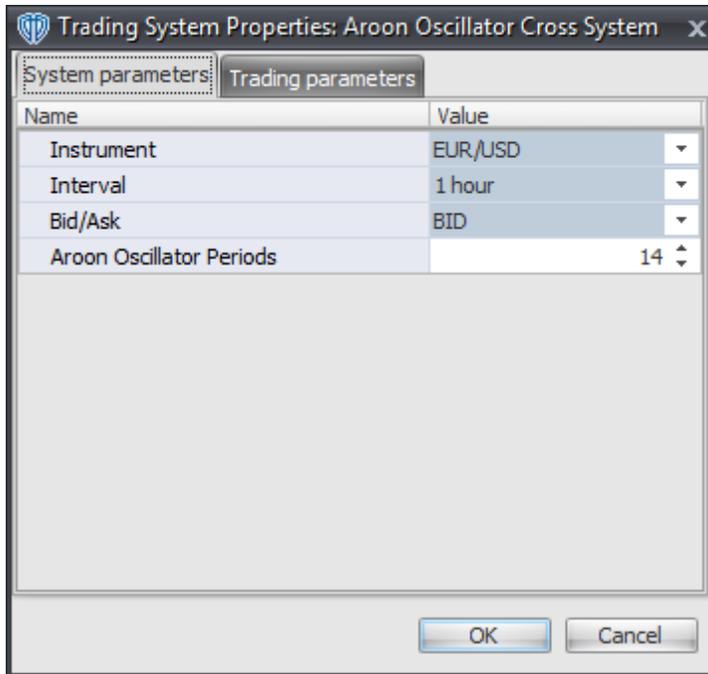
- The Aroon Oscillator displays in Additional Frame 1 as a blue histogram.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Aroon Oscillator crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Aroon Oscillator crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Aroon Oscillator Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

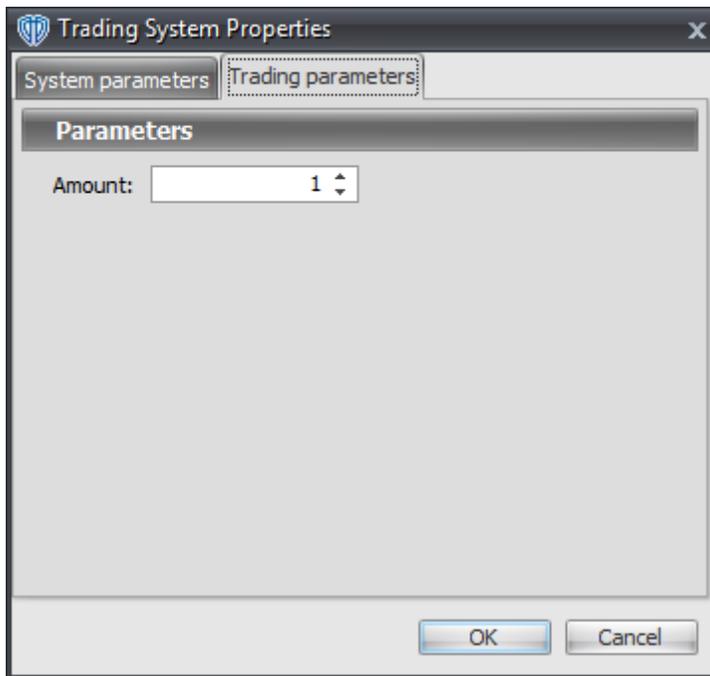
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Aroon Oscillator Periods

This parameter defines the number of periods used to calculate the Aroon Oscillator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.2 Balance of Power Cross System

Overview

The **Balance of Power Cross System** uses the Balance of Power (BOP) indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the BOP crosses above zero.

A *Short* signal is generated when the BOP crosses below zero.

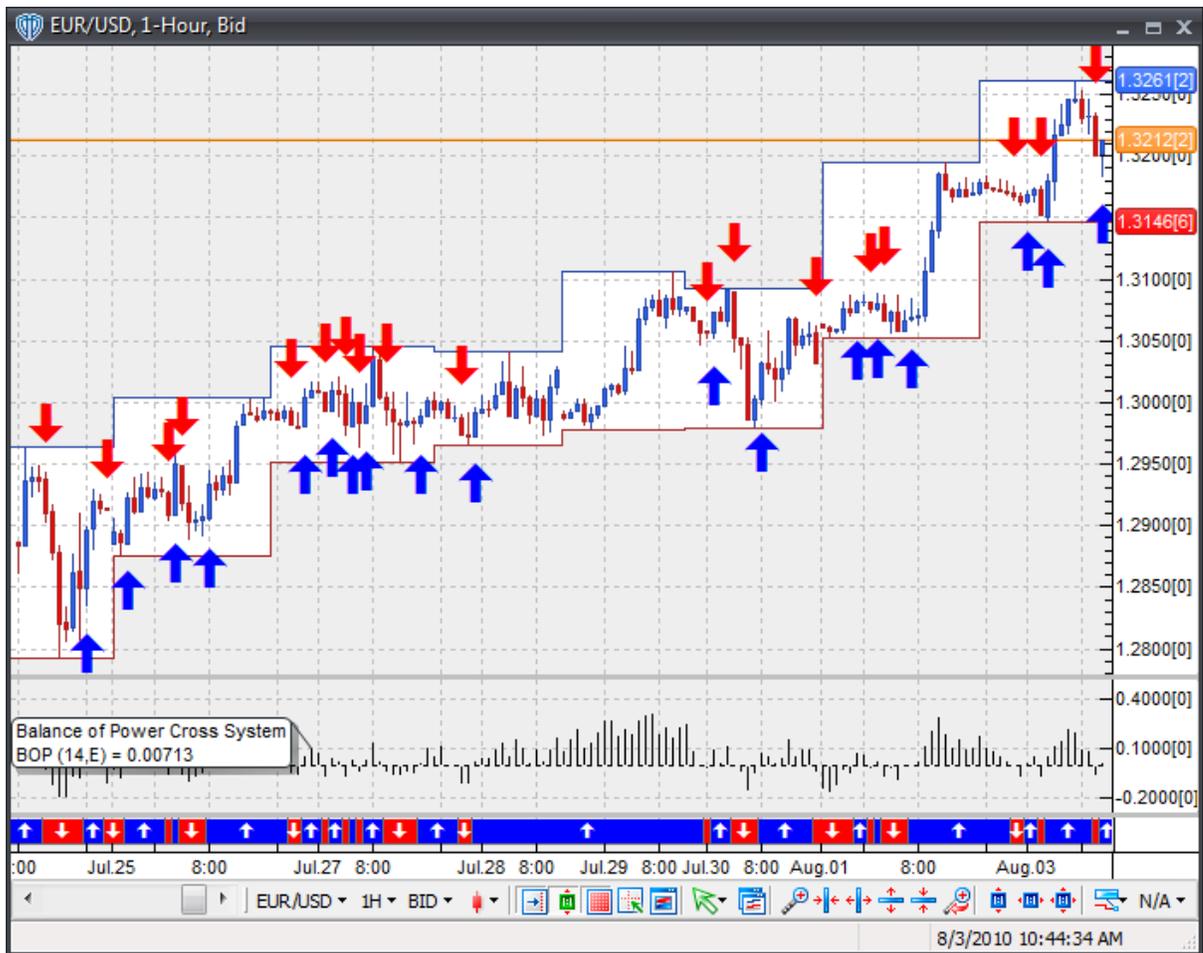
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Balance of Power Cross System** consists of the following output variables and display parameters:

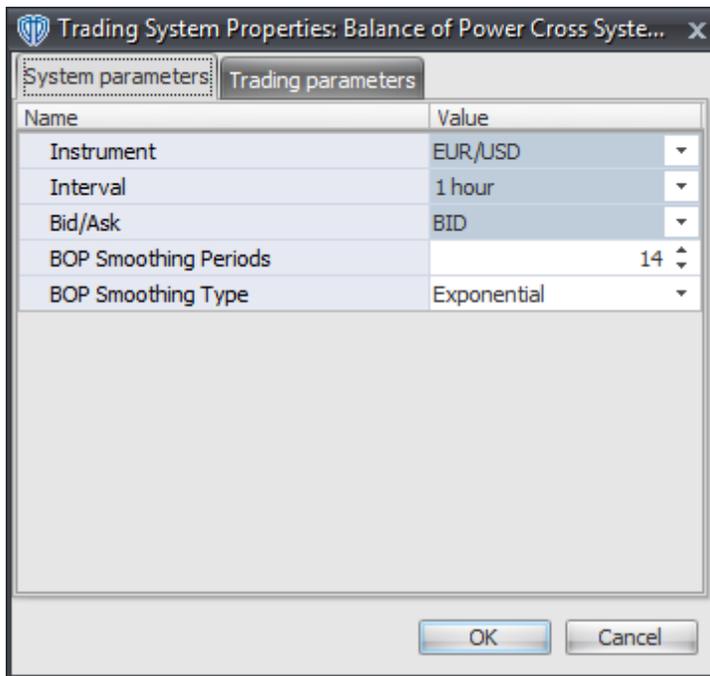
- The Balance of Power (BOP) indicator displays in Additional Frame 1 as a black histogram. Its mid-level (0) displays in the same frame as a dashed black line.
- The Trend Frame displays a white up arrow against a blue background while the BOP is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the BOP is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Balance of Power crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Balance of Power crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Balance of Power Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

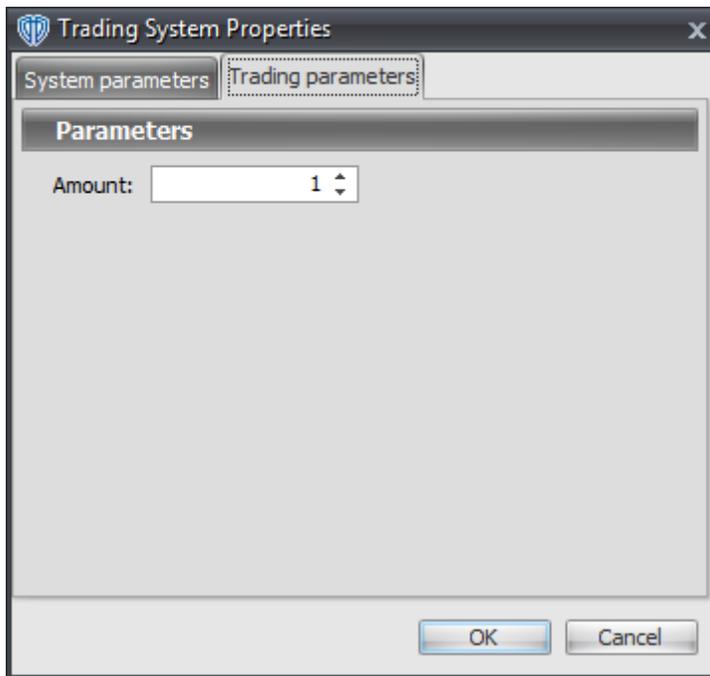
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

BOP Smoothing Periods and DOP Smoothing Type

These parameters define the number of periods and the type of moving average used to used to calculate the Balance of Power (BOP) indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.3 Bollinger Bands Breakout System

Overview

The **Bollinger Bands Breakout System** uses Bollinger Bands to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the upper Bollinger Band. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the upper Bollinger Band breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the lower Bollinger Band. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the lower Bollinger Band breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input

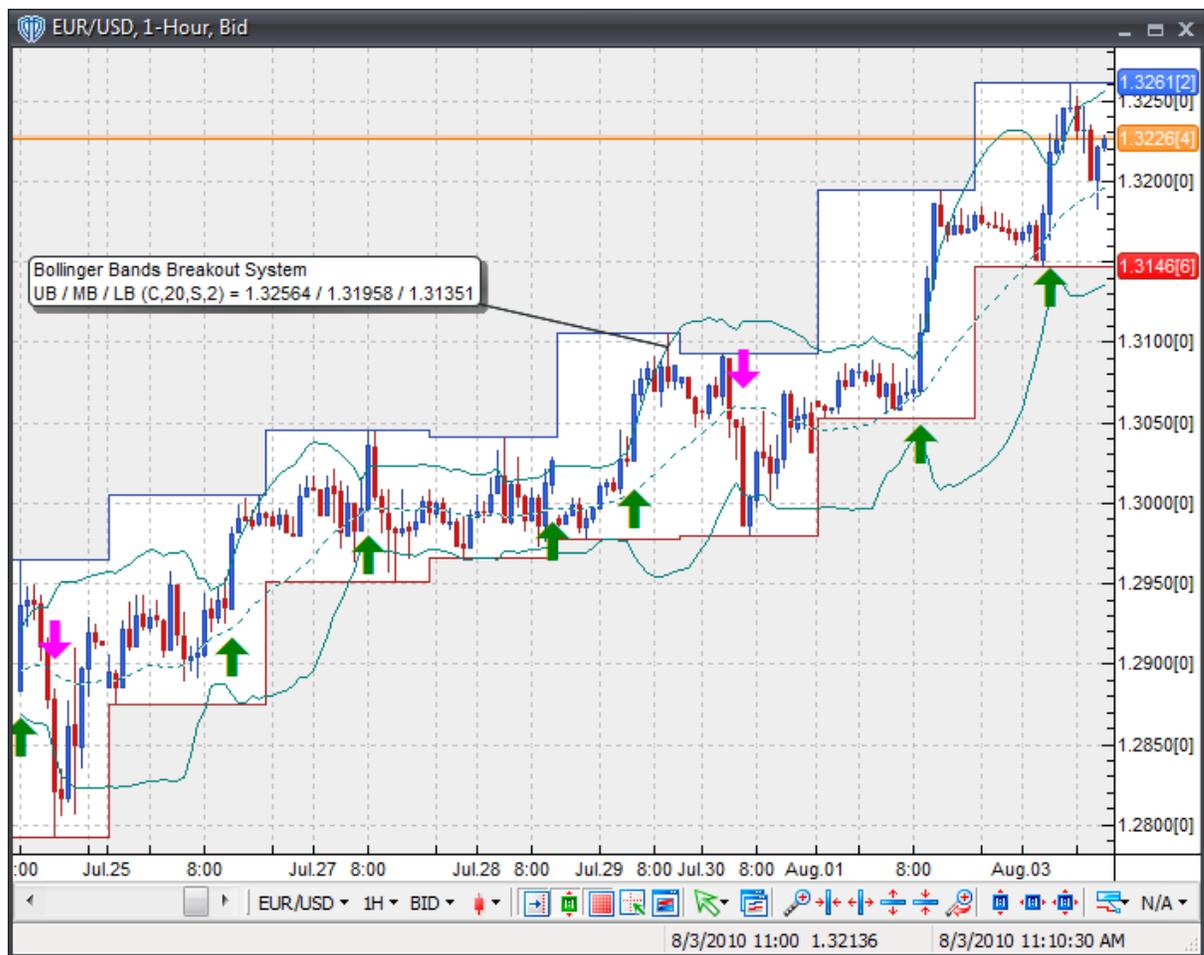
selection is chosen.

System Outputs and Signals Logic

The **Bollinger Bands Breakout System** consists of the following output variables and display parameters:

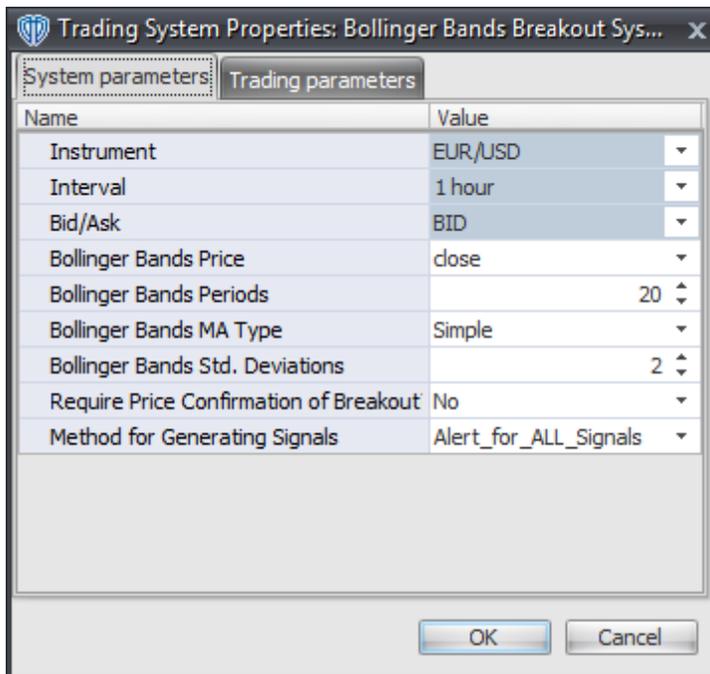
- The upper and lower Bollinger Bands display in the Price Frame as thin, solid, green lines. The middle Bollinger Band displays in the Price Frame as a thin, dashed, green line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the upper Bollinger Band breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the lower Bollinger Band breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above the Upper Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below the Lower Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Bollinger Bands Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Bollinger Bands Price, Periods, MA Type, and Std. Deviations

These parameters define price, number of periods, MA Type, and number of standard deviations used to calculate the Bollinger Bands.

Require Price Confirmation of Breakout?

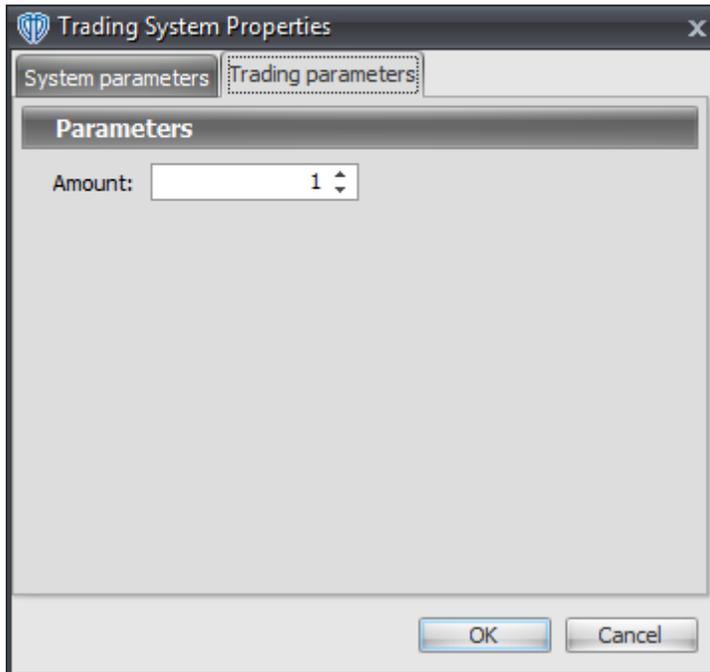
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.4 Bollinger Bands Reversal System

Overview

The **Bollinger Bands Reversal System** uses Bollinger Bands to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the price reverses from the lower Bollinger Band using either a 1-bar or 2-bar reversal formation.

- Long 1-Bar Formation = Close price > Open price AND Close price > Lower Bollinger Band AND Low price <= Lower Bollinger Band
- Long 2-Bar Formation = Close price > Open price AND Close price > Lower Bollinger Band AND Close price > Open price 1 bar ago AND Close price 1 bar ago < Open price 1 bar ago AND Low price 1 bar ago <= Lower Bollinger Band 1 bar ago

A *Short* signal is generated when the price reverses from the upper Bollinger Band using either a 1-bar or 2-bar reversal formation.

- Short 1-Bar Formation = Close price < Open price AND Close price < Upper Bollinger Band AND

High price \geq Upper Bollinger Band

- Short 2-Bar Formation = Close price $<$ Open price AND Close price $<$ Upper Bollinger Band AND Close price $<$ Open price 1 bar ago AND Close price 1 bar ago $>$ Open price 1 bar ago AND High price 1 bar ago \geq Upper Bollinger Band 1 bar ago

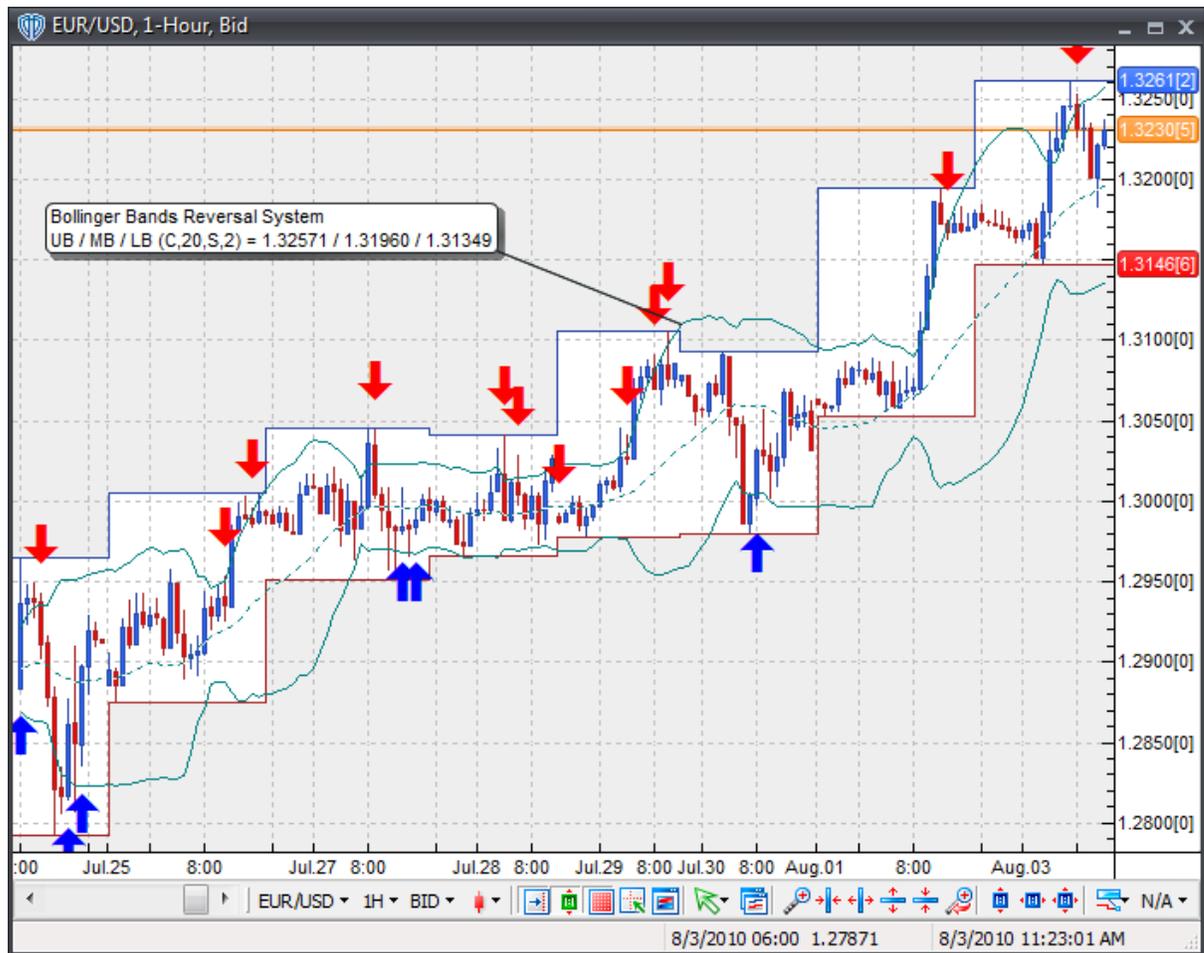
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Bollinger Bands Reversal System** consists of the following output variables and display parameters:

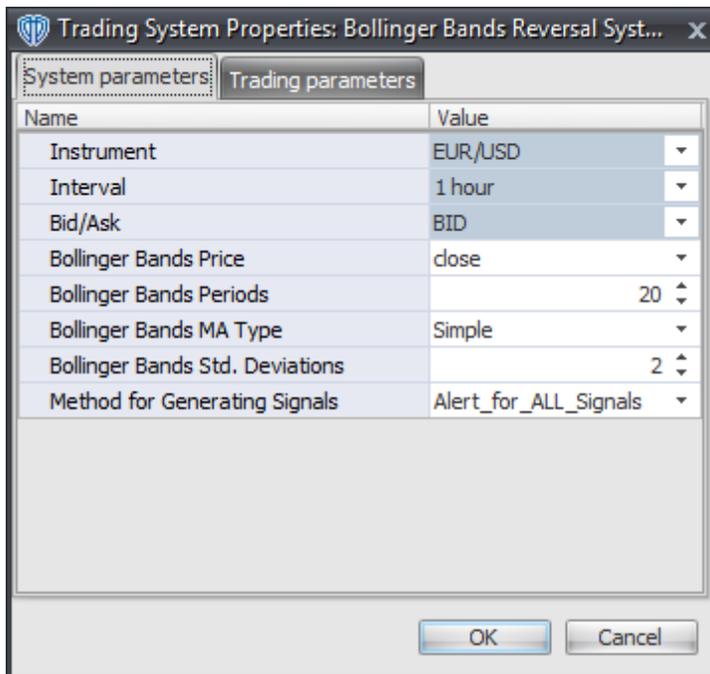
- The upper and lower Bollinger Bands display in the Price Frame as thin, solid, green lines. The middle Bollinger Band displays in the Price Frame as a thin, dashed, green line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Price is potentially reversing from Lower Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Price is potentially reversing from the Upper Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Bollinger Bands Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Bollinger Bands Price, Periods, MA Type, and Std. Deviations

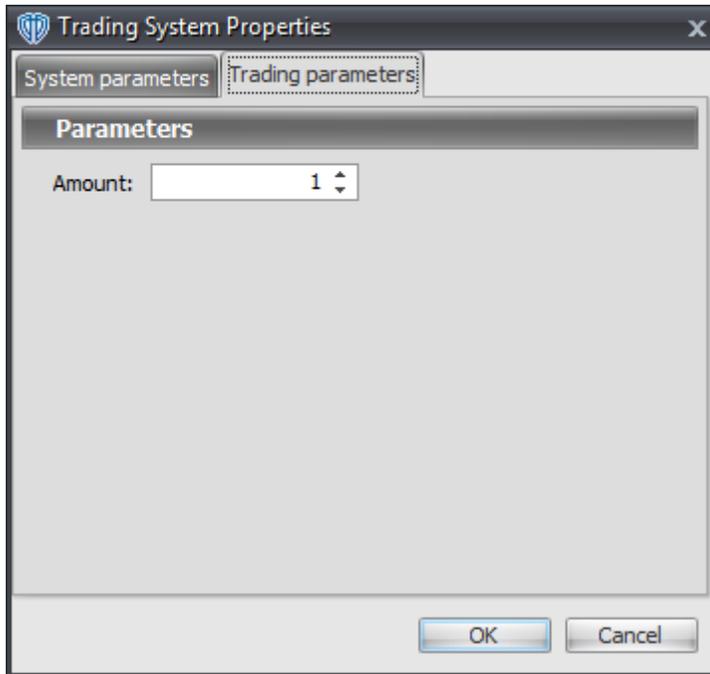
These parameters define price, number of periods, MA Type, and number of standard deviations used to calculate the Bollinger Bands.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.5 Bull / Bear Heikin-Ashi Candlesticks Reversal System

Overview

The **Bull / Bear Heikin-Ashi Candlesticks Reversal System** uses the Heikin-Ashi candlesticks to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the specified number of consecutive Bull Heikin-Ashi candlesticks form. A Bull candlestick forms when its Close price is greater than its Open price.

A *Short* signal is generated when the specified number of consecutive Bear Heikin-Ashi candlesticks form. A Bear candlestick forms when its Close price is less than its Open price.

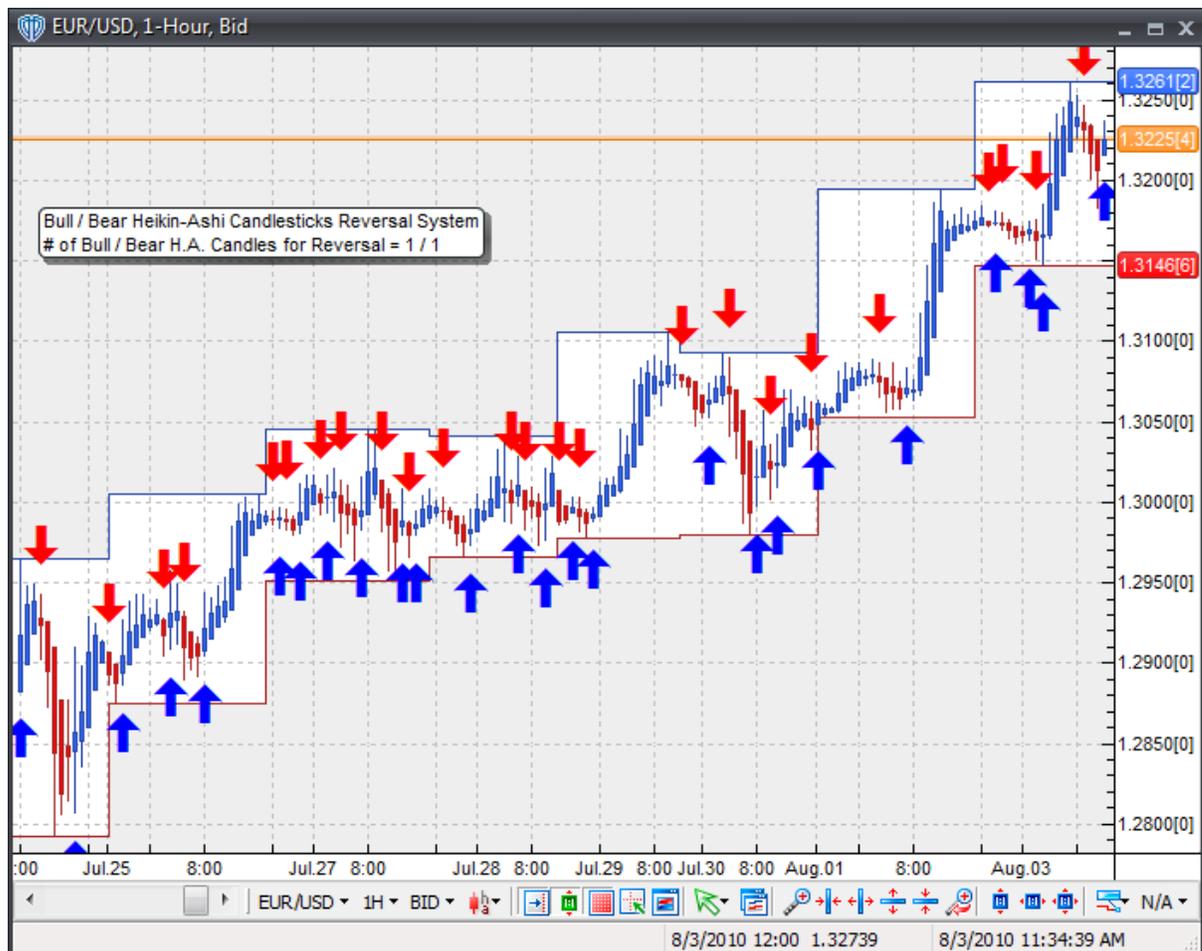
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Bull / Bear Heikin-Ashi Candlesticks Reversal System** consists of the following output variables and display parameters:

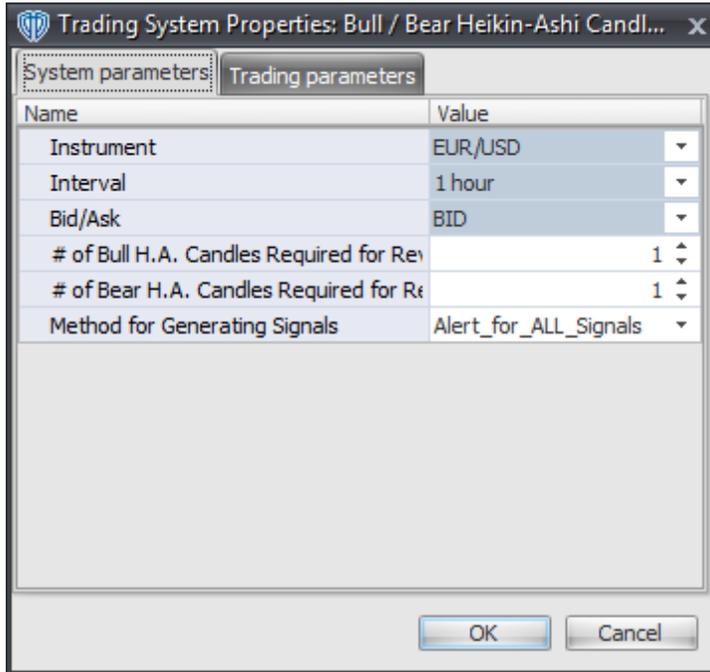
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Bull Heikin-Ashi Candle(s) formation suggests a potential price reversal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Bear Heikin-Ashi Candle(s) formation suggests a potential price reversal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Bull / Bear Heikin-Ashi Candlesticks Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

of Bull H.A. Candles Required for Reversal

This parameter defines the number of consecutive Bull Heikin-Ashi candlesticks that must form before a *Long* signal is generated.

of Bear H.A. Candles Required for Reversal

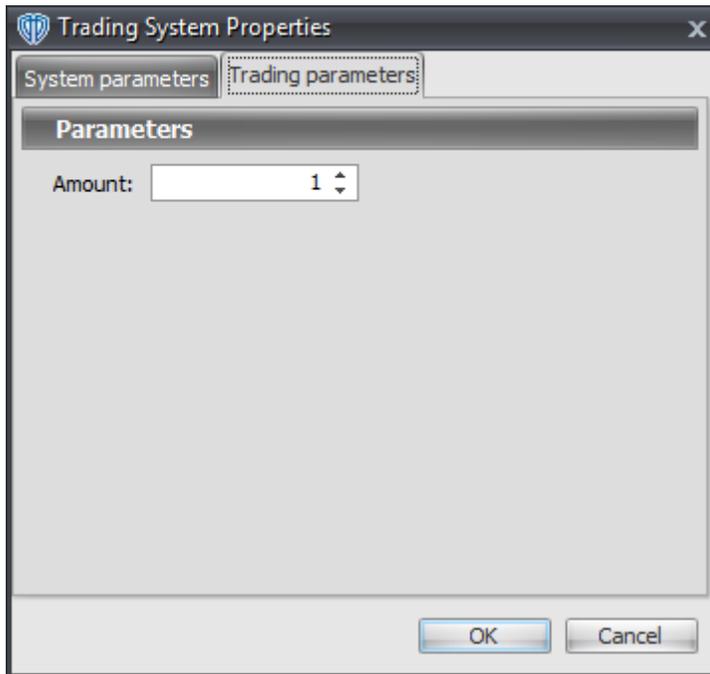
This parameter defines the number of consecutive Bear Heikin-Ashi candlesticks that must form before a *Short* signal is generated.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.6 Bull / Bear Japanese Candlesticks Reversal System

Overview

The **Bull / Bear Japanese Candlesticks Reversal System** uses the traditional Japanese candlesticks to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the specified number of consecutive Bull Japanese candlesticks form. A Bull candlestick forms when its Close price is greater than its Open price.

A *Short* signal is generated when the specified number of consecutive Bear Japanese candlesticks form. A Bear candlestick forms when its Close price is less than its Open price.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose,

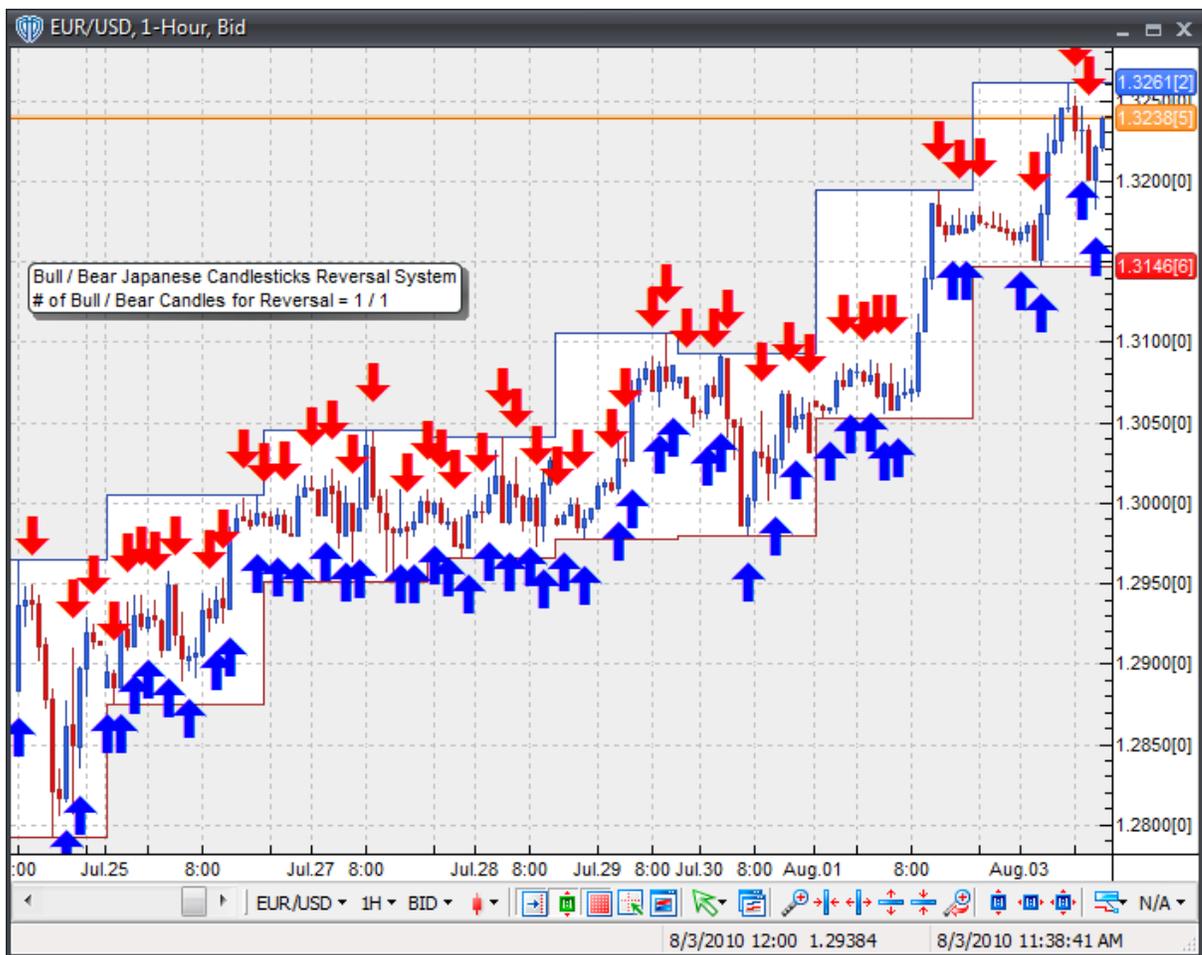
in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Bull / Bear Japanese Candlesticks Reversal System** consists of the following output variables and display parameters:

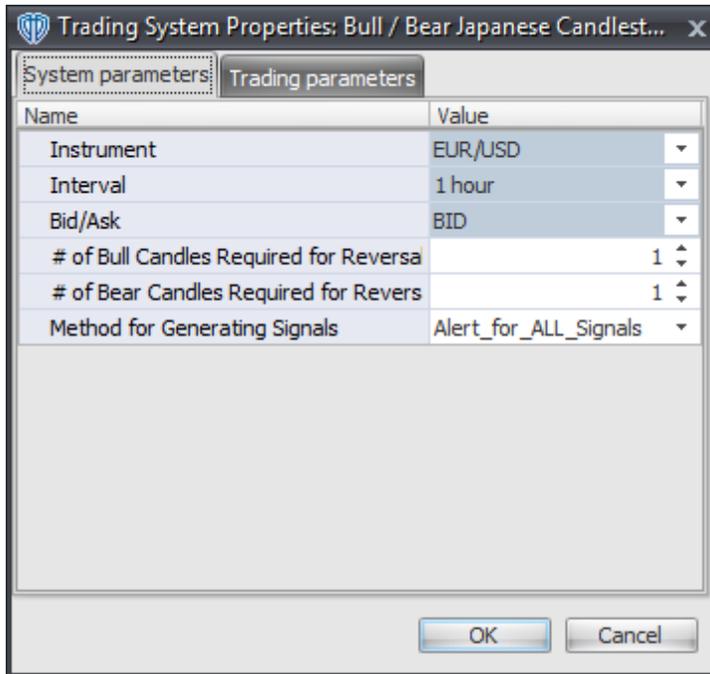
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Bull Candle(s) formation suggests a potential price reversal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Bear Candle(s) formation suggests a potential price reversal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Bull / Bear Japanese Candlesticks Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

of Bull Candles Required for Reversal

This parameter defines the number of consecutive Bull Japanese candlesticks that must form before a *Long* signal is generated.

of Bear Candles Required for Reversal

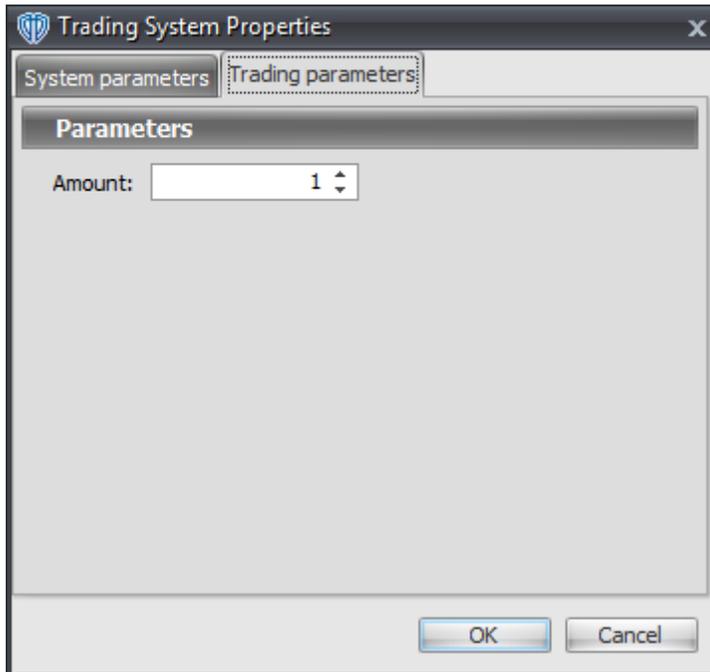
This parameter defines the number of consecutive Bear Japanese candlesticks that must form before a *Short* signal is generated.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.7 Chande's Dynamic Momentum Index Cross System

Overview

The **Chande's Dynamic Momentum Index Cross System** uses Chande's Dynamic Momentum Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Chande's Dynamic Momentum Index crosses above its Long Entry Level.

A *Short* signal is generated when the Chande's Dynamic Momentum Index crosses below its Short Entry Level.

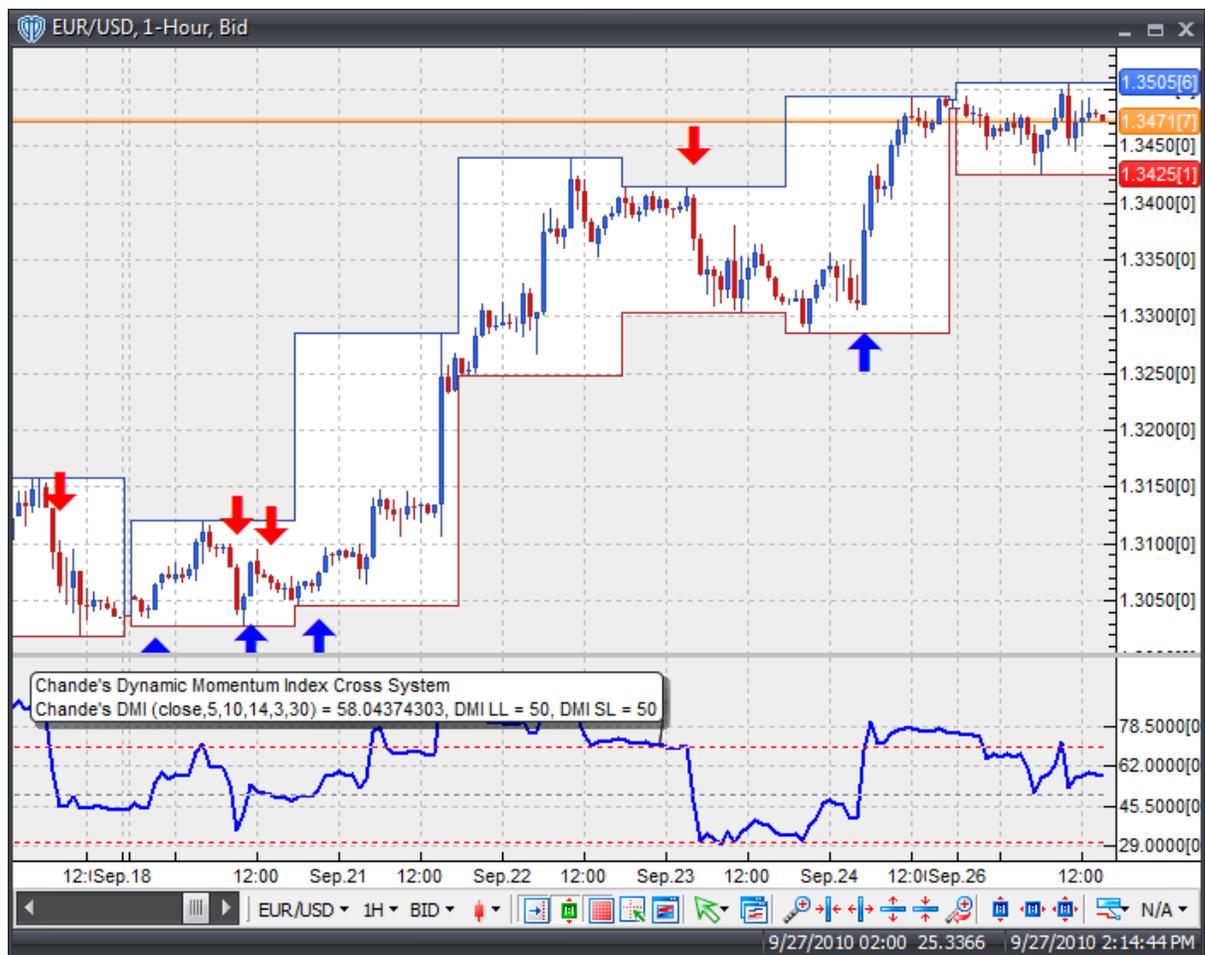
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Chande's Dynamic Momentum Index Cross System** consists of the following output variables and display parameters:

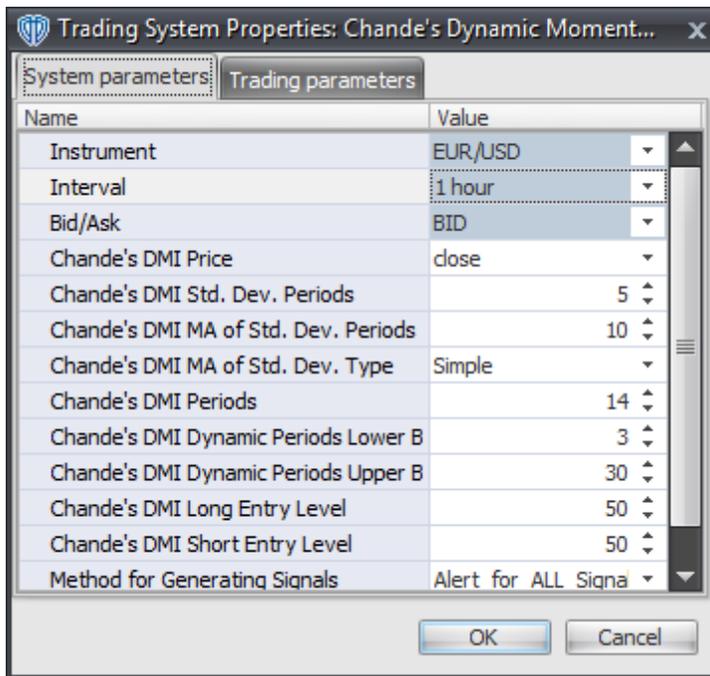
- The Chande's Dynamic Momentum Index displays in Additional Frame 1 as a slightly thicker, solid blue line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Chande's Dynamic Momentum Index's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Chande's DMI crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Chande's DMI crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chande's Dynamic Momentum Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chande's DMI Price, Std. Dev. Periods, MA of Std. Dev. Periods, MA of Std. Dev. Type, Periods, and Dynamic Periods Lower/Upper Bounds

These parameters define the values used to calculate Chande's Dynamic Momentum Index. Please refer to Chande's Dynamic Momentum Index's *Notes* section in VT Trader for additional indicator details.

Chande's DMI Long Entry Level

This parameter defines the value used in the Chande's DMI-related conditions to generate the *Long* signal.

Chande's DMI Short Entry Level

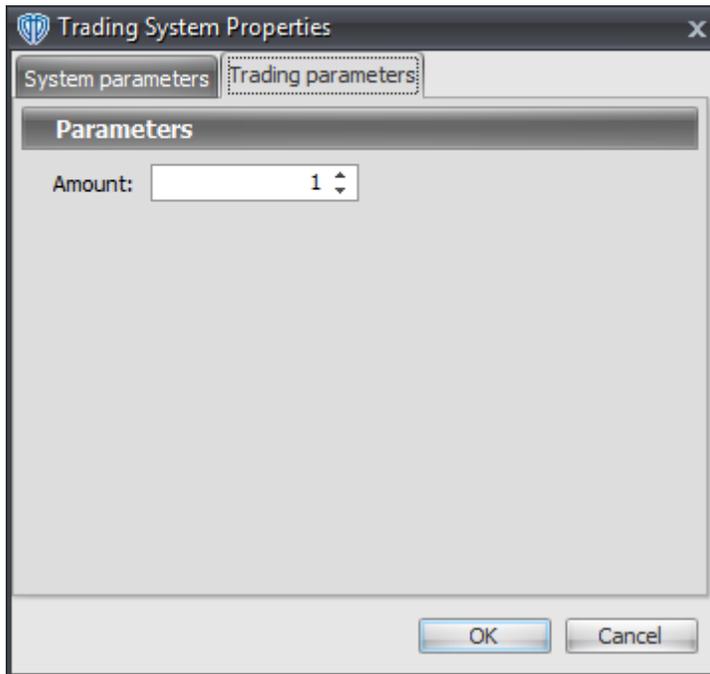
This parameter defines the value used in the Chande's DMI-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.8 Chande's Dynamic Momentum Index Reversal System

Overview

The **Chande's Dynamic Momentum Index Reversal System** uses Chande's Dynamic Momentum Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when Chande's Dynamic Momentum Index crosses above its OverSold Level from below.

A *Long Exit* signal is generated when Chande's Dynamic Momentum Index crosses below its OverBought Level from above OR Chande's Dynamic Momentum Index crosses below its OverSold Level from above.

A *Short Entry* signal is generated when Chande's Dynamic Momentum Index crosses below its OverBought Level from above.

A *Short Exit* signal is generated when Chande's Dynamic Momentum Index crosses above its OverSold Level from below OR Chande's Dynamic Momentum Index crosses above its OverBought Level from below.

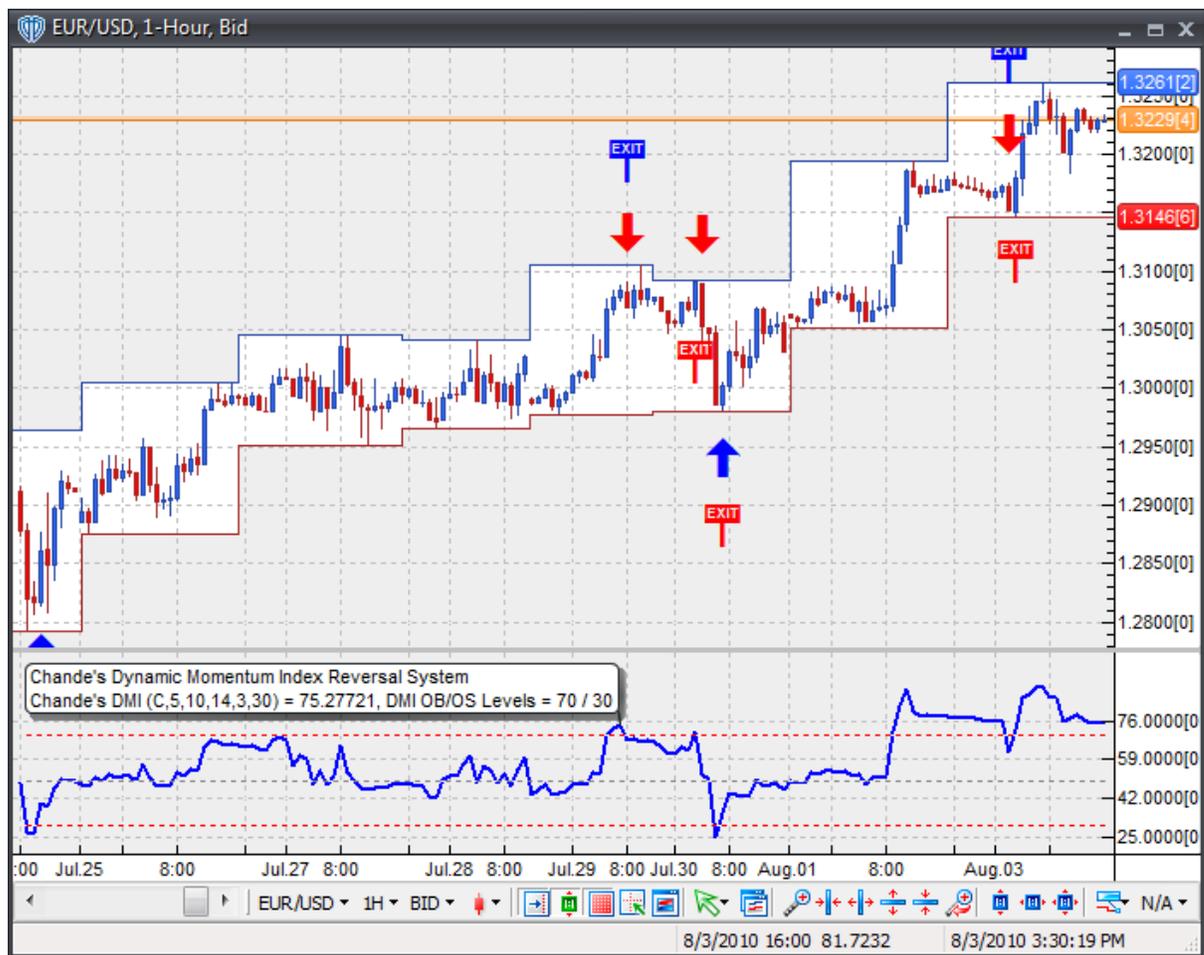
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Chande's Dynamic Momentum Index Reversal System** consists of the following output variables and display parameters:

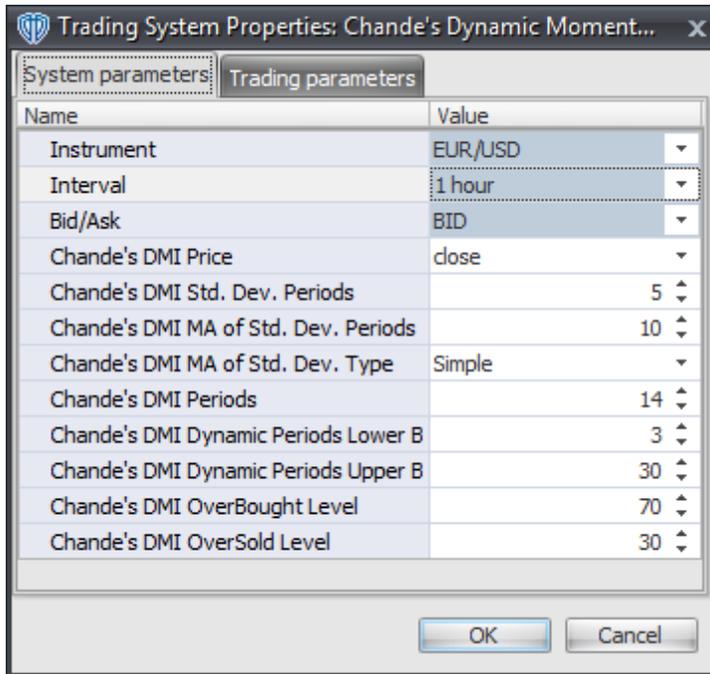
- Chande's Dynamic Momentum Index displays in Additional Frame 1 as a solid, slightly thicker blue line.
- Chande's Dynamic Momentum Index OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Chande's DMI crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! Chande's DMI crossed below its OverBought Level or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Chande's DMI crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! Chande's DMI crossed above its OverSold Level or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chande's Dynamic Momentum Index Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chande's DMI Price, Std. Dev. Periods, MA of Std. Dev. Periods, MA of Std. Dev. Type, Periods, and Dynamic Periods Lower/Upper Bounds

These parameters define the values used to calculate Chande's Dynamic Momentum Index. Please refer to Chande's Dynamic Momentum Index's *Notes* section in VT Trader for additional indicator details.

Chande's DMI OverBought Level

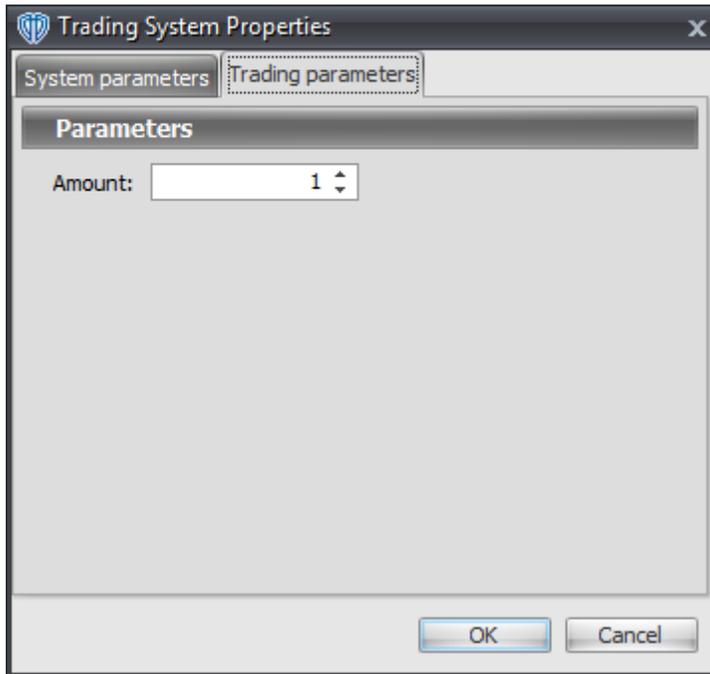
This parameter defines the OverBought value used in the Chande's Dynamic Momentum Index-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

Chande's DMI OverSold Level

This parameter defines the OverSold value used in the Chande's Dynamic Momentum Index-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.9 Chande's QStick Cross System

Overview

The **Chande's QStick Cross System** uses Chande's QStick to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when Chande's QStick Histogram crosses above zero.

A *Short* signal is generated when Chande's QStick Histogram crosses below zero.

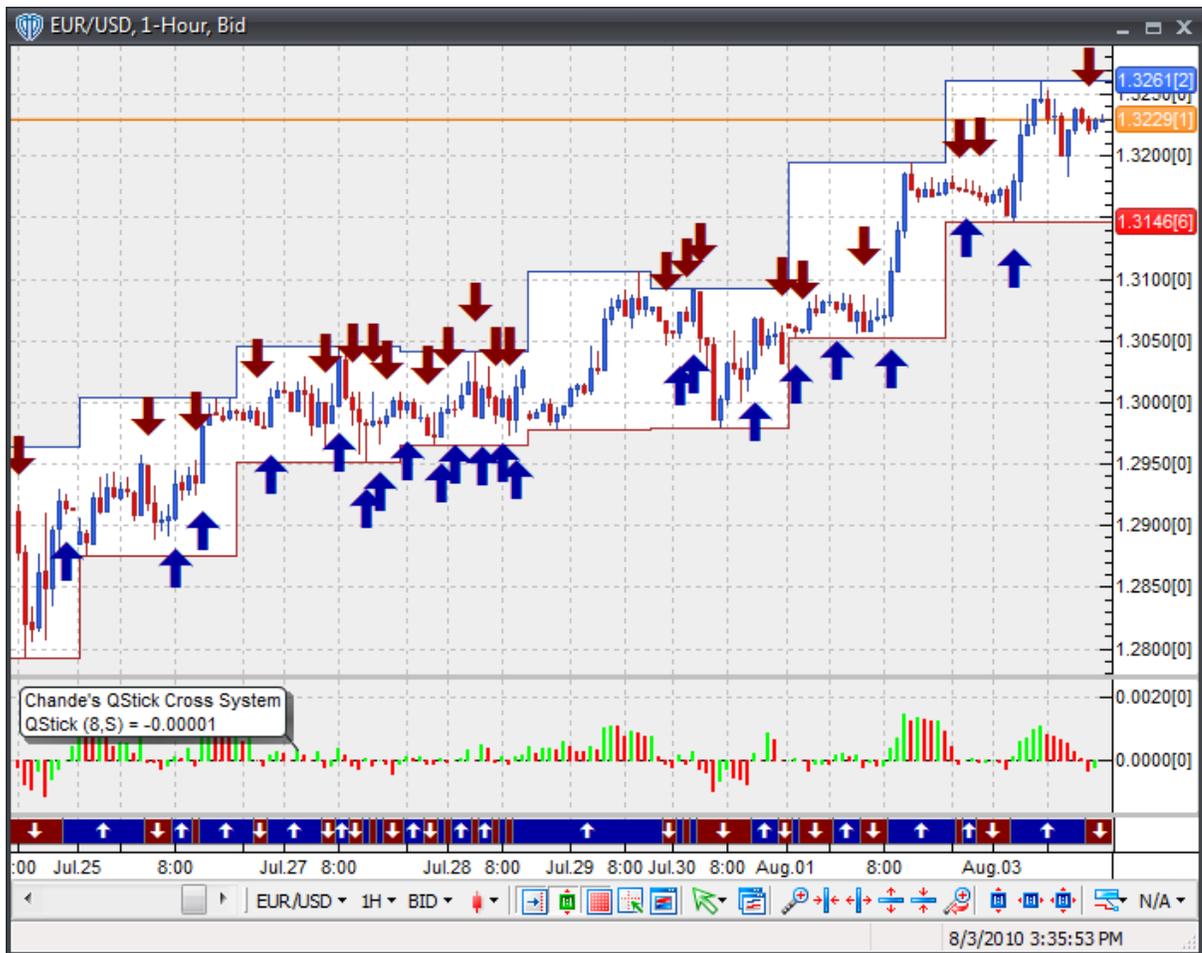
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Chande's QStick Cross System** consists of the following output variables and display parameters:

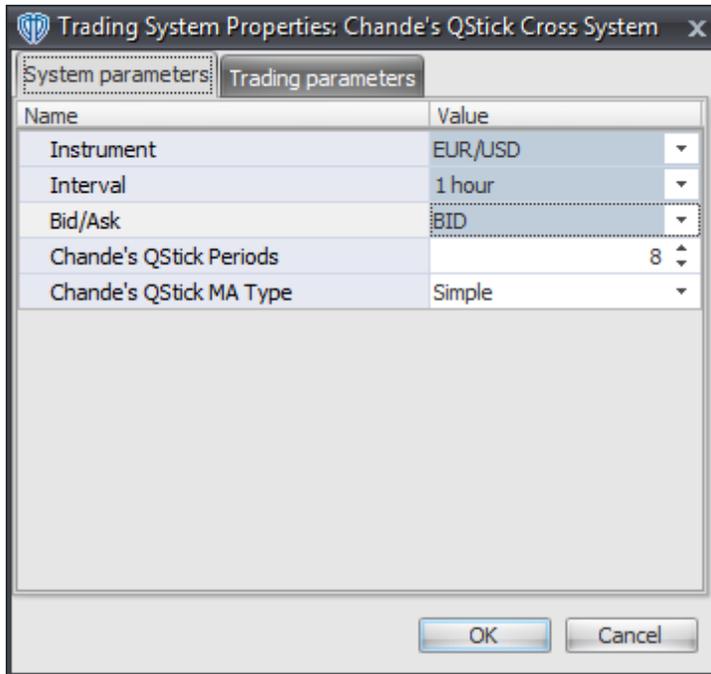
- The Chande's QStick Histogram displays in Additional Frame 1 as a histogram. The histogram is green if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago.
- The Trend Frame displays a white up arrow against a dark blue background while Chande's QStick Histogram is greater than zero.
- The Trend Frame displays a white down arrow against a dark red background while Chande's QStick Histogram is less than zero.
- When a *Long* signal is generated a dark blue up arrow graphic displays in the chart window, the message "Long signal detected! Chande's QStick crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a dark red down arrow graphic displays in the chart window, the message "Short signal detected! Chande's QStick crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chande's QStick Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chande's QStick Periods

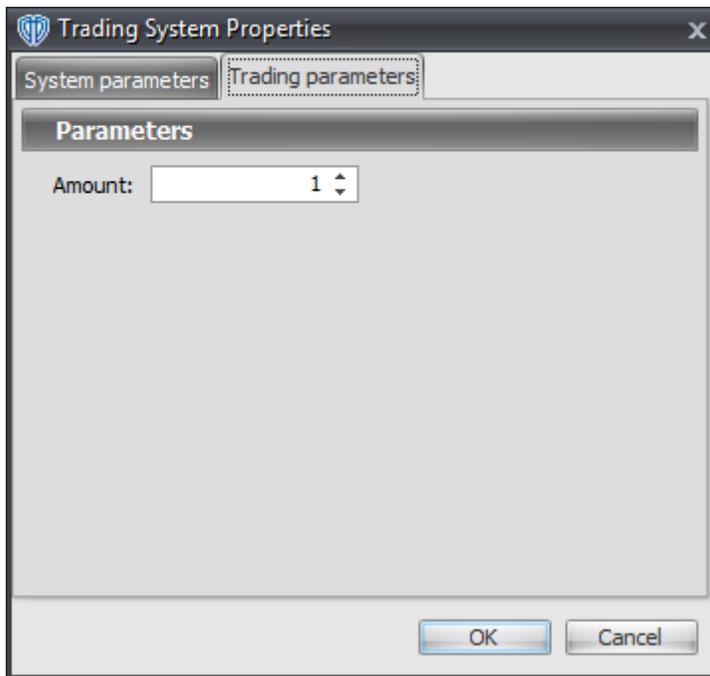
This parameter defines the number of periods used to calculate Chande's QStick

Chande's QStick MA Type

This parameter defines the type of moving average used to calculate Chande's QStick

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.10 Chande's Trend Momentum System

Overview

The **Chande's Trend Momentum System** uses Chande's Momentum Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when Chande's Momentum Oscillator crosses above its Long Entry Level.

A *Long Exit* signal is generated when Chande's Momentum Oscillator crosses below its OverBought Level OR Chande's Momentum Oscillator crosses below its Short Entry Level.

A *Short Entry* signal is generated when Chande's Momentum Oscillator crosses below its Short Entry Level.

A *Short Exit* signal is generated when Chande's Momentum Oscillator crosses above its OverSold Level OR Chande's Momentum Oscillator crosses above its Long Entry Level.

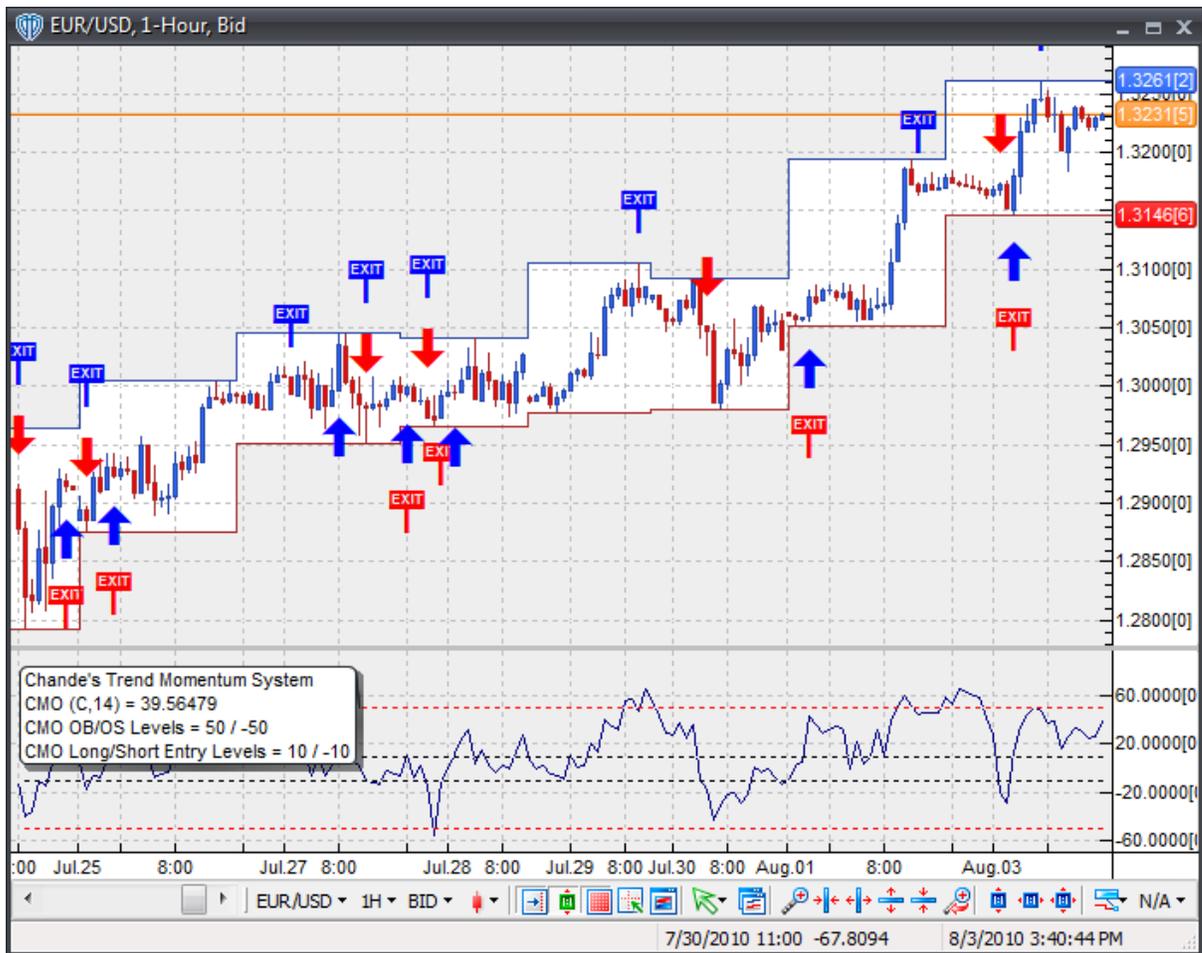
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Chande's Trend Momentum System** consists of the following output variables and display parameters:

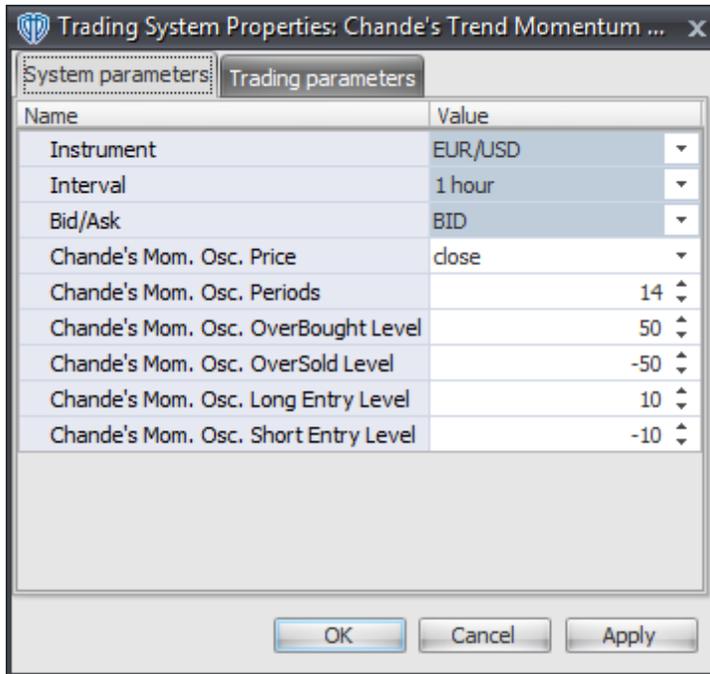
- Chande's Momentum Oscillator displays in Additional Frame 1 as a solid blue line.
- Chande's Momentum Oscillator OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- Chande's Momentum Oscillator Long Entry and Short Entry levels display in Additional Frame 1 as dashed black lines.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! CMO crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! CMO crossed below its OverBought Level or its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! CMO crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! CMO crossed above its OverSold Level or its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chande's Trend Momentum System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chande's Mom. Osc. Price and Chande' Mom. Osc. Periods

These parameters define the values used to calculate Chande's Momentum Oscillator.

Chande's Mom. Osc. OverBought Level

This parameter defines the value used in the Chande's Momentum Oscillator-related conditions to generate the *Long Exit* signal.

Chande's Mom. Osc. OverSold Level

This parameter defines the value used in the Chande's Momentum Oscillator-related conditions to generate the *Short Exit* signal.

Chande's Mom. Osc. Long Entry Level

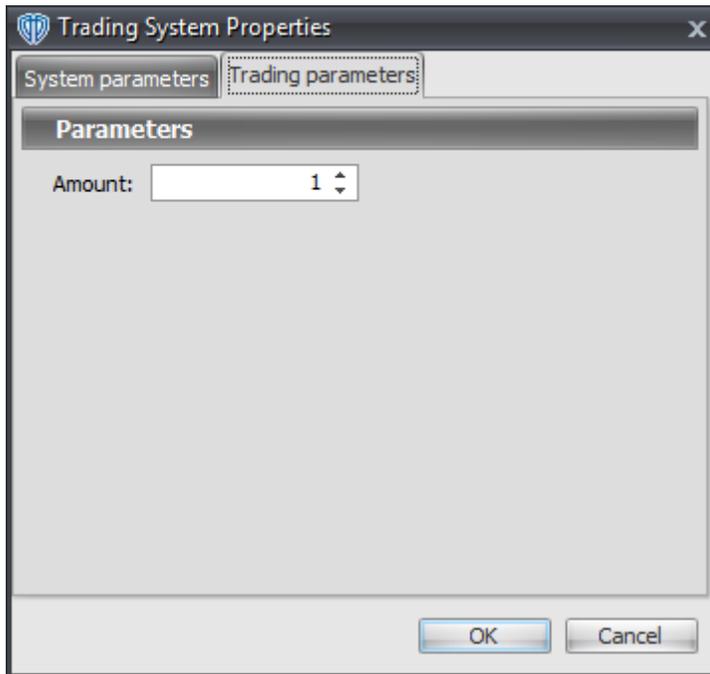
This parameter defines the value used in the Chande's Momentum Oscillator-related conditions to generate the *Long Entry* signal.

Chande's Mom. Osc. Short Entry Level

This parameter defines the value used in the Chande's Momentum Oscillator-related conditions to generate the *Short Entry* signal.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.11 Chande's TrendScore Trend Surfing System

Overview

The **Chande's TrendScore Trend Surfing System** uses Chande's TrendScore indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when Chande's TrendScore is equal to 10 for two bars.

A *Long Exit* signal is generated when Chande's TrendScore crosses below zero.

A *Short Entry* signal is generated when Chande's TrendScore is equal to -10 for two bars.

A *Short Exit* signal is generated when Chande's TrendScore crosses above zero.

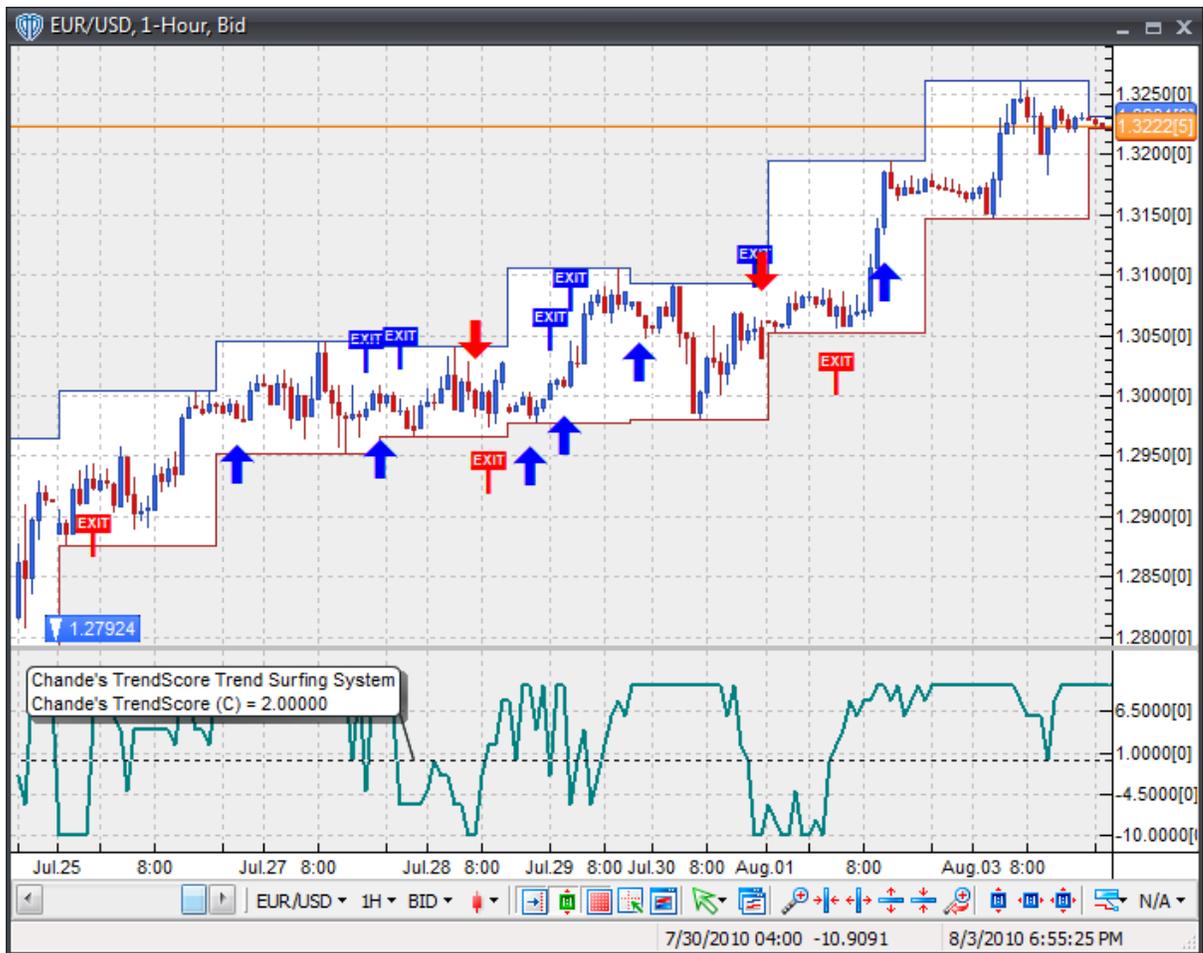
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Chande's TrendScore Trend Surfing System** consists of the following output variables and display parameters:

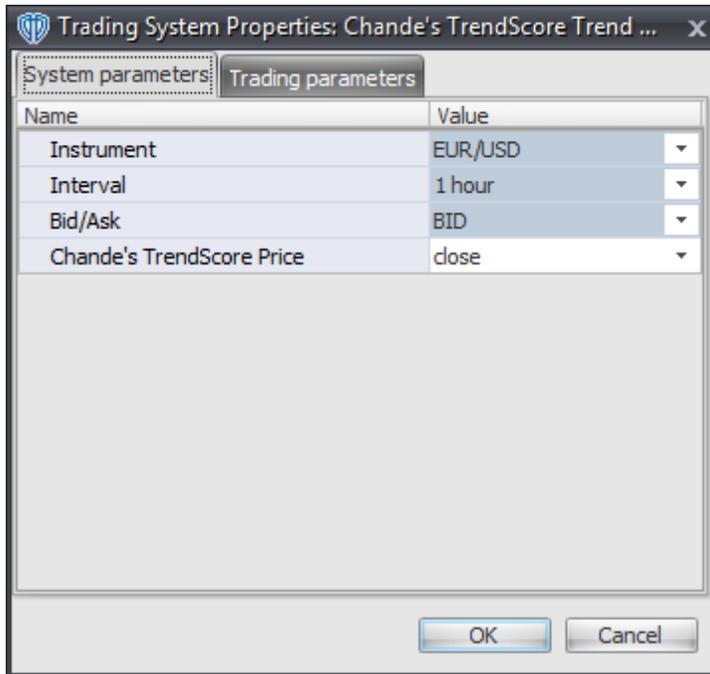
- Chande's Momentum Oscillator displays in Additional Frame 1 as a solid, slightly thicker green line. Its mid-level (0) displays in the same frame as a dashed black line.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Chande's TrendScore has been equal to 10 for two bars." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! Chande's TrendScore crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Chande's TrendScore has been equal to -10 for two bars." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! Chande's TrendScore crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chande's TrendScore Trend Surfing System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

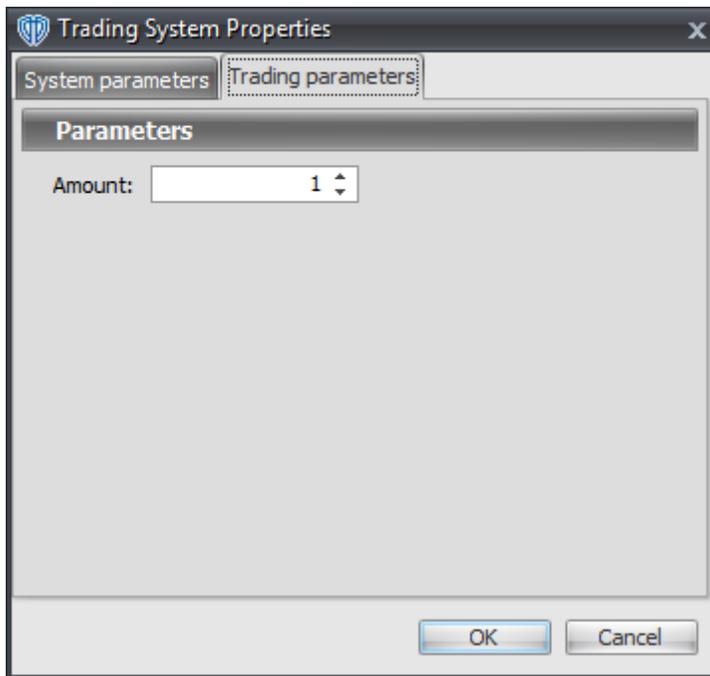
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chande's TrendScore Price

These parameters define the price used to calculate Chande's TrendScore

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.12 Chande's VIDYA Cross System

Overview

Chande's VIDYA Cross System uses fast and slow Chande Variable Index Dynamic Averages (VIDYA's) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast VIDYA crosses above the Slow VIDYA.

A *Short* signal is generated when the Fast VIDYA crosses below the Slow VIDYA.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

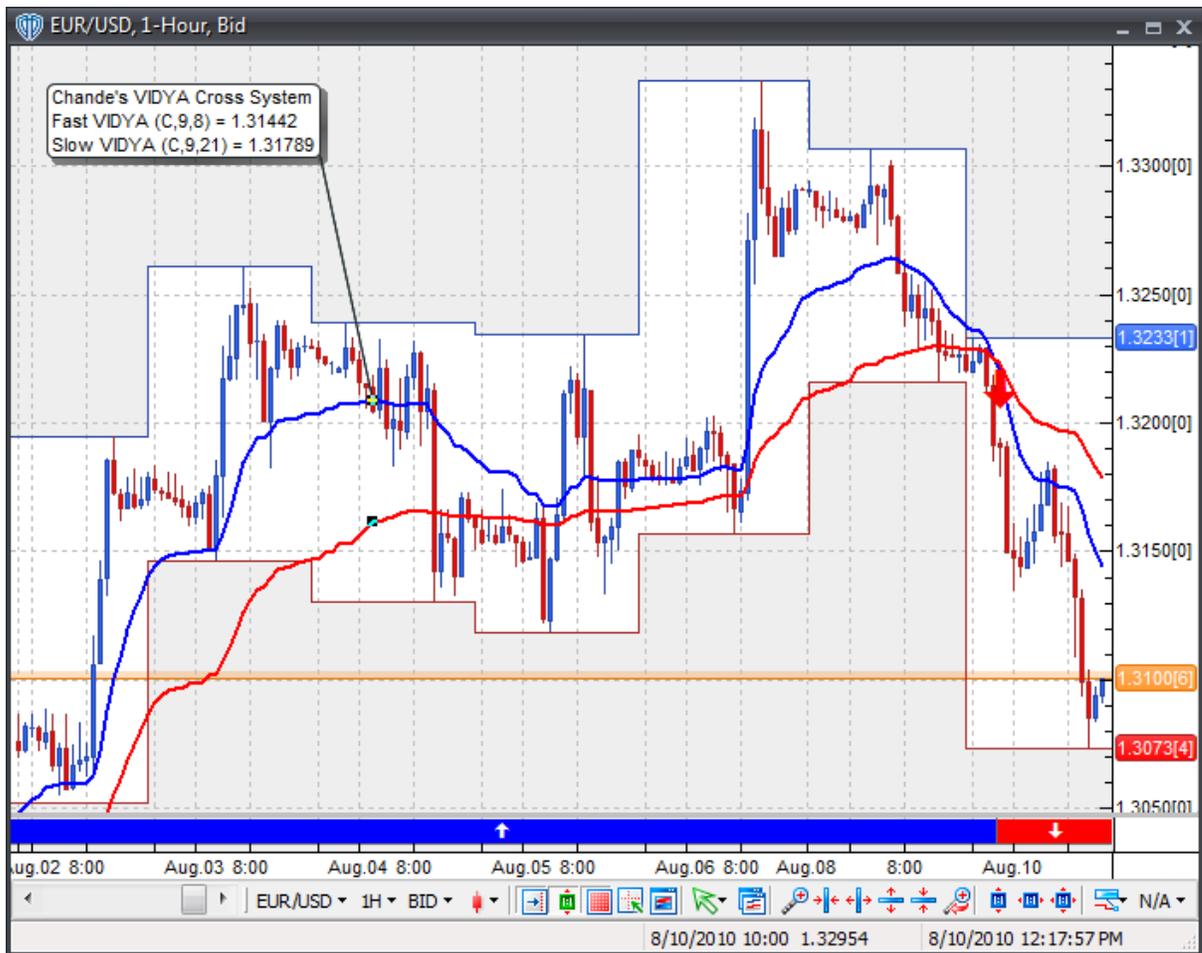
System Outputs and Signals Logic

The **Chande's VIDYA Cross System** consists of the following output variables and display parameters:

- The Fast VIDYA displays in the Price Frame as slightly thicker, solid blue line.

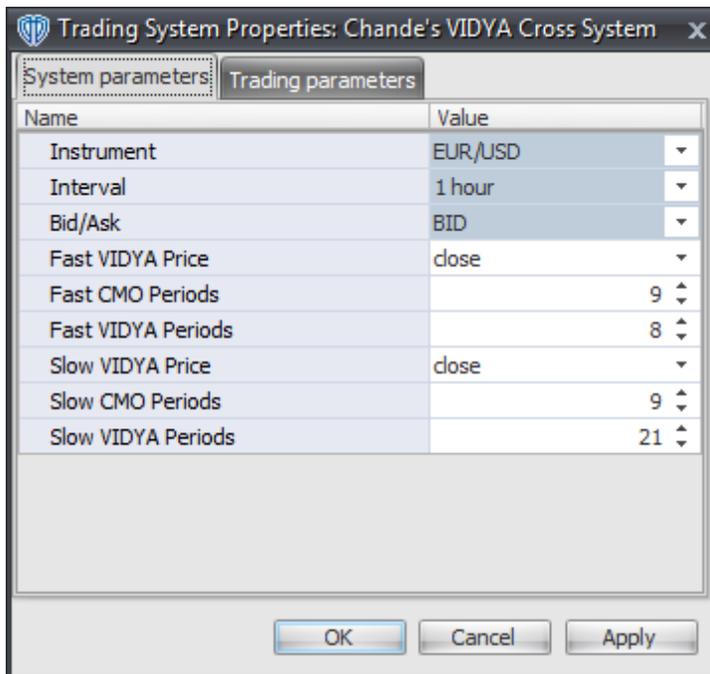
- The Slow VIDYA displays in the Price Frame as a slightly thicker, solid red line.
- The Trend Frame displays a white up arrow against a blue background while the Fast VIDYA is greater than the Slow VIDYA.
- The Trend Frame displays a white down arrow against a red background while the Fast VIDYA is less than the Slow VIDYA.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast VIDYA crossed above Slow VIDYA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast VIDYA crossed below Slow VIDYA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Double Exponential Moving Average (DEMA) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast VIDYA Price, Fast CMO Periods, and Fast VIDYA Periods

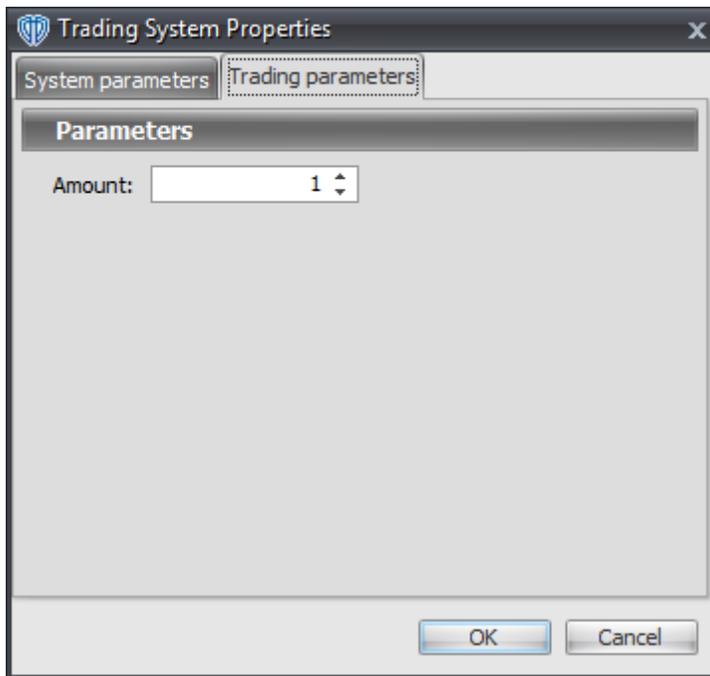
These parameters define the price, number of periods, and number of CMO periods used to calculate the Fast Variable Index Dynamic Average (VIDYA).

Slow VIDYA Price, Slow CMO Periods, and Slow VIDYA Periods

These parameters define the price, number of periods, and number of CMO periods used to calculate the Slow Variable Index Dynamic Average (VIDYA).

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.13 Chaos Accelerator Oscillator Cross System

Overview

The **Chaos Accelerator Oscillator Cross System** uses the Chaos Accelerator Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Chaos Accelerator Oscillator crosses above zero.

A *Short* signal is generated when the Chaos Accelerator Oscillator crosses below zero.

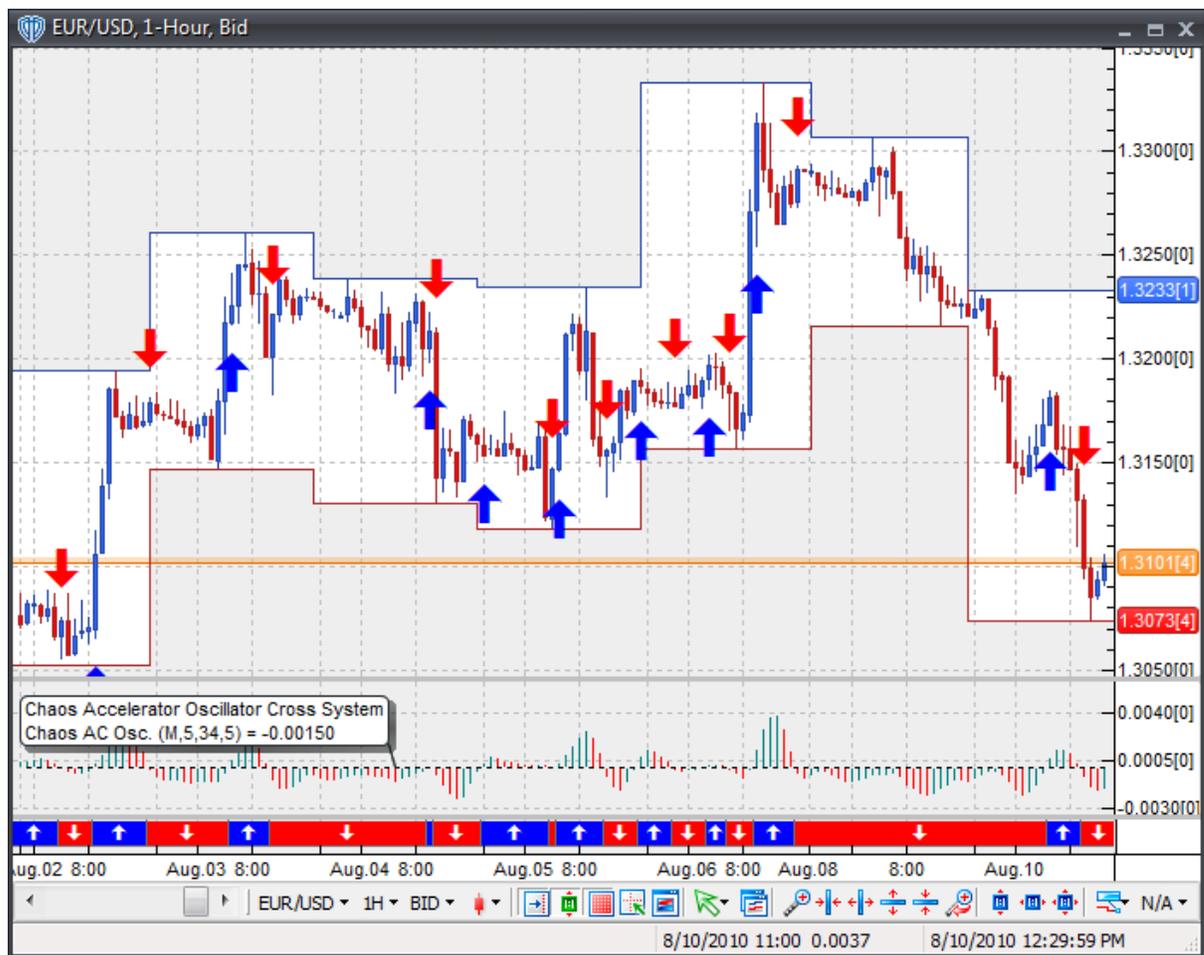
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Chaos Accelerator Oscillator Cross System** consists of the following output variables and display parameters:

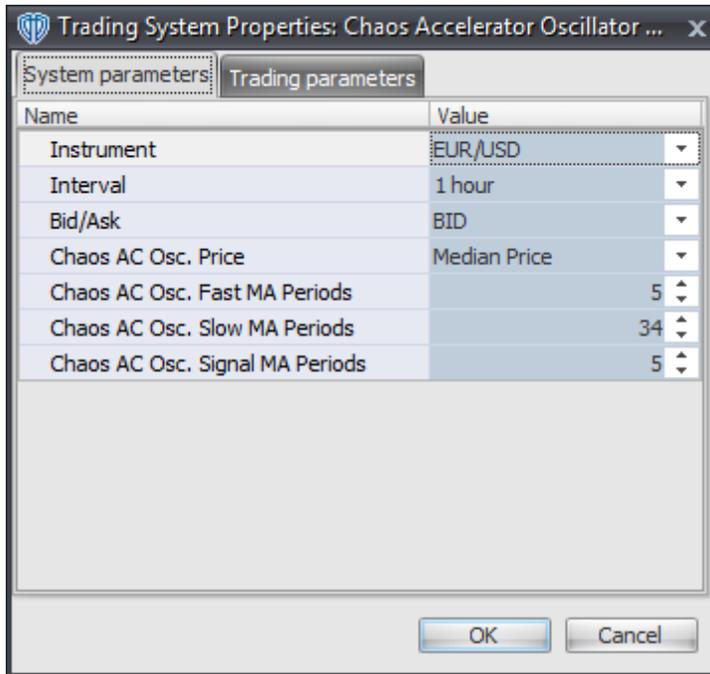
- The Chaos Accelerator Oscillator displays in Additional Frame 1 as a histogram. The histogram is green if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- The Trend Frame displays a white up arrow against a blue background while the Chaos Accelerator Oscillator is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the Chaos Accelerator Oscillator is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Chaos Accelerator Osc. crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Chaos Accelerator Osc. crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chaos Accelerator Oscillator Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chaos AC Osc. Price

This parameter defines the price used to calculate the Chaos Accelerator Oscillator

Chaos AC Osc. Fast MA Periods

This parameter defines the number of periods used to calculate the fast moving average used to calculate the Chaos Accelerator Oscillator

Chaos AC Osc. Slow MA Periods

This parameter defines the number of periods used to calculate the slow moving average used to calculate the Chaos Accelerator Oscillator

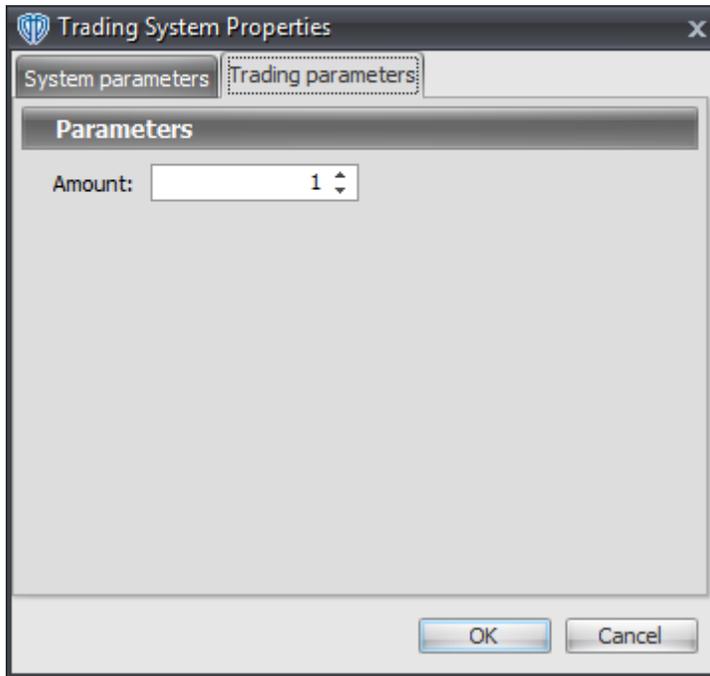
Chaos AC Osc. Signal MA Periods

This parameter defines the number of periods used to calculate the signal line used to calculate the Chaos Accelerator Oscillator

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading

Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.14 Chaos Accelerator Oscillator Reversal System

Overview

The **Chaos Accelerator Oscillator Reversal System** uses the Chaos Accelerator Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Chaos Accelerator Oscillator turns upwards (*i.e. the current Chaos AC value is greater than the previous Chaos AC value*).

A *Short* signal is generated when the Chaos Accelerator Oscillator turns downwards (*i.e. the current Chaos AC value is less than the previous Chaos AC value*).

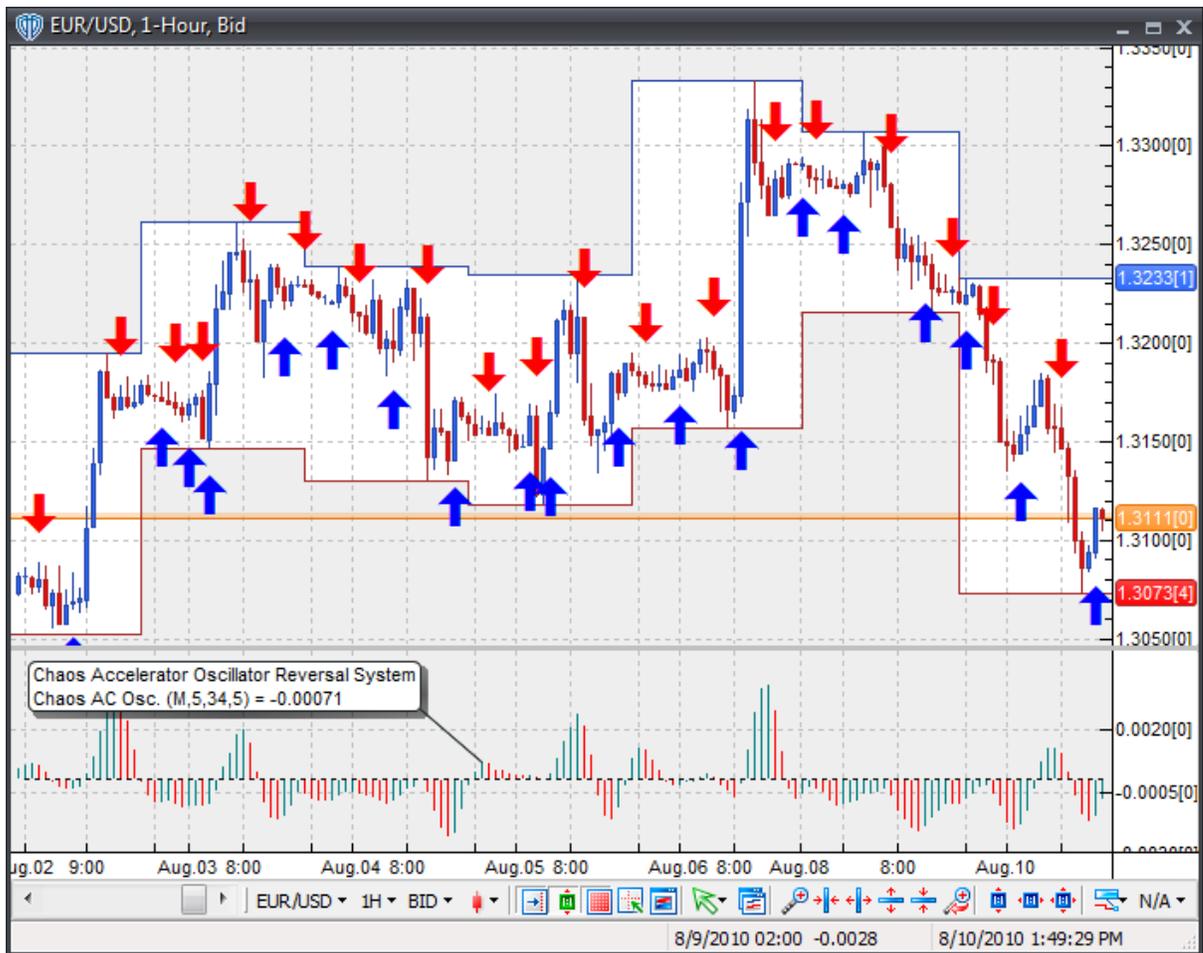
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy, CloseBuy, OpenSell, and CloseSell*).

System Outputs and Signals Logic

The **Chaos Accelerator Oscillator Reversal System** consists of the following output variables and display parameters:

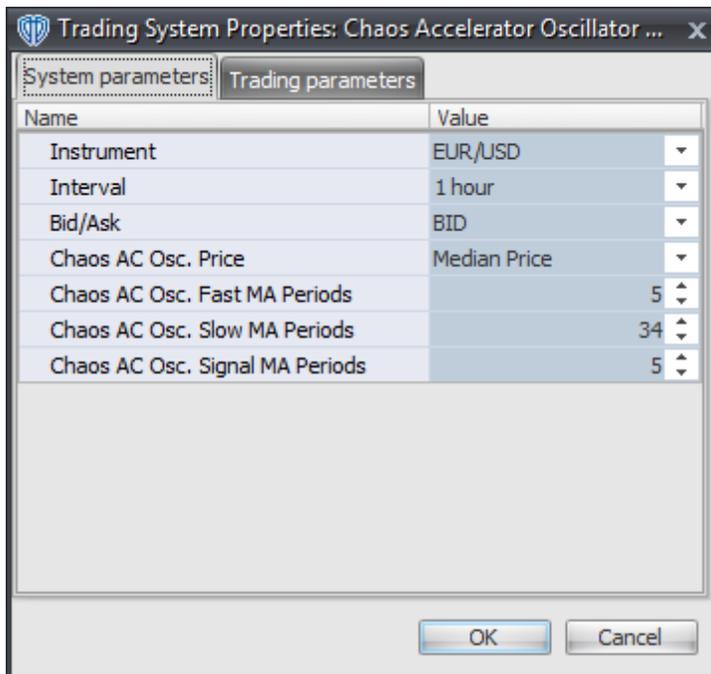
- The Chaos Accelerator Oscillator displays in Additional Frame 1 as a histogram. The histogram is green if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Chaos Accelerator Osc. turned upwards." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Chaos Accelerator Osc. turned downwards." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chaos Accelerator Oscillator Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chaos AC Osc. Price

This parameter defines the price used to calculate the Chaos Accelerator Oscillator

Chaos AC Osc. Fast MA Periods

This parameter defines the number of periods used to calculate the fast moving average used to calculate the Chaos Accelerator Oscillator

Chaos AC Osc. Slow MA Periods

This parameter defines the number of periods used to calculate the slow moving average used to calculate the Chaos Accelerator Oscillator

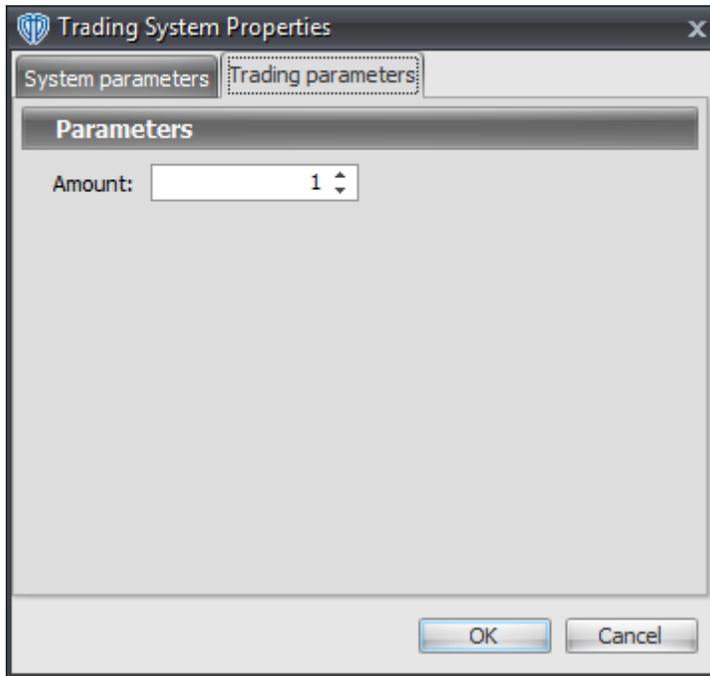
Chaos AC Osc. Signal MA Periods

This parameter defines the number of periods used to calculate the signal line used to calculate the Chaos Accelerator Oscillator

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading

Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.15 Chaos Awesome Oscillator / Signal Line Cross System

Overview

The **Chaos Awesome Oscillator / Signal Line Cross System** uses the Chaos Awesome Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Chaos Awesome Oscillator crosses above its Signal Line.

A *Short* signal is generated when the Chaos Awesome Oscillator crosses below its Signal Line.

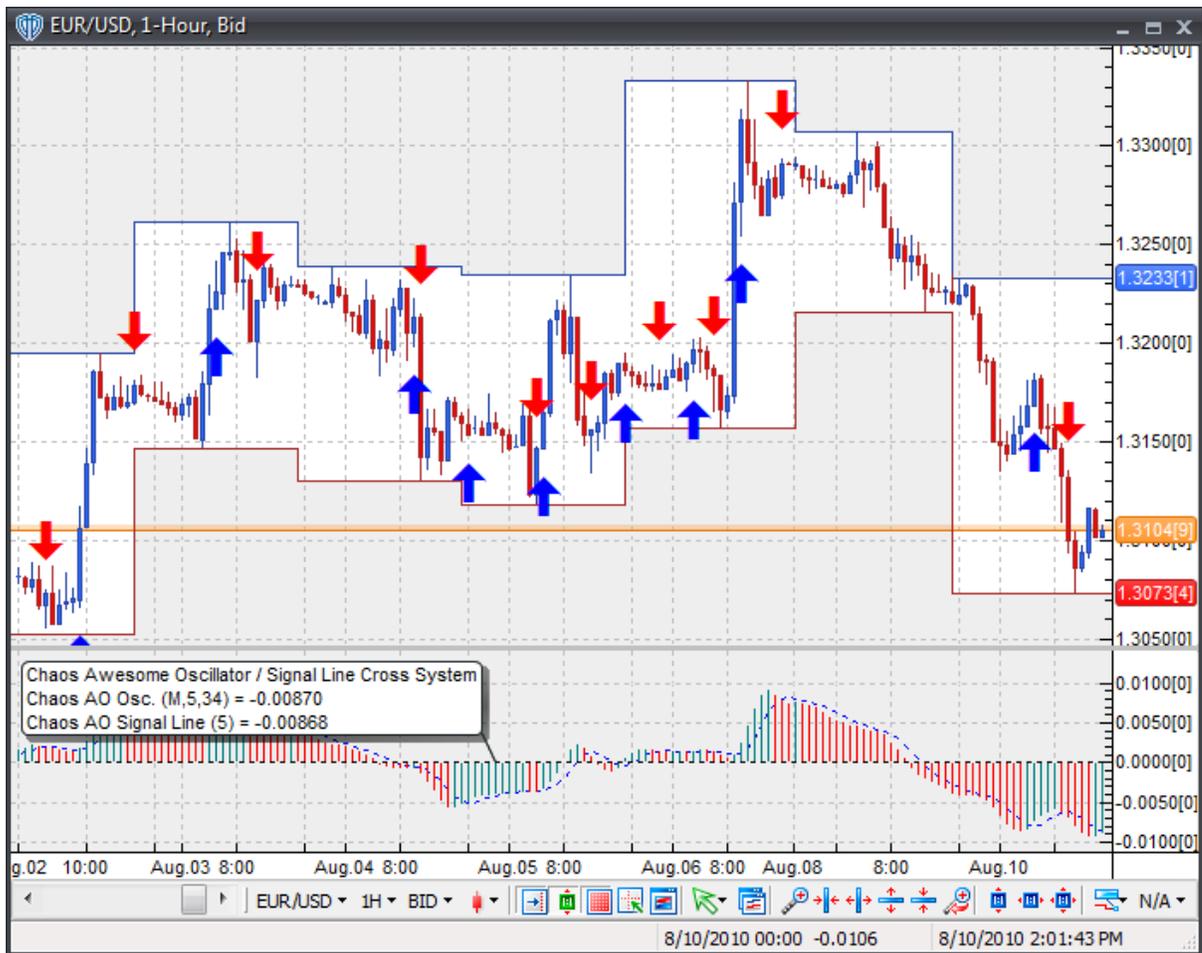
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Chaos Awesome Oscillator / Signal Line Cross System** consists of the following output variables and display parameters:

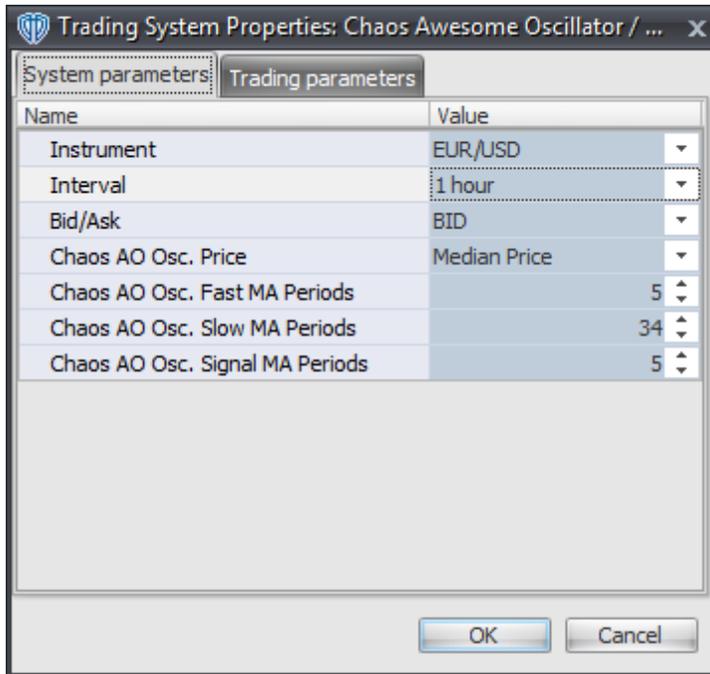
- The Chaos Awesome Oscillator displays in Additional Frame 1 as a histogram. The histogram is green if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- The Chaos Awesome Oscillator's Signal Line displays in Additional Frame 1 as a blue dashed line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Chaos Awesome Osc. crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Chaos Awesome Osc. crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chaos Awesome Oscillator / Signal Line Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chaos AO Osc. Price

This parameter defines the price used to calculate the Chaos Awesome Oscillator

Chaos AO Osc. Fast MA Periods

This parameter defines the number of periods used to calculate the fast moving average used to calculate the Chaos Awesome Oscillator

Chaos AO Osc. Slow MA Periods

This parameter defines the number of periods used to calculate the slow moving average used to calculate the Chaos Awesome Oscillator

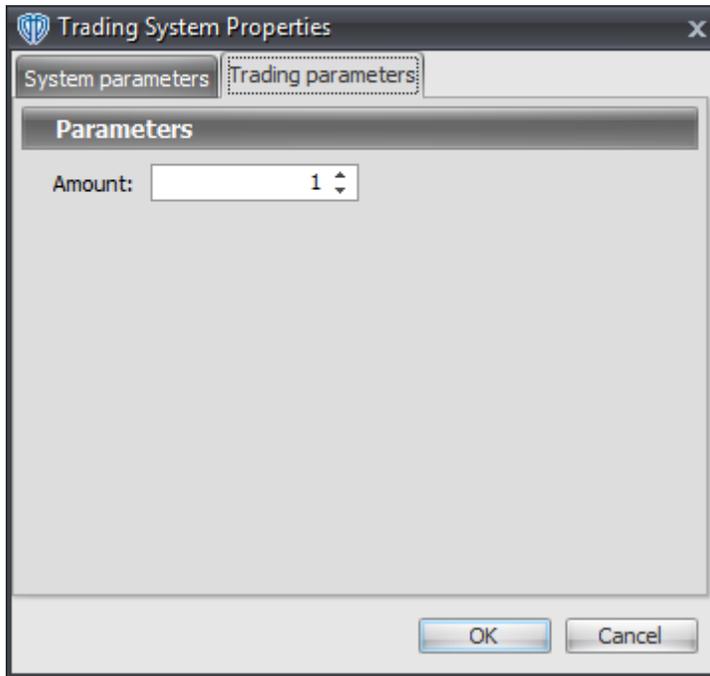
Chaos AO Osc. Signal MA Periods

This parameter defines the number of periods used to calculate the Chaos Awesome Oscillator's Signal Line

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading

Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.16 Chaos Awesome Oscillator / Zero Cross System

Overview

The **Chaos Awesome Oscillator / Zero Cross System** uses the Chaos Awesome Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Chaos Awesome Oscillator crosses above zero.

A *Short* signal is generated when the Chaos Awesome Oscillator crosses below zero.

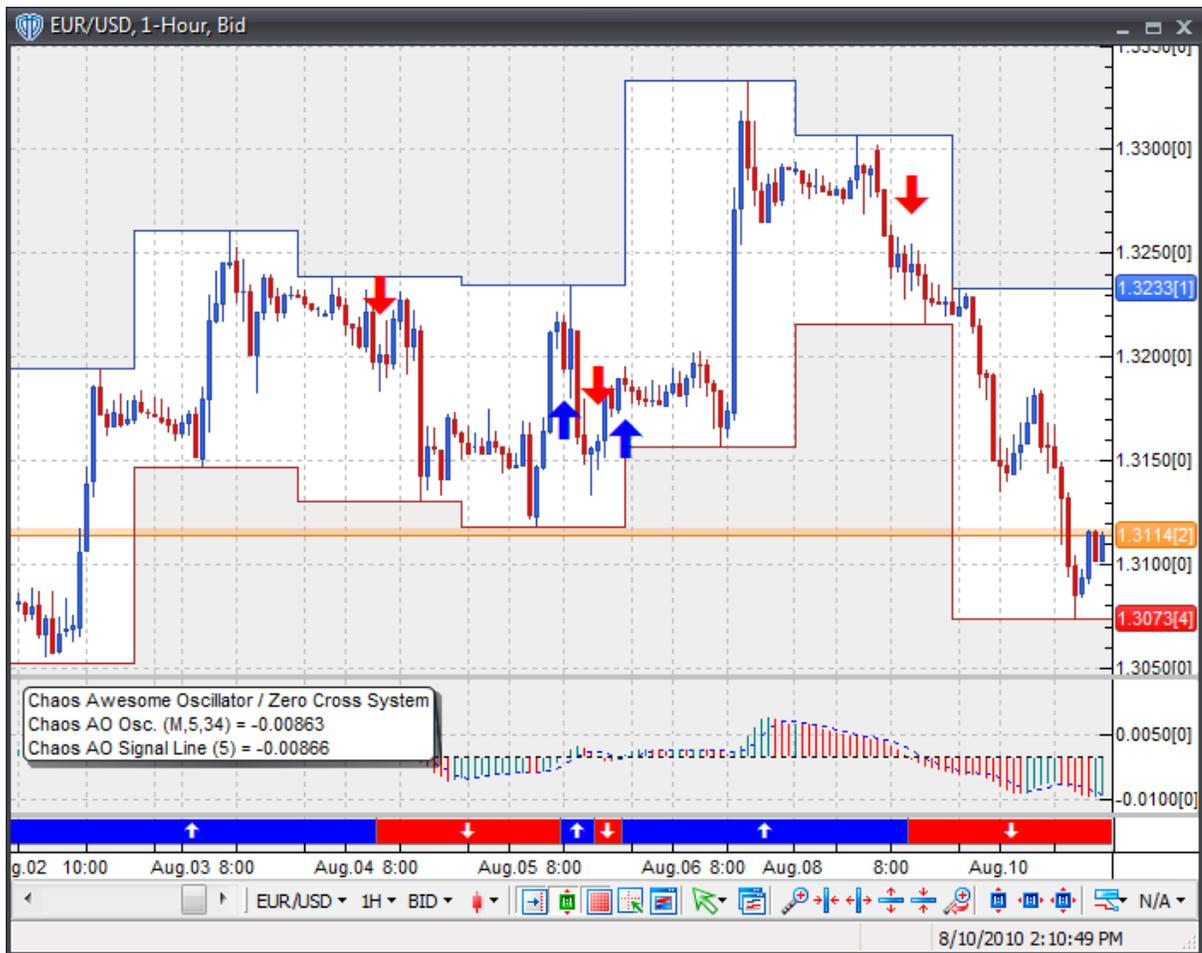
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Chaos Awesome Oscillator / Zero Cross System** consists of the following output variables and display parameters:

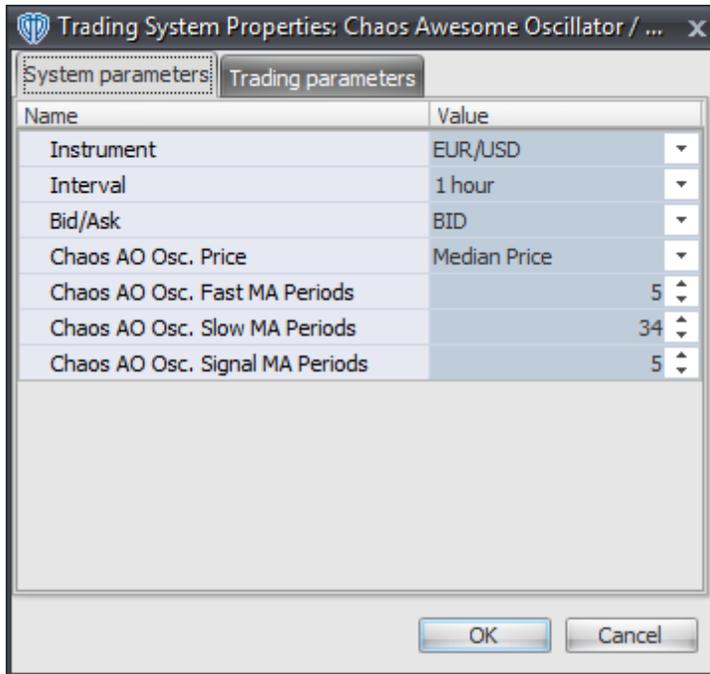
- The Chaos Awesome Oscillator displays in Additional Frame 1 as a histogram. The histogram is green if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- The Chaos Awesome Oscillator's Signal Line displays in Additional Frame 1 as a blue dashed line.
- The Trend Frame displays a white up arrow against a blue background while the Chaos Awesome Oscillator is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the Chaos Awesome Oscillator is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Chaos Awesome Osc. crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Chaos Awesome Osc. crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chaos Awesome Oscillator / Zero Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chaos AO Osc. Price

This parameter defines the price used to calculate the Chaos Awesome Oscillator

Chaos AO Osc. Fast MA Periods

This parameter defines the number of periods used to calculate the fast moving average used to calculate the Chaos Awesome Oscillator

Chaos AO Osc. Slow MA Periods

This parameter defines the number of periods used to calculate the slow moving average used to calculate the Chaos Awesome Oscillator

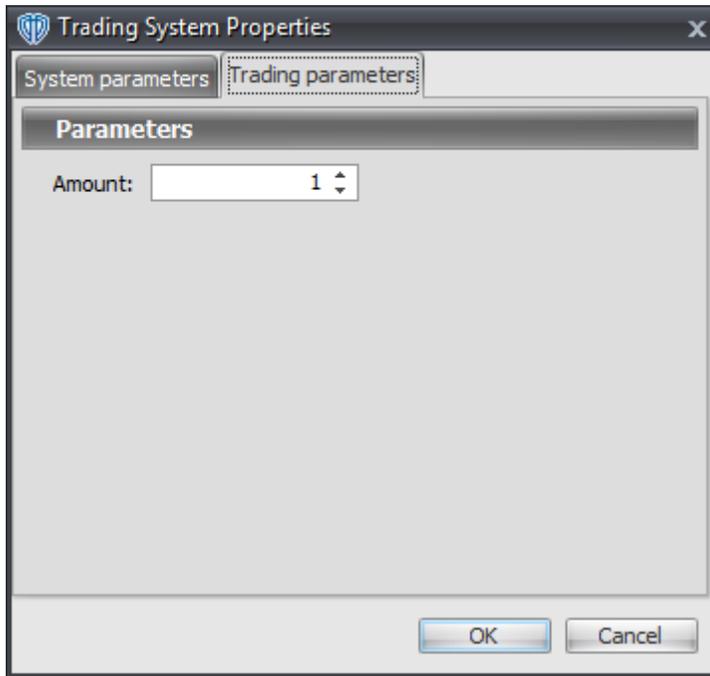
Chaos AO Osc. Signal MA Periods

This parameter defines the number of periods used to calculate the Chaos Awesome Oscillator's Signal Line

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading

Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.17 Chaos Awesome Oscillator Reversal System

Overview

The **Chaos Awesome Oscillator Reversal System** uses the Chaos Awesome Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Chaos Awesome Oscillator turns upwards (*i.e. the current Chaos AO value is greater than the previous Chaos AO value*).

A *Short* signal is generated when the Chaos Awesome Oscillator turns downwards (*i.e. the current Chaos AO value is less than the previous Chaos AO value*).

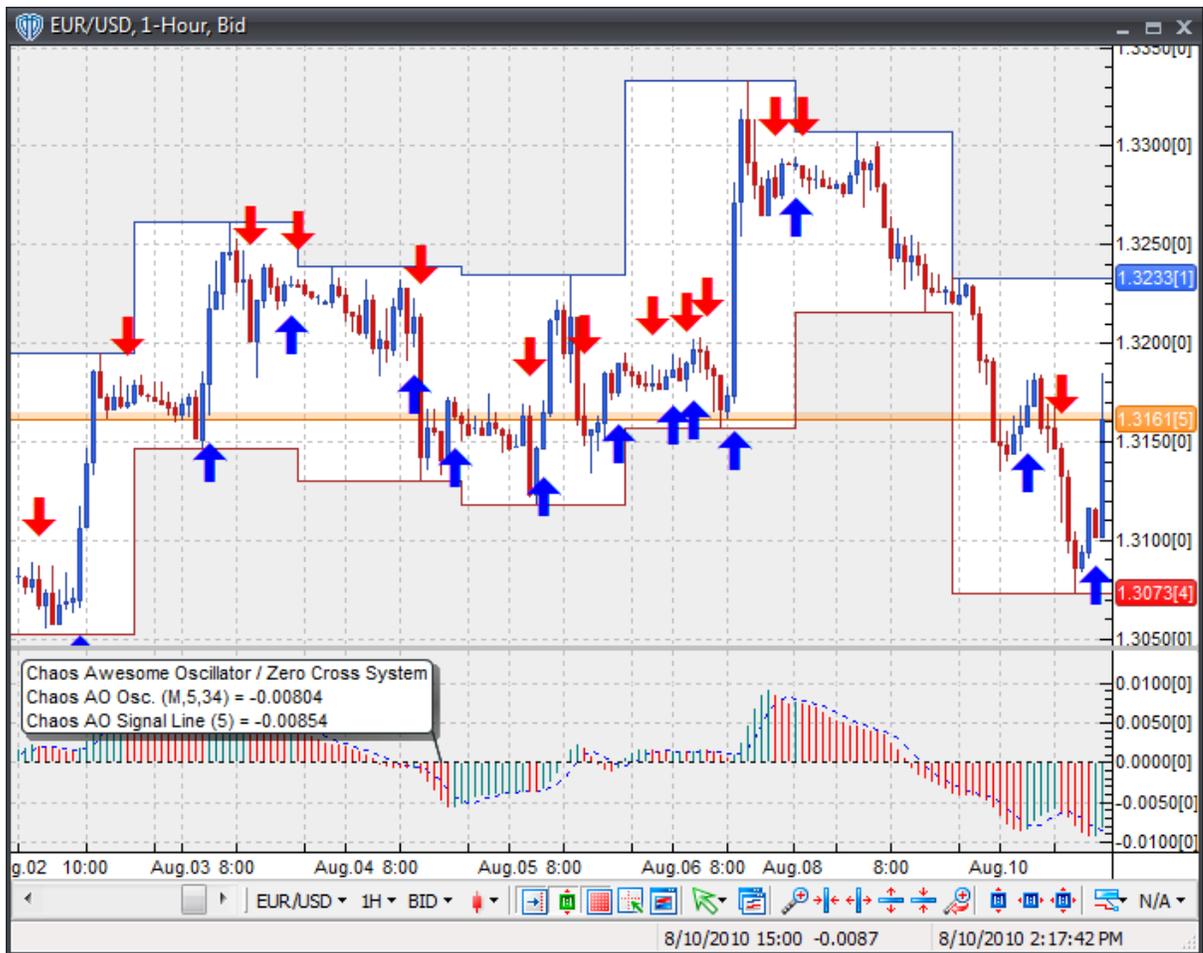
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy, CloseBuy, OpenSell, and CloseSell*).

System Outputs and Signals Logic

The **Chaos Awesome Oscillator Reversal System** consists of the following output variables and display parameters:

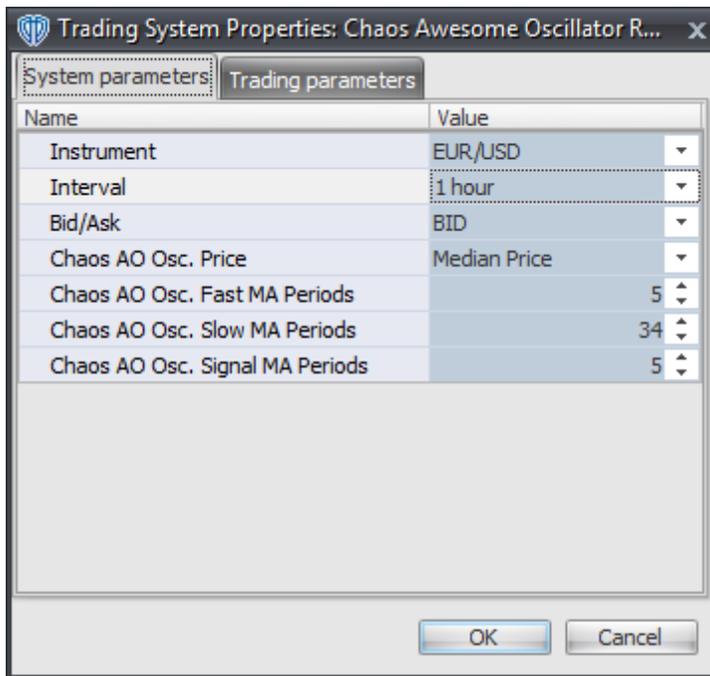
- The Chaos Awesome Oscillator displays in Additional Frame 1 as a histogram. The histogram is green if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- The Chaos Awesome Oscillator's Signal Line displays in Additional Frame 1 as a blue dashed line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Chaos Awesome Osc. turned upwards." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Chaos Awesome Osc. turned downwards." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chaos Awesome Oscillator Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Chaos AO Osc. Price

This parameter defines the price used to calculate the Chaos Awesome Oscillator

Chaos AO Osc. Fast MA Periods

This parameter defines the number of periods used to calculate the fast moving average used to calculate the Chaos Awesome Oscillator

Chaos AO Osc. Slow MA Periods

This parameter defines the number of periods used to calculate the slow moving average used to calculate the Chaos Awesome Oscillator

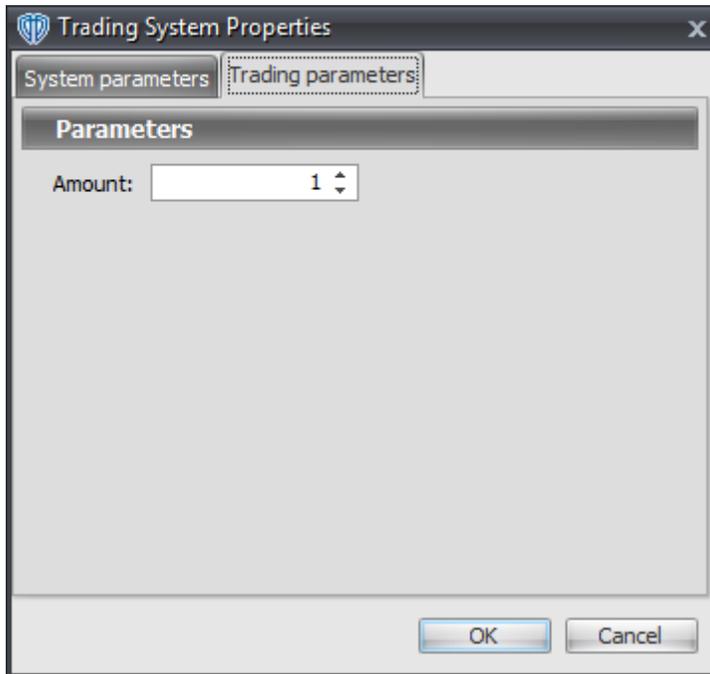
Chaos AO Osc. Signal MA Periods

This parameter defines the number of periods used to calculate the Chaos Awesome Oscillator's Signal Line

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading

Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.18 Chaos Fractals Breakout System

Overview

The **Chaos Fractals Breakout System** uses the Chaos Fractals indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the most recent Up Fractal. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the most recent Up Fractal breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the most recent Down Fractal. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the most recent Down Fractal breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output

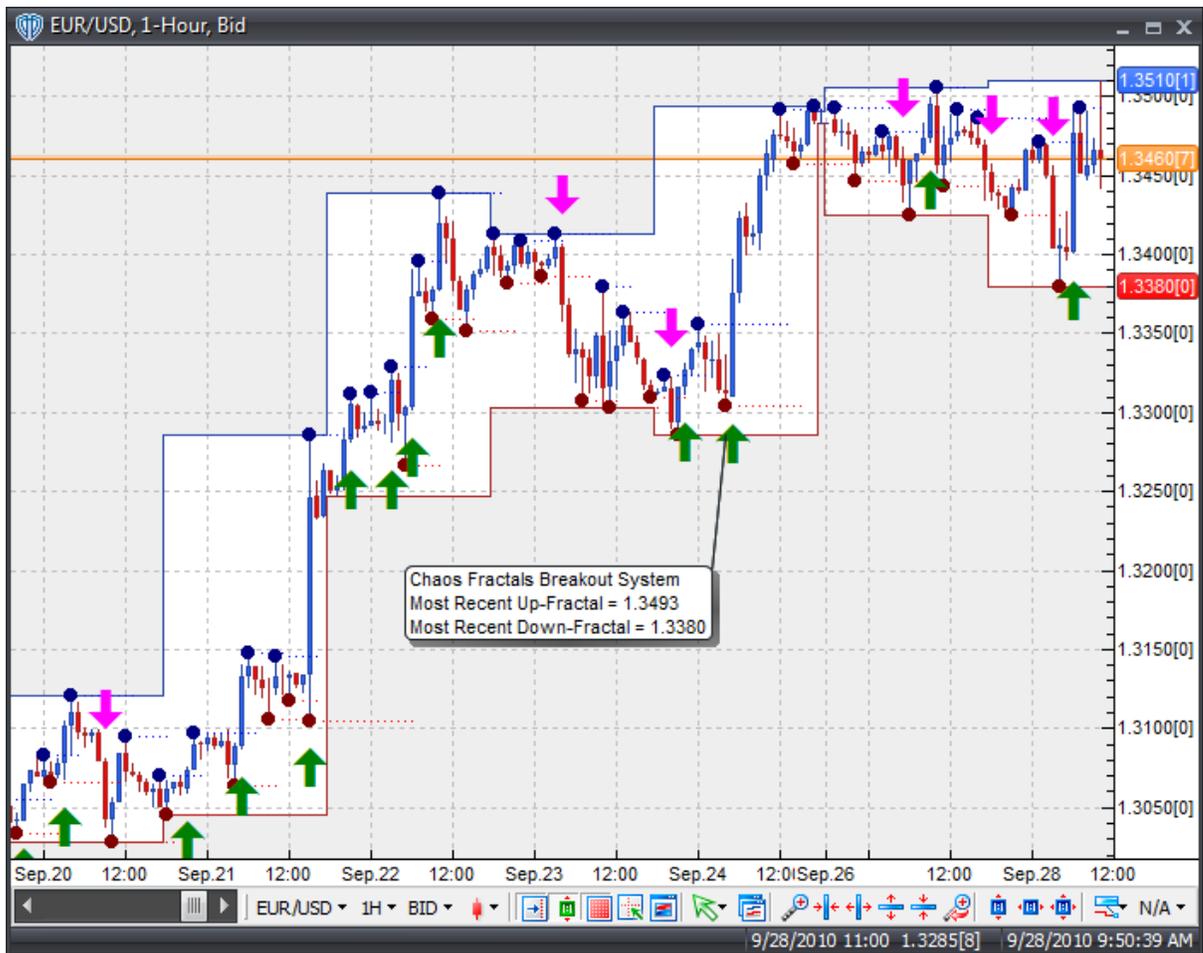
variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Chaos Fractals Breakout System** consists of the following output variables and display parameters:

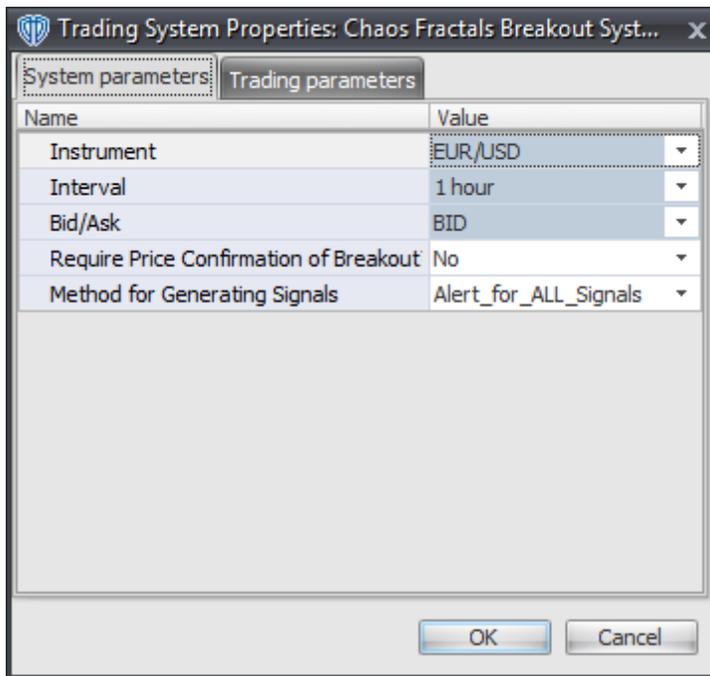
- The Up Fractals levels are shown in the Price Frame as small blue dots.
- The highest High value of the Up Fractals are shown in the Price Frame as large dark blue dots. These dots are shown over the 3rd bar of the fractal only after the fractal has been identified on its 5th bar.
- The Down Fractals levels are shown in the Price Frame as small red dots. These dots are shown under the 3rd bar of the fractal only after the fractal has been identified on its 5th bar.
- The lowest Low value of the Down Fractals are shown in the Price Frame as large dark red dots.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the most recent Up Fractal breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the most recent Down Fractal breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above the most recent Up Fractal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below the most recent Down Fractal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chaos Fractals Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Require Price Confirmation of Breakout?

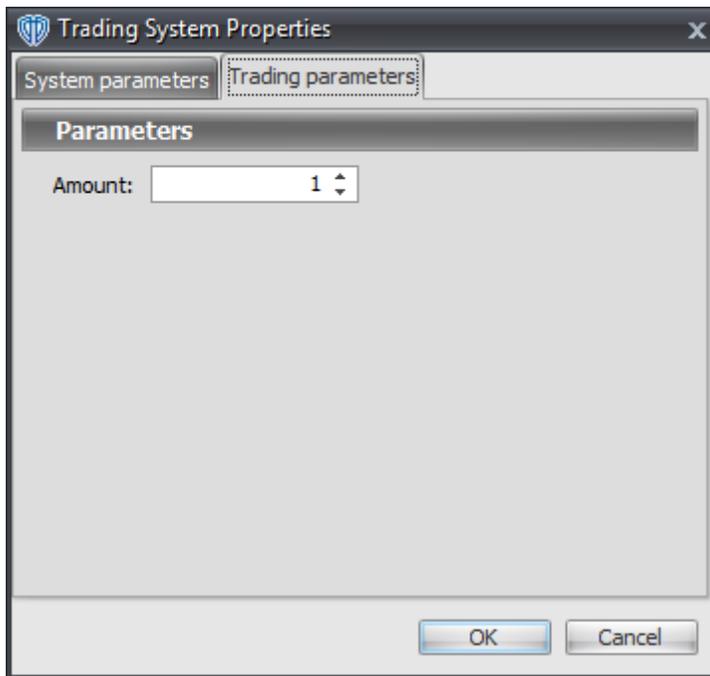
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.19 Chaos Fractals Reversal System

Overview

The **Chaos Fractals Reversal System** uses the Chaos Fractals indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the prices form a new Down Fractal.

A *Short* signal is generated when the prices form a new Up Fractal.

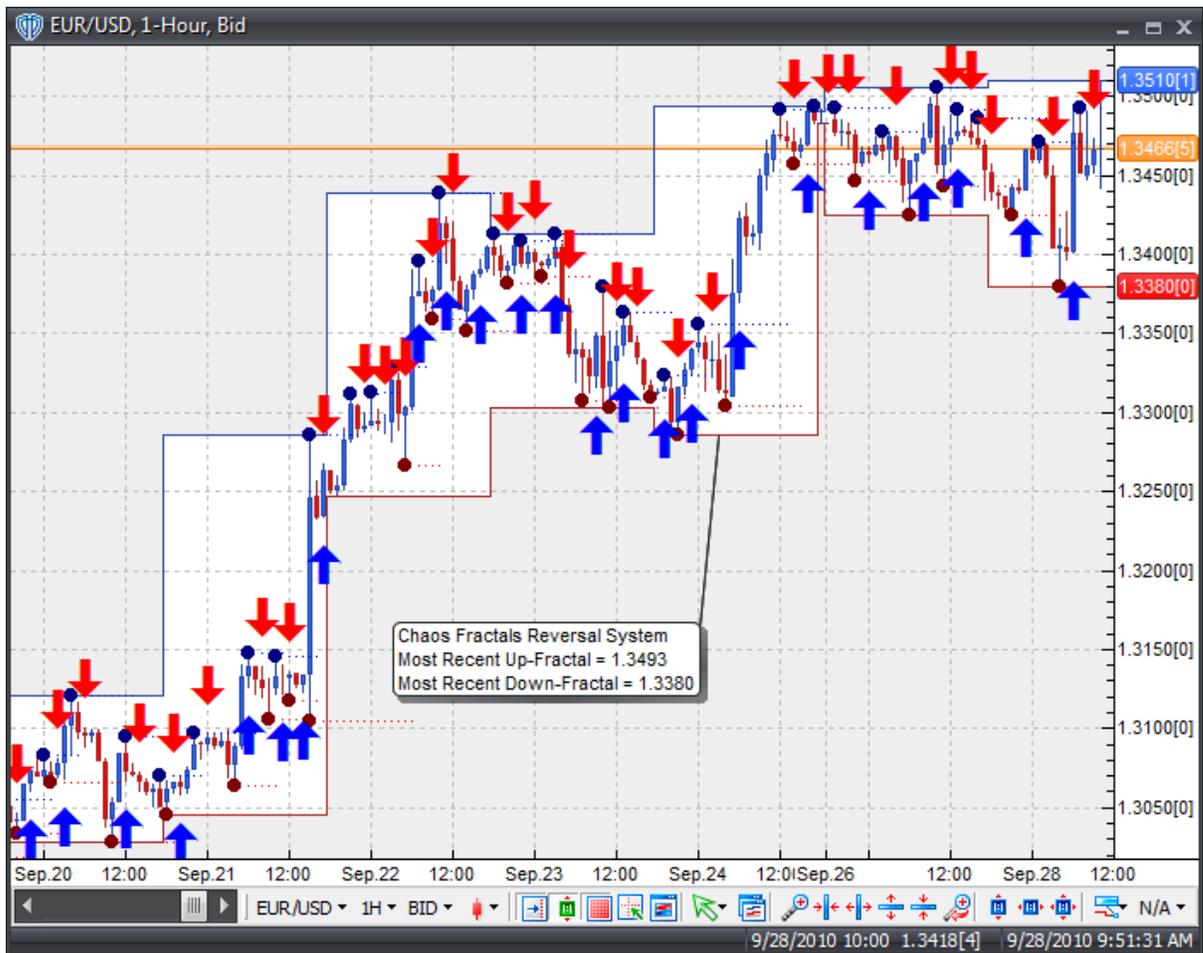
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Chaos Fractals Reversal System** consists of the following output variables and display parameters:

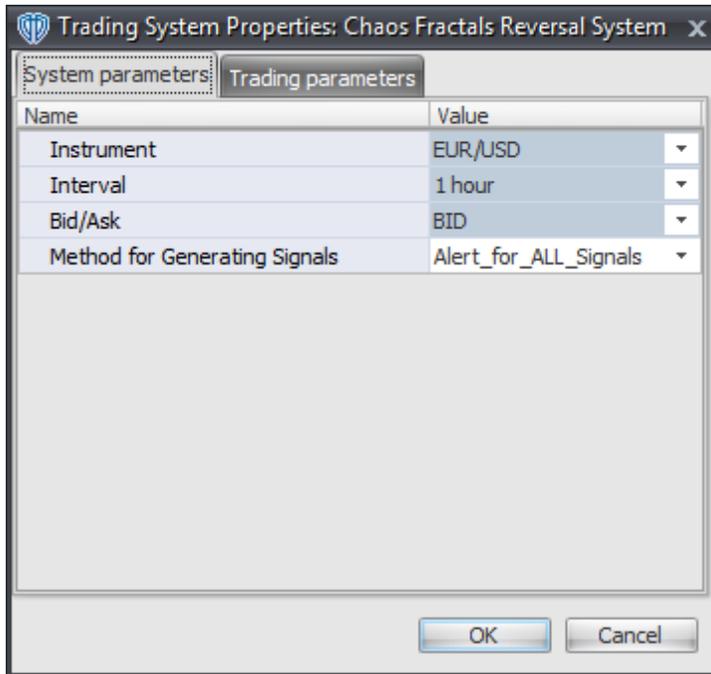
- The Up Fractals levels are shown in the Price Frame as small blue dots.
- The highest High value of the Up Fractals are shown in the Price Frame as large dark blue dots. These dots are shown over the 3rd bar of the fractal only after the fractal has been identified on its 5th bar.
- The Down Fractals levels are shown in the Price Frame as small red dots. These dots are shown under the 3rd bar of the fractal only after the fractal has been identified on its 5th bar.
- The lowest Low value of the Down Fractals are shown in the Price Frame as large dark red dots.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Price has formed a new Down Fractal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Price has formed a new Up Fractal." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Chaos Fractals Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

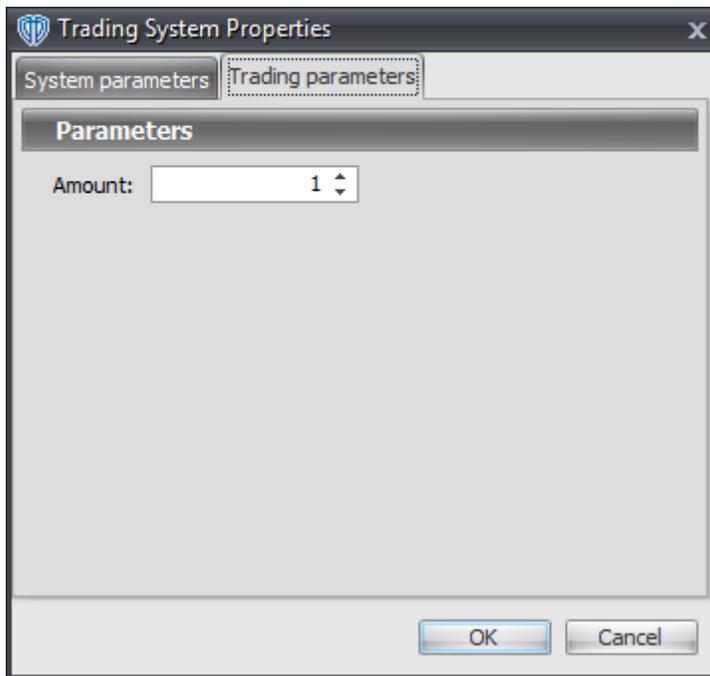
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.20 Commodity Channel Index (CCI) Complex Cross System

Overview

The **Commodity Channel Index (CCI) Complex Cross System** uses the Commodity Channel Index (CCI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the CCI crosses above the CCI + Control Level, but only if the CCI has crossed below and then above zero since the 2nd most recent occurrence of the CCI crossing above the CCI + Control Level.

If the CCI crosses above the CCI + Extreme Level, then a *Long Exit* signal occurs when the CCI crosses below the CCI + Control Level; however, if the CCI does not cross above the CCI + Extreme Level, then a *Long Exit* signal occurs when the CCI crosses below zero.

A *Short Entry* signal is generated when the CCI crosses below the CCI - Control Level, but only if the CCI has crossed above and then below zero since the 2nd most recent occurrence of the CCI crossing below the CCI - Control Level.

If the CCI crosses below the CCI - Extreme Level, then a *Short Exit* signal occurs when the CCI crosses above the CCI - Control Level; however, if the CCI does not cross below the CCI - Extreme Level, then a *Short Exit* signal occurs when the CCI crosses above zero.

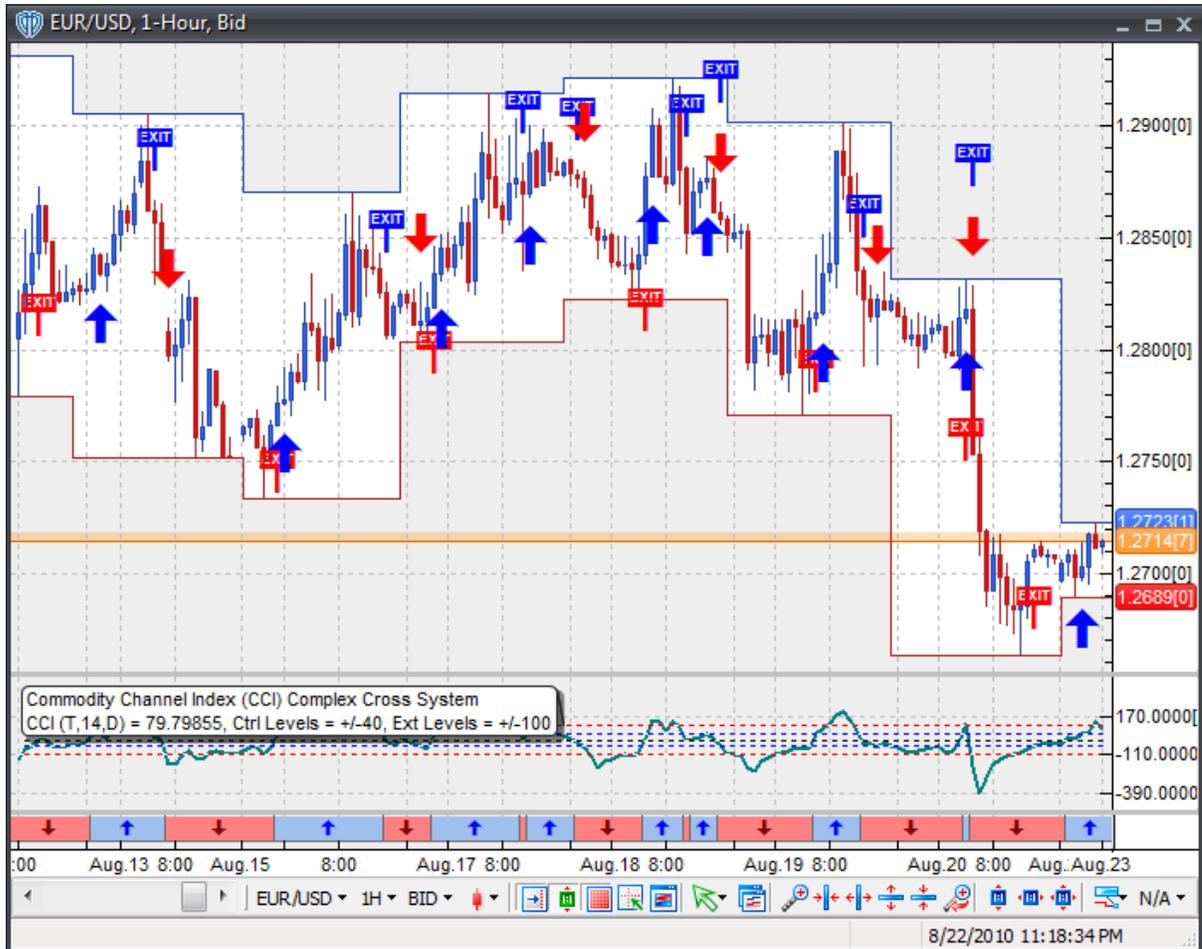
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Commodity Channel Index (CCI) Complex Cross System** consists of the following output variables and display parameters:

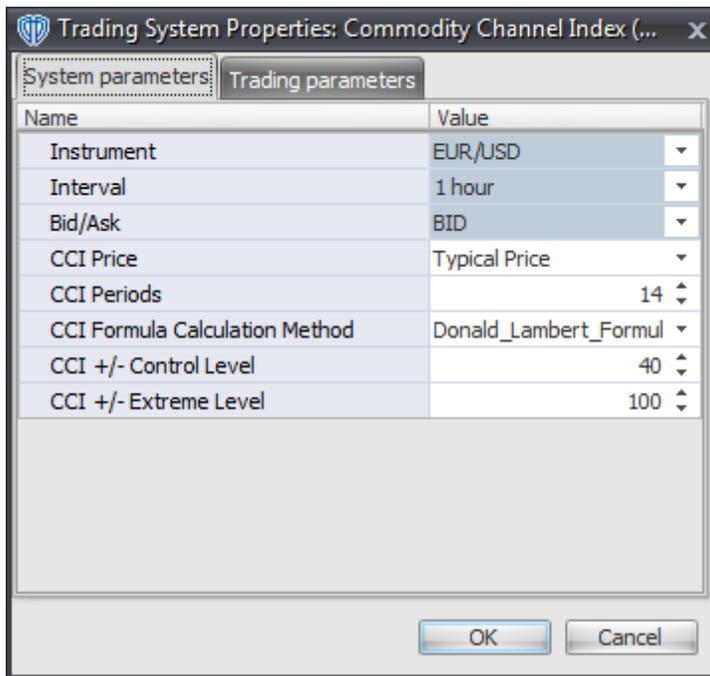
- The Commodity Channel Index (CCI) displays in Additional Frame 1 as a solid blue line. Its mid-level (0) displays in the same frame as a black dashed line.
- Commodity Channel Index (CCI)'s +/- Control Levels display in Additional Frame 1 as dashed blue lines.
- Commodity Channel Index (CCI)'s +/- Extreme Levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue up arrow against a light blue background while the Commodity Channel Index (CCI) is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the Commodity Channel Index (CCI) is less than zero.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The CCI Complex Cross Long Entry conditions have been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The CCI Complex Cross Long Exit conditions have been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The CCI Complex Cross Short Entry conditions have been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The CCI Complex Cross Short Exit conditions have been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Commodity Channel Index (CCI) Complex Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

CCI Price, Periods, and Formula Calculation Method

These parameters define the price, number of periods, and method used to calculate the Commodity Channel Index (CCI).

CCI +/- Control Level

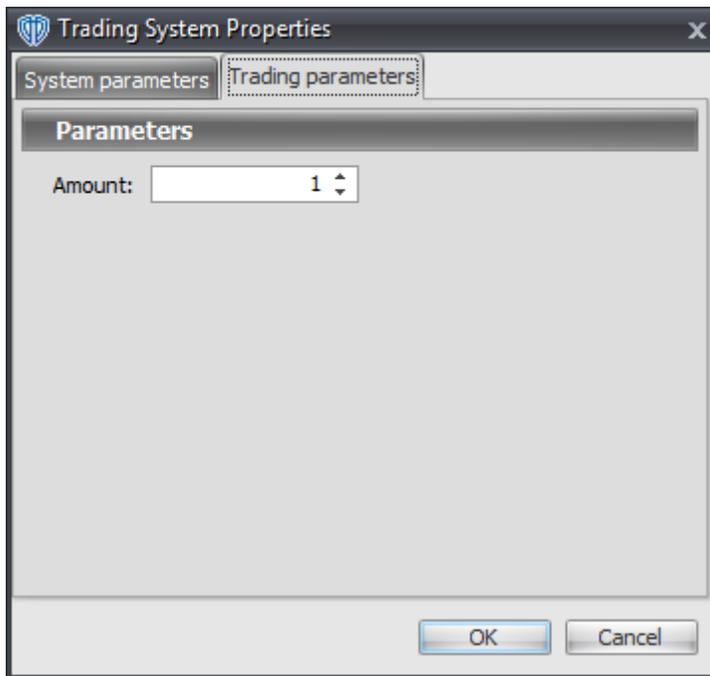
This parameter defines the positive/negative values used in the conditions to generate the *Long Entry*, *Long Exit*, *Short Entry*, and *Short Exit* signals.

CCI +/- Extreme Level

This parameter defines the positive/negative values used in the conditions to generate the *Long Exit* and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.21 Commodity Channel Index (CCI) Cross System

Overview

The **Commodity Channel Index (CCI) Cross System** uses the Commodity Channel Index (CCI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the CCI crosses above its Long Entry Level.

A *Short* signal is generated when the CCI crosses below its Short Entry Level.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Commodity Channel Index (CCI) Cross System** consists of the following output variables and display parameters:

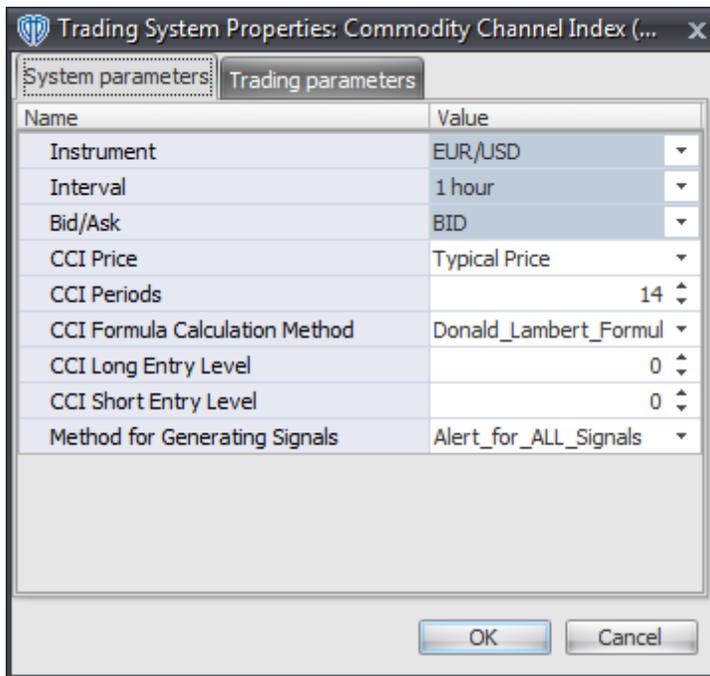
- The Commodity Channel Index (CCI) displays in Additional Frame 1 as a solid blue line. Its overbought (+100) and oversold (-100) levels display in the same frame as red dashed lines. Its mid-level (0) displays in the same frame as a black dashed line.
- The Commodity Channel Index (CCI)'s Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The CCI crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The CCI crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Commodity Channel Index (CCI) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

CCI Price, Periods, and Formula Calculation Method

These parameters define the price, number of periods, and method used to calculate the Commodity Channel Index (CCI).

CCI Long Entry Level

This parameter defines the value used in the CCI-related conditions to generate the *Long* signal.

CCI Short Entry Level

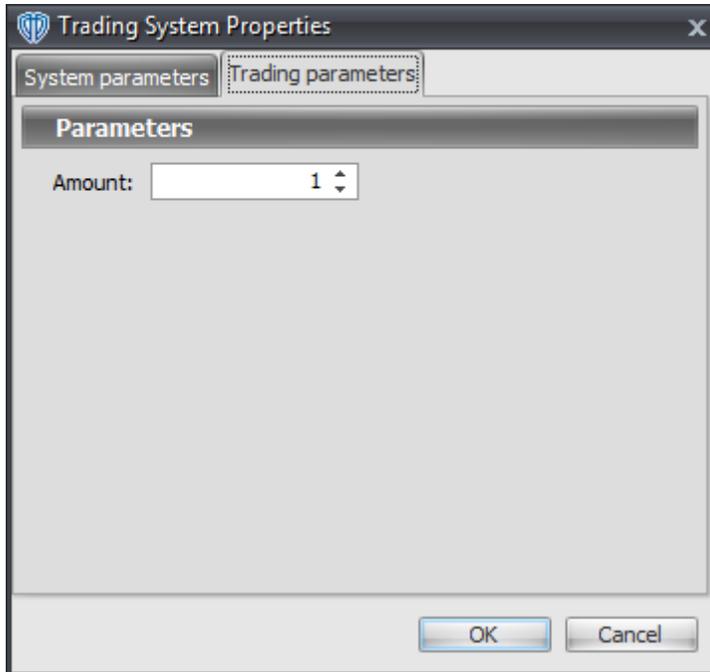
This parameter defines the value used in the CCI-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.22 Commodity Channel Index (CCI) Reversal System

Overview

The **Commodity Channel Index (CCI) Reversal System** uses the Commodity Channel Index (CCI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the CCI crosses above its *OverSold* Level from below.

A *Long Exit* signal is generated when the CCI crosses below its *OverBought* Level from above OR the CCI crosses below its *OverSold* Level from above.

A *Short Entry* signal is generated when the CCI crosses below its *OverBought* Level from above.

A *Short Exit* signal is generated when the CCI crosses above its *OverSold* Level from below OR the CCI crosses above its *OverBought* Level from below.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose,

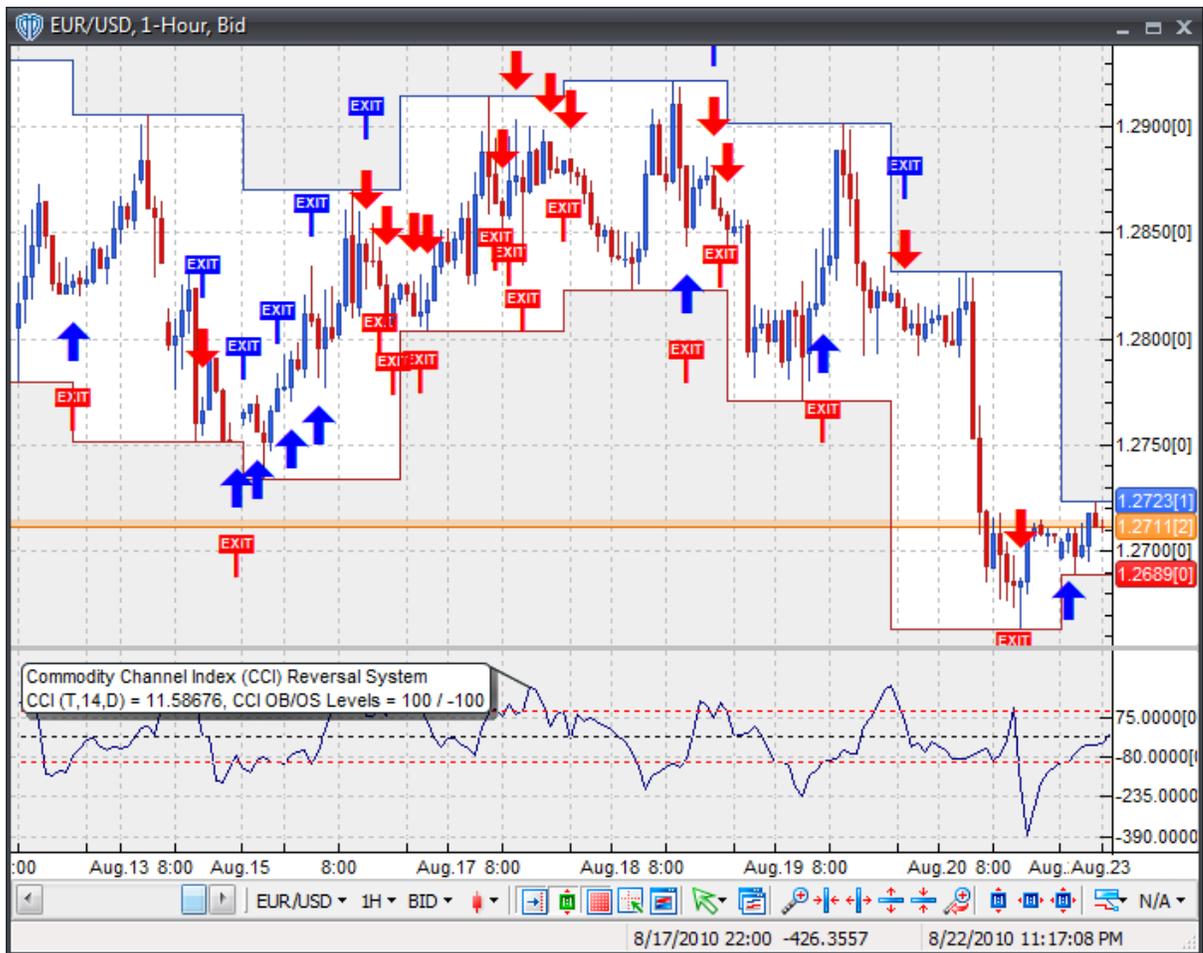
in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Commodity Channel Index (CCI) Reversal System** consists of the following output variables and display parameters:

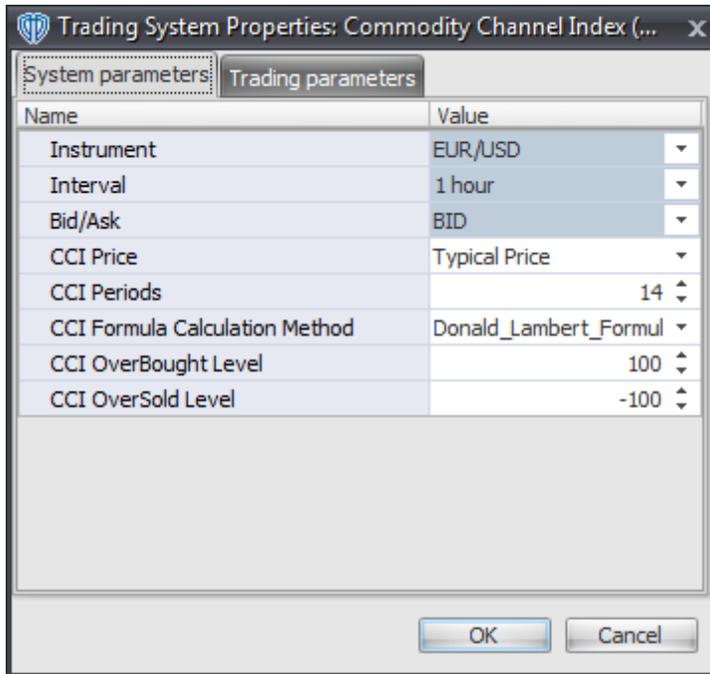
- The Commodity Channel Index (CCI) displays in Additional Frame 1 as a solid blue line. Its mid-level (0) displays in the same frame as a black dashed line.
- Commodity Channel Index (CCI)'s OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The CCI crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The CCI crossed below its OverBought Level or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The CCI crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The CCI crossed above its OverSold Level or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Commodity Channel Index (CCI) Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

CCI Price, Periods, and Formula Calculation Method

These parameters define the price, number of periods, and method used to calculate the Commodity Channel Index (CCI).

CCI OverBought Level

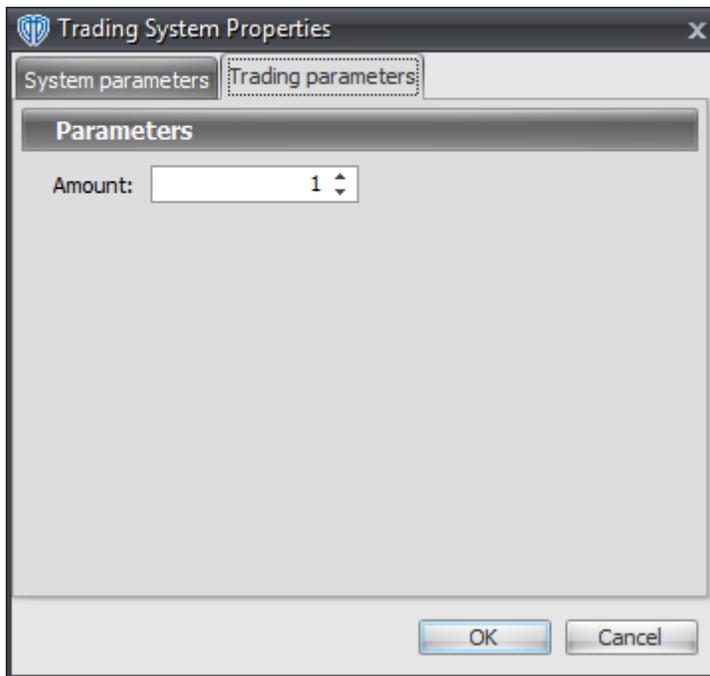
This parameter defines the OverBought value used in the CCI-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

CCI OverSold Level

This parameter defines the OverSold value used in the CCI-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.23 Complex Trend System #1 (Fast MA / Slow MA / RSI / MACD)

Overview

The **Complex Trend System #1 (Fast MA / Slow MA / RSI / MACD)** uses Fast and Slow Moving Averages, the Relative Strength Index (RSI), and the Moving Average Convergence Divergence (MACD) indicators to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated for the first bar when all of the following conditions become true:

- Fast Moving Average is greater than Slow Moving Average
- RSI is greater than 50, and
- MACD Fast Line is greater than MACD Signal Line

A *Short* signal is generated for the first bar when all of the following conditions become true:

- Fast Moving Average is less than Slow Moving Average
- RSI is less than 50, and
- MACD Fast Line is less than MACD Signal Line

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals

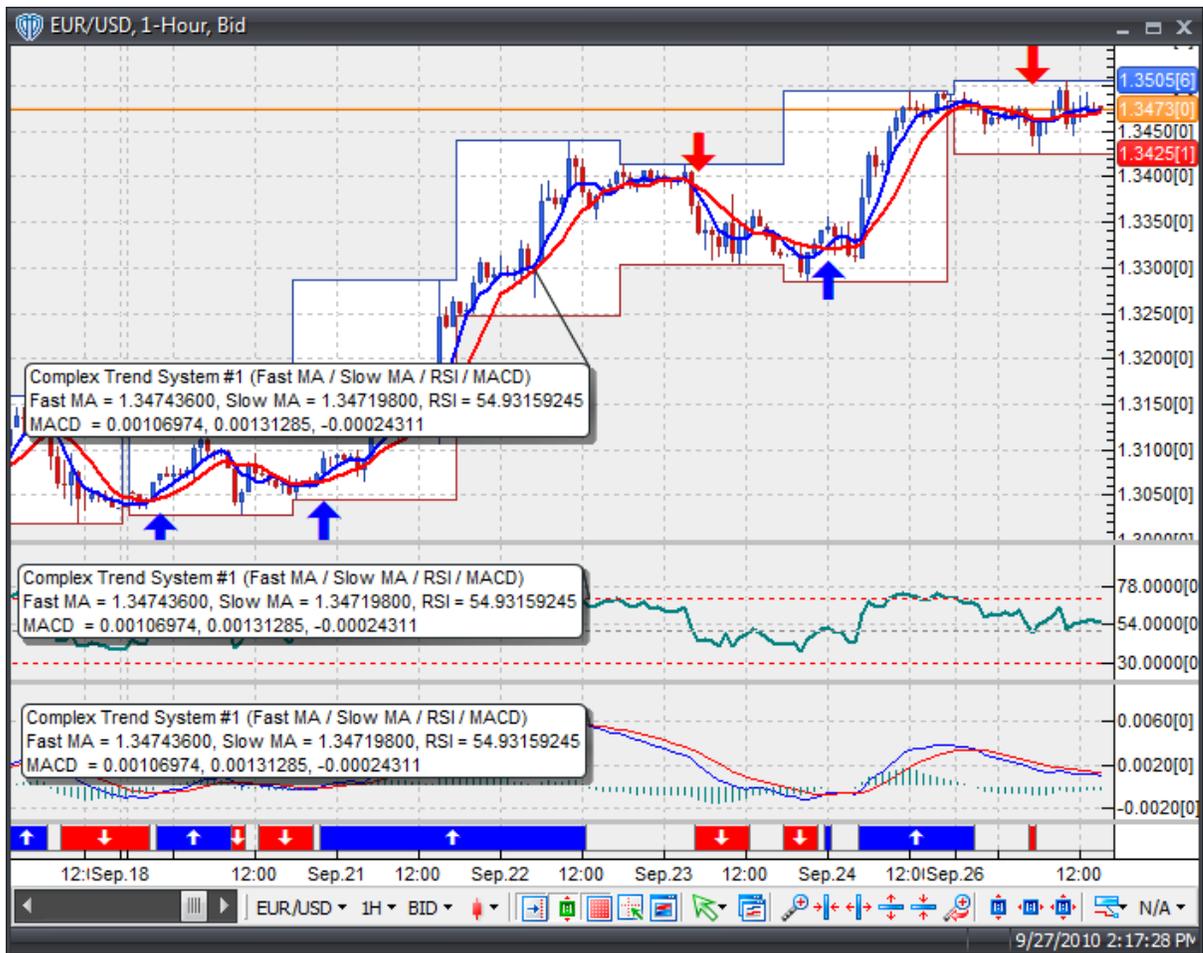
to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Complex Trend System #1 (Fast MA / Slow MA / RSI / MACD)** consists of the following output variables and display parameters:

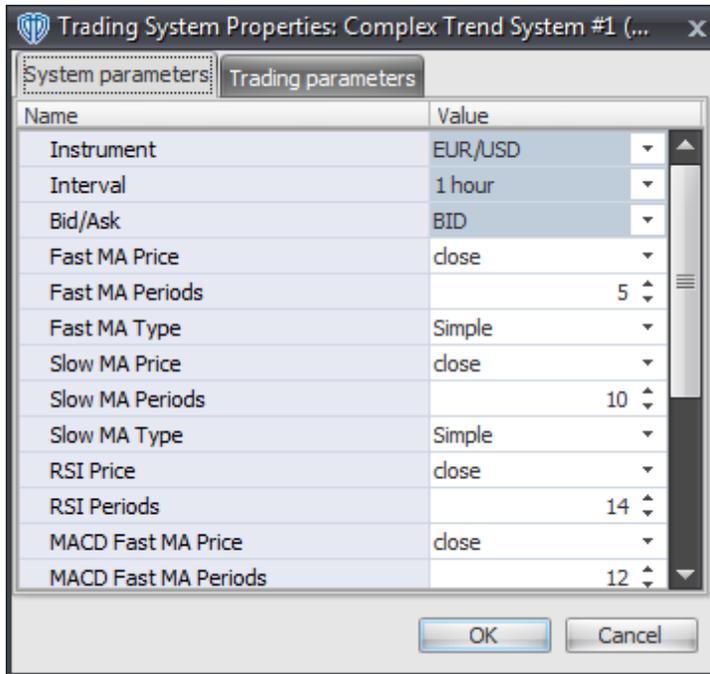
- The Fast Moving Average displays in the Price Frame as slightly thicker, solid blue line.
- The Slow Moving Average displays in the Price Frame as a slightly thicker, solid red line.
- The Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid green line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The MACD Fast Line, Signal Line, and Histogram display in Additional Frame 2. The MACD Fast Line is the thin, solid blue line; the MACD Signal Line is the thin, solid red line; the MACD Histogram is the thin, green histogram. Its mid-level (0) displays in the same frame as a black dashed line.
- The Trend Frame displays a white up arrow against a blue background while the Fast MA is greater than the Slow MA and the RSI is greater than 50 and the MACD Fast Line is greater than the MACD Signal Line.
- The Trend Frame displays a white down arrow against a red background while the Fast MA is less than the Slow MA and the RSI is less than 50 and the MACD Fast Line is less than the MACD Signal Line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast MA > Slow MA AND RSI > 50 AND MACD Fast Line > MACD Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast MA < Slow MA AND RSI < 50 AND MACD Fast Line < MACD Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Complex Trend System #1 (Fast MA / Slow MA / RSI / MACD)** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast MA Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Fast Moving Average.

Slow MA Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Slow Moving Average.

RSI Price and RSI Periods

These parameters define the price and number of periods used to calculate the Relative Strength Index.

MACD Fast MA Price, MACD Fast MA Periods, and MACD Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Fast Line of the MACD indicator.

MACD Slow MA Price, MACD Slow MA Periods, and MACD Slow MA Type

These parameters define price, number of periods, and type of the slow moving average used to calculate the Fast Line of the MACD indicator.

MACD Signal MA Periods and MACD Signal MA Type

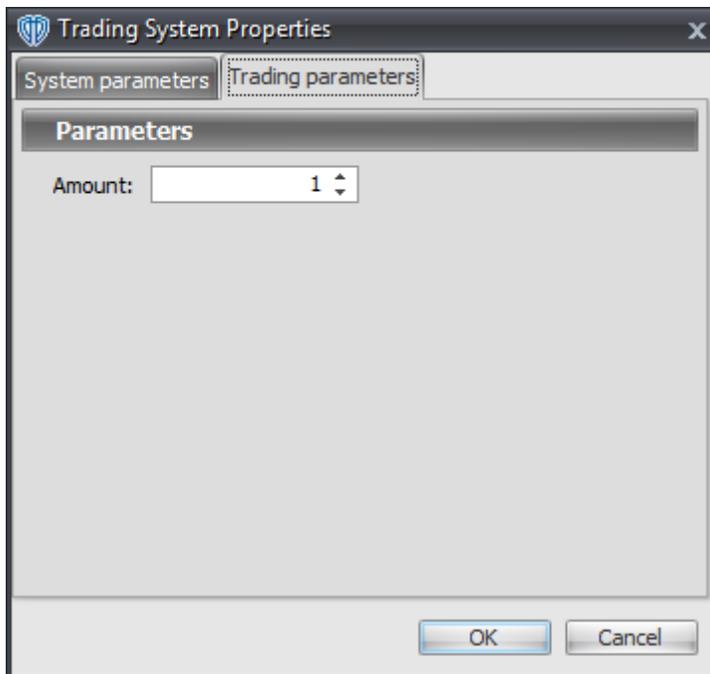
These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the MACD indicator.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.24 Darvas Box Breakout System

Overview

The **Darvas Box Breakout System** uses the Darvas Box to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the top Darvas Box. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the top Darvas Box breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the bottom Darvas Box. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the bottom Darvas Box breakout bar within the following two bars.

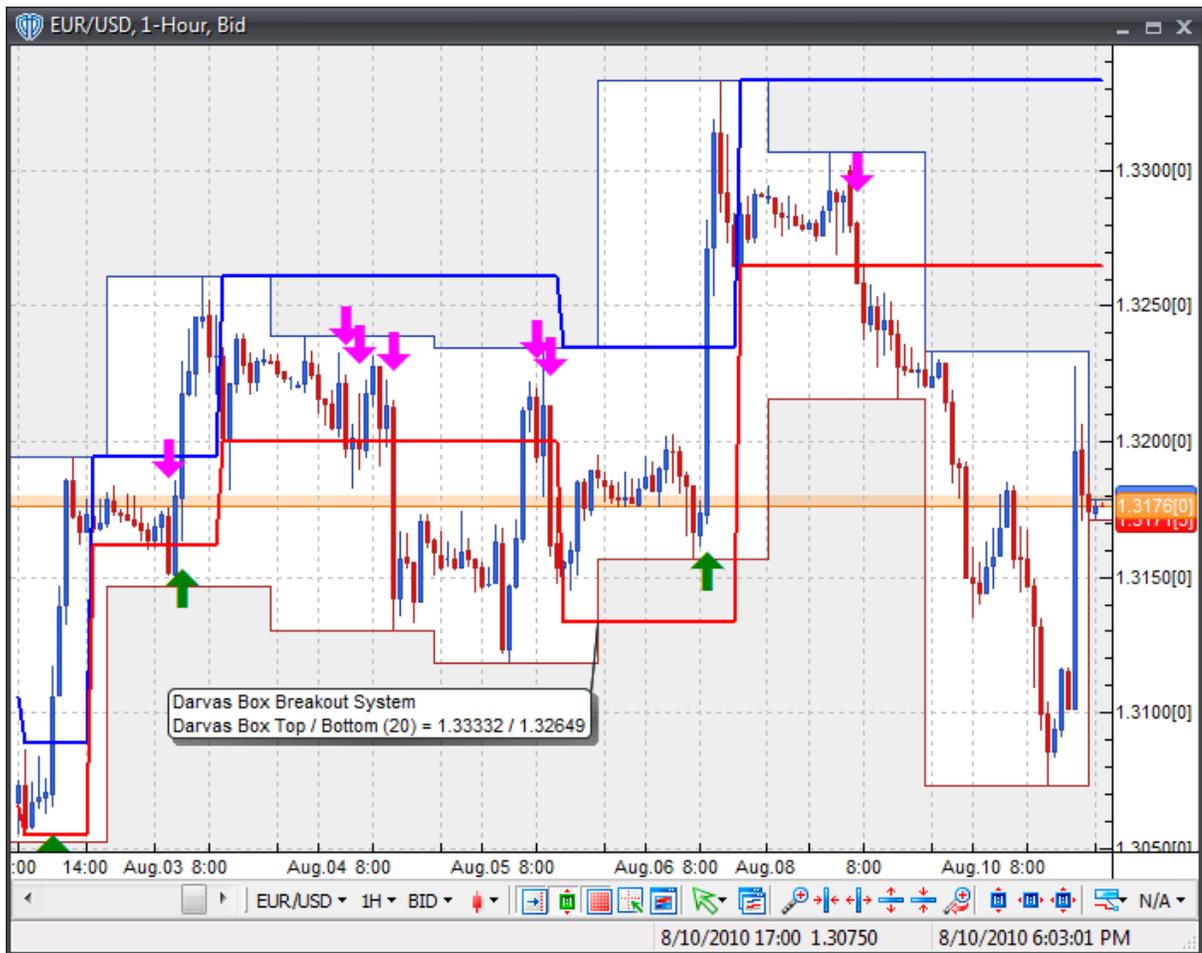
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Darvas Box Breakout System** consists of the following output variables and display parameters:

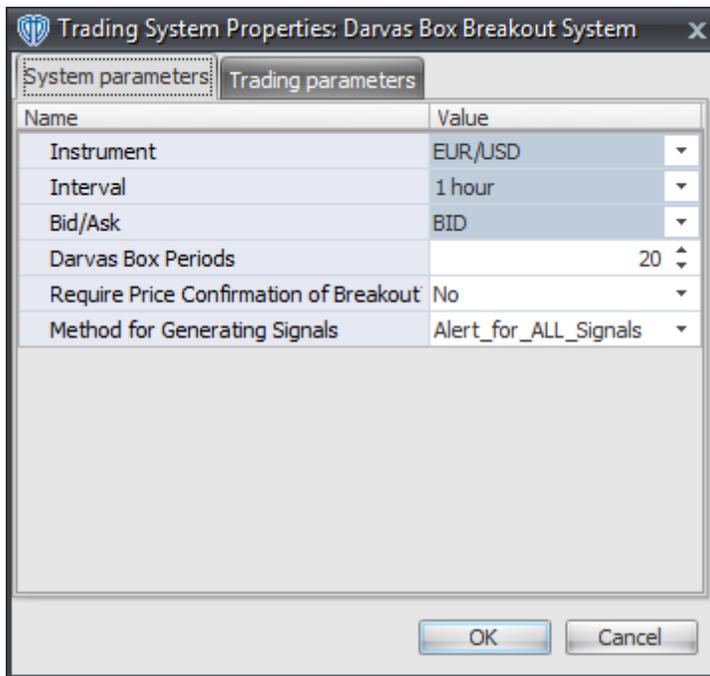
- The Darvas Box displays in the Price Frame. The top Darvas Box is a slightly thicker, solid blue line and the bottom Darvas box is a slightly thicker, solid red line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the top Darvas Box breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the bottom Darvas Box breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above the Top Darvas Box." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below the Bottom Darvas Box." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Darvas Box Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Darvas Box Periods

This parameter defines the number of periods used to calculate the Darvas Box.

Require Price Confirmation of Breakout?

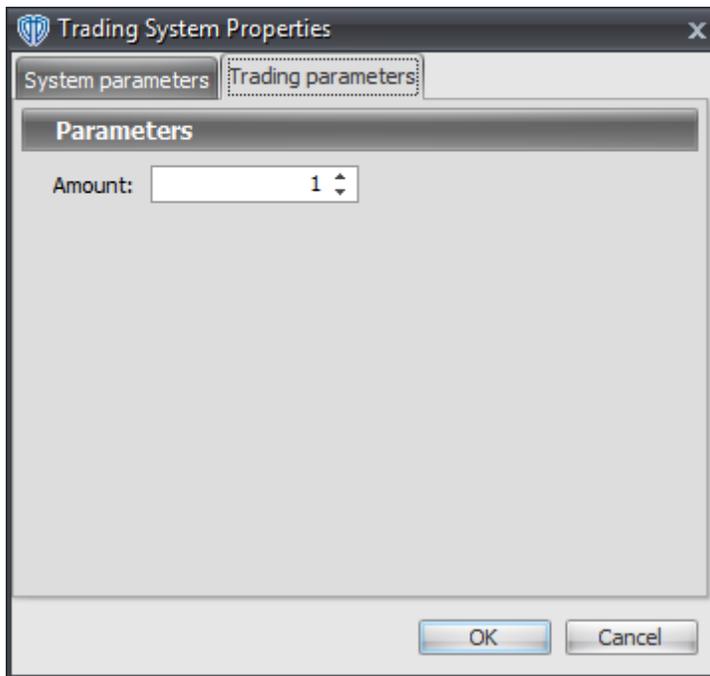
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.25 Detrended Price Oscillator (DPO) Cross System

Overview

The **Detrended Price Oscillator (DPO) Cross System** uses the Detrended Price Oscillator (DPO) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the DPO crosses above zero.

A *Short* signal is generated when the DPO crosses below zero.

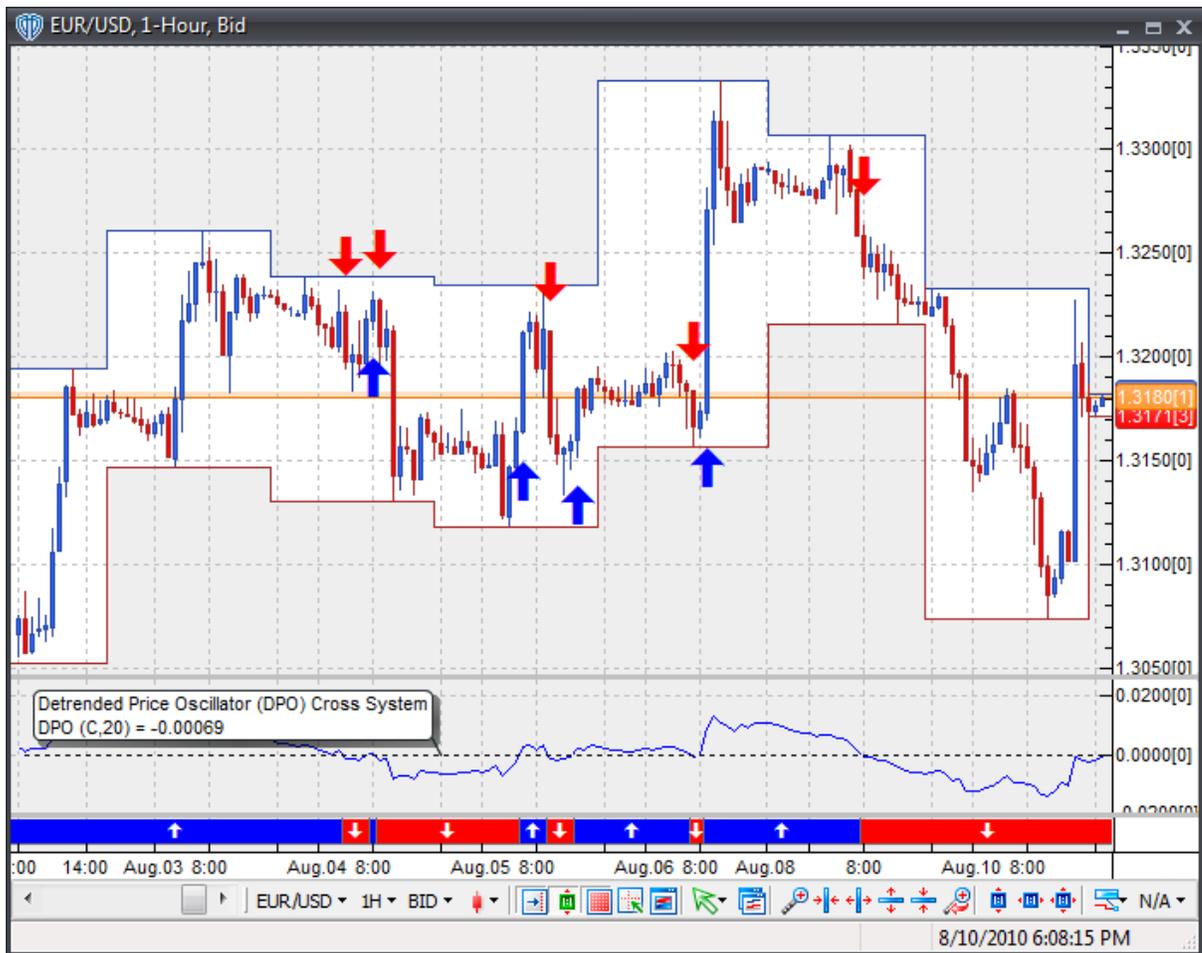
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Detrended Price Oscillator (DPO) Cross System** consists of the following output variables and display parameters:

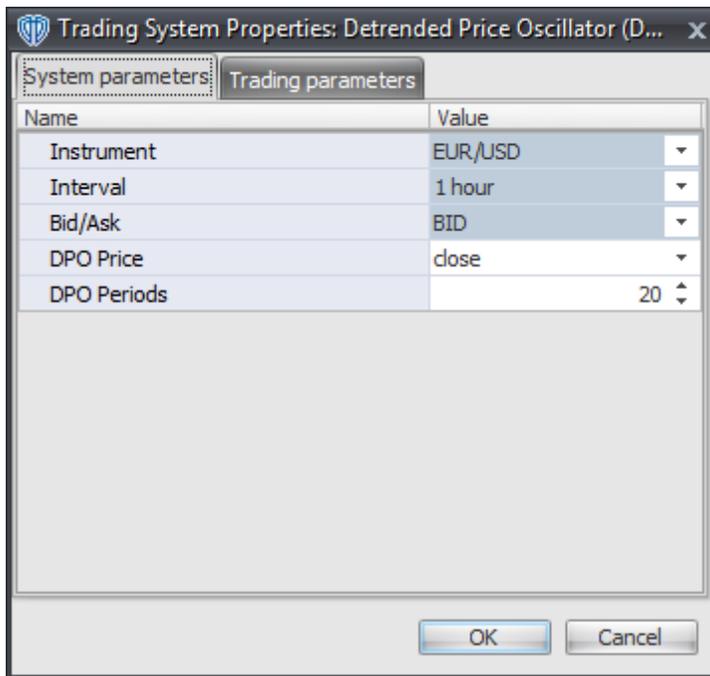
- The Detrended Price Oscillator (DPO) displays in Additional Frame 1 as solid blue line. Its mid-level (0) displays in the same frame as a dashed black line.
- The Trend Frame displays a white up arrow against a blue background while the DPO is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the DPO is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The DPO crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The DPO crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Detrended Price Oscillator (DPO) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

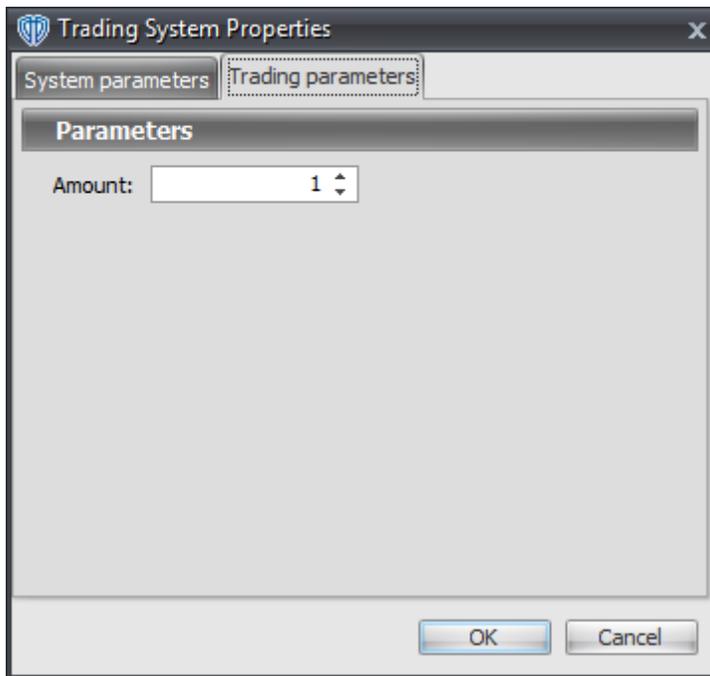
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

DPO Price and DPO Periods

These parameters define the price and number of periods used to calculate the Detrended Price Oscillator (DPO).

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.26 Directional Movement Index "Extreme Point Rule" System

Overview

The **Directional Movement Index "Extreme Point Rule" System** uses the Directional Movement Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when +DI is greater than -DI and the Close price crosses above the High price of the bar when +DI crossed above -DI.

A *Long Exit* signal is generated when +DI crosses below -DI.

A *Short Entry* signal is generated when +DI is less than -DI and the Close price crosses below the Low price of bar when +DI crossed below -DI.

A *Short Exit* signal is generated when +DI crosses above -DI.

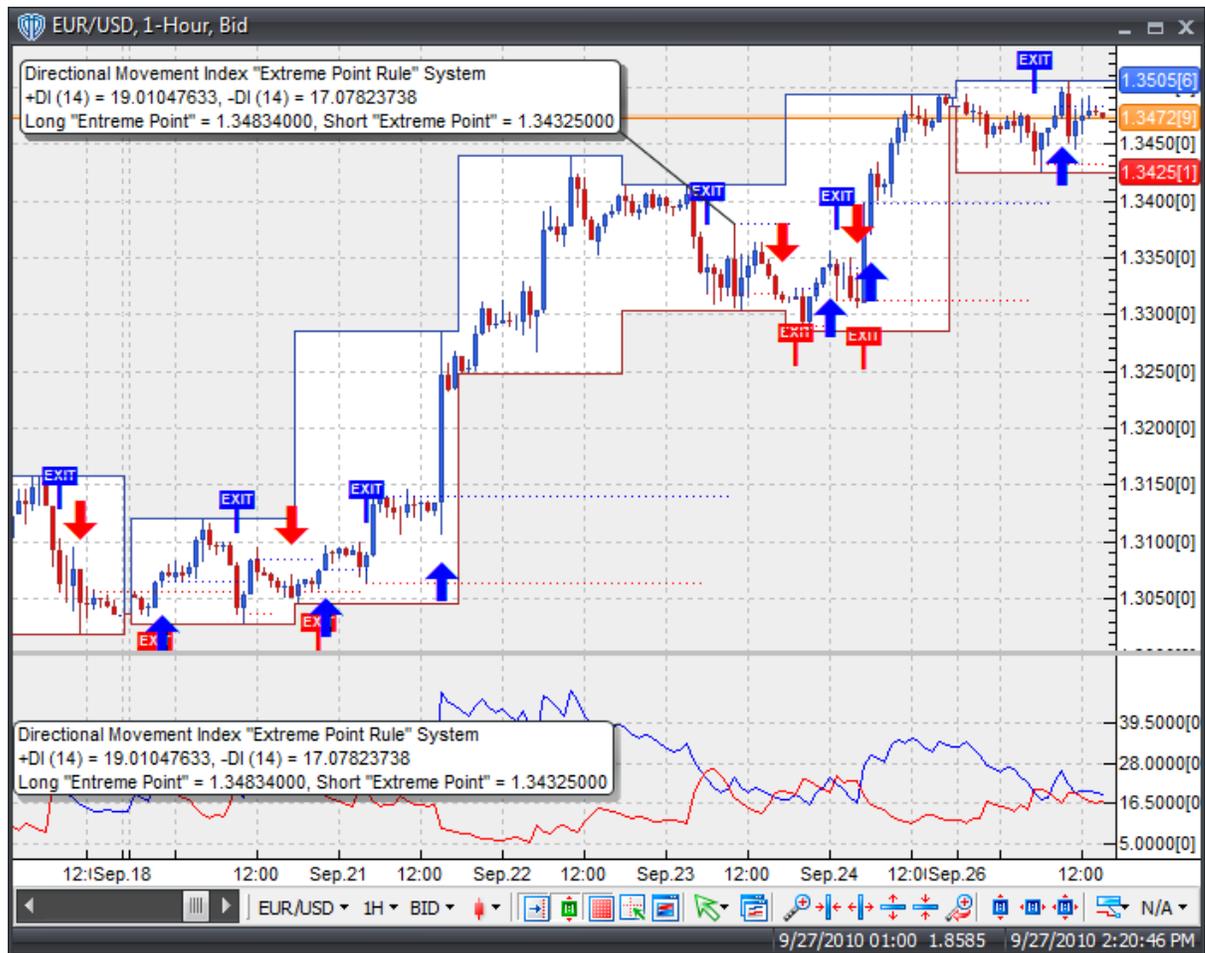
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Directional Movement Index "Extreme Point Rule" System** consists of the following output variables and display parameters:

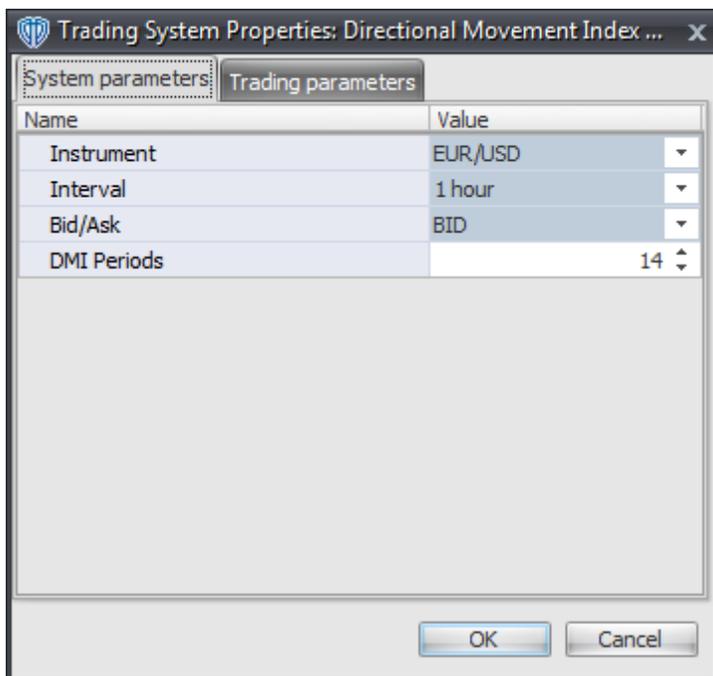
- The Directional Movement Index's +DI displays in Additional Frame 1 as a solid blue line.
- The Directional Movement Index's -DI displays in Additional Frame 1 as a solid red line.
- The Long Extreme Point value displays in the Price Frame as small blue dots.
- The Short Extreme Point value displays in the Price Frame as small red dots.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! +DI > -DI and the Close price crossed above the High price of the bar when +DI crossed above -DI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! +DI crossed below -DI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! +DI < -DI and the Close price crossed below the Low price of the bar when +DI crossed below -DI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! +DI crossed above -DI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Directional Movement Index "Extreme Point Rule" System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

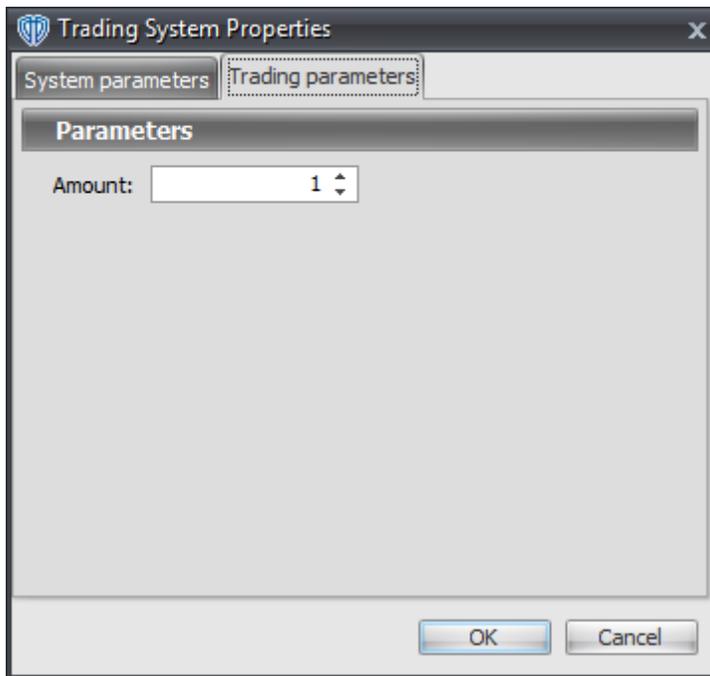
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

DMI Periods

This parameter defines the number of periods used calculate the Directional Movement Index.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.27 Directional Movement Index Cross System

Overview

The **Directional Movement Index Cross System** uses the Directional Movement Index to generate signals for potential trading opportunities. The Average Directional Movement Index (ADX) is included as a visual aid only.

The signals are generated using the following logic:

A *Long* signal is generated when +DI crosses above -DI.

A *Short* signal is generated when +DI crosses below -DI.

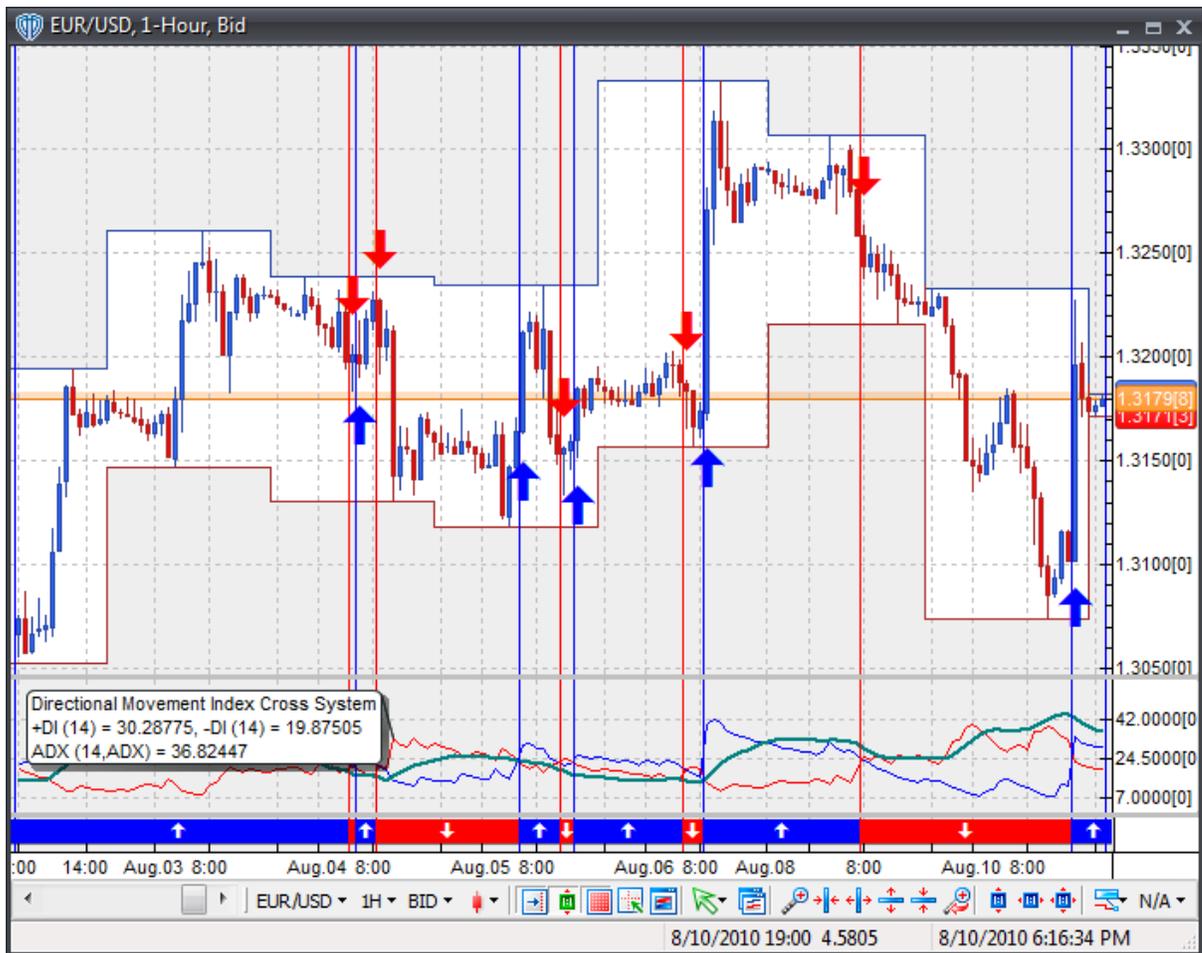
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Directional Movement Index Cross System** consists of the following output variables and display parameters:

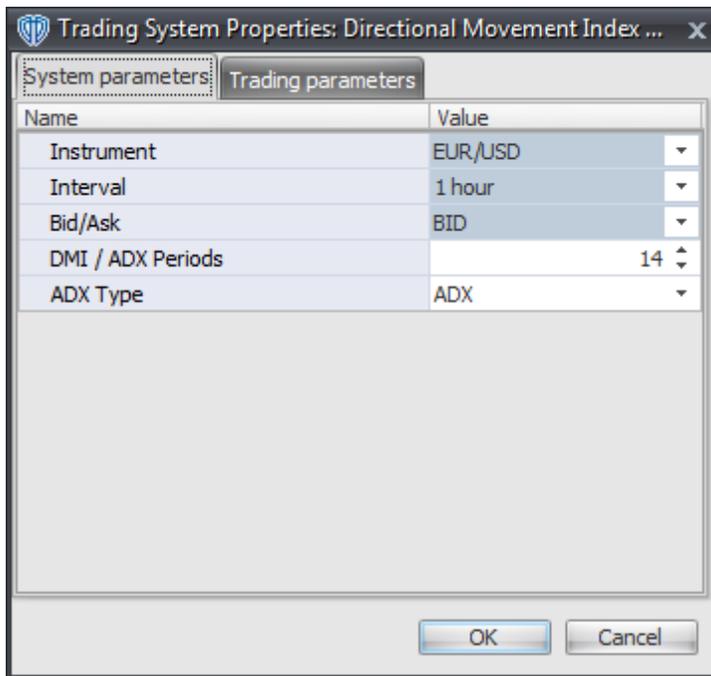
- The Directional Movement Index's +DI displays in Additional Frame 1 as a solid blue line.
- The Directional Movement Index's -DI displays in Additional Frame 1 as a solid red line.
- The Average Directional Movement Index (ADX) displays in Additional Frame 1 as a slightly-thicker, solid green line.
- The Short Extreme Point value displays in the Price Frame as small red dots.
- The Trend Frame displays a white up arrow against a blue background along with beginning/ending vertical blue lines while +DI is greater than -DI.
- The Trend Frame displays a white down arrow against a red background along with beginning/ending vertical red lines while +DI is less than -DI.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! +DI crossed above -DI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! +DI crossed below -DI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Directional Movement Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

DMI / ADX Periods

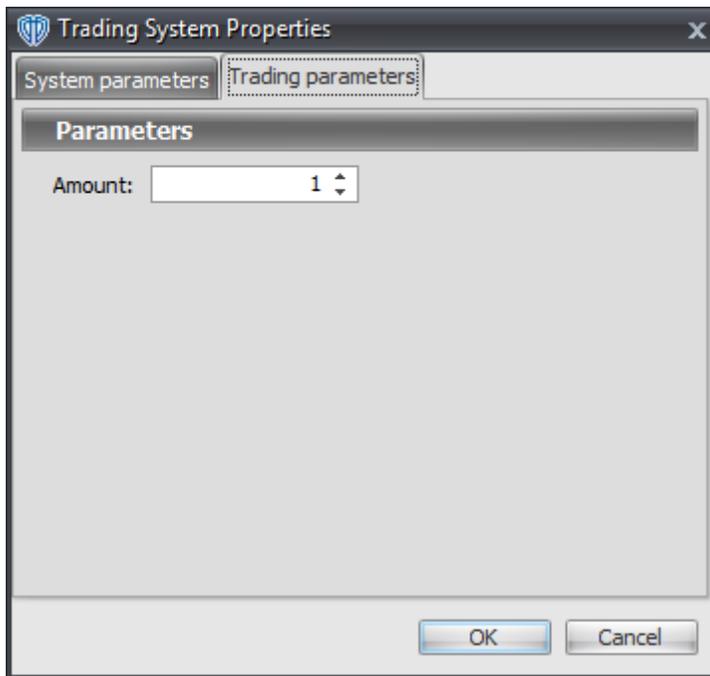
This parameter defines the number of periods used calculate the Directional Movement Index and the Average Directional Movement Index (ADX).

ADX Type

This parameter defines the type of Average Directional Movement Index (ADX) that is calculated.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.28 Disparity Index Cross System

Overview

The **Disparity Index Cross System** uses the Disparity Index indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Disparity Index crosses above zero.

A *Short* signal is generated when the Disparity Index crosses below zero.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

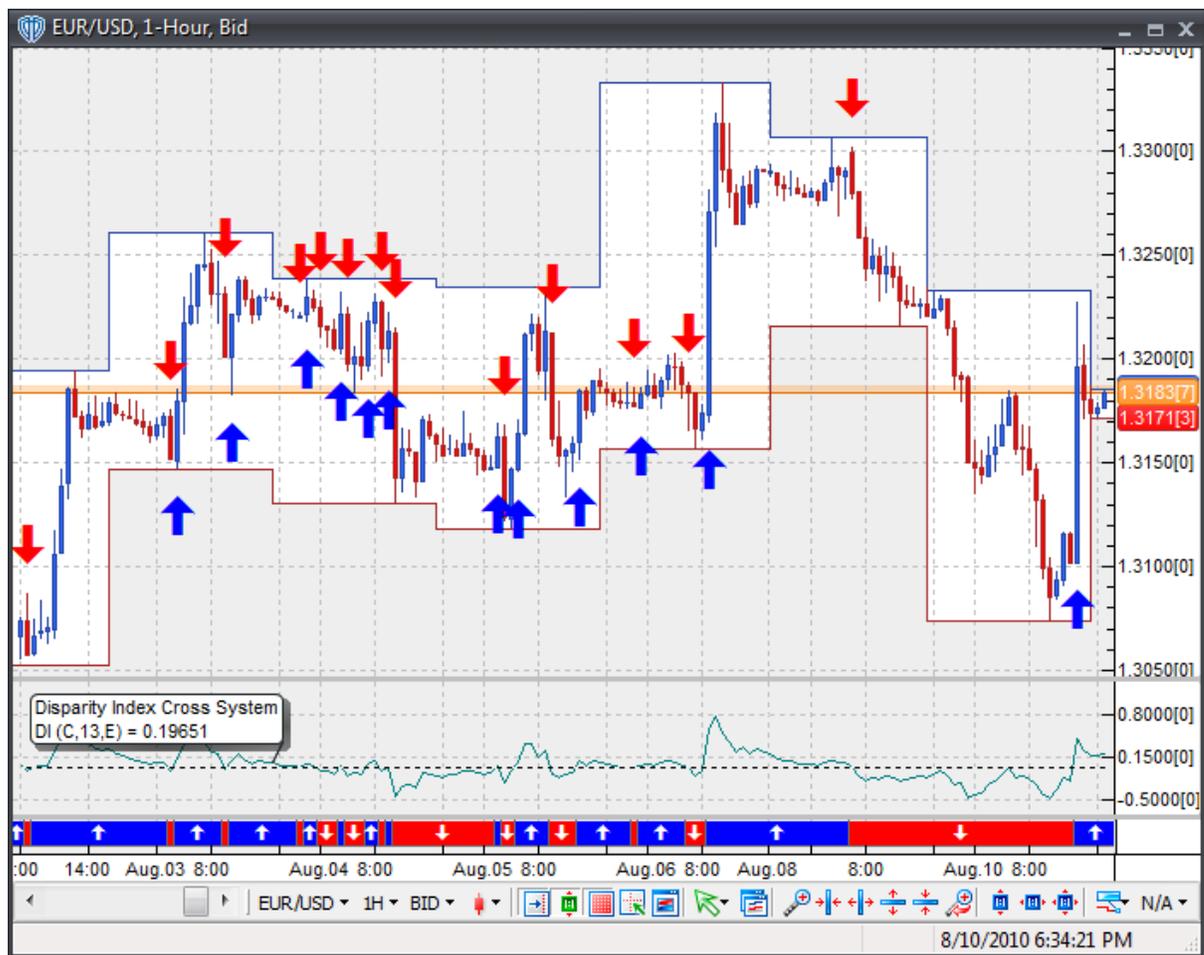
The **Disparity Index Cross System** consists of the following output variables and display parameters:

- The Disparity Index displays in Additional Frame 1 as solid green line. Its mid-level (0) displays in

the same frame as a dashed black line.

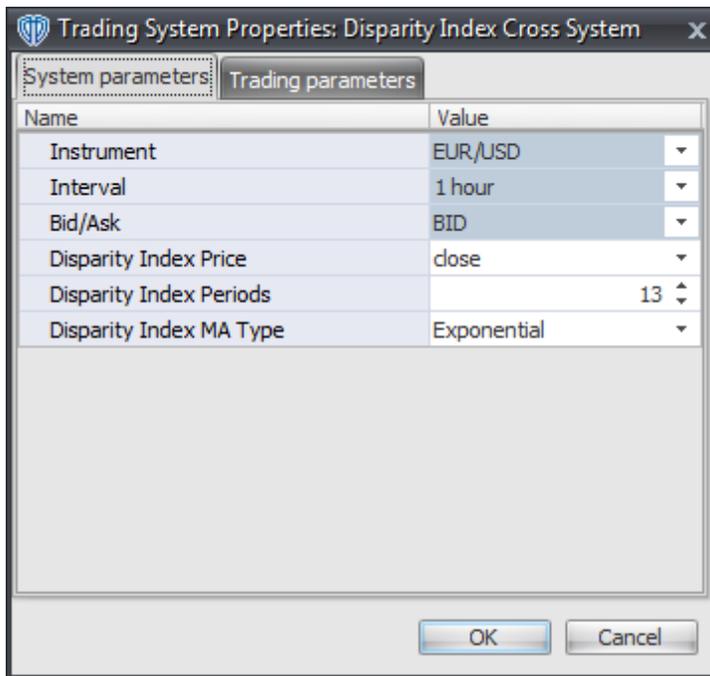
- The Trend Frame displays a white up arrow against a blue background while the Disparity Index is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the Disparity Index is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Disparity Index crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Disparity Index crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Disparity Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

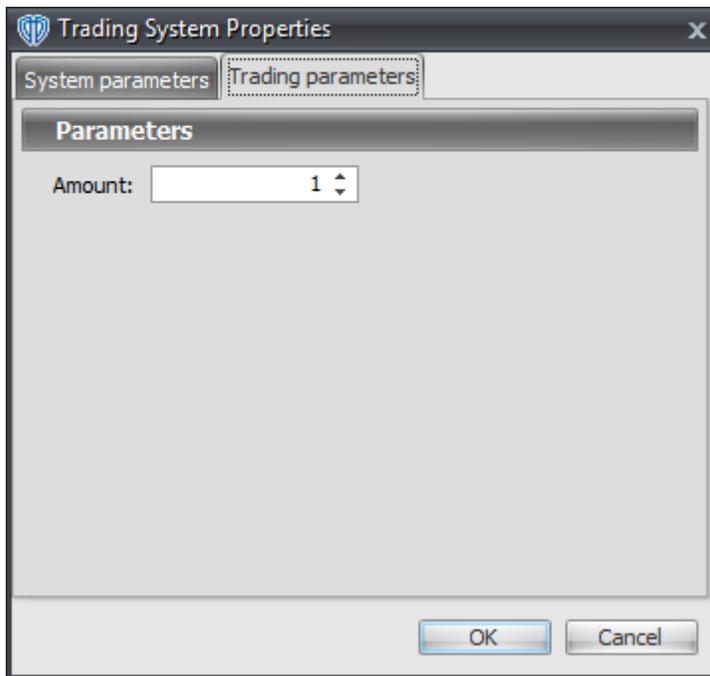
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Disparity Index Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Disparity Index.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.29 Disparity Index Reversal System

Overview

The **Disparity Index Reversal System** uses the Disparity Index indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Disparity Index crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Disparity Index crosses below its OverBought Level, Zero, or its OverSold Level from above.

A *Short Entry* signal is generated when the Disparity Index crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Disparity Index crosses above its OverSold Level, Zero, or its OverBought Level from below.

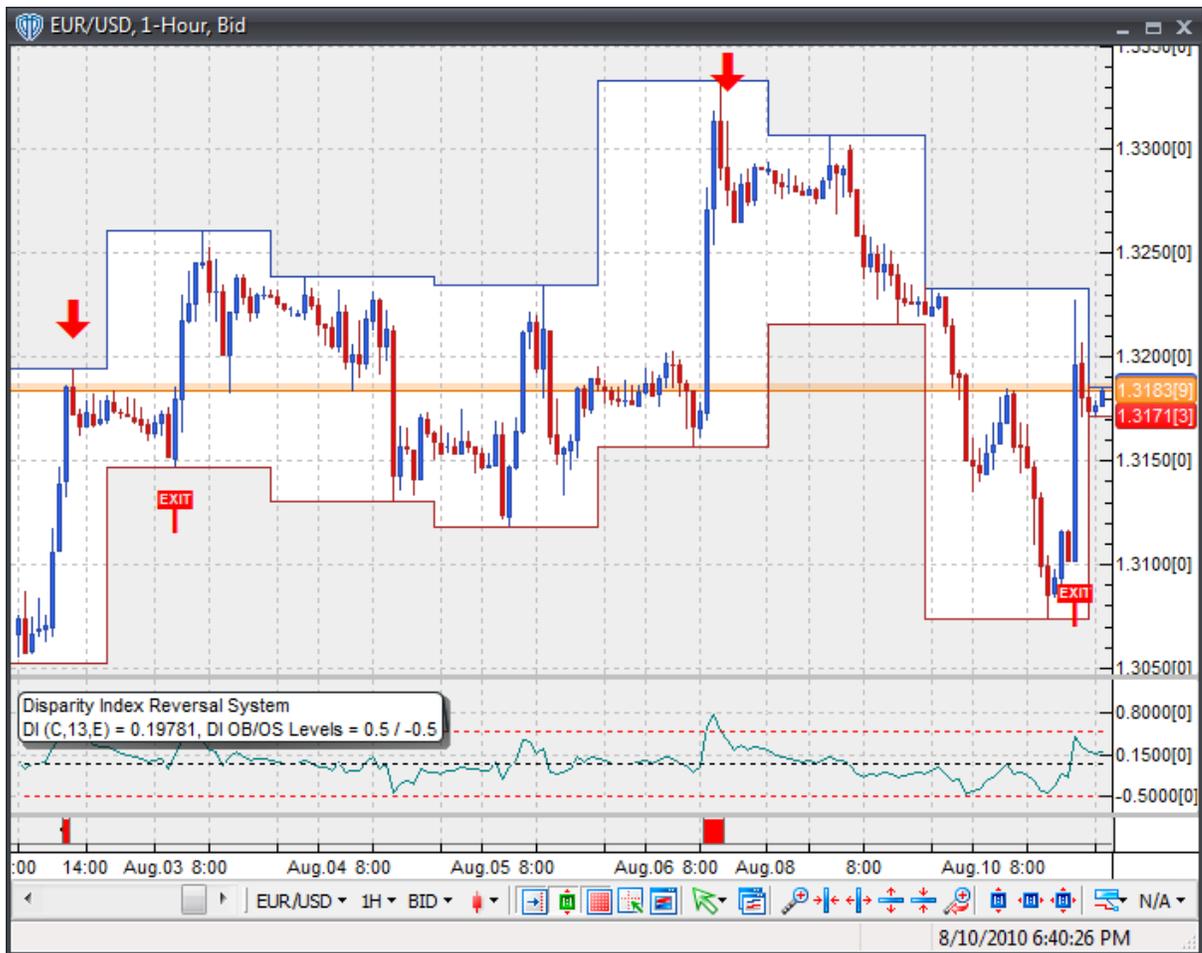
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Disparity Index Reversal System** consists of the following output variables and display parameters:

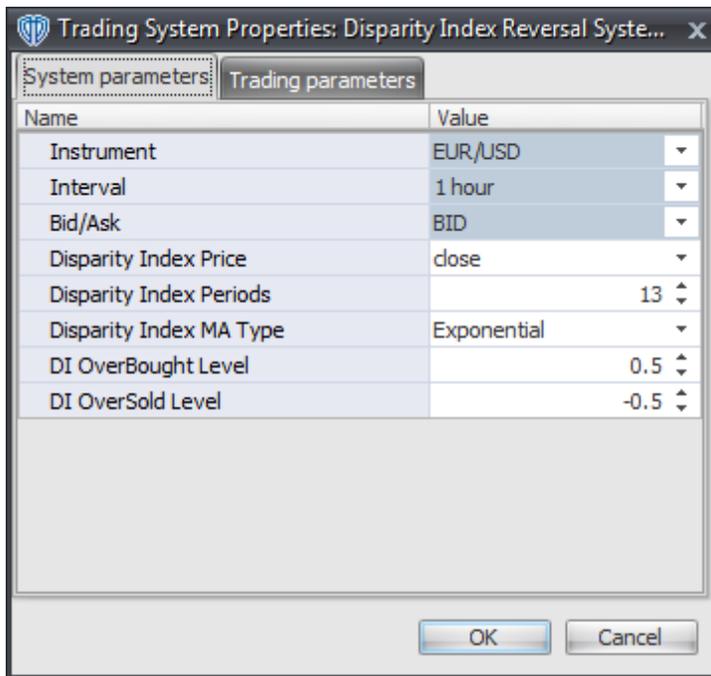
- The Disparity Index displays in Additional Frame 1 as a solid green line. Its mid-level (0) displays in the same frame as a black dashed line.
- The Disparity Index's OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue background while the Disparity Index is less than its OverSold Level.
- The Trend Frame displays a red background while the Disparity Index is greater than its OverBought Level.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The Disparity Index crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The Disparity Index crossed below its OverBought Level, Zero, or its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The Disparity Index crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The Disparity Index crossed above its OverSold Level, Zero, or its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Disparity Index Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Disparity Index Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Disparity Index.

DI OverBought Level

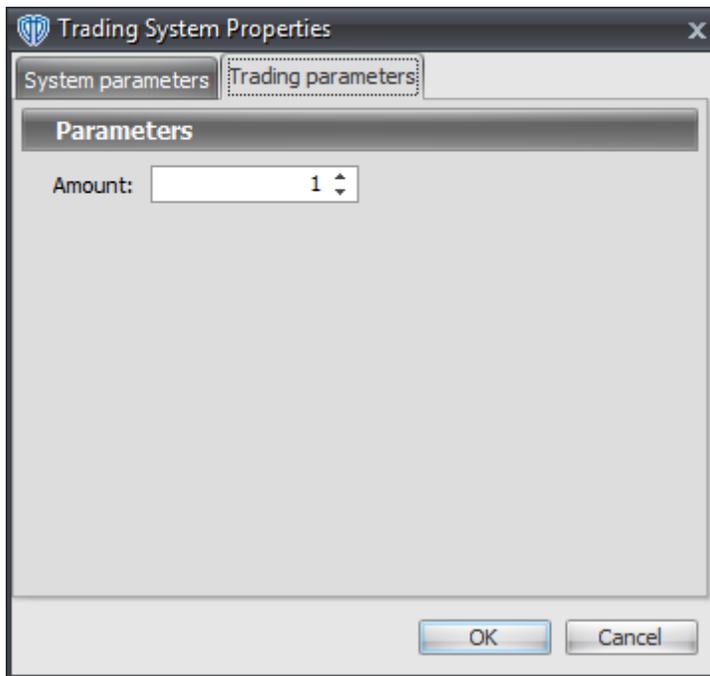
This parameter defines the OverBought value used in the Disparity Index-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

DI OverSold Level

This parameter defines the OverSold value used in the Disparity Index-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.30 Donchian Channel Breakout System

Overview

The **Donchian Channel Breakout System** uses the Donchian Channel to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the upper Donchian Channel. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the upper Donchian Channel breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the lower Donchian Channel. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the lower Donchian Channel breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input

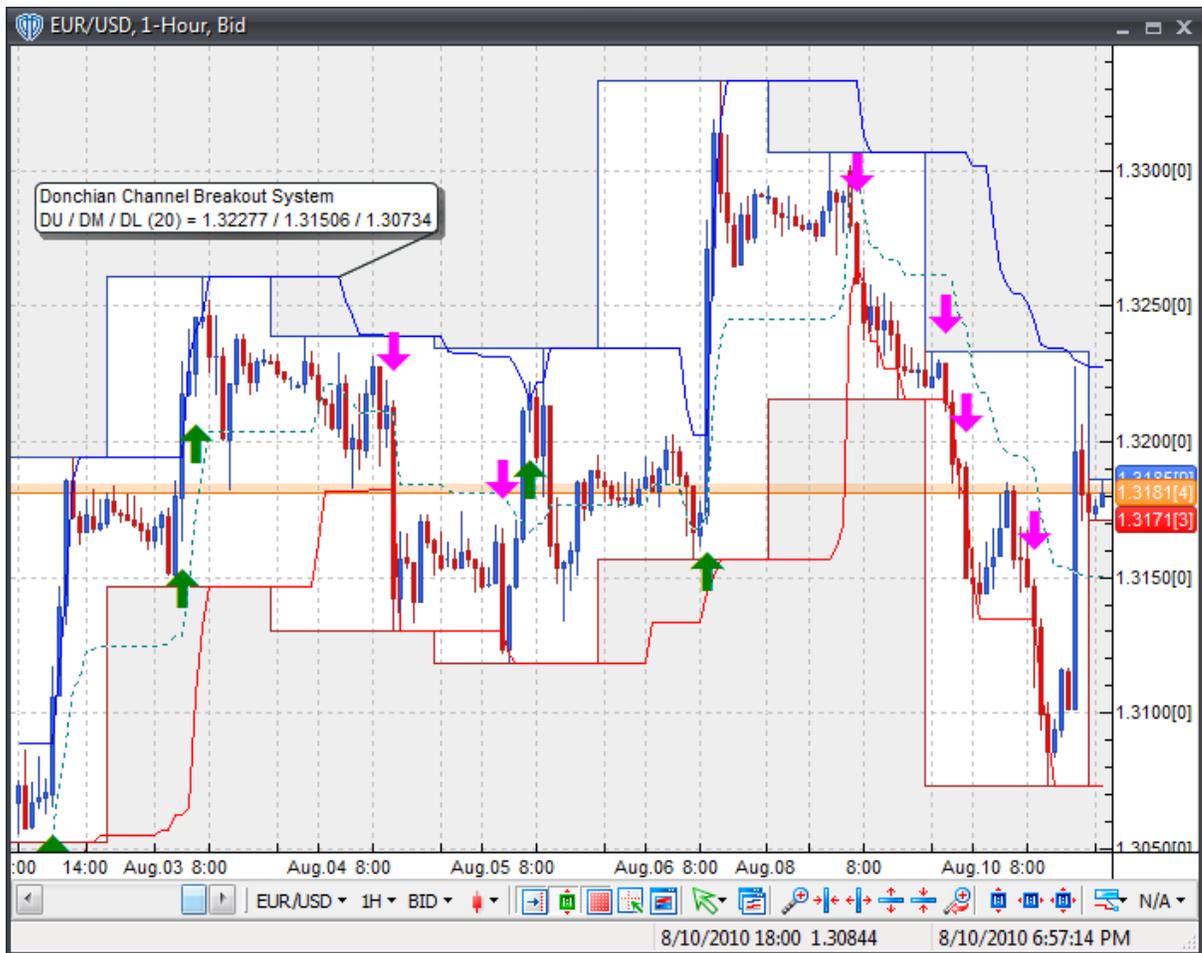
selection is chosen.

System Outputs and Signals Logic

The **Donchian Channel Breakout System** consists of the following output variables and display parameters:

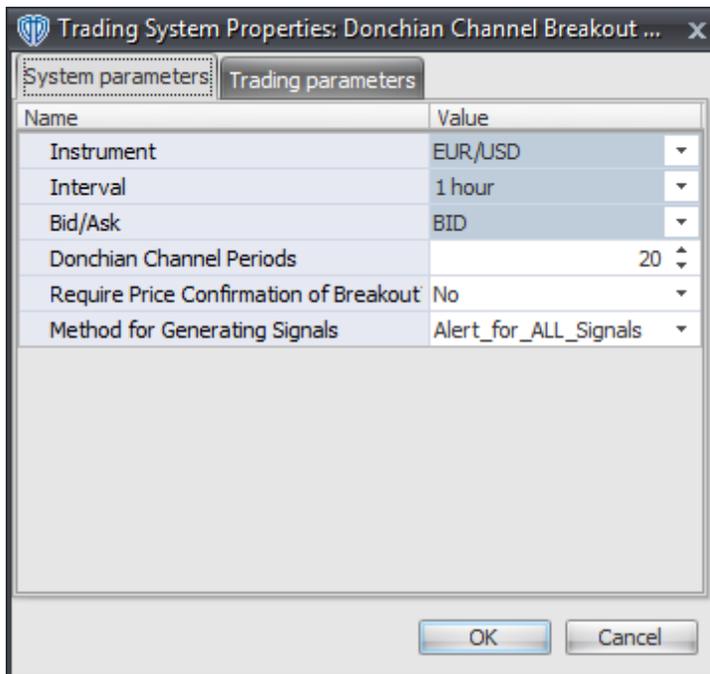
- The Donchian Channel displays in the Price Frame. The upper Donchian Channel solid blue line. The lower Donchian Channel is a solid red line. The middle Donchian Channel is a dashed green line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the top Darvas Box breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the bottom Darvas Box breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above the Upper Donchian Channel." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below the Lower Donchian Channel." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Donchian Channel Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Donchian Channel Periods

This parameter defines the number of periods used to calculate the Donchian Channel.

Require Price Confirmation of Breakout?

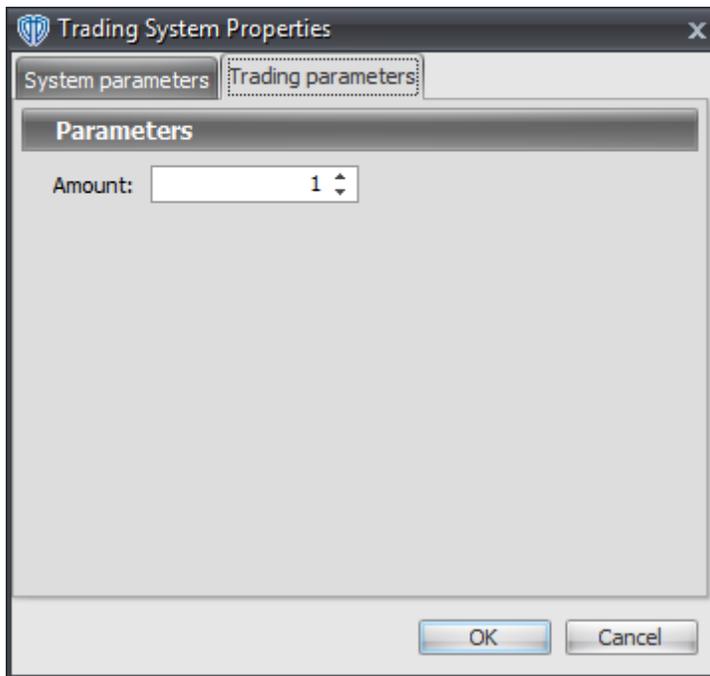
This parameter changes the conditions necessary to generate its *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.31 Double Exponential Moving Average (DEMA) Cross System

Overview

The **Double Exponential Moving Average (DEMA) Cross System** uses fast and slow Double Exponential Moving Averages (DEMA's) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast DEMA crosses above the Slow DEMA.

A *Short* signal is generated when the Fast DEMA crosses below the Slow DEMA.

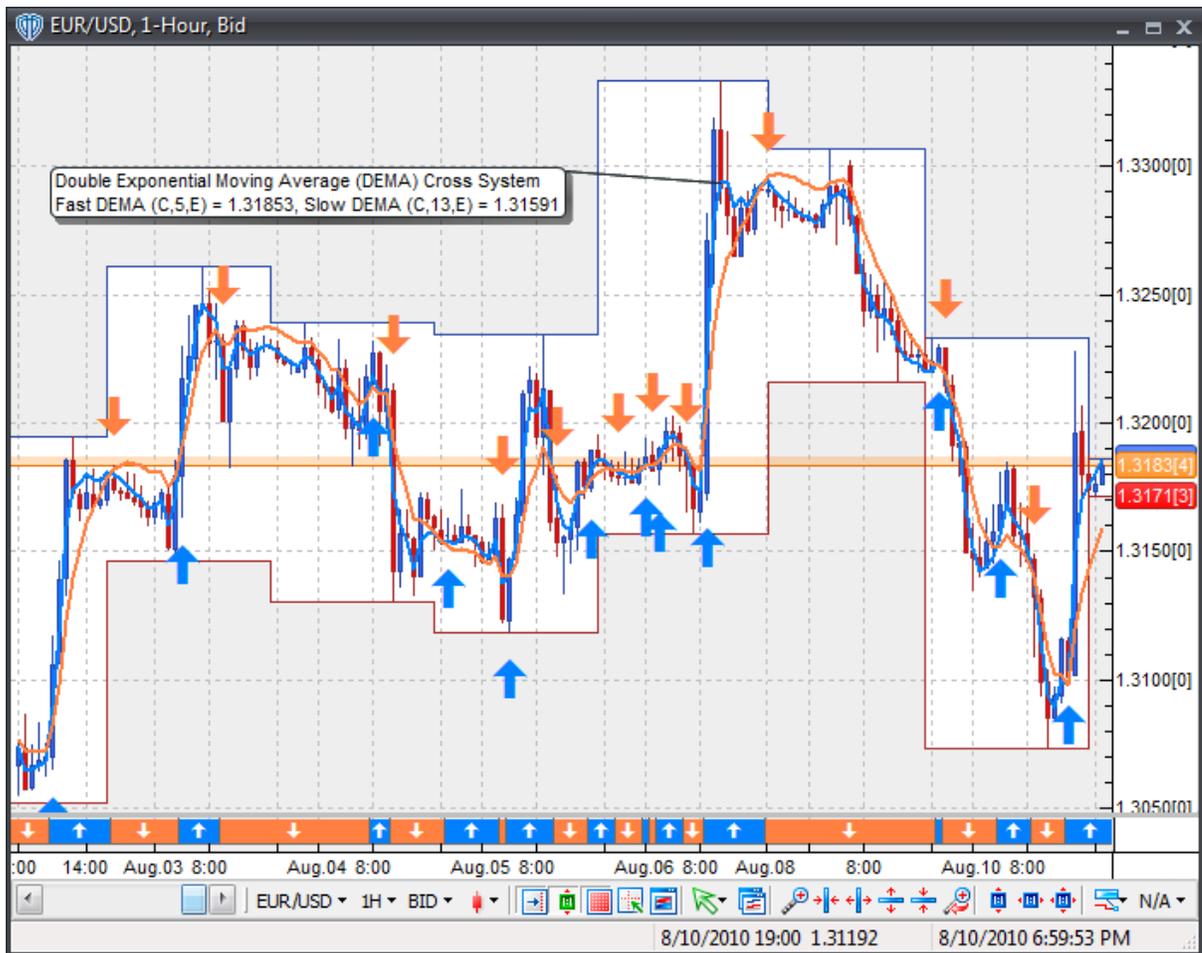
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Double Exponential Moving Average (DEMA) Cross System** consists of the following output variables and display parameters:

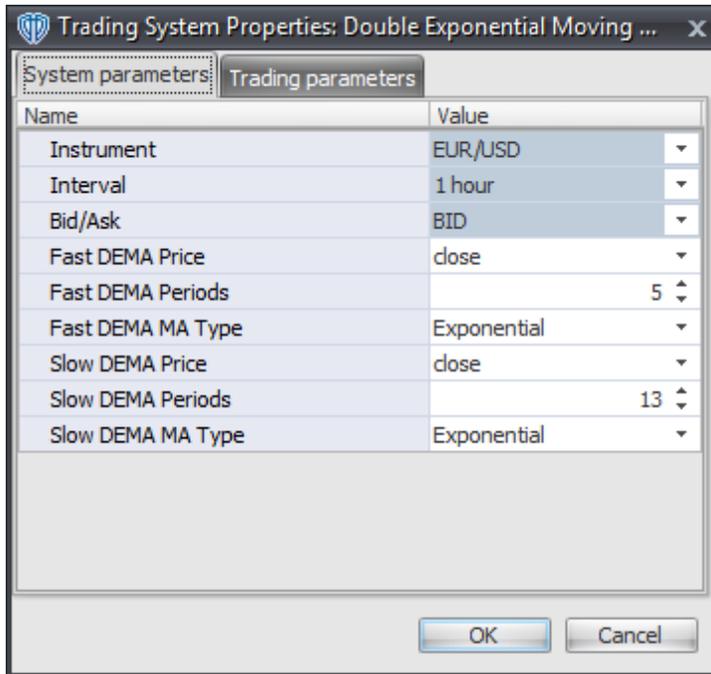
- The Fast DEMA displays in the Price Frame as slightly thicker, solid light blue line.
- The Slow DEMA displays in the Price Frame as a slightly thicker, solid orange line.
- The Trend Frame displays a white up arrow against a light blue background while the Fast DEMA is greater than the Slow DEMA.
- The Trend Frame displays a white down arrow against an orange background while the Fast DEMA is less than the Slow DEMA.
- When a *Long* signal is generated a light blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast DEMA crossed above Slow DEMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated an orange down arrow graphic displays in the chart window, the message "Short signal detected! Fast DEMA crossed below Slow DEMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Double Exponential Moving Average (DEMA) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast DEMA Price, Periods, and MA Type

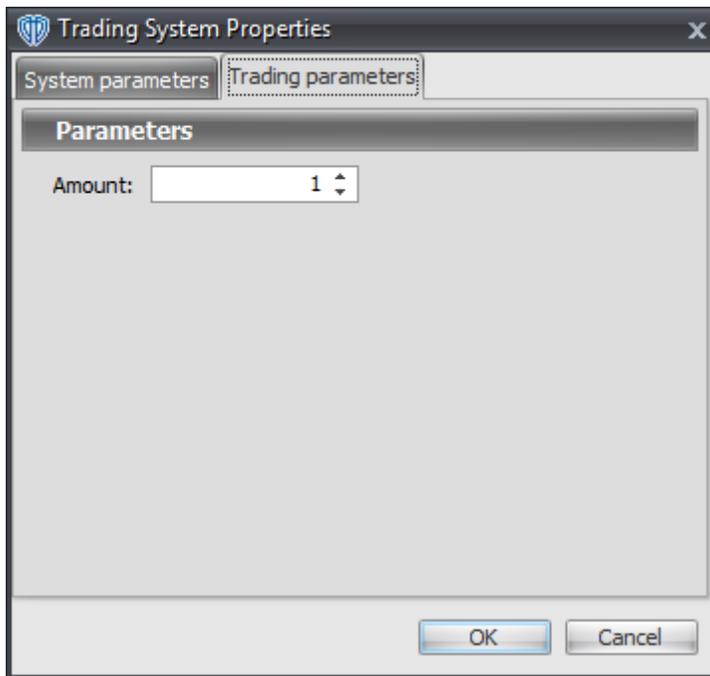
These parameters define the price, number of periods, and type of moving average used to calculate the Fast Double Exponential Moving Average (DEMA).

Slow DEMA Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Slow Double Exponential Moving Average (DEMA).

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.32 Double Stochastic Oscillator Cross System

Overview

The **Double Stochastic Oscillator Cross System** uses the Double Stochastic Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Double Stochastic Oscillator's %K line crosses above its %D Line.

A *Short* signal is generated when the Double Stochastic Oscillator's %K line crosses below its %D Line.

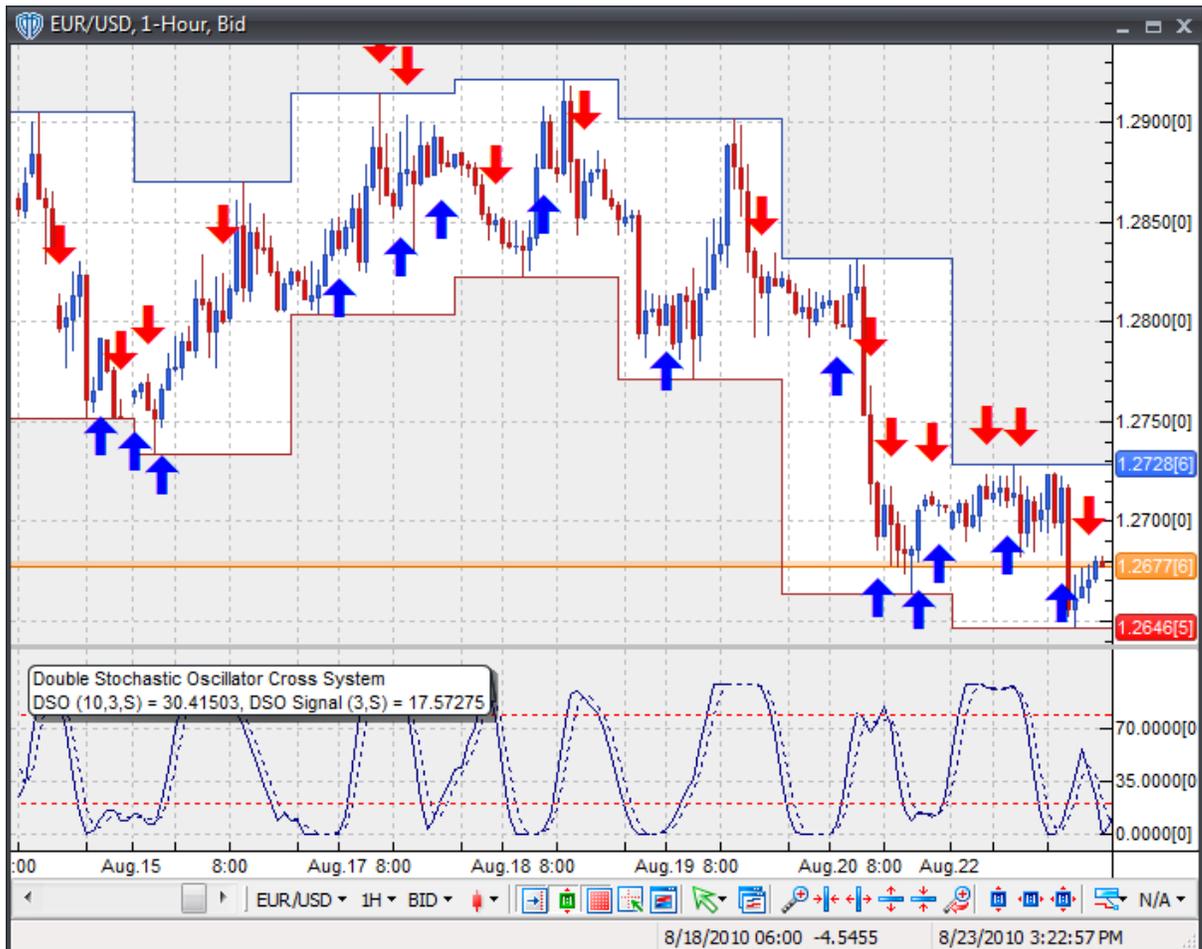
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Double Stochastic Oscillator Cross System** consists of the following output variables and display parameters:

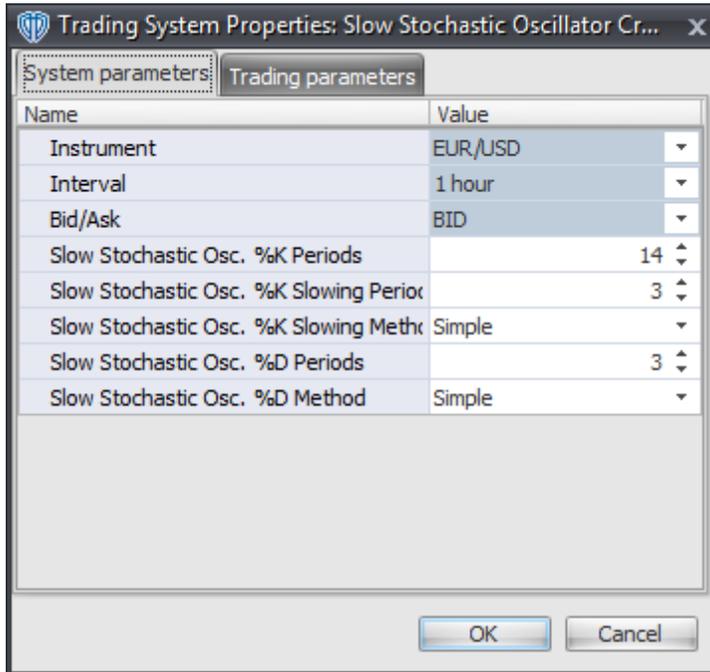
- The Double Stochastic Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines.
- The Double Stochastic Oscillator's Signal Line displays in Additional Frame 1 as a thin, dashed, dark blue line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! DSO crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! DSO crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Double Stochastic Oscillator Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

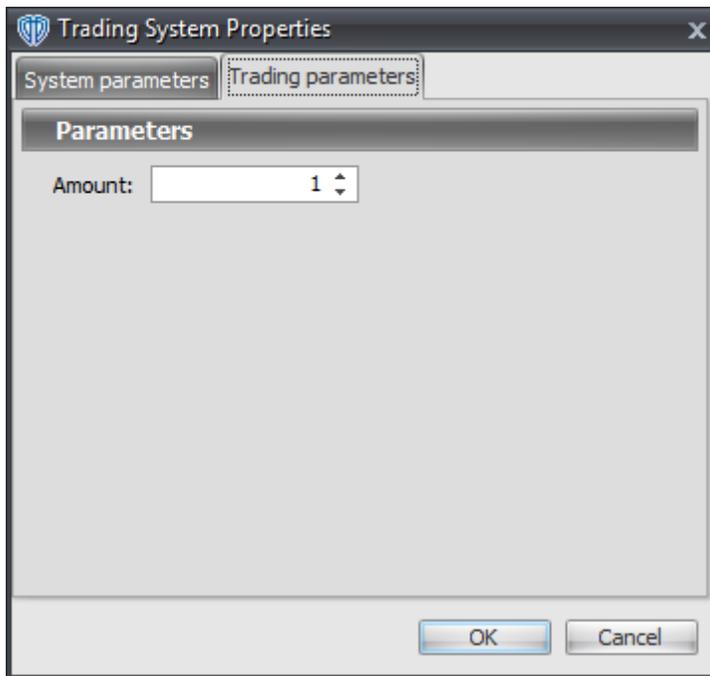
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Double Stochastic Osc. %K Periods, %K Slowing Periods, %K Slowing Method, %D Periods, and %D Method

These parameters define the values used calculate the Double Stochastic Oscillator and its Signal Line.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.33 Double Stochastic Oscillator Reversal Cross System

Overview

The **Double Stochastic Oscillator Reversal Cross System** uses the Double Stochastic Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Double Stochastic Oscillator crosses above its Signal Line while both are below the OverSold Level. If the "Require Bull Candle for Long Entry?" input parameter (see description below) is set to "Yes", the *Long Entry* signal is only generated if the entry bar is a Bull Candle (i.e. its Close price > its Open price).

A *Long Exit* signal is generated when the Double Stochastic Oscillator crosses below its Signal Line.

A *Short Entry* signal is generated when the Double Stochastic Oscillator crosses below its Signal Line while both are above the OverBought Level. If the "Require Bear Candle for Short Entry?" input parameter (see description below) is set to "Yes", the *Short Entry* signal is only generated if the entry bar is a Bear Candle (i.e. its Close price < its Open price).

A *Short Exit* signal is generated when the Double Stochastic Oscillator crosses above its Signal Line.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose,

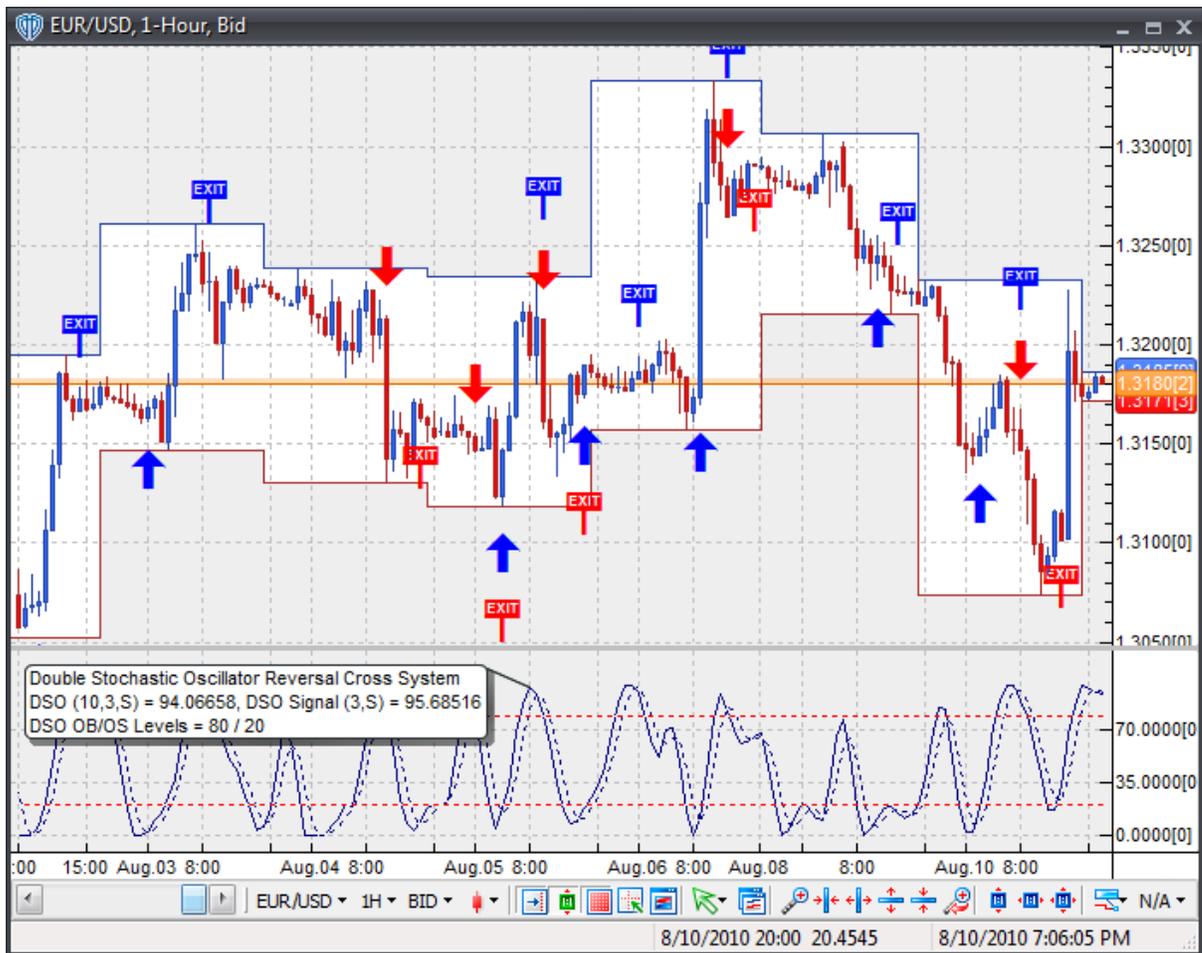
in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Double Stochastic Oscillator Reversal Cross System** consists of the following output variables and display parameters:

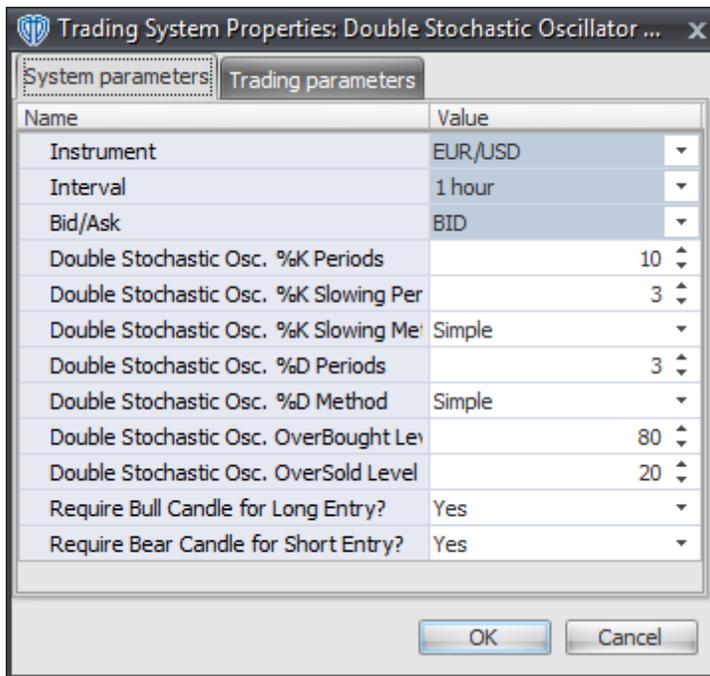
- The Double Stochastic Oscillator displays in Additional Frame 1 as a solid blue line.
- The Double Stochastic Oscillator's Signal Line displays in Additional Frame 1 as a dashed blue line.
- The Double Stochastic Oscillator's OverBought and OverSold Levels display in Additional Frame 1 as dashed red lines.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! DSO crossed above its Signal Line while both were below the OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! DSO crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! DSO crossed above its Signal Line while both were above the OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! DSO crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Double Stochastic Oscillator Reversal Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Double Stochastic Osc. %K Periods, %K Slowing Periods, %K Slowing Method, %D Periods, and %D Method

These parameters define the values used calculate the Double Stochastic Oscillator and its Signal Line.

Double Stochastic Osc. OverBought Level

This parameter defines the OverBought value used in the Double Stochastic Oscillator-related conditions to generate the *Short Entry* signal.

Double Stochastic Osc. OverSold Level

This parameter defines the OverSold value used in the Double Stochastic Oscillator-related conditions to generate the *Long Entry* signal.

Require Bull Candle for Long Entry?

This parameter changes the conditions necessary to generate the *Long Entry* signal. Please refer to the *Overview* section above for details.

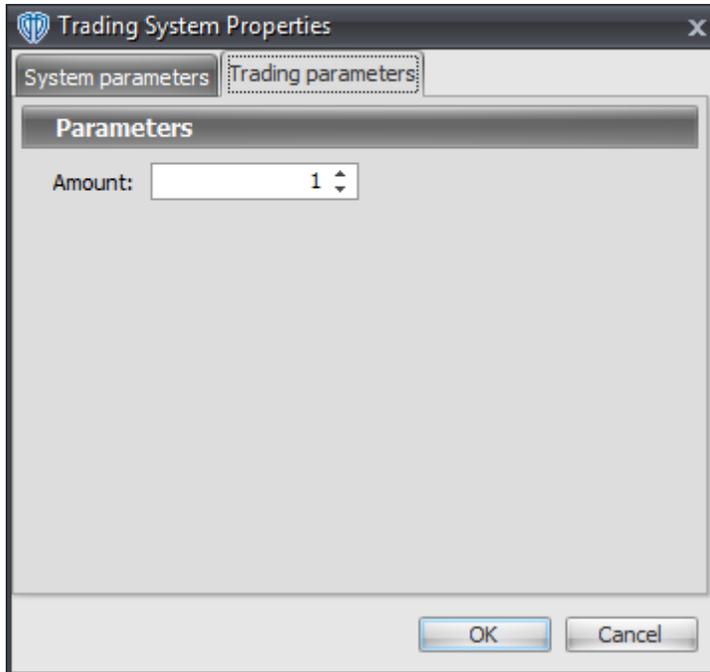
Require Bear Candle for Short Entry?

This parameter changes the conditions necessary to generate the *Short Entry* signal. Please refer to

the *Overview* section above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.34 Ehlers Fisher Transform Cross System

Overview

The **Ehlers Fisher Transform Cross System** uses Ehlers Fisher Transform to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when Ehlers Fisher Transform crosses above its Signal Line.

A *Short* signal is generated when Ehlers Fisher Transform crosses below its Signal Line.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose,

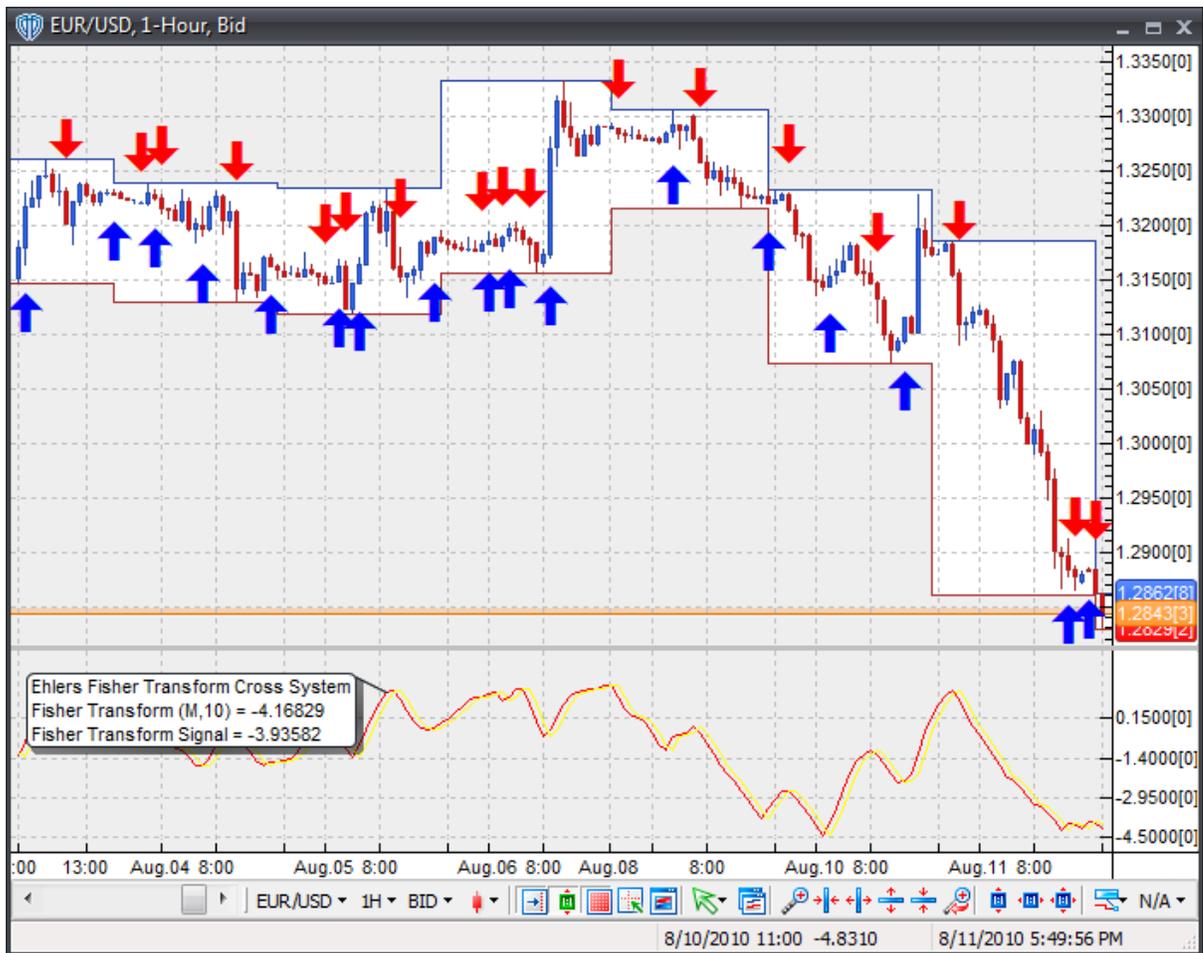
in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Ehlers Fisher Transform Cross System** consists of the following output variables and display parameters:

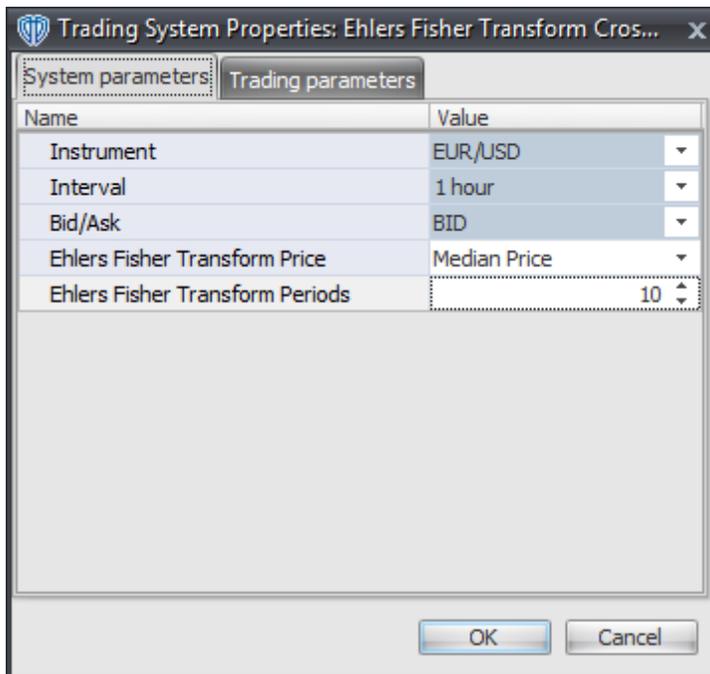
- Ehlers Fisher Transform displays in Additional Frame 1 as a solid orange line.
- Ehlers Fisher Transform Signal Line displays in Additional Frame 1 as a solid yellow line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Ehlers Fisher Transform crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Ehlers Fisher Transform crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ehlers Fisher Transform Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Ehlers Fisher Transform Price

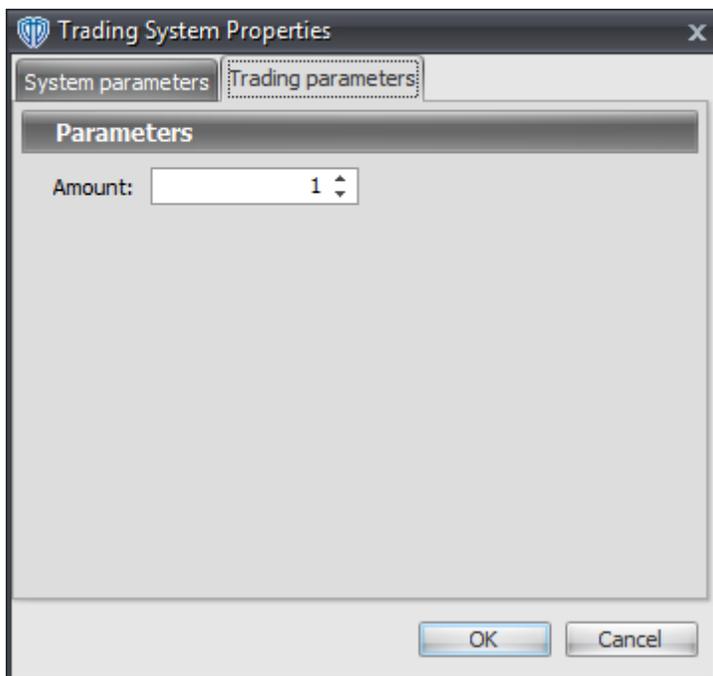
This parameter defines the price used to calculate Ehlers Fisher Transform.

Ehlers Fisher Transform Periods

This parameter defines the number of periods used to calculate Ehlers Fisher Transform.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.35 Ehlers Laguerre Relative Strength Index Cross System

Overview

The **Ehlers Laguerre Relative Strength Index Cross System** uses Ehlers Laguerre Relative Strength Index indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when Ehlers Laguerre Relative Strength Index crosses above its Long Entry Level.

A *Short* signal is generated when Ehlers Laguerre Relative Strength Index crosses below its Short Entry Level.

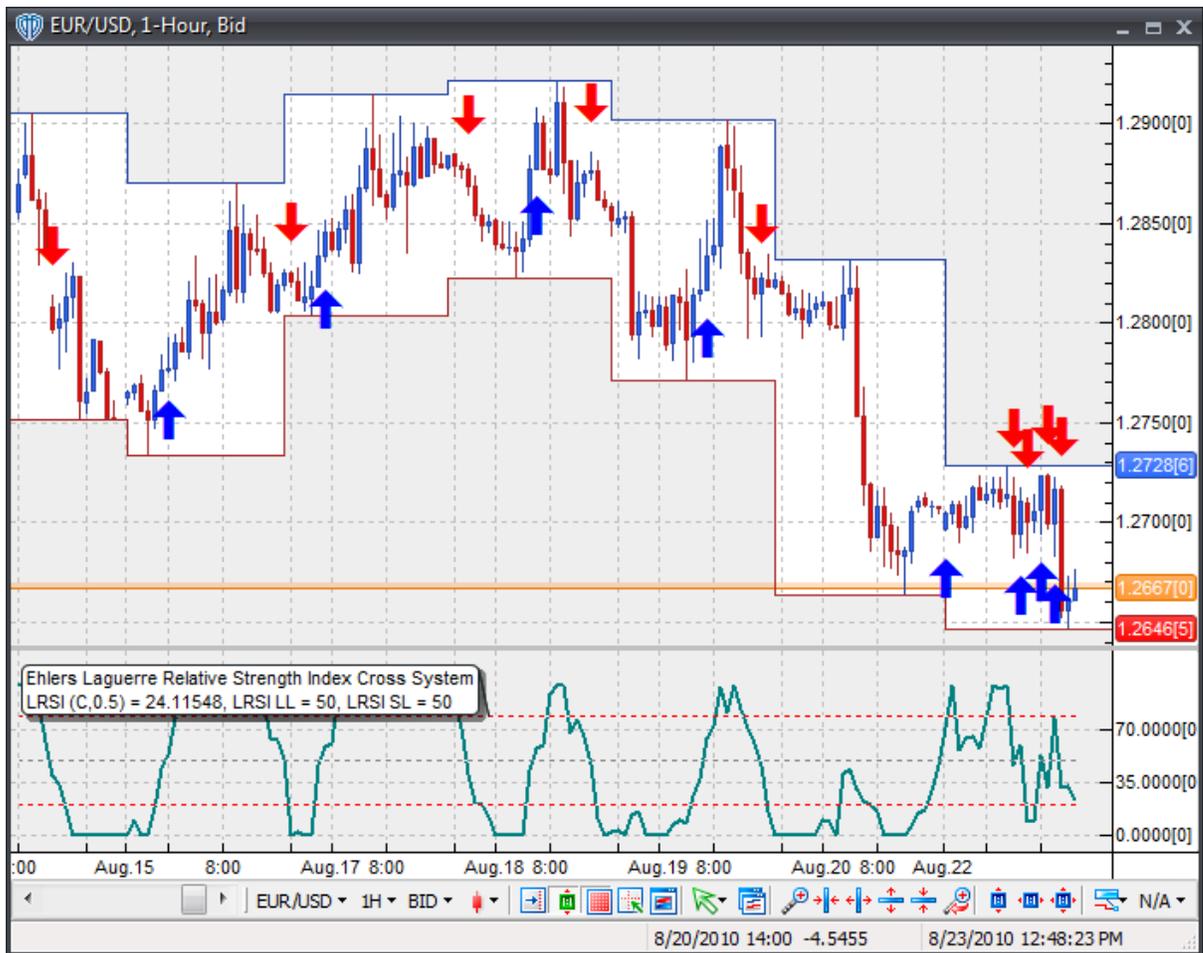
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Ehlers Laguerre Relative Strength Index Cross System** consists of the following output variables and display parameters:

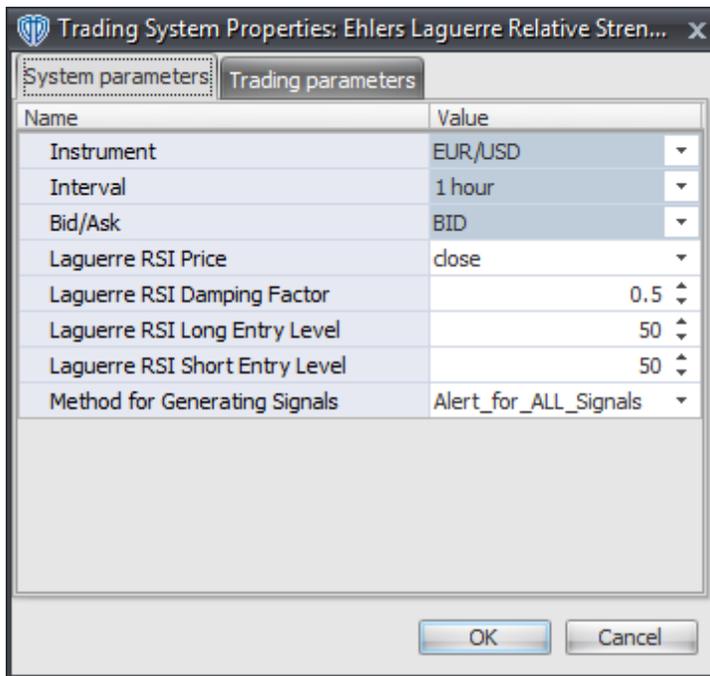
- Ehlers Laguerre Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid green line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- Ehlers Laguerre Relative Strength Index's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Ehlers Laguerre RSI crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Ehlers Laguerre RSI crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ehlers Laguerre Relative Strength Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Laguerre RSI Price and Laguerre RSI Damping Factor

These parameters define the price and damping factor used to calculate Ehlert Laguerre Relative Strength Index.

Laguerre RSI Long Entry Level

This parameter defines the value used in Ehlert Laguerre Relative Strength Index-related conditions to generate the *Long* signal.

Laguerre RSI Short Entry Level

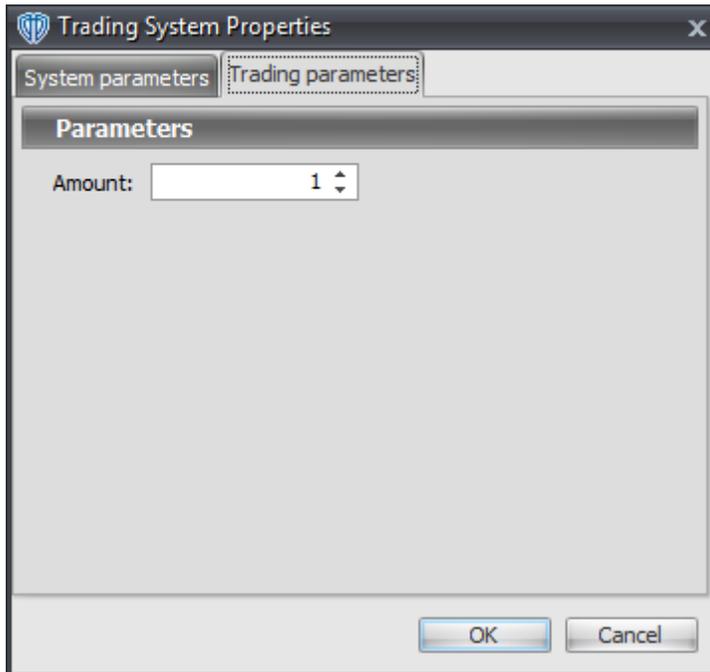
This parameter defines the value used in Ehlert Laguerre Relative Strength Index-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.36 Ehlers Laguerre Relative Strength Index Reversal System

Overview

Ehlers Laguerre Relative Strength Index Reversal System uses Ehlers Laguerre Relative Strength Index indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when Ehlers Laguerre Relative Strength Index crosses above its OverSold Level from below.

A *Long Exit* signal is generated when Ehlers Laguerre Relative Strength Index crosses below its OverBought Level, Mid-Level, or OverSold Level from above.

A *Short Entry* signal is generated when Ehlers Laguerre Relative Strength Index crosses below its OverBought Level from above.

A *Short Exit* signal is generated when Ehlers Laguerre Relative Strength Index crosses above its OverSold Level, Mid-Level, or OverBought Level from below.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

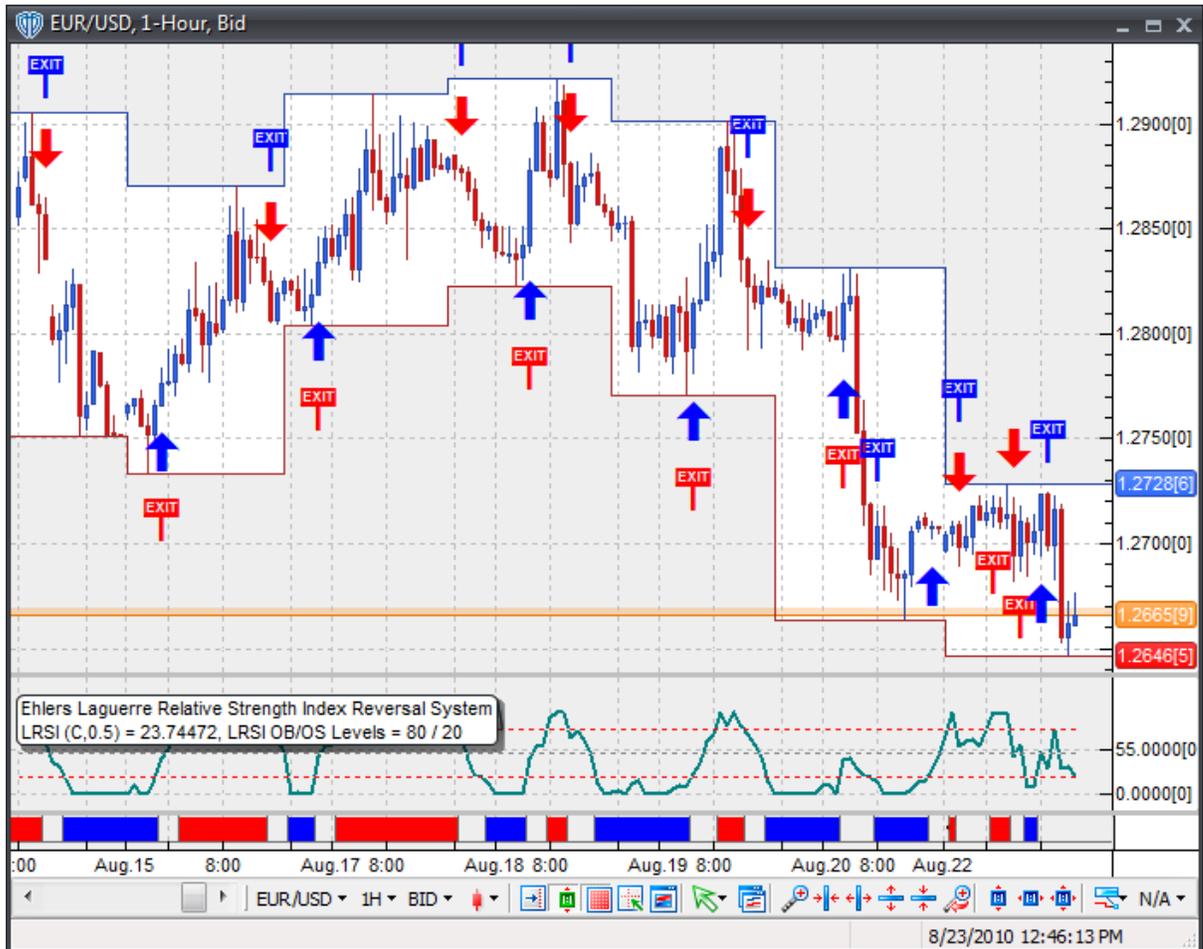
System Outputs and Signals Logic

The **Ehlers Laguerre Relative Strength Index Reversal System** consists of the following output variables and display parameters:

- Ehlers Laguerre Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid green line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- Ehlers Laguerre Relative Strength Index OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue background while Ehlers Laguerre Relative Strength Index is less than its OverSold Level.
- The Trend Frame displays a red background while Ehlers Laguerre Relative Strength Index is greater than its OverBought Level.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Ehlers Laguerre RSI crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! Ehlers Laguerre RSI crossed below its OverBought Level, Mid Level, or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Ehlers Laguerre RSI crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! Ehlers Laguerre RSI crossed above its OverSold Level, Mid Level, or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic

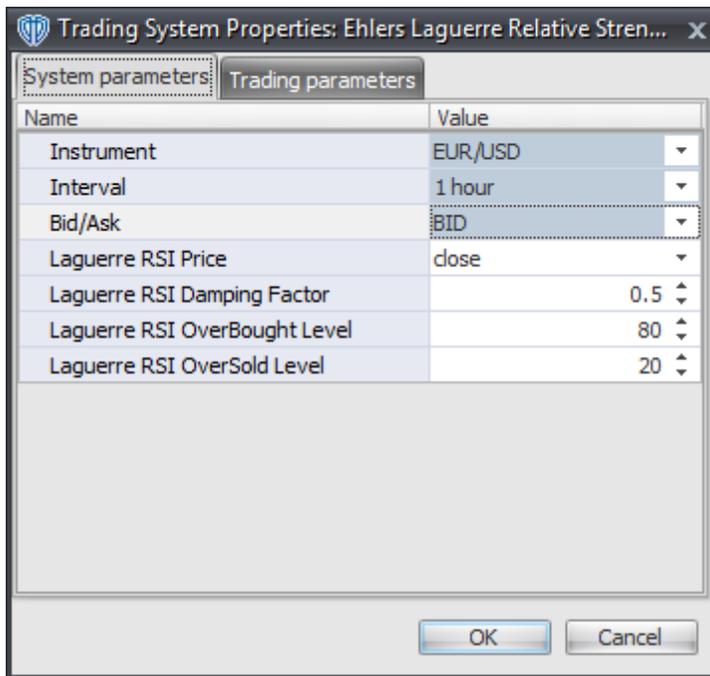
of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ehlers Laguerre Relative Strength Index Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Laguerre RSI Price and Laguerre RSI Damping Factor

These parameters define the price and damping factor used to calculate Ehlers Laguerre Relative Strength Index.

Laguerre RSI OverBought Level

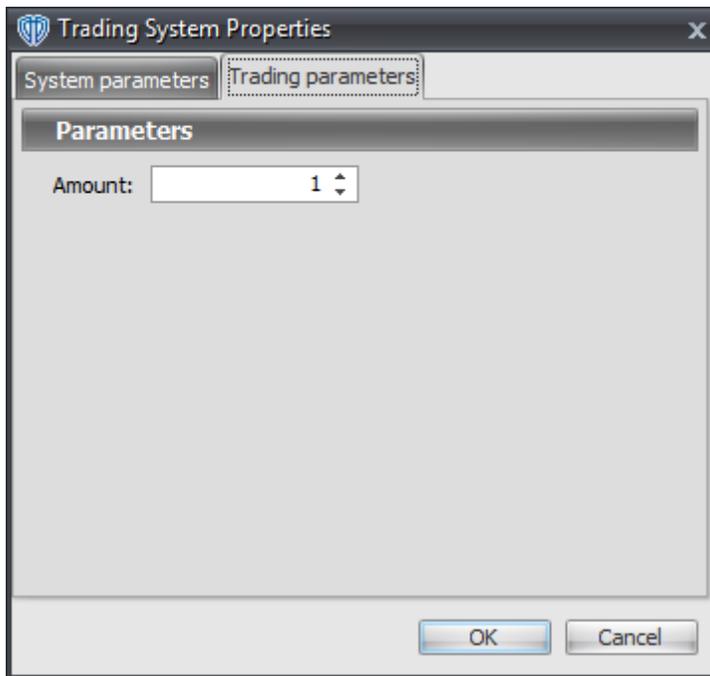
This parameter defines the OverBought value used in Ehlers Laguerre Relative Strength Index-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

Laguerre RSI OverSold Level

This parameter defines the OverSold value used in Ehlers Laguerre Relative Strength Index-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.37 Ehlers MAMA / FAMA Cross System

Overview

The **Ehlers MAMA / FAMA Cross System** uses Ehlers MESA Adaptive Moving Average (MAMA) and Ehlers Following Adaptive Moving Average (FAMA) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when Ehlers MAMA crosses above Ehlers FAMA.

A *Short* signal is generated when Ehlers MAMA crosses below Ehlers FAMA.

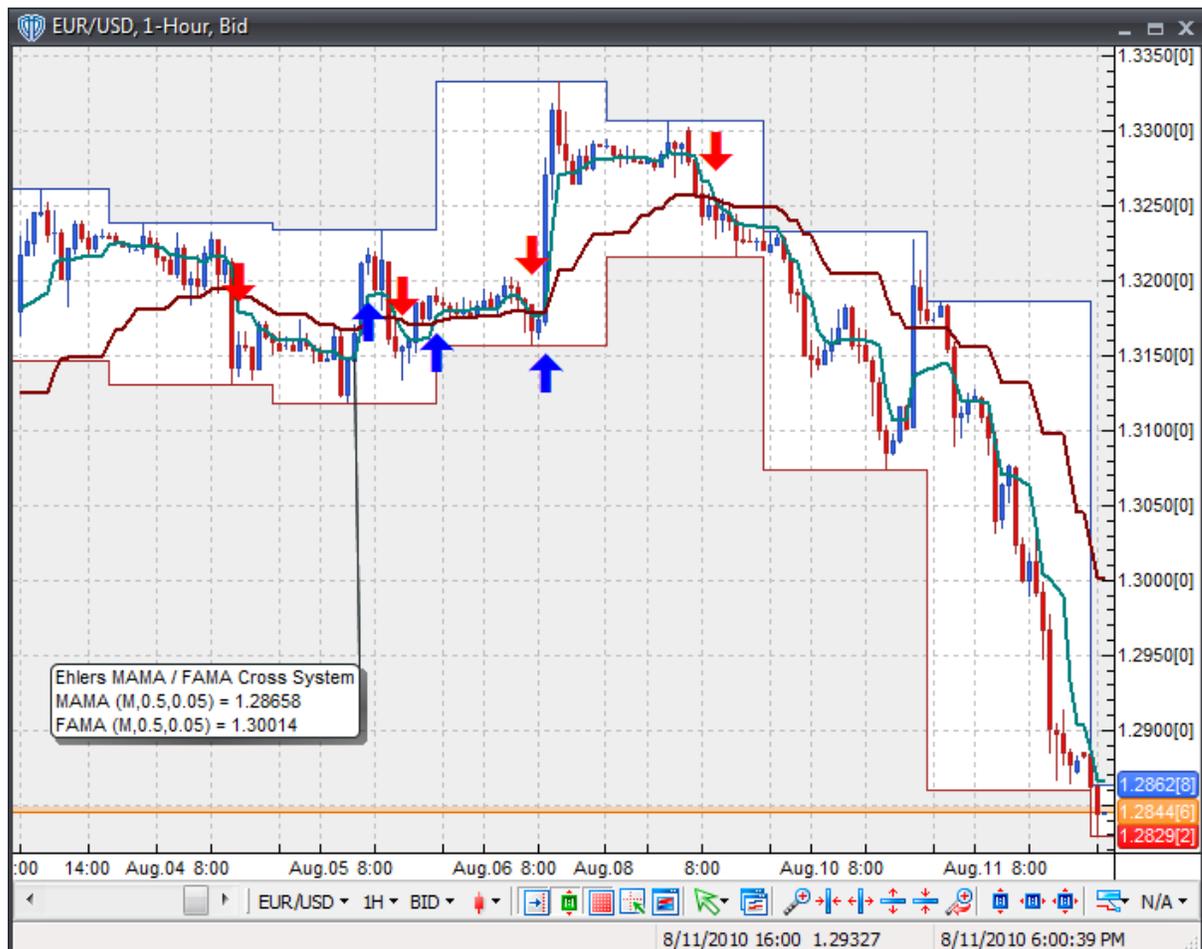
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Ehlers MAMA / FAMA Cross System** consists of the following output variables and display parameters:

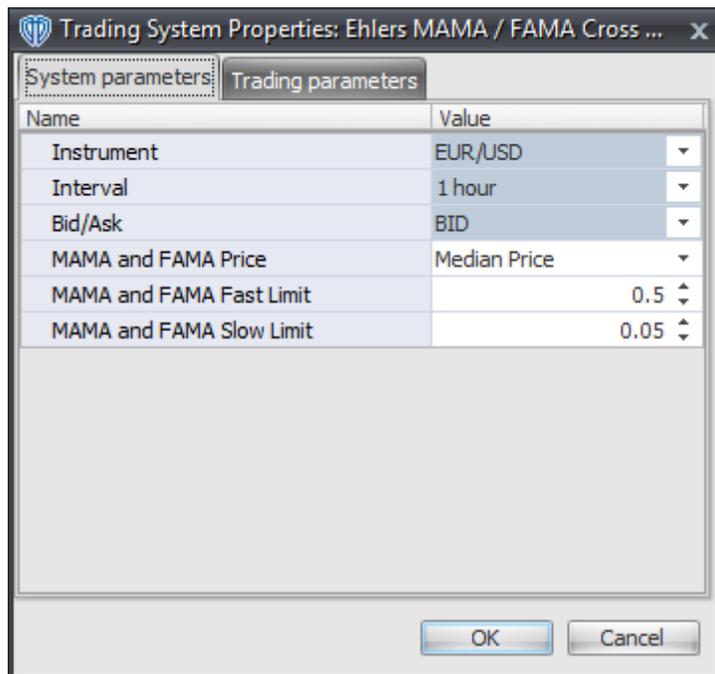
- Ehlers MESA Adaptive MA (MAMA) displays in the Price Frame as slightly thicker, solid green line.
- Ehlers Following Adaptive Moving Average (FAMA) displays in the Price Frame as a slightly thicker, solid dark red line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Ehlers MAMA crossed above Ehlers FAMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Ehlers MAMA crossed below Ehlers FAMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ehlers MAMA / FAMA Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MAMA and FAMA Price

This parameter defines the price used to calculate Ehlert's MAMA and Ehlert's FAMA.

MAMA and FAMA Fast Limit

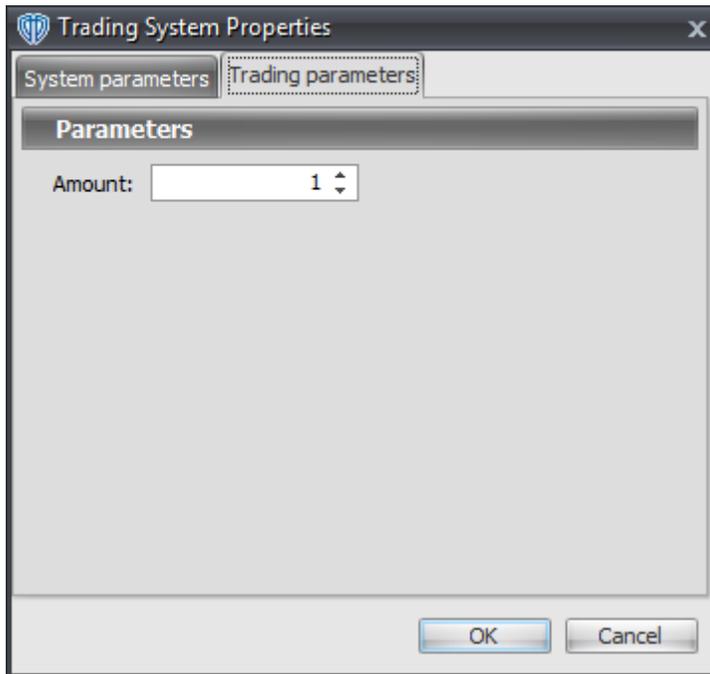
This parameter defines the fast limit used to calculate the "phase" rate of change alpha value of Ehlert's MAMA and Ehlert's FAMA. Please refer to John F. Ehlers' published works for additional details.

MAMA and FAMA Slow Limit

This parameter defines the slow limit used to calculate the "phase" rate of change alpha value of Ehlert's MAMA and Ehlert's FAMA. Please refer to John F. Ehlers' published works for additional details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.38 Ehlers Relative Vigor Index Cross System

Overview

The **Ehlers Relative Vigor Index Cross System** uses Ehlers Relative Vigor Index (RVI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when Ehlers Relative Vigor Index crosses above its Signal Line.

A *Short* signal is generated when Ehlers Relative Vigor Index crosses below its Signal Line.

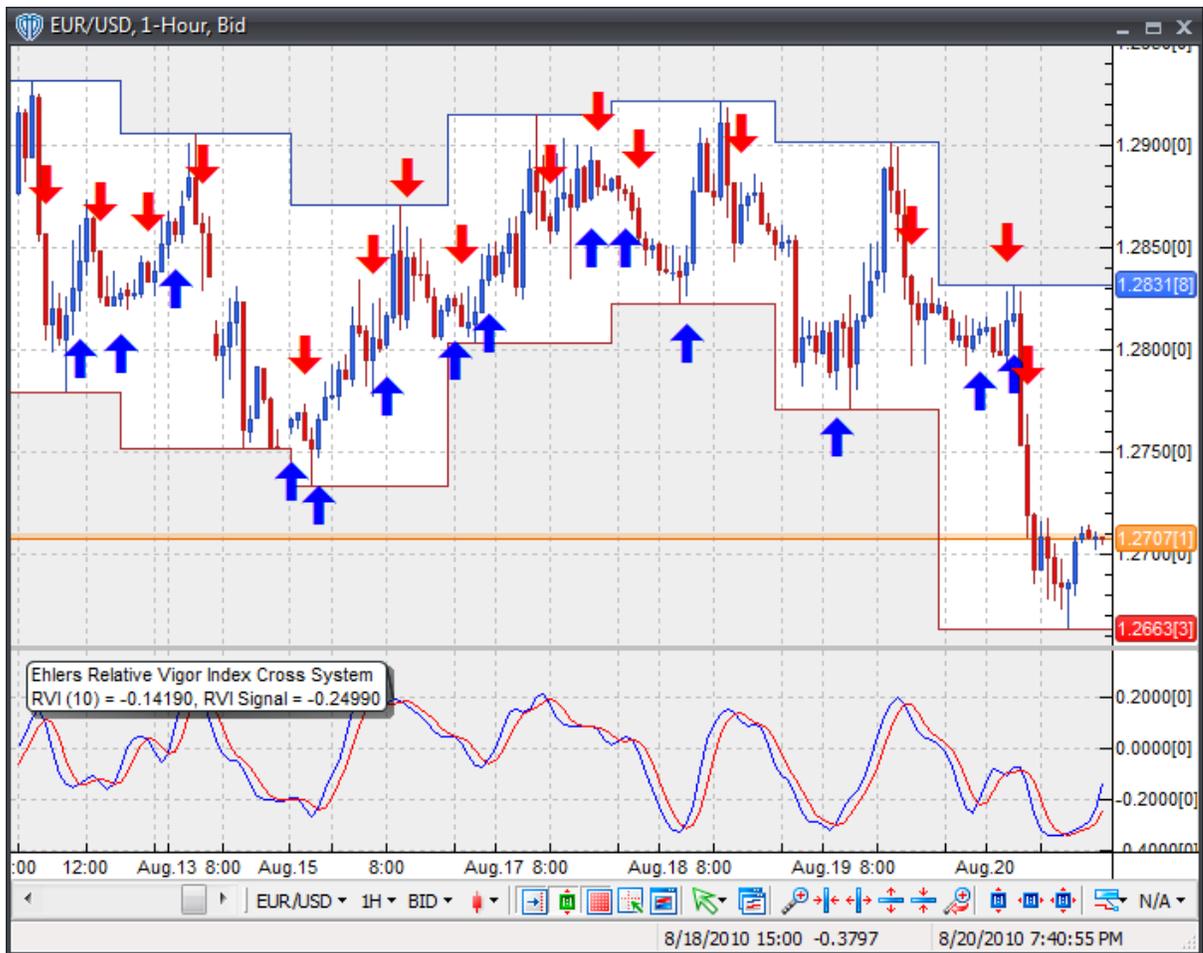
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Ehlers Relative Vigor Index Cross System** consists of the following output variables and display parameters:

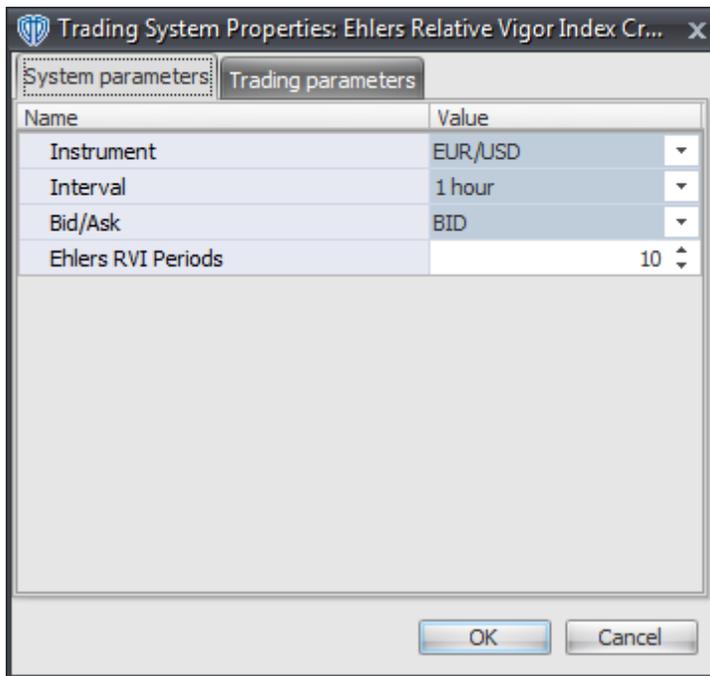
- Ehlers Relative Vigor Index displays in Additional Frame 1 as a solid blue line.
- Ehlers Relative Vigor Index Signal Line displays in Additional Frame 1 as a solid red line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Ehlers RVI crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Ehlers RVI crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ehlers Relative Vigor Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

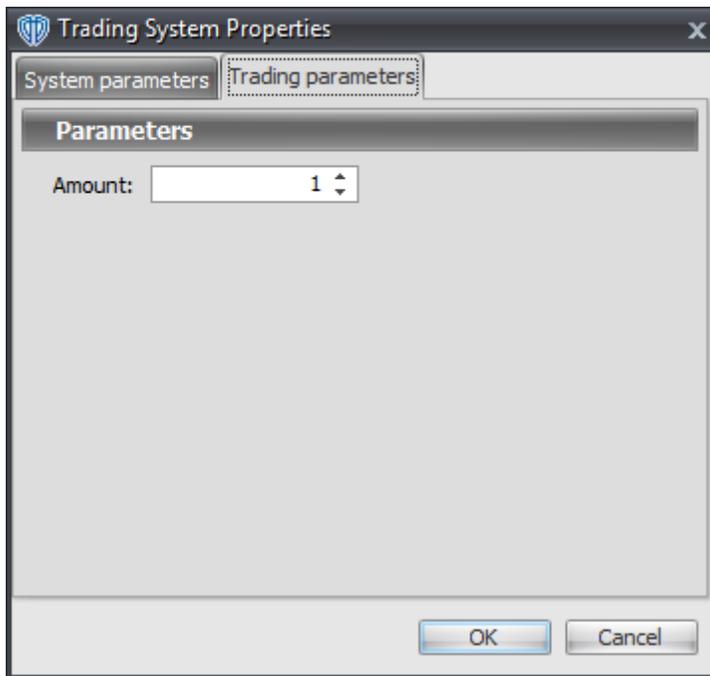
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Ehlers RVI Periods

This parameter defines the periods used to calculate Ehlers Relative Vigor Index.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.39 Gann Basic "Swing Chartist" System

Overview

The **Gann Basic "Swing Chartist" System** uses the Gann HiLo Activator, Gann Swing Oscillator, and Gann Trend Oscillator indicators to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Gann Trend Oscillator = +1 AND the Gann Swing Oscillator = +1 AND the Close price crosses above the Gann HiLo Activator.

A *Long Exit* signal is generated when the Close price crosses below the Gann Hi/Lo Activator.

A *Short Entry* signal is generated when the Gann Trend Oscillator = -1 AND the Gann Swing Oscillator = -1 AND the Close price crosses below the Gann HiLo Activator.

A *Short Exit* signal is generated when the Close price crosses above the Gann Hi/Low Activator.

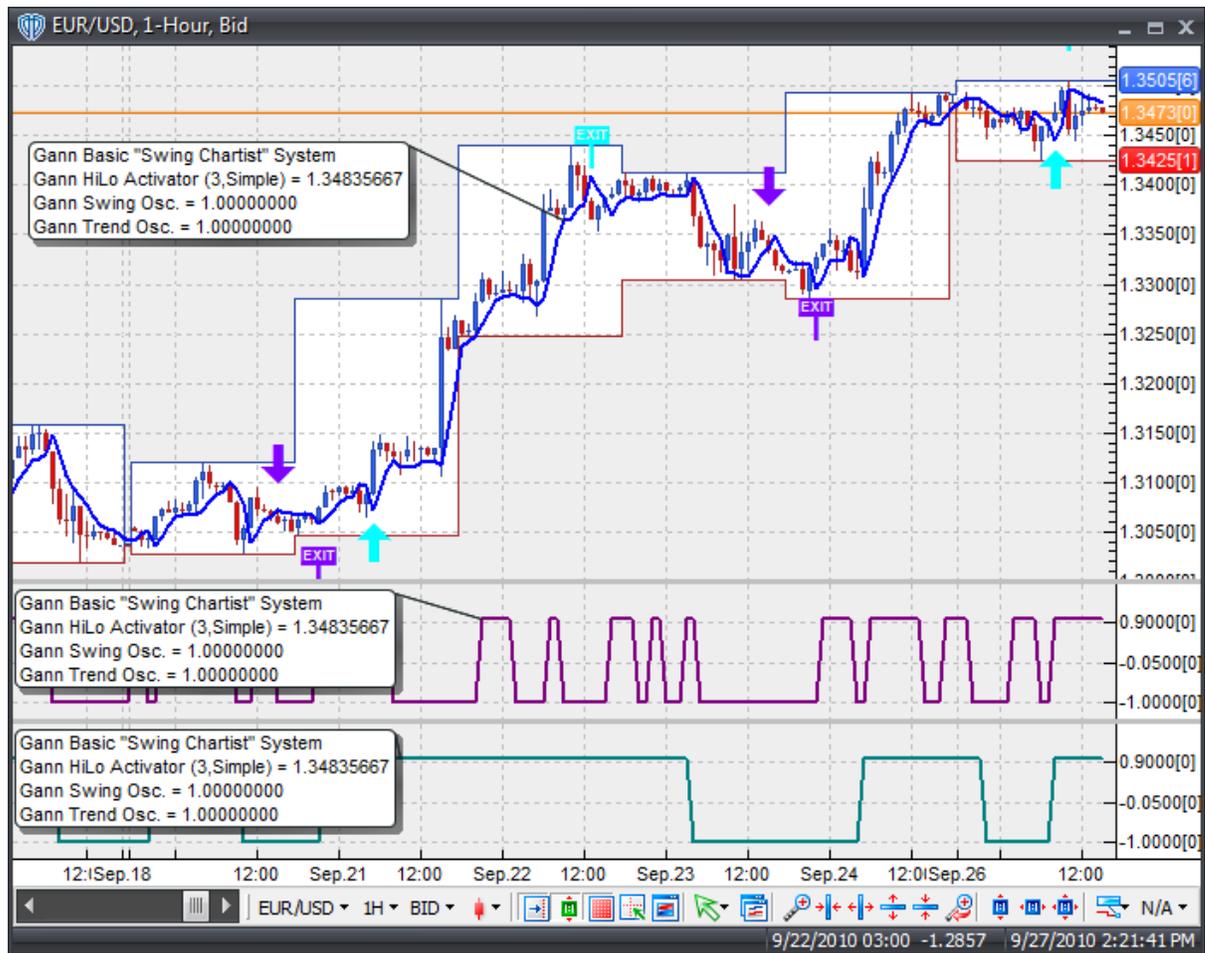
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Gann Basic "Swing Chartist" System** consists of the following output variables and display parameters:

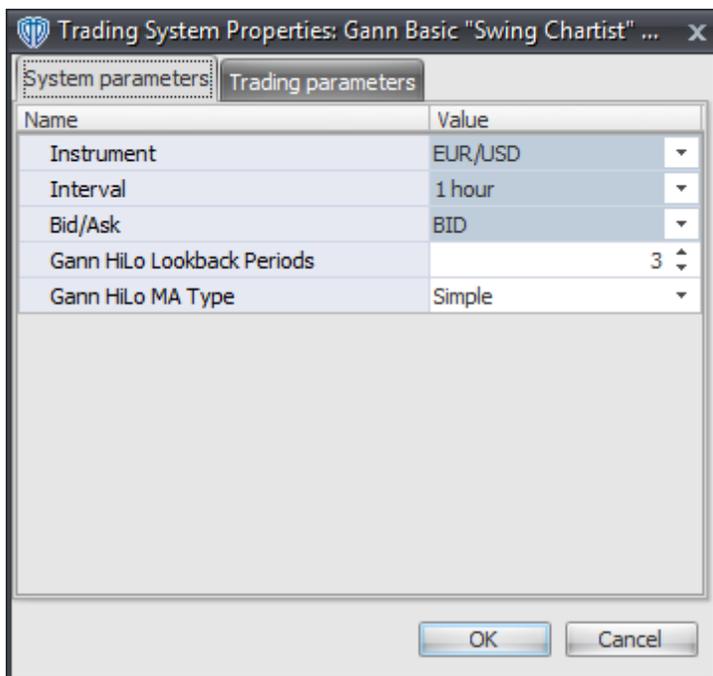
- The Gann HiLo Activator displays in the Price Frame as a slightly thicker, solid, blue line.
- The Gann Swing Oscillator displays in Additional Frame 1 as a slightly thicker, solid, purple line.
- The Gann Trend Oscillator displays in Additional Frame 2 as a slightly thicker, solid, green line.
- When a *Long Entry* signal is generated a cyan up arrow graphic displays in the chart window, the message "Long entry signal detected! Gann Swing Osc. = +1, Gann Trend Osc. = +1, and Close price crossed above Gann HiLo Activator." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a cyan exit graphic displays in the chart window, the message "Long exit signal detected! Close price crossed below Gann HiLo Activator." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a purple down arrow graphic displays in the chart window, the message "Short entry signal detected! Gann Swing Osc. = -1, Gann Trend Osc. = -1, and Close price crossed below Gann HiLo Activator." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a purple exit graphic displays in the chart window, the message "Short exit signal detected! Close price crossed above Gann HiLo Activator." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Gann Basic "Swing Chartist" System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

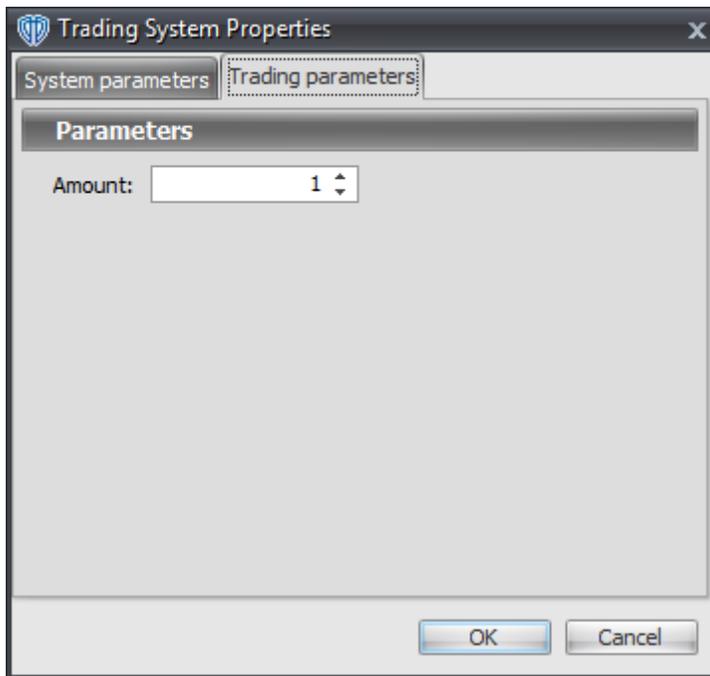
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Gann HiLo Lookback Periods and Gann HiLo MA Type

These parameters define the number of periods and type of moving average used to calculate the Gann HiLo Activator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.40 Hull Moving Average Cross System

Overview

The **Hull Moving Average Cross System** uses fast and slow Hull Moving Averages to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast Hull Moving Average crosses above the Slow Hull Moving Average.

A *Short* signal is generated when the Fast Hull Moving Average crosses below the Slow Hull Moving Average.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

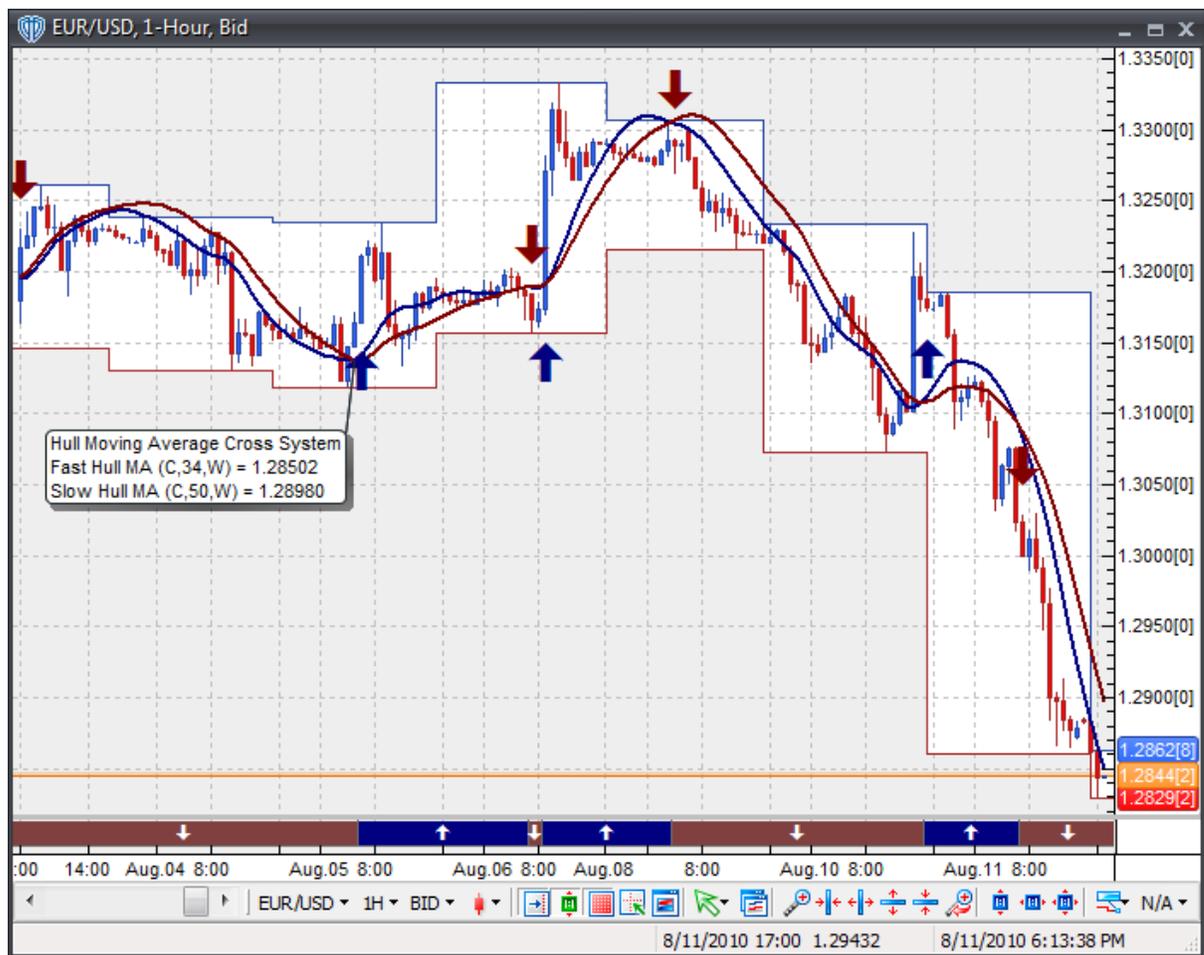
System Outputs and Signals Logic

The **Hull Moving Average Cross System** consists of the following output variables and display

parameters:

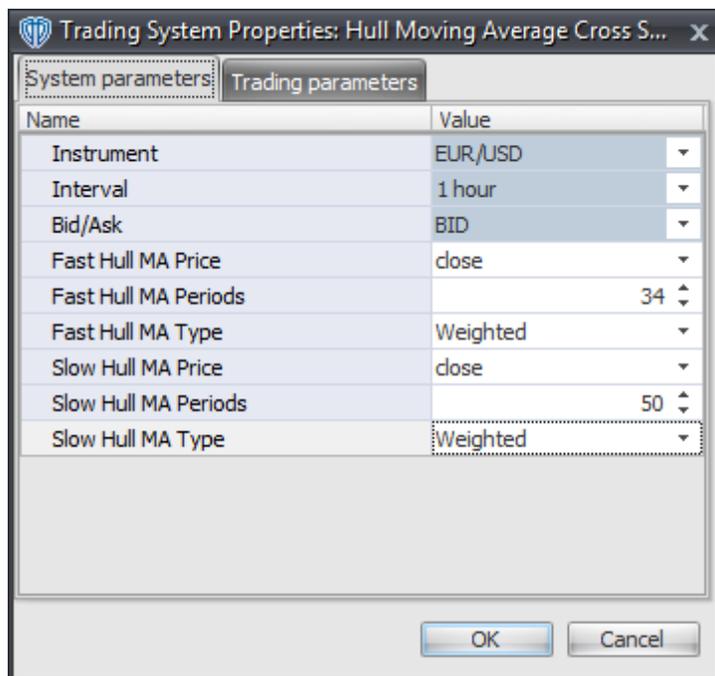
- The Fast Hull Moving Average displays in the Price Frame as slightly thicker, solid dark blue line.
- The Slow Hull Moving Average displays in the Price Frame as a slightly thicker, solid dark red line.
- The Trend Frame displays a white up arrow against a dark blue background while the Fast Hull Moving Average is greater than the Slow Hull Moving Average.
- The Trend Frame displays a white down arrow against a dark red background while the Fast Hull Moving Average is less than the Slow Hull Moving Average.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast Hull MA crossed above Slow Hull MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast Hull MA crossed below Slow Hull MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Hull Moving Average Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast Hull MA Price, Periods, and MA Type

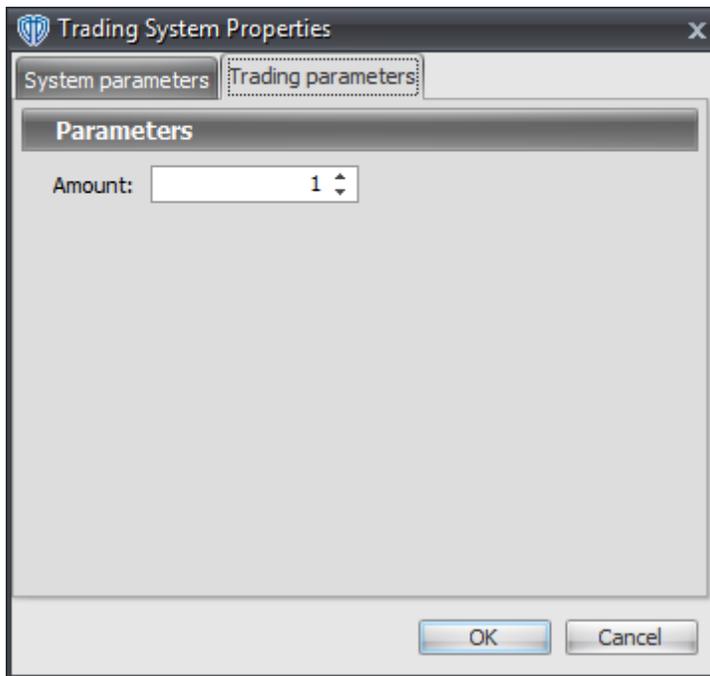
These parameters define the price, number of periods, and type of moving average used to calculate the Fast Hull Moving Average.

Slow Hull MA Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Slow Hull Moving Average.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.41 Ichimoku Kinko Huo "Strong Signals" System

Overview

The **Ichimoku Kinko Huo "Strong Signals" System** uses the Ichimoku Kinko Huo indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated by an Ichimoku Kinko Huo "Strong" buy signal (*i.e. Tenkan-Sen crosses above Kijun-Sen while both are above the Kumo*).

A *Long Exit* signal is generated when the Close price crosses down into the Kumo.

A *Short Entry* signal is generated by an Ichimoku Kinko Huo "Strong" sell signal (*i.e. Tenkan-Sen crosses below Kijun-Sen while both are below the Kumo*).

A *Short Exit* signal is generated when the Close price crosses up into the Kumo.

If the "Provide Ichimoku Weak / Medium Signals?" input parameter (*see description below*) is set to "Yes", supplemental Ichimoku Kinko Huo "Weak" and "Medium" buy and sell alerts are provided.

An Ichimoku Kinko Huo "Weak" buy signal is generated when Tenkan-Sen crosses above Kijun-Sen while both are below the Kumo.

An Ichimoku Kinko Huo "Medium" buy signal is generated when Tenkan-Sen crosses above Kijun-Sen while both are within the Kumo.

An Ichimoku Kinko Huo "Weak" sell signal is generated when Tenkan-Sen crosses below Kijun-Sen while both are above the Kumo.

An Ichimoku Kinko Huo "Medium" sell signal is generated when Tenkan-Sen crosses below Kijun-Sen while both are within the Kumo.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the *Long Entry*, *Long Exit*, *Short Entry*, and *Short Exit* signals even if the "Provide Ichimoku Weak / Medium Signals?" input selection is set to "Yes".

System Outputs and Signals Logic

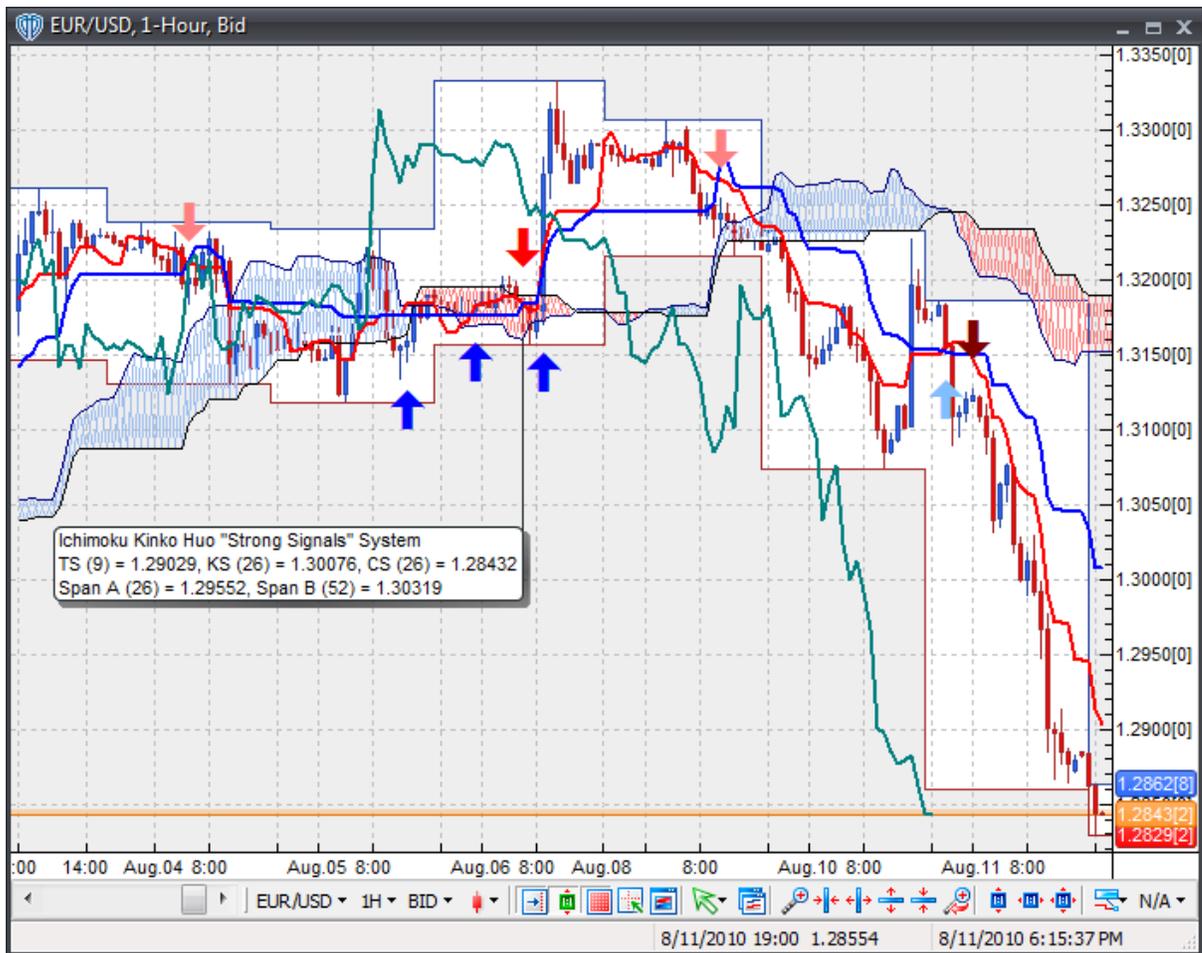
The **Ichimoku Kinko Huo "Strong Signals" System** consists of the following output variables and display parameters:

- Ichimoku's Tenkan-Sen displays in the Price Frame as a slightly thicker, solid, red line.
- Ichimoku's Kijun-Sen displays in the Price Frame as a slightly thicker, solid, blue line.
- Ichimoku's Chinkou Span displays in the Price Frame as a slightly thicker, solid, green line.
- Ichimoku's Senkou Span A displays in the Price Frame as a thin, solid, dark blue line.
- Ichimoku's Senkou Span B displays in the Price Frame as a thin, solid, black line.
- Ichimoku's Up Kumo displays in the Price Frame as a light blue cloud.
- Ichimoku's Down Kumo displays in the Price Frame as a light red cloud.
- When a *Long Entry* signal is generated a dark blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Ichimoku Buy Signal: Strong" displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a dark blue exit graphic displays in the chart window, the message "Long exit signal detected! Close price crossed down into the Kumo." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a dark red down arrow graphic displays in the chart window, the message "Short entry signal detected! Ichimoku Sell Signal: Strong" displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the

CloseBuy output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

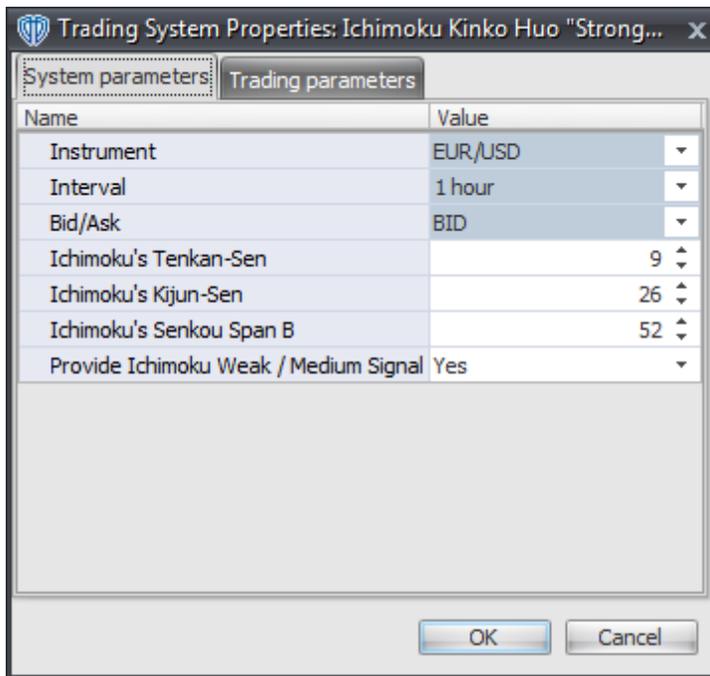
- When a *Short Exit* signal is generated a dark red exit graphic displays in the chart window, the message "Short exit signal detected! Close price crossed up into the Kumo." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- If the "Provide Ichimoku Weak / Medium Signals?" input parameter (*see description below*) is set to "Yes", when an Ichimoku Kinko Huo "Weak" buy signal is generated a light blue up arrow graphic displays in the chart window, the message "Ichimoku Buy Signal: Weak" displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Ichimoku Weak / Medium Signals?" input parameter (*see description below*) is set to "Yes", when an Ichimoku Kinko Huo "Medium" buy signal is generated a blue up arrow graphic displays in the chart window, the message "Ichimoku Buy Signal: Medium" displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Ichimoku Weak / Medium Signals?" input parameter (*see description below*) is set to "Yes", when an Ichimoku Kinko Huo "Weak" sell signal is generated a light red down arrow graphic displays in the chart window, the message "Ichimoku Sell Signal: Weak" displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Ichimoku Weak / Medium Signals?" input parameter (*see description below*) is set to "Yes", when an Ichimoku Kinko Huo "Medium" sell signal is generated a red down arrow graphic displays in the chart window, the message "Ichimoku Sell Signal: Medium" displays in the Trading Activity window, and an audio sound file plays.

Below is a screenshot that shows the **Ichimoku Kinko Huo "Strong Signals" System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Ichimoku's Tenkan-Sen, Kijun_Sen, and Senkou Span B

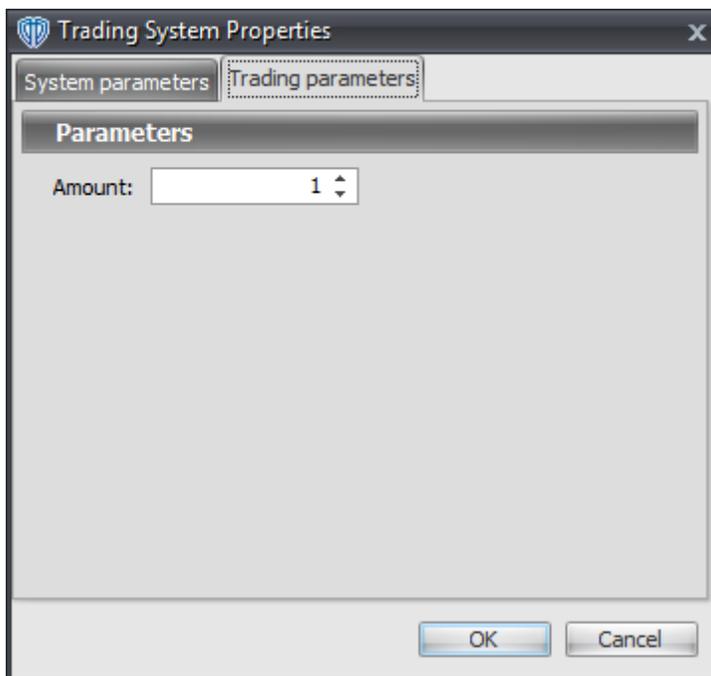
These parameters define the values used to calculate the various aspects of the Ichimoku Kinko Huo indicator.

Provide Ichimoku Weak / Medium Signals?

This parameter defines if the trading system provides additional, supplemental Ichimoku Kinko Hou "Weak" and "Medium" buy and sell alerts. Please refer to the *Overview* and *System Outputs and Signals Logic* sections above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.42 Inertia Cross System

Overview

The **Inertia Cross System** uses the Inertia indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Inertia indicator crosses above 50.

A *Short* signal is generated when the Inertia indicator crosses below 50.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

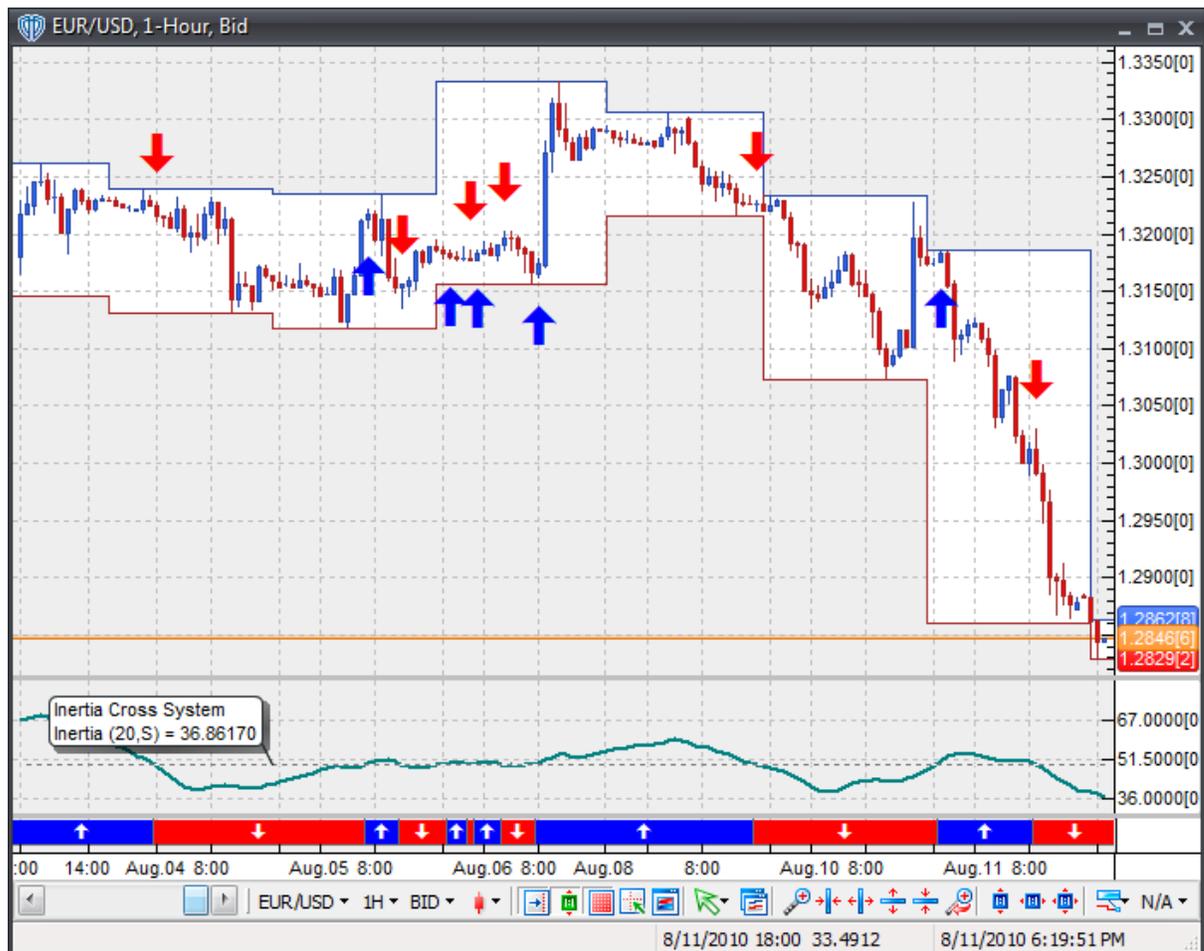
The **Inertia Cross System** consists of the following output variables and display parameters:

- The Inertia indicator displays in Additional Frame 1 as slightly thicker, solid dark green line. Its mid-

level (50) displays in the same frame as a dashed grey line.

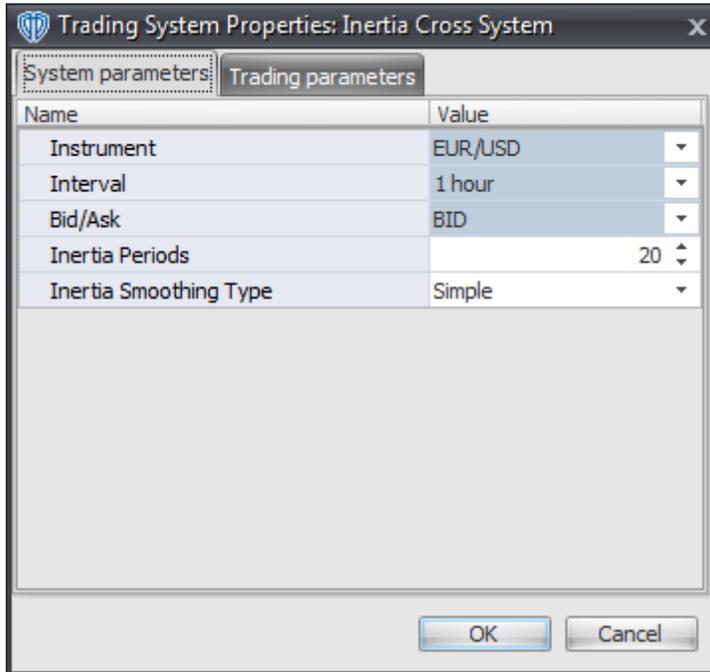
- The Trend Frame displays a white up arrow against a blue background while the Inertia indicator is greater than 50.
- The Trend Frame displays a white down arrow against a red background while the Inertia indicator is less than 50.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Inertia crossed above 50." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Inertia crossed below 50." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Inertia Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Inertia Periods

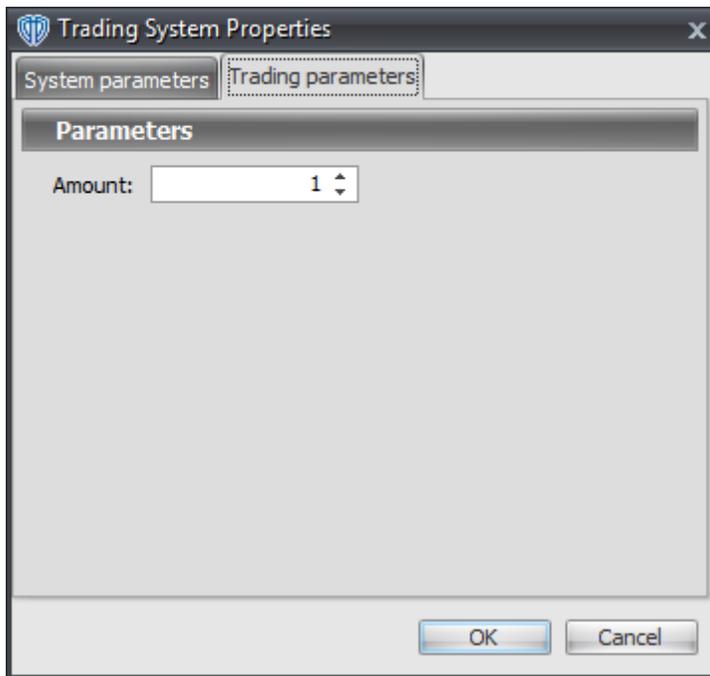
This parameter defines the price used to calculate the Inertia indicator.

Inertia Smoothing Type

This parameter defines the type of moving average used to calculate the Inertia indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.43 Kase CD Cross System

Overview

The **Kase CD Cross System** uses the Kase CD indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Kase CD crosses above the Kase CD's Signal Line.

A *Short* signal is generated when the Kase CD crosses below the Kase CD's Signal Line.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

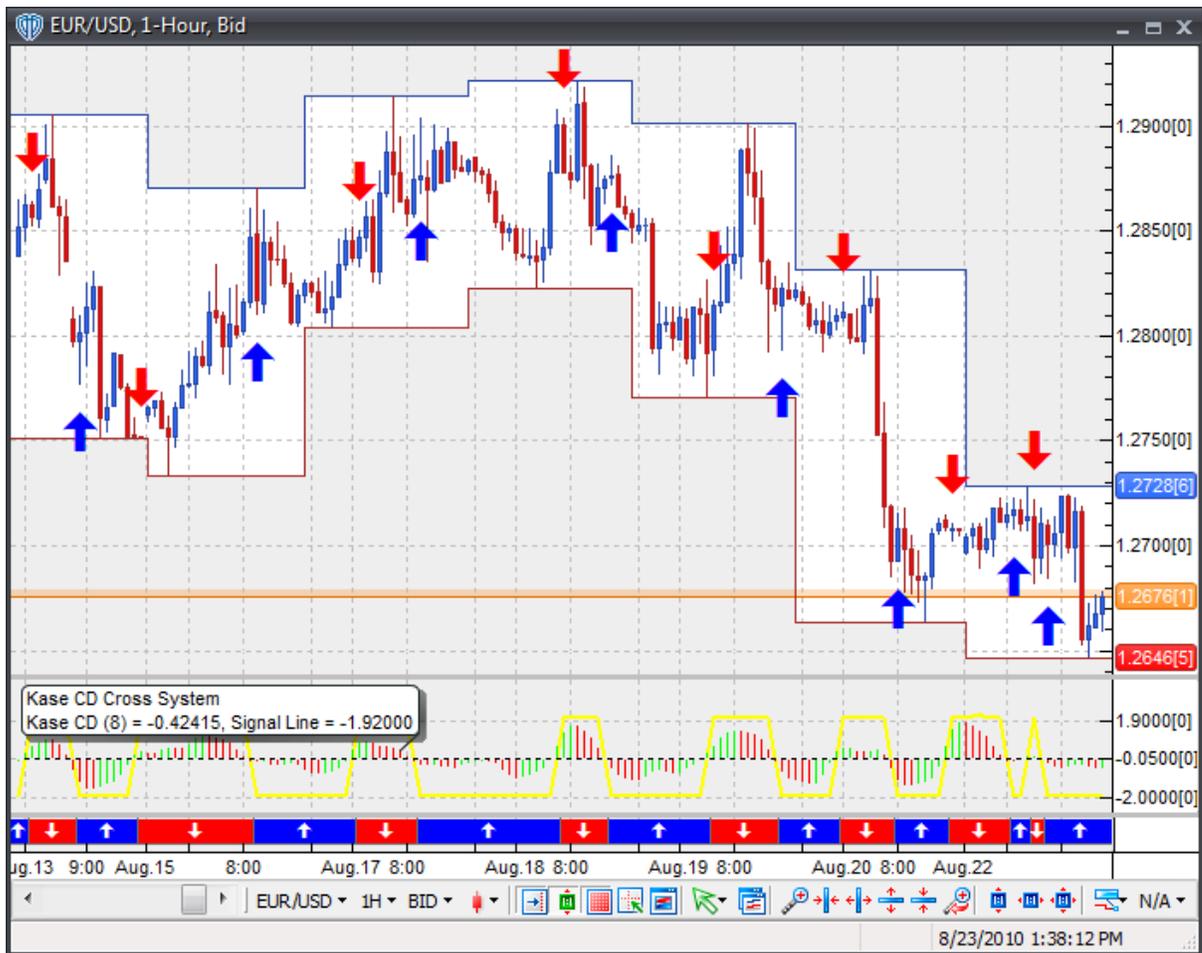
The **Kase CD Cross System** consists of the following output variables and display parameters:

- The Kase CD displays in Additional Frame 1 as a histogram. The histogram is green if the current

value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.

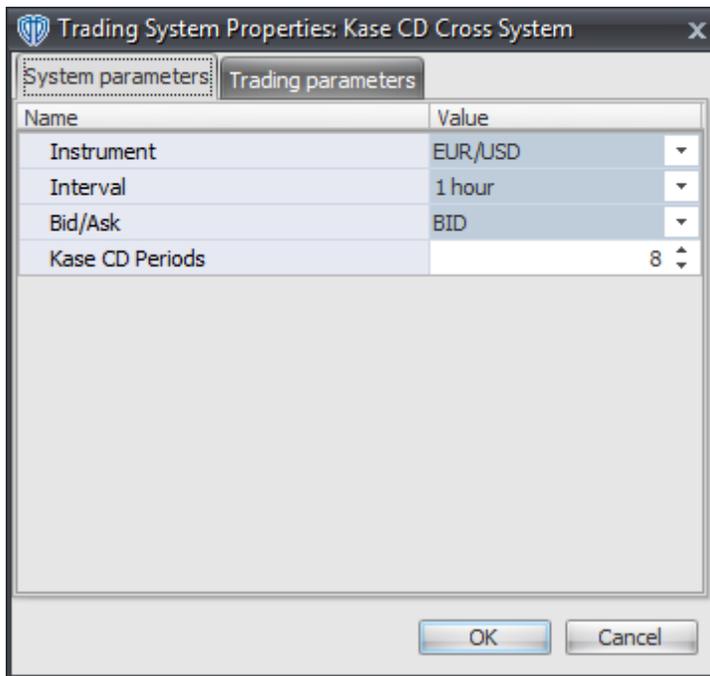
- The Kase CD Signal Line displays in Additional Frame 1 as a slightly thicker, solid, yellow line.
- The Trend Frame displays a white up arrow against a blue background while the Kase CD is greater than the Kase CD's Signal Line.
- The Trend Frame displays a white up arrow against a red background while the Kase CD is less than the Kase CD's Signal Line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Kase CD crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Kase CD crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Kase CD Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

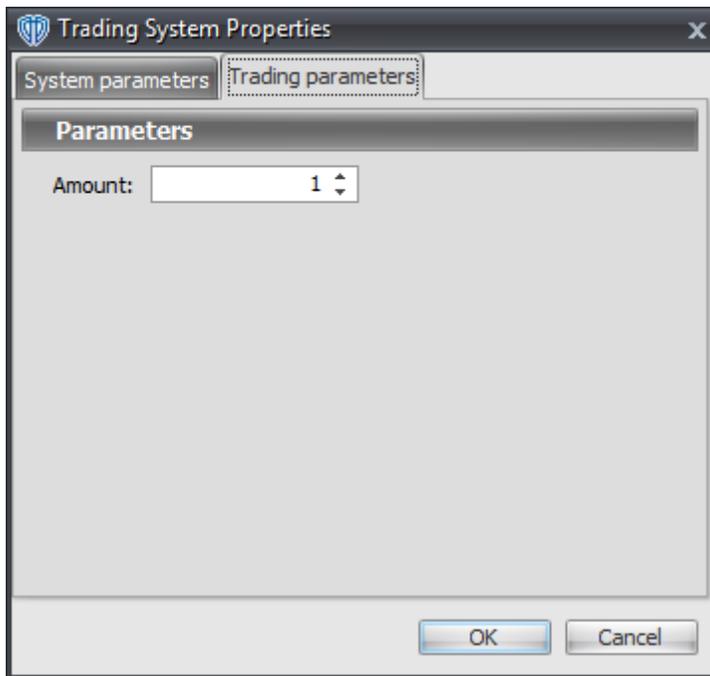
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Kase CD Periods

This parameter defines the number of periods used to calculate the Kase CD indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.44 Kase Peak Oscillator Cross System

Overview

The **Kase Peak Oscillator Cross System** uses the Kase Peak Oscillator indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Kase Peak Oscillator crosses above the Kase Peak Oscillator's Signal Line.

A *Short* signal is generated when the Kase Peak Oscillator crosses below the Kase Peak Oscillator's Signal Line.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

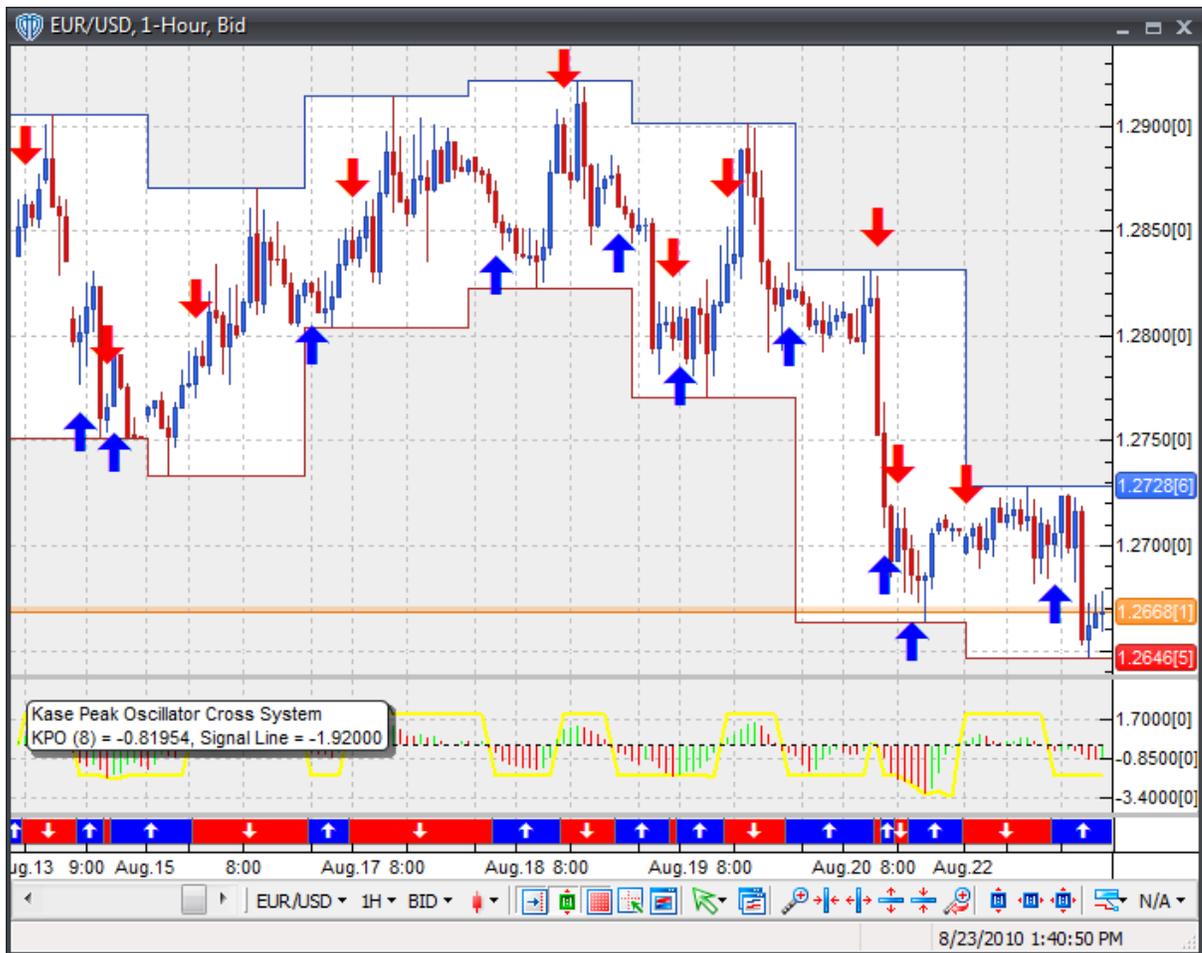
System Outputs and Signals Logic

The **Kase Peak Oscillator Cross System** consists of the following output variables and display

parameters:

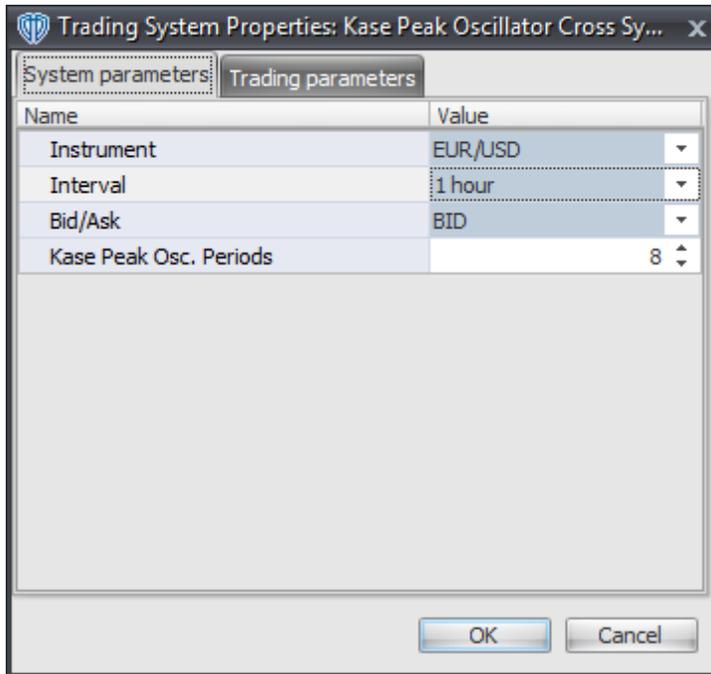
- The Kase Peak Oscillator displays in Additional Frame 1 as a histogram. The histogram is green if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- The Kase Peak Oscillator Signal Line displays in Additional Frame 1 as a slightly thicker, solid, yellow line.
- The Trend Frame displays a white up arrow against a blue background while the Kase Peak Oscillator is greater than the Kase Peak Oscillator's Signal Line.
- The Trend Frame displays a white up arrow against a red background while the Kase Peak Oscillator is less than the Kase Peak Oscillator's Signal Line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Kase Peak Osc. crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Kase Peak Osc. crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Kase Peak Oscillator Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

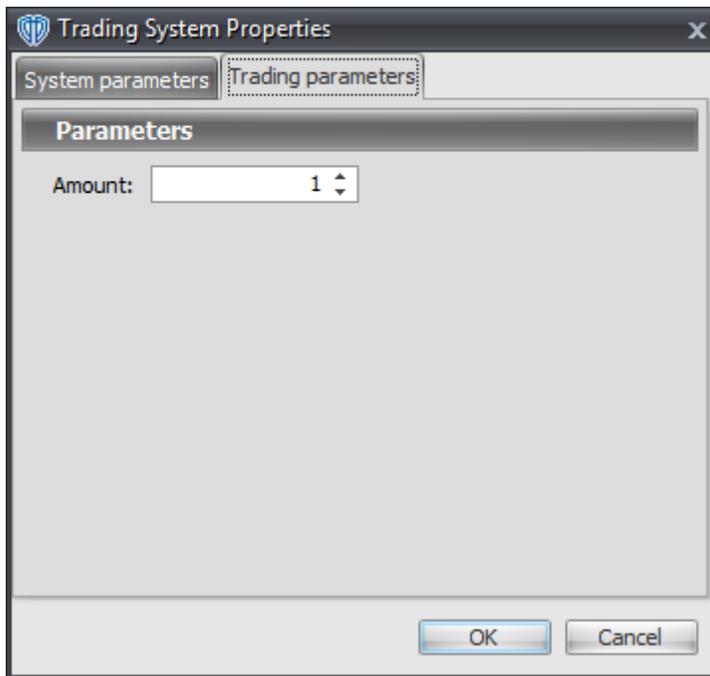
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Kase Peak Osc. Periods

This parameter defines the number of periods used to calculate the Kase Peak Oscillator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.45 Kaufman's Adaptive Moving Average (KAMA) Cross System

Overview

The **Kaufman's Adaptive Moving Average (KAMA) Cross System** uses fast and slow Kaufman Adaptive Moving Averages (KAMA's) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast KAMA crosses above the Slow KAMA.

A *Short* signal is generated when the Fast KAMA crosses below the Slow KAMA.

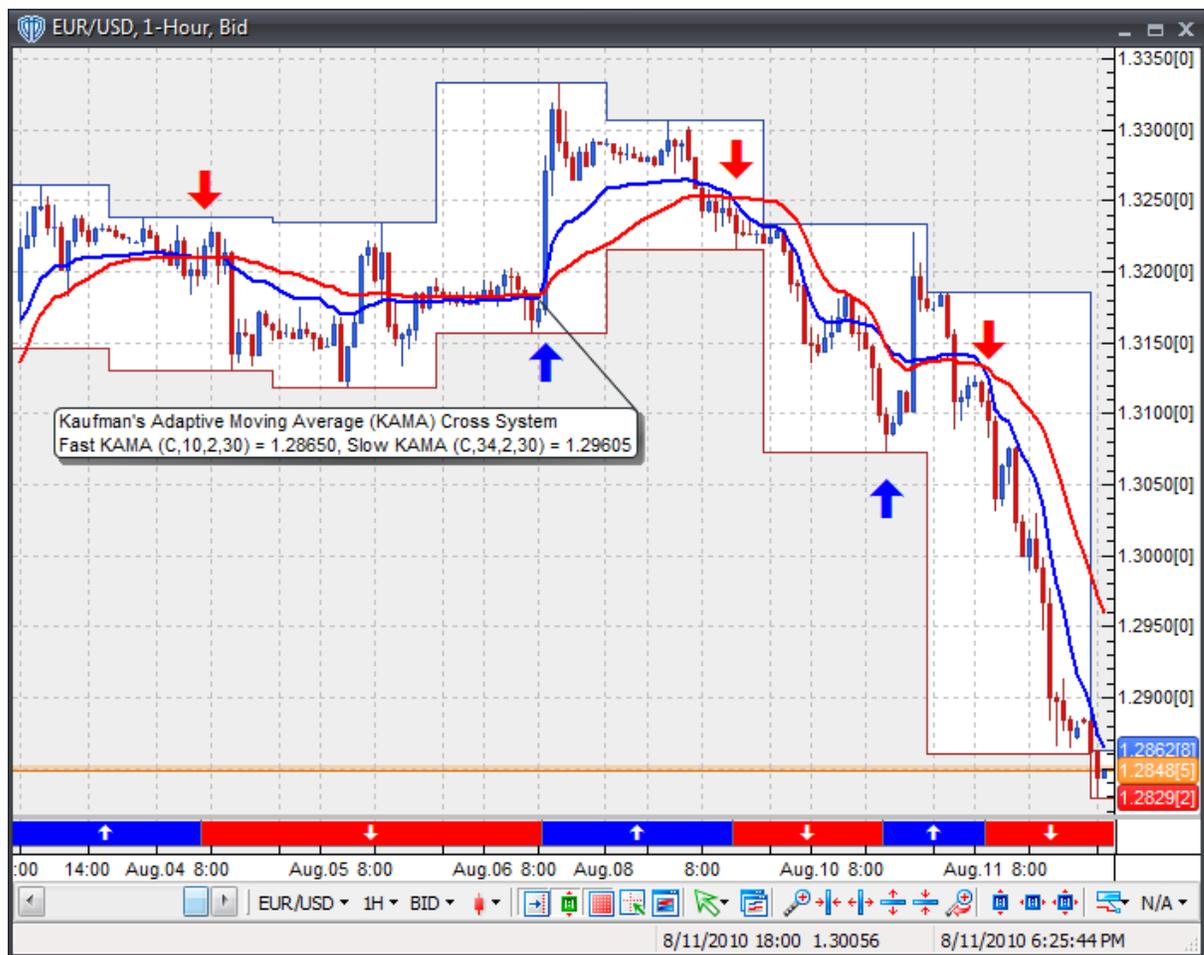
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Kaufman's Adaptive Moving Average (KAMA) Cross System** consists of the following output variables and display parameters:

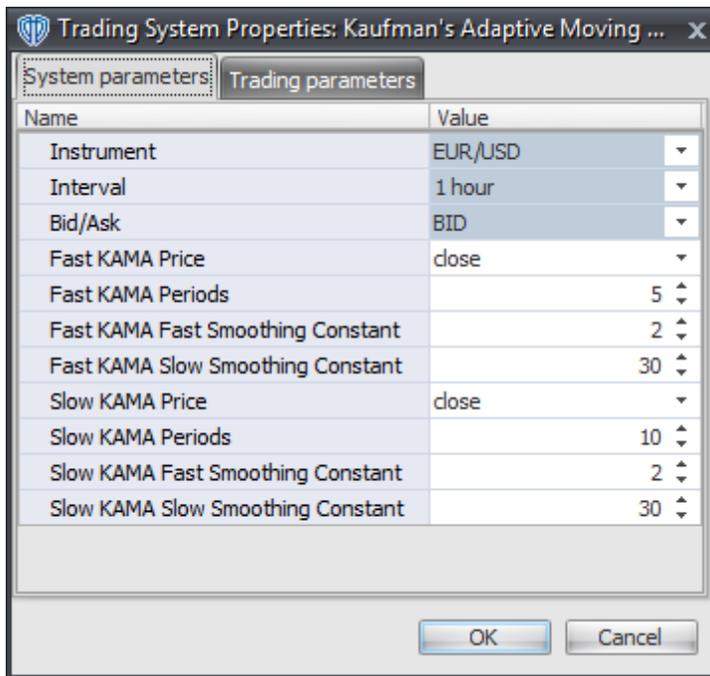
- The Fast KAMA displays in the Price Frame as slightly thicker, solid blue line.
- The Slow KAMA displays in the Price Frame as a slightly thicker, solid red line.
- The Trend Frame displays a white up arrow against a blue background while the Fast KAMA is greater than the Slow KAMA.
- The Trend Frame displays a white down arrow against a red background while the Fast KAMA is less than the Slow KAMA.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast KAMA crossed above Slow KAMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast KAMA crossed below Slow KAMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Kaufman's Adaptive Moving Average (KAMA) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast KAMA Price, Periods, Fast Smoothing Constant, and Slow Smoothing Constants

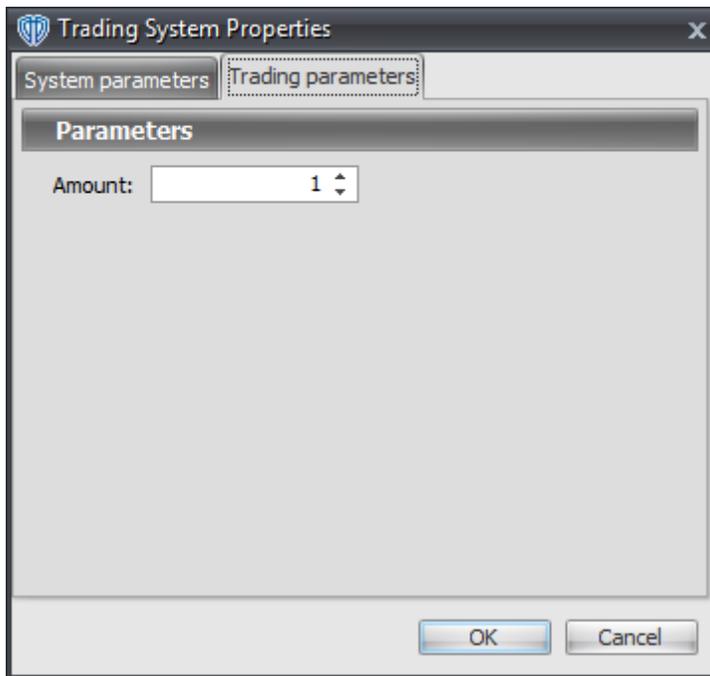
These parameters define the price, number of periods, and smoothing constants used to calculate the Fast Kaufman's moving average.

Slow KAMA Price, Periods, Fast Smoothing Constant, and Slow Smoothing Constants

These parameters define the price, number of periods, and smoothing constants used to calculate the Slow Kaufman's moving average.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.46 Kaufman's Efficiency Ratio UpTrend / DownTrend System

Overview

The **Kaufman's Efficiency Ratio UpTrend / DownTrend System** uses Kaufman's Efficiency Ratio indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated by Kaufman's Efficiency Ratio crossing above the UpTrend Threshold Level.

A *Long Exit* signal is generated by your choice of: the Kaufman's Efficiency Ratio crossing below the UpTrend Threshold Level, Zero, or the DownTrend Threshold Level.

A *Short Entry* signal is generated by Kaufman's Efficiency Ratio crossing below the DownTrend Threshold Level.

A *Short Exit* signal is generated by your choice of: the Kaufman's Efficiency Ratio crossing above the DownTrend Threshold Level, Zero, or the UpTrend Threshold Level.

If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", supplemental Kaufman's Efficiency Ratio long and short alerts are provided.

Supplemental long signals are generated when Kaufman's Efficiency Ratio crosses above zero.

Supplemental short signals are generated when Kaufman's Efficiency Ratio crosses below zero.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the *Long Entry*, *Long Exit*, *Short Entry*, and *Short Exit* signals even if the "Provide Supplemental Alert Signals?" input selection is set to "Yes".

System Outputs and Signals Logic

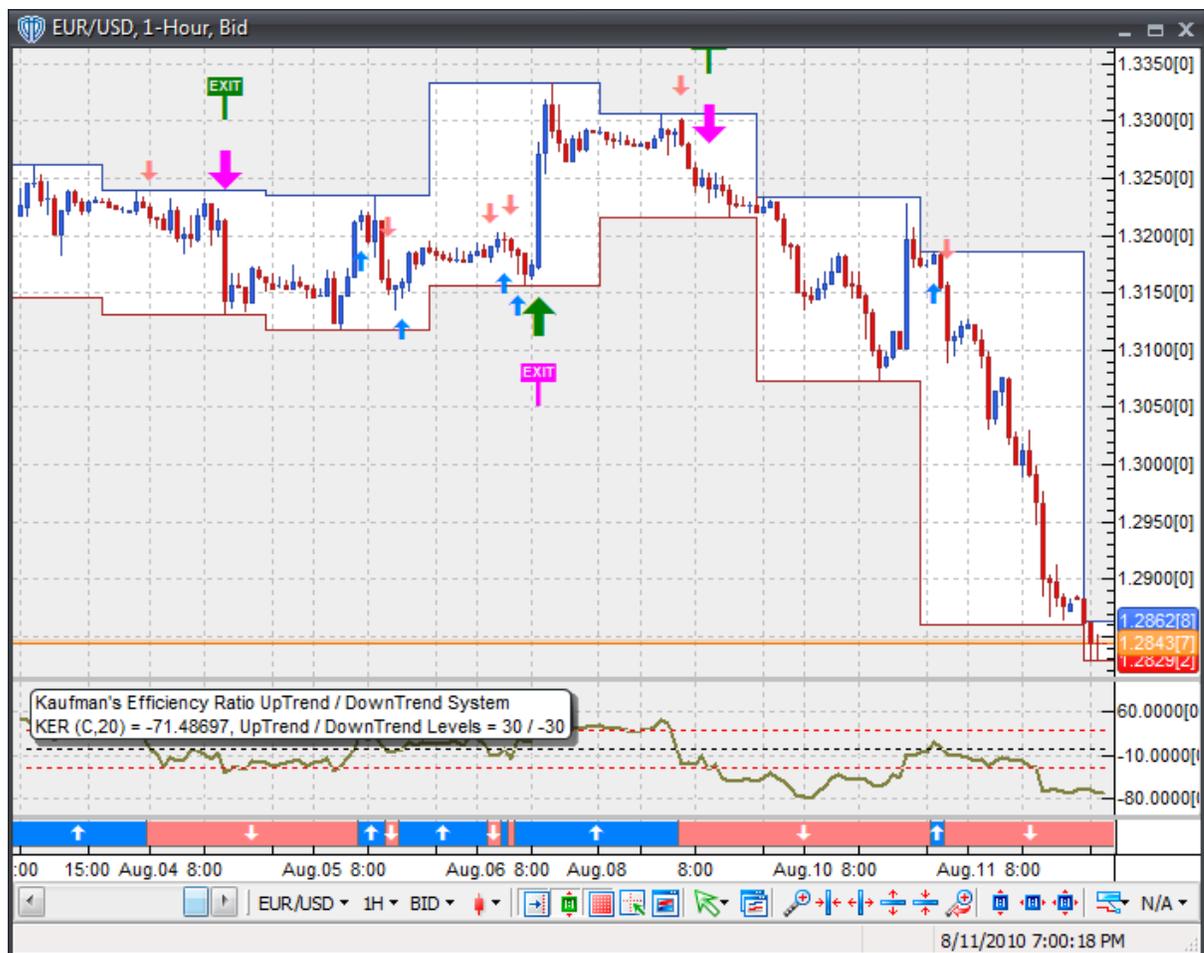
The **Kaufman's Efficiency Ratio UpTrend / DownTrend System** consists of the following output variables and display parameters:

- Kaufman's Efficiency Ratio displays in Additional Frame 1 as a slightly thicker, solid dark gold line. Its mid-level (0) displays in the same frame as a black dashed line.
- The UpTrend Threshold Level displays in Additional Frame 1 as a thin, dashed, red line.
- The DownTrend Threshold Level displays in Additional Frame 1 as a thin, dashed, red line.
- The Trend Frame displays a white up arrow against a light blue background while Kaufman's Efficiency Ratio is greater than zero.
- The Trend Frame displays a white down arrow against a light red background while Kaufman's Efficiency Ratio is less than zero.
- When a *Long Entry* signal is generated a green up arrow graphic displays in the chart window, the message "Long entry signal detected! KER crossed above the UpTrend Theshold." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a green exit graphic displays in the chart window, the message "Long exit signal detected! Your specified QQE condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a pink down arrow graphic displays in the chart window, the message "Short entry signal detected! KER crossed below DownTrend Theshold." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a pink exit graphic displays in the chart window, the message "Short exit signal detected! Your specified KER condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the

parameters defined in the Trading System Properties window's Trading Parameters tab.

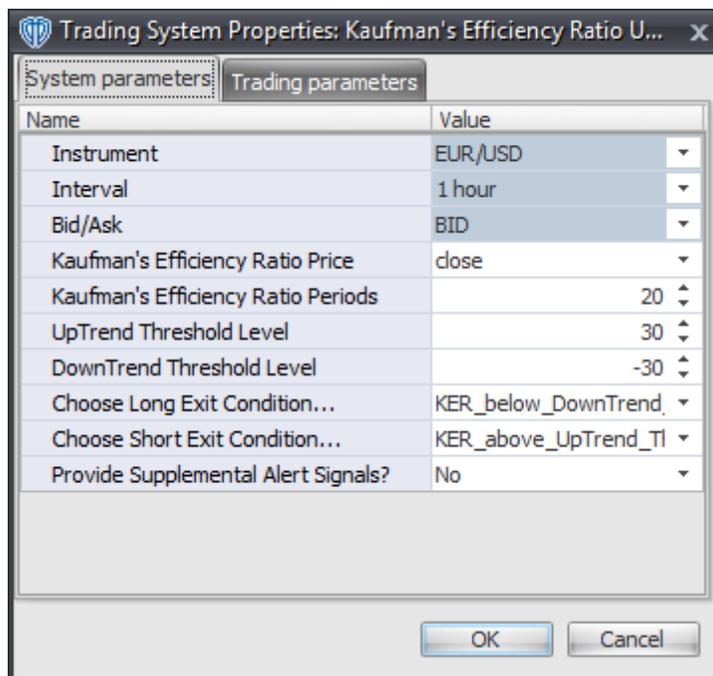
- If the "Provide Supplemental Alert Signals?" input parameter (see description below) is set to "Yes", when a supplemental "KER crosses above zero" long signal is generated a small, light blue up arrow graphic displays in the chart window, the message "Kaufman's Efficiency Ratio crossed above zero!" displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (see description below) is set to "Yes", when a supplemental "KER crosses below" short signal is generated a small, red down arrow graphic displays in the chart window, the message "Kaufman's Efficiency Ratio crossed below zero!" displays in the Trading Activity window, and an audio sound file plays.

Below is a screenshot that shows the **Kaufman's Efficiency Ratio UpTrend / DownTrend System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Kaufman's Efficiency Ratio Price and Kaufman's Efficiency Ratio Periods

These parameters define the price and the number of periods used to calculate Kaufman's Efficiency Ratio.

UpTrend Threshold Level

This parameter defines the value used in Kaufman's Efficiency Ratio-related conditions to generate the *Long Entry* signal and, depending on your choice for the long exit condition, the *Long Exit* signal.

DownTrend Threshold Level

This parameter defines the value used in Kaufman's Efficiency Ratio-related conditions to generate the *Short Entry* signal and, depending on your choice for the short exit condition, the *Short Exit* signal.

Choose Long Exit Condition...

This parameter defines the condition used to generate the *Long Exit* signal.

Choose Short Exit Condition...

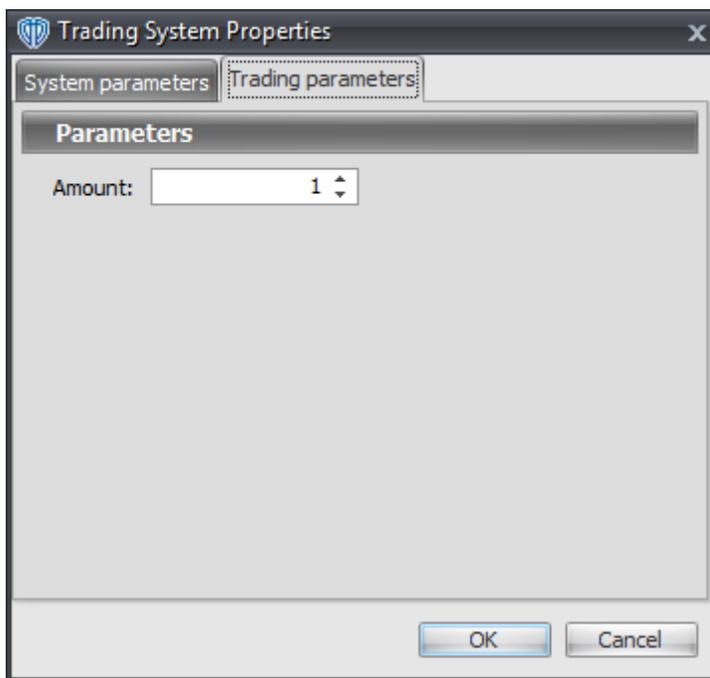
This parameter defines the condition used to generate the *Short Exit* signal.

Provide Supplemental Alert Signals?

This parameter defines if the trading system provides additional, supplemental Kaufman's Efficiency Ratio long and short alerts. Please refer to the *Overview* and *System Outputs and Signals Logic* sections above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.47 Keltner Bands Breakout System

Overview

The **Keltner Bands Breakout System** uses Keltner Bands to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the upper Keltner Band. If the "Require

Price Confirmation of Breakout?" input parameter (see *description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the upper Keltner Band breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the lower Keltner Band. If the "Require Price Confirmation of Breakout?" input parameter (see *description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the lower Keltner Band breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Keltner Bands Breakout System** consists of the following output variables and display parameters:

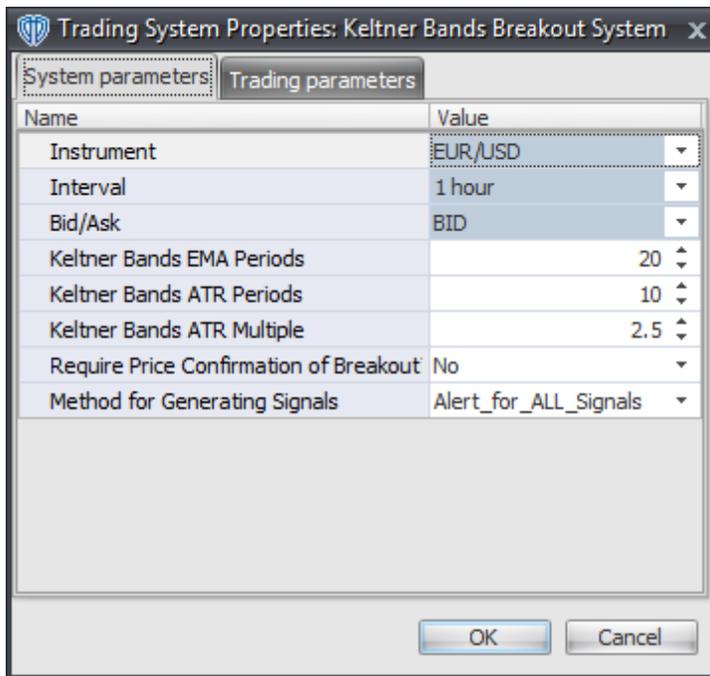
- The upper and lower Keltner Bands display in the Price Frame as thin, solid, purple lines. The middle Keltner Band displays in the Price Frame as a thin, dashed, dark blue line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the upper Keltner Band breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the lower Keltner Band breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above the Upper Keltner Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below the Lower Keltner Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Keltner Bands Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Keltner Bands EMA Periods, ATR Periods, and ATR Multiple

These parameters define the values used to calculate the Keltner Bands.

Require Price Confirmation of Breakout?

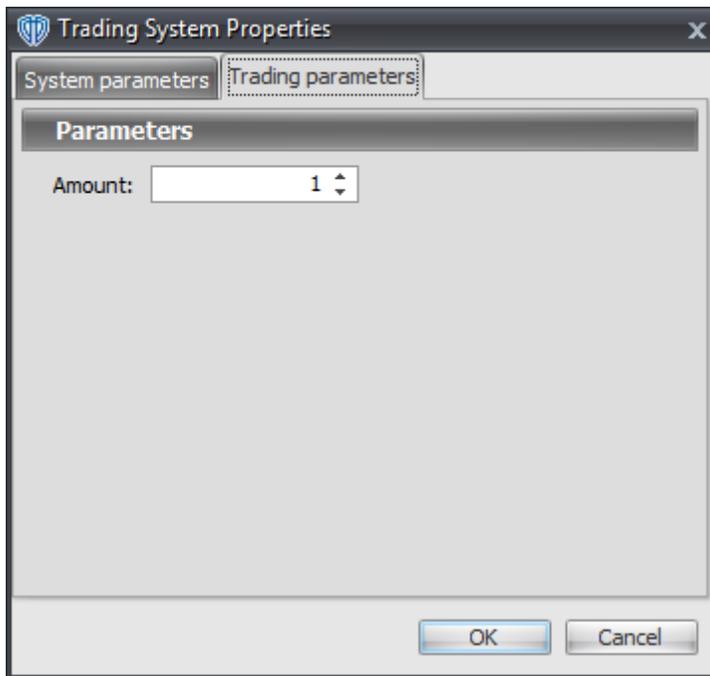
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.48 Keltner Bands Reversal System

Overview

The **Keltner Bands Reversal System** uses Keltner Bands to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the price reverses from the lower Keltner Band using either a 1-bar or 2-bar reversal formation.

- Long 1-Bar Formation = Close price > Open price AND Close price > Lower Keltner Band AND Low price <= Lower Keltner Band
- Long 2-Bar Formation = Close price > Open price AND Close price > Lower Keltner Band AND Close price > Open price 1 bar ago AND Close price 1 bar ago < Open price 1 bar ago AND Low price 1 bar ago <= Lower Keltner Band 1 bar ago

A *Short* signal is generated when the price reverses from the upper Keltner Band using either a 1-bar or 2-bar reversal formation.

- Short 1-Bar Formation = Close price < Open price AND Close price < Upper Keltner Band AND High price >= Upper Keltner Band

- Short 2-Bar Formation = Close price < Open price AND Close price < Upper Keltner Band AND Close price < Open price 1 bar ago AND Close price 1 bar ago > Open price 1 bar ago AND High price 1 bar ago >= Upper Keltner Band 1 bar ago

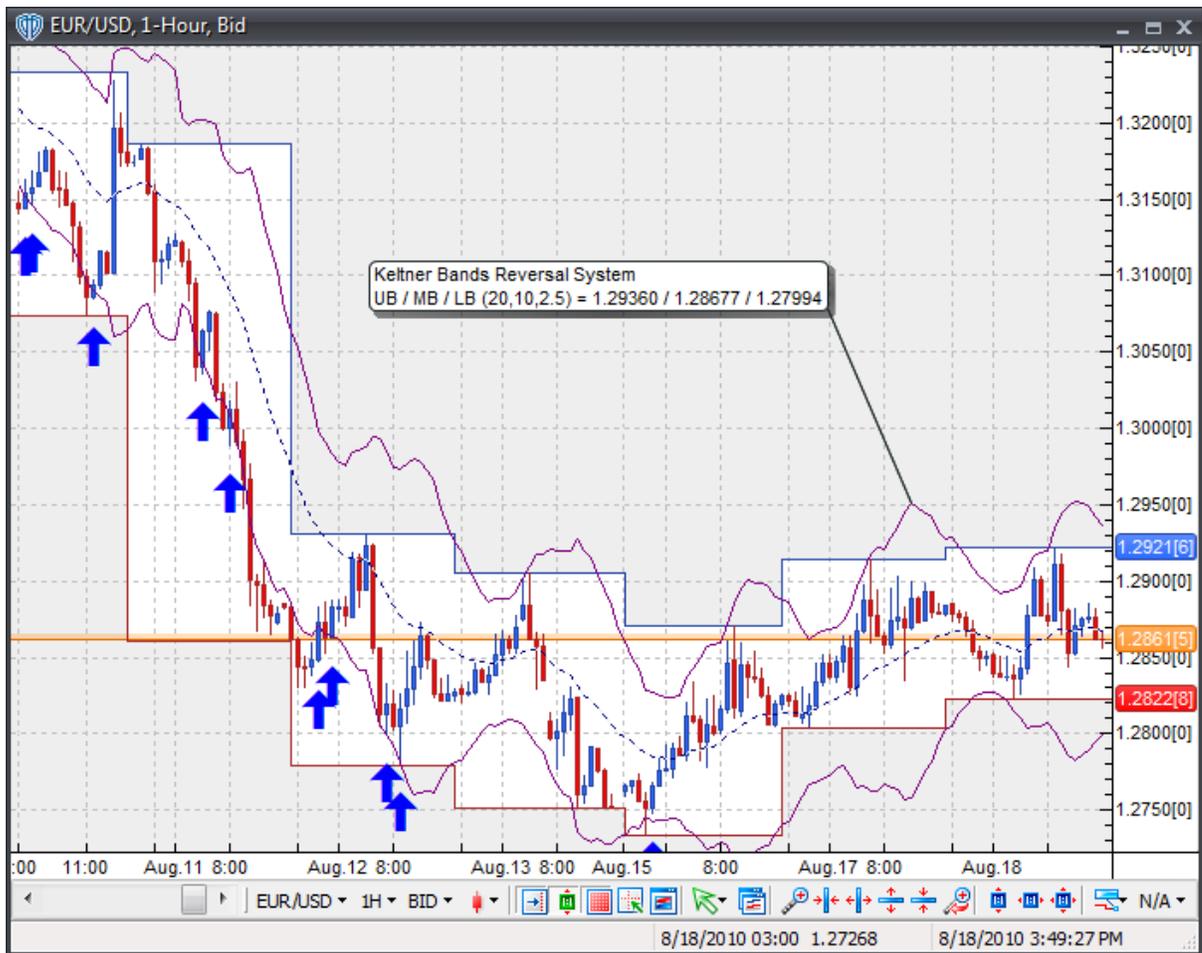
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Keltner Bands Reversal System** consists of the following output variables and display parameters:

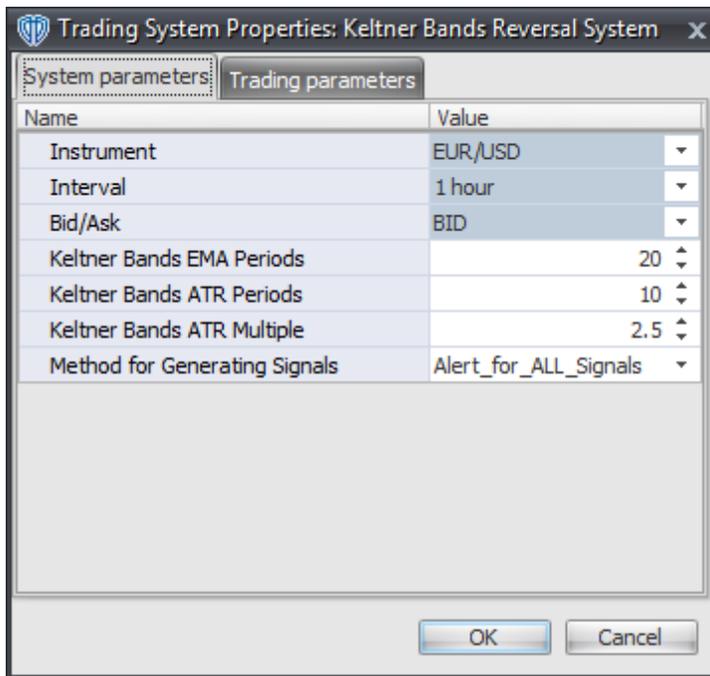
- The upper and lower Keltner Bands display in the Price Frame as thin, solid, purple lines. The middle Keltner Band displays in the Price Frame as a thin, dashed, dark blue line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Price is potentially reversing from Lower Keltner Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Price is potentially reversing from the Upper Keltner Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Keltner Bands Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Keltner Bands EMA Periods, ATR Periods, and ATR Multiple

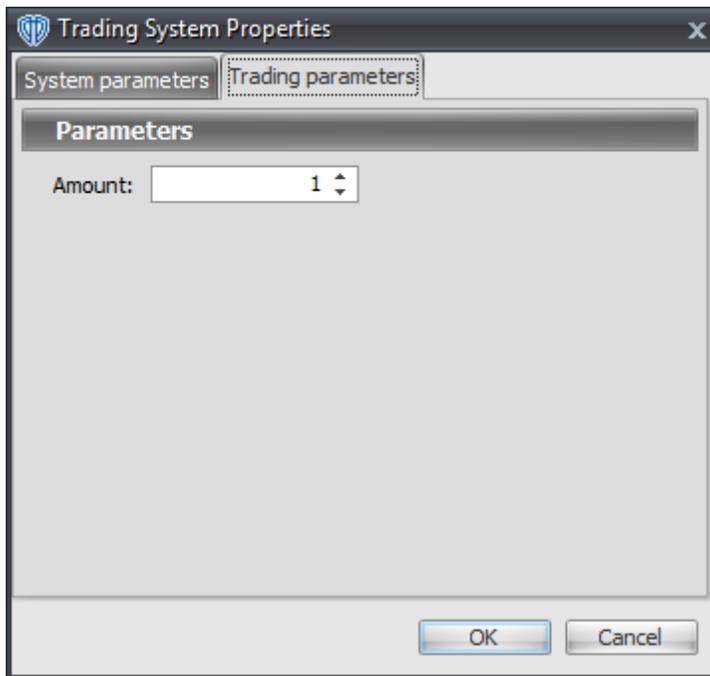
These parameters define the values used to calculate the Keltner Bands.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.49 Keltner Channels Breakout System

Overview

The **Keltner Channels Breakout System** uses Keltner Channels to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the upper Keltner Channel. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the upper Keltner Channel breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the lower Keltner Channel. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the lower Keltner Channel breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input

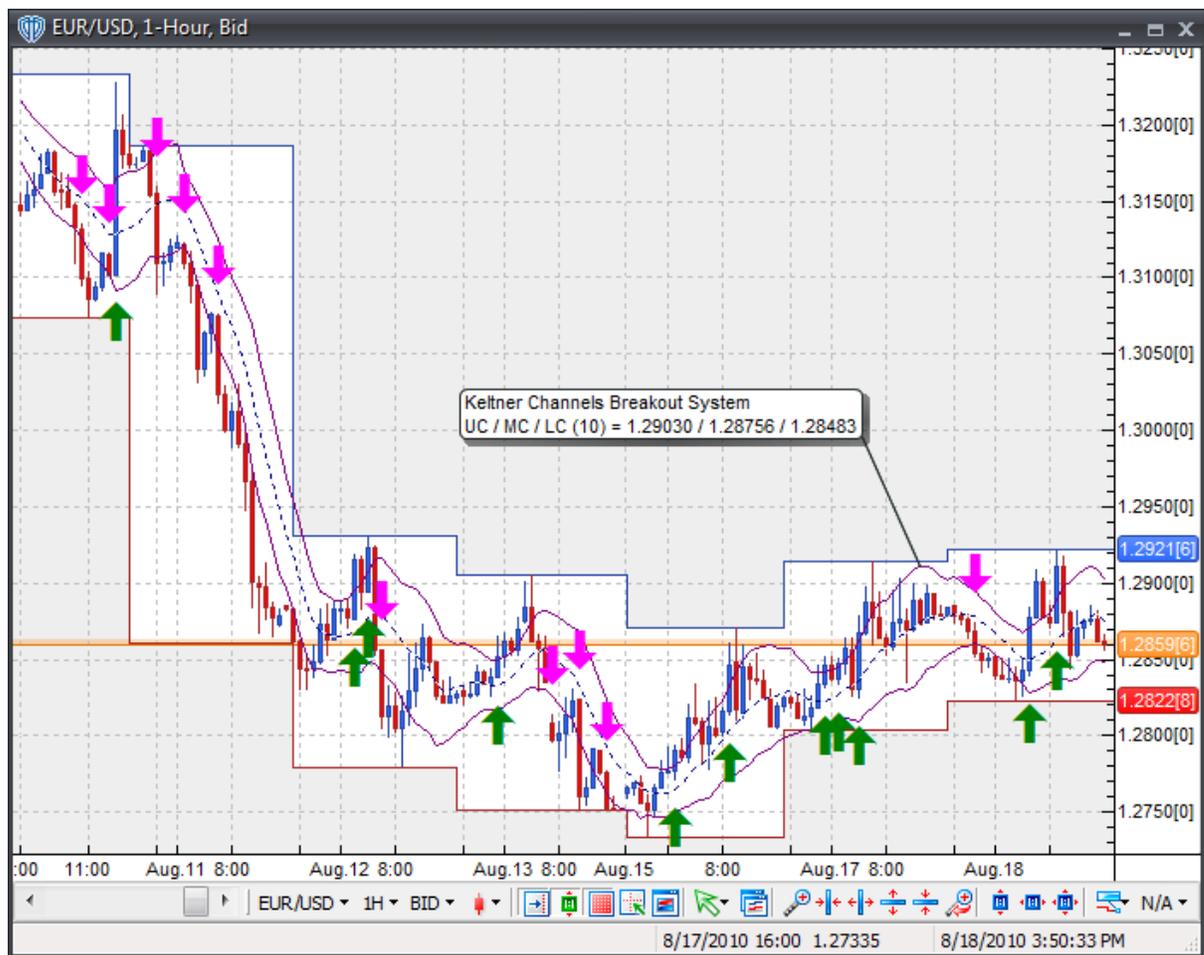
selection is chosen.

System Outputs and Signals Logic

The **Keltner Channels Breakout System** consists of the following output variables and display parameters:

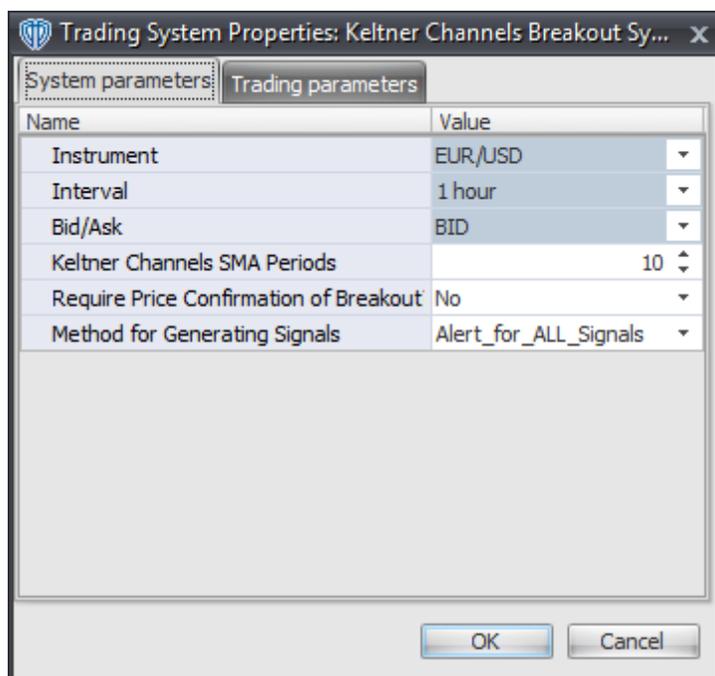
- The upper and lower Keltner Channels display in the Price Frame as thin, solid, purple lines. The middle Keltner Channel displays in the Price Frame as a thin, dashed, dark blue line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the upper Keltner Channel breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the lower Keltner Channel breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above the Upper Keltner Channel." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below the Lower Keltner Channel." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Keltner Channels Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Keltner Channels SMA Periods

This parameter defines the number of periods used to calculate the Keltner Channels.

Require Price Confirmation of Breakout?

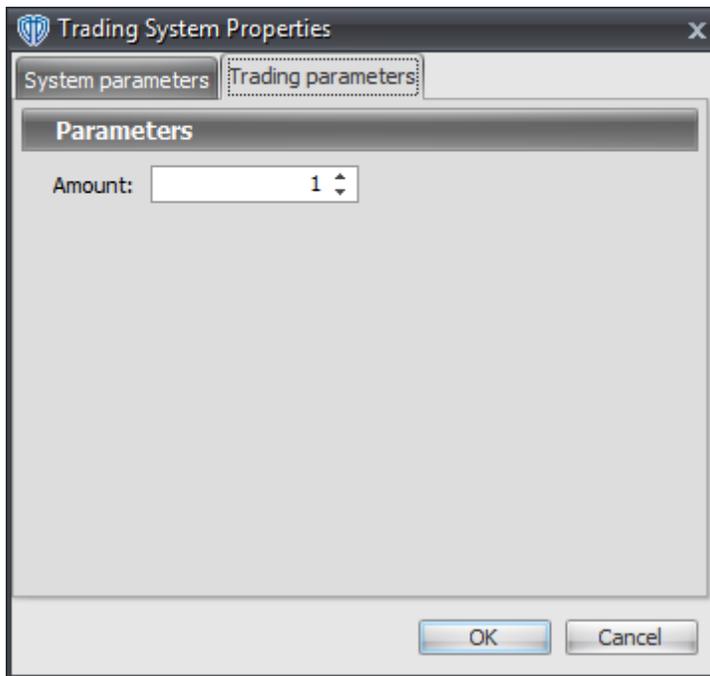
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.50 Keltner Channels Reversal System

Overview

The **Keltner Channels Reversal System** uses Keltner Channels to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the price reverses from the lower Keltner Channel using either a 1-bar or 2-bar reversal formation.

- Long 1-Bar Formation = Close price > Open price AND Close price > Lower Keltner Channel AND Low price <= Lower Keltner Channel
- Long 2-Bar Formation = Close price > Open price AND Close price > Lower Keltner Channel AND Close price > Open price 1 bar ago AND Close price 1 bar ago < Open price 1 bar ago AND Low price 1 bar ago <= Lower Keltner Channel 1 bar ago

A *Short* signal is generated when the price reverses from the upper Keltner Channel using either a 1-bar or 2-bar reversal formation.

- Short 1-Bar Formation = Close price < Open price AND Close price < Upper Keltner Channel AND High price >= Upper Keltner Channel

- Short 2-Bar Formation = Close price < Open price AND Close price < Upper Keltner Channel AND Close price < Open price 1 bar ago AND Close price 1 bar ago > Open price 1 bar ago AND High price 1 bar ago >= Upper Keltner Channel 1 bar ago

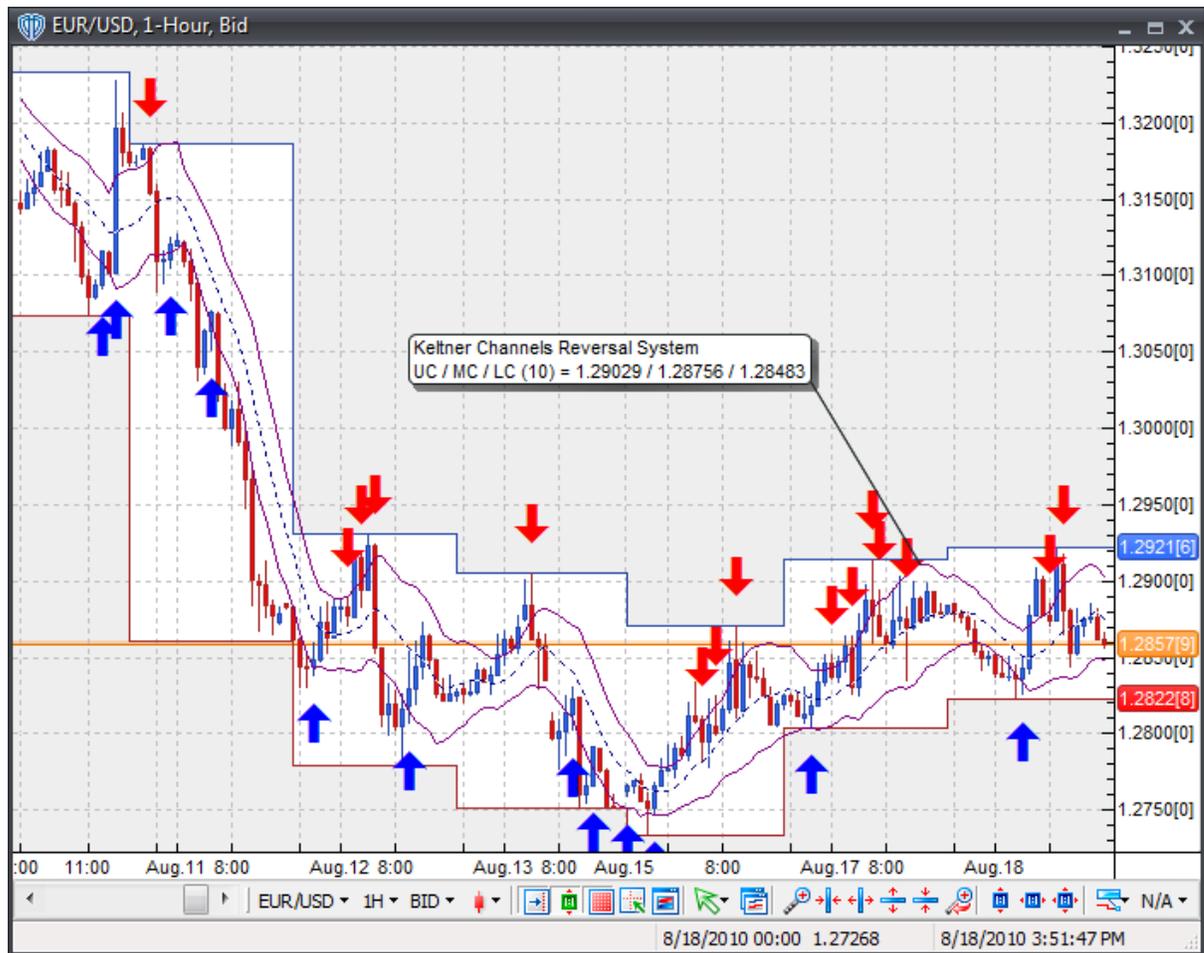
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Keltner Channels Reversal System** consists of the following output variables and display parameters:

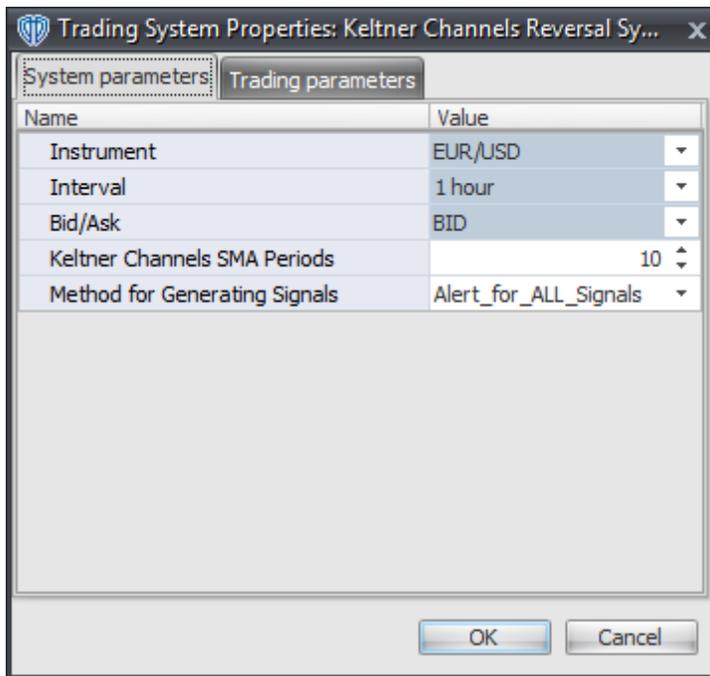
- The upper and lower Keltner Channels display in the Price Frame as thin, solid, purple lines. The middle Keltner Channel displays in the Price Frame as a thin, dashed, dark blue line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Price is potentially reversing from Lower Keltner Channel." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Price is potentially reversing from the Upper Keltner Channel." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Keltner Channels Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Keltner Channels SMA Periods

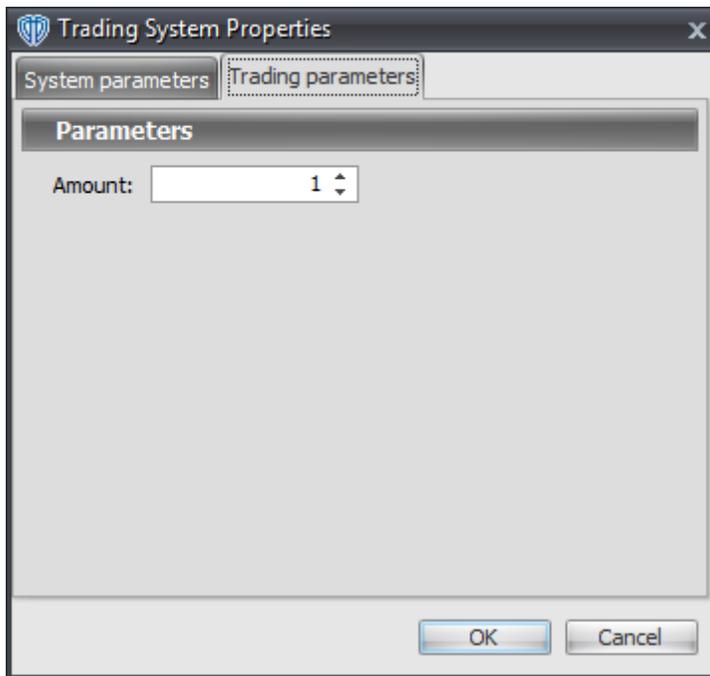
This parameter defines the number of periods used to calculate the Keltner Channels.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.51 Kurtosis Cross System

Overview

The **Kurtosis Cross System** uses the Kurtosis indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Kurtosis indicator crosses above zero.

A *Short* signal is generated when the Kurtosis indicator crosses below zero.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

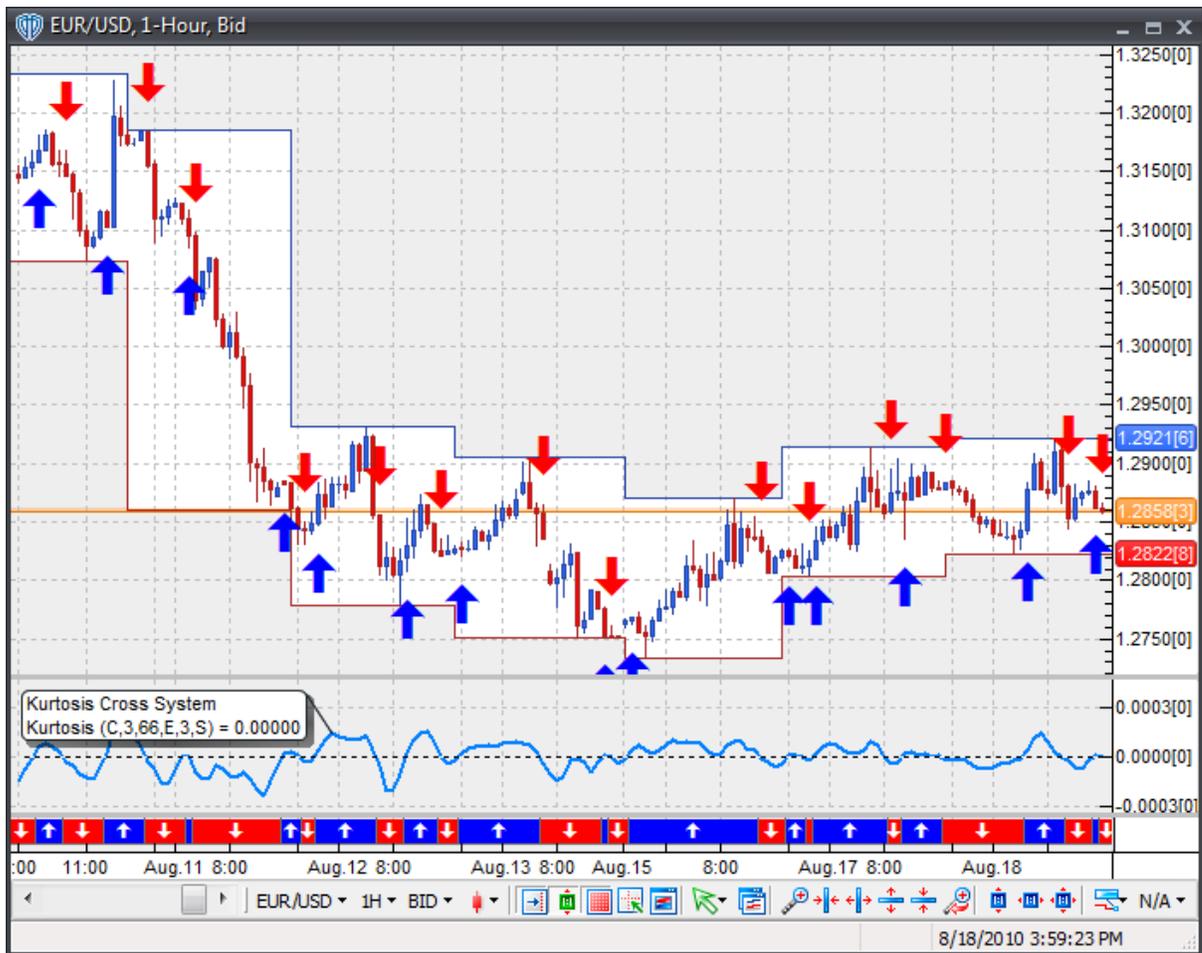
The **Kurtosis Cross System** consists of the following output variables and display parameters:

- The Kurtosis indicator displays in Additional Frame 1 as solid blue line. Its mid-level (0) displays in

the same frame as a dashed black line.

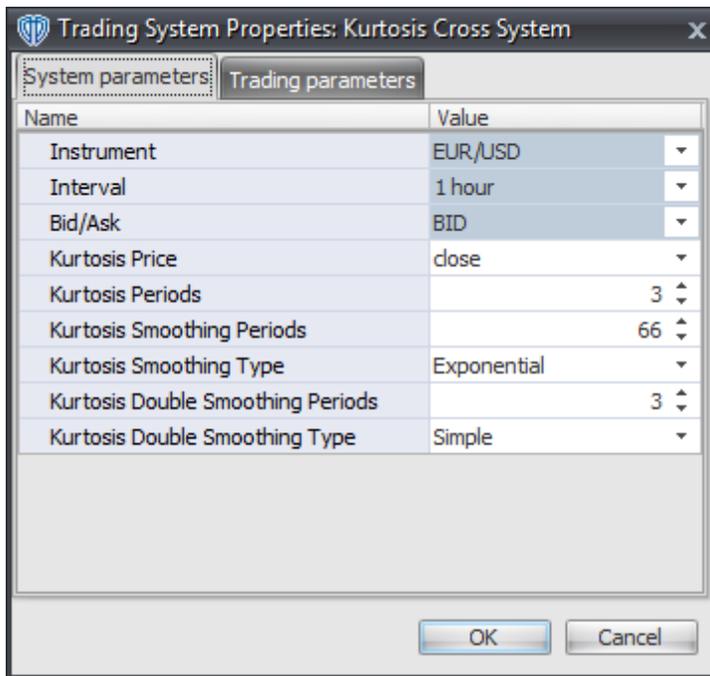
- The Trend Frame displays a white up arrow against a blue background while the Kurtosis indicator is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the Kurtosis indicator is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Kurtosis indicator crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Kurtosis indicator crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Kurtosis Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Kurtosis Price and Kurtosis Periods

These parameters define the price and number of periods used to calculate the momentum and Kurtosis components of the Kurtosis indicator.

Kurtosis Smoothing Periods and Kurtosis Smoothing Type

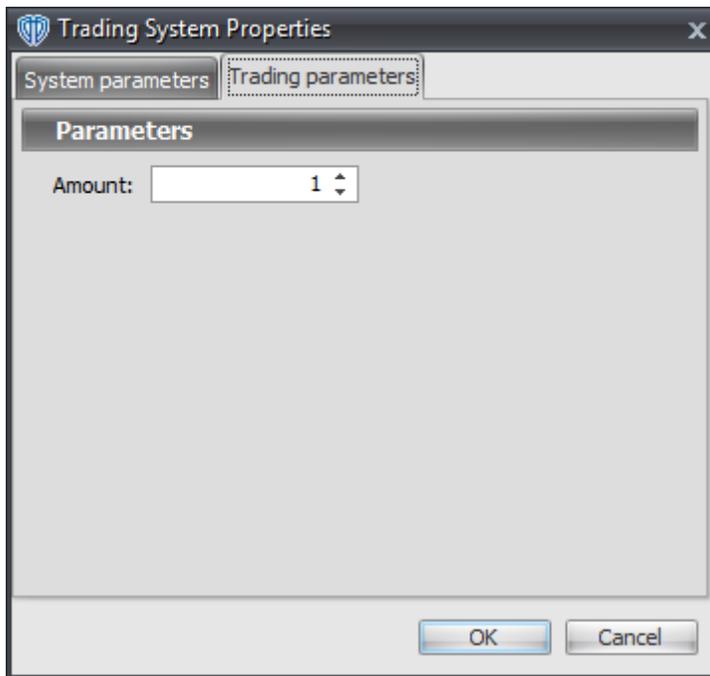
These parameters define the number of periods and type of smoothing used to calculate smoothing component of the Kurtosis indicator.

Kurtosis Double Smoothing Periods and Kurtosis Double Smoothing Type

These parameters define the number of periods and type of smoothing used to calculate the double smoothing component of the Kurtosis indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.52 Linear Regression Cross System

Overview

The **Linear Regression Cross System** uses fast and slow Linear Regression indicators to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast Linear Regression indicator crosses above the Slow Linear Regression indicator.

A *Short* signal is generated when the Fast Linear Regression indicator crosses below the Slow Linear Regression indicator.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

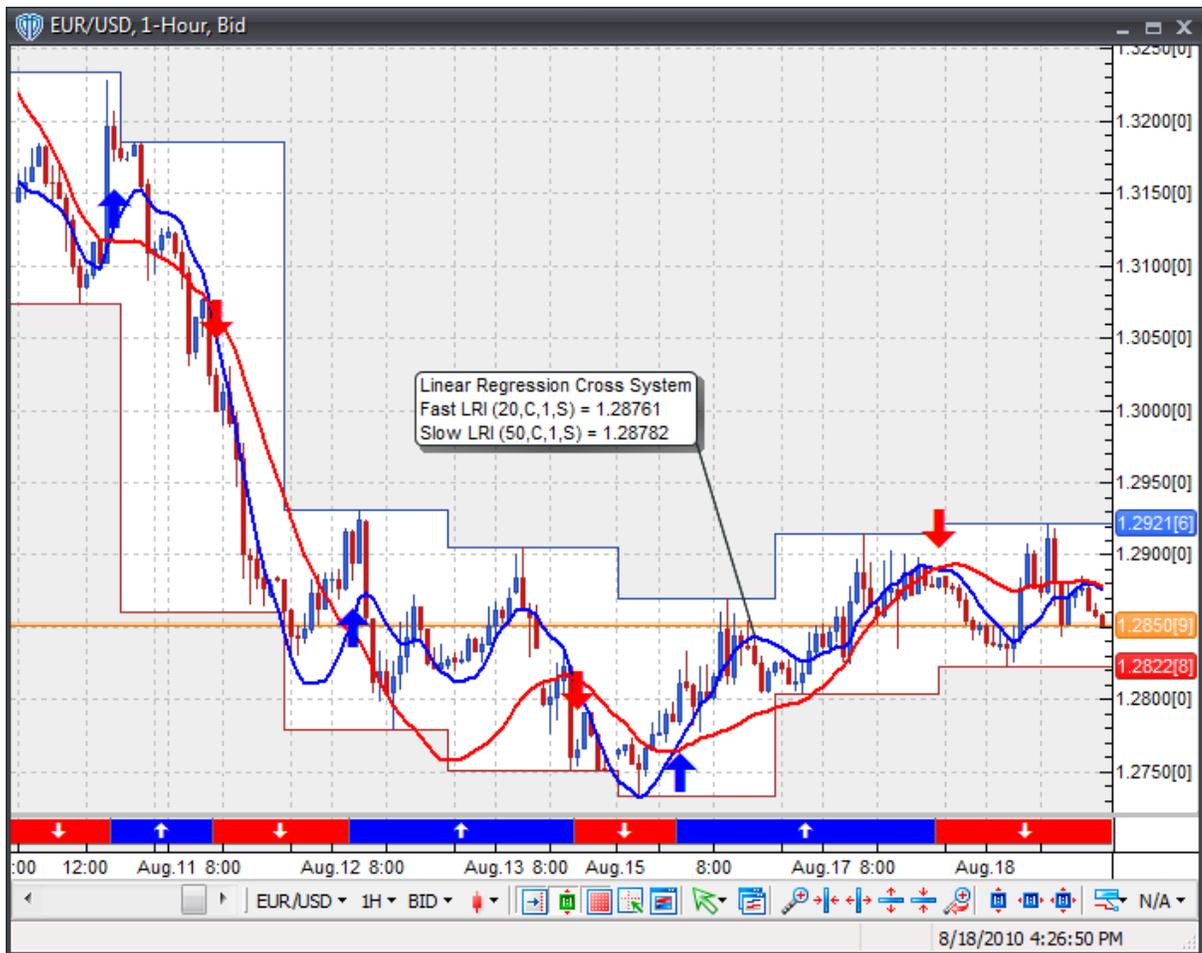
System Outputs and Signals Logic

The **Linear Regression Cross System** consists of the following output variables and display

parameters:

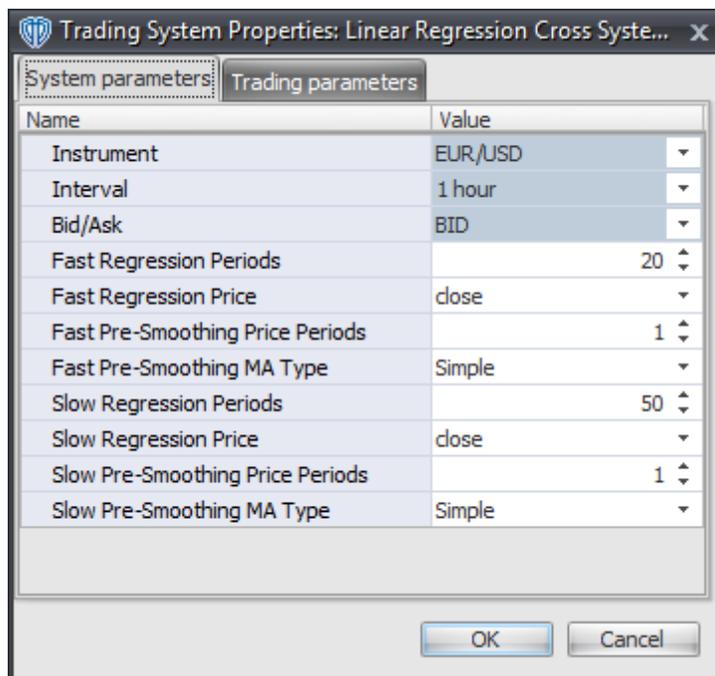
- The Fast Linear Regression indicator displays in the Price Frame as slightly thicker, solid blue line.
- The Slow Linear Regression indicator displays in the Price Frame as a slightly thicker, solid red line.
- The Trend Frame displays a white up arrow against a blue background while the Fast Linear Regression indicator is greater than the Slow Linear Regression indicator.
- The Trend Frame displays a white down arrow against a red background while the Fast Linear Regression indicator is less than the Slow Linear Regression indicator.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast LRI crossed above Slow LRI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast LRI crossed below Slow LRI." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Linear Regression Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast Regression Periods, Fast Regression Price, Fast Pre-Smoothing Price Periods, Fast Pre-Smoothing MA Type

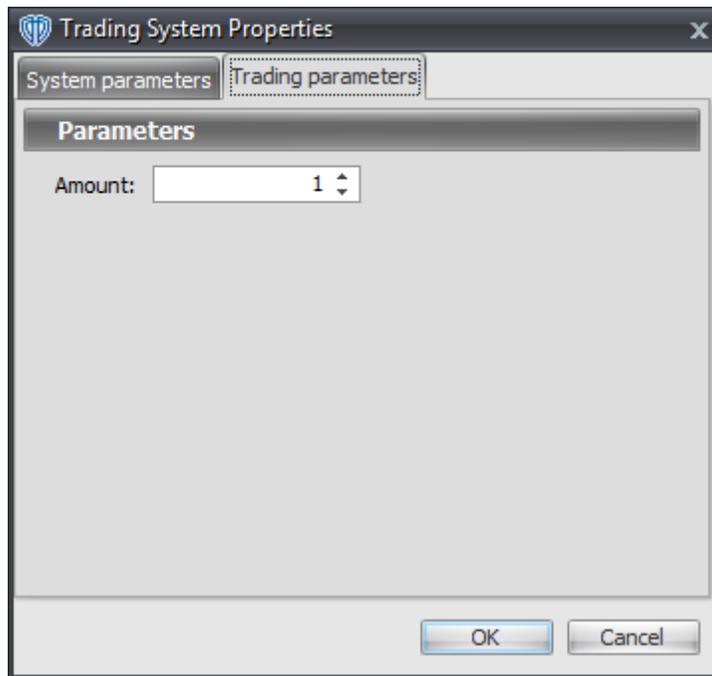
These parameters define the values used to calculate the Fast Linear Regression Indicator.

Slow Regression Periods, Slow Regression Price, Slow Pre-Smoothing Price Periods, Slow Pre-Smoothing MA Type

These parameters define the values used to calculate the Slow Linear Regression Indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.53 Linear Regression Reversal System

Overview

The **Linear Regression Reversal System** uses the Linear Regression Indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Linear Regression Indicator turns upwards (*i.e. the current LRI value is greater than the previous LRI value*).

A *Short* signal is generated when the Linear Regression Indicator turns downwards (*i.e. the current LRI value is less than the previous LRI value*).

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

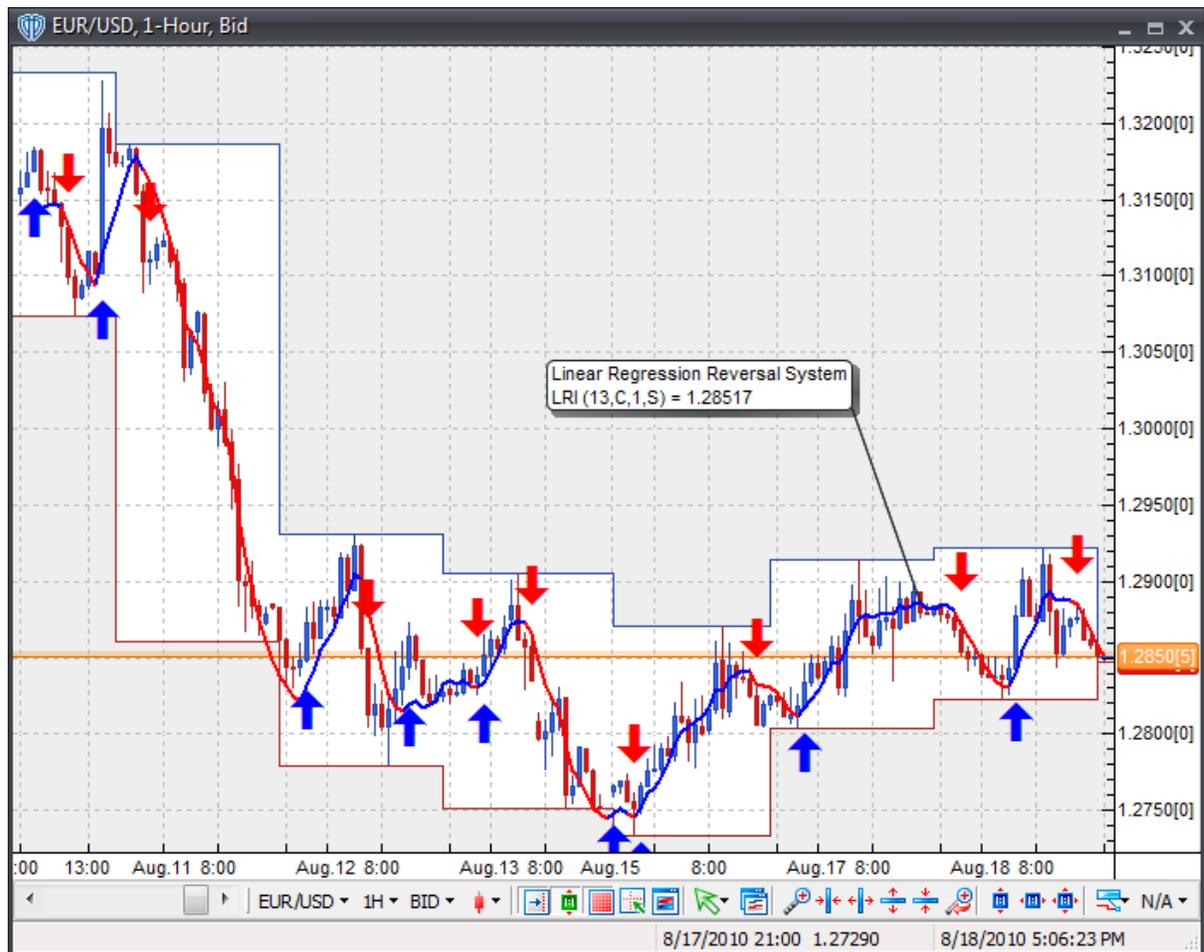
System Outputs and Signals Logic

The **Linear Regression Reversal System** consists of the following output variables and display

parameters:

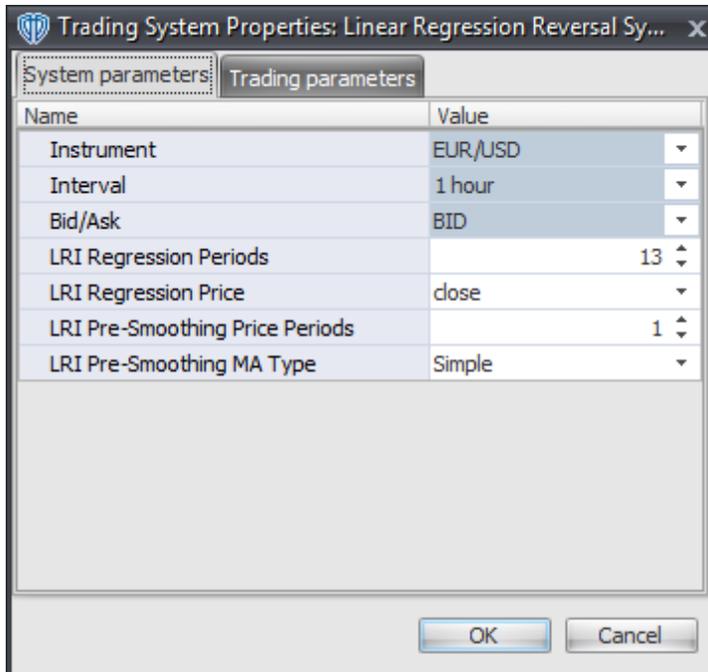
- The Linear Regression Indicator displays in the Price Frame as a slightly thicker, solid, two-color line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The LRI turned blue." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The LRI turned red." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Linear Regression Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

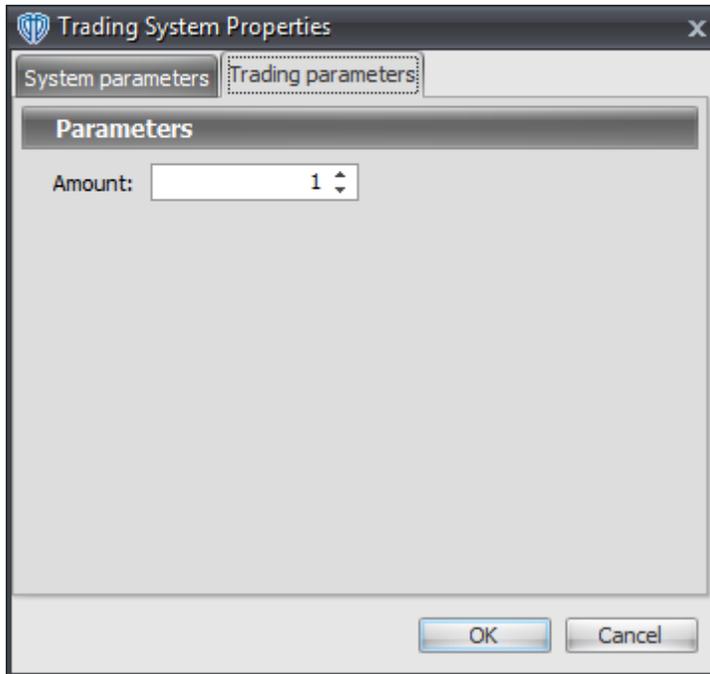
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

LRI Regression Periods, Regression Price, Pre-Smoothing Price Periods, Pre-Smoothing MA Type

These parameters define the values used to calculate the Linear Regression Indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.54 Linear Regression Slope Cross System

Overview

The **Linear Regression Slope Cross System** uses the Linear Regression Slope indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Linear Regression Slope crosses above its Long Entry Level.

A *Short* signal is generated when the Linear Regression Slope crosses below its Short Entry Level.

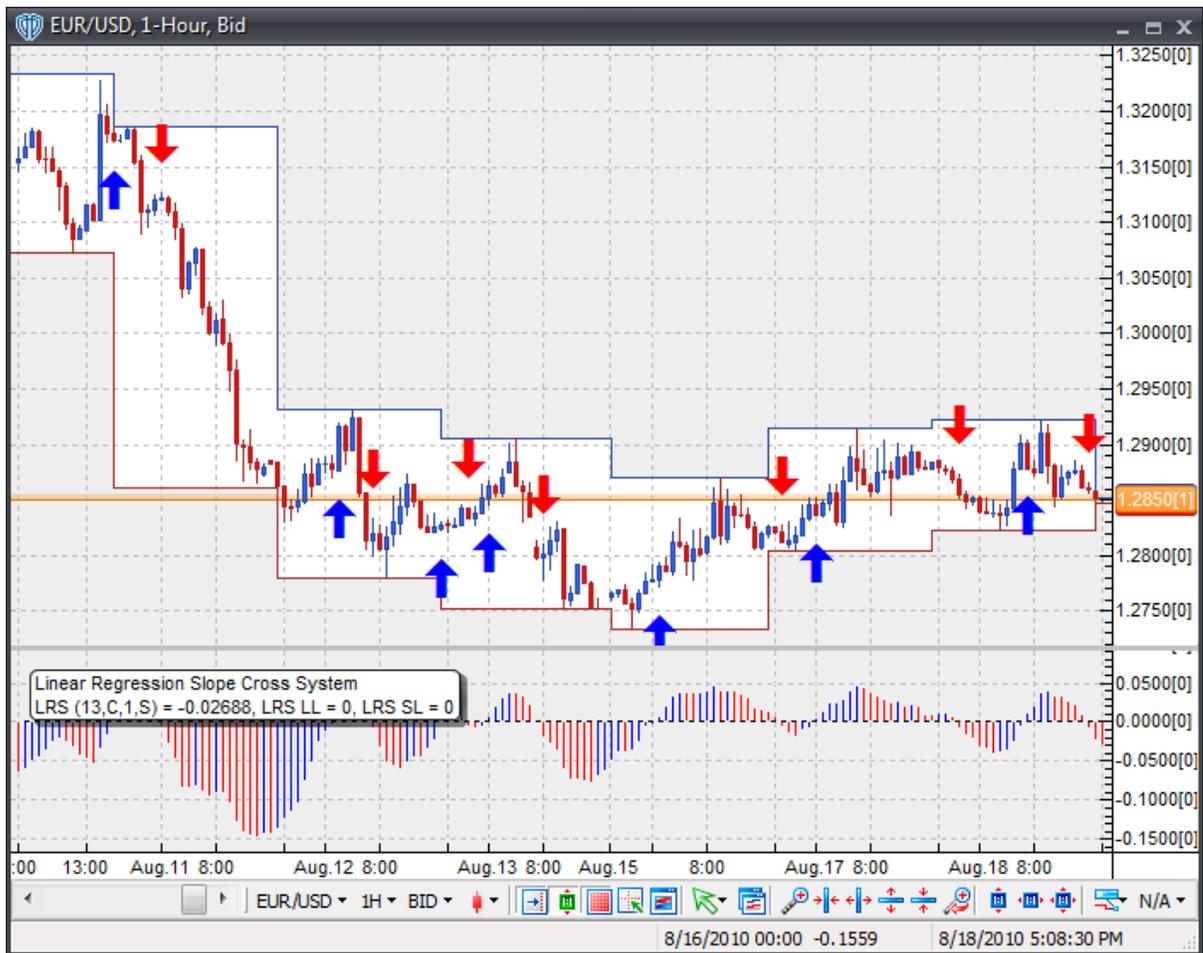
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Linear Regression Slope Cross System** consists of the following output variables and display parameters:

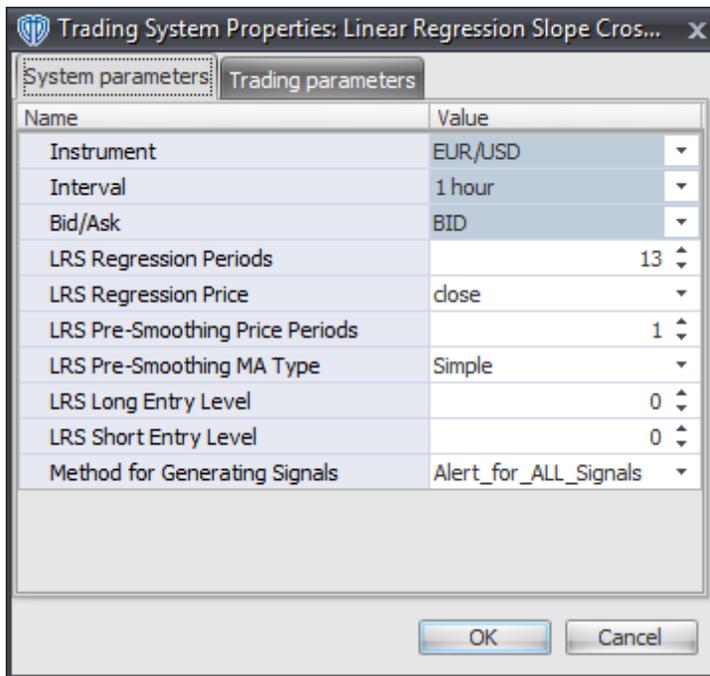
- The Linear Regression Slope indicator displays in Additional Frame 1 as a histogram. The histogram is blue if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- The Linear Regression Slope's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The LRS crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The LRS crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Linear Regression Slope Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

LRS Regression Periods, LRS Regression Price, LRS Pre-Smoothing Price Periods, and LRS Pre-Smoothing MA Type

These parameters define the values used to calculate the Linear Regression Slope indicator.

LRS Long Entry Level

This parameter defines the value used in the Linear Regression Slope-related conditions to generate the *Long* signal.

LRS Short Entry Level

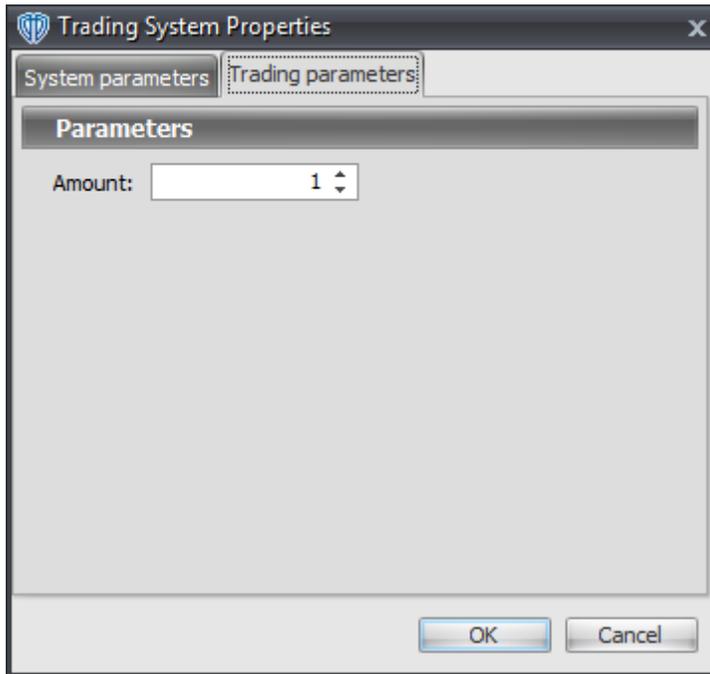
This parameter defines the value used in the Linear Regression Slope-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.55 Linear Regression Slope High / Low Breakout System

Overview

The **Linear Regression Slope High / Low Breakout System** uses the Linear Regression Slope indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Linear Regression Slope crosses above its highest high value of the previous n-bars. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long Entry* signal is generated when the Close price crosses above the High price of the Linear Regression Slope highest high value breakout bar within the following two bars.

A *Short* signal is generated when the Linear Regression Slope crosses below its lowest low value of the previous n-bars. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short Entry* signal is generated when the Close price crosses below the Low price of

the Linear Regression Slope lowest low value breakout bar within the following two bars.

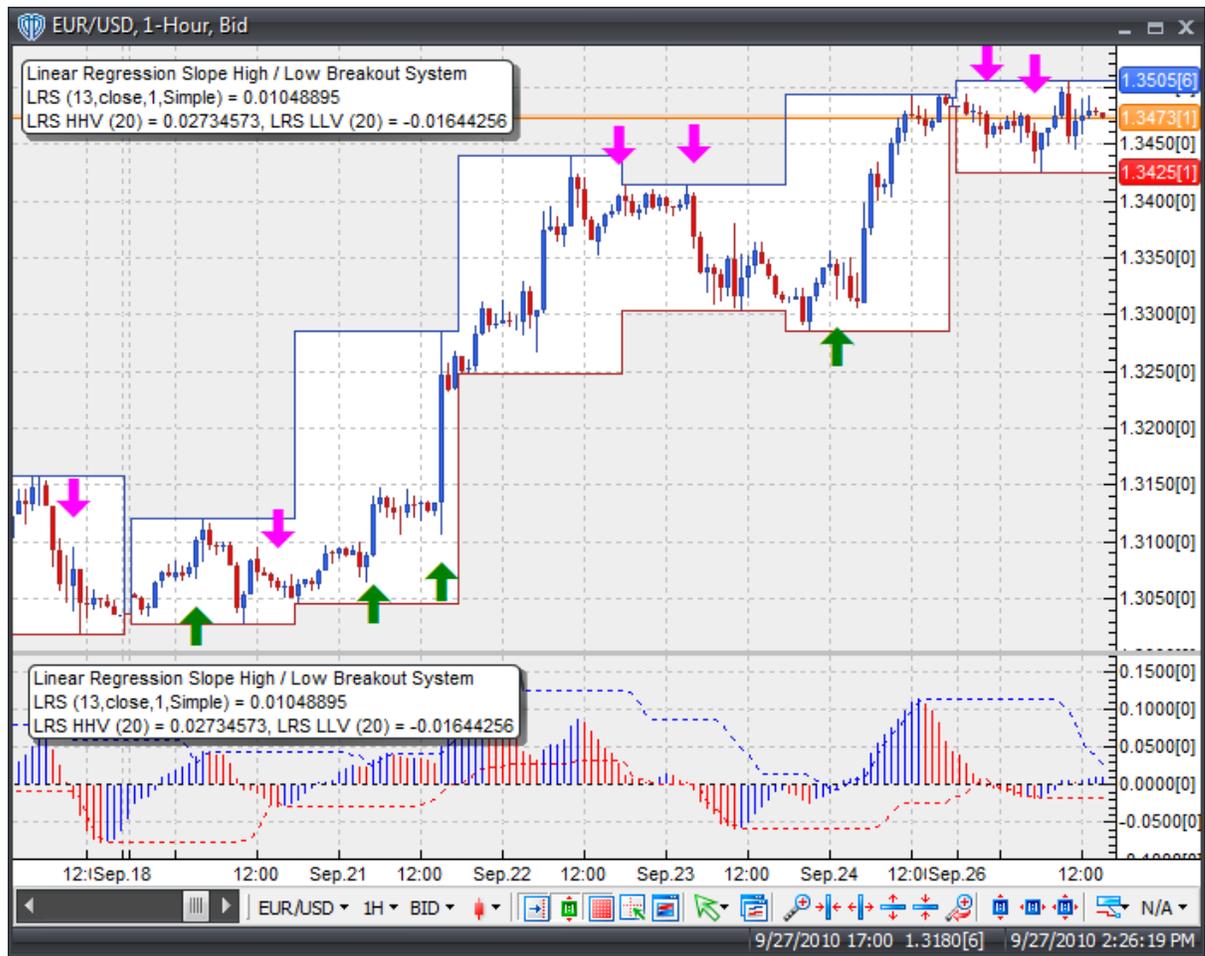
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Linear Regression Slope High / Low Breakout System** consists of the following output variables and display parameters:

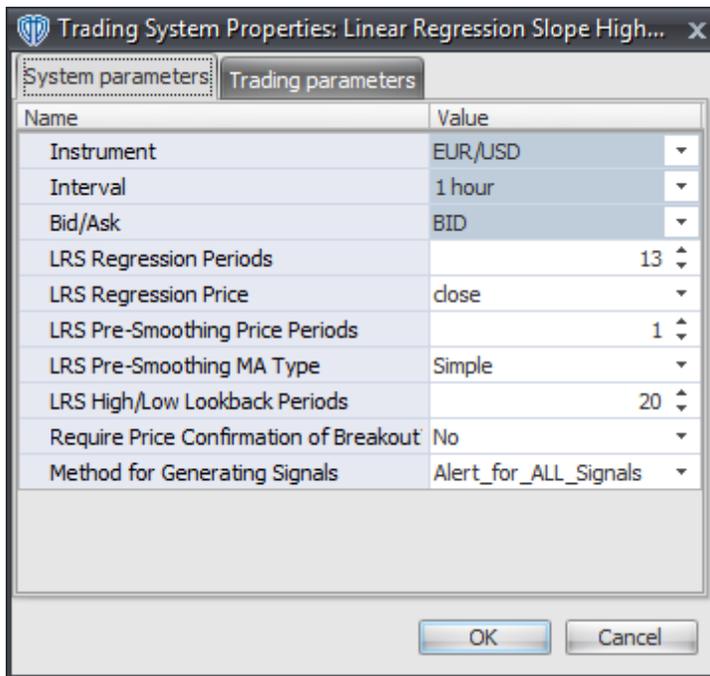
- The Linear Regression Slope indicator displays in Additional Frame 1 as a histogram. The histogram is blue if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- The highest high value of the Linear Regression Slope during the last n-bars displays in Additional Frame 1 as a thin, dashed, blue line.
- The lowest low value of the Linear Regression Slope during the last n-bars displays in Additional Frame 1 as a thin, dashed, red line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the Linear Regression Slope highest high value breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the Linear Regression Slope lowest low value breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! LRS has broken out above its HHV." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! LRS Histogram has broken out below its LLV." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Linear Regression Slope High / Low Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

LRS Regression Periods, LRS Regression Price, LRS Pre-Smoothing Price Periods, and LRS Pre-Smoothing MA Type

These parameters define the values used to calculate the Linear Regression Slope indicator.

LRS High/Low Lookback Periods

This parameter defines the number of previous bars used to calculate the highest high value and lowest low value of the Linear Regression Slope.

Require Price Confirmation of Breakout?

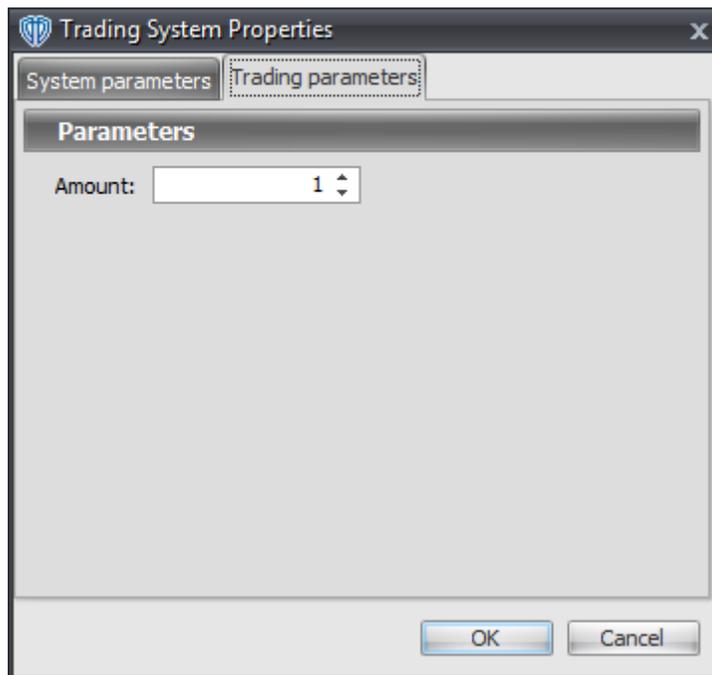
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.56 Linear Regression Slope Tops / Bottoms Reversal System

Overview

The **Linear Regression Slope Tops / Bottoms Reversal System** uses the Linear Regression Slope indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Linear Regression Slope forms a 5-bar Trough Fractal formation (*i.e. a lowest low value with 2 subsequent lower low values on each side of it*). This formation can form while the Linear Regression Slope is above or below zero. If it forms while below zero, it may be considered a potential reversal signal; if forms while above zero it may be considered a potential continuation signal.

A *Short* signal is generated when the Linear Regression Slope forms a 5-bar Peak Fractal formation (*i.e. a highest high value with 2 subsequent lower high values on each side of it*). This formation can form

while the Linear Regression Slope is above or below zero. If it forms while above zero, it may be considered a potential reversal signal; if it forms while below zero it may be considered a potential continuation signal.

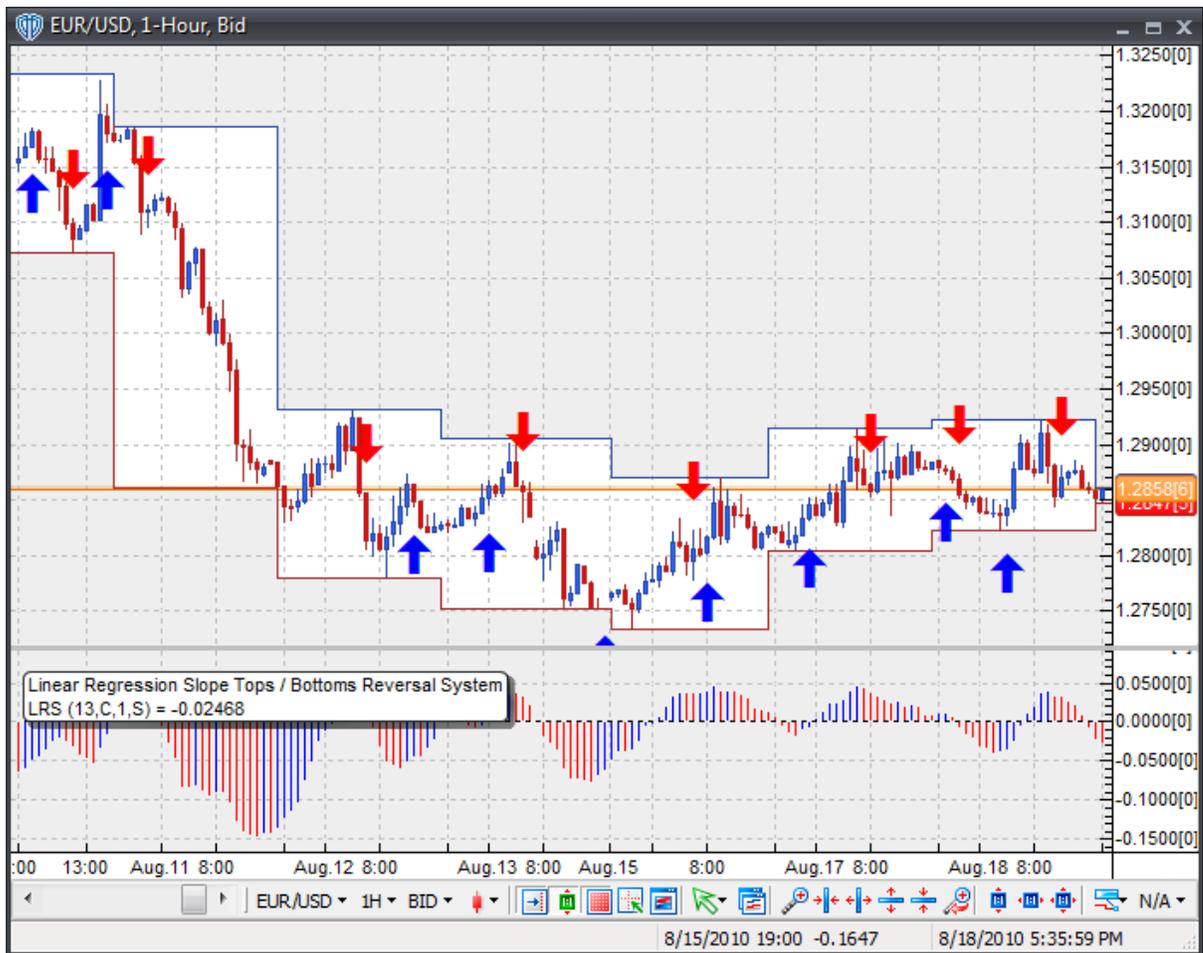
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Linear Regression Slope Tops / Bottoms Reversal System** consists of the following output variables and display parameters:

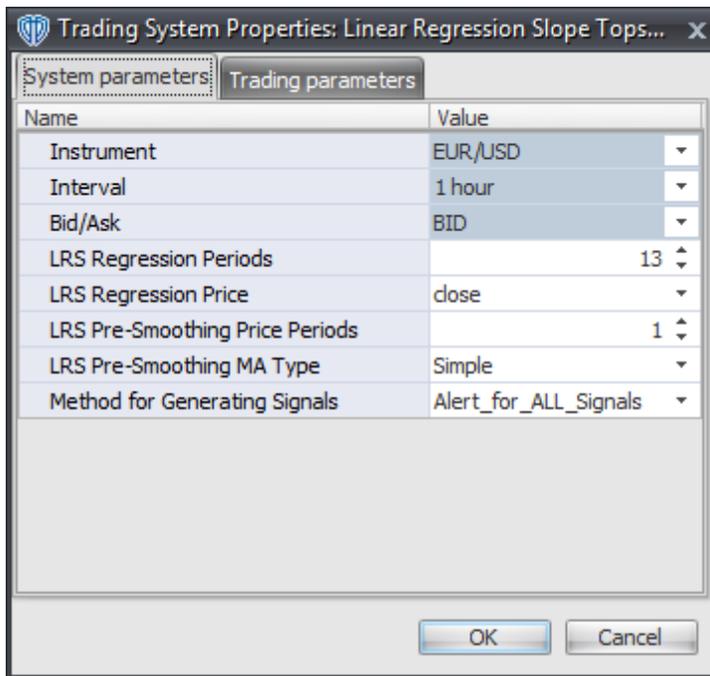
- The Linear Regression Slope indicator displays in Additional Frame 1 as a histogram. The histogram is blue if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! LRS completed a trough fractal formation." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! LRS Histogram completed a peak fractal formation." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Linear Regression Slope Tops / Bottoms Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

LRS Regression Periods, LRS Regression Price, LRS Pre-Smoothing Price Periods, and LRS Pre-Smoothing MA Type

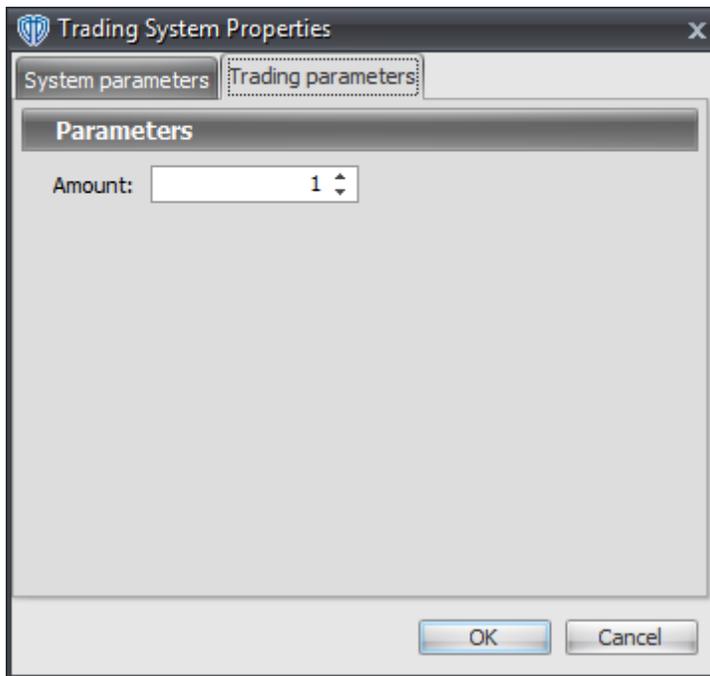
These parameters define the values used to calculate the Linear Regression Slope indicator.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.57 MACD Fast Line / Signal Line Cross System

Overview

The **MACD Fast Line / Signal Line Cross System** uses the Moving Average Convergence Divergence (MACD) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the MACD's Fast Line crosses above the MACD's Signal Line.

A *Short* signal is generated when the MACD's Fast Line crosses below the MACD's Signal Line.

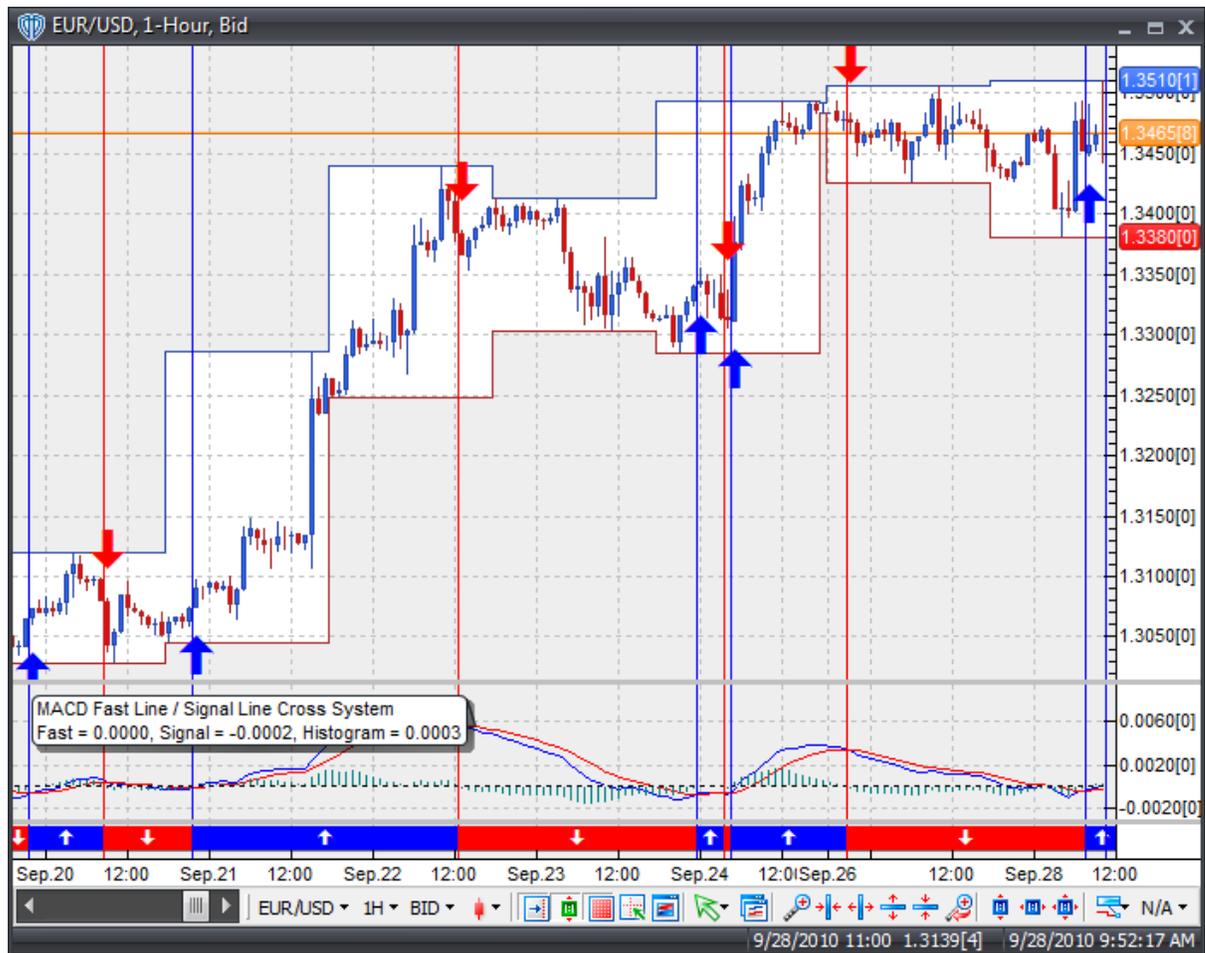
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **MACD Fast Line / Signal Line Cross System** consists of the following output variables and display parameters:

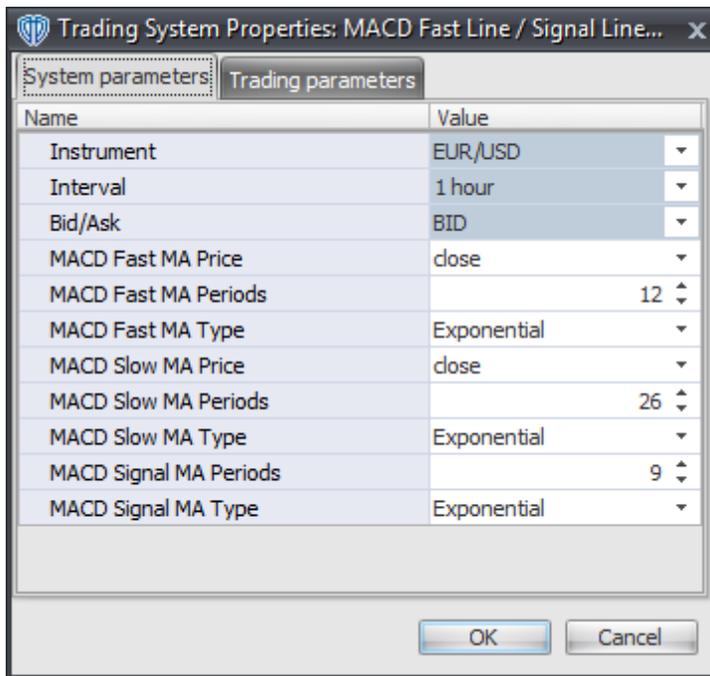
- The MACD Fast Line displays in Additional Frame 1 as a thin, solid, blue line.
- The MACD Signal Line displays in Additional Frame 1 as a thin, solid, red line.
- The MACD Histogram displays in Additional Frame 1 as a green histogram. Its mid-level (0) displays in the same frame as a black dashed line.
- The Trend Frame displays a white up arrow against a blue background along with beginning/ending vertical blue lines while the MACD's Fast Line is greater than the MACD's Signal Line.
- The Trend Frame displays a white up arrow against a red background along with beginning/ending vertical red lines while the MACD's Fast Line is less than the MACD's Signal Line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! MACD Fast Line crossed above MACD Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! MACD Fast Line crossed below MACD Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **MACD Fast Line / Signal Line Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MACD Fast MA Price, MACD Fast MA Periods, and MACD Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Fast Line of the MACD indicator.

MACD Slow MA Price, MACD Slow MA Periods, and MACD Slow MA Type

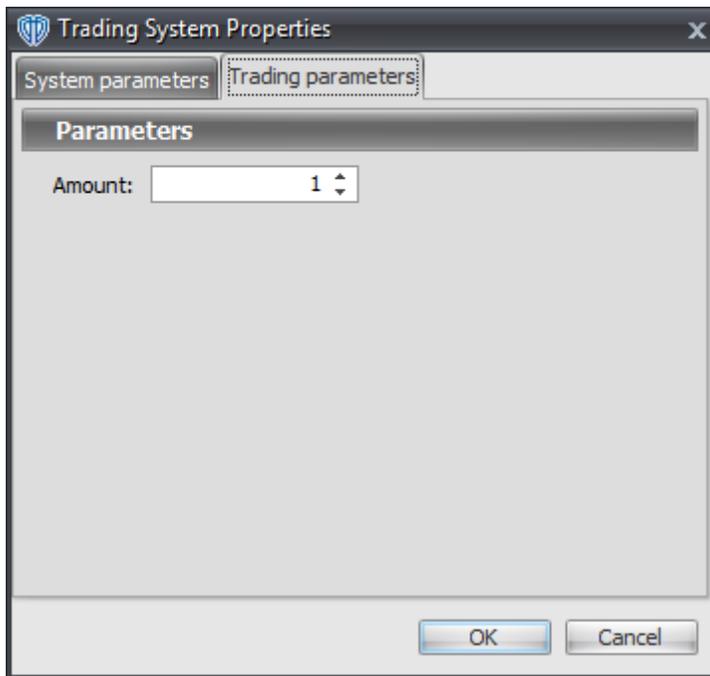
These parameters define price, number of periods, and type of the slow moving average used to calculate the Fast Line of the MACD indicator.

MACD Signal MA Periods and MACD Signal MA Type

These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the MACD indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.58 MACD Fast Line / Zero Cross System

Overview

The **MACD Fast Line / Zero Cross System** uses the Moving Average Convergence Divergence (MACD) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the MACD's Fast Line crosses above zero.

A *Short* signal is generated when the MACD's Fast Line crosses below zero.

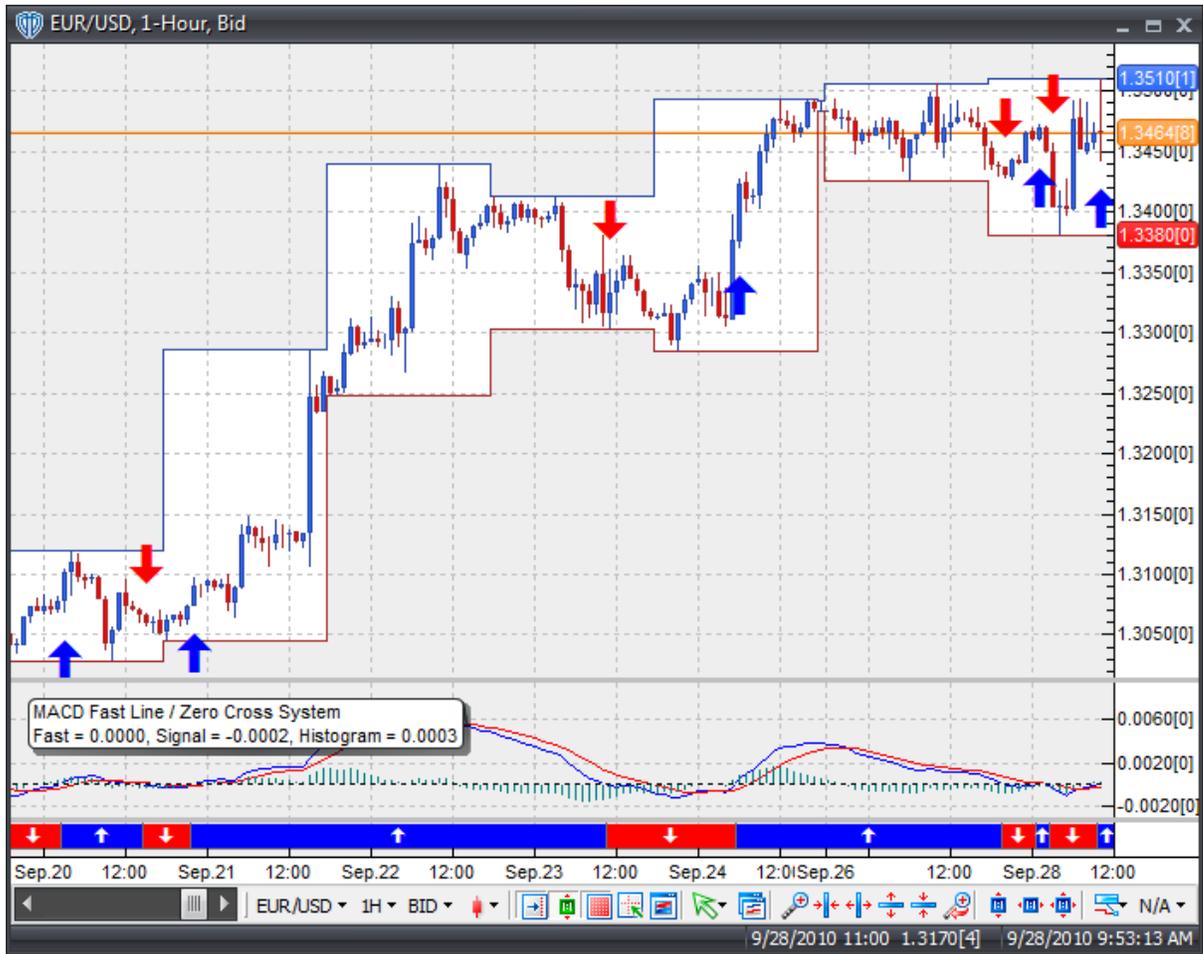
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **MACD Fast Line / Zero Cross System** consists of the following output variables and display parameters:

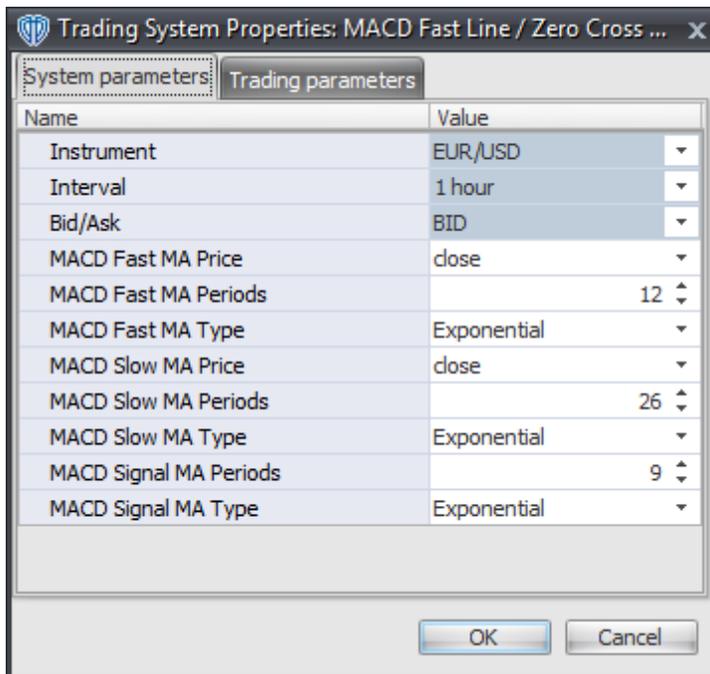
- The MACD Fast Line displays in Additional Frame 1 as a thin, solid, blue line.
- The MACD Signal Line displays in Additional Frame 1 as a thin, solid, red line.
- The MACD Histogram displays in Additional Frame 1 as a green histogram. Its mid-level (0) displays in the same frame as a black dashed line.
- The Trend Frame displays a white up arrow against a blue background while the MACD's Fast Line is greater than zero.
- The Trend Frame displays a white up arrow against a red background while the MACD's Fast Line is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! MACD Fast Line crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! MACD Fast Line crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **MACD Fast Line / Zero Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MACD Fast MA Price, MACD Fast MA Periods, and MACD Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Fast Line of the MACD indicator.

MACD Slow MA Price, MACD Slow MA Periods, and MACD Slow MA Type

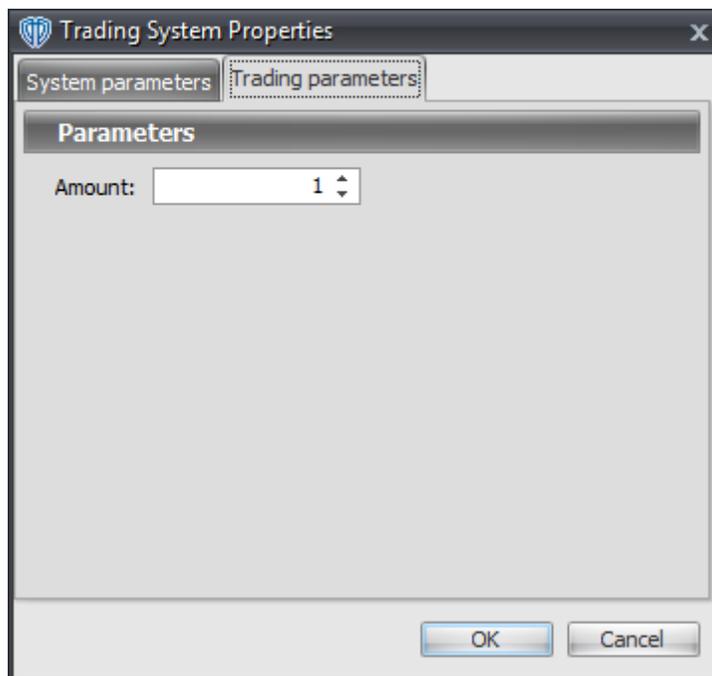
These parameters define price, number of periods, and type of the slow moving average used to calculate the Fast Line of the MACD indicator.

MACD Signal MA Periods and MACD Signal MA Type

These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the MACD indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.59 MACD Histogram High / Low Breakout System

Overview

The **MACD Histogram High / Low Breakout System** uses the Moving Average Convergence Divergence (MACD) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the MACD Histogram crosses above its highest high value of the previous *n*-bars. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long Entry* signal is generated when the Close price crosses above the High price of the MACD Histogram highest high value breakout bar within the following two bars.

A *Short* signal is generated when the MACD Histogram crosses below its lowest low value of the previous *n*-bars. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short Entry* signal is generated when the Close price crosses below the Low price of the MACD Histogram lowest low value breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy, CloseBuy, OpenSell, and CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input

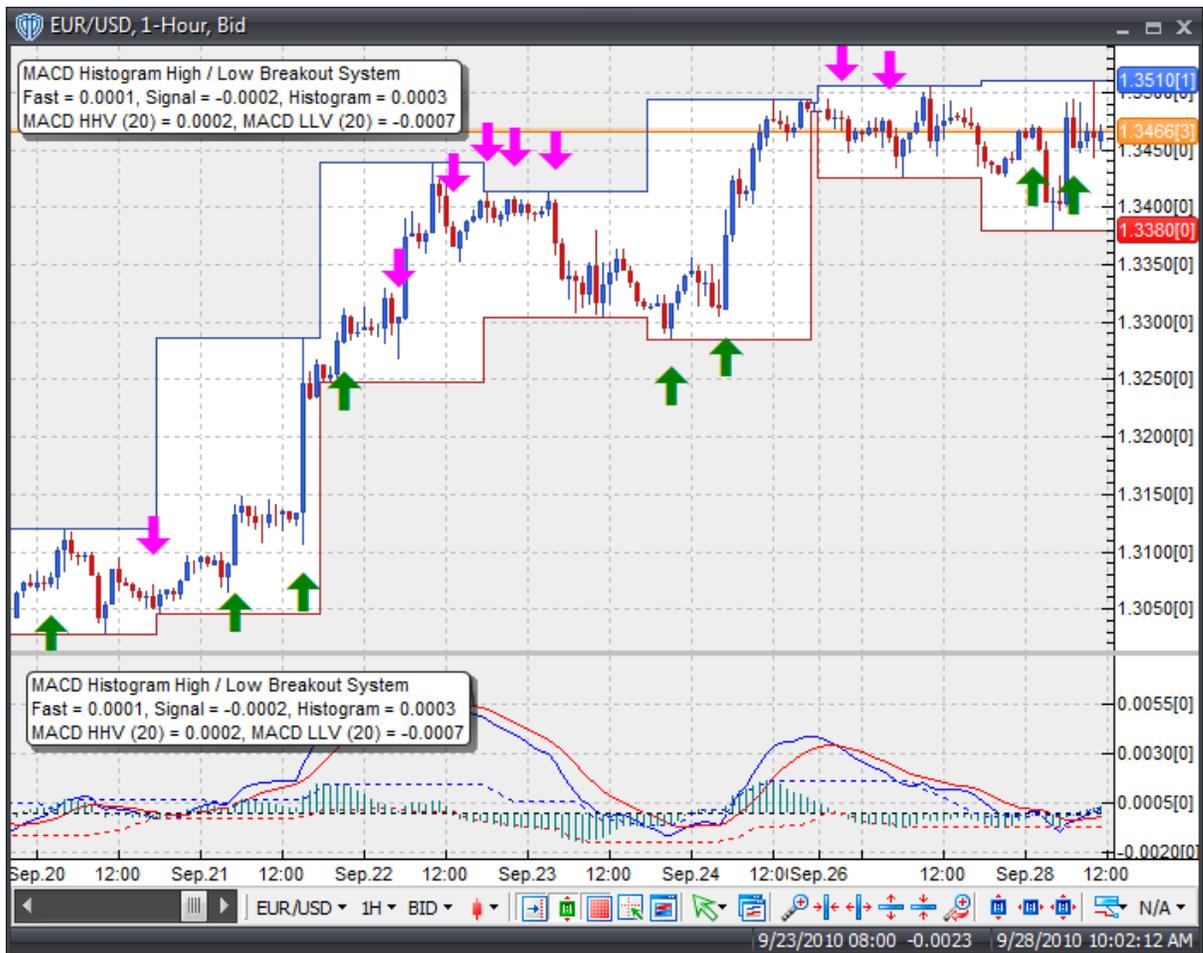
selection is chosen.

System Outputs and Signals Logic

The **MACD Histogram High / Low Breakout System** consists of the following output variables and display parameters:

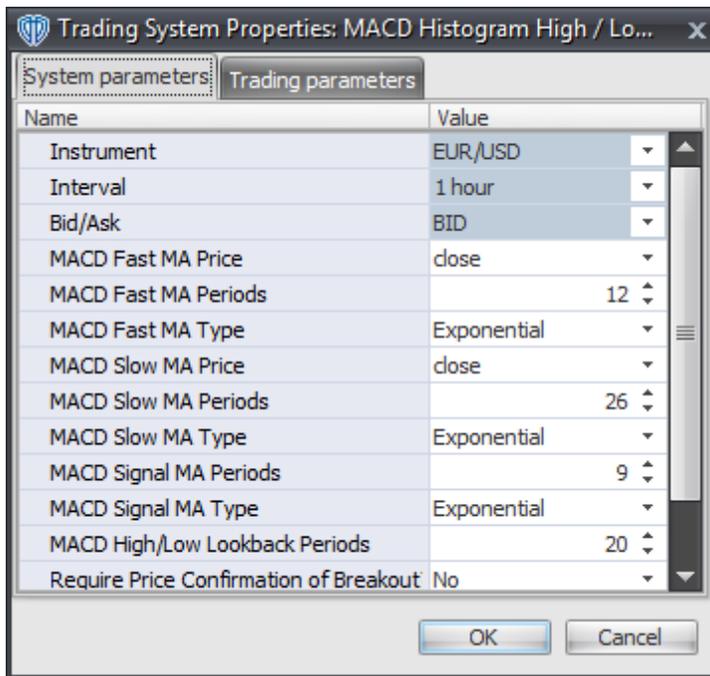
- The MACD Fast Line displays in Additional Frame 1 as a thin, solid, blue line.
- The MACD Signal Line displays in Additional Frame 1 as a thin, solid, red line.
- The MACD Histogram displays in Additional Frame 1 as a green histogram. Its mid-level (0) displays in the same frame as a black dashed line.
- The highest high value of the MACD Histogram during the last n-bars displays in Additional Frame 1 as a thin, dashed, blue line.
- The lowest low value of the MACD Histogram during the last n-bars displays in Additional Frame 1 as a thin, dashed, red line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the MACD Histogram highest high value breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the MACD Histogram lowest low value breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! MACD Histogram has broken out above its HHV." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! MACD Histogram has broken out below its LLV." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **MACD Histogram High / Low Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MACD Fast MA Price, MACD Fast MA Periods, and MACD Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Fast Line of the MACD indicator.

MACD Slow MA Price, MACD Slow MA Periods, and MACD Slow MA Type

These parameters define price, number of periods, and type of the slow moving average used to calculate the Fast Line of the MACD indicator.

MACD Signal MA Periods and MACD Signal MA Type

These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the MACD indicator.

MACD High/Low Lookback Periods

This parameter defines the number of previous bars used to calculate the highest high value and lowest low value of the MACD Histogram.

Require Price Confirmation of Breakout?

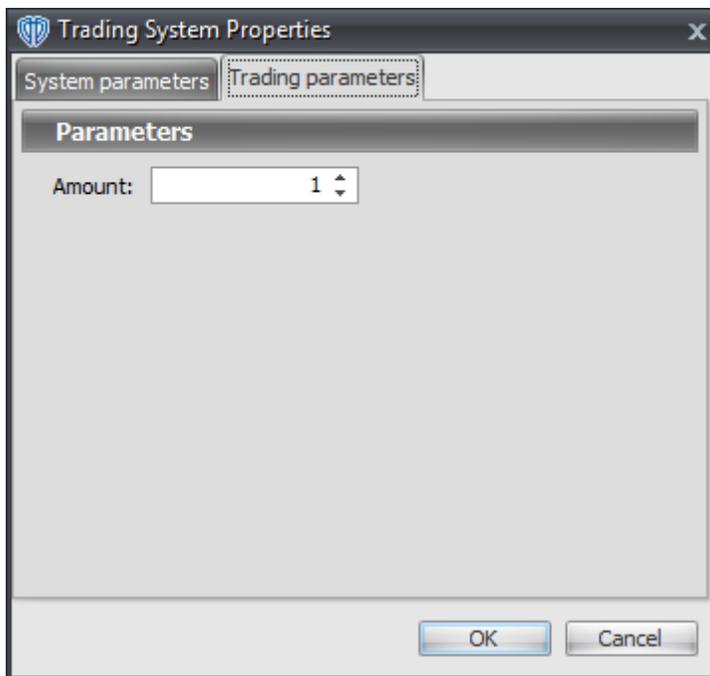
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.60 MACD Histogram Tops / Bottoms Reversal System

Overview

The **MACD Histogram Tops / Bottoms Reversal System** uses the Moving Average Convergence Divergence (MACD) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the MACD Histogram forms a 5-bar Trough Fractal formation (*i.e. a lowest low value with 2 subsequent lower low values on each side of it*). This formation can form while the MACD Histogram is above or below zero. If it forms while below zero, it may be considered a potential reversal signal; if forms while above zero it may be considered a potential continuation signal.

A *Short* signal is generated when the MACD Histogram forms a 5-bar Peak Fractal formation (*i.e. a highest high value with 2 subsequent lower high values on each side of it*). This formation can form while the MACD Histogram is above or below zero. If it forms while above zero, it may be considered a potential reversal signal; if it forms while below zero it may be considered a potential continuation signal.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **MACD Histogram Tops / Bottoms Reversal System** consists of the following output variables and display parameters:

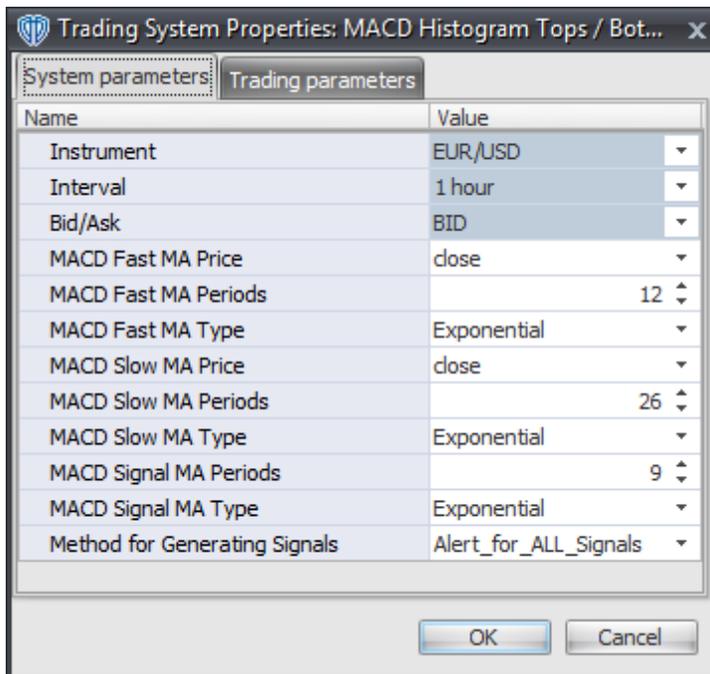
- The MACD Fast Line displays in Additional Frame 1 as a thin, solid, blue line.
- The MACD Signal Line displays in Additional Frame 1 as a thin, solid, red line.
- The MACD Histogram displays in Additional Frame 1 as a histogram. The histogram is blue if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! MACD Histogram completed a trough fractal formation." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! MACD Histogram completed a peak fractal formation." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **MACD Histogram Tops / Bottoms Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MACD Fast MA Price, MACD Fast MA Periods, and MACD Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Fast Line of the MACD indicator.

MACD Slow MA Price, MACD Slow MA Periods, and MACD Slow MA Type

These parameters define price, number of periods, and type of the slow moving average used to calculate the Fast Line of the MACD indicator.

MACD Signal MA Periods and MACD Signal MA Type

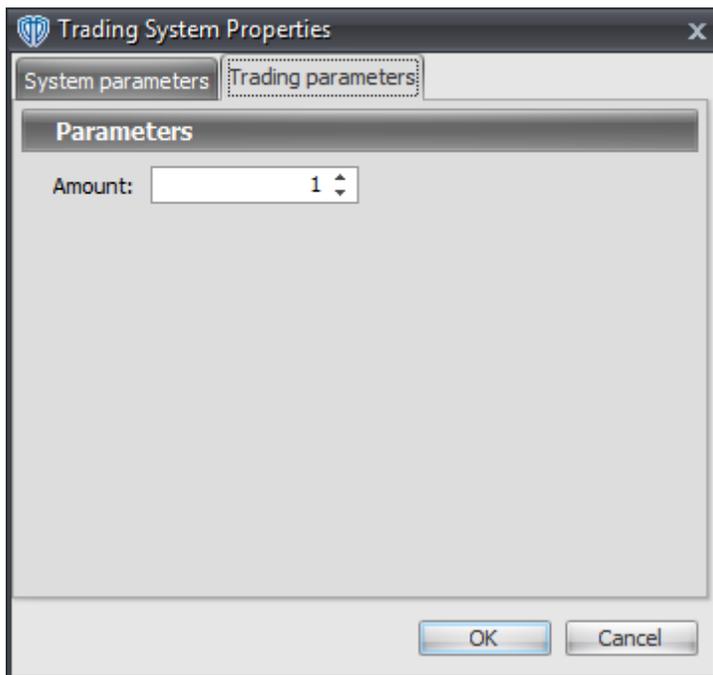
These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the MACD indicator.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.61 McClellan Oscillator Cross System

Overview

The **McClellan Oscillator Cross System** uses the McClellan Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the McClellan Oscillator crosses above zero.

A *Short* signal is generated when the McClellan Oscillator crosses below zero.

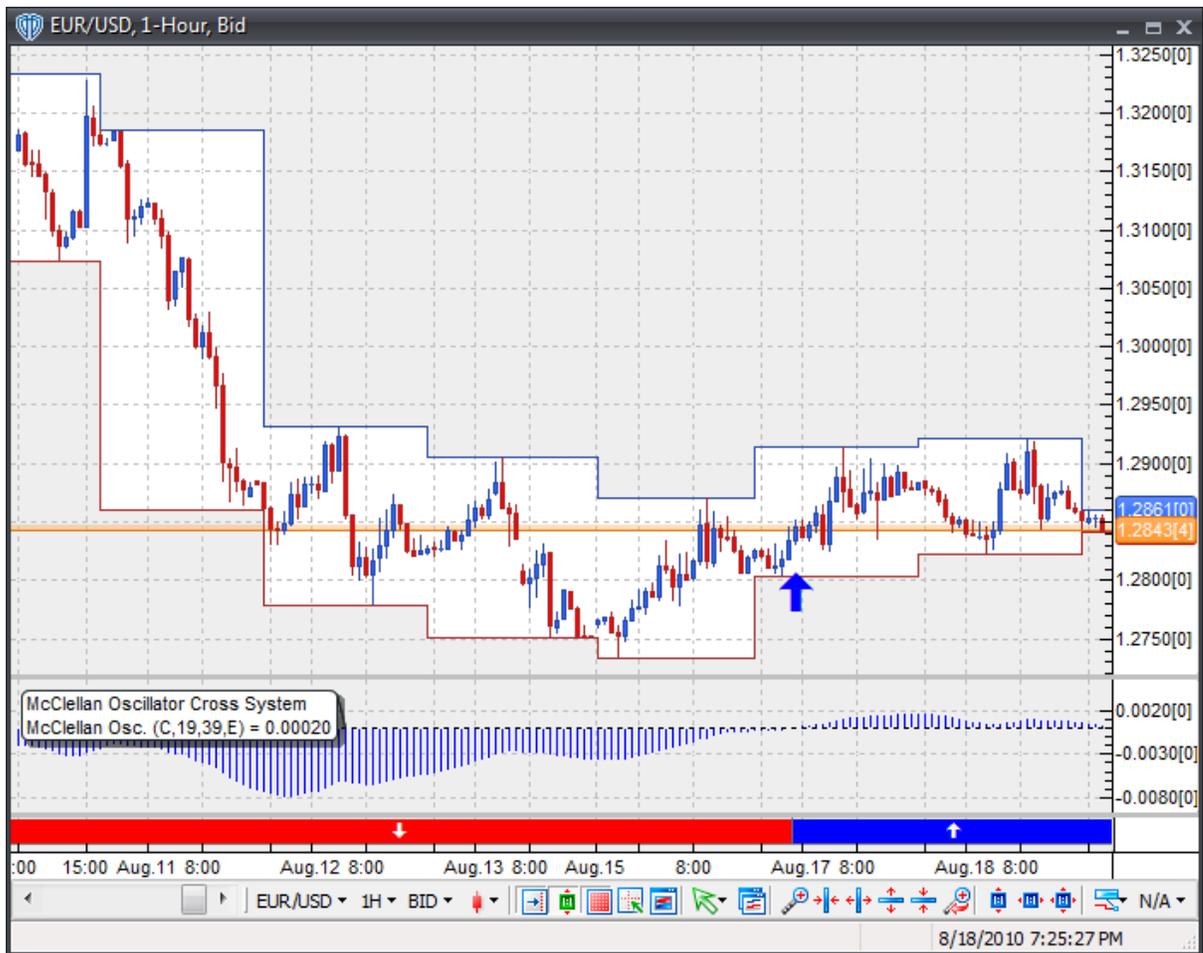
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **McClellan Oscillator Cross System** consists of the following output variables and display parameters:

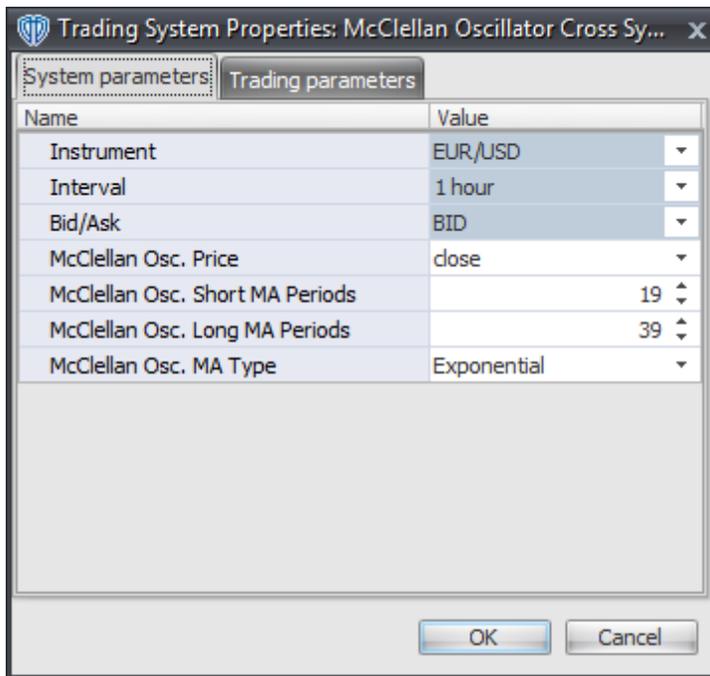
- The McClellan Oscillator displays in Additional Frame 1 as blue histogram. Its mid-level (0) displays in the same frame as a dashed black line.
- The Trend Frame displays a white up arrow against a blue background while the McClellan Oscillator is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the McClellan Oscillator is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The McClellan Oscillator crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The McClellan Oscillator crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **McClellan Oscillator Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

McClellan Osc. Price

This parameter defines the price used to calculate the McClellan Oscillator.

McClellan Osc. Short MA Periods

This parameter defines the number of periods used to calculate the short moving average component of the McClellan Oscillator.

McClellan Osc. Long MA Periods

This parameter defines the price used to calculate the long moving average component of the McClellan Oscillator.

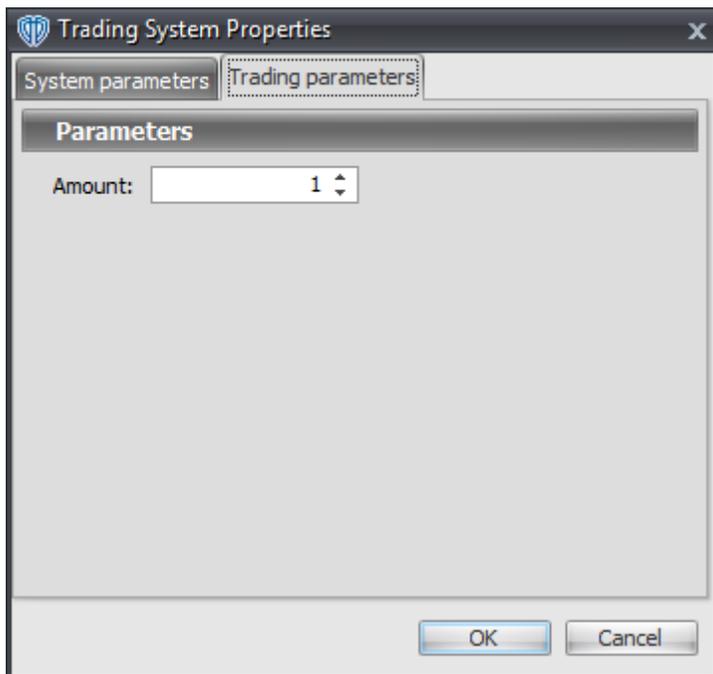
McClellan Osc. MA Type

This parameter defines the type of moving averages used to calculate the McClellan Oscillator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the

Amount (in Lots) that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.62 McClellan Summation Index Cross System

Overview

The **McClellan Summation Index Cross System** uses the McClellan Summation Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the McClellan Summation Index crosses above zero.

A *Short* signal is generated when the McClellan Summation Index crosses below zero.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

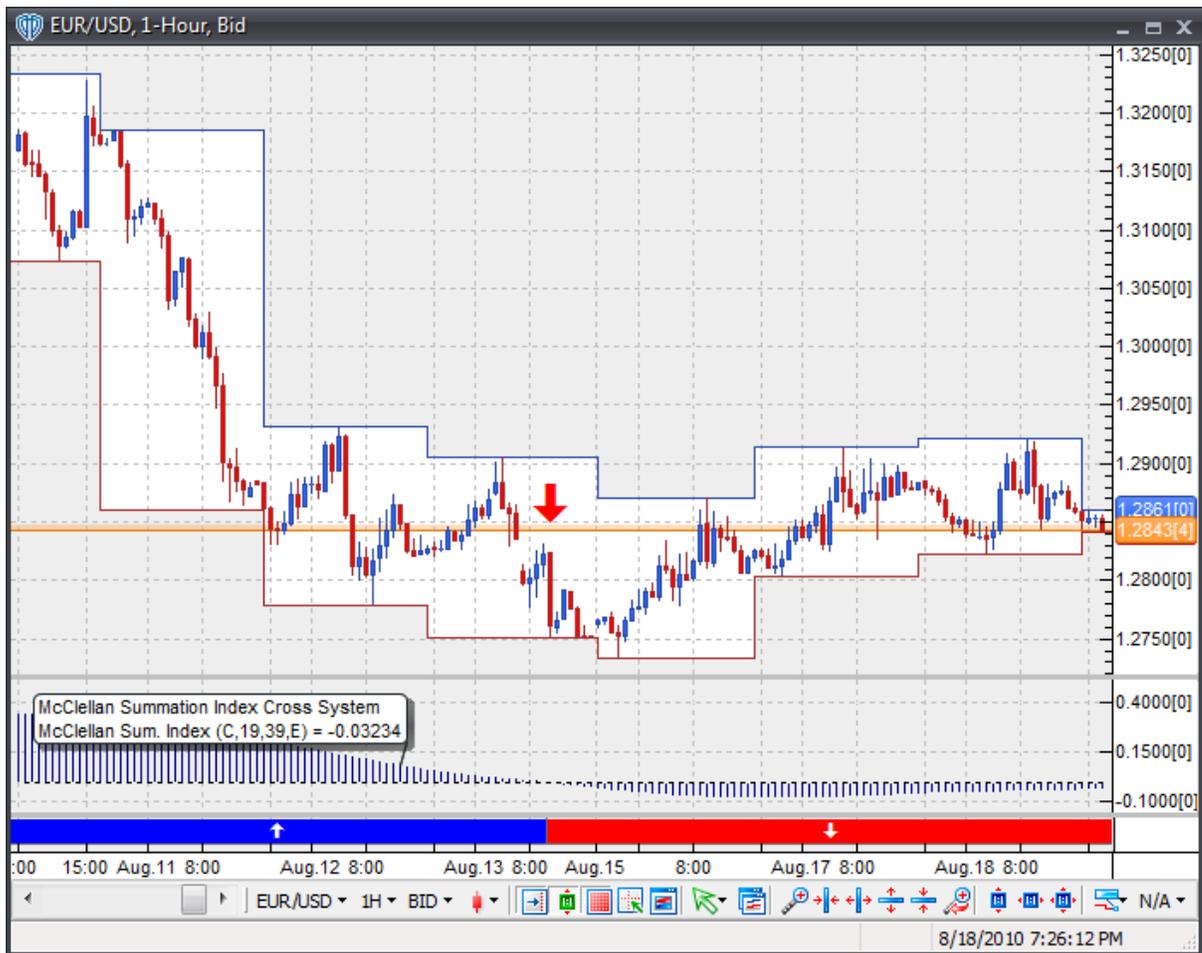
System Outputs and Signals Logic

The **McClellan Summation Index Cross System** consists of the following output variables and display

parameters:

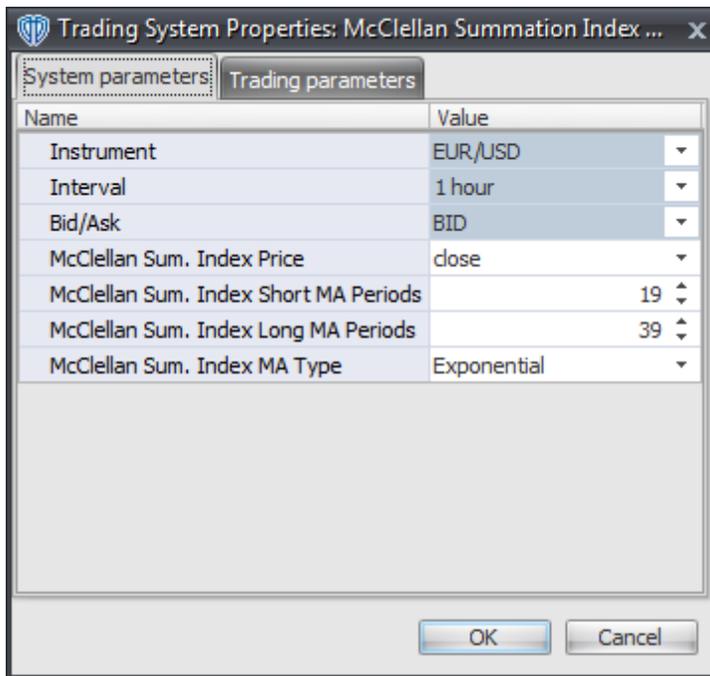
- The McClellan Summation Index displays in Additional Frame 1 as blue histogram. Its mid-level (0) displays in the same frame as a dashed black line.
- The Trend Frame displays a white up arrow against a blue background while the McClellan Summation Index is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the McClellan Summation Index is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The McClellan Summation Index crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The McClellan Summation Index crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **McClellan Summation Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

McClellan Sum. Index Price

This parameter defines the price used to calculate the McClellan Summation Index.

McClellan Sum. Index Short MA Periods

This parameter defines the number of periods used to calculate the short moving average component of the McClellan Summation Index.

McClellan Sum. Index Long MA Periods

This parameter defines the price used to calculate the long moving average component of the McClellan Summation Index.

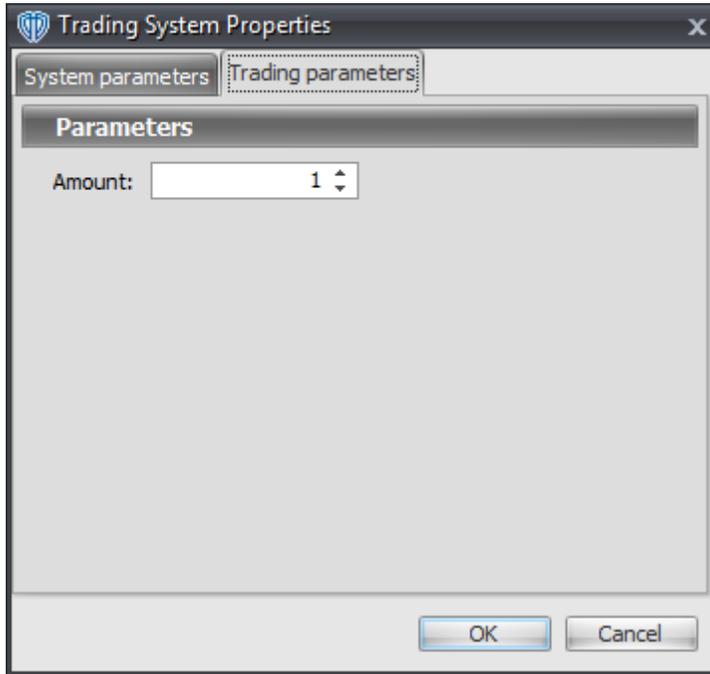
McClellan Sum. Index MA Type

This parameter defines the type of moving averages used to calculate the McClellan Summation Index.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading

Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.63 McGinley Dynamic Cross System

Overview

The **McGinley Dynamic Cross System** uses fast and slow McGinley Dynamic indicators to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast McGinley Dynamic indicator crosses above the Slow McGinley Dynamic indicator.

A *Short* signal is generated when the Fast McGinley Dynamic indicator crosses below the Slow McGinley Dynamic indicator.

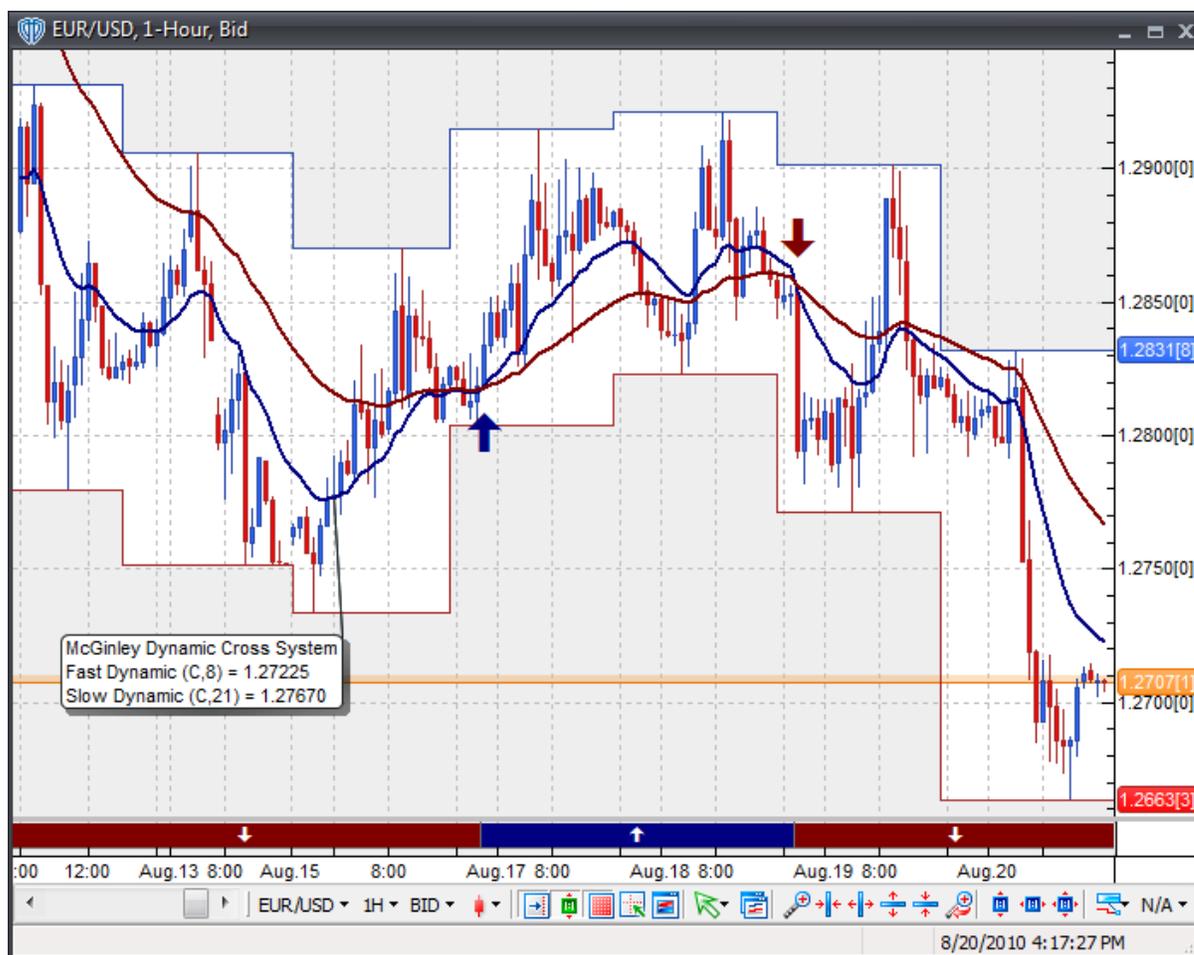
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **McGinley Dynamic Cross System** consists of the following output variables and display parameters:

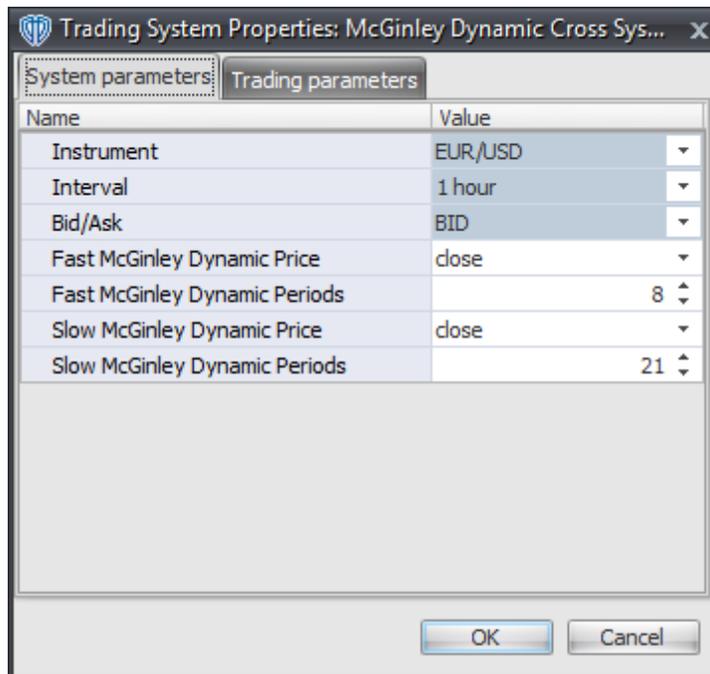
- The Fast McGinley Dynamic indicator displays in the Price Frame as slightly thicker, solid dark blue line.
- The Slow McGinley Dynamic indicator displays in the Price Frame as a slightly thicker, solid dark red line.
- The Trend Frame displays a white up arrow against a dark blue background while the Fast McGinley Dynamic indicator is greater than the Slow McGinley Dynamic indicator.
- The Trend Frame displays a white down arrow against a dark red background while the Fast McGinley Dynamic indicator is less than the Slow McGinley Dynamic indicator.
- When a *Long* signal is generated a dark blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast McG. Dynamic crossed above Slow McG. Dynamic." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a dark red down arrow graphic displays in the chart window, the message "Short signal detected! Fast McG. Dynamic crossed below Slow McG. Dynamic." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **McGinley Dynamic Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast McGinley Dynamic Price and Fast McGinley Dynamic Periods

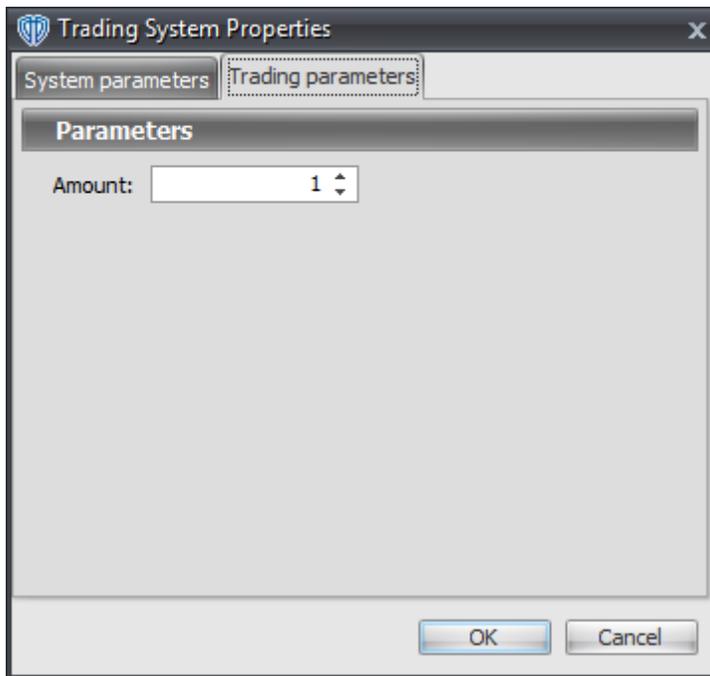
These parameters define the price and number of periods used to calculate the Fast McGinley Dynamic indicator.

Slow McGinley Dynamic Price and Slow McGinley Dynamic Periods

These parameters define the price and number of periods used to calculate the Slow McGinley Dynamic indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.64 Momentum Cross System

Overview

The **Momentum Cross System** uses Momentum to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when Momentum crosses above zero.

A *Short* signal is generated when Momentum crosses below zero.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

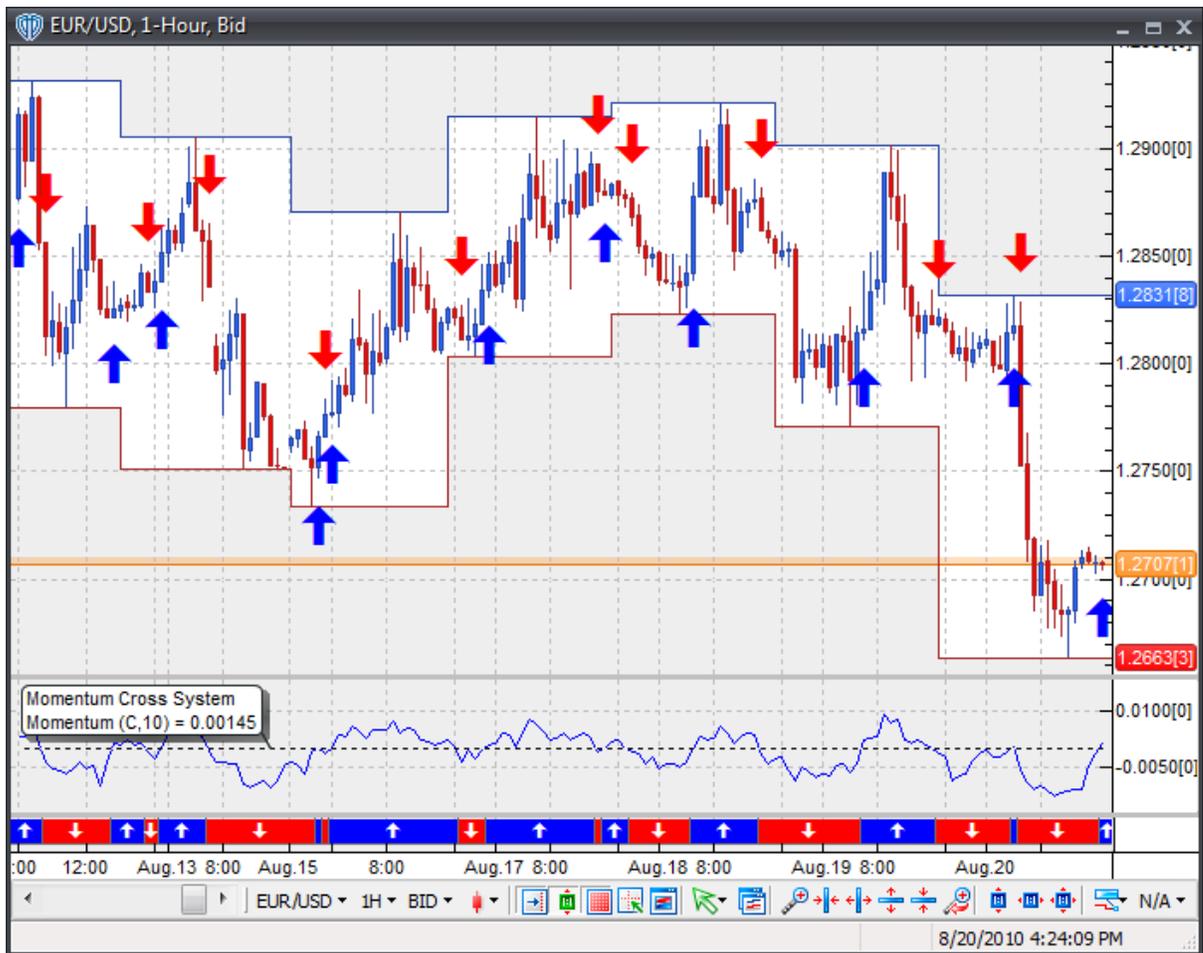
System Outputs and Signals Logic

The **Momentum Cross System** consists of the following output variables and display parameters:

- Momentum displays in Additional Frame 1 as a thin, solid, blue line. It's mid-level (0) displays in the same frame as a dashed black line.

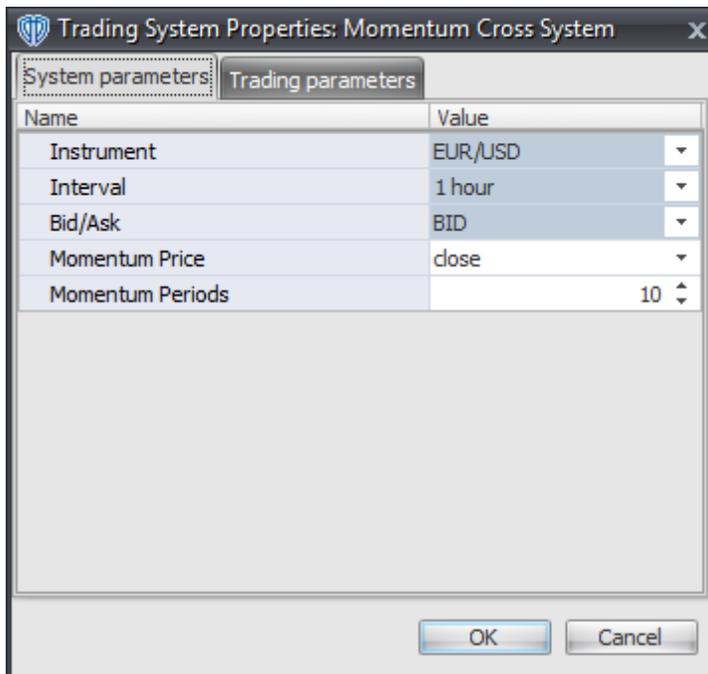
- The Trend Frame displays a white up arrow against a blue background while Momentum is greater than zero.
- The Trend Frame displays a white down arrow against a red background while Momentum is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Momentum crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Momentum crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Momentum Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

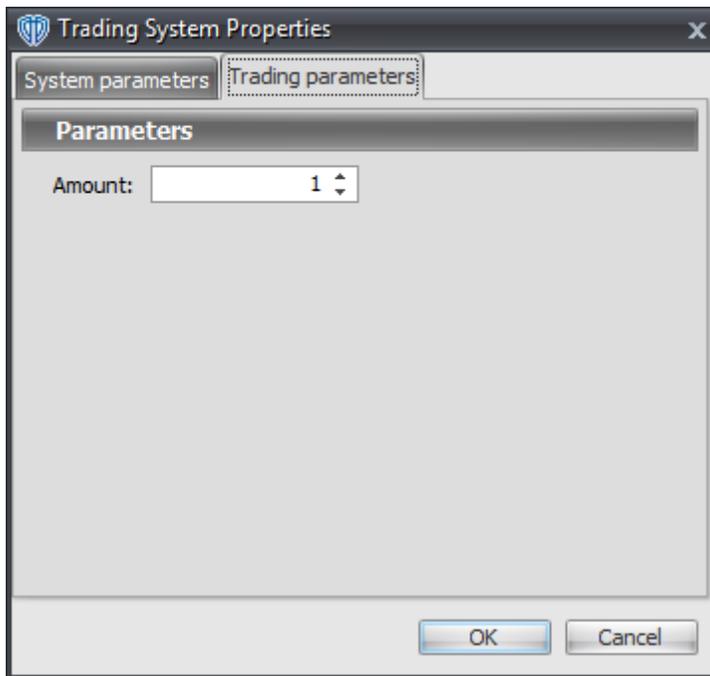
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Momentum Price and Momentum Periods

These parameters define the price and number of periods used to calculate Momentum.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.65 Moving Average Envelope Breakout System

Overview

The **Moving Average Envelope Breakout System** uses a Moving Average Envelope to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the upper MA Envelope. If the "Require Price Confirmation of Breakout?" input parameter (see *description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the upper MA Envelope breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the lower MA Envelope. If the "Require Price Confirmation of Breakout?" input parameter (see *description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the lower MA Envelope breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input

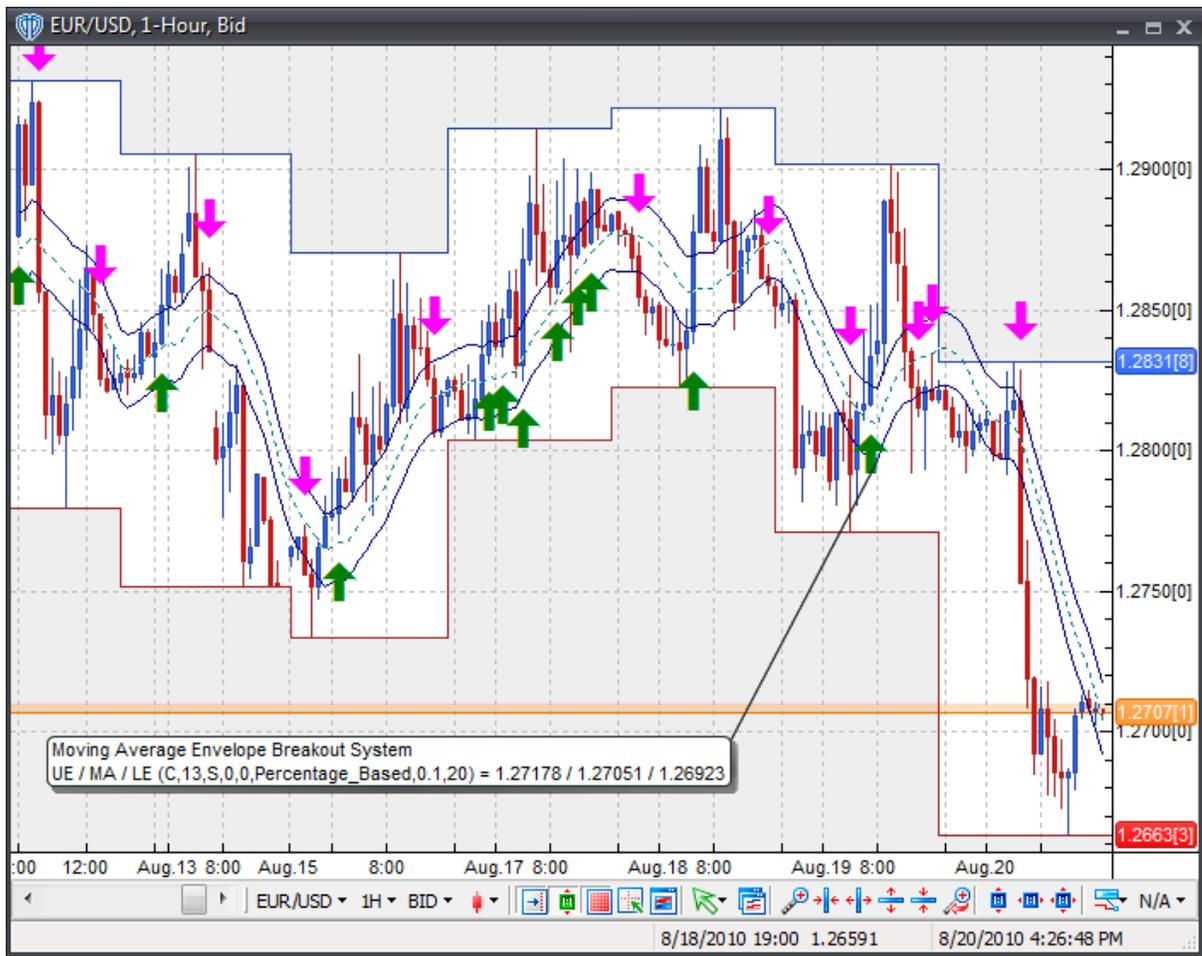
selection is chosen.

System Outputs and Signals Logic

The **Moving Average Envelope Breakout System** consists of the following output variables and display parameters:

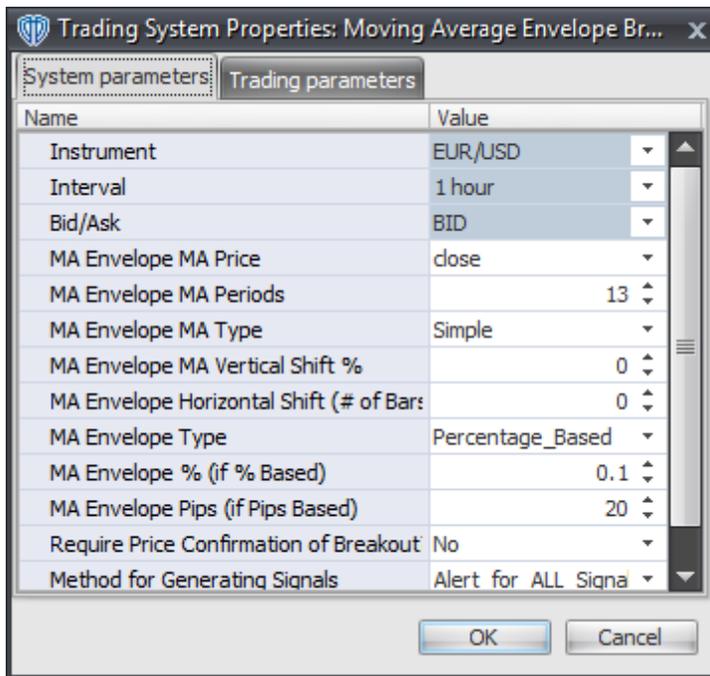
- The upper and lower MA Envelopes display in the Price Frame as thin, solid, dark blue lines. The middle MA Envelope displays in the Price Frame as a thin, dashed, dark blue line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the upper MA Envelope breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the lower MA Envelope breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above the Upper MA Envelope." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below the Lower MA Envelope." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Moving Average Envelope Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MA Envelope MA Price, MA Periods, MA Type, MA Vertical Shift %, Horizontal Shift (# of bars), Envelope Type, Envelope % (if % Based), and Envelope Pips (if Pips Based)

These parameters define the price, number of periods, MA Type, vertical and horizontal shifts of the moving average as well as the type (*% or pips based*) of moving average envelope calculated.

Require Price Confirmation of Breakout?

This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

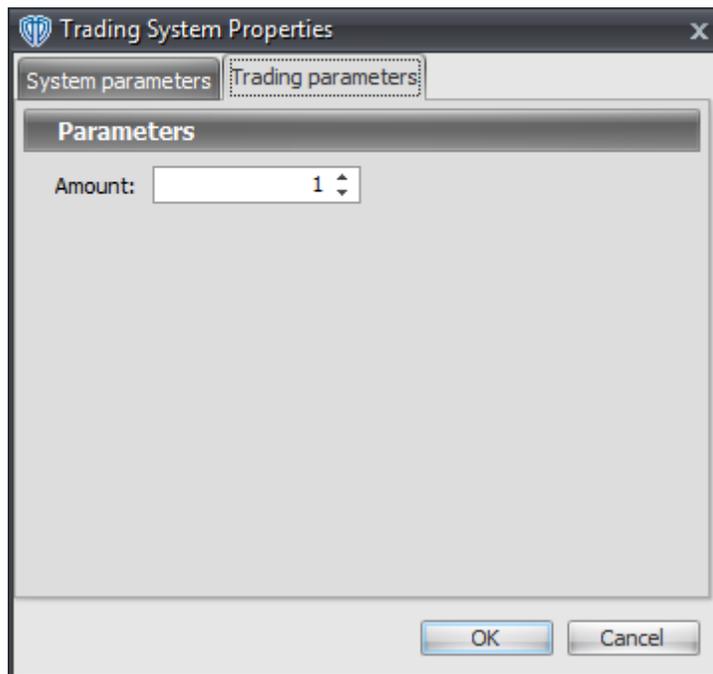
Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the

Amount (in Lots) that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.66 Moving Average Envelope Reversal System

Overview

The **Moving Average Envelope Reversal System** uses a Moving Average Envelope to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the price reverses from the lower MA Envelope using either a 1-bar or 2-bar reversal formation.

- Long 1-Bar Formation = Close price > Open price AND Close price > Lower MA Envelope AND Low price <= Lower MA Envelope
- Long 2-Bar Formation = Close price > Open price AND Close price > Lower MA Envelope AND Close price > Open price 1 bar ago AND Close price 1 bar ago < Open price 1 bar ago AND Low price 1 bar ago <= Lower MA Envelope 1 bar ago

A *Short* signal is generated when the price reverses from the upper MA Envelope using either a 1-bar or 2-bar reversal formation.

- Short 1-Bar Formation = Close price < Open price AND Close price < Upper MA Envelope AND High price >= Upper MA Envelope
- Short 2-Bar Formation = Close price < Open price AND Close price < Upper MA Envelope AND Close price < Open price 1 bar ago AND Close price 1 bar ago > Open price 1 bar ago AND High price 1 bar ago >= Upper MA Envelope 1 bar ago

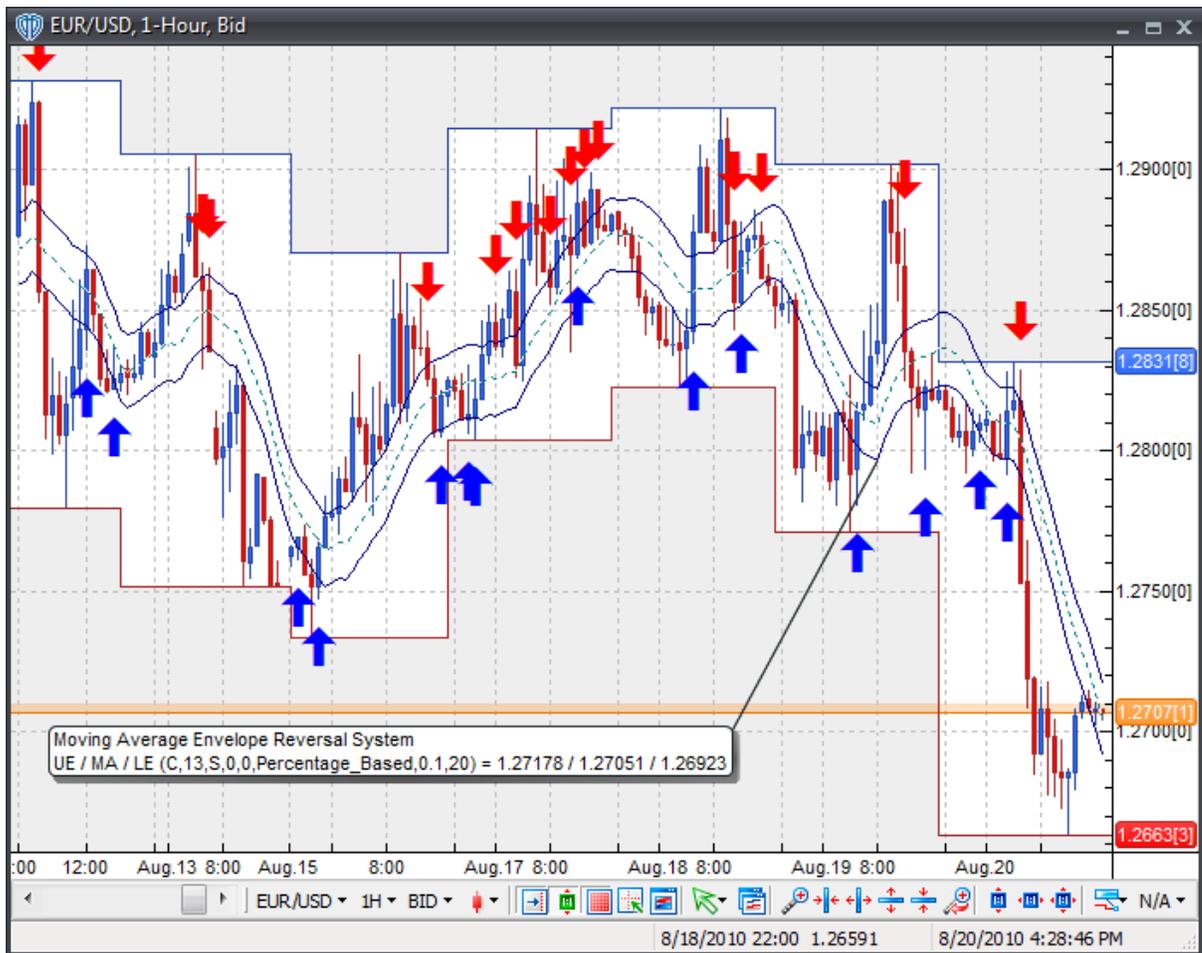
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Moving Average Envelope Reversal System** consists of the following output variables and display parameters:

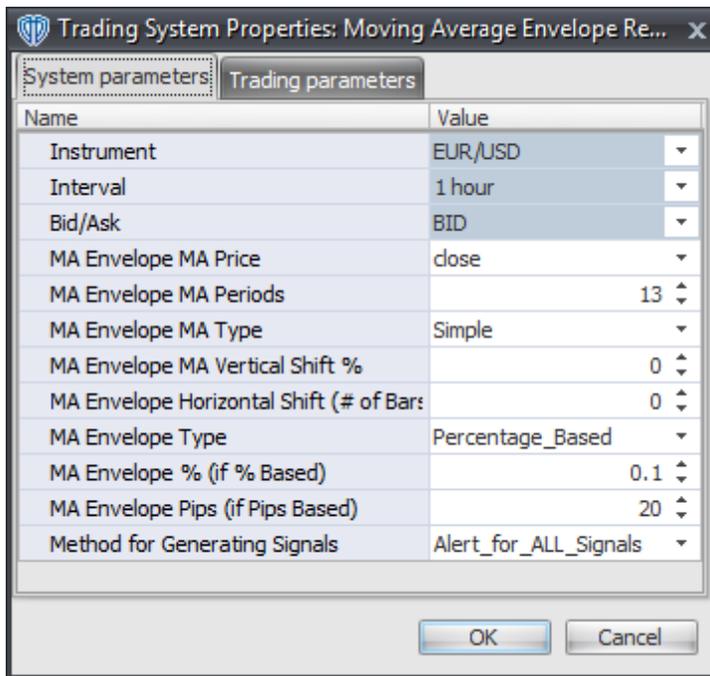
- The upper and lower MA Envelopes display in the Price Frame as thin, solid, dark blue lines. The middle MA Envelope displays in the Price Frame as a thin, dashed, dark blue line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Price is potentially reversing from the Lower MA Envelope." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Price is potentially reversing from the Upper MA Envelope." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Moving Average Envelope Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MA Envelope MA Price, MA Periods, MA Type, MA Vertical Shift %, Horizontal Shift (# of bars), Envelope Type, Envelope % (if % Based), and Envelope Pips (if Pips Based)

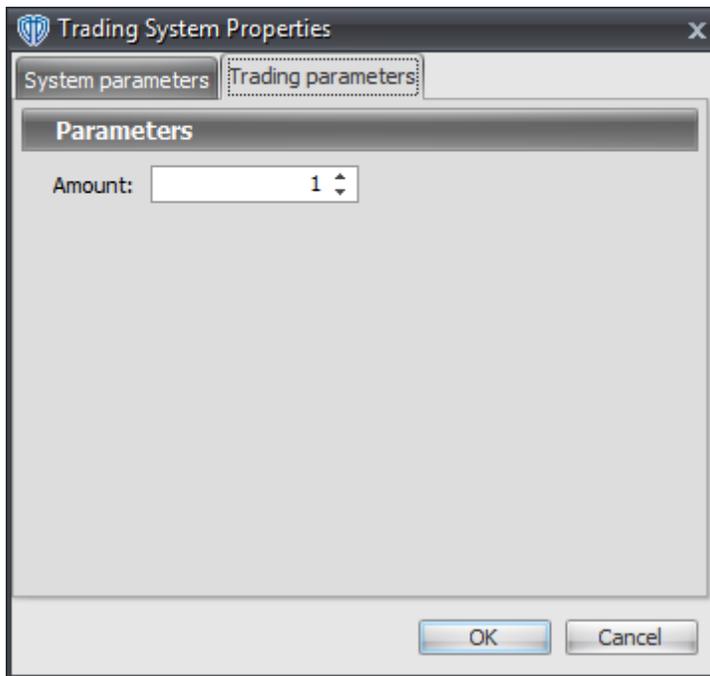
These parameters define the price, number of periods, MA Type, vertical and horizontal shifts of the moving average as well as the type (*% or pips based*) of moving average envelope calculated.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.67 Moving Averages Cross System

Overview

The **Moving Averages Cross System** uses fast and slow Moving Averages to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast Moving Average crosses above the Slow Moving Average.

A *Short* signal is generated when the Fast Moving Average crosses below the Slow Moving Average.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

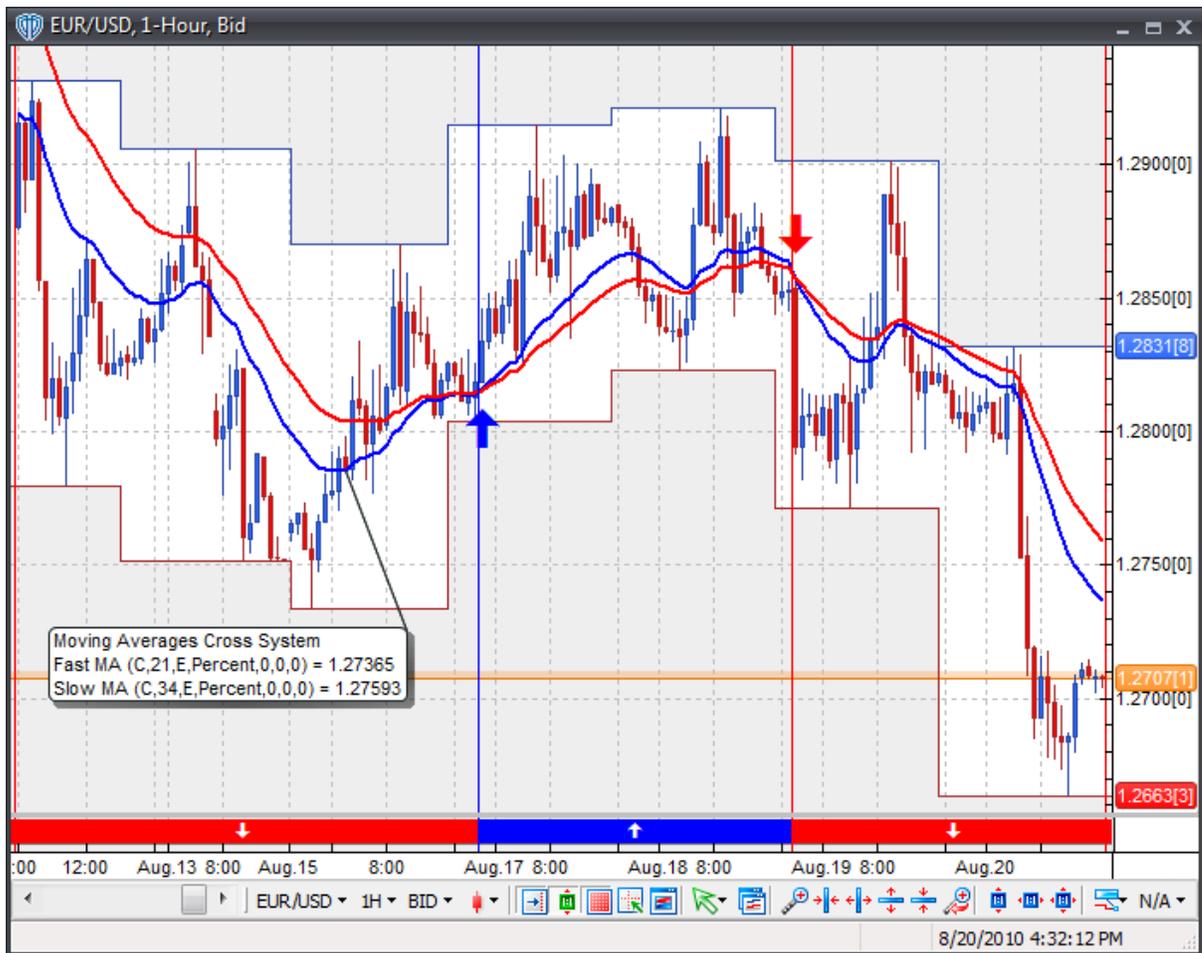
System Outputs and Signals Logic

The **Moving Averages Cross System** consists of the following output variables and display parameters:

- The Fast Moving Average displays in the Price Frame as slightly thicker, solid blue line.

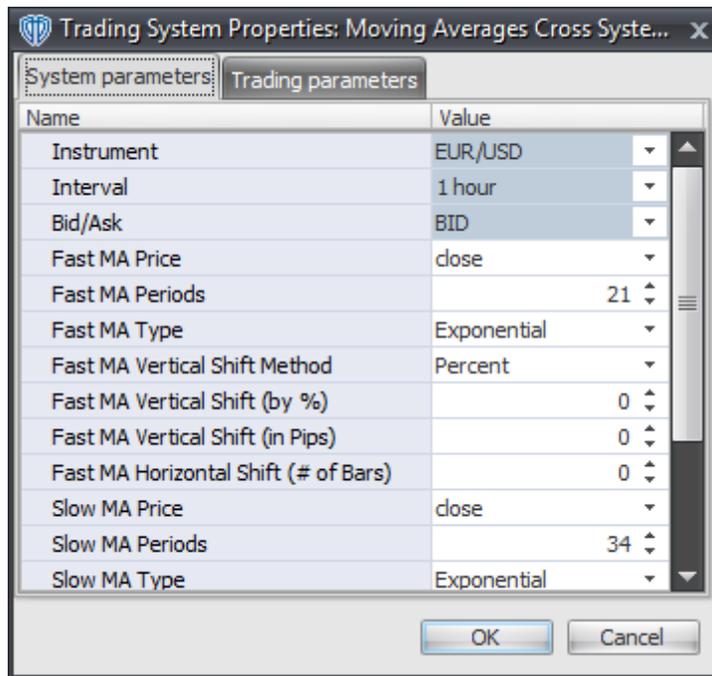
- The Slow Moving Average displays in the Price Frame as a slightly thicker, solid red line.
- The Trend Frame displays a white up arrow against a blue background along with beginning/ending vertical blue lines while the Fast Moving Average is greater than the Slow Moving Average.
- The Trend Frame displays a white down arrow against a red background along with beginning/ending vertical red lines while the Fast Moving Average is less than the Slow Moving Average.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast MA crossed above Slow MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast MA crossed below Slow MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Moving Averages Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast MA Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Fast Moving Average.

Fast MA Vertical Shift Method

This parameter defines the method used to shift the Fast Moving Average's plot up or down. The available choices are: *Percent* and *Pips*.

Fast MA Vertical Shift (by %)

This parameter defines the percentage used to shift the Fast Moving Average's plot up or down while *Percent* is chosen as the **Fast MA Vertical Shift Method**.

Fast MA Vertical Shift (by Pips)

This parameter defines the number of pips used to shift the Fast Moving Average's plot up or down while *Pips* is chosen as the **Fast MA Vertical Shift Method**.

Fast MA Horizontal Shift (# of Bars)

This parameter defines the number of bars used to shift the Fast Moving Average's plot ahead of the price data.

Slow MA Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Slow Moving Average.

Slow MA Vertical Shift Method

This parameter defines the method used to shift the Slow Moving Average's plot up or down. The available choices are: *Percent* and *Pips*.

Slow MA Vertical Shift (by %)

This parameter defines the percentage used to shift the Slow Moving Average's plot up or down while *Percent* is chosen as the **Slow MA Vertical Shift Method**.

Slow MA Vertical Shift (by Pips)

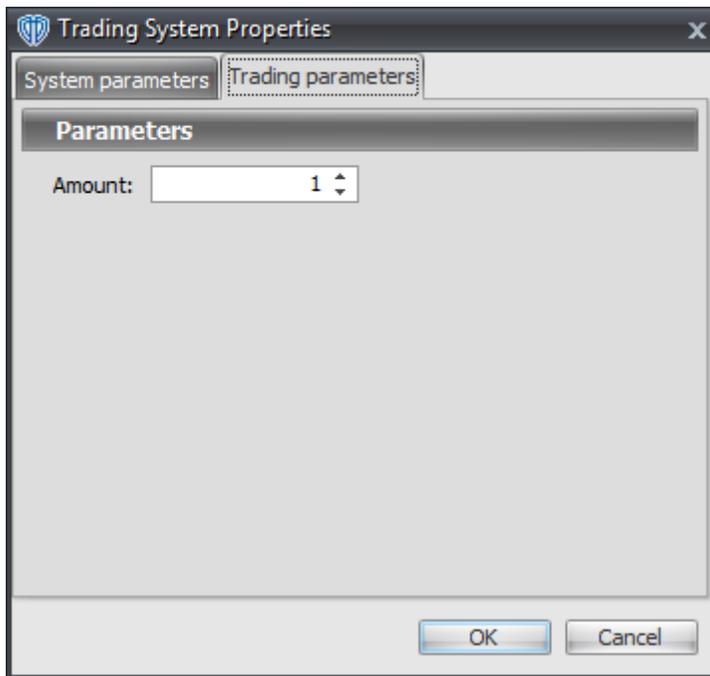
This parameter defines the number of pips used to shift the Slow Moving Average's plot up or down while *Pips* is chosen as the **Slow MA Vertical Shift Method**.

Slow MA Horizontal Shift (# of Bars)

This parameter defines the number of bars used to shift the Slow Moving Average's plot ahead of the price data.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.68 Moving Averages Double Cross System

Overview

The **Moving Averages Double Cross System** uses 3 moving averages (*short, medium, and long*) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated for each initial bar when the Close price is greater than the short MA AND the short MA is greater than the medium MA AND the medium MA is greater than the long MA.

A *Long Exit* signal is generated when the short MA crosses below the medium MA.

A *Short Entry* signal is generated for each initial bar when the Close price is less than the short MA AND the short MA is less than the medium MA AND the medium MA is less than the long MA.

A *Short Exit* signal is generated when the short MA crosses above the medium MA.

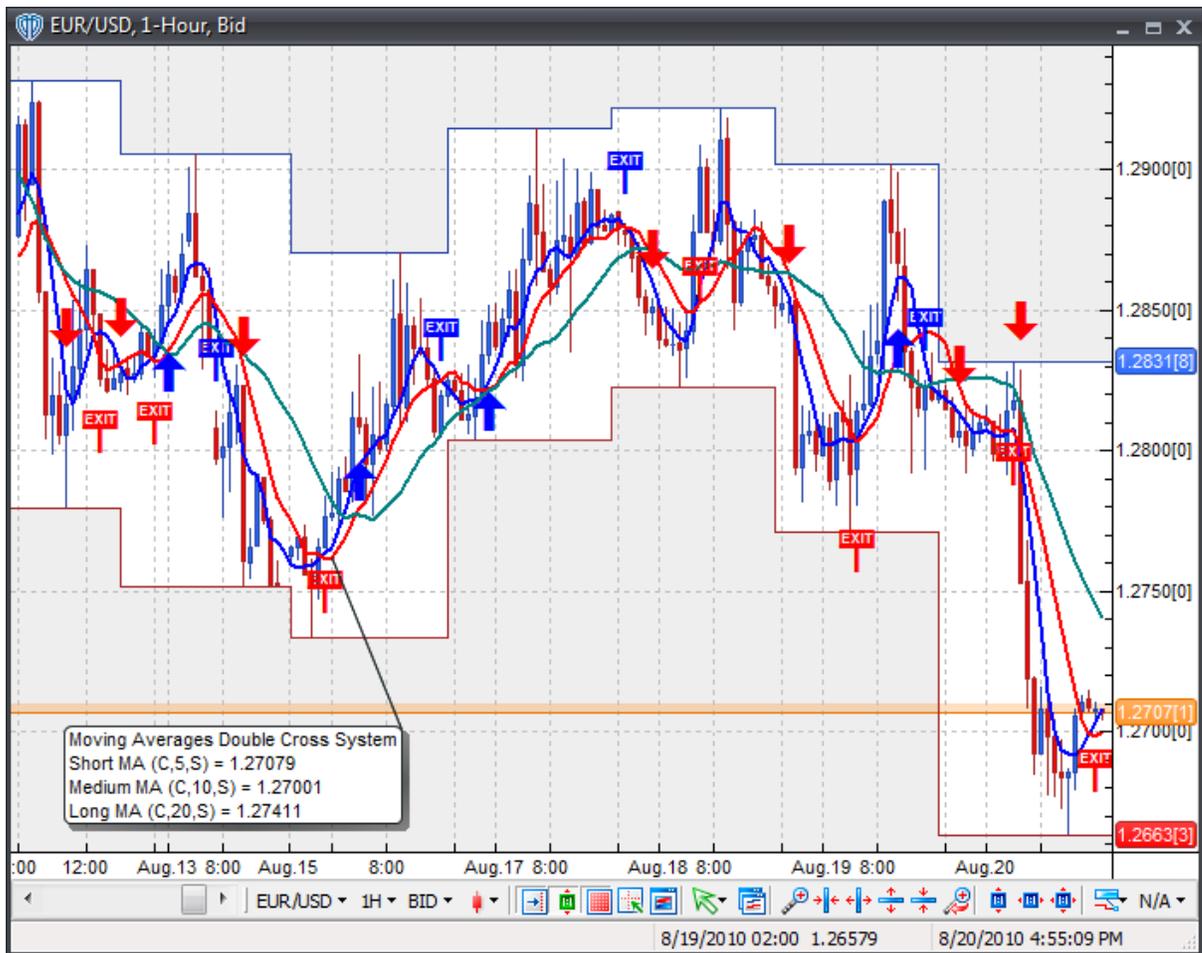
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy, CloseBuy, OpenSell, and CloseSell*).

System Outputs and Signals Logic

The **Moving Averages Double Cross System** consists of the following output variables and display parameters:

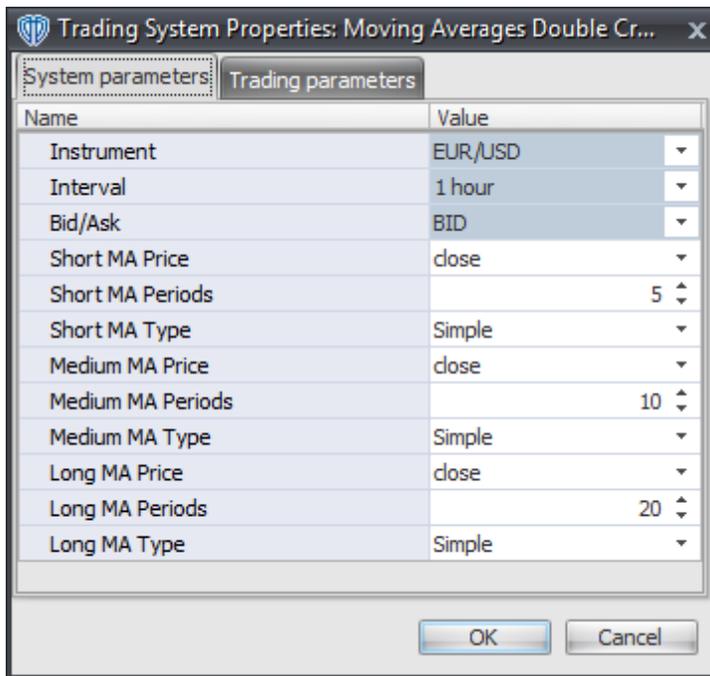
- The Short Moving Average displays in the Price Frame as a solid, slightly thicker blue line.
- The Medium Moving Average displays in the Price Frame as a solid, slightly thicker red line.
- The Long Moving Average displays in the Price Frame as a solid, slightly thicker green line.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Close price > Short MA > Medium MA > Long MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! Short MA crossed below Medium MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Close price < Short MA < Medium MA < Long MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! Short MA crossed above Medium MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Moving Averages Double Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Short MA Price, Periods, and Type

These parameters define the price, number of periods, and type of moving average used to calculate the short moving average.

Medium MA Price, Periods, and Type

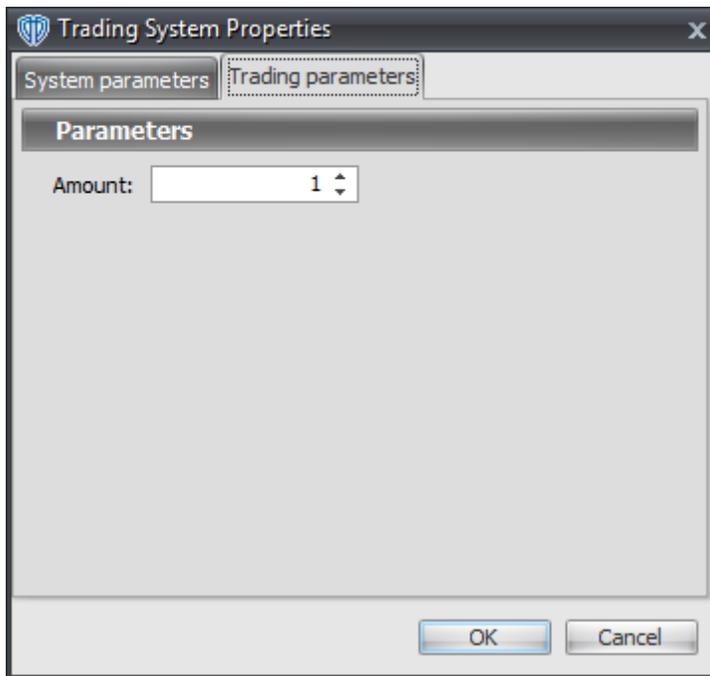
These parameters define the price, number of periods, and type of moving average used to calculate the medium moving average.

Long MA Price, Periods, and Type

These parameters define the price, number of periods, and type of moving average used to calculate the long moving average.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.69 Moving Slope Rate of Change Cross System

Overview

The **Moving Slope Rate of Change Cross System** uses the Moving Slope Rate of Change to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Moving Slope Rate of Change crosses above zero.

A *Short* signal is generated when the Moving Slope Rate of Change crosses below zero.

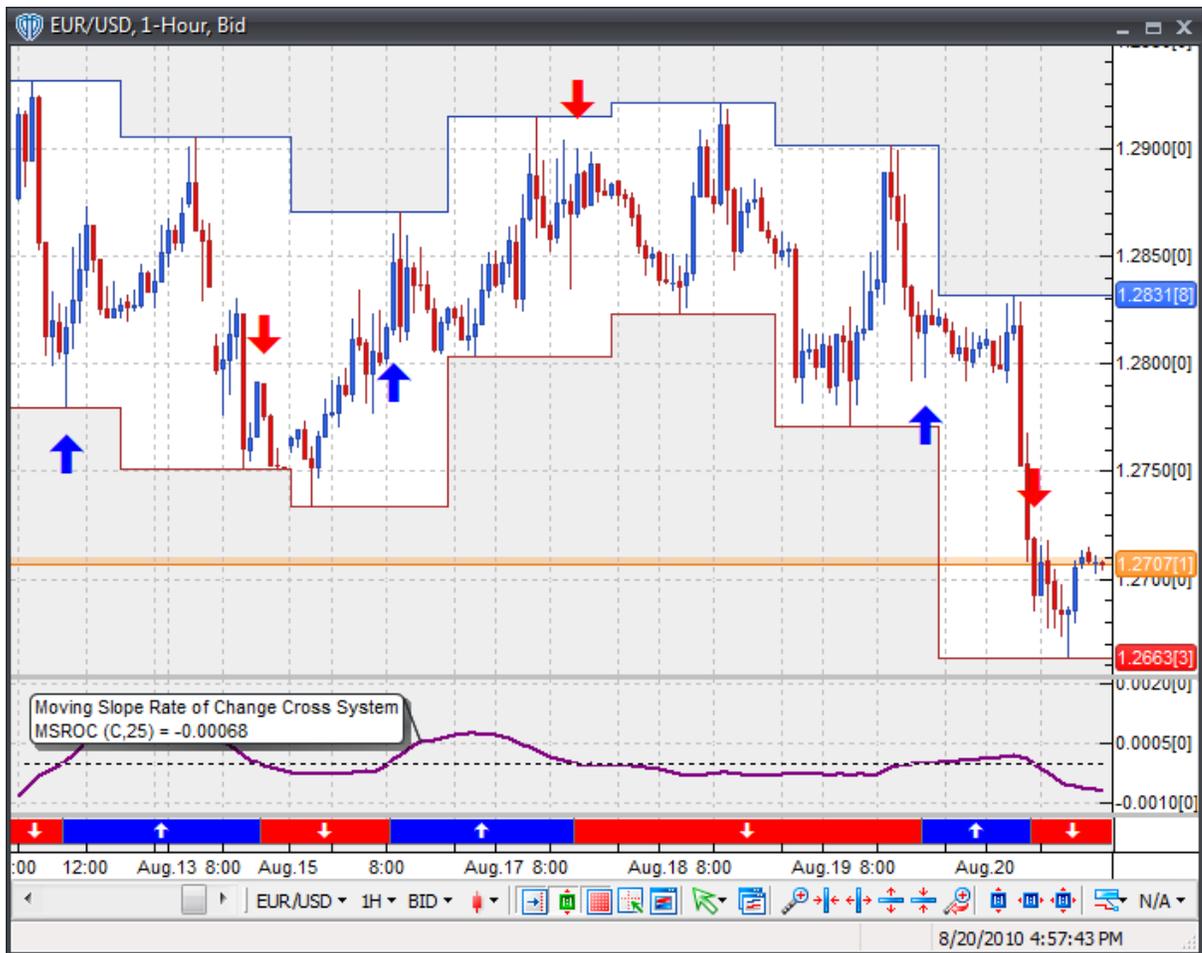
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Moving Slope Rate of Change Cross System** consists of the following output variables and display parameters:

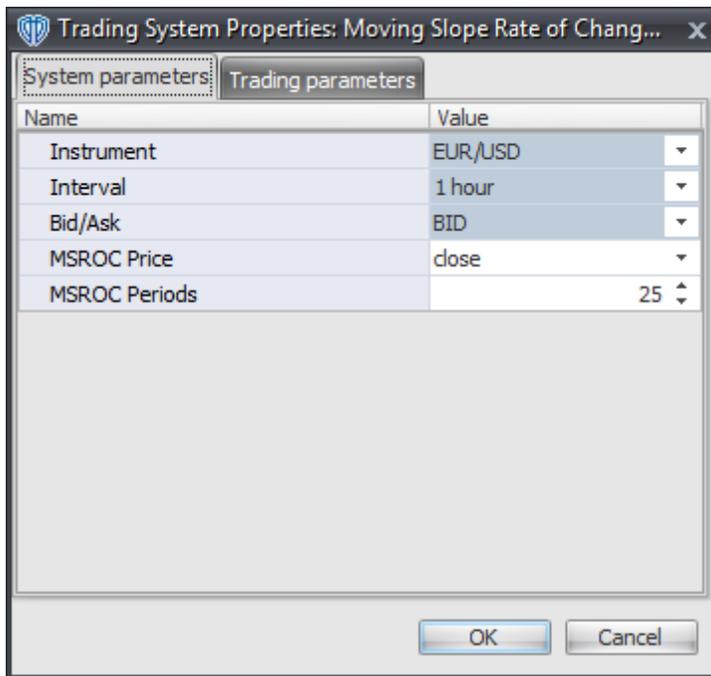
- The Moving Slope Rate of Change displays in Additional Frame 1 as slightly thicker, solid, purple line. Its mid-level (0) displays in the same frame as a dashed black line.
- The Trend Frame displays a white up arrow against a blue background while the Moving Slope Rate of Change is greater than zero.
- The Trend Frame displays a white down arrow against a red background while the Moving Slope Rate of Change is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The MSROC crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The MSROC crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Moving Slope Rate of Change Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

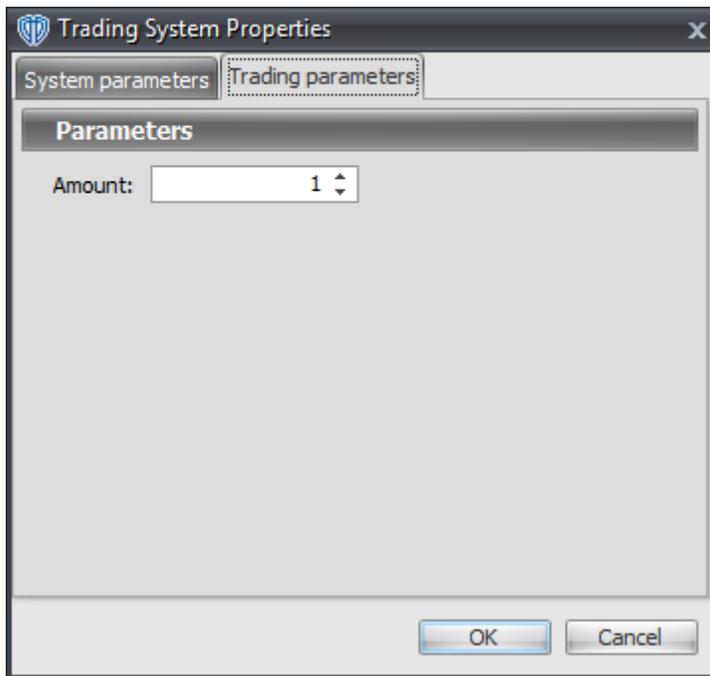
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

MSROC Price and MSROC Periods

These parameters define the price and number of periods used to calculate the Moving Slope Rate of Change.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.70 Parabolic SAR Reversal System

Overview

The **Parabolic SAR Reversal System** uses the Parabolic SAR to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the Parabolic SAR.

A *Short* signal is generated when the Close price crosses below the Parabolic SAR.

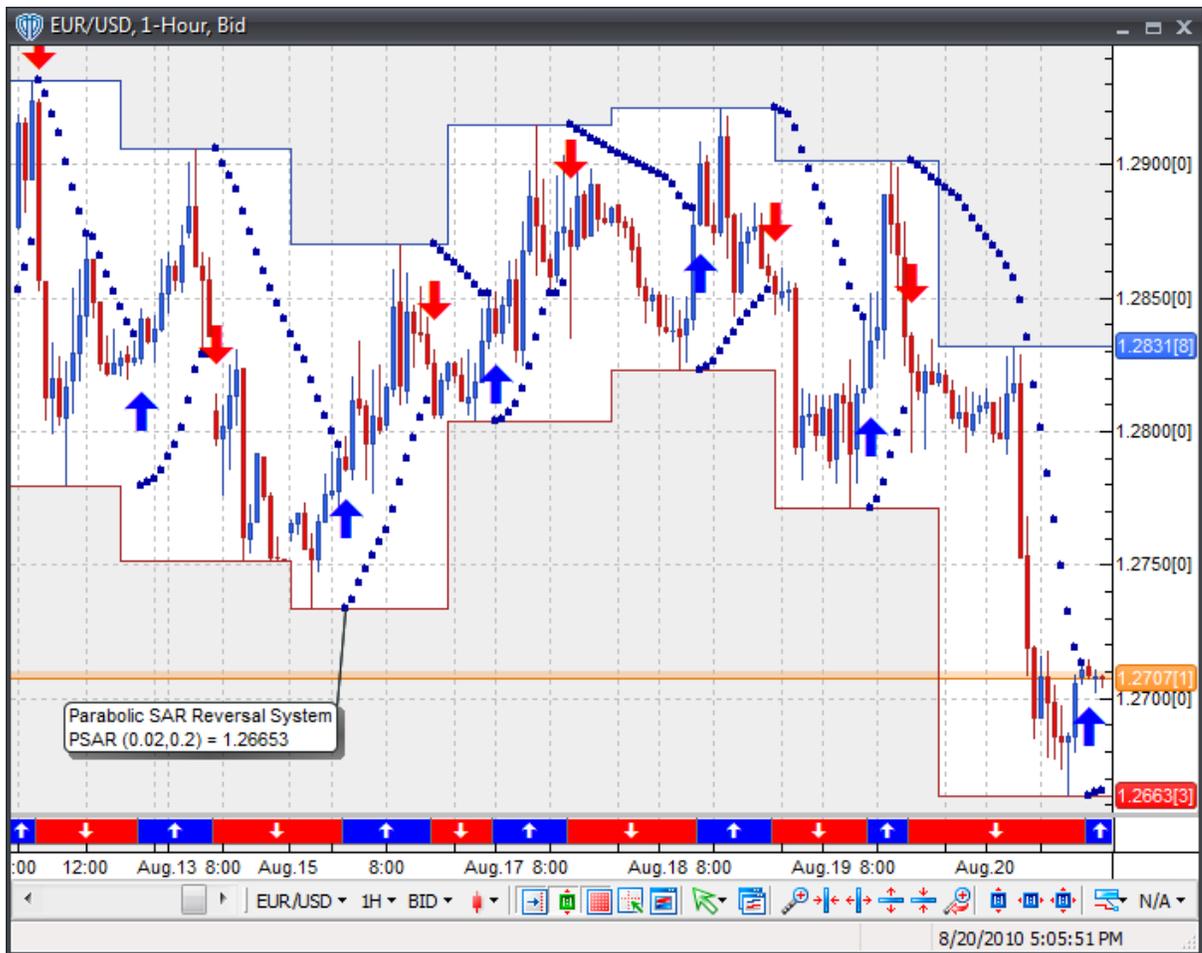
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Parabolic SAR Reversal System** consists of the following output variables and display parameters:

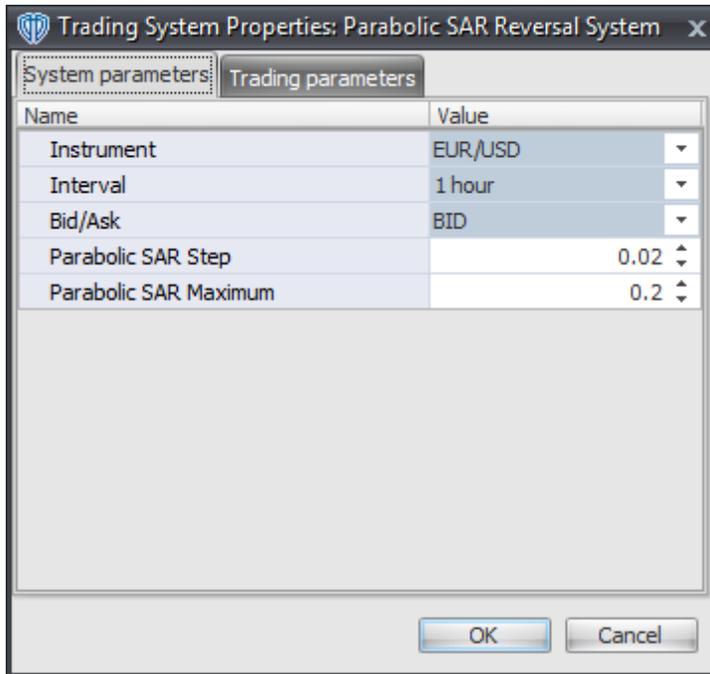
- The Parabolic SAR displays in the Price Frame as slightly thicker blue dots.
- The Trend Frame displays a white up arrow against a blue background while the Close price is greater than the Parabolic SAR.
- The Trend Frame displays a white down arrow against a red background while the Close price is less than the Parabolic SAR.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Close price crossed above the Parabolic SAR." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Close price crossed below the Parabolic SAR." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Parabolic SAR Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

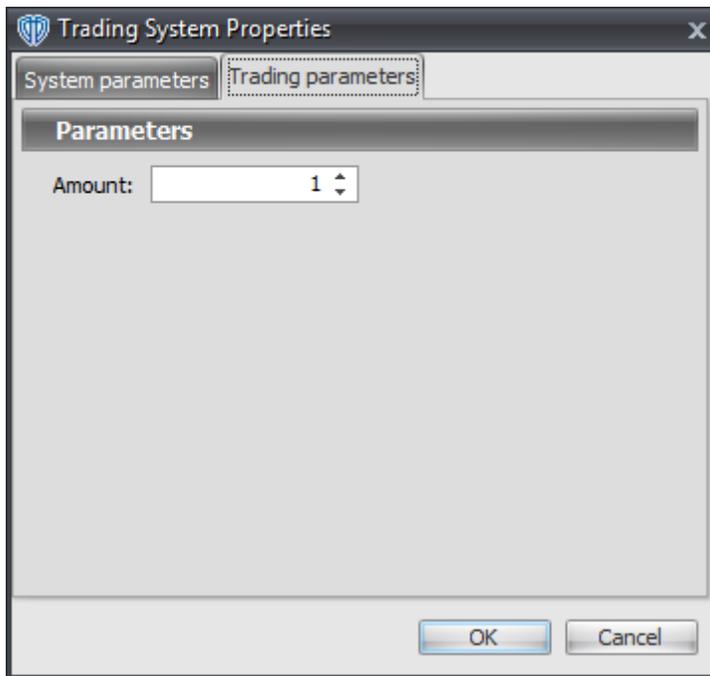
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Parabolic SAR Step and Parabolic SAR Maximum

These parameters define the values used to calculate the Parabolic SAR.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.71 Percentage Price Oscillator / Signal Line Cross System

Overview

The **Percentage Price Oscillator / Signal Line Cross System** uses the Percentage Price Oscillator (PPO) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the PPO crosses above the PPO's Signal Line.

A *Short* signal is generated when the PPO crosses below the PPO's Signal Line.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Percentage Price Oscillator / Signal Line Cross System** consists of the following output variables and display parameters:

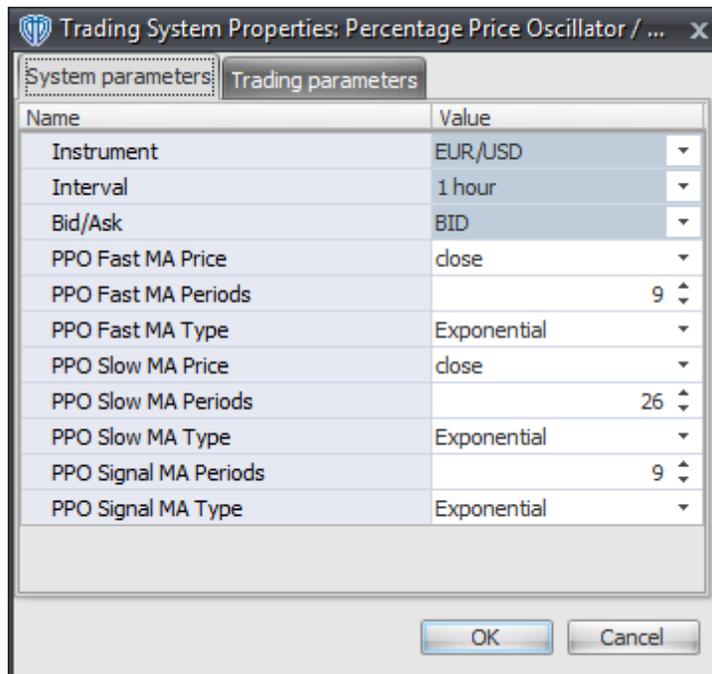
- The Percentage Price Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line.
- The Percentage Price Oscillator Signal Line displays in Additional Frame 1 as a thin, solid, dark red line.
- The Percentage Price Oscillator Histogram displays in Additional Frame 1 as a green histogram. Its mid-level (0) displays in the same frame as a black dashed line.
- The Trend Frame displays a white up arrow against a blue background along with beginning/ending vertical blue lines while the PPO is greater than the PPO's Signal Line.
- The Trend Frame displays a white up arrow against a red background along with beginning/ending vertical red lines while the PPO is less than the PPO's Signal Line.
- When a *Long* signal is generated a dark blue up arrow graphic displays in the chart window, the message "Long signal detected! PPO crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a dark red down arrow graphic displays in the chart window, the message "Short signal detected! PPO crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Percentage Price Oscillator / Signal Line Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

PPO Fast MA Price, PPO Fast MA Periods, and PPO Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Percentage Price Oscillator.

PPO Slow MA Price, PPO Slow MA Periods, and PPO Slow MA Type

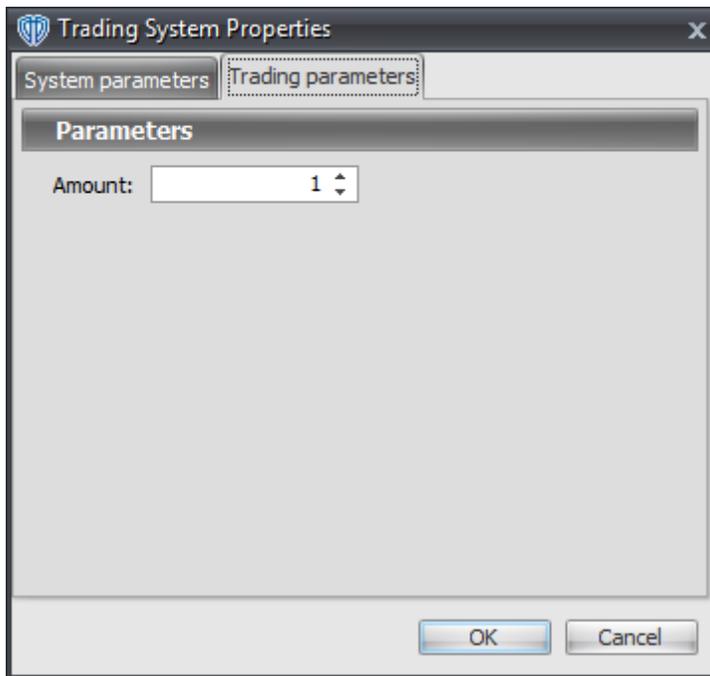
These parameters define price, number of periods, and type of the slow moving average used to calculate the Percentage Price Oscillator.

PPO Signal MA Periods and PPO Signal MA Type

These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the Percentage Price Oscillator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.72 Percentage Price Oscillator / Zero Cross System

Overview

The **Percentage Price Oscillator / Zero Cross System** uses the Percentage Price Oscillator (PPO) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the PPO crosses above zero.

A *Short* signal is generated when the PPO crosses below zero.

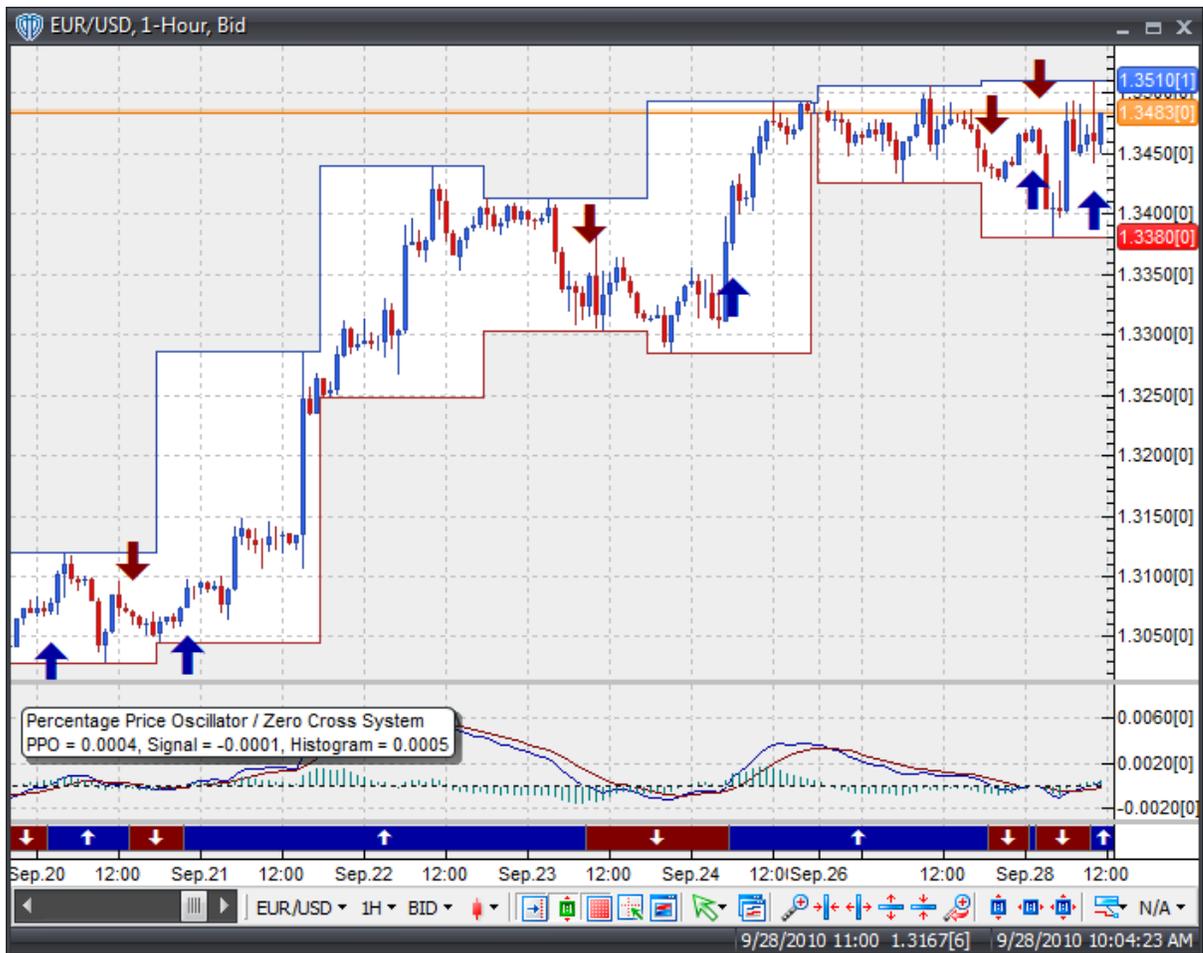
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Percentage Price Oscillator / Zero Cross System** consists of the following output variables and display parameters:

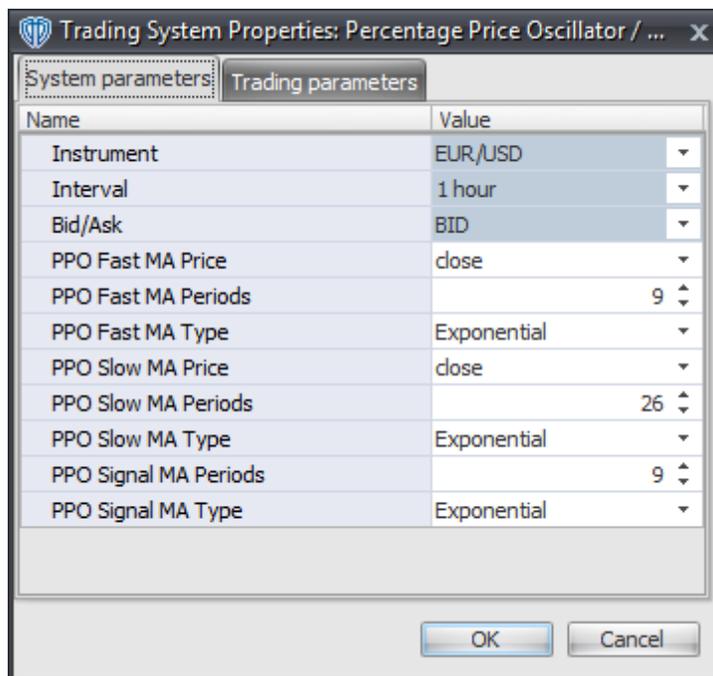
- The Percentage Price Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line.
- The Percentage Price Oscillator Signal Line displays in Additional Frame 1 as a thin, solid, dark red line.
- The Percentage Price Oscillator Histogram displays in Additional Frame 1 as a green histogram. Its mid-level (0) displays in the same frame as a black dashed line.
- The Trend Frame displays a white up arrow against a dark blue background while the PPO is greater than zero.
- The Trend Frame displays a white up arrow against a dark red background while the PPO is less than zero.
- When a *Long* signal is generated a dark blue up arrow graphic displays in the chart window, the message "Long signal detected! PPO crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a dark red down arrow graphic displays in the chart window, the message "Short signal detected! PPO crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Percentage Price Oscillator / Zero Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

PPO Fast MA Price, PPO Fast MA Periods, and PPO Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Percentage Price Oscillator.

PPO Slow MA Price, PPO Slow MA Periods, and PPO Slow MA Type

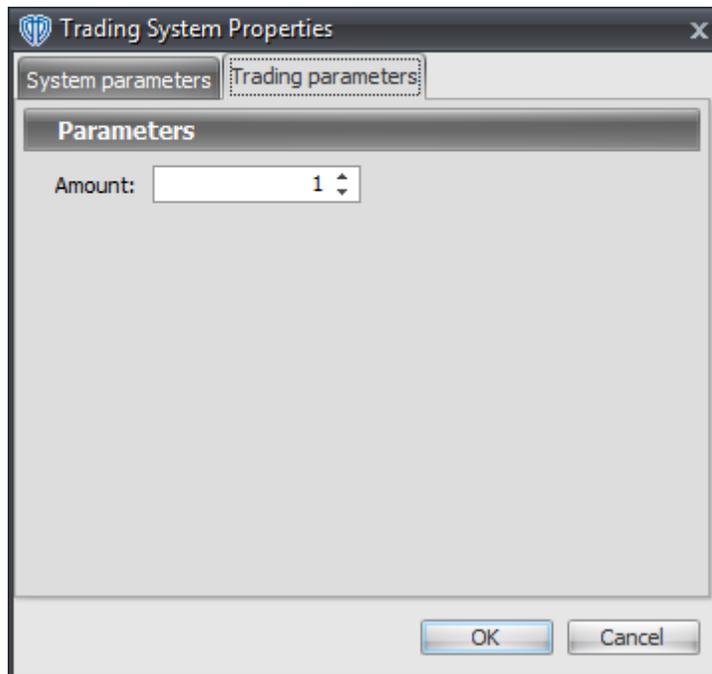
These parameters define price, number of periods, and type of the slow moving average used to calculate the Percentage Price Oscillator.

PPO Signal MA Periods and PPO Signal MA Type

These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the Percentage Price Oscillator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.73 Percentage Price Oscillator Histogram High / Low Breakout System

Overview

The **Percentage Price Oscillator Histogram High / Low Breakout System** uses the Percentage Price Oscillator (PPO) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the PPO Histogram crosses above its highest high value of the previous *n*-bars. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long Entry* signal is generated when the Close price crosses above the High price of the PPO Histogram highest high value breakout bar within the following two bars.

A *Short* signal is generated when the PPO Histogram crosses below its lowest low value of the previous *n*-bars. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short Entry* signal is generated when the Close price crosses below the Low price of the PPO Histogram lowest low value breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals

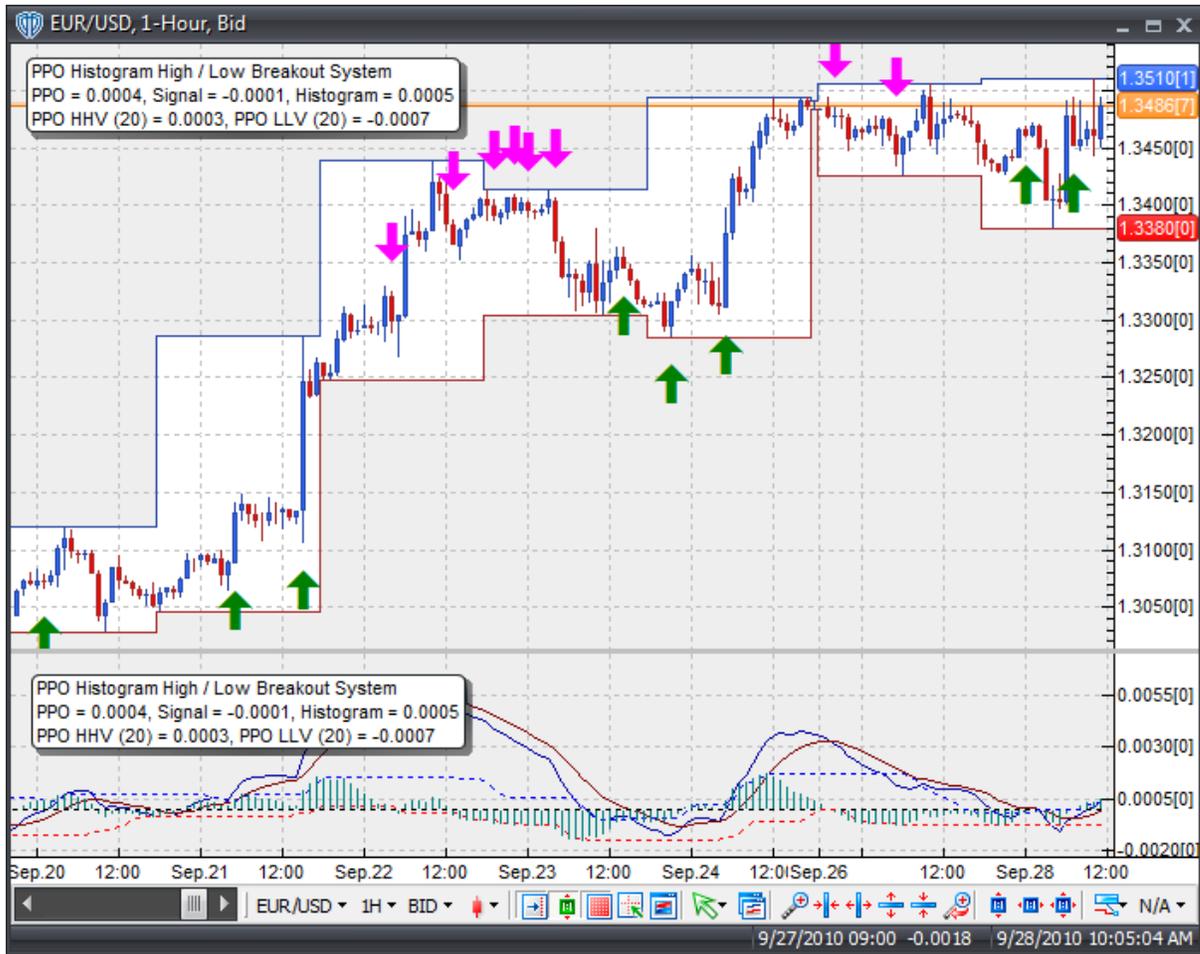
to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Percentage Price Oscillator Histogram High / Low Breakout System** consists of the following output variables and display parameters:

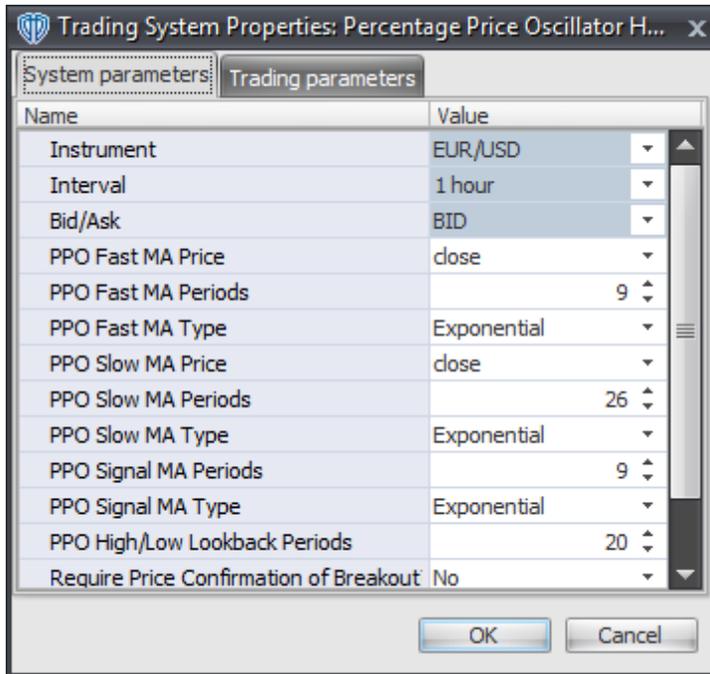
- The Percentage Price Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line.
- The Percentage Price Oscillator Signal Line displays in Additional Frame 1 as a thin, solid, dark red line.
- The Percentage Price Oscillator Histogram displays in Additional Frame 1 as a green histogram. Its mid-level (0) displays in the same frame as a black dashed line.
- The highest high value of the PPO Histogram during the last n-bars displays in Additional Frame 1 as a thin, dashed, blue line.
- The lowest low value of the PPO Histogram during the last n-bars displays in Additional Frame 1 as a thin, dashed, red line.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the PPO Histogram highest high value breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the PPO Histogram lowest low value breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! PPO Histogram has broken out above its HHV." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! PPO Histogram has broken out below its LLV." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Percentage Price Oscillator Histogram High / Low Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

PPO Fast MA Price, PPO Fast MA Periods, and PPO Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Percentage Price Oscillator.

PPO Slow MA Price, PPO Slow MA Periods, and PPO Slow MA Type

These parameters define price, number of periods, and type of the slow moving average used to calculate the Percentage Price Oscillator.

PPO Signal MA Periods and PPO Signal MA Type

These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the Percentage Price Oscillator.

PPO High/Low Lookback Periods

This parameter defines the number of previous bars used to calculate the highest high value and lowest low value of the PPO Histogram.

Require Price Confirmation of Breakout?

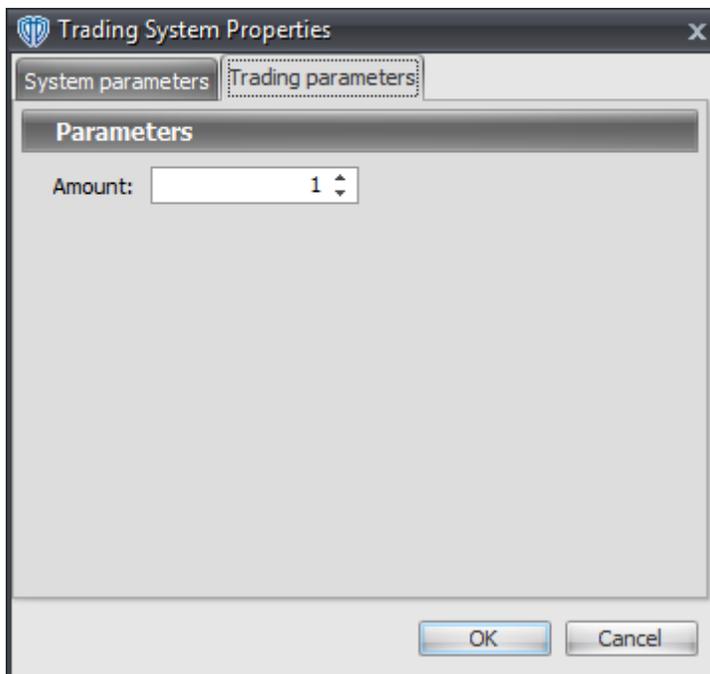
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.74 Percentage Price Oscillator Histogram Tops / Bottoms Reversal System

Overview

The **Percentage Price Oscillator Histogram Tops / Bottoms Reversal System** uses the Percentage Price Oscillator (PPO) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the PPO Histogram forms a 5-bar Trough Fractal formation (*i.e. a lowest low value with 2 subsequent lower low values on each side of it*). This formation can form while the PPO Histogram is above or below zero. If it forms while below zero, it may be considered a potential reversal signal; if forms while above zero it may be considered a potential continuation signal.

A *Short* signal is generated when the PPO Histogram forms a 5-bar Peak Fractal formation (*i.e. a highest high value with 2 subsequent lower high values on each side of it*). This formation can form while the PPO Histogram is above or below zero. If it forms while above zero, it may be considered a potential reversal signal; if it forms while below zero it may be considered a potential continuation signal.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy, CloseBuy, OpenSell, and CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Percentage Price Oscillator Histogram Tops / Bottoms Reversal System** consists of the following output variables and display parameters:

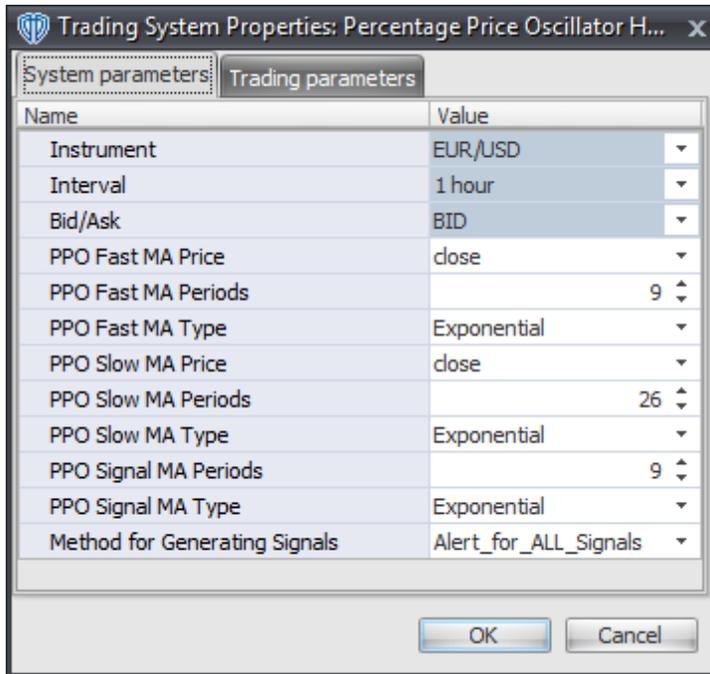
- The Percentage Price Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line.
- The Percentage Price Oscillator Signal Line displays in Additional Frame 1 as a thin, solid, dark red line.
- The Percentage Price Oscillator Histogram displays in Additional Frame 1 as a histogram. The histogram is blue if the current value is greater than the value 1 bar ago and it's red when the current value is less than the value 1 bar ago. Its mid-level (0) displays in the same frame as a black dashed line.
- When a *Long* signal is generated a dark blue up arrow graphic displays in the chart window, the message "Long signal detected! PPO Histogram completed a trough fractal formation." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a dark red down arrow graphic displays in the chart window, the message "Short signal detected! PPO Histogram completed a peak fractal formation." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Percentage Price Oscillator Histogram Tops / Bottoms Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

PPO Fast MA Price, PPO Fast MA Periods, and PPO Fast MA Type

These parameters define price, number of periods, and type of the fast moving average used to calculate the Percentage Price Oscillator.

PPO Slow MA Price, PPO Slow MA Periods, and PPO Slow MA Type

These parameters define price, number of periods, and type of the slow moving average used to calculate the Percentage Price Oscillator.

PPO Signal MA Periods and PPO Signal MA Type

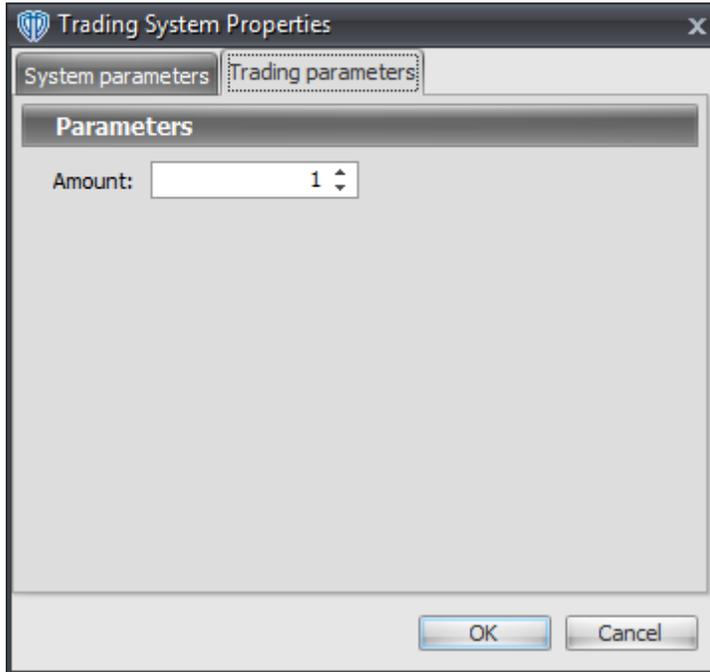
These parameters define the number of periods and type of the moving average used to calculate the Signal Line of the Percentage Price Oscillator.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.75 Polarized Fractal Efficiency Cross System

Overview

The **Polarized Fractal Efficiency Cross System** uses the Polarized Fractal Efficiency (PFE) indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Polarized Fractal Efficiency crosses above its Long Entry Level.

A *Short* signal is generated when the Polarized Fractal Efficiency crosses below its Short Entry Level.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals

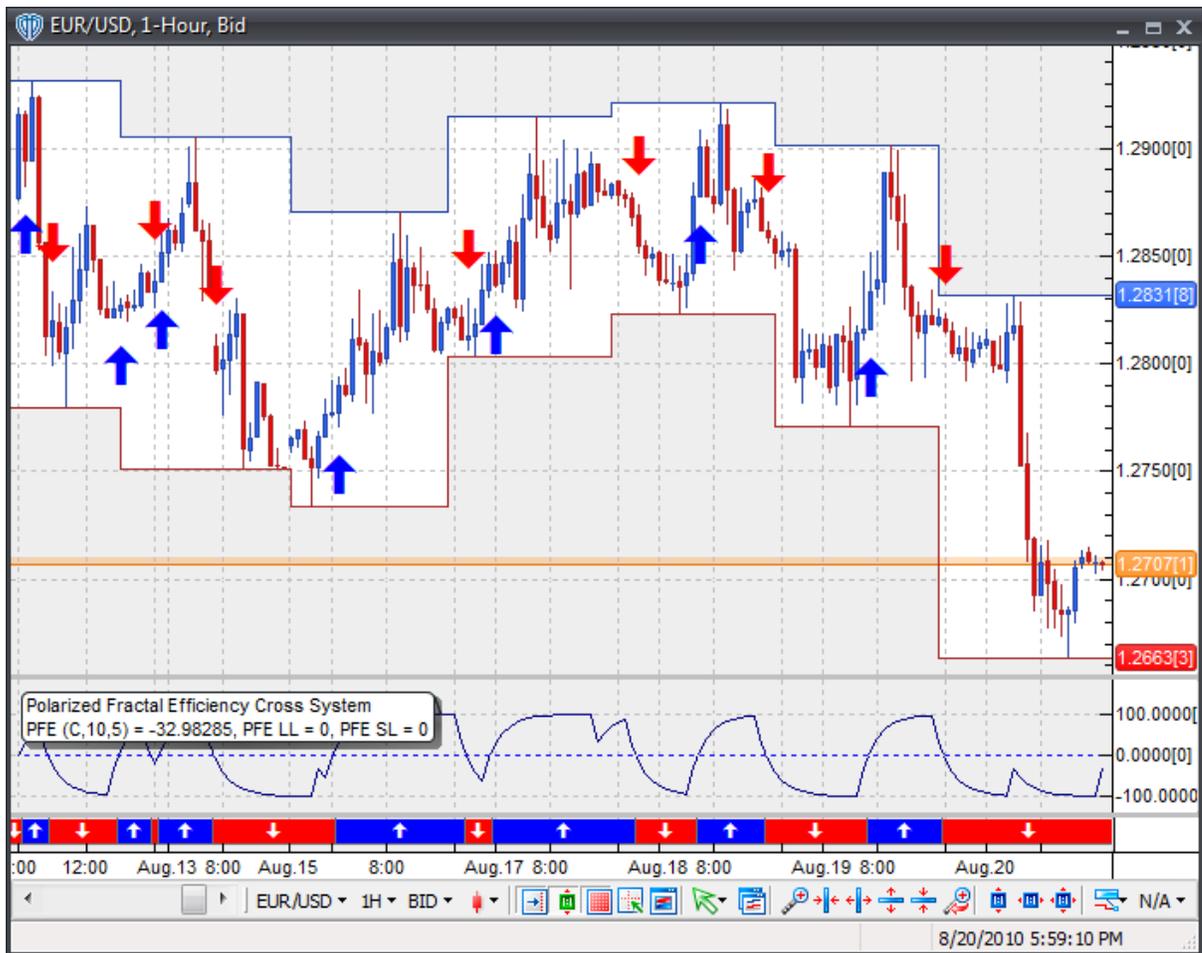
to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Polarized Fractal Efficiency Cross System** consists of the following output variables and display parameters:

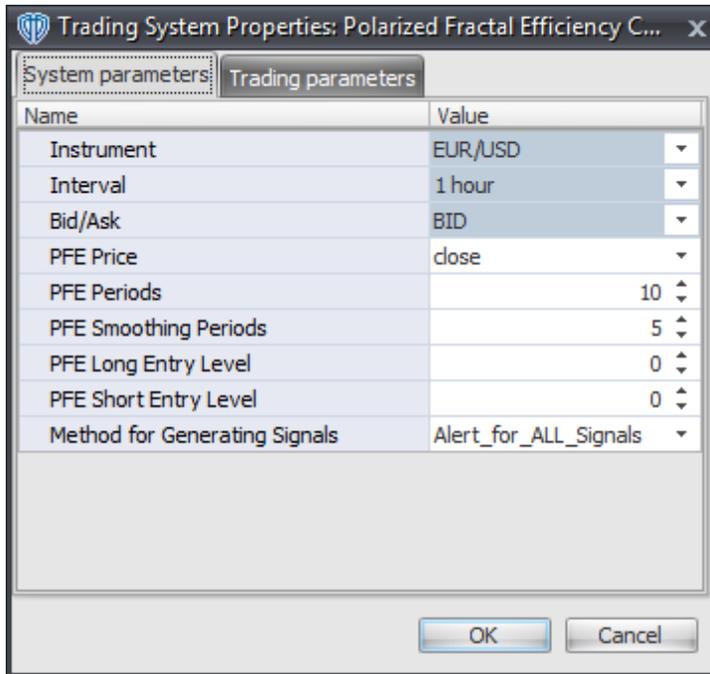
- The Polarized Fractal Efficiency displays in Additional Frame 1 as a solid dark blue line. Its mid-level (0) displays in the same frame as a black dashed line.
- The Polarized Fractal Efficiency's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- The Trend Frame displays a white up arrow against a blue background while the Polarized Fractal Efficiency is greater than zero.
- The Trend Frame displays a white up arrow against a red background while the Polarized Fractal Efficiency is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The Polarized Fractal Efficiency crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The Polarized Fractal Efficiency crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Polarized Fractal Efficiency Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

PFE Price, Periods, and Smoothing Periods

These parameters define the price, number of periods, and number of smoothing periods used to calculate the Polarized Fractal Efficiency.

PFE Long Entry Level

This parameter defines the value used in the Polarized Fractal Efficiency-related conditions to generate the *Long* signal.

PFE Short Entry Level

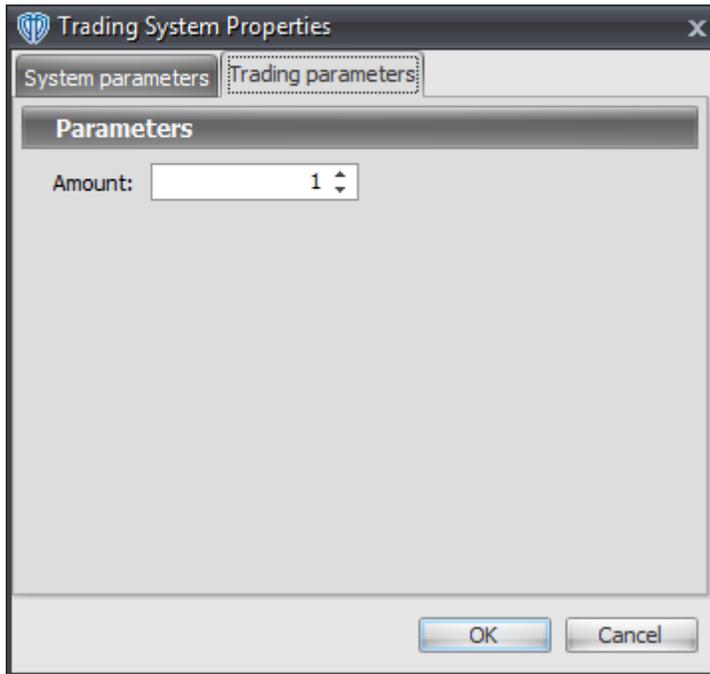
This parameter defines the value used in the Polarized Fractal Efficiency-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.76 Quantitative Qualitative Estimation (QQE) Cross System

Overview

The **Quantitative Qualitative Estimation (QQE) Cross System** uses the Quantitative Qualitative Estimation (QQE) indicator to generate signals for potential trading opportunities. The QQE indicator consists of a smoothed Relative Strength Index (RSI) indicator and two volatility-based trailing levels (*fast and slow*). The Fast Trailing Level (TL) and Slow TL are constructed by calculating the ATR of the smoothed RSI over n -periods and then further smoothing the ATR using an additional n -periods Wilders smoothing function. This smoothed ATR of RSI is then multiplied by the Fast and Slow ATR Multipliers to calculate the final Fast and Slow Trailing Levels (TL's).

The signals are generated using the following logic:

A *Long Entry* signal is generated by your choice of: the QQE crossing above the Fast TL OR the QQE crossing above the Slow TL OR the Fast TL crossing above the Slow TL.

A *Long Exit* signal is generated by your choice of: the QQE crossing below the Fast TL OR the QQE crossing below the Slow TL OR the Fast TL crossing below the Slow TL.

A *Short Entry* signal is generated by your choice of: the QQE crossing below the Fast TL OR the QQE crossing below the Slow TL OR the Fast TL crossing below the Slow TL.

A *Short Exit* signal is generated by your choice of: the QQE crossing above the Fast TL OR the QQE crossing above the Slow TL OR the Fast TL crossing above the Slow TL.

If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", supplemental QQE long and short alerts are provided.

Supplemental long signals are generated when either of the two conditions **not** chosen to generate the *Long Entry* signal occur. For example, if the condition chosen for the *Long Entry* signal is "QQE crosses above the Fast TL" then the supplemental long signals are generated when the QQE crosses above the Slow TL OR the Fast TL crosses above the Slow TL.

Supplemental short signals are generated when either of the two conditions **not** chosen to generate the *Short Entry* signal occur. For example, if the condition chosen for the *Short Entry* signal is "QQE crosses below the Fast TL" then the supplemental short signals are generated when the QQE crosses below the Slow TL OR the Fast TL crosses below the Slow TL.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the *Long Entry*, *Long Exit*, *Short Entry*, and *Short Exit* signals even if the "Provide Supplemental Alert Signals?" input selection is set to "Yes".

System Outputs and Signals Logic

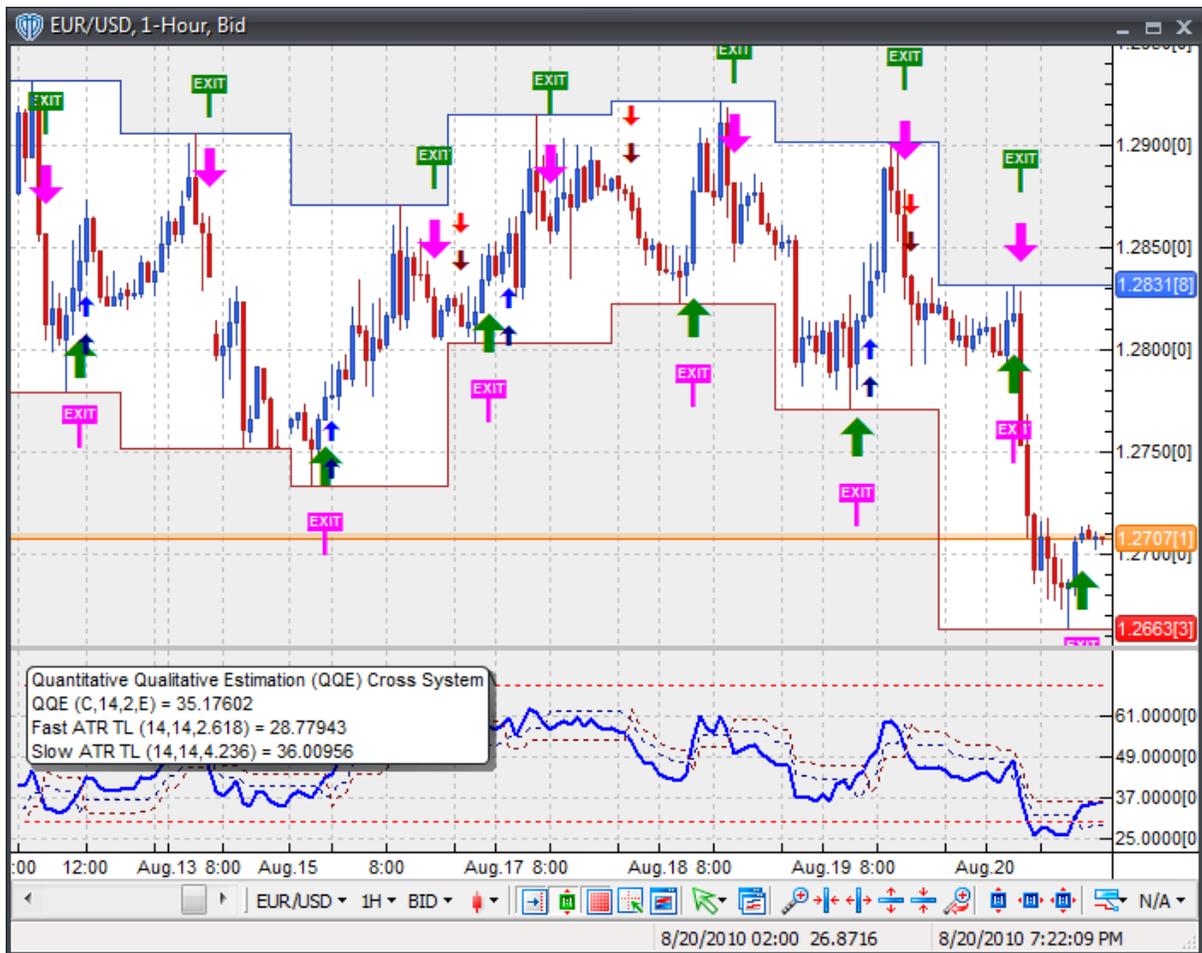
The **Quantitative Qualitative Estimation (QQE) Cross System** consists of the following output variables and display parameters:

- The QQE's Smoothed Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid blue line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines.
- The QQE's Fast Trailing Level displays in Additional Frame 1 as a thin, dashed, dark blue line.
- The QQE's Slow Trailing Level displays in Additional Frame 1 as a thin, dashed, dark red line.
- When a *Long Entry* signal is generated a green up arrow graphic displays in the chart window, the message "Long entry signal detected! Your specified QQE condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a green exit graphic displays in the chart window, the message "Long exit signal detected! Your specified QQE condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters

defined in the Trading System Properties window's Trading Parameters tab.

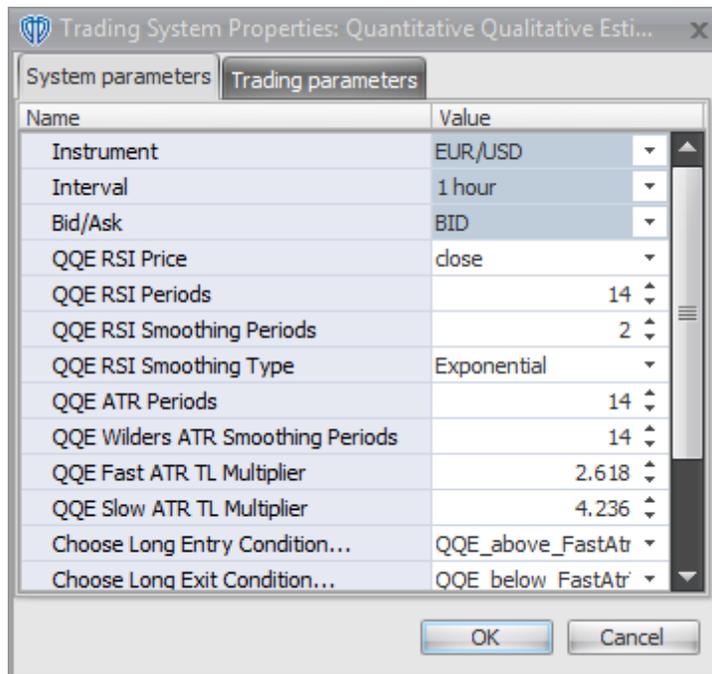
- When a *Short Entry* signal is generated a pink down arrow graphic displays in the chart window, the message "Short entry signal detected! Your specified QQE condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a pink exit graphic displays in the chart window, the message "Short exit signal detected! Your specified QQE condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "QQE crosses above the Fast TL" long signal is generated a small, light blue up arrow graphic displays in the chart window, the message "QQE crossed above Fast ATR Trailing Level!" displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "QQE crosses above the Slow TL" long signal is generated a small, blue up arrow graphic displays in the chart window, the message "QQE crossed above Slow ATR Trailing Level." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when when a supplemental "Fast TL crosses above the Slow TL" long signal is generated a small, dark blue up arrow graphic displays in the chart window, the message "QQE Fast ATR Trailing Level crossed above QQE Slow ATR Trailing Level." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "QQE crosses below the Fast TL" short signal is generated a small, light red down arrow graphic displays in the chart window, the message "QQE crossed above Fast ATR Trailing Level!" displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "QQE crosses below the Slow TL" short signal is generated a small, red down arrow graphic displays in the chart window, the message "QQE crossed below Slow ATR Trailing Level." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "Fast TL crosses below the Slow TL" short signal is generated a small, dark red down arrow graphic displays in the chart window, the message "QQE Fast ATR Trailing Level crossed below QQE Slow ATR Trailing Level." displays in the Trading Activity window, and an audio sound file plays.

Below is a screenshot that shows the **Quantitative Qualitative Estimation (QQE) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

QQE RSI Price, RSI Periods, RSI Smoothing Periods, and RSI Smoothing Type

These parameters define the price, number of periods, number of smoothing periods, type of moving average used to calculate the smoothed RSI component of the QQE indicator.

QQE ATR Periods and QQE Wilders ATR Smoothing Periods

These parameters define the number of ATR periods and number of ATR smoothing periods used to calculate the smoothed average true range (ATR) component of the QQE indicator that is then further used to calculate the Fast Trailing Level and Slow Trailing level components.

QQE Fast ATR TL Multiplier

This parameter defines the average true range (ATR) multiplier value used to calculate the Fast Trailing Level component of the QQE indicator.

QQE Slow ATR TL Multiplier

This parameter defines the average true range (ATR) multiplier value used to calculate the Slow Trailing Level component of the QQE indicator.

Choose Long Entry Condition...

This parameter defines the condition used to generate the *Long Entry* signal. Please refer to the

Overview section above for details.

Choose Long Exit Condition...

This parameter defines the condition used to generate the *Long Exit* signal. Please refer to the *Overview* section above for details.

Choose Short Entry Condition...

This parameter defines the condition used to generate the *Short Entry* signal. Please refer to the *Overview* section above for details.

Choose Short Exit Condition...

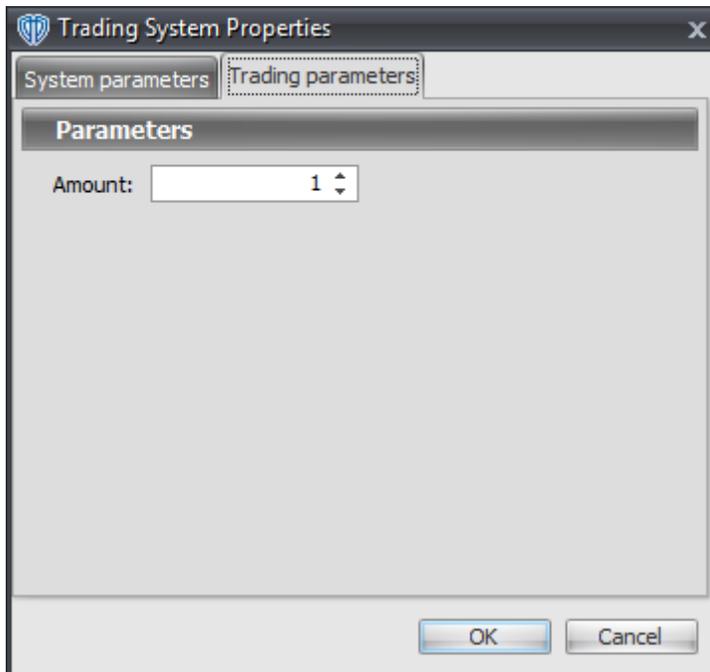
This parameter defines the condition used to generate the *Short Exit* signal. Please refer to the *Overview* section above for details.

Provide Supplemental Alert Signals?

This parameter defines if the trading system provides additional, supplemental QQE long and short alerts. Please refer to the *Overview* and *System Outputs and Signals Logic* sections above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.77 Rate of Change (ROC) Cross System

Overview

The **Rate of Change (ROC) Cross System** uses the Rate of Change (ROC) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Rate of Change crosses above zero.

A *Short* signal is generated when the Rate of Change crosses below zero.

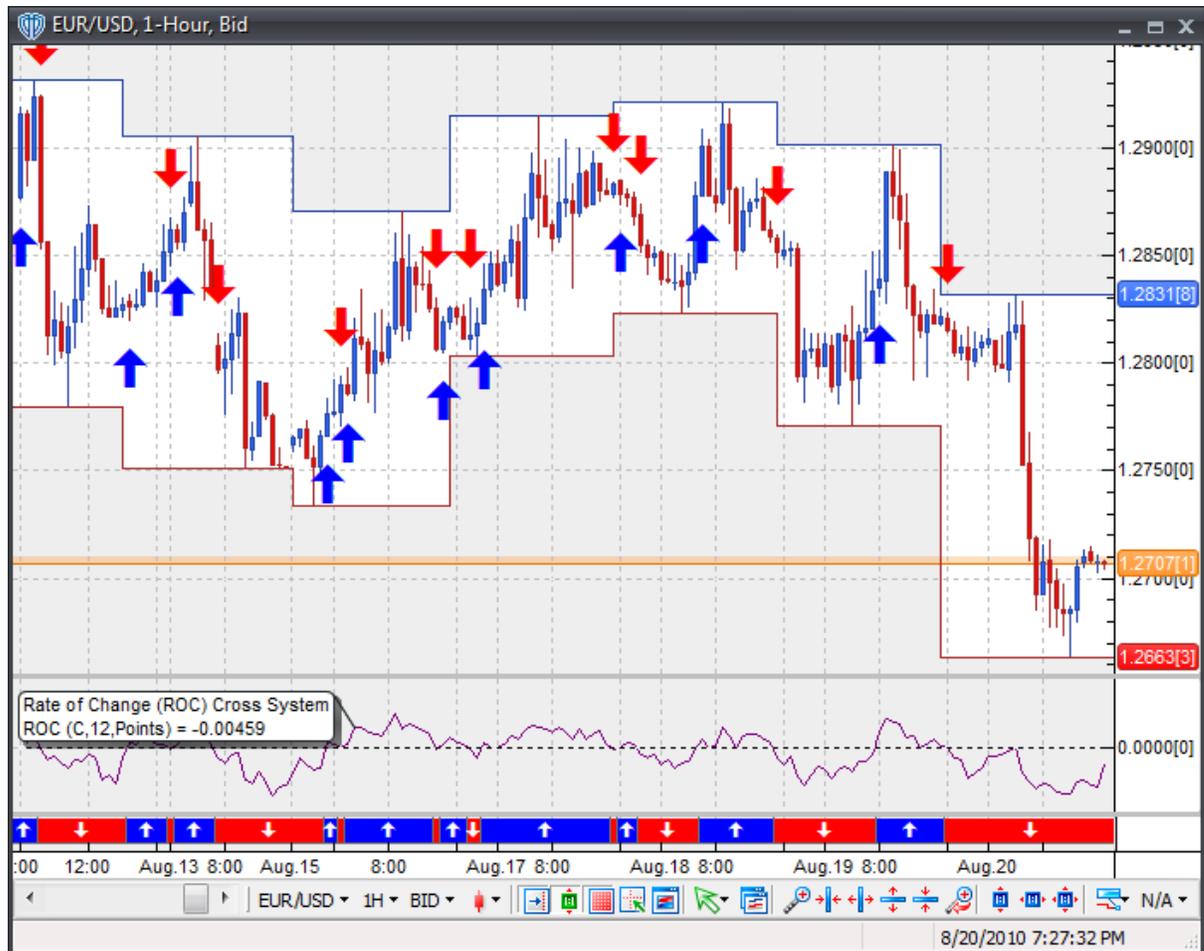
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Rate of Change (ROC) Cross System** consists of the following output variables and display parameters:

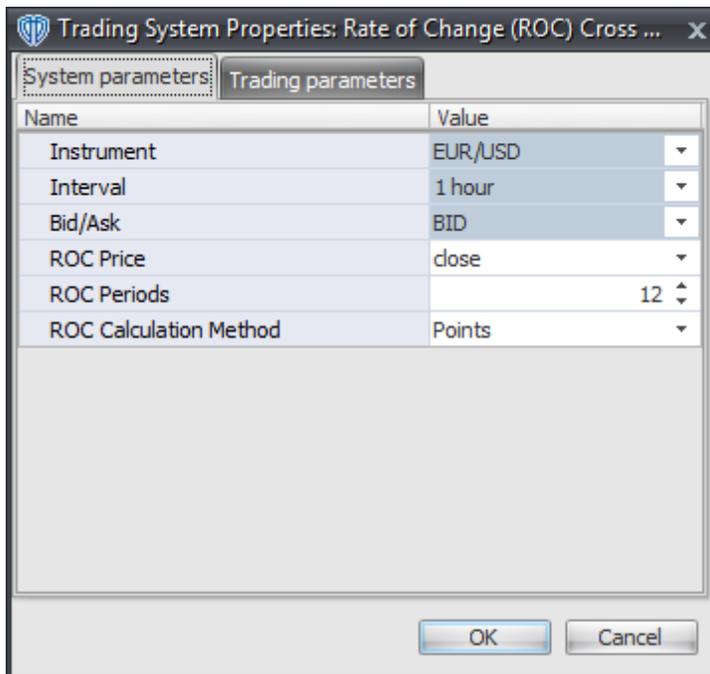
- Rate of Change displays in Additional Frame 1 as a thin, solid, purple line. Its mid-level (0) displays in the same frame as a dashed black line.
- The Trend Frame displays a white up arrow against a blue background while Momentum is greater than zero.
- The Trend Frame displays a white down arrow against a red background while Momentum is less than zero.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The ROC crossed above zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The ROC crossed below zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Rate of Change (ROC) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

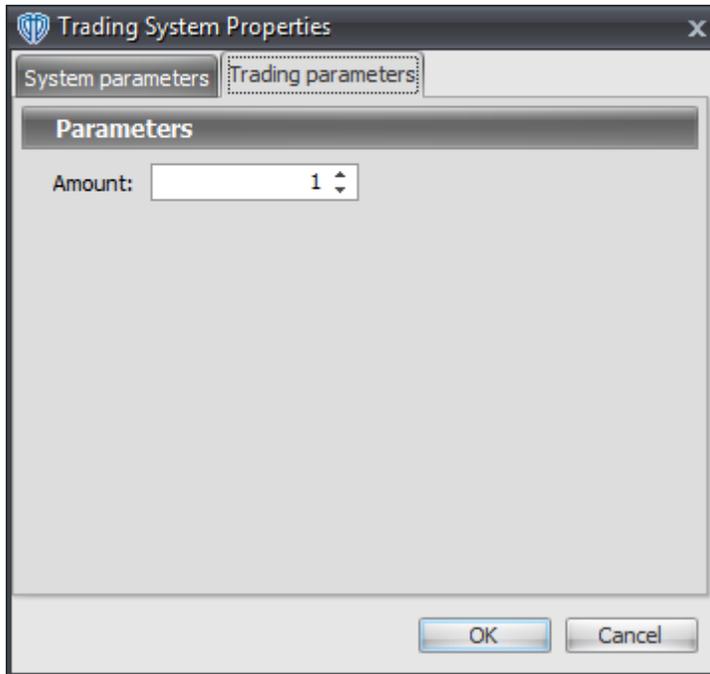
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

ROC Price, Periods, Calculation Method

These parameters define the price, number of periods, and method used to calculate the Rate of Change.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.78 Relative Momentum Index Cross System

Overview

The **Relative Momentum Index Cross System** uses the Relative Momentum Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Relative Momentum Index crosses above its Long Entry Level.

A *Short* signal is generated when the Relative Momentum Index crosses below its Short Entry Level.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Relative Momentum Index Cross System** consists of the following output variables and display parameters:

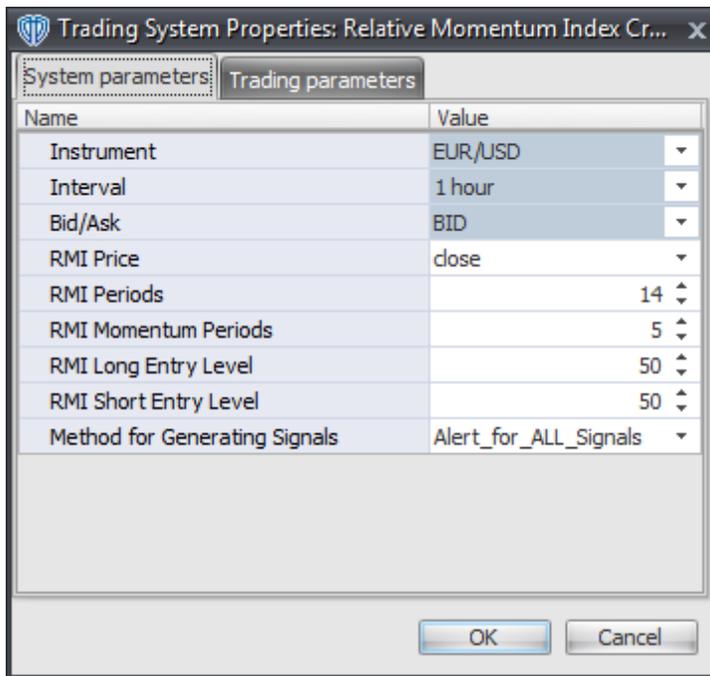
- The Relative Momentum Index displays in Additional Frame 1 as a slightly thicker, solid green line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Relative Momentum Index's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The RMI crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The RMI crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Relative Momentum Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RMI Price, Periods, and Momentum Periods

These parameters define the values used to calculate the Relative Momentum Index.

RMI Long Entry Level

This parameter defines the value used in the Relative Momentum Index-related conditions to generate the *Long* signal.

RMI Short Entry Level

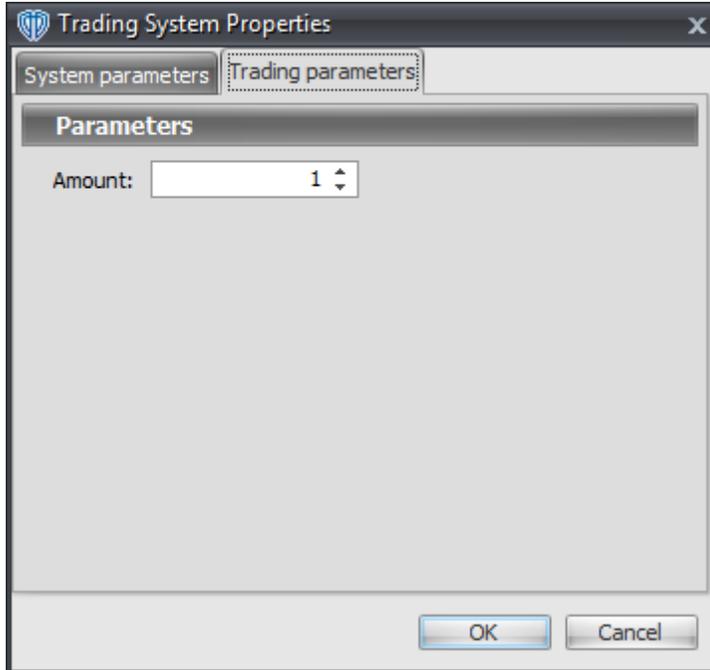
This parameter defines the value used in the Relative Momentum Index-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.79 Relative Momentum Index Reversal System

Overview

The **Relative Momentum Index Reversal System** uses the Relative Momentum Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Relative Momentum Index crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Relative Momentum Index crosses below its OverBought Level, Mid-Level, or OverSold Level from above.

A *Short Entry* signal is generated when the Relative Momentum Index crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Relative Momentum Index crosses above its OverSold Level,

Mid-Level, or OverBought Level from below.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

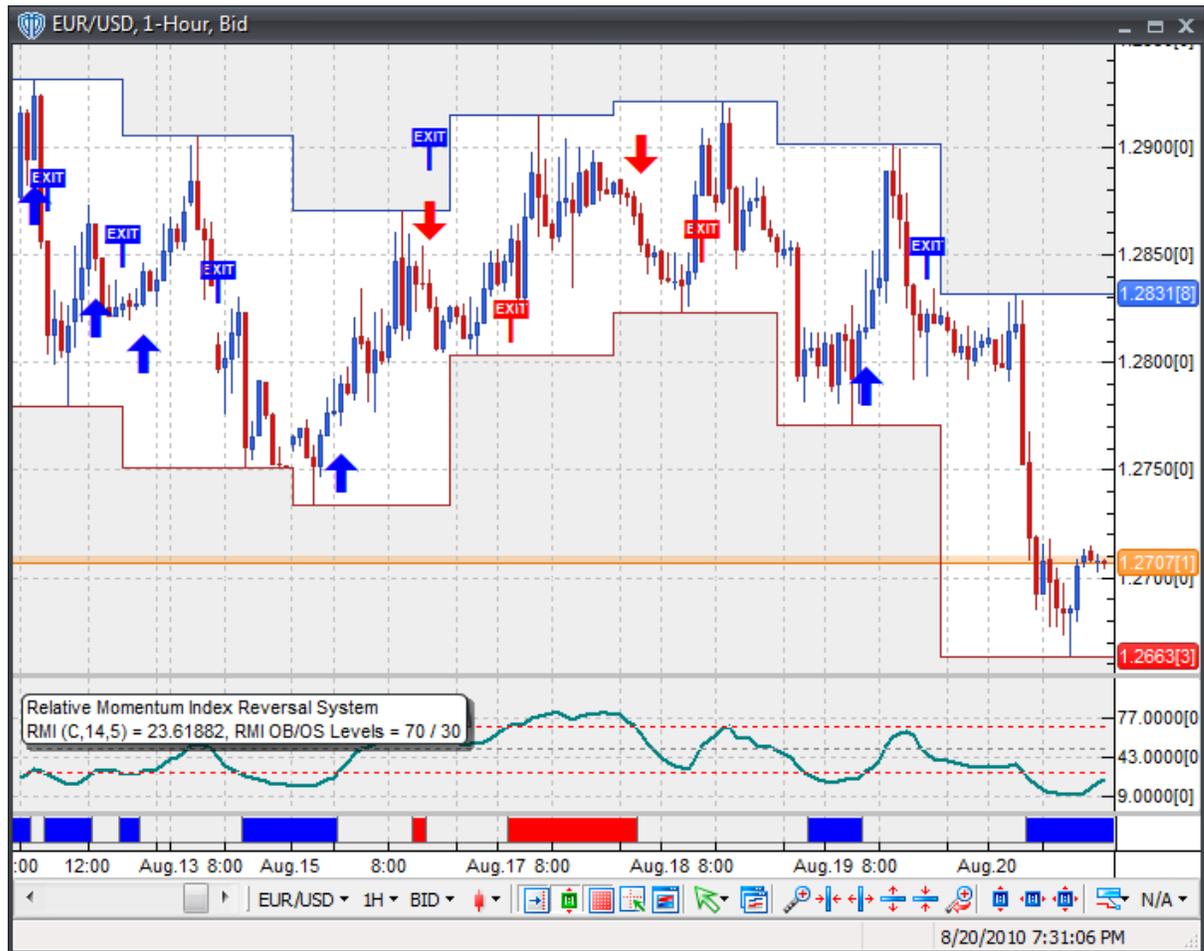
System Outputs and Signals Logic

The **Relative Momentum Index Reversal System** consists of the following output variables and display parameters:

- The Relative Momentum Index displays in Additional Frame 1 as a slightly thicker, solid, green line.
- The Relative Momentum Index OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue background while the Relative Momentum Index is less than its OverSold Level.
- The Trend Frame displays a red background while the Relative Momentum Index is greater than its OverBought Level.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The RMI crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The RMI crossed below its OverBought Level, Mid Level, or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The RMI crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The RMI crossed above its OverSold Level, Mid Level, or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

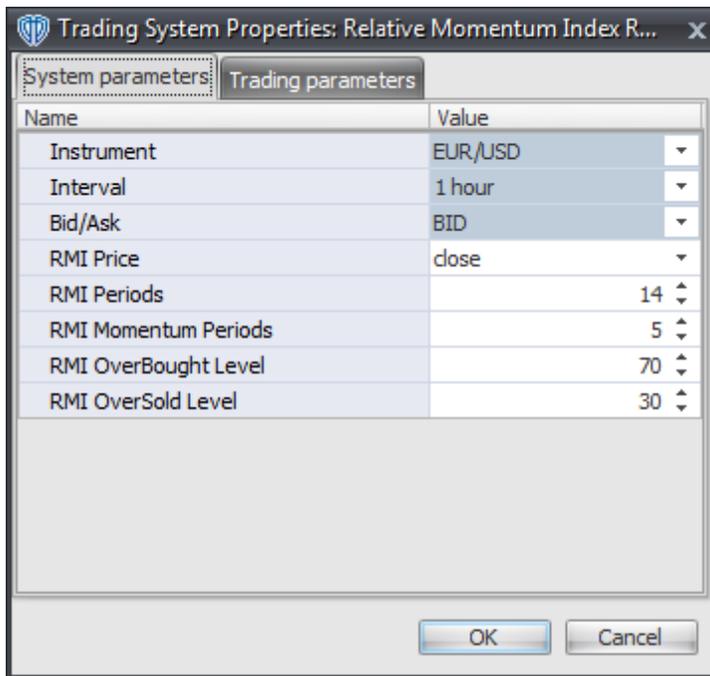
Below is a screenshot that shows the **Relative Momentum Index Reversal System** attached to a

chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RMI Price, Periods, and Momentum Periods

These parameters define the values used to calculate the Relative Momentum Index.

RMI OverBought Level

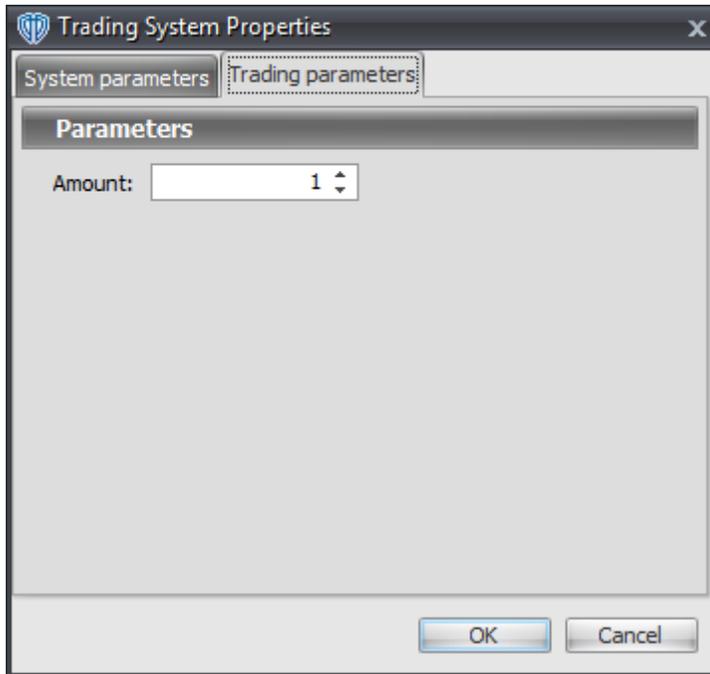
This parameter defines the OverBought value used in the Relative Momentum Index-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

RMI OverSold Level

This parameter defines the OverSold value used in the Relative Momentum Index-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.80 Relative Strength Index (RSI) Cross System

Overview

The **Relative Strength Index (RSI) Cross System** uses the Relative Strength Index (RSI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Relative Strength Index crosses above its Long Entry Level.

A *Short* signal is generated when the Relative Strength Index crosses below its Short Entry Level.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Relative Strength Index (RSI) Cross System** consists of the following output variables and display parameters:

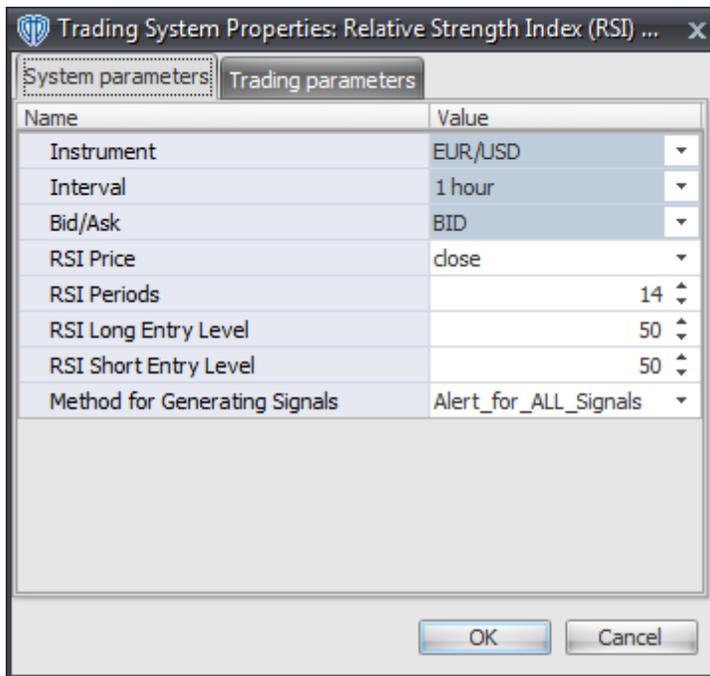
- The Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid green line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Relative Strength Index's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The RSI crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The RSI crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Relative Strength Index (RSI) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RSI Price and RSI Periods

These parameters define the price and number of periods used to calculate the Relative Strength Index.

RSI Long Entry Level

This parameter defines the value used in the Relative Strength Index-related conditions to generate the *Long* signal.

RSI Short Entry Level

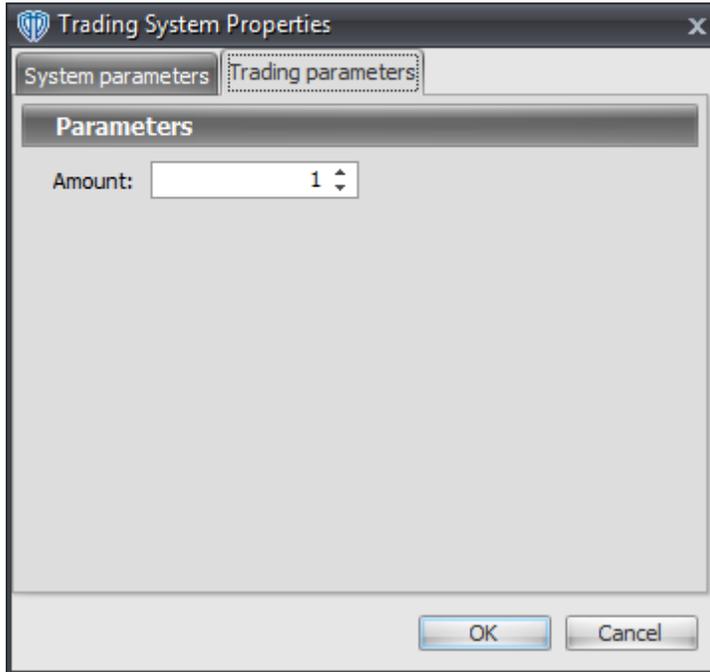
This parameter defines the value used in the Relative Strength Index-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.81 Relative Strength Index (RSI) Reversal System

Overview

The **Relative Strength Index (RSI) Reversal System** uses the Relative Strength Index (RSI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Relative Strength Index crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Relative Strength Index crosses below its OverBought Level, Mid-Level, or OverSold Level from above.

A *Short Entry* signal is generated when the Relative Strength Index crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Relative Strength Index crosses above its OverSold Level, Mid-Level, or OverBought Level from below.

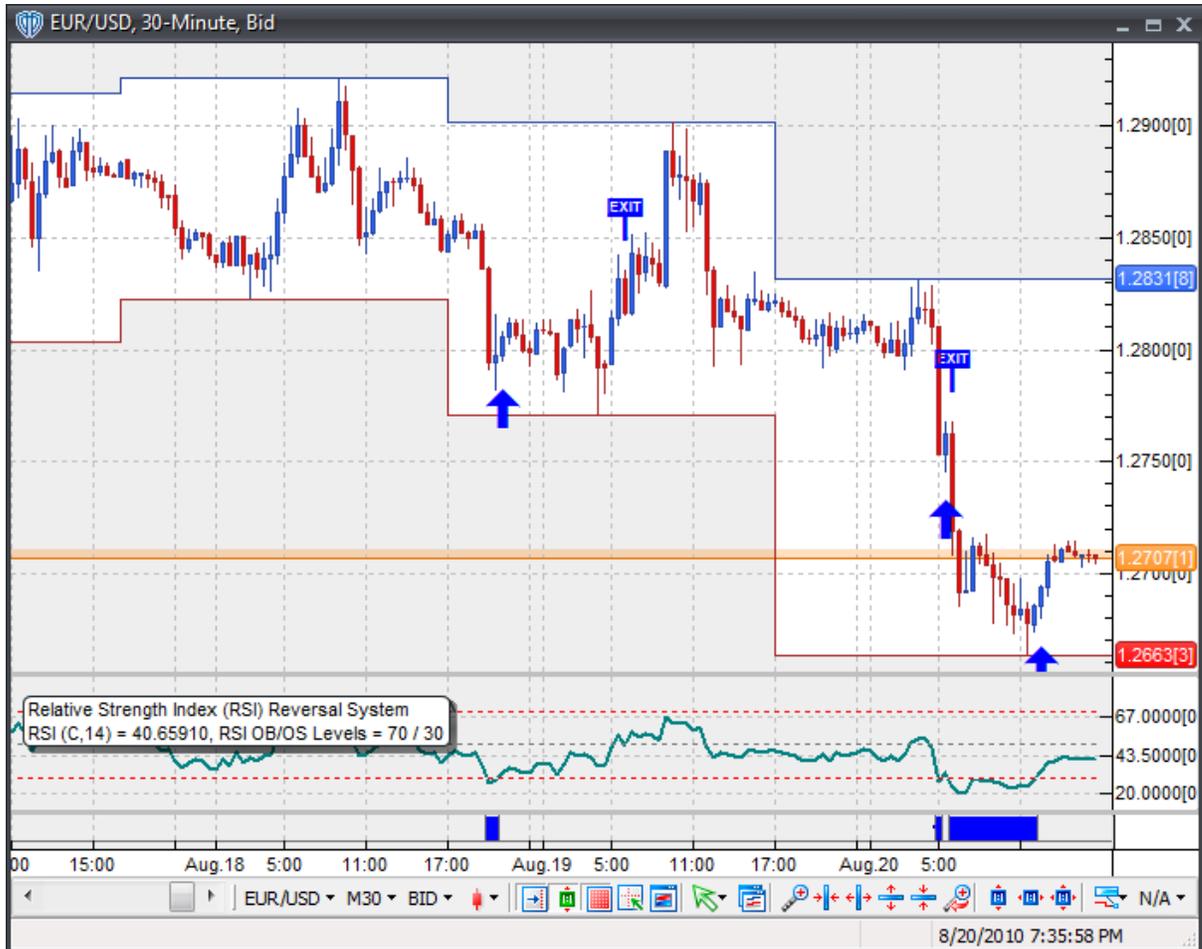
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Relative Strength Index (RSI) Reversal System** consists of the following output variables and display parameters:

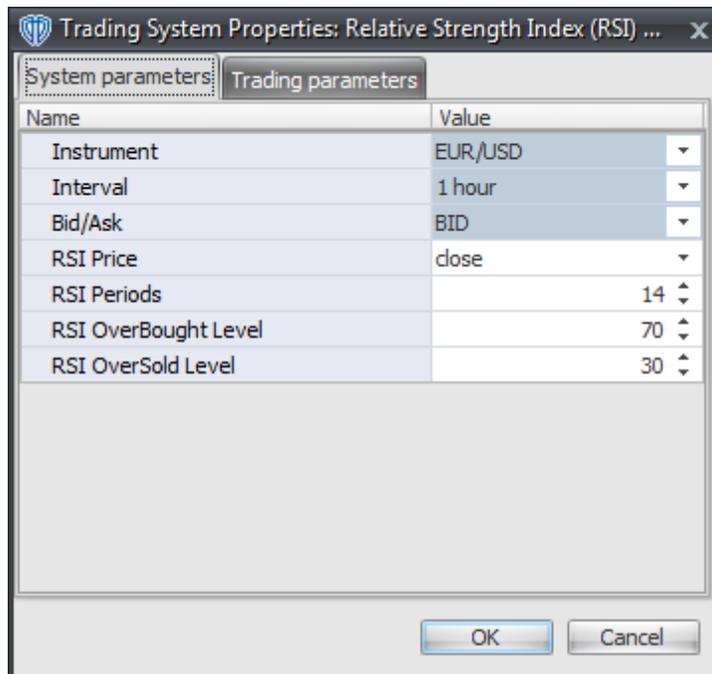
- The Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid, green line. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Relative Strength Index OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue background while the Relative Strength Index is less than its OverSold Level.
- The Trend Frame displays a red background while the Relative Strength Index is greater than its OverBought Level.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The RSI crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The RSI crossed below its OverBought Level, Mid Level, or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The RSI crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The RSI crossed above its OverSold Level, Mid Level, or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Relative Strength Index (RSI) Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RSI Price and RSI Periods

These parameters define the price and number of periods used to calculate the Relative Strength Index.

RSI OverBought Level

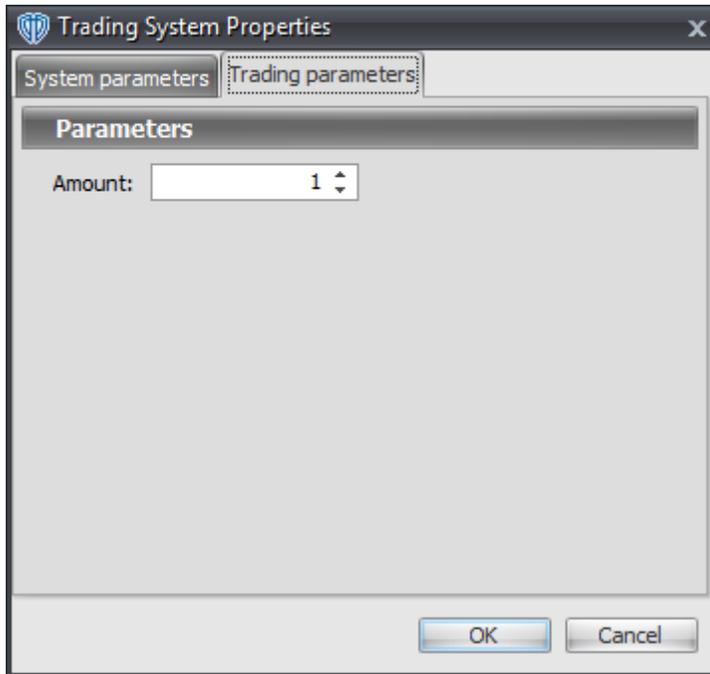
This parameter defines the OverBought value used in the Relative Strength Index-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

RSI OverSold Level

This parameter defines the OverSold value used in the Relative Strength Index-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.82 Relative Volatility Index (RVI) Cross System

Overview

The **Relative Volatility Index (RVI) Cross System** uses the Relative Volatility Index (RVI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Relative Volatility Index crosses above its Long Entry Level.

A *Short* signal is generated when the Relative Volatility Index crosses below its Short Entry Level.

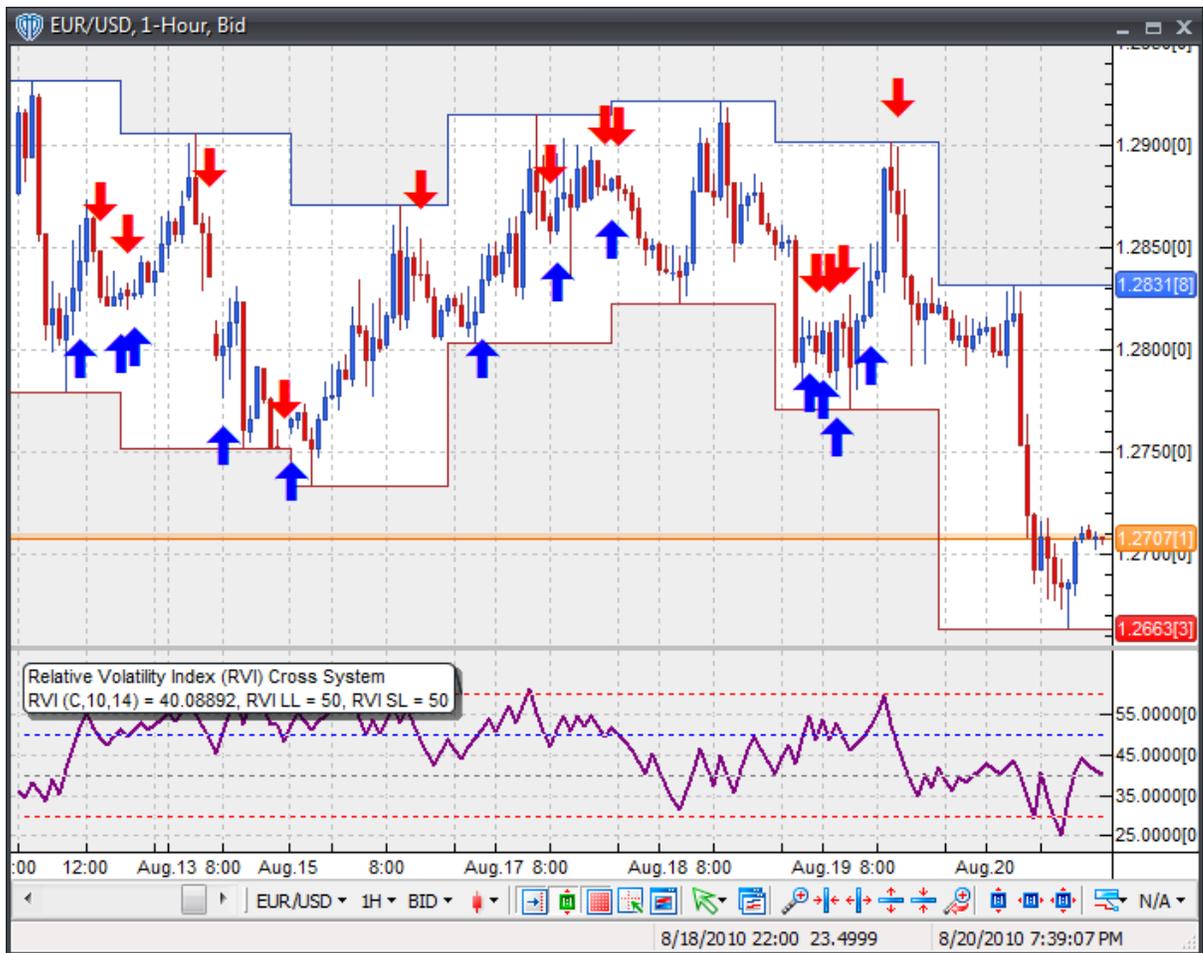
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Relative Volatility Index (RVI) Cross System** consists of the following output variables and display parameters:

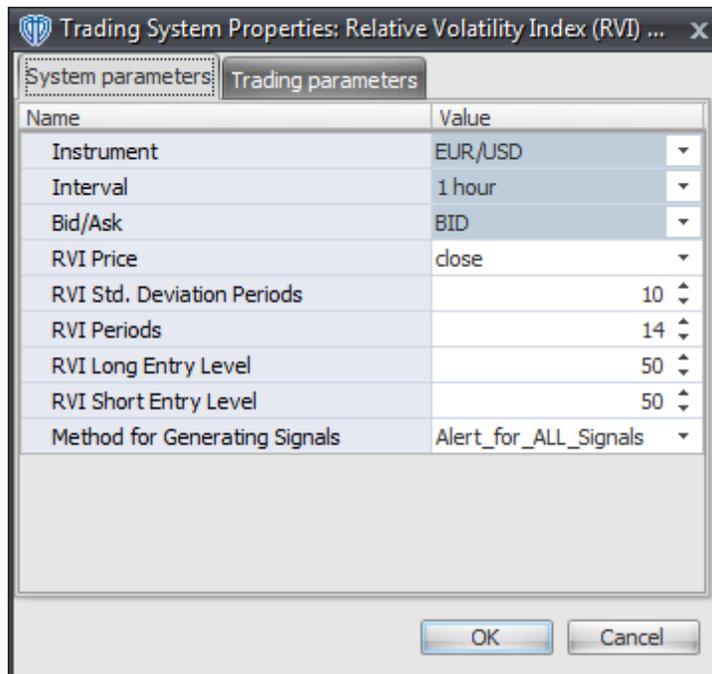
- The Relative Volatility Index displays in Additional Frame 1 as a slightly thicker, solid purple line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Relative Volatility Index's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The RVI crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The RVI crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Relative Volatility Index (RVI) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RVI Price, Std. Deviation Periods, and RVI Periods

These parameters define the price, number of standard deviation periods, and number of periods used to calculate the Relative Volatility Index.

RVI Long Entry Level

This parameter defines the value used in the Relative Volatility Index-related conditions to generate the *Long* signal.

RVI Short Entry Level

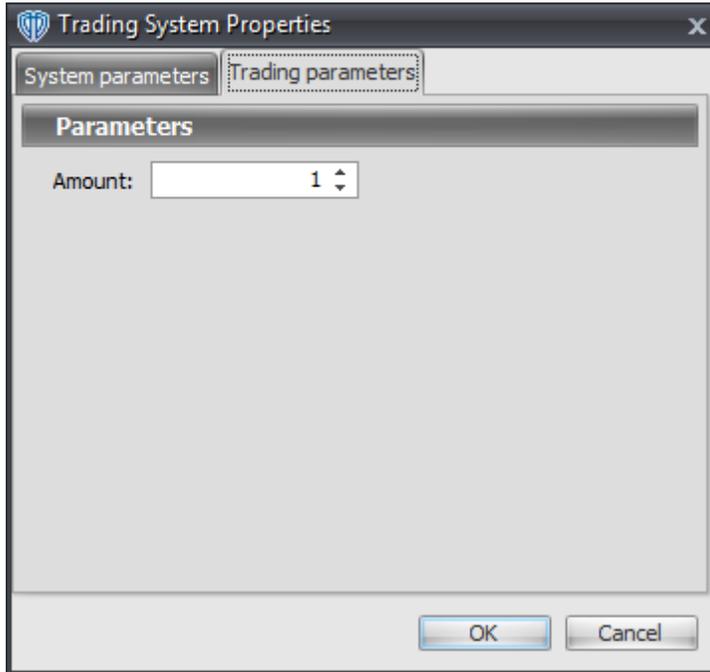
This parameter defines the value used in the Relative Volatility Index-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.83 Relative Volatility Index (RVI) Reversal System

Overview

The **Relative Volatility Index (RVI) Reversal System** uses the Relative Volatility Index (RVI) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Relative Volatility Index crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Relative Volatility Index crosses below its OverBought Level, Mid-Level, or OverSold Level from above.

A *Short Entry* signal is generated when the Relative Volatility Index crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Relative Volatility Index crosses above its OverSold Level, Mid-Level, or OverBought Level from below.

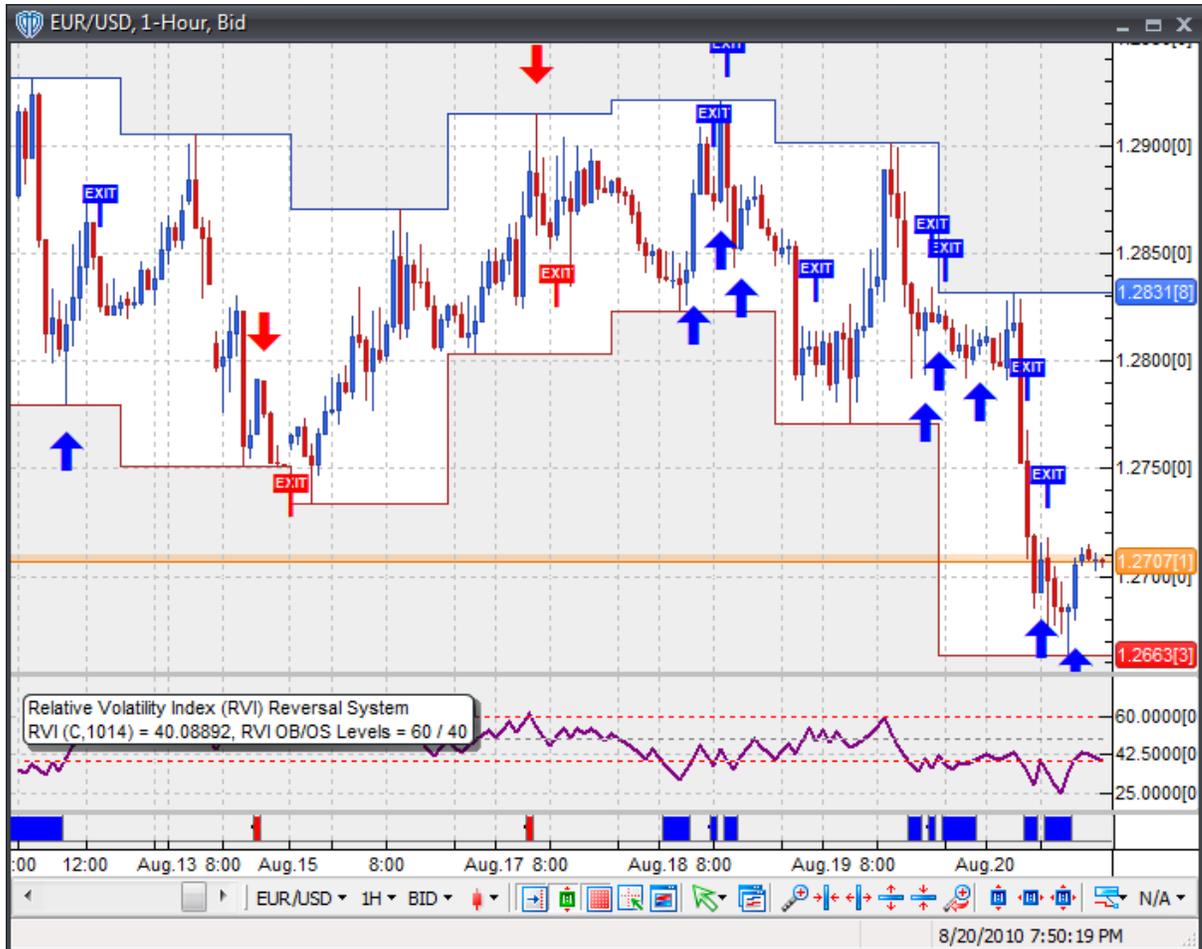
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Relative Volatility Index (RVI) Reversal System** consists of the following output variables and display parameters:

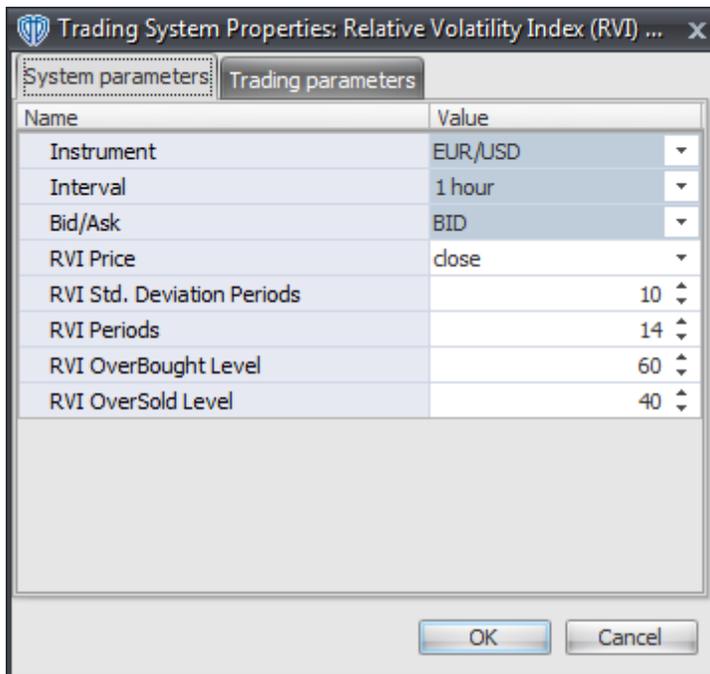
- The Relative Volatility Index displays in Additional Frame 1 as a slightly thicker, solid, purple line. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Relative Volatility Index OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue background while the Relative Volatility Index is less than its OverSold Level.
- The Trend Frame displays a red background while the Relative Volatility Index is greater than its OverBought Level.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The RVI crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The RVI crossed below its OverBought Level, Mid Level, or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The RVI crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The RVI crossed above its OverSold Level, Mid Level, or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Relative Volatility Index (RVI) Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RVI Price, Std. Deviation Periods, and RVI Periods

These parameters define the price, number of standard deviation periods, and number of periods used to calculate the Relative Volatility Index.

RVI OverBought Level

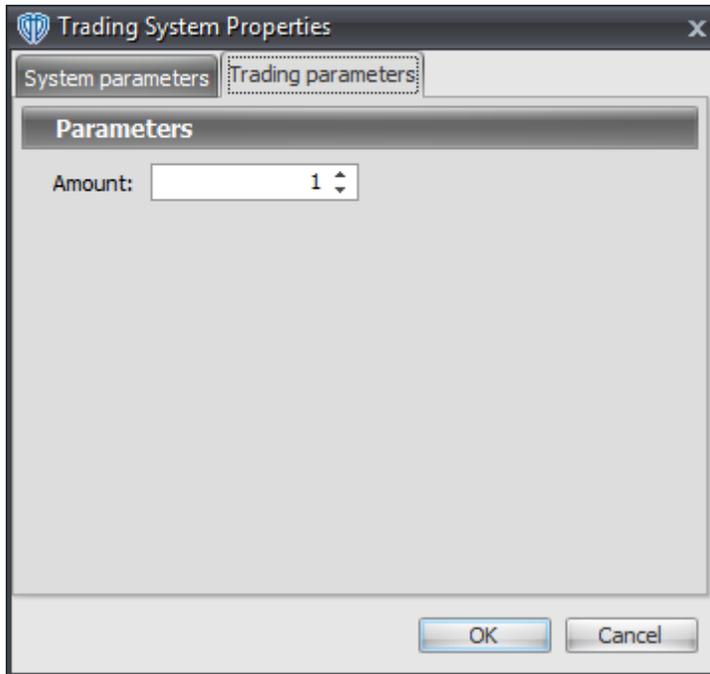
This parameter defines the OverBought value used in the Relative Volatility Index-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

RVI OverSold Level

This parameter defines the OverSold value used in the Relative Volatility Index-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.84 RSI Bollinger Bands Breakout System

Overview

The **RSI Bollinger Bands Breakout System** uses the Relative Strength Index (RSI) and Bollinger Bands based on the RSI to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the RSI crosses above its upper Bollinger Band. If the "Require RSI Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long Entry* signal is generated when the RSI is above its upper Bollinger Band AND the RSI is greater than its value of one bar ago AND the RSI crossed above its upper Bollinger Band one bar ago.

A *Long Exit* signal is generated when the RSI crosses below its middle Bollinger Band.

A *Short Entry* signal is generated when the RSI crosses below its lower Bollinger Band. If the "Require RSI Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short Entry* signal is generated when the RSI is below its lower Bollinger Band AND the RSI is less than its value of one bar ago AND the RSI crossed below its lower Bollinger Band one bar ago.

A *Short Exit* signal is generated when the RSI crossed above its middle Bollinger Band.

If the "Provide Supplemental Entry Alert Signals?" input parameter (*see description below*) is set to

"Yes", supplemental RSI Bollinger Bands long entry and short entry alerts are provided.

Supplemental long entry signals are generated using the same conditions as the *Long Entry* signal. However, these supplemental long entry signals are only generated after the initial *Long Entry* signal is generated and before its corresponding *Long Exit* signal is generated.

Supplemental short entry signals are generated using the same conditions as the *Short Entry* signal. However, these supplemental short entry signals are only generated after the initial *Short Entry* signal is generated and before its corresponding *Short Exit* signal is generated.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the *Long Entry*, *Long Exit*, *Short Entry*, and *Short Exit* signals even if the "Provide Supplemental Entry Alert Signals?" input selection is set to "Yes".

System Outputs and Signals Logic

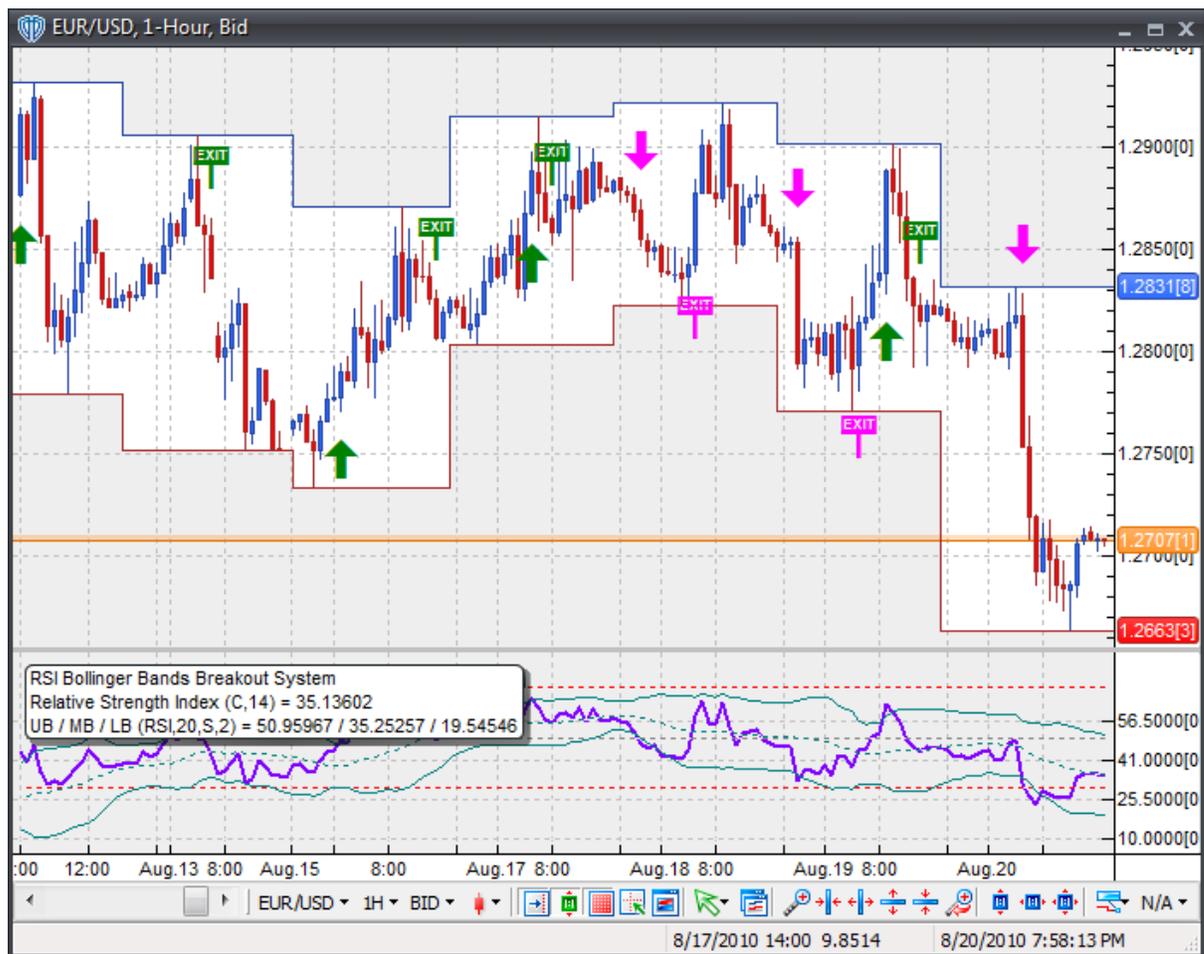
The **RSI Bollinger Bands Breakout System** consists of the following output variables and display parameters:

- The Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid purple line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The upper and lower RSI Bollinger Bands display in Additional Frame 1 as thin, solid, green lines. The middle RSI Bollinger Band displays in the same as a thin, dashed, green line.
- When a *Long Entry* signal is generated a green up arrow graphic displays in the chart window, the message "Long entry signal detected! RSI has broken out above its Upper Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a green exit graphic displays in the chart window, the message "Long exit signal detected! RSI crossed below its Middle Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! RSI has broken out below its Lower Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a pink exit graphic displays in the chart window, the message "Short exit signal detected! RSI has crossed above its Middle Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled*

automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

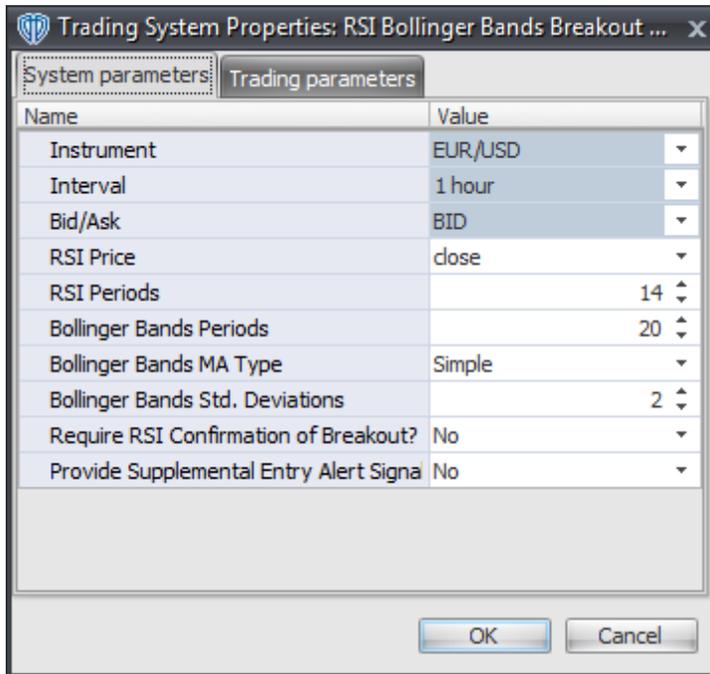
- If the "Provide Supplemental Entry Alert Signals?" input parameter (see description below) is set to "Yes", when a supplemental long entry signal is generated a small, green up arrow graphic displays in the chart window, the message "Additional long entry signal detected! RSI has broken out above its Upper Bollinger Band again." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Entry Alert Signals?" input parameter (see description below) is set to "Yes", when a supplemental short entry signal is generated a small, pink down arrow graphic displays in the chart window, the message "Additional short entry signal detected! RSI has broken out below its Lower Bollinger Band again." displays in the Trading Activity window, and an audio sound file plays.

Below is a screenshot that shows the **RSI Bollinger Bands Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RSI Price and RSI Periods

These parameters define the price and number of periods used to calculate the Relative Strength Index.

Bollinger Bands Periods, MA Type, and Std. Deviations

These parameters define the number of periods, MA Type, and number of standard deviations used to calculate the Bollinger Bands based on the Relative Strength Index.

Require RSI Confirmation of Breakout?

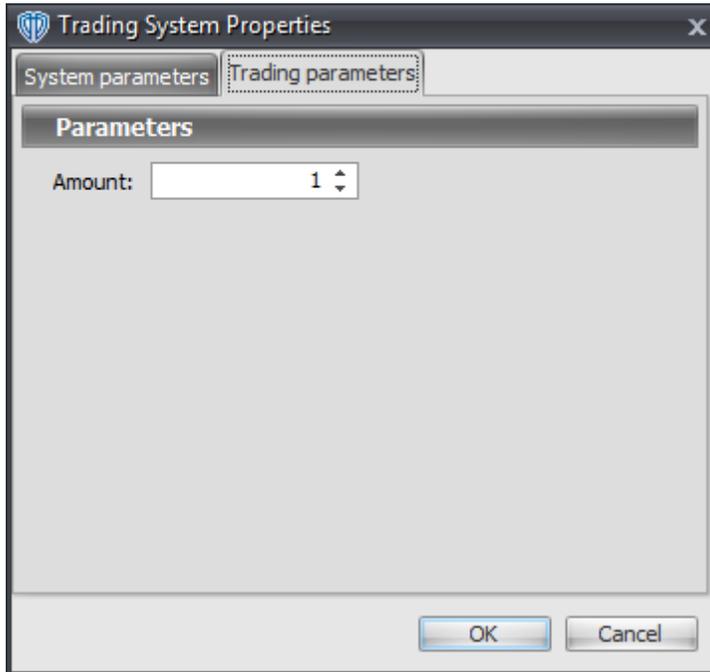
This parameter changes the conditions necessary to generate the *Long Entry* and *Short Entry* signals. Please refer to the *Overview* section above for details.

Provide Supplemental Entry Alert Signals?

This parameter defines if the trading system provides additional, supplemental RSI Bollinger Bands long entry and short entry alerts. Please refer to the *Overview* and *System Outputs and Signals Logic* sections above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.85 RSI Bollinger Bands Reversal System

Overview

The **RSI Bollinger Bands Reversal System** uses the Relative Strength Index (RSI) and Bollinger Bands based on the RSI to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the RSI crosses above its lower Bollinger Band from below.

A *Short* signal is generated when the RSI crosses below its upper Bollinger Band from above.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode

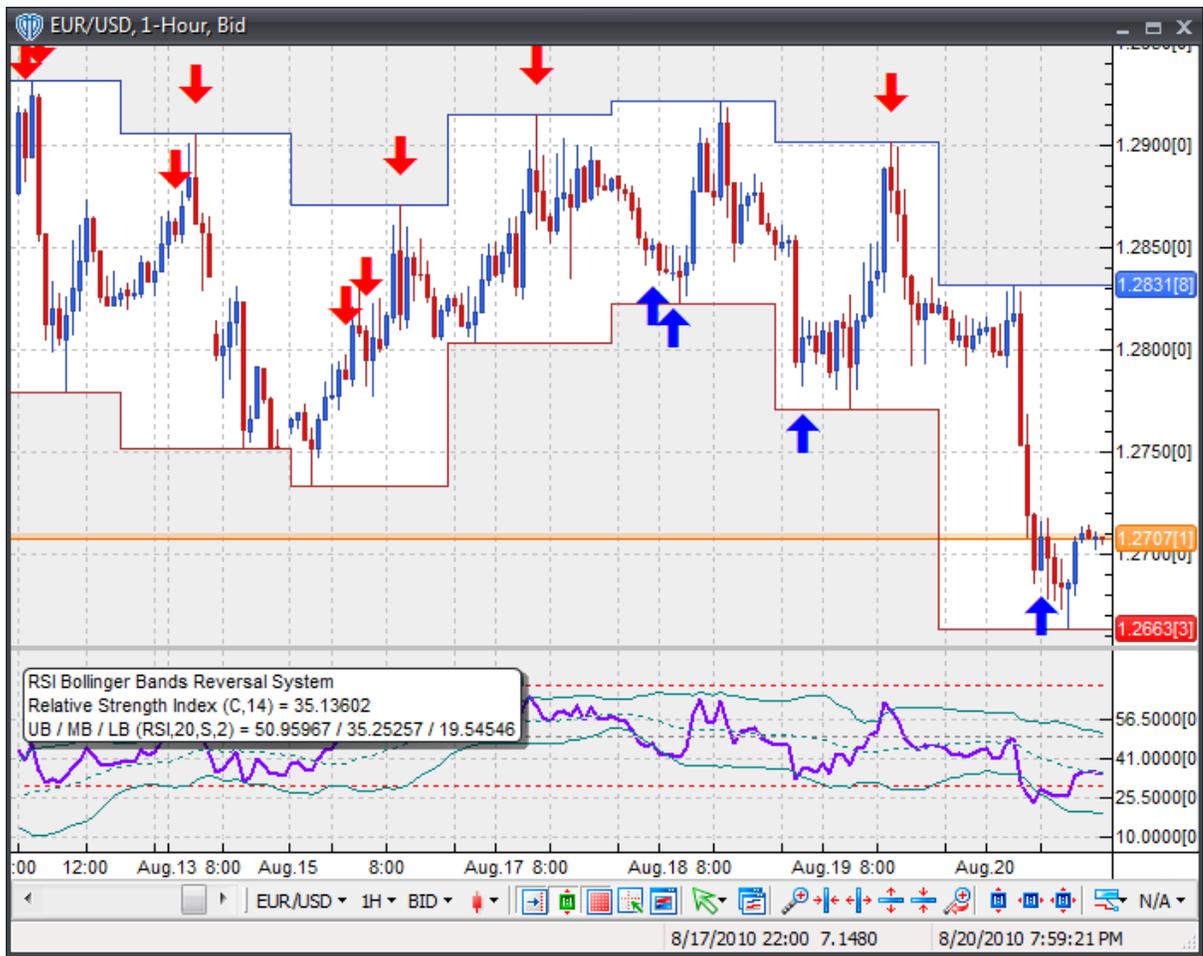
always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **RSI Bollinger Bands Reversal System** consists of the following output variables and display parameters:

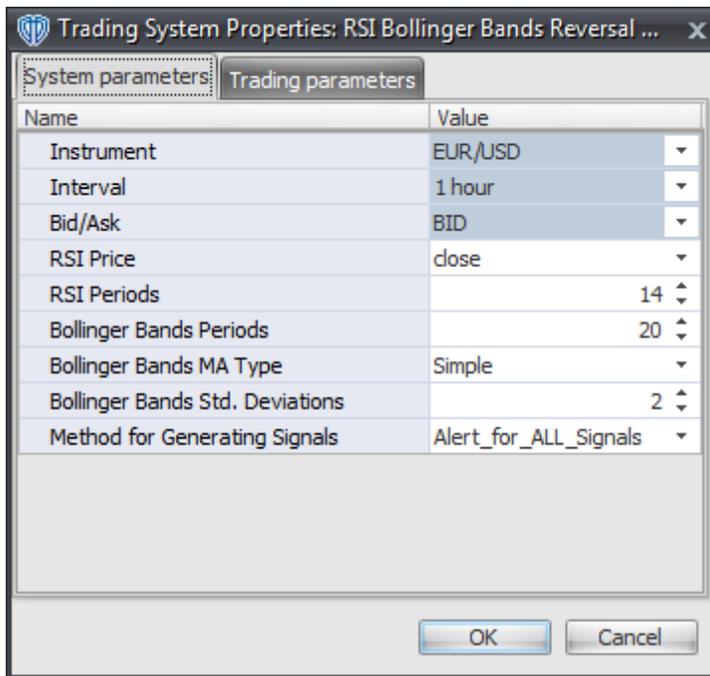
- The Relative Strength Index displays in Additional Frame 1 as a slightly thicker, solid purple line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The upper and lower RSI Bollinger Bands display in Additional Frame 1 as thin, solid, green lines. The middle RSI Bollinger Band displays in the same as a thin, dashed, green line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! RSI is potentially reversing from Lower Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! RSI is potentially reversing from the Upper Bollinger Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **RSI Bollinger Bands Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RSI Price and RSI Periods

These parameters define the price and number of periods used to calculate the Relative Strength Index.

Bollinger Bands Periods, MA Type, and Std. Deviations

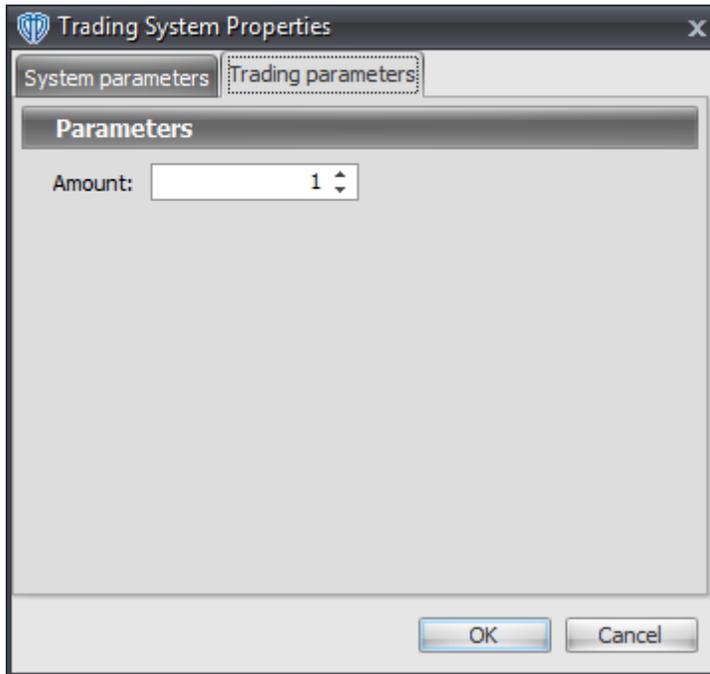
These parameters define the number of periods, MA Type, and number of standard deviations used to calculate the Bollinger Bands based on the Relative Strength Index.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.86 RSI Moving Averages Cross System

Overview

The **RSI Moving Averages Cross System** uses the Relative Strength Index (RSI) indicator along with fast and slow moving averages of the RSI indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated by your choice of: the RSI crossing above the Fast RSI Moving Average OR the RSI crossing above the Slow RSI Moving Average OR the Fast RSI Moving Average crossing above the Slow RSI Moving Average.

A *Long Exit* signal is generated by your choice of: the RSI crossing below the Fast RSI Moving Average OR the RSI crossing below the Slow RSI Moving Average OR the Fast RSI Moving Average crossing below the Slow RSI Moving Average.

A *Short Entry* signal is generated by your choice of: the RSI crossing below the Fast RSI Moving Average OR the RSI crossing below the Slow RSI Moving Average OR the Fast RSI Moving Average crossing below the Slow RSI Moving Average.

A *Short Exit* signal is generated by your choice of: the RSI crossing above the Fast RSI Moving Average OR the RSI crossing above the Slow RSI Moving Average OR the Fast RSI Moving Average crossing

above the Slow RSI Moving Average.

If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", supplemental long and short alerts are provided.

Supplemental long signals are generated when either of the two conditions **not** chosen to generate the *Long Entry* signal occur. For example, if the condition chosen for the *Long Entry* signal is "RSI crosses above the Fast RSI Moving Average" then the supplemental long signals are generated when the RSI crosses above the Slow RSI Moving Average OR the Fast RSI Moving Average crosses above the Slow RSI Moving Average.

Supplemental short signals are generated when either of the two conditions **not** chosen to generate the *Short Entry* signal occur. For example, if the condition chosen for the *Short Entry* signal is "RSI crosses below the Fast RSI Moving Average" then the supplemental short signals are generated when the RSI crosses below the Slow RSI Moving Average OR the Fast RSI Moving Average crosses below the Slow RSI Moving Average.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the *Long Entry*, *Long Exit*, *Short Entry*, and *Short Exit* signals even if the "Provide Supplemental Alert Signals?" input selection is set to "Yes".

System Outputs and Signals Logic

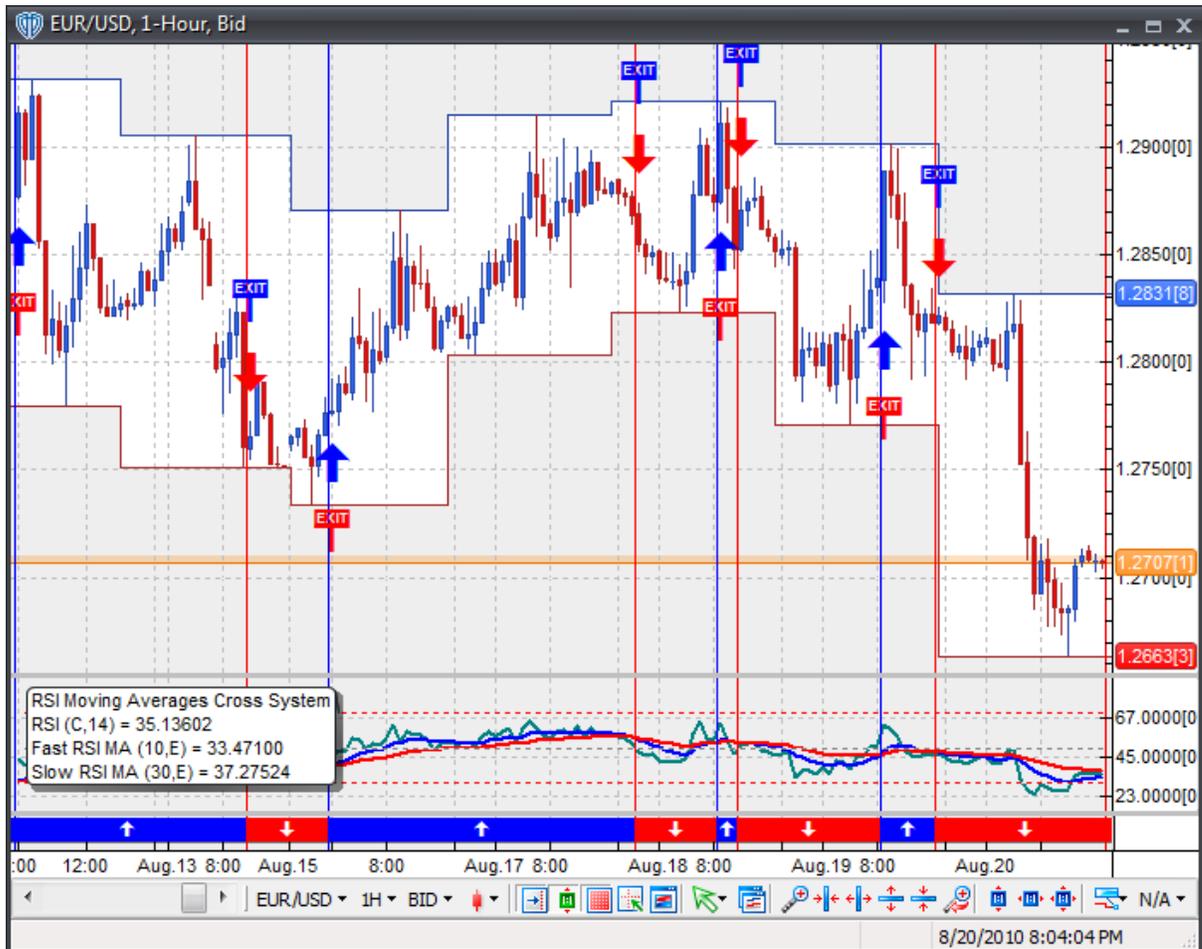
The **RSI Moving Averages Cross System** consists of the following output variables and display parameters:

- The Relative Strength Index (RSI) displays in Additional Frame 1 as a slightly thicker, solid green line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Fast RSI Moving Average displays in Additional Frame 1 as a slightly thicker, solid blue line.
- The Slow RSI Moving Average displays in Additional Frame 1 as a slightly thicker, solid red line.
- The Trend Frame displays a white up arrow against a blue background along with beginning/ending vertical blue lines while a simulated long (*buy*) trade is in progress.
- The Trend Frame displays a white down arrow against a red background along with beginning/ending vertical red lines while a simulated short (*sell*) trade is in progress.
- When a *Long Entry* signal is generated a green up arrow graphic displays in the chart window, the message "Long entry signal detected! Your specified RSI Moving Averages condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a green exit graphic displays in the chart window, the message "Long exit signal detected! Your specified RSI Moving Averages condition has been

met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

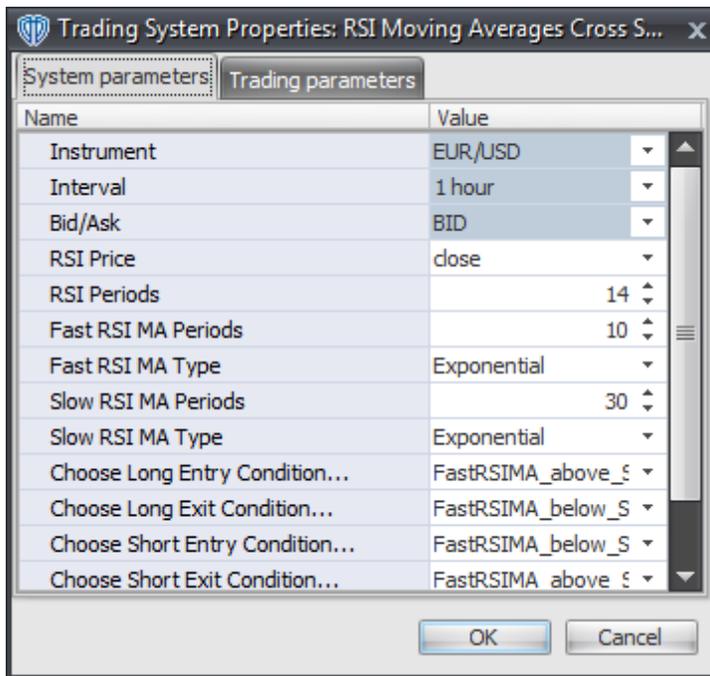
- When a *Short Entry* signal is generated a pink down arrow graphic displays in the chart window, the message "Short entry signal detected! Your specified RSI Moving Averages condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a pink exit graphic displays in the chart window, the message "Short exit signal detected! Your specified RSI Moving Averages condition has been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "RSI crosses above the Fast RSI Moving Average" long signal is generated a small, light blue up arrow graphic displays in the chart window, the message "RSI crossed above Fast RSI MA." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "RSI crosses above the Slow RSI Moving Average" long signal is generated a small, blue up arrow graphic displays in the chart window, the message "RSI crossed above Slow RSI MA." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when when a supplemental "Fast RSI Moving Average crosses above the Slow RSI Moving Average" long signal is generated a small, dark blue up arrow graphic displays in the chart window, the message "Fast RSI MA crossed above Slow RSI MA." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "RSI crosses below the Fast RSI Moving Average" short signal is generated a small, light red down arrow graphic displays in the chart window, the message "RSI crossed above Fast RSI MA." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "RSI crosses below the Slow RSI Moving Average" short signal is generated a small, red down arrow graphic displays in the chart window, the message "RSI crossed below Slow RSI MA." displays in the Trading Activity window, and an audio sound file plays.
- If the "Provide Supplemental Alert Signals?" input parameter (*see description below*) is set to "Yes", when a supplemental "Fast RSI Moving Average crosses below the Slow RSI Moving Average" short signal is generated a small, dark red down arrow graphic displays in the chart window, the message "Fast RSI MA crossed below Slow RSI MA." displays in the Trading Activity window, and an audio sound file plays.

Below is a screenshot that shows the **RSI Moving Averages Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

RSI Price and RSI Periods

These parameters define the price and number of periods used to calculate the Relative Strength Index (RSI) indicator.

Fast RSI MA Periods and Fast RSI MA Type

These parameters define the number of periods and type of moving average used to calculate the Fast RSI Moving Average.

Slow RSI MA Periods and Slow RSI MA Type

These parameters define the number of periods and type of moving average used to calculate the Slow RSI Moving Average.

Choose Long Entry Condition...

This parameter defines the condition used to generate the *Long Entry* signal. Please refer to the *Overview* section above for details.

Choose Long Exit Condition...

This parameter defines the condition used to generate the *Long Exit* signal. Please refer to the *Overview* section above for details.

Choose Short Entry Condition...

This parameter defines the condition used to generate the *Short Entry* signal. Please refer to the *Overview* section above for details.

Choose Short Exit Condition...

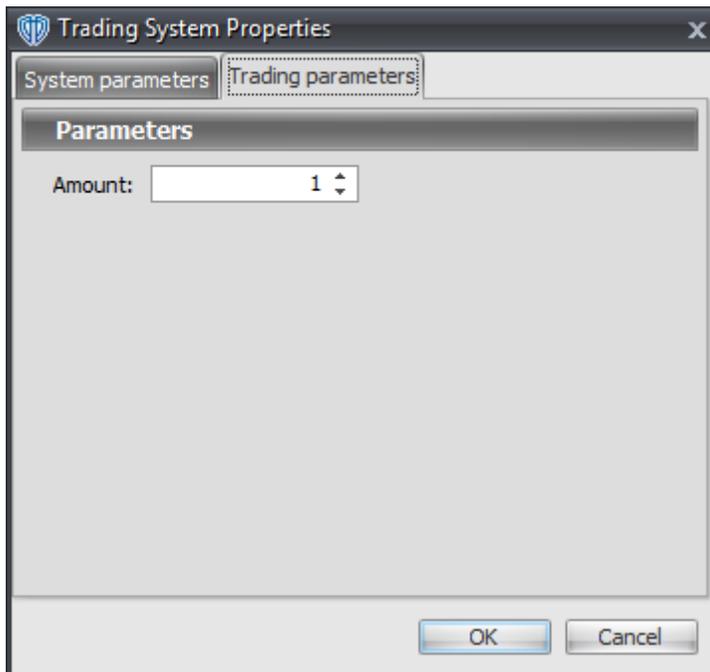
This parameter defines the condition used to generate the *Short Exit* signal. Please refer to the *Overview* section above for details.

Provide Supplemental Alert Signals?

This parameter defines if the trading system provides additional, supplemental long and short alerts. Please refer to the *Overview* and *System Outputs and Signals Logic* sections above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.87 Schaff Trend Cycle Double Reversal System

Overview

The **Schaff Trend Cycle Double Reversal System** uses the Schaff Trend Cycle and a Fast Schaff Trend Cycle indicator to generate signals for potential trading opportunities. The Schaff Trend Cycle sets its cycle length to 1/2 the *Cycle Periods*. The Fast Schaff Trend Cycle indicator sets its cycle length to 1/4 the *Cycle Periods*.

The signals are generated using the following logic:

A *Long* signal is generated when the (Fast Schaff TC is greater than its OverSold Level and the Fast Schaff TC is less than its OverBought Level and the Fast Schaff TC crosses above the Schaff TC) OR when the (Fast Schaff TC crosses above its OverSold Level and the Fast Schaff TC is greater than Schaff TC and the Fast Schaff TC is less than its OverBought Level).

A *Short* signal is generated when the (Fast Schaff TC crosses below the Schaff TC and the Fast Schaff TC is less than its OverBought Level and the Fast Schaff TC is greater than its OverSold Level) OR when the (Fast Schaff TC crosses below its OverBought Level and the Fast Schaff TC is less than Schaff TC and the Fast Schaff TC is greater than its OverSold Level).

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Schaff Trend Cycle Double Reversal System** consists of the following output variables and display parameters:

- The Schaff Trend Cycle displays in Additional Frame 1 as a slightly thicker, solid, dark red line.
- The Fast Schaff Trend Cycle displays in Additional Frame 1 as a thin, dashed dark red line.
- The Schaff Trend Cycle OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a white up arrow against a blue background while the Close price is greater than the Parabolic SAR.
- The Trend Frame displays a white down arrow against a red background while the Close price is less than the Parabolic SAR.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Schaff TC long trade conditions have been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled*

automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

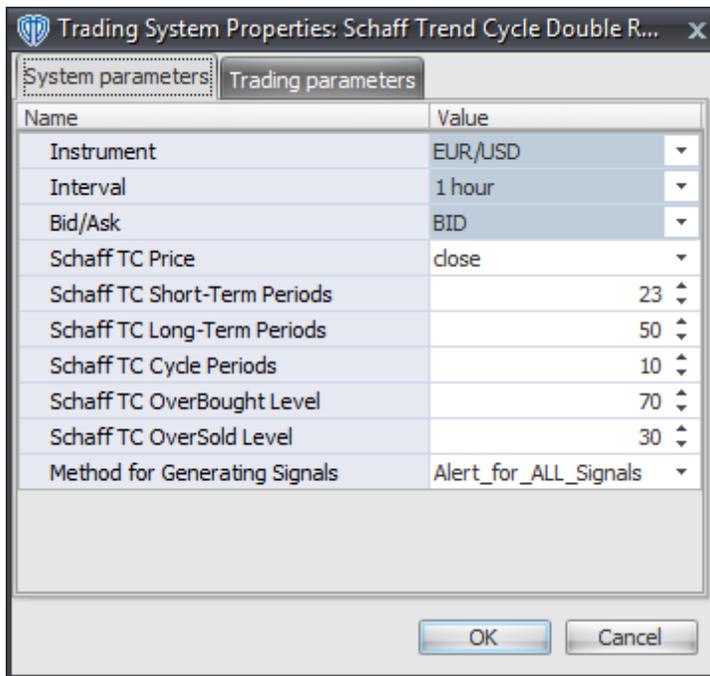
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Schaff TC short trade conditions have been met." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Schaff Trend Cycle Double Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Schaff TC Price, Short-Term Periods, Long-Term Periods, and Cycle Periods

These parameters define the values used to calculate the Schaff Trend Cycle and Fast Schaff Trend Cycle indicators.

Schaff TC OverBought Level

This parameter defines the OverBought value used in the conditions to generate the *Long* and *Short* signals.

Schaff TC OverSold Level

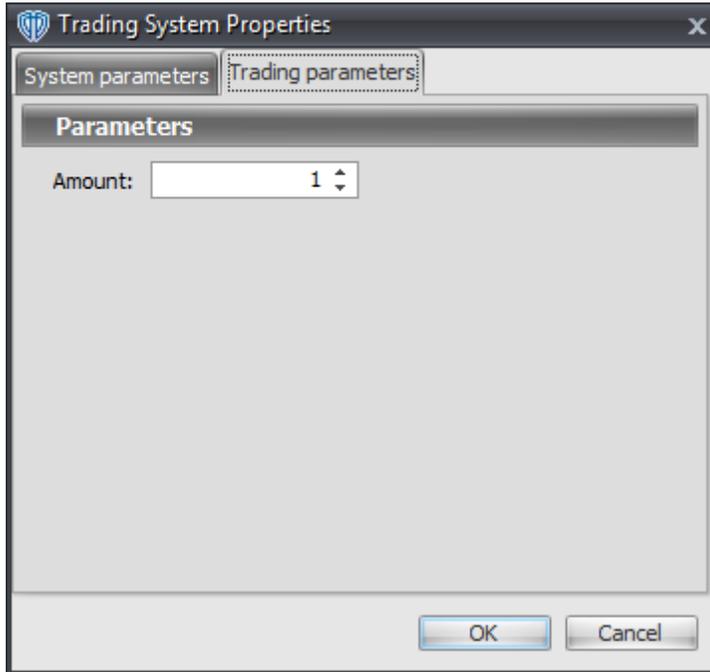
This parameter defines the OverSold value used in the conditions to generate the *Long* and *Short* signals.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.88 Schaff Trend Cycle Reversal System

Overview

The **Schaff Trend Cycle Reversal System** uses the Schaff Trend Cycle to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Schaff Trend Cycle crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Schaff Trend Cycle crosses below its OverBought Level from above OR the Schaff Trend Cycle crosses below its OverSold Level from above.

A *Short Entry* signal is generated when the Schaff Trend Cycle crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Schaff Trend Cycle crosses above its OverSold Level from below OR the Schaff Trend Cycle crosses above its OverBought Level from below.

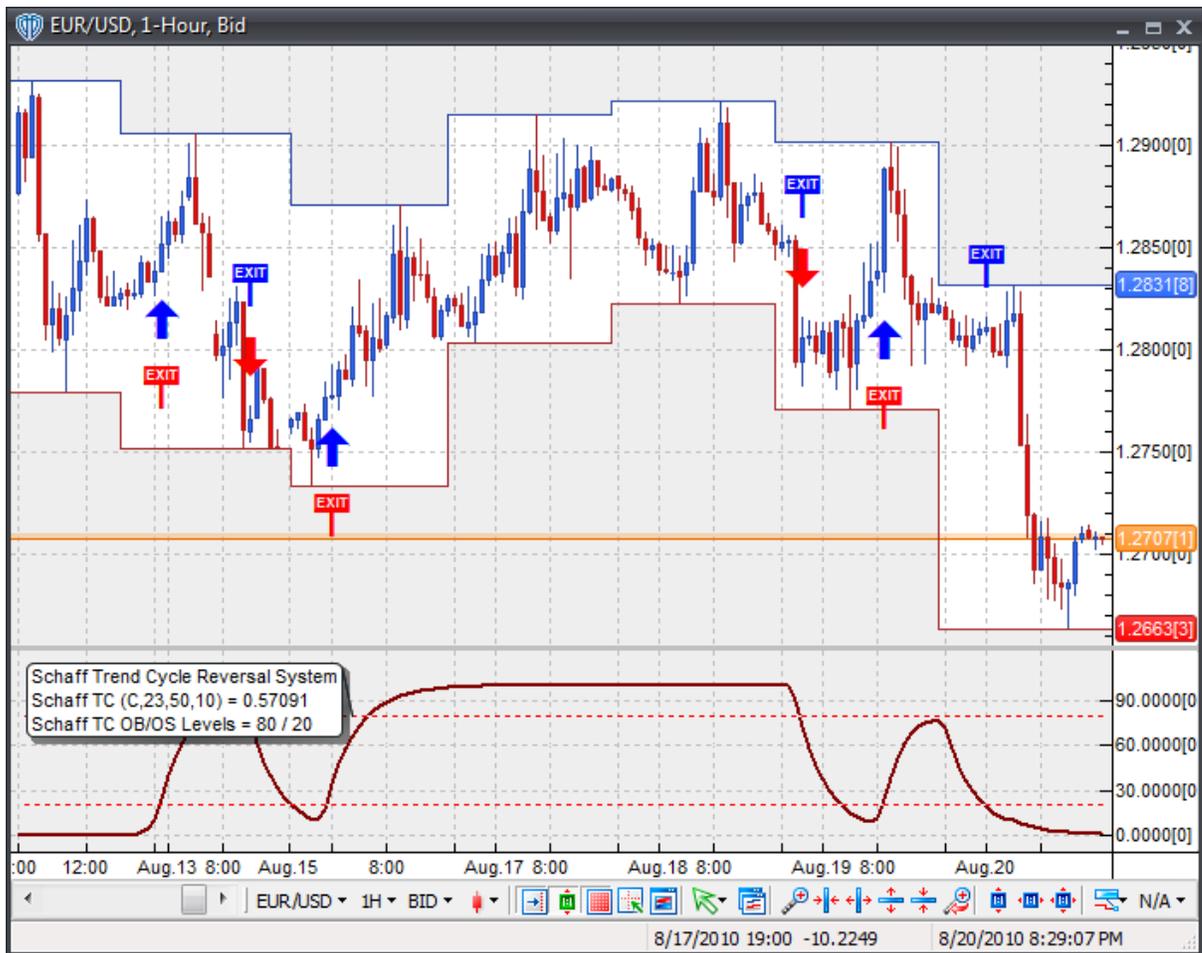
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Schaff Trend Cycle Reversal System** consists of the following output variables and display parameters:

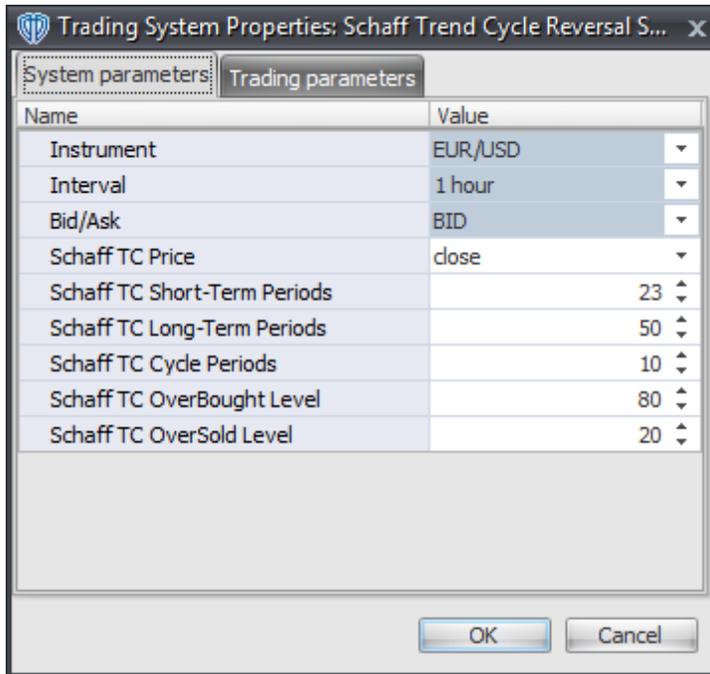
- The Schaff Trend Cycle displays in Additional Frame 1 as a slightly thicker, solid, dark red line.
- The Schaff Trend Cycle OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The Schaff TC crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The Schaff TC crossed below its OverBought Level or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The Schaff TC crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The Schaff TC crossed above its OverSold Level or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Schaff Trend Cycle Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Schaff TC Price, Short-Term Periods, Long-Term Periods, and Cycle Periods

These parameters define the values used to calculate the Schaff Trend Cycle.

Schaff TC OverBought Level

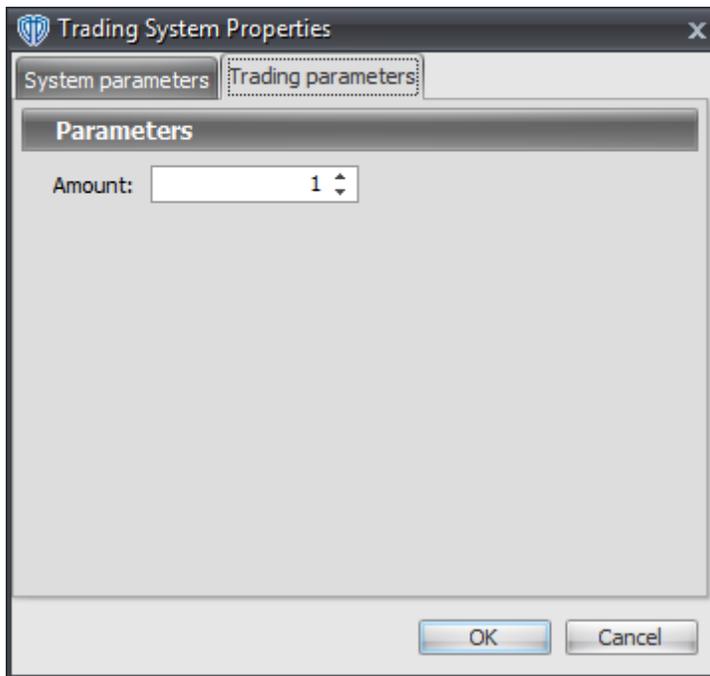
This parameter defines the OverBought value used in the Schaff Trend Cycle-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

Schaff TC OverSold Level

This parameter defines the OverSold value used in the Schaff Trend Cycle-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.89 Slow Stochastic Oscillator Cross System

Overview

The **Slow Stochastic Oscillator Cross System** uses the Slow Stochastic Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Slow Stochastic Oscillator's %K line crosses above its %D Line.

A *Short* signal is generated when the Slow Stochastic Oscillator's %K line crosses below its %D Line.

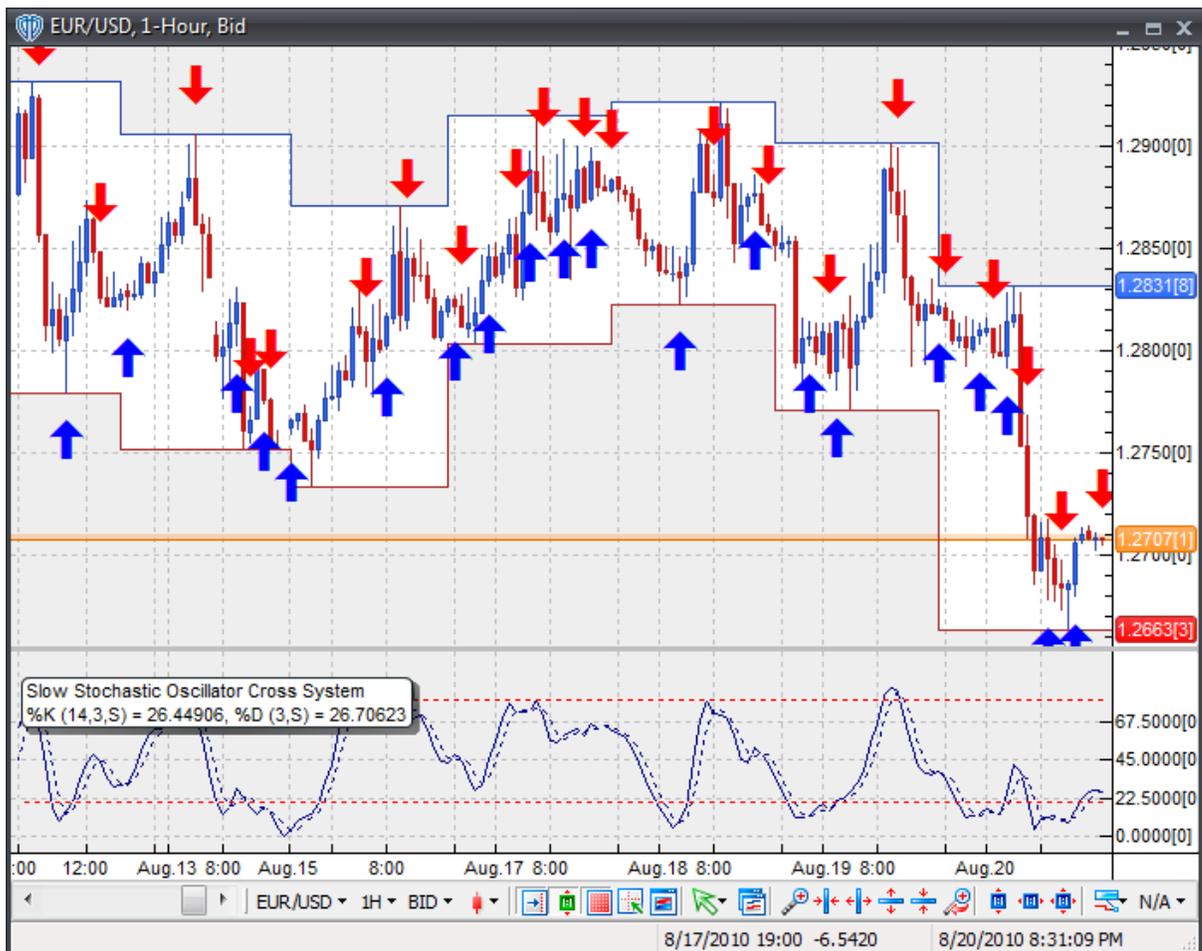
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Slow Stochastic Oscillator Cross System** consists of the following output variables and display parameters:

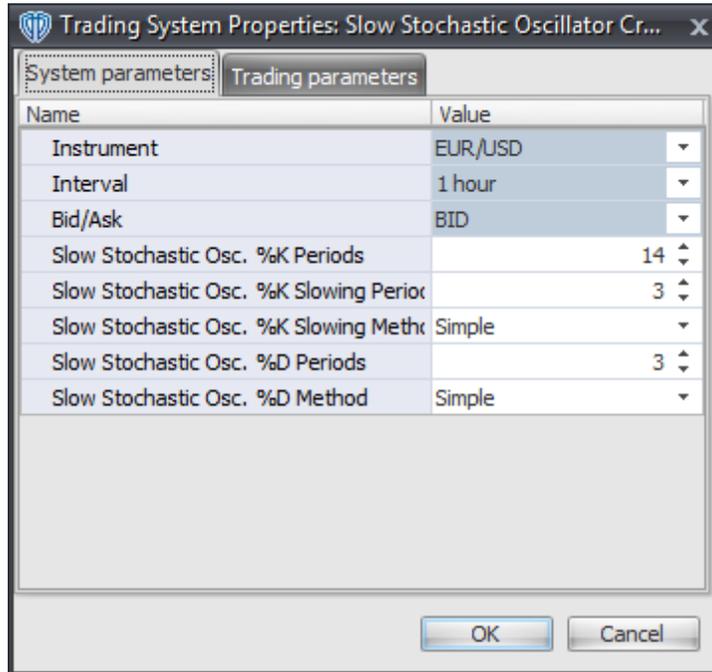
- The Slow Stochastic Oscillator's %K displays in Additional Frame 1 as a thin, solid, dark blue line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines.
- The Slow Stochastic Oscillator's %D displays in Additional Frame 1 as a thin, dashed, dark blue line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Slow Stochastic Oscillator's %K line crossed above its %D line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Slow Stochastic Oscillator's %K line crossed below its %D line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Slow Stochastic Oscillator Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Slow Stochastic Osc. %K Periods, %K Slowing Periods, and %K Slow Method

These parameters define the number of periods, number of smoothing periods, and type of moving average used to calculate the Slow Stochastic Oscillator's %K line.

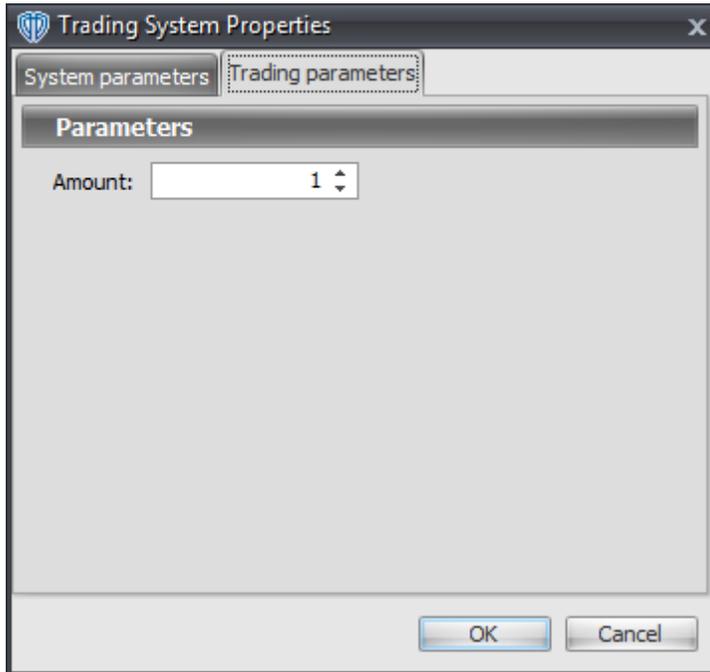
Slow Stochastic Osc. %D Periods and %D Method

These parameters define the number of periods and type of moving average used to calculate the Slow Stochastic Oscillator's %D line.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the

Amount (in Lots) that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.90 Slow Stochastic Oscillator Reversal Cross System

Overview

The **Slow Stochastic Oscillator Reversal Cross System** uses the Slow Stochastic Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Slow Stochastic Oscillator crosses above its Signal Line while both are below the OverSold Level. If the "Require Bull Candle for Long Entry?" input parameter (see description below) is set to "Yes", the *Long Entry* signal is only generated if the entry bar is a Bull Candle (i.e. its Close price > its Open price).

A *Long Exit* signal is generated when the Slow Stochastic Oscillator crosses below its Signal Line.

A *Short Entry* signal is generated when the Slow Stochastic Oscillator crosses below its Signal Line while both are above the OverBought Level. If the "Require Bear Candle for Short Entry?" input parameter (see description below) is set to "Yes", the *Short Entry* signal is only generated if the entry bar is a Bear Candle (i.e. its Close price < its Open price).

A *Short Exit* signal is generated when the Slow Stochastic Oscillator crosses above its Signal Line.

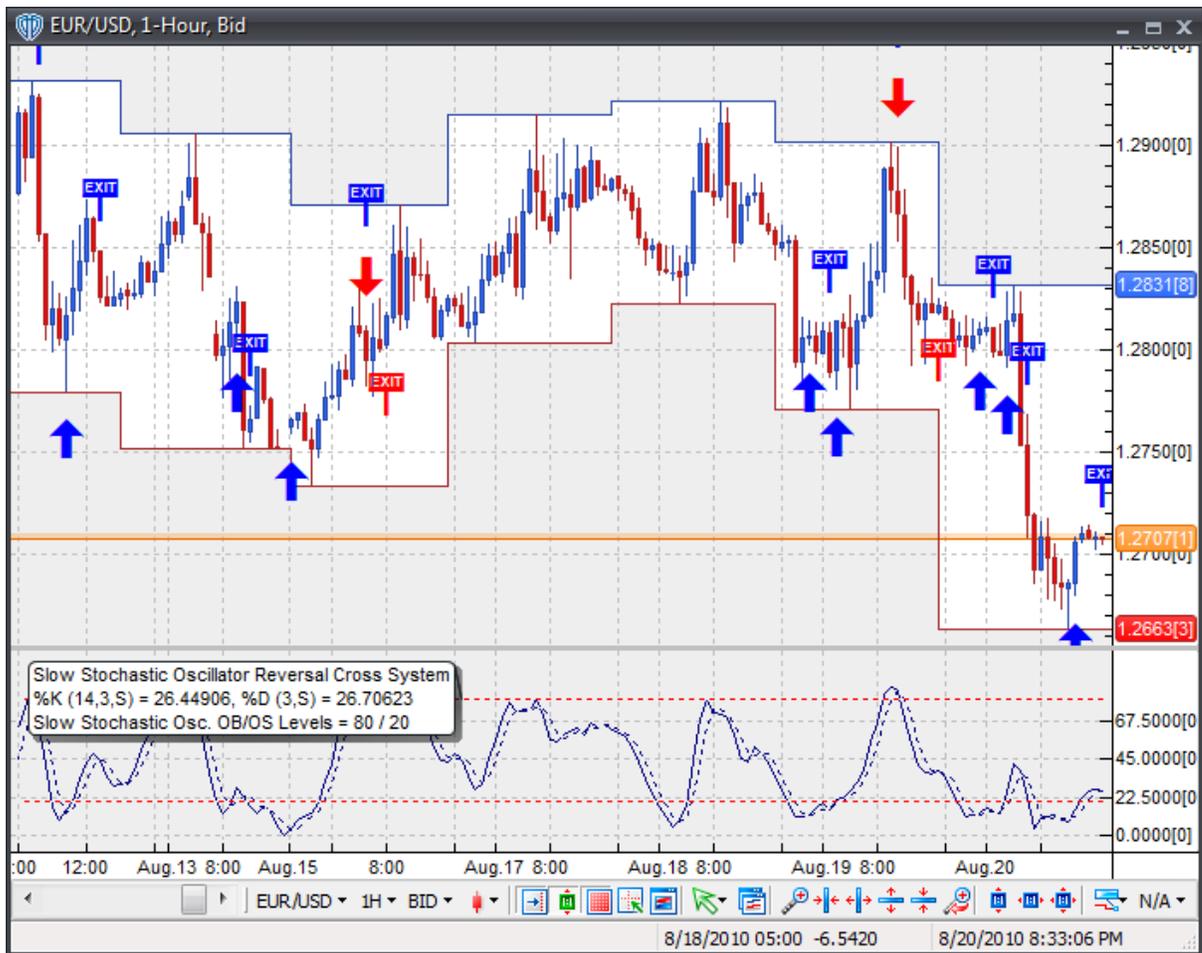
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Slow Stochastic Oscillator Reversal Cross System** consists of the following output variables and display parameters:

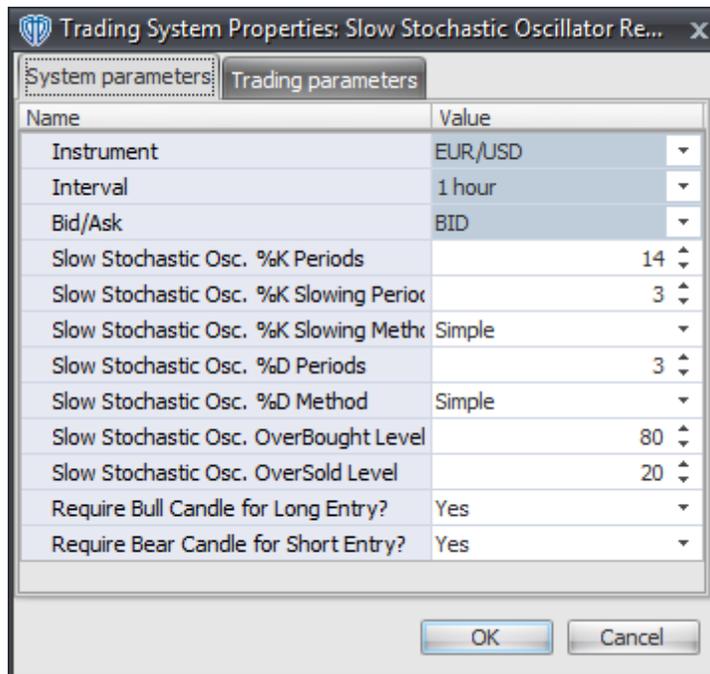
- The Slow Stochastic Oscillator displays in Additional Frame 1 as a solid blue line.
- The Slow Stochastic Oscillator's Signal Line displays in Additional Frame 1 as a dashed blue line.
- The Slow Stochastic Oscillator's OverBought and OverSold Levels display in Additional Frame 1 as dashed red lines.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! SSO %K crossed above SSO %D while both were below the OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! SSO %K crossed below SSO %D." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! SSO %K crossed above SSO %D while both were above the OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! SSO %K crossed above SSO %D." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Slow Stochastic Oscillator Reversal Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Slow Stochastic Osc. %K Periods, %K Slowing Periods, %K Slowing Method, %D Periods, and %D Method

This parameter defines the values used calculate the Slow Stochastic Oscillator.

Slow Stochastic Osc. OverBought Level

This parameter defines the OverBought value used in the Slow Stochastic Oscillator-related conditions to generate the *Short Entry* signal.

Slow Stochastic Osc. OverSold Level

This parameter defines the OverSold value used in the Slow Stochastic Oscillator-related conditions to generate the *Long Entry* signal.

Require Bull Candle for Long Entry?

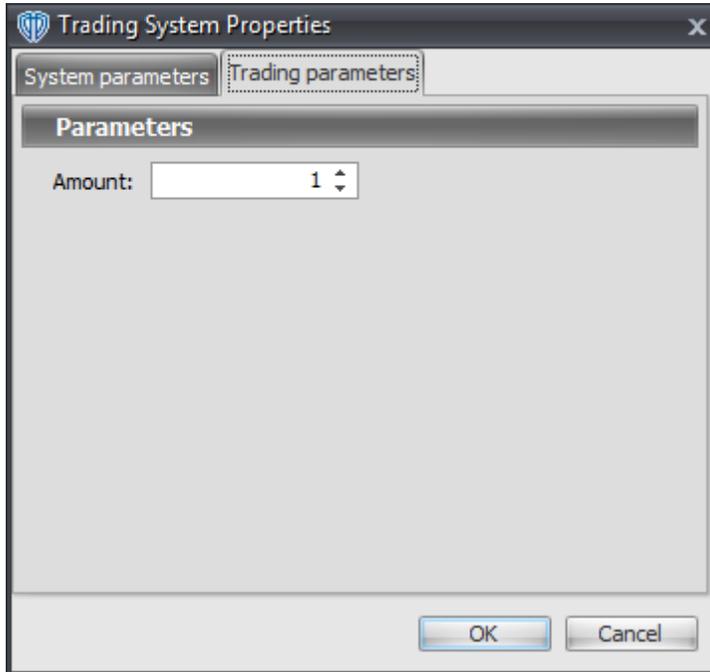
This parameter changes the conditions necessary to generate the *Long Entry* signal. Please refer to the *Overview* section above for details.

Require Bear Candle for Short Entry?

This parameter changes the conditions necessary to generate the *Short Entry* signal. Please refer to the *Overview* section above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.91 STARC Bands Reversal System

Overview

The **STARC Bands Reversal System** uses the Stoller Average Range Channels (STARC Bands) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the price reverses from the lower STARC Band using either a 1-bar or 2-bar reversal formation.

- Long 1-Bar Formation = Close price > Open price AND Close price > Lower STARC Band AND Low price <= Lower STARC Band

- Long 2-Bar Formation = Close price > Open price AND Close price > Lower STARC Band AND Close price > Open price 1 bar ago AND Close price 1 bar ago < Open price 1 bar ago AND Low price 1 bar ago <= Lower STARC Band 1 bar ago

A *Short* signal is generated when the price reverses from the upper STARC Band using either a 1-bar or 2-bar reversal formation.

- Short 1-Bar Formation = Close price < Open price AND Close price < Upper STARC Band AND High price >= Upper STARC Band
- Short 2-Bar Formation = Close price < Open price AND Close price < Upper STARC Band AND Close price < Open price 1 bar ago AND Close price 1 bar ago > Open price 1 bar ago AND High price 1 bar ago >= Upper STARC Band 1 bar ago

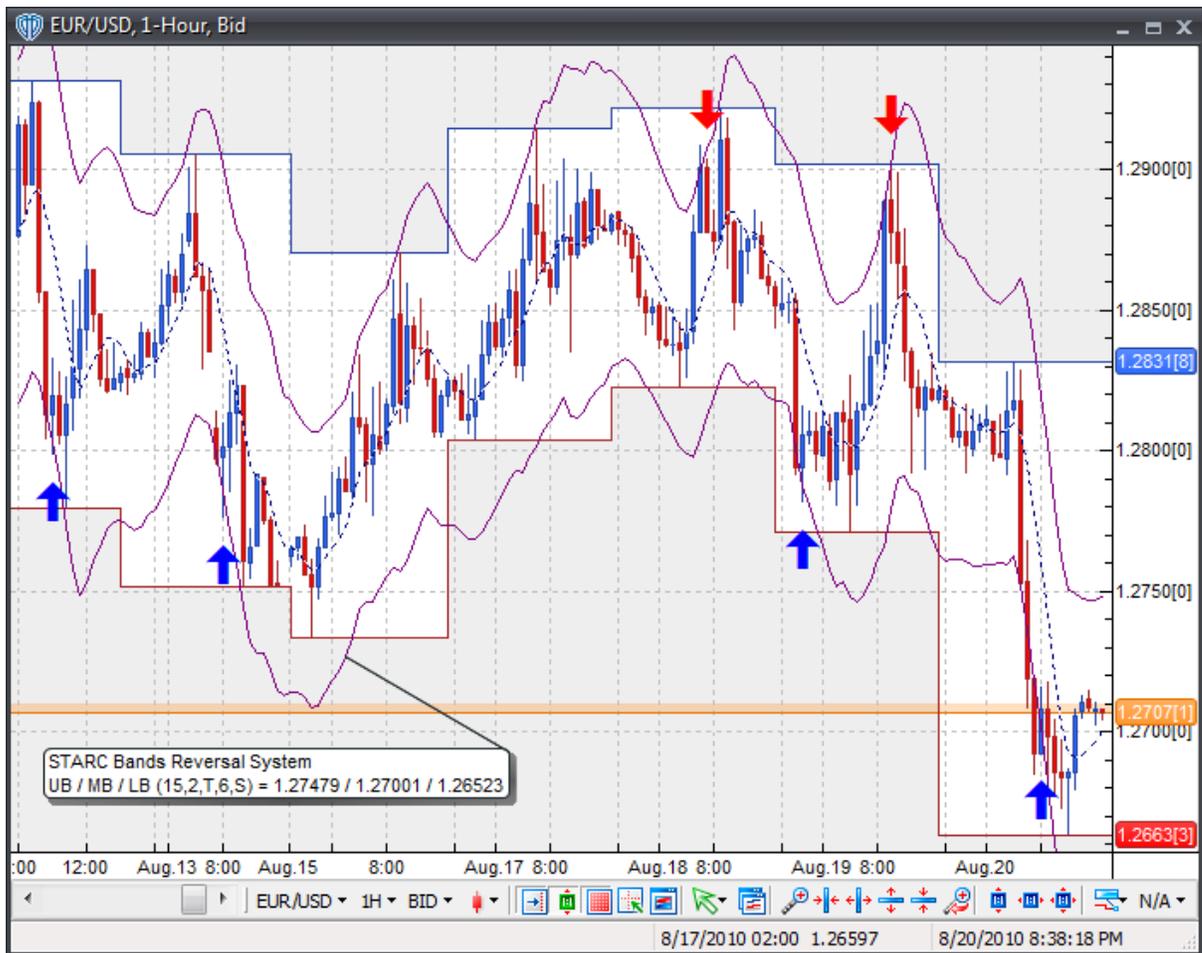
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **STARC Bands Reversal System** consists of the following output variables and display parameters:

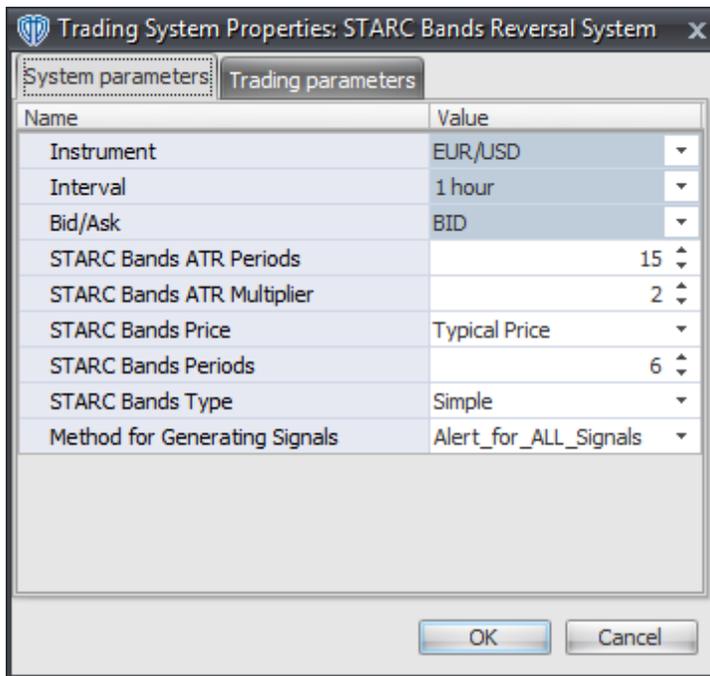
- The upper and lower STARC Bands display in the Price Frame as thin, solid, purple lines. The middle STARC Band displays in the Price Frame as a thin, dashed, dark blue line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Price is potentially reversing from Lower STARC Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Price is potentially reversing from the Upper STARC Band." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **STARC Bands Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

STARC Bands ATR Periods, ATR Multiplier, Price, Periods, and Type

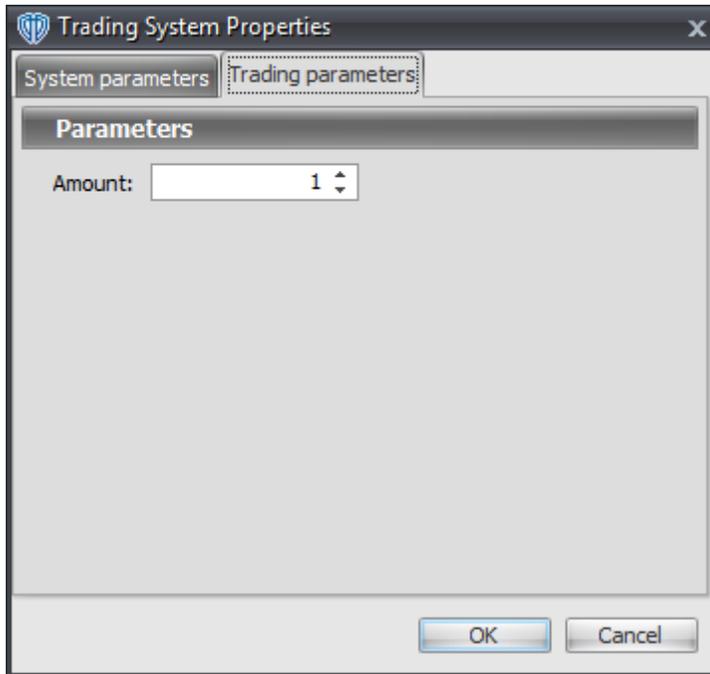
These parameters define ATR periods and multiplier, price, number of periods, and MA Type used to calculate the STARC Bands.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.92 Stochastic Momentum Index Cross System

Overview

The **Stochastic Momentum Index Cross System** uses the Stochastic Momentum Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Stochastic Momentum Index crosses above its Signal Line.

A *Short* signal is generated when the Stochastic Momentum Index crosses below its Signal Line.

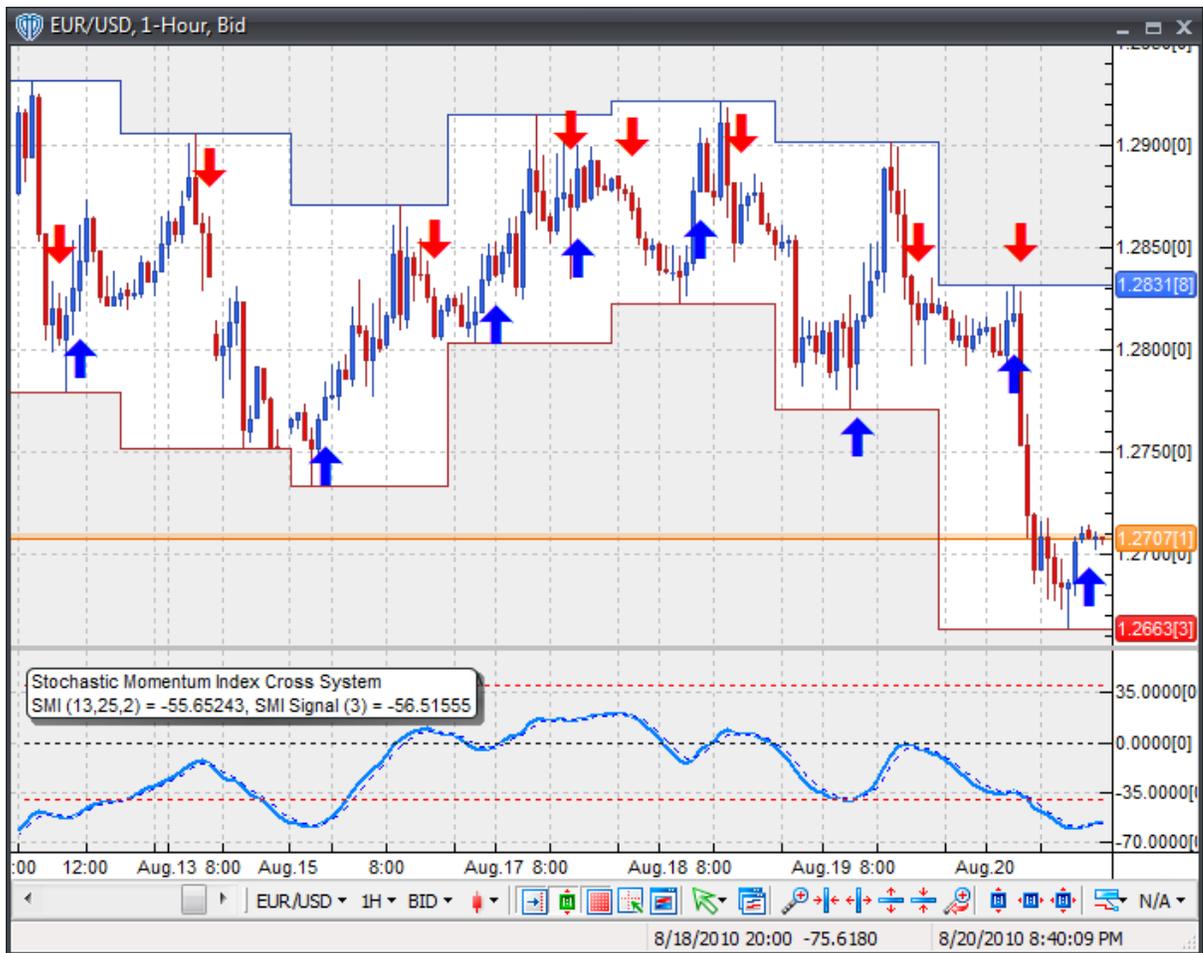
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Stochastic Momentum Index Cross System** consists of the following output variables and display parameters:

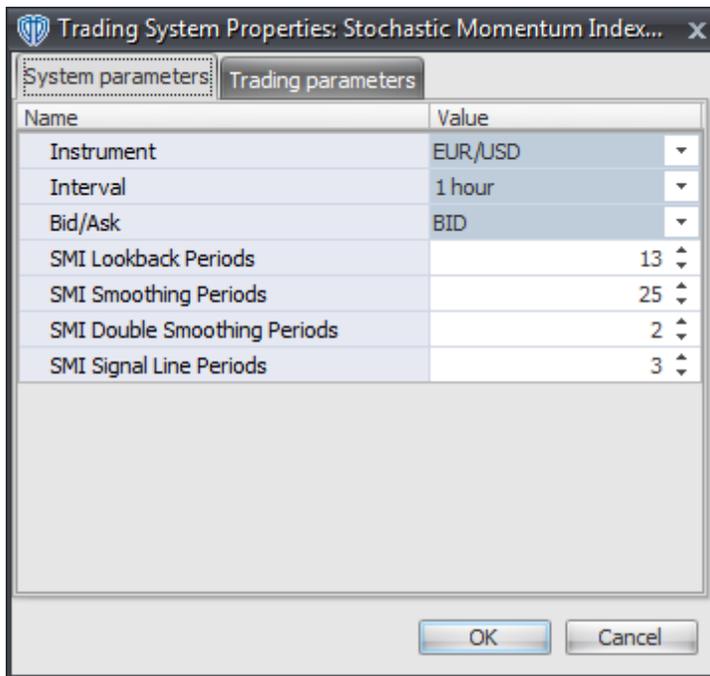
- The Stochastic Momentum Index displays in Additional Frame 1 as a slightly thicker, solid, light blue line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Stochastic Momentum Index Signal Line displays in Additional Frame 1 as a thin, dashed blue line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The SMI crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The SMI crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Stochastic Momentum Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

SMI Lookback Periods, Smoothing Periods, and Double Smoothing Periods

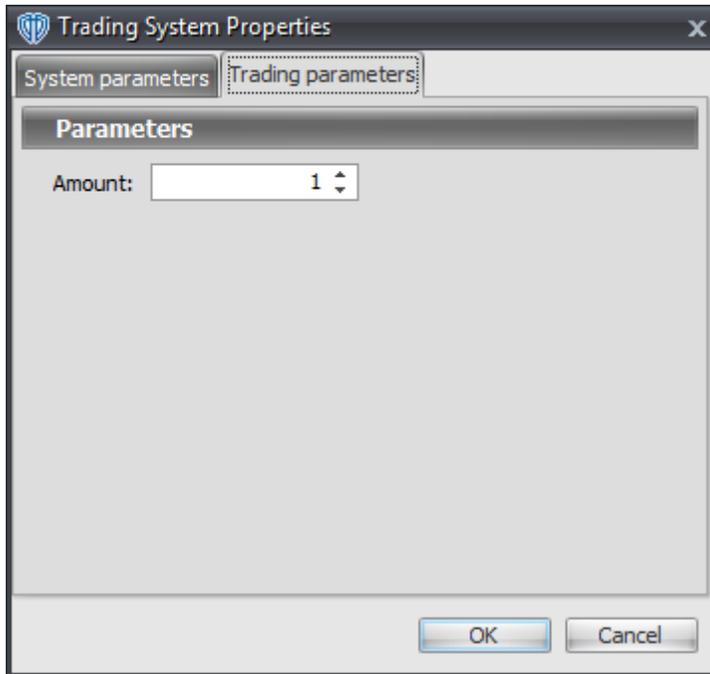
These parameters define the values used to calculate the Stochastic Momentum Index.

SMI Signal Line Periods

This parameter defines the number of periods used to calculate the Stochastic Momentum Index Signal Line.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.93 Support and Resistance Breakout System

Overview

The **Support and Resistance Breakout System** uses the Support and Resistance indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the Resistance. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Long* signal is generated when the Close price crosses above the High price of the Resistance breakout bar within the following two bars.

A *Short* signal is generated when the Close price crosses below the Support. If the "Require Price Confirmation of Breakout?" input parameter (*see description below*) is set to "Yes", the *Short* signal is generated when the Close price crosses below the Low price of the Support breakout bar within the following two bars.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input

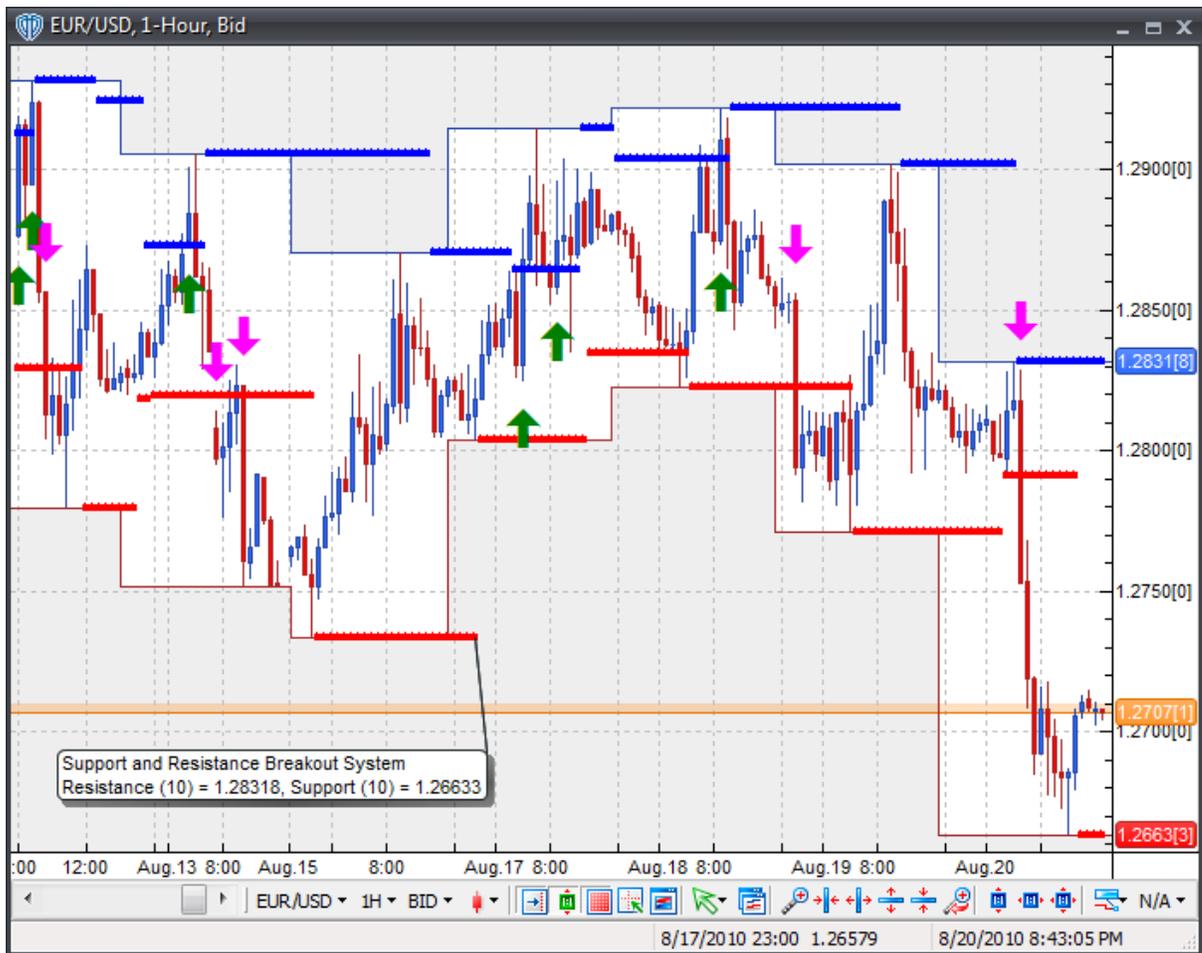
selection is chosen.

System Outputs and Signals Logic

The **Support and Resistance Breakout System** consists of the following output variables and display parameters:

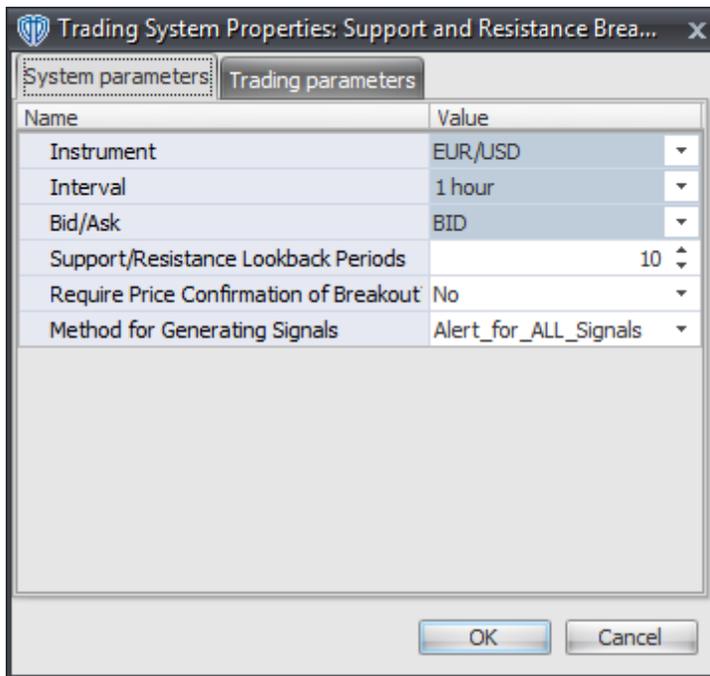
- Resistance levels display in the Price Frame as slightly thicker, blue dots.
- Support levels display in the Price Frame as slightly thicker, red dots.
- If the "Require Price Confirmation of Breakout?" input parameter is set to "Yes", medium-sized green dots display in the Price Frame to designate the High price of the Resistance breakout bar and medium-sized pink dots display in the Price Frame to designate the Low price of the Support breakout bar.
- When a *Long* signal is generated a green up arrow graphic displays in the chart window, the message "Long signal detected! Price has broken out above Resistance." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a pink down arrow graphic displays in the chart window, the message "Short signal detected! Price has broken out below Support." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Support and Resistance Breakout System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Support / Resistance Lookback Periods

This parameter defines the number of periods used to calculate the Support and Resistance levels.

Require Price Confirmation of Breakout?

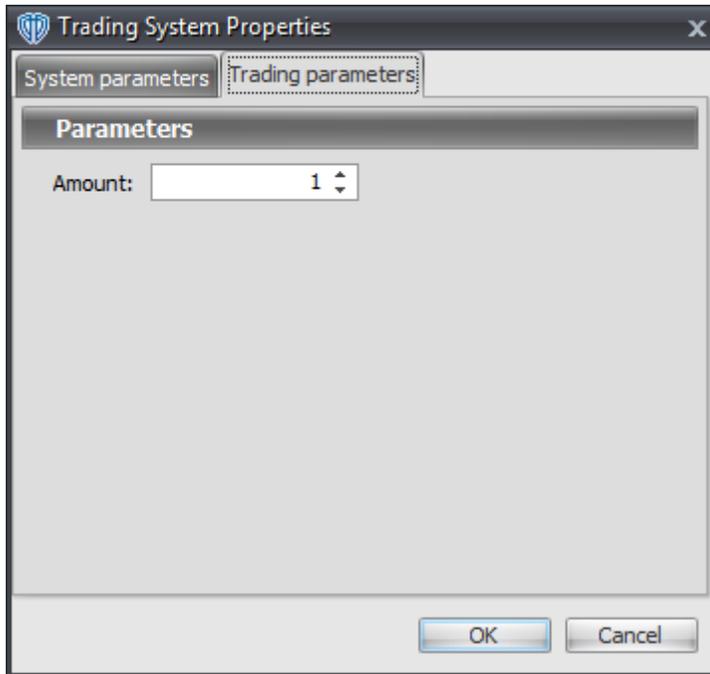
This parameter changes the conditions necessary to generate the *Long* and *Short* signals. Please refer to the *Overview* section above for details.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.94 T3 Moving Average Cross System

Overview

The **T3 Moving Average Cross System** uses fast and slow T3 Moving Averages to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast T3 moving average crosses above the Slow T3 moving average.

A *Short* signal is generated when the Fast T3 moving average crosses below the Slow T3 moving average.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

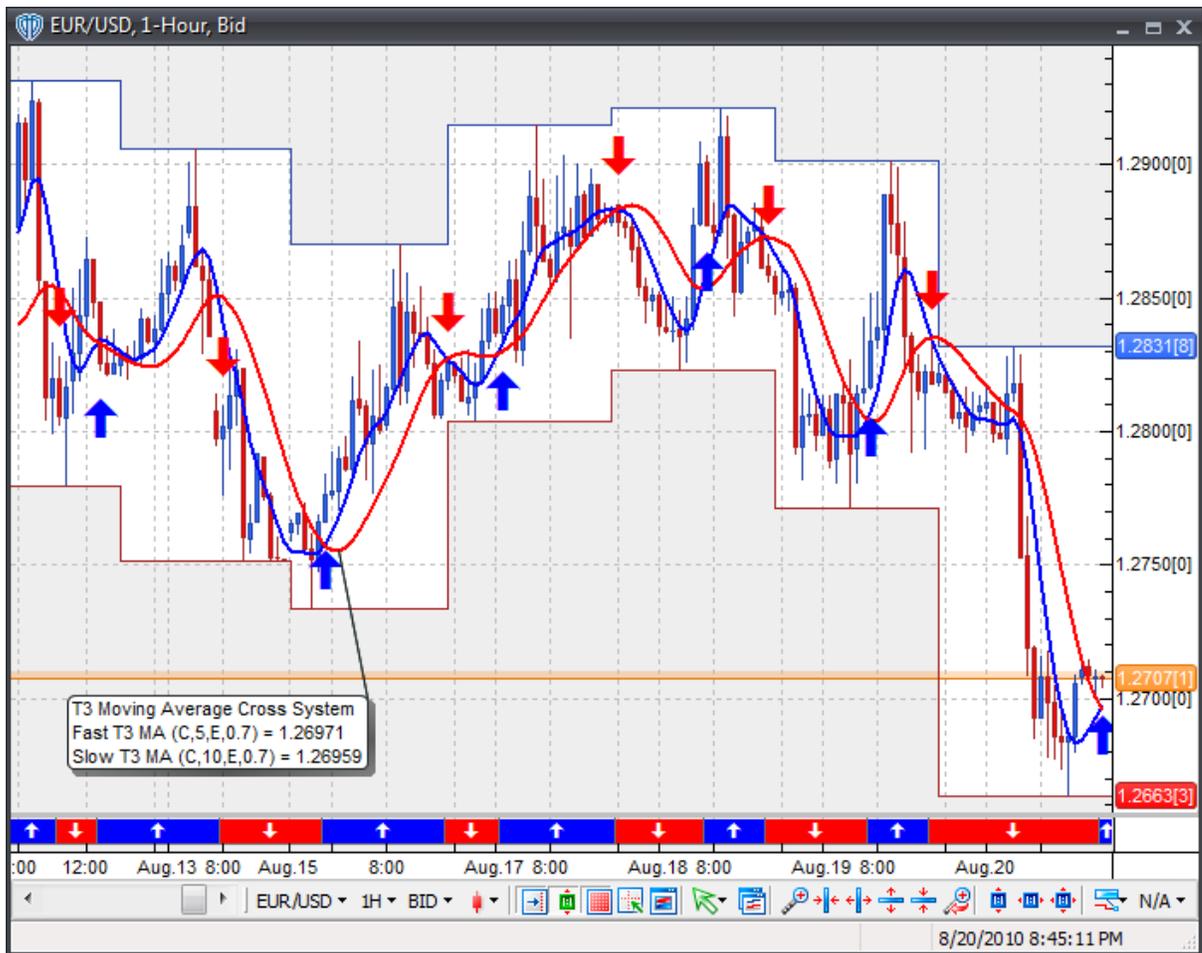
System Outputs and Signals Logic

The **T3 Moving Average Cross System** consists of the following output variables and display

parameters:

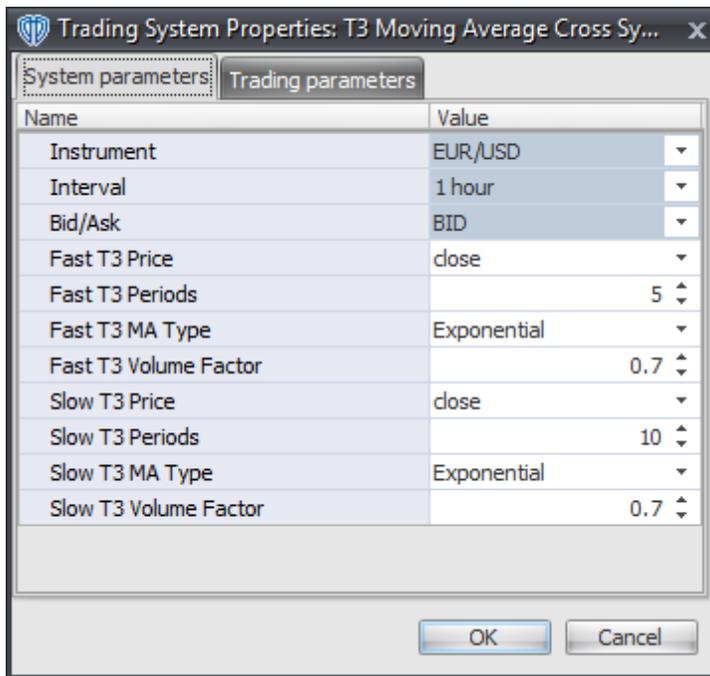
- The Fast T3 moving average displays in the Price Frame as slightly thicker, solid blue line.
- The Slow T3 moving average displays in the Price Frame as a slightly thicker, solid red line.
- The Trend Frame displays a white up arrow against a blue background while the Fast T3 moving average is greater than the Slow T3 moving average.
- The Trend Frame displays a white down arrow against a red background while the Fast T3 moving average is less than the Slow T3 moving average.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast T3 MA crossed above Slow T3 MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast T3 MA crossed below Slow T3 MA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **T3 Moving Average Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast T3 Price, Periods, MA Type, and Volume Factor

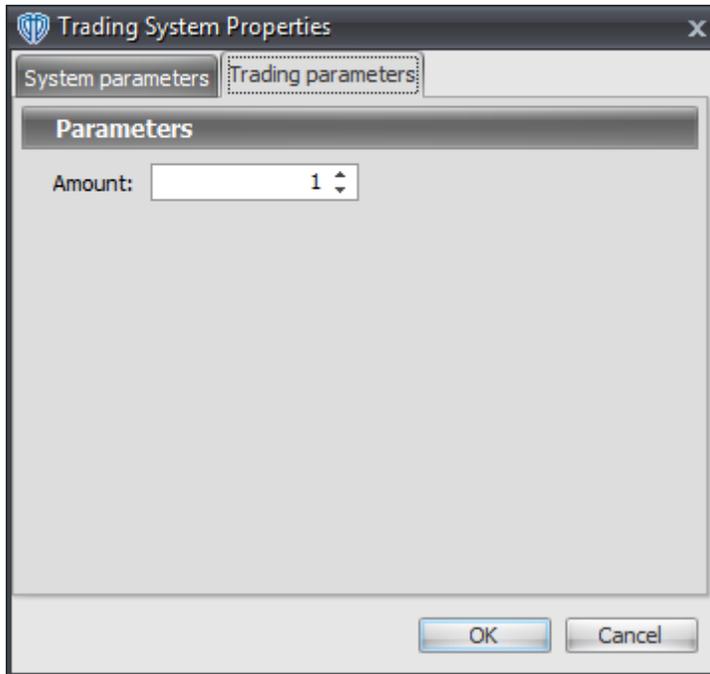
These parameters define the price, number of periods, type of moving average, and volume weighting used to calculate the Fast T3 moving average.

Slow T3 Price, Periods, MA Type, Volume Factor

These parameters define the price, number of periods, type of moving average, and volume weighting used to calculate the Slow T3 moving average.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.95 Trailing Stoploss Reversal Level Cross System

Overview

The **Trailing Stoploss Reversal Level Cross System** uses the Trailing Stoploss Reversal Level indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Close price crosses above the Trailing Stoploss Reversal Level.

A *Short* signal is generated when the Close price crosses below the Trailing Stoploss Reversal Level.

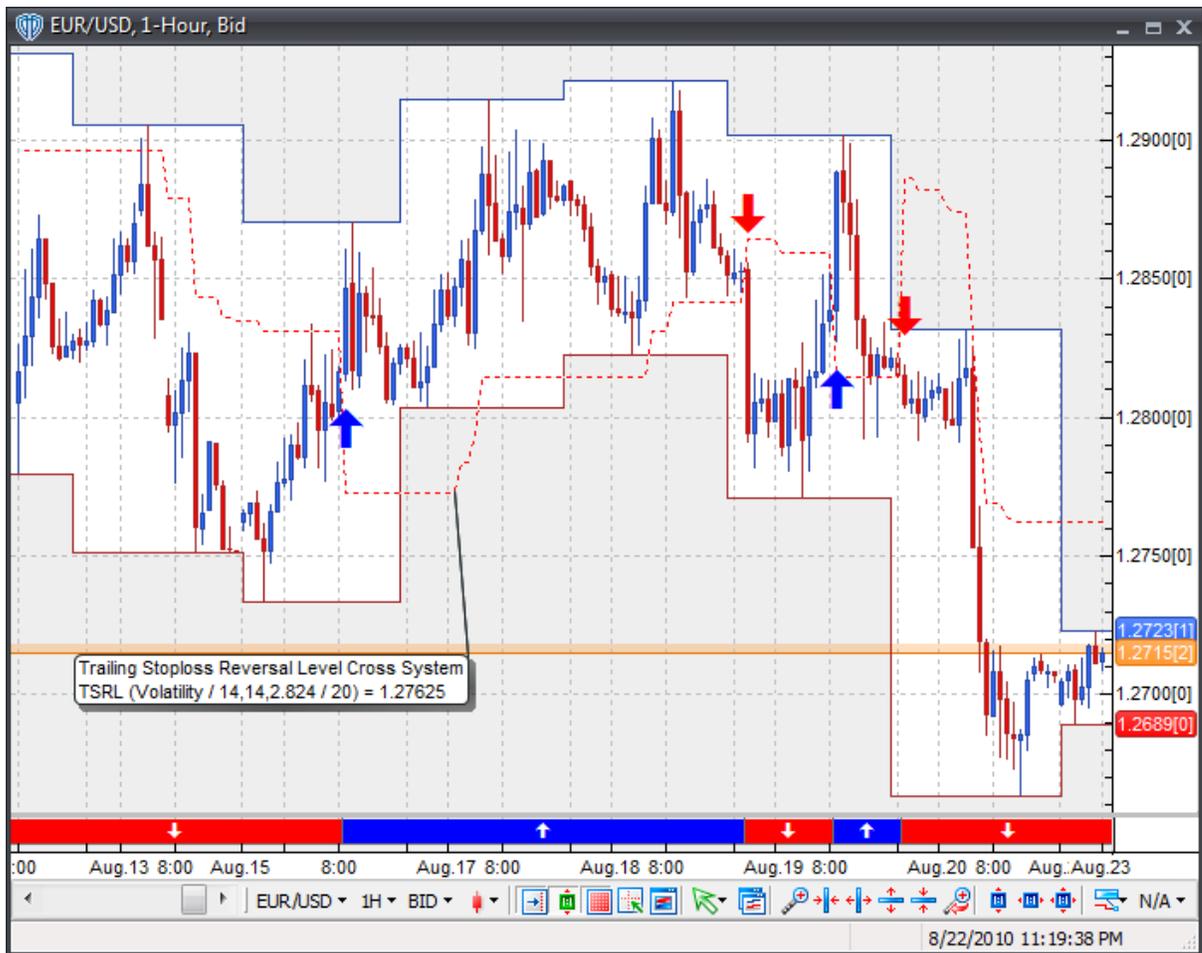
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Trailing Stoploss Reversal Level Cross System** consists of the following output variables and display parameters:

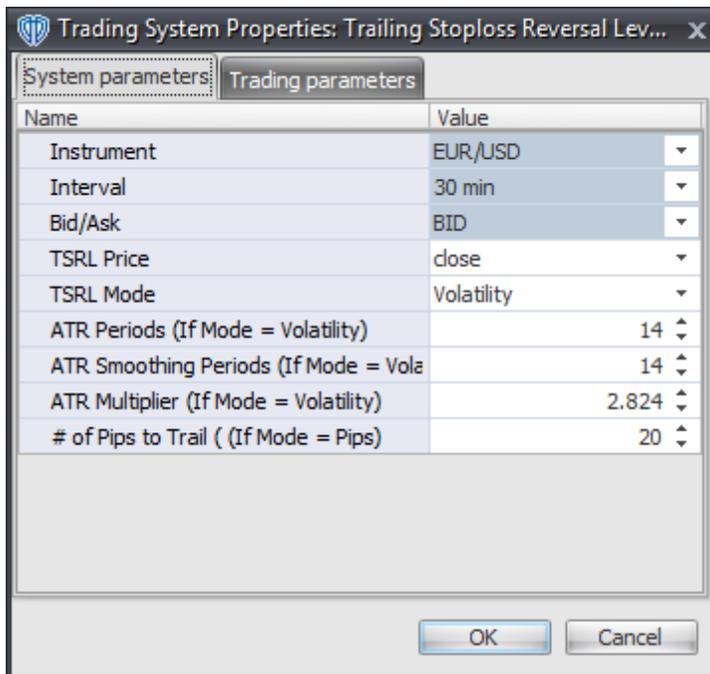
- The Trailing Stoploss Reversal Level displays in the Price Frame as thin, dashed red line.
- The Trend Frame displays a white up arrow against a blue background while the Close price is greater than the Trailing Stoploss Reversal Level.
- The Trend Frame displays a white down arrow against a red background while the Close price is less than the Trailing Stoploss Reversal Level.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The Close price crossed above the TSRL." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The Close price crossed below the TSRL." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Trailing Stoploss Reversal Level Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

TSRL Price

This parameter defines the price used to calculate the Trailing Stoploss Reversal Level indicator.

TSRL Mode

This parameter defines the calculation mode used for the Trailing Stoploss Reversal Level indicator; the available choices are *Volatility* and *Pips*.

ATR Periods (If Mode = Volatility)

This parameter is only used if *Volatility* is chosen as the **TSRL Mode**, otherwise it has no effect on the trading system. It defines the number of periods used to calculate the ATR indicator which is used in the volatility calculations.

Wilders ATR Smoothing Periods (If Mode = Volatility)

This parameter is only used if *Volatility* is chosen as the **TSRL Mode**, otherwise it has no effect on the trading system. It defines the number of periods used to smooth the ATR indicator's data.

ATR Multiplier (If Mode = Volatility)

This parameter is only used if *Volatility* is chosen as the **TSRL Mode**, otherwise it has no effect on the trading system. It defines the multiplication factor of the ATR indicator's value. The resulting ATR

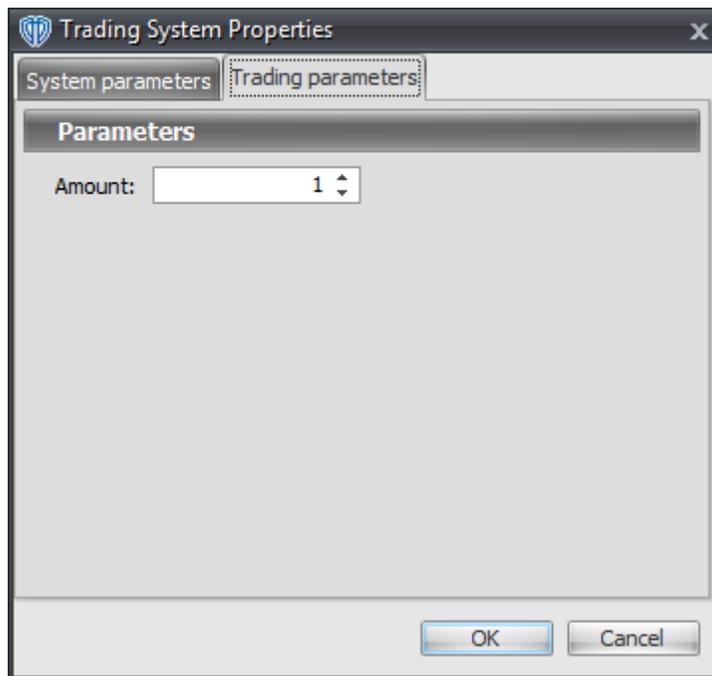
indicator's value is multiplied by this amount and the final multiplied ATR value is what actually determines how far behind the price the Trailing Stoploss Reversal Level indicator follows.

of Pips to Trail (If Mode = Pips)

This parameter is only used if *Pips* is chosen as the **TSRL Mode**, otherwise it has no affect on the trading system. It defines the number of pips that the Trailing Stoploss Reversal Level follows behind the price.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.96 Trend Continuation Factor Cross System

Overview

The **Trend Continuation Factor Cross System** uses the Trend Continuation Factor indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when Plus TCF crosses above Minus TCF.

A *Short* signal is generated when Plus TCF crosses below Minus TCF.

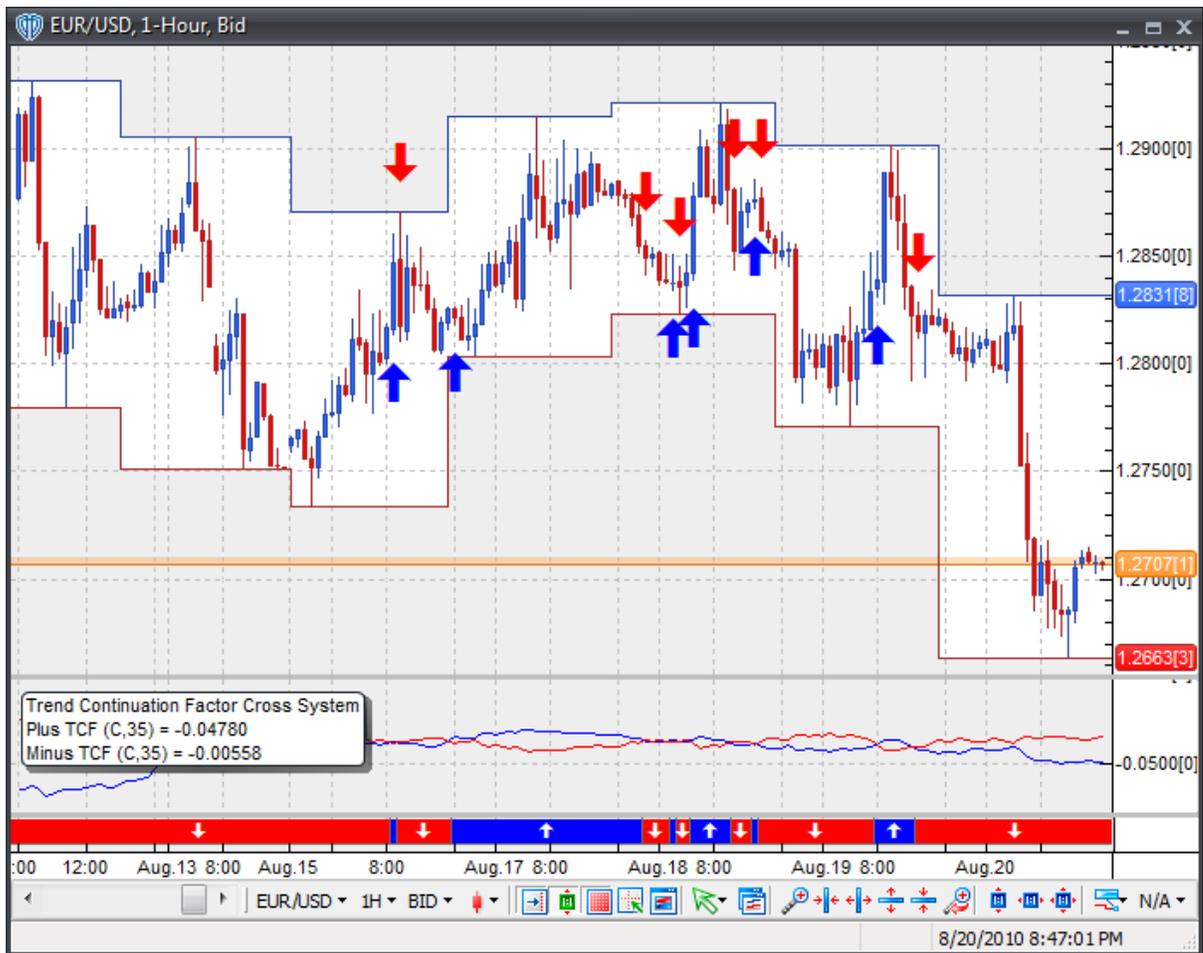
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Trend Continuation Factor Cross System** consists of the following output variables and display parameters:

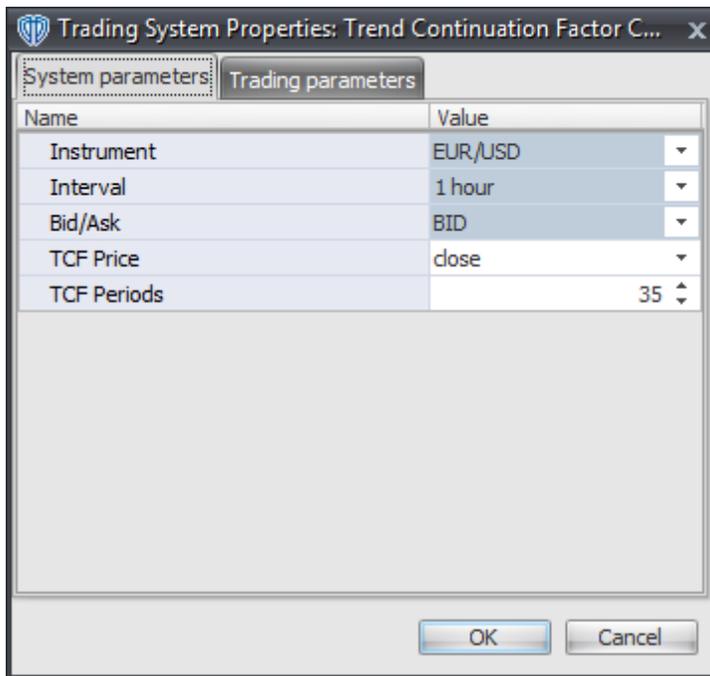
- Plus TCF displays in Additional Frame 1 as a thin, solid, blue line.
- Minus TCF displays in Additional Frame 1 as a thin, solid, red line.
- The Trend Frame displays a white up arrow against a blue background while Plus TCF is greater than Minus TCF.
- The Trend Frame displays a white down arrow against a red background while Plus TCF is less than Minus TCF.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Plus TCF crossed above Minus TCF." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Plus TCF crossed below Minus TCF." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Trend Continuation Factor Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

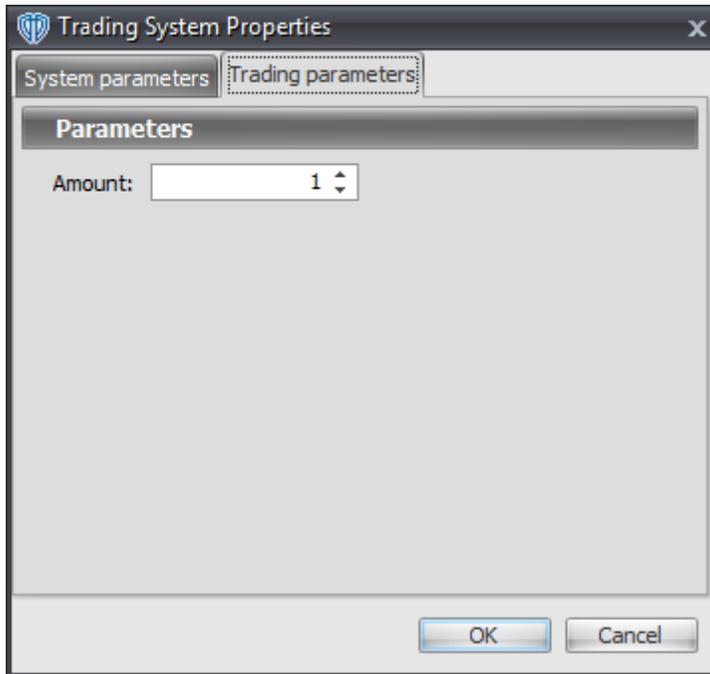
These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

TCF Price and TCF Periods

These parameters define the price and number of periods used to calculate the Trend Continuation Factor indicator.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.97 Trend Continuation Factor Strong Trend System

Overview

The **Trend Continuation Factor Strong Trend System** uses the Directional Movement Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when Plus TCF crosses above zero.

A *Long Exit* signal is generated when your choice of: Plus TCF crosses below zero OR Plus TCF crosses below Minus TCF.

A *Short Entry* signal is generated when Minus TCF crosses above zero.

A *Short Exit* signal is generated when your choice of: Minus TCF crosses below zero or Minus TCF crosses below Plus TCF.

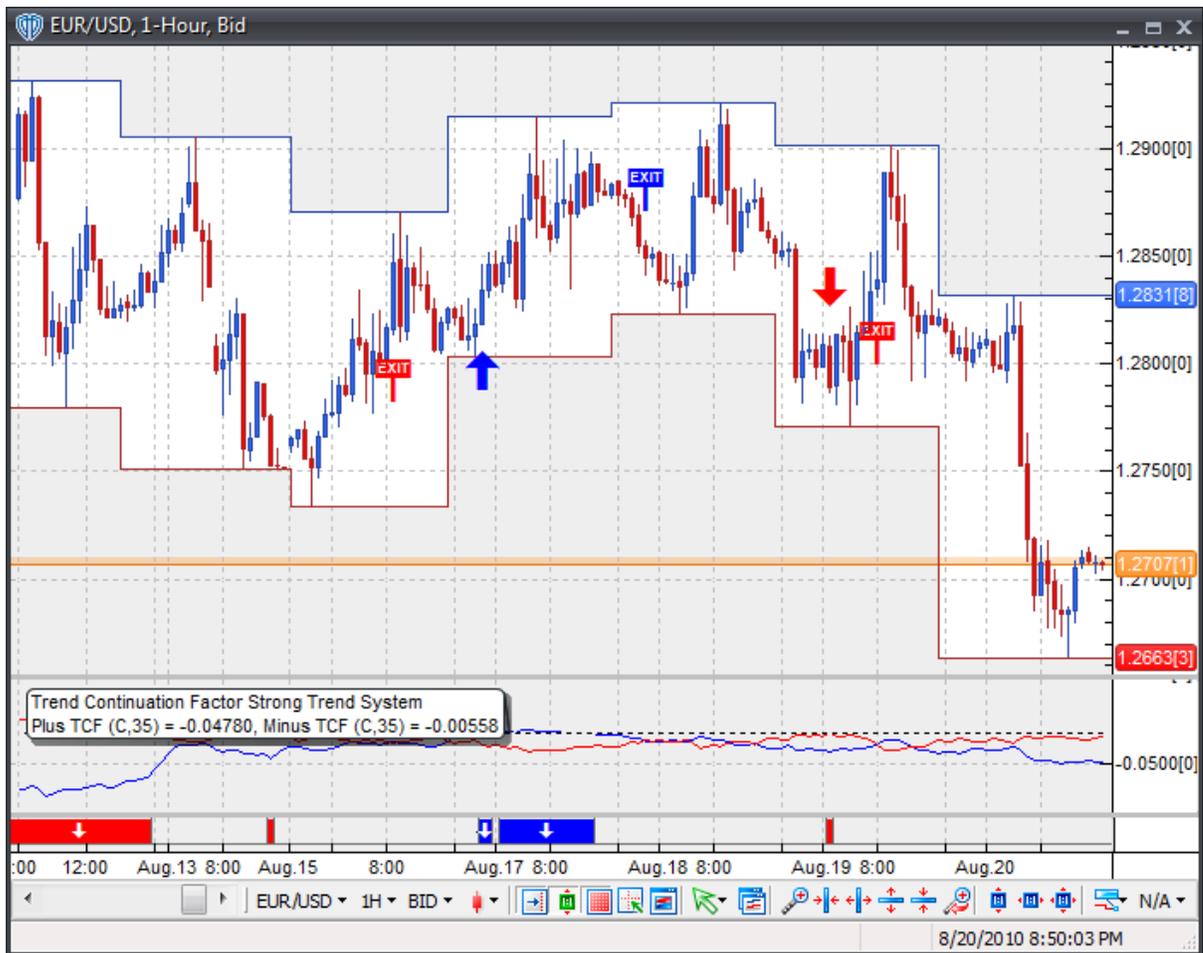
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Trend Continuation Factor Strong Trend System** consists of the following output variables and display parameters:

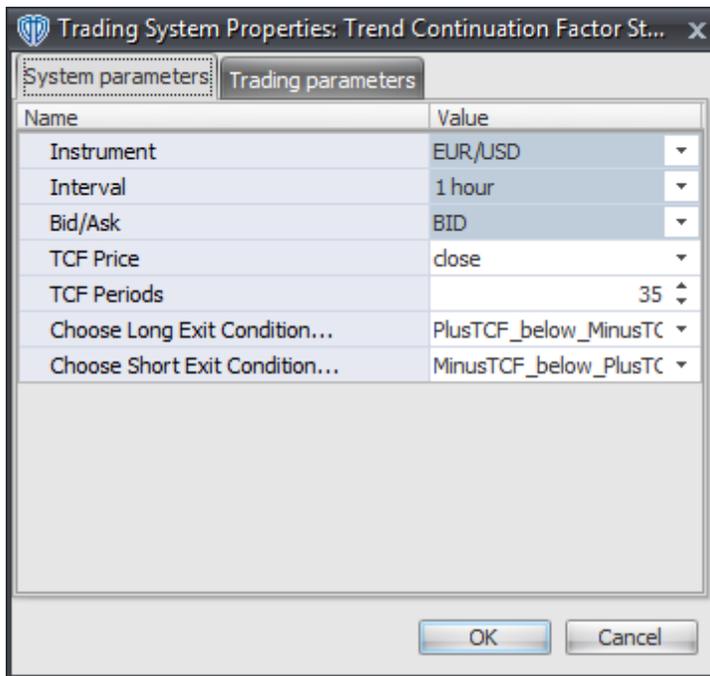
- Plus TCF displays in Additional Frame 1 as a thin, solid, blue line.
- Minus TCF displays in Additional Frame 1 as a thin, solid, red line.
- The Trend Frame displays a white up arrow against a blue background while Plus TCF is greater than zero.
- The Trend Frame displays a white down arrow against a red background while Minus TCF is greater than zero.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Plus TCF crossed above Zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! Plus TCF crossed below Zero OR Plus TCF crossed below Minus TCF." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Minus TCF crossed above Zero." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! Minus TCF crossed below Zero OR Plus TCF crossed above Minus TCF." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Trend Continuation Factor Strong Trend System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

TCF Price and TCF Periods

These parameters define the price and number of periods used to calculate the Trend Continuation Factor indicator.

Choose Long Exit Condition...

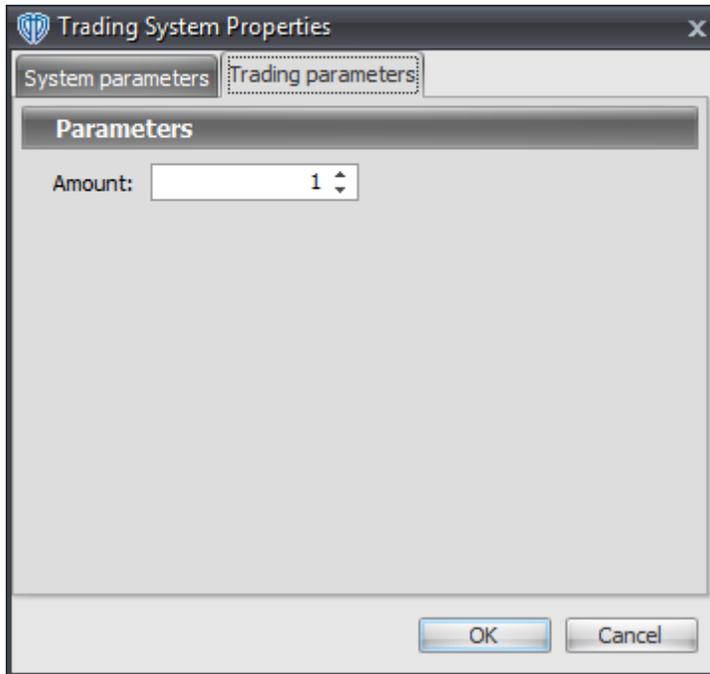
This parameter defines the condition necessary to generate the *Long Exit* signal. Please refer to the *Overview* section above for details.

Choose Short Exit Condition...

This parameter defines the condition necessary to generate the *Short Exit* signal. Please refer to the *Overview* section above for details.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.98 Trend Trigger Factor (TTF) Reversal System

Overview

The **Trend Trigger Factor (TTF) Reversal System** uses the Trend Trigger Factor (TTF) indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Trend Trigger Factor crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Trend Trigger Factor crosses below its OverBought Level from above OR the Trend Trigger Factor crosses below its OverSold Level from above.

A *Short Entry* signal is generated when the Trend Trigger Factor crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Trend Trigger Factor crosses above its OverSold Level from below OR the Trend Trigger Factor crosses above its OverBought Level from below.

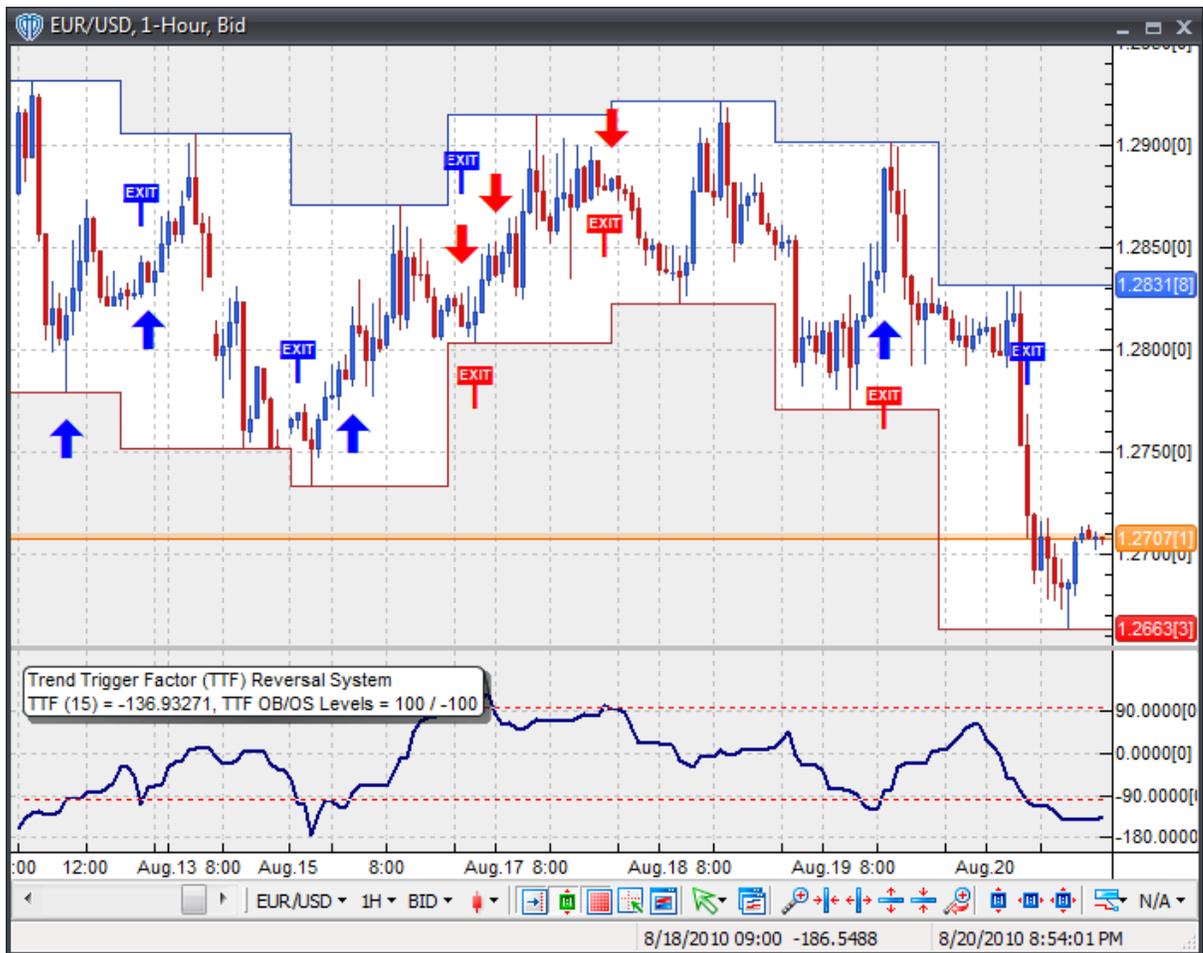
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Trend Trigger Factor (TTF) Reversal System** consists of the following output variables and display parameters:

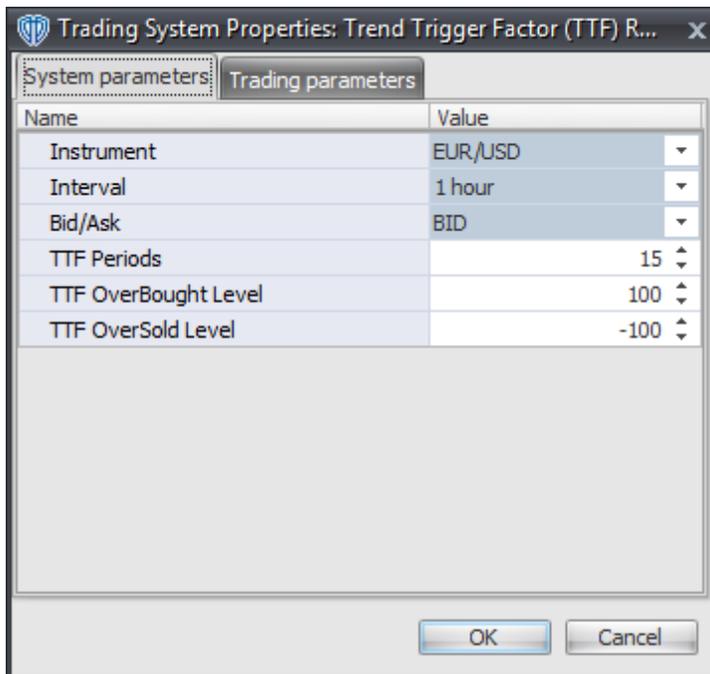
- The Trend Trigger Factor displays in Additional Frame 1 as a slightly thicker, solid, dark blue line.
- The Trend Trigger Factor OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The TTF crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The TTF crossed below its OverBought Level or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The TTF crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The TTF crossed above its OverSold Level or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Trend Trigger Factor (TTF) Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

TTF Periods

This parameter defines the number of periods used to calculate the Trend Trigger Factor indicator.

TTF OverBought Level

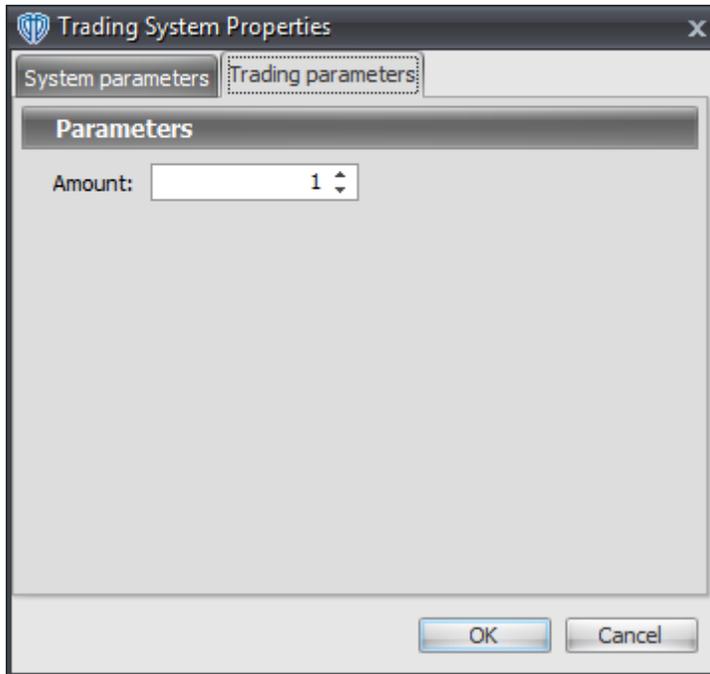
This parameter defines the OverBought value used in the Trend Trigger Factor-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

TTF OverSold Level

This parameter defines the OverSold value used in the Trend Trigger Factor-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.99 Triple Exponential Average (TRIX) Cross System

Overview

The **Triple Exponential Average (TRIX) Cross System** uses the Triple Exponential Average (TRIX) indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the TRIX crosses above its Signal Line.

A *Short* signal is generated when the TRIX crosses below its Signal Line.

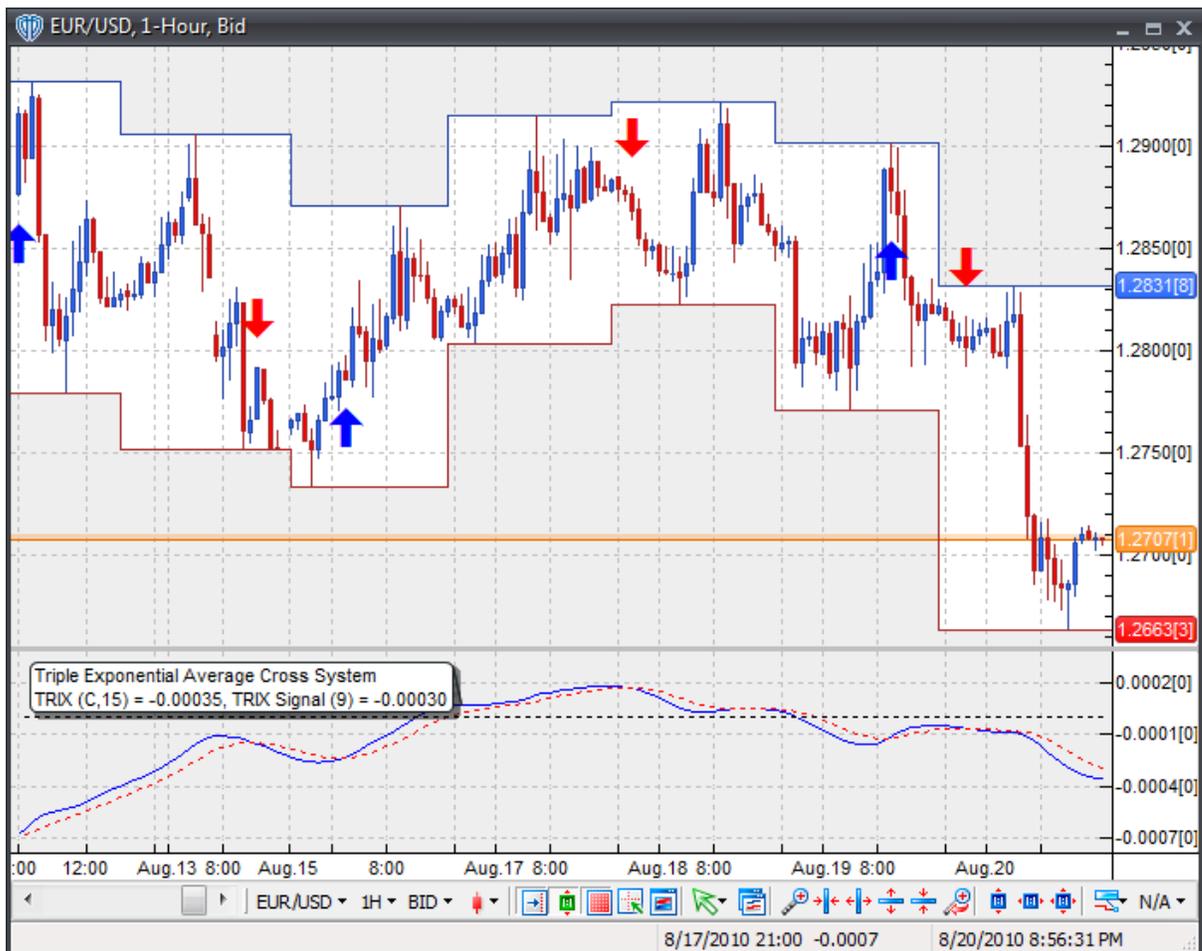
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Triple Exponential Average (TRIX) Cross System** consists of the following output variables and display parameters:

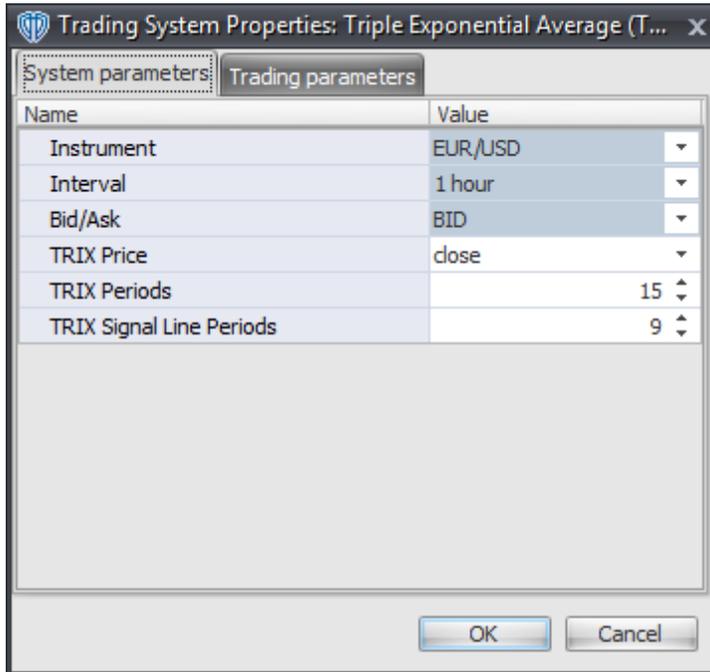
- The Triple Exponential Average (TRIX) displays in Additional Frame 1 as a thin, solid, blue line. Its mid-level (0) displays in the same frame as a black dashed line.
- The Triple Exponential Average (TRIX) Signal Line displays in Additional Frame 1 as a thin, dashed, red line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The TRIX crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The TRIX crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Triple Exponential Average (TRIX) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

TRIX Price and TRIX Periods

These parameters define the price and number of periods used to calculate the Triple Exponential Average (TRIX).

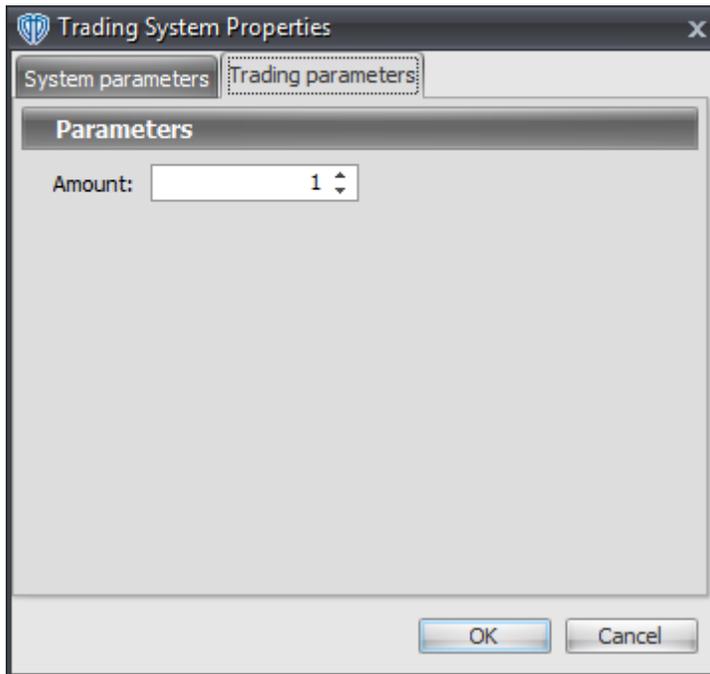
TRIX Signal Line Periods

This parameter defines the number of periods used to calculate the Triple Exponential Average (TRIX) Signal Line.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the

Amount (in Lots) that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.100 Triple Exponential Moving Average (TEMA) Cross System

Overview

The **Triple Exponential Moving Average (TEMA) Cross System** uses fast and slow Triple Exponential Moving Averages (TEMA's) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Fast TEMA crosses above the Slow TEMA.

A *Short* signal is generated when the Fast TEMA crosses below the Slow TEMA.

This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

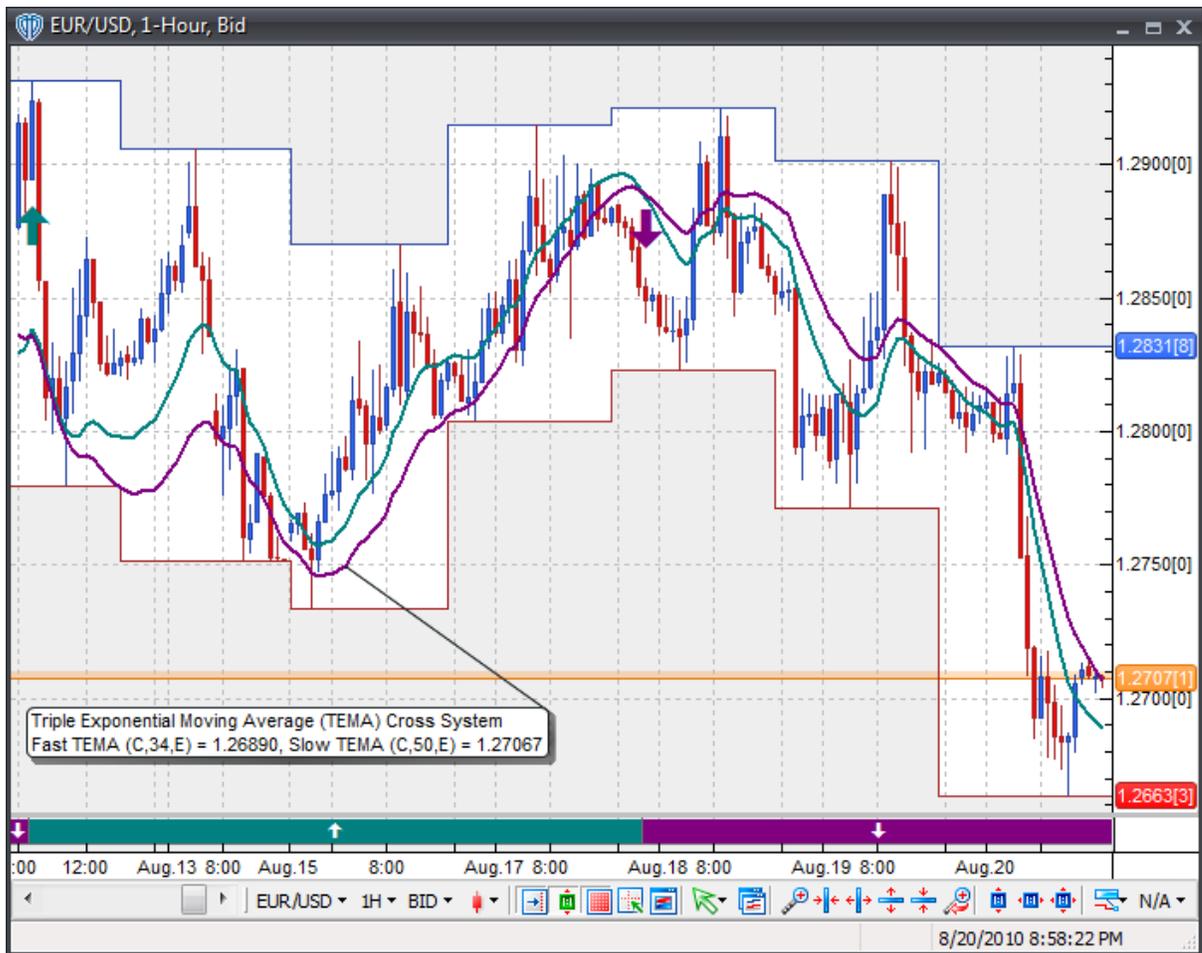
System Outputs and Signals Logic

The **Triple Exponential Moving Average (TEMA) Cross System** consists of the following output

variables and display parameters:

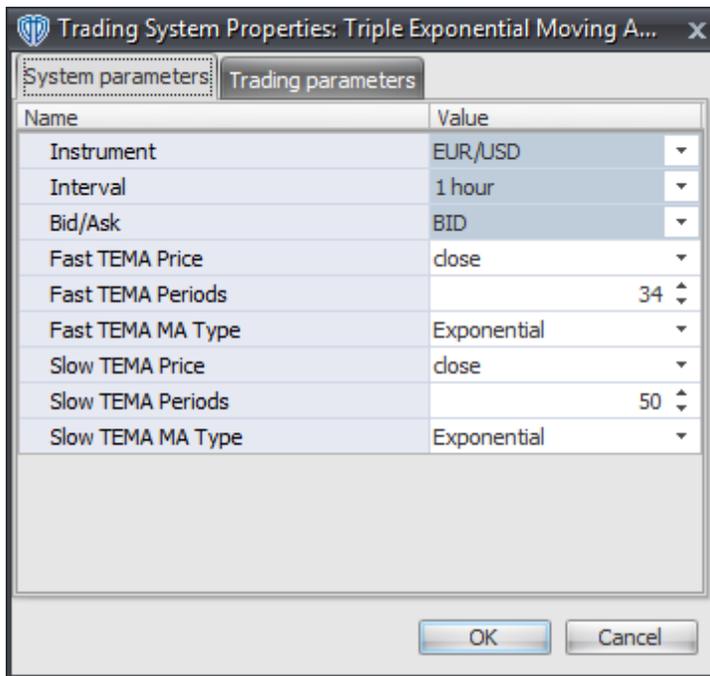
- The Fast TEMA displays in the Price Frame as slightly thicker, solid green line.
- The Slow TEMA displays in the Price Frame as a slightly thicker, solid purple line.
- The Trend Frame displays a white up arrow against a green background while the Fast TEMA is greater than the Slow TEMA.
- The Trend Frame displays a white down arrow against a purple background while the Fast TEMA is less than the Slow TEMA.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! Fast TEMA crossed above Slow TEMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! Fast TEMA crossed below Slow TEMA." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Triple Exponential Moving Average (TEMA) Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Fast TEMA Price, Periods, and MA Type

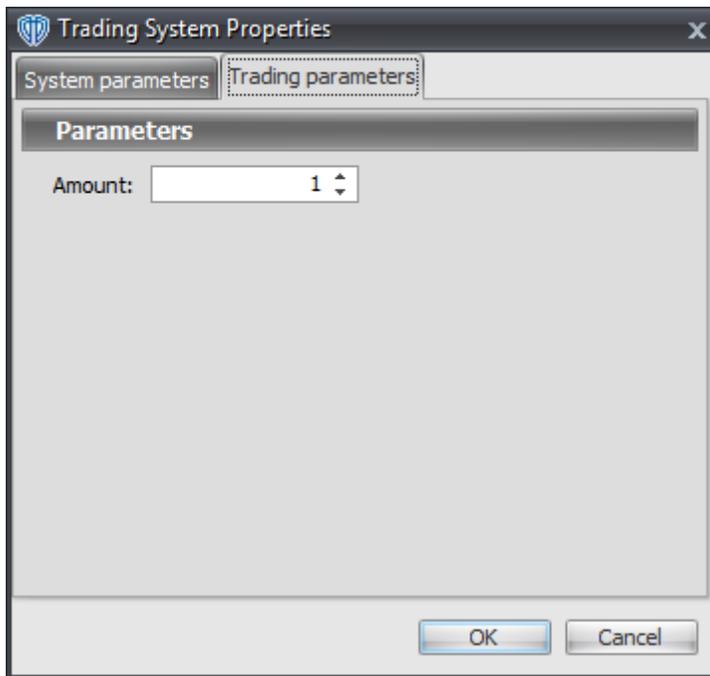
These parameters define the price, number of periods, and type of moving average used to calculate the Fast Triple Exponential Moving Average (TEMA).

Slow TEMA Price, Periods, and MA Type

These parameters define the price, number of periods, and type of moving average used to calculate the Slow Triple Exponential Moving Average (TEMA).

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.101 True Strength Index Cross System

Overview

The **True Strength Index Cross System** uses the True Strength Index to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the True Strength Index crosses above its Signal Line.

A *Short* signal is generated when the True Strength Index crosses below its Signal Line.

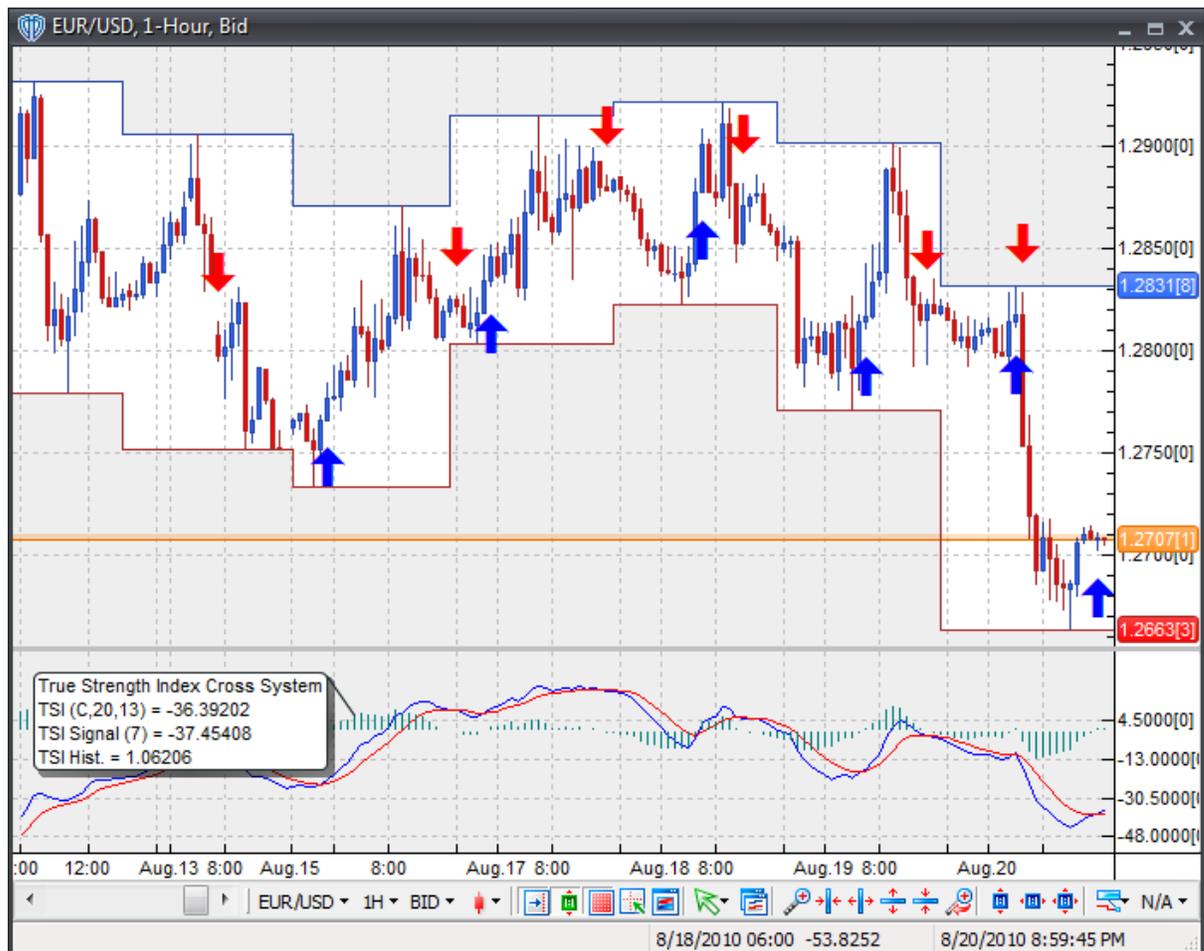
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **True Strength Index Cross System** consists of the following output variables and display parameters:

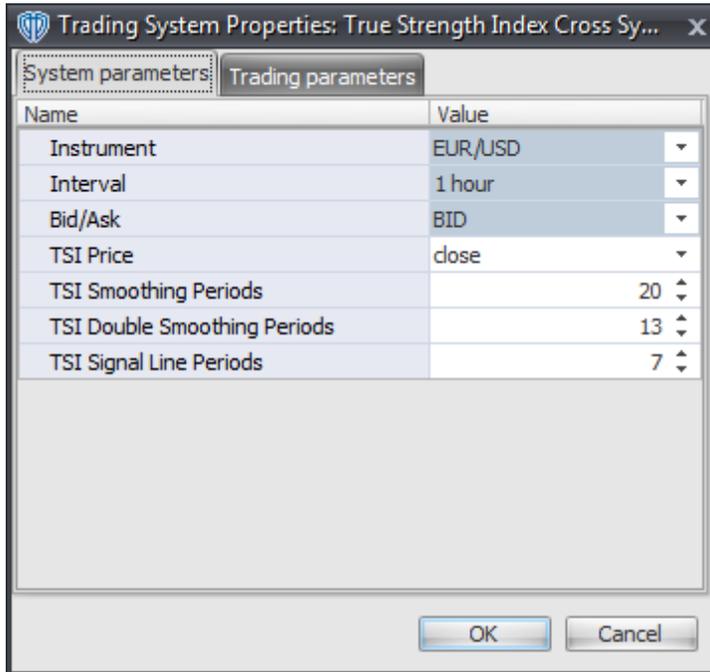
- The True Strength Index displays in Additional Frame 1 as a thin, solid, blue line.
- The True Strength Index Signal Line displays in Additional Frame 1 as a thin, solid, red line.
- The True Strength Index Histogram displays in Additional Frame 1 as a green histogram.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long signal detected! The TSI crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short signal detected! The TSI crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **True Strength Index Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

TSI Price, Smoothing Periods, and Double Smoothing Periods

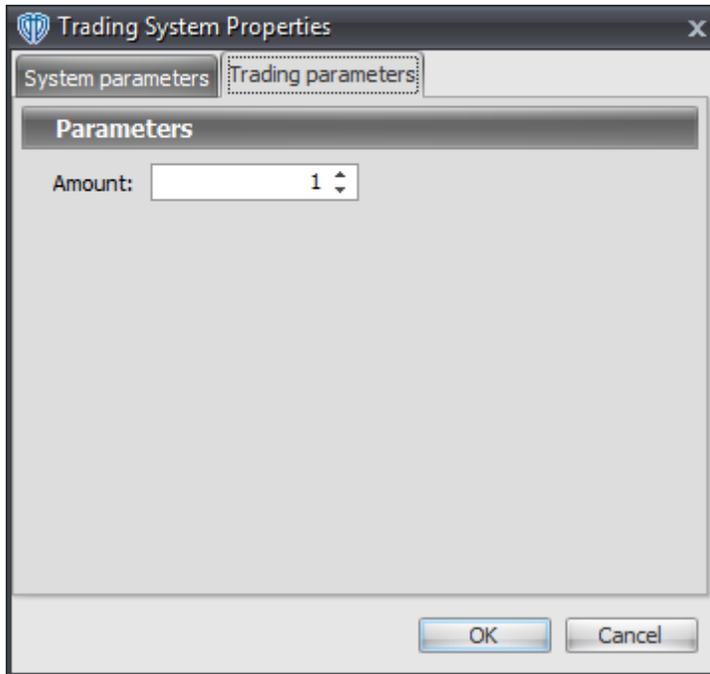
These parameters define the values used to calculate the True Strength Index.

TSI Signal Line Periods

This parameter defines the number of periods used to calculate the True Strength Index Signal Line.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.102 Ultimate Oscillator / Signal Line Cross System

Overview

The **Ultimate Oscillator / Signal Line Cross System** uses the Ultimate Oscillator and a moving average of the Ultimate Oscillator (*i.e. its Signal Line*) to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Ultimate Oscillator crosses above the Ultimate Oscillator's Signal Line.

A *Short* signal is generated when the Ultimate Oscillator crosses below the Ultimate Oscillator's Signal Line.

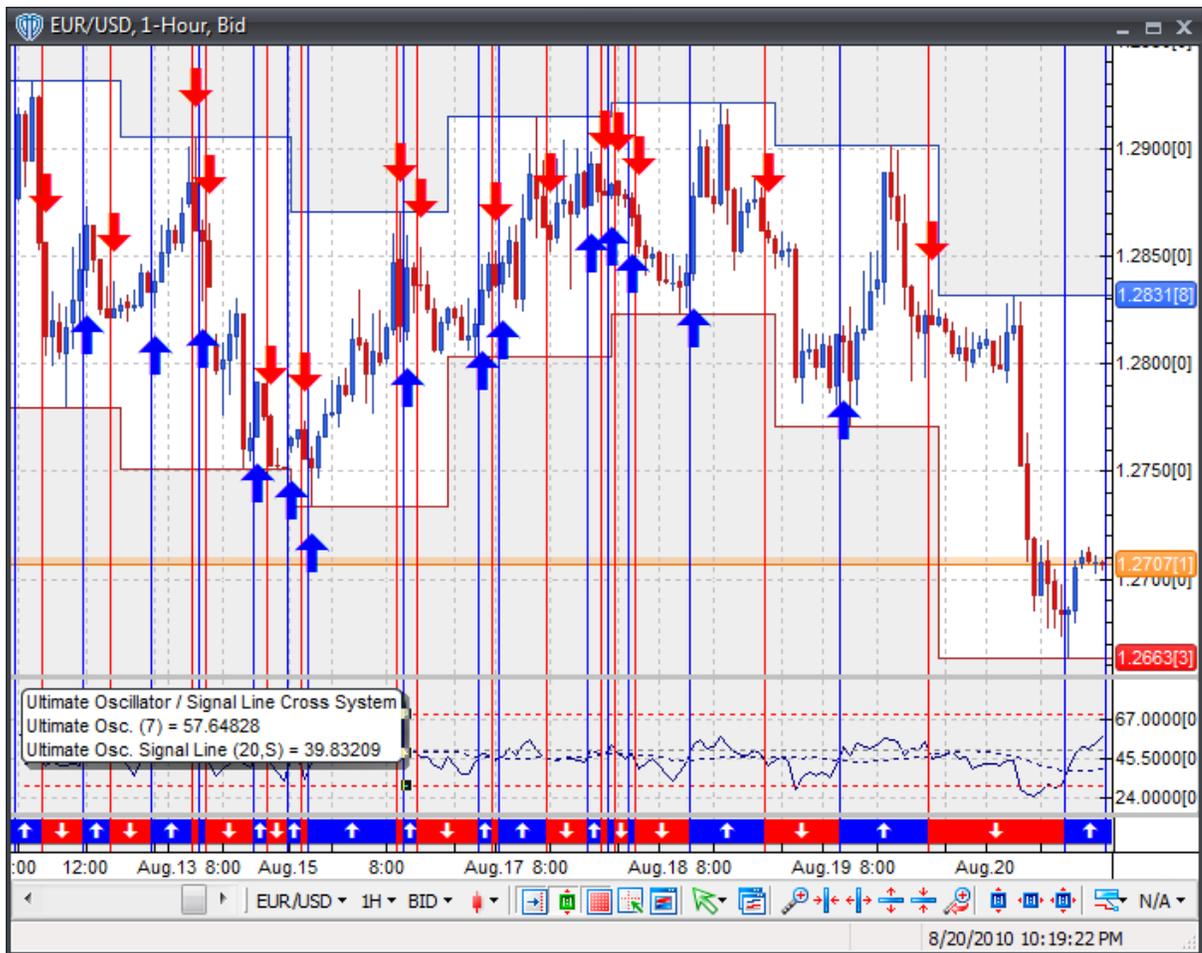
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy, CloseBuy, OpenSell, and CloseSell*).

System Outputs and Signals Logic

The **Ultimate Oscillator / Signal Line Cross System** consists of the following output variables and display parameters:

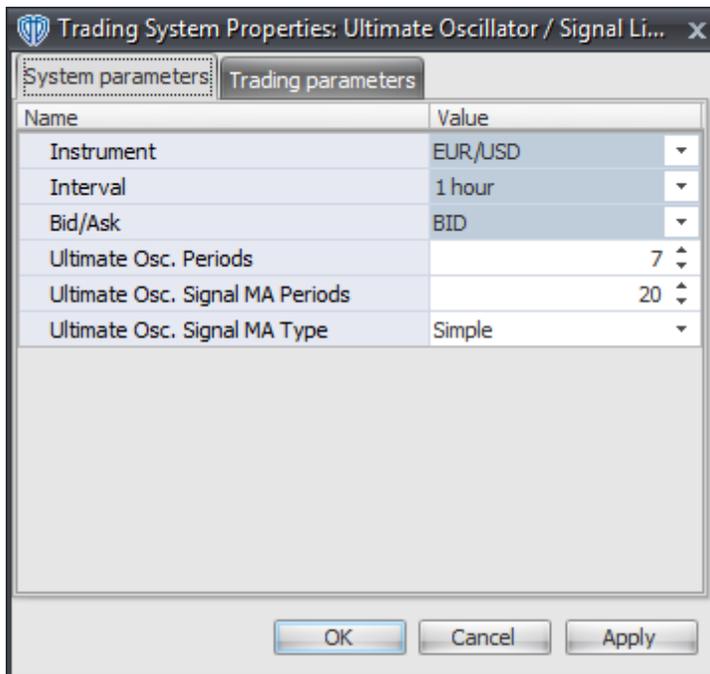
- The Ultimate Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Ultimate Oscillator Signal Line displays in Additional Frame 1 as a thin, dashed dark blue line.
- The Trend Frame displays a white up arrow against a blue background along with beginning/ending vertical blue lines while the Ultimate Oscillator is greater than the Ultimate Oscillator's Signal Line.
- The Trend Frame displays a white up arrow against a red background along with beginning/ending vertical red lines while the Ultimate Oscillator is less than the Ultimate Oscillator's Signal Line.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The Ultimate Osc. crossed above its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The Ultimate Osc. crossed below its Signal Line." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ultimate Oscillator / Signal Line Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Ultimate Osc. Periods

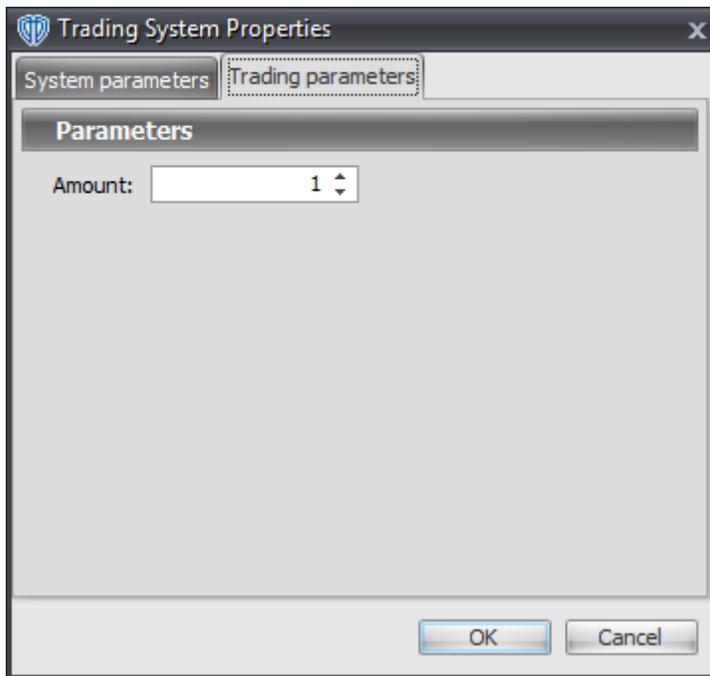
This parameter defines the number of periods used to calculate the Ultimate Oscillator.

Ultimate Osc. Signal MA Periods and Ultimate Osc. Signal MA Type

These parameters define the number of periods and type of the moving average used to calculate the Ultimate Oscillator's Signal Line.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.103 Ultimate Oscillator Cross System

Overview

The **Ultimate Oscillator Cross System** uses the Ultimate Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Ultimate Oscillator crosses above its Long Entry Level.

A *Short* signal is generated when the Ultimate Oscillator crosses below its Short Entry Level.

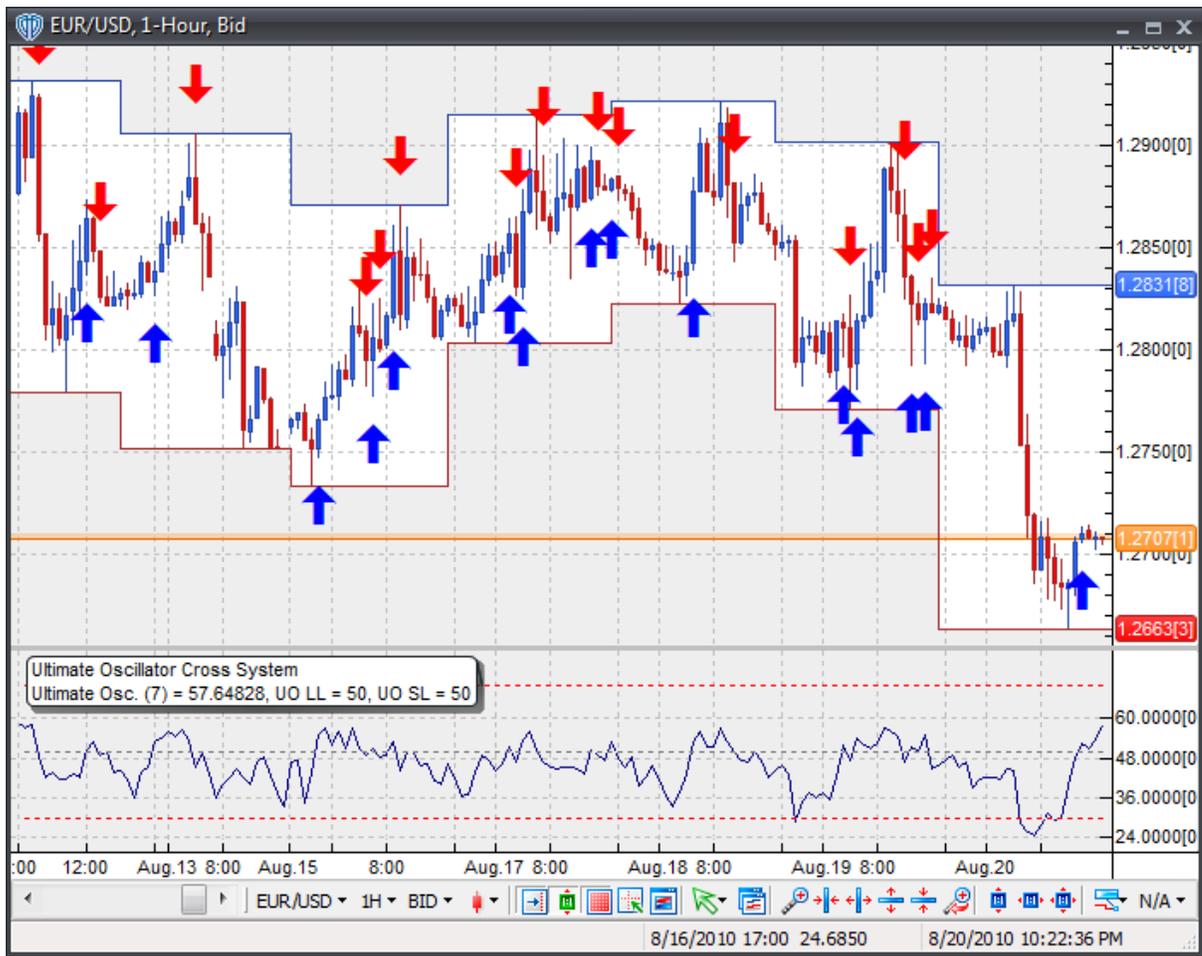
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Ultimate Oscillator Cross System** consists of the following output variables and display parameters:

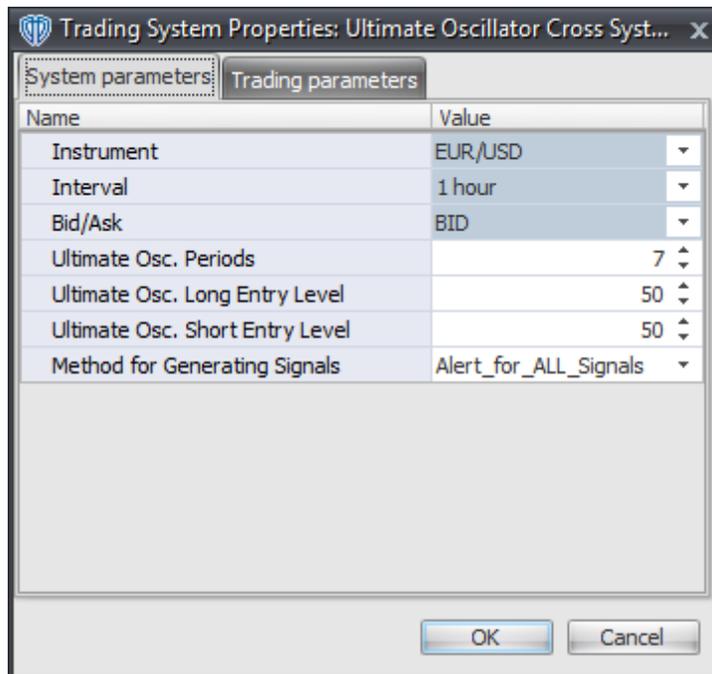
- The Ultimate Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line. Its overbought (70) and oversold (30) levels display in the same frame as red dashed lines. Its mid-level (50) displays in the same frame as a grey dashed line.
- Ultimate Oscillator's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The Ultimate Osc. crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The Ultimate Osc. crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ultimate Oscillator Cross System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Ultimate Osc. Periods

This parameter defines the number of periods used to calculate the Ultimate Oscillator.

Ultimate Osc. Long Entry Level

This parameter defines the value used in the Ultimate Oscillator-related conditions to generate the *Long* signal.

Ultimate Osc. Short Entry Level

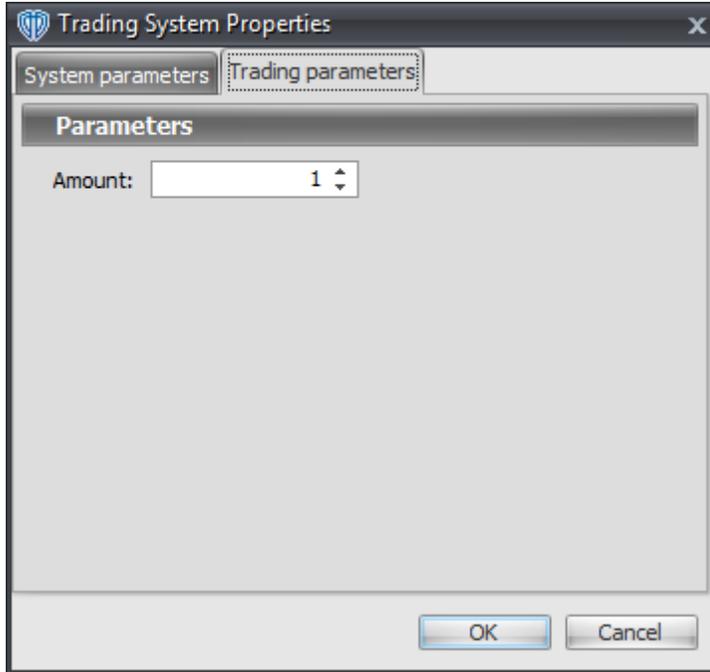
This parameter defines the value used in the Ultimate Oscillator-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.104 Ultimate Oscillator Reversal System

Overview

The **Ultimate Oscillator Reversal System** uses the Ultimate Oscillator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Ultimate Oscillator crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Ultimate Oscillator crosses below its OverBought Level, Mid-Level, or OverSold Level from above.

A *Short Entry* signal is generated when the Ultimate Oscillator crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Ultimate Oscillator crosses above its OverSold Level, Mid-

Level, or OverBought Level from below.

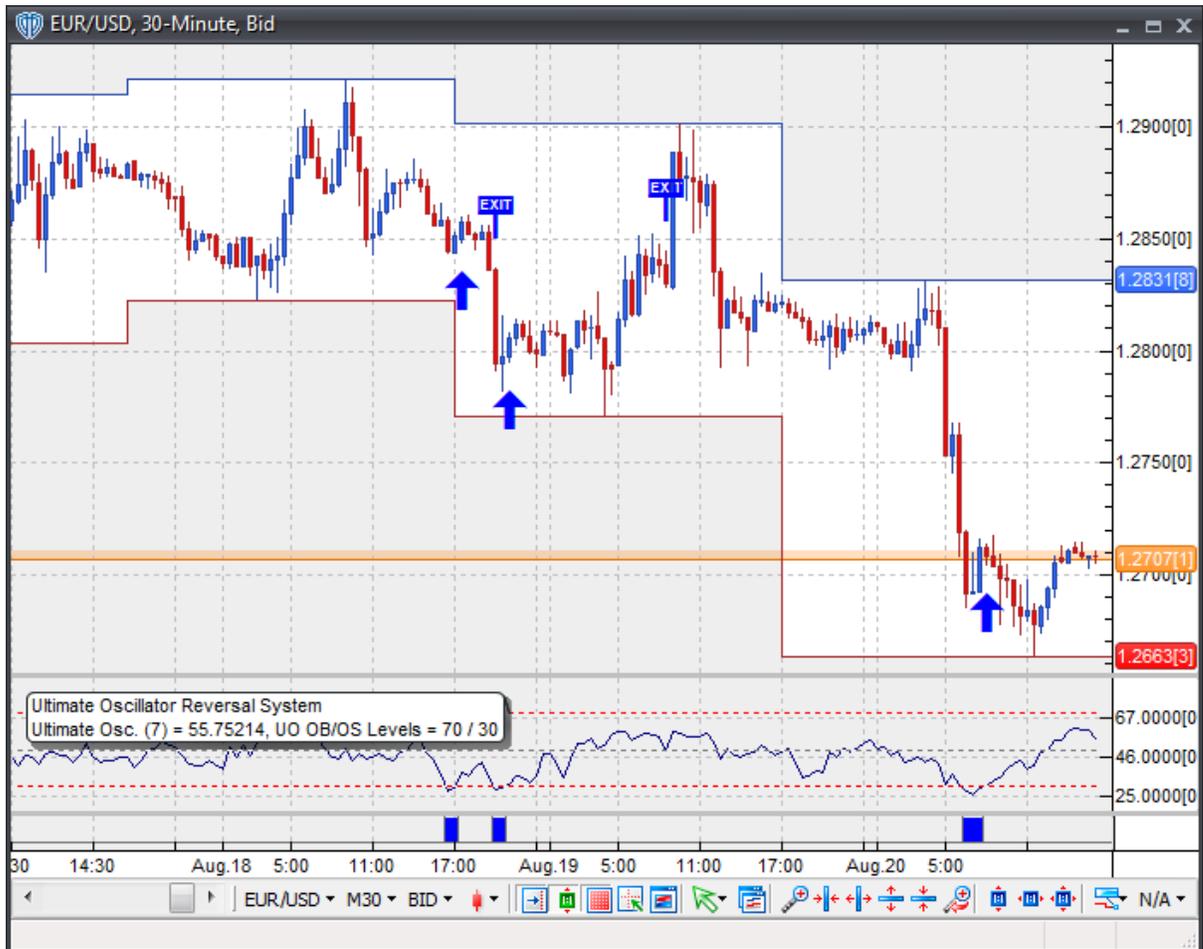
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Ultimate Oscillator Reversal System** consists of the following output variables and display parameters:

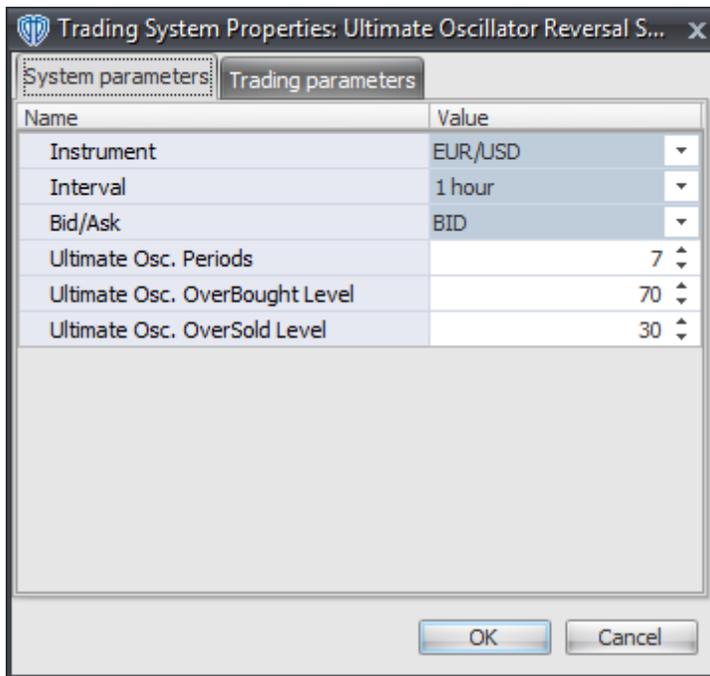
- The Ultimate Oscillator displays in Additional Frame 1 as a thin, solid, dark blue line. Its mid-level (50) displays in the same frame as a grey dashed line.
- The Ultimate Oscillator OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue background while the Ultimate Oscillator is less than its OverSold Level.
- The Trend Frame displays a red background while the Ultimate Oscillator is greater than its OverBought Level.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! The Ultimate Oscillator crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! The Ultimate Oscillator crossed below its OverBought Level, Mid Level, or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! The Ultimate Oscillator crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! The Ultimate Oscillator crossed above its OverSold Level, Mid Level, or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ultimate Oscillator Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Ultimate Osc. Periods

This parameter defines the number of periods used to calculate the Ultimate Oscillator.

Ultimate Osc. OverBought Level

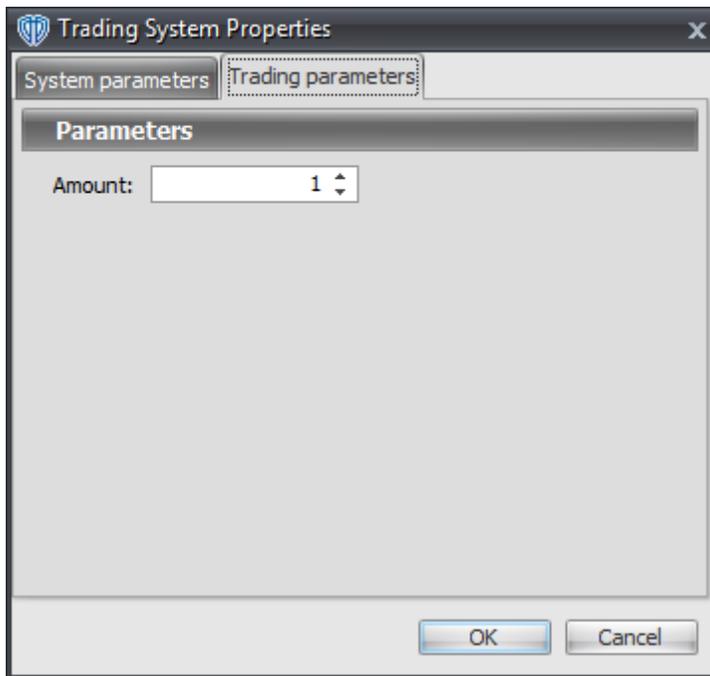
This parameter defines the OverBought value used in the Ultimate Oscillator-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

Ultimate Osc. OverSold Level

This parameter defines the OverSold value used in the Ultimate Oscillator-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.105 Williams Percent Range (%R) Cross System

Overview

The **Williams Percent Range (%R) Cross System** uses the Williams Percent Range (%R) indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long* signal is generated when the Williams %R crosses above its Long Entry Level.

A *Short* signal is generated when the Williams %R crosses below its Short Entry Level.

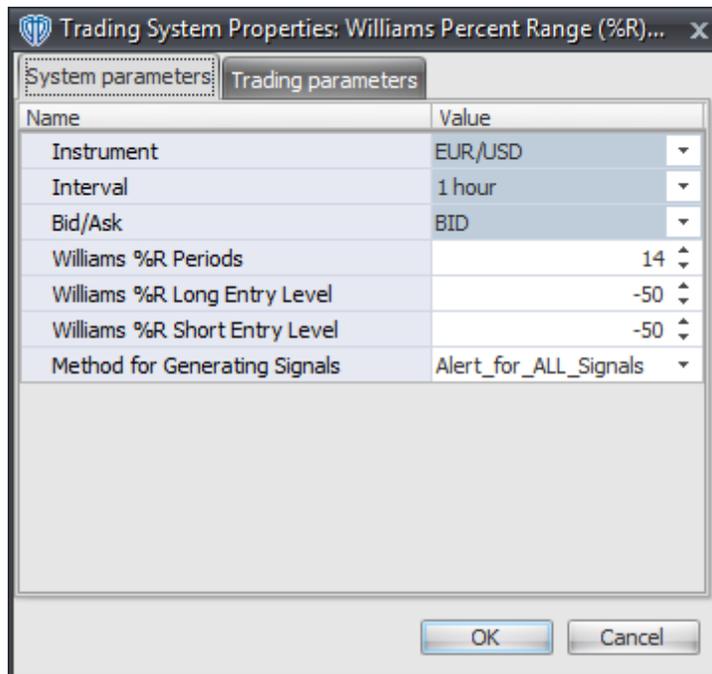
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*). **Note:** This trading system's *Auto-Trade* mode always attempts to request orders based on the "Always_in_the_Market" method of generating signals to help ensure that only one position is open at any given time even if the "Alert_for_ALL_Signals" input selection is chosen.

System Outputs and Signals Logic

The **Williams Percent Range (%R) Cross System** consists of the following output variables and display parameters:

- The Williams Percent Range (%R) displays in Additional Frame 1 as a thin, solid dark blue line. Its overbought (-20) and oversold (-80) levels display in the same frame as red dashed lines. Its mid-level (-50) displays in the same frame as a grey dashed line.
- The Williams %R's Long Entry Level and Short Entry Level display in Additional Frame 1 as dashed blue lines.
- When a *Long* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Williams %R crossed above its Long Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable, the logic of the *CloseSell* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Williams %R crossed below its Short Entry Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Williams Percent Range (%R) Cross System** attached to a chart window using its default parameters...



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Williams %R Periods

This parameter defines the number of periods used to calculate the Williams Percent Range (%R).

Williams %R Long Entry Level

This parameter defines the value used in the Williams %R-related conditions to generate the *Long* signal.

Williams %R Short Entry Level

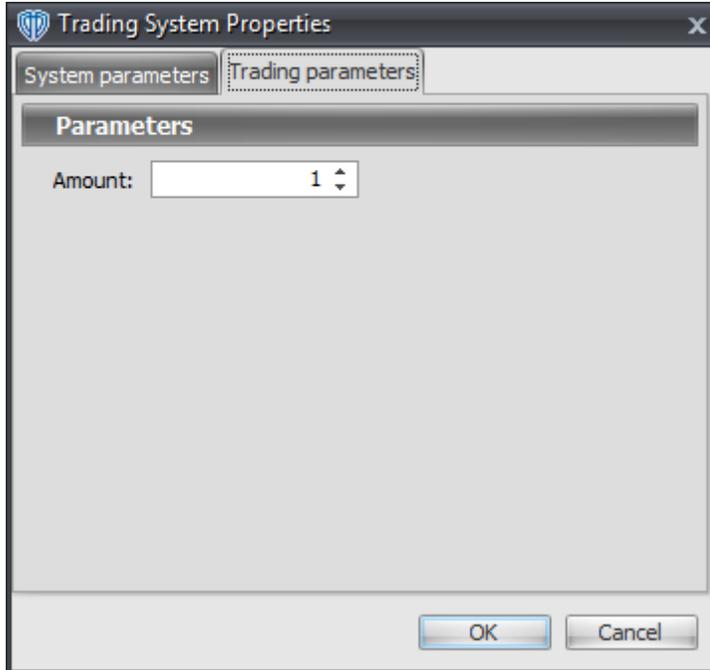
This parameter defines the value used in the Williams %R-related conditions to generate the *Short* signal.

Method for Generating Signals

This parameter is a selection list with two choices. "Alert_for_ALL_Signals" allows the trading system to provide alerts for all potential trading signals, including multiple consecutive long or short signals. "Always_in_the_Market" forces the trading system to provide alerts for only the first signal in a consecutive series of long or short signals.

Auto-Trading Parameters

It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

7.106 Williams Percent Range (%R) Reversal System

Overview

The **Williams Percent Range (%R) Reversal System** uses the Williams Percent Range (%R) indicator to generate signals for potential trading opportunities.

The signals are generated using the following logic:

A *Long Entry* signal is generated when the Williams %R crosses above its OverSold Level from below.

A *Long Exit* signal is generated when the Williams %R crosses below its OverBought Level, Mid-Level, or OverSold Level from above.

A *Short Entry* signal is generated when the Williams %R crosses below its OverBought Level from above.

A *Short Exit* signal is generated when the Williams %R crosses above its OverSold Level, Mid-Level, or OverBought Level from below.

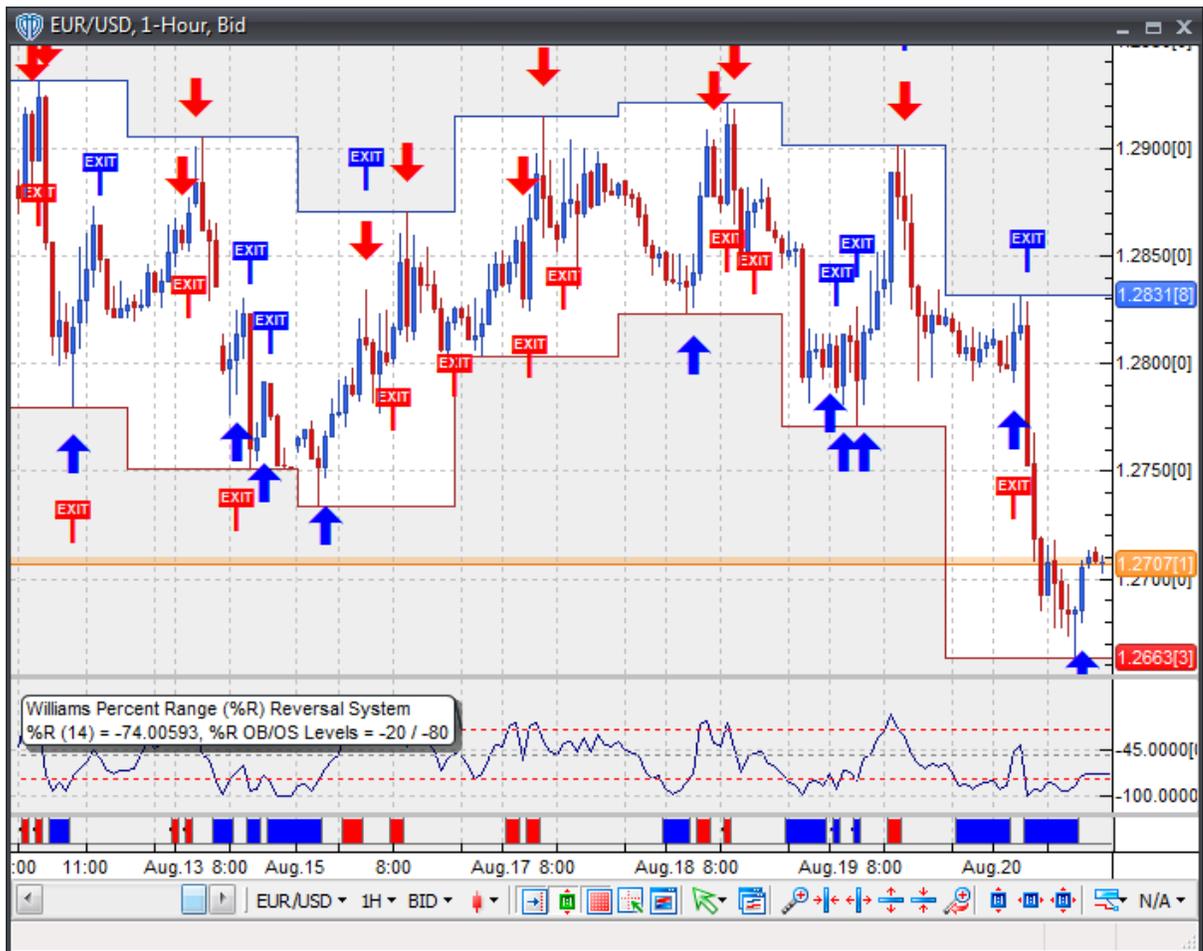
This trading system can be used in *Recommendation Only* mode to generate alerts and, if you choose, in *Auto-Trade* mode to automatically request orders based on its signals and its *Trading Enabled* output variables (*OpenBuy*, *CloseBuy*, *OpenSell*, and *CloseSell*).

System Outputs and Signals Logic

The **Ultimate Oscillator Reversal System** consists of the following output variables and display parameters:

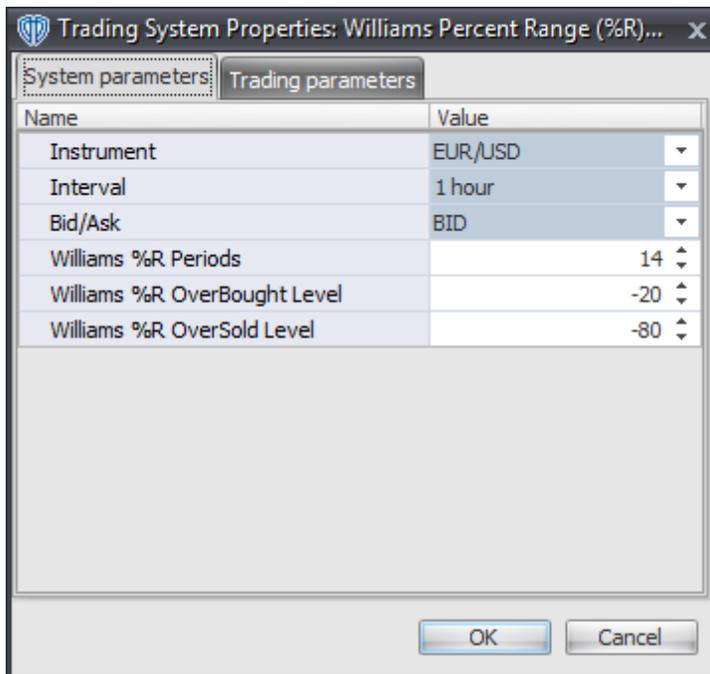
- The Williams Percent Range (%R) displays in Additional Frame 1 as a thin, solid dark blue line. Its mid-level (-50) displays in the same frame as a grey dashed line.
- The Williams Percent Range (%R) OverBought and OverSold levels display in Additional Frame 1 as dashed red lines.
- The Trend Frame displays a blue background while the Williams Percent Range (%R) is less than its OverSold Level.
- The Trend Frame displays a red background while the Williams Percent Range (%R) is greater than its OverBought Level.
- When a *Long Entry* signal is generated a blue up arrow graphic displays in the chart window, the message "Long entry signal detected! Williams %R crossed above its OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenBuy* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Long Exit* signal is generated a blue exit graphic displays in the chart window, the message "Long exit signal detected! Williams %R crossed below its OverBought Level, Mid Level, or OverSold Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *CloseBuy* variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Entry* signal is generated a red down arrow graphic displays in the chart window, the message "Short entry signal detected! Williams %R crossed below its OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable, the logic of the *CloseBuy* output variable, and the parameters defined in the Trading System Properties window's Trading Parameters tab.
- When a *Short Exit* signal is generated a red exit graphic displays in the chart window, the message "Short exit signal detected! Williams %R crossed above its OverSold Level, Mid Level, or OverBought Level." displays in the Trading Activity window, and an audio sound file plays. If *Auto-Trade* mode is *enabled* automated trading actions request orders based on the logic of the *OpenSell* output variable and the parameters defined in the Trading System Properties window's Trading Parameters tab.

Below is a screenshot that shows the **Ultimate Oscillator Reversal System** attached to a chart window using its default parameters...



System Parameters

This trading system includes adjustable input parameters for added flexibility. You can make any required changes from the System Parameters tab in its properties window.



The System Parameters tab contains the following input parameters:

Instrument, Interval, Bid/Ask

These parameters are "read only" values. They are the instrument, chart interval, and chart type the trading system is (*or will be*) attached to.

Williams %R Periods

This parameter defines the number of periods used to calculate the Williams Percent Range (%R).

Williams %R OverBought Level

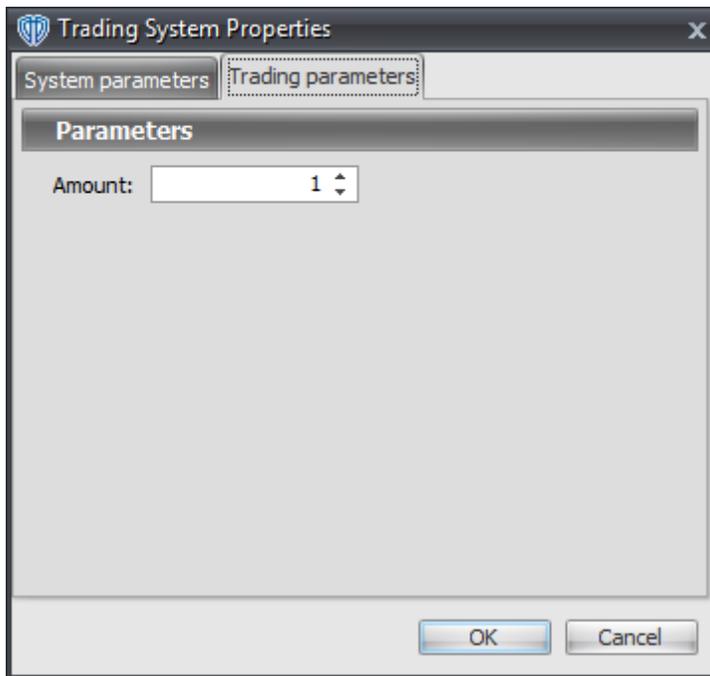
This parameter defines the OverBought value used in the Williams %R-related conditions to generate the *Long Exit*, *Short Entry*, and *Short Exit* signals.

Williams %R OverSold Level

This parameter defines the OverSold value used in the Williams %R-related conditions to generate the *Long Entry*, *Long Exit*, and *Short Exit* signals.

Auto-Trading Parameters

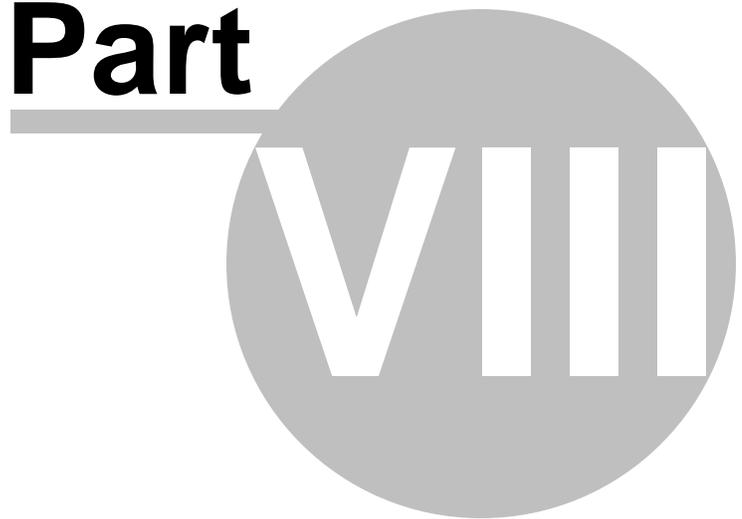
It is extremely important that you verify (*and change, if necessary*) the parameters in the Trading Parameters tab if you intend to use this trading system in *Auto-Trade* mode. You must specify the *Amount (in Lots)* that will be used for each order the trading system requests.



For the trading system to auto-trade, it is necessary to start it in *Auto-Trade* mode; failure to do this will result in no automated order requests being submitted. *Auto-Trade* mode may be started once the trading system is properly configured and successfully attached to a chart.

Automated Trading FAQ for Trading Systems

Part



8 Automated Trading FAQ for Trading Systems

Certain rules and restrictions apply to any trading system started in *Auto-Trade* mode. It is **STRONGLY** recommended that you take a few minutes to read through these Auto-Trading FAQ. Please do not attempt to use any trading system in VT Trader in *Auto-Trade* mode until you are absolutely certain that you fully understand the rules and restrictions that govern trading systems' auto-trading functionality. For the sake of brevity, all of the FAQs assume that a trading system is already attached to the chart and running in *Auto-Trade* mode unless stated otherwise.

Q. Are there any limitations as to how many trading systems can be used in a single account and/or on a single instrument?

You can use as many trading systems attached to as many different charts as your computer hardware can handle when running the trading systems in *Recommendation* mode. However, there are some restrictions when running one or more trading systems in *Auto-Trade* mode. There is a maximum of one trading system running in *Auto-Trade* mode per instrument per account (** it is possible to have more than one account assigned to a given platform login username*). For example, at the time of this writing VT Trader supports 42 different instruments. If you have one account, you can have up to 42 trading systems (*all different trading systems, multiple copies of the same trading system, or any combination thereof*) each running in *Auto-Trade* mode if each trading system is attached to a different instrument. If you have more than one account, each account can have a maximum of one trading system per instrument running in *Auto-Trade* mode.

Q. What types of orders can be requested and/or managed by a trading system?

A trading system can only request *Buy* market orders and/or *Sell* market orders. A trading system **cannot** request, manage, or remove the following order types: attached *stop*, attached *limit*, *entry stop buy*, *entry stop sell*, *entry limit buy*, *entry limit sell*, *One Cancels Other (OCO)*, *If/Then Single*, and/or *If/Then OCO*.

Q. When does a trading system request its automated orders?

A trading system can generate alerts in real-time, tick-by-tick, as the chart interval (*i.e. candle or bar*) progresses. However, a trading system can only perform automated trading requests on the first price tick of the most current, newly forming chart interval (*i.e. candle or bar*) provided that the condition needed to trigger the automated order request was valid when the previous chart interval (*i.e. candle or bar*) completed. A real-time, tick-by-tick, automated trading method may be implemented in the future, but *Complete Bar* mode is the only method currently available for automated trading.

Q. Should I submit orders and continue to trade normally in the same instrument using the same account as a trading system running in *Auto-Trade* mode is using? Will manual trading interfere with the trading system's auto-trading?

If the trading system you are working with uses the `EventCount()` function to help control its automated trading actions, you should not submit any orders of any type or perform any additional trading actions in the same instrument using the same account as a trading system running in *Auto-Trade* mode is using. Doing so could adversely affect a trading system's ability to auto-trade properly. The internal "*event count*" logic is very limited and it cannot properly account for any manual trading activities. A trading system has no knowledge of any actual open positions, pending orders, or attached stop/limit orders in your account and therefore it cannot properly interact with

any such positions/orders or avoid potentially conflicting trading situations.

It is strongly recommended that a trading system use some combination of the PositionCount(), BuyPositionCount(), and/or SellPositionCount() functions vs. the EventCount() function to help control its automated trading actions while running in *Auto-Trade* mode.

Q. Can I start a trading system in *Auto-Trade* mode when I already have an open position in the instrument using the same account that the trading system will be using? Will a trading system continue auto-trading correctly if I stop its *Auto-Trade* mode while there is a position open and then restart its *Auto-Trade* mode while the position is still open?

If the trading system you are working with uses the EventCount() function to help control its automated trading actions, when you start (or restart) a trading system in *Auto-Trade* mode there must be no existing open positions in the instrument using the same account that the trading system will be using for its automated trading. A trading system using internal "event count" logic cannot detect that an open position already exists when its *Auto-Trade* mode is started. Since the trading system cannot detect an existing open position, its automated trading requests will not be properly correlated to what the trading system assumes is the open position status of your account for that instrument.

For example, let's assume that you already have a 1.0 lot *Buy* position open in the EUR/USD using *Account1*. You attach a simple moving average crossover trading system to the EUR/USD, configure it to request 1.0 lot *Buy* and *Sell* market orders using *Account1*, and start it in *Auto-Trade* mode. The first alert the trading system generates is for a 1.0 lot *Buy* market order to enter the market long. Since you already have an existing 1.0 lot *Buy* position, you now have 2.0 lots in *Buy* positions (but the trading system's internal "event count" logic assumes there is only one 1.0 lot *Buy* position open). The next alert the trading system generates is for two 1.0 lot *Sell* market orders; these orders are to close out the existing 1.0 lot *Buy* position and enter the market short with 1.0 lot. The trading system now assumes it is 1.0 lot short, but it is not. The trading system is actually "flat" (0.0 lots in the market in either direction). Instead of closing out the existing 1.0 lot *Buy* position and entering short with 1.0 lot, the trading system had to use both 1.0 lot *Sell* market orders to close out the existing two 1.0 lot *Buy* positions. You are now in a predicament whereby the trading system is requesting automated orders that are not properly correlated to its alerts or to what the trading system assumes is the open position status in EUR/USD for *Account1*.

It is strongly recommended that a trading system use some combination of the PositionCount(), BuyPositionCount(), and/or SellPositionCount() functions vs. the EventCount() function to help control its automated trading actions while running in *Auto-Trade* mode.

Q. How does a trading system handle requotes and/or rejected orders?

Requoted orders and/or rejected orders cannot be properly accounted for by a trading system that utilizes the EventCount() function to help control its automated trading actions while running in *Auto-Trade* mode. This is an unfortunate limitation of the rudimentary "event count" logic used by many trading systems (although none of the sample trading systems included in our trading platform use "event count" logic any longer).

A trading system can utilize the *Market Range* parameter to help minimize the possibility of having an automated order rejected. The *Market Range* parameter allows you to specify the maximum number of pips of deviation (0-99) from the quoted price (in either direction) that you are willing to accept without having to manually approve a requote request. The *Market Range* parameter can be defined independently for each logical (trading enabled) variable included in a trading system. You can adjust this parameter from the Trading Parameters tab of the Trading Systems Properties

window.

It is strongly recommended that you utilize the *Market Range* parameter and set its value high enough to avoid requote requests and/or order rejections that could potentially occur during the market conditions you expect to be trading in. In the event that you do receive a requote request and do not approve it (or an order gets rejected for some reason) a trading system using "event count" logic cannot account for this missed automated order and will assume that the order was successfully requested, approved, and its position opened. Should that happen, you should immediately stop the trading system's *Auto-Trade* mode and manage any open position(s) manually.

It is strongly recommended that a trading system use some combination of the `PositionCount()`, `BuyPositionCount()`, and/or `SellPositionCount()` functions vs. the `EventCount()` function to help control its automated trading actions while running in *Auto-Trade* mode. The use of these functions will not prohibit a trading system from experiencing a missed requoted or rejected order. However, they can help prevent the trading system from assuming that an order was successfully requested, approved, and its position opened when, in fact, that order was rejected and canceled.

Q. Will a trading system continue auto-trading if I shutdown VT Trader?

No. Your computer must remain powered on and connected to the Internet and VT Trader must remain connected to your broker's services for a trading system to request automated orders while running in *Auto-Trade* mode. If you exit VT Trader while there is one or more trading systems running in *Auto-Trade* mode, when you restart VT Trader those trading systems will attempt to automatically restart in *Auto-Trade* mode. When a trading system reloads, it recalculates its data and alerts. If a trading system determines that no alerts were missed while VT Trader was disconnected from your broker's services it will restart *Auto-Trade* mode and continue auto-trading normally. However, if a trading system determines that it missed what would have been one or more automated order requests while VT Trader was disconnected it will stop its *Auto-Trade* mode and notify you of the missed alert(s). It will then be up to you to manage any existing open position(s) and/or to manually restart the trading system in *Auto-Trade* mode.

Q. How does a trading system handle service interruptions or disconnection/reconnection events?

Your computer must remain powered on and connected to the Internet and VT Trader must remain connected to your broker's services for a trading system to request automated orders while running in *Auto-Trade* mode. Should VT Trader experience a service interruption, no trading system(s) running in *Auto-Trade* mode will not be able to request any automated orders while VT Trader remains disconnected. When VT Trader regains its connection any trading system(s) previously running in *Auto-Trade* mode (prior to the service interruption) will attempt to automatically restart in *Auto-Trade* mode. When a trading system reloads, it recalculates its alerts. If a trading system determines that no alerts were missed while VT Trader was disconnected from your broker's services it will restart *Auto-Trade* mode and continue auto-trading normally. However, if a trading system determines that it missed what would have been one or more automated order requests while VT Trader was disconnected it will stop its *Auto-Trade* mode and notify you of the missed alert(s). It will then be up to you to manage any existing open position(s).

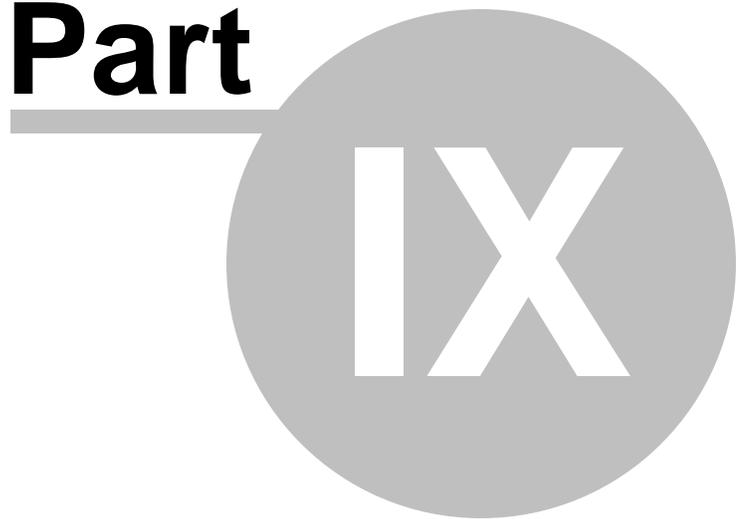
Q. How can I determine if there is one or more trading systems currently in *Auto-Trade* mode?

VT Trader makes it very easy to determine if there are any trading systems running in *Auto-Trade* mode. If there is one or more trading systems running in *Auto-Trade* mode in VT Trader the VT Trader Notification Icon will display a green, flashing circular LED over top of the VT Trader logo.

Additionally, you can quickly review a detailed list of all the trading systems currently attached to chart windows (*along with their status - Recommendation mode or Auto-Trade mode*) using the Active Trading Systems Summary window. Each chart window that has an attached trading system running in *Auto-Trade* mode will display the text "*(Trading System Running)*" in its caption bar. You can also check the status of a particular trading system in a chart window by positioning the cursor over its chart label, clicking the right mouse button, and reviewing the *Auto-Trade Mode* command's text. If a trading system is in *Recommendation* mode the command will read "*Start Auto-Trade Mode*"; if a trading system is running in *Auto-Trade* mode, the command will read "*Stop Auto-Trade Mode*".

Requesting Orders and Supported Order Types

Part



9 Requesting Orders and Supported Order Types

Performing trading activities such as requesting orders is easy with VT Trader. You can request orders using any of the following methods:

- Quotes Board's [Instrument Panel](#)^[90]
- Quote Board Instrument Panel's [contextual menu](#)^[92]
- Advanced Rates window's [contextual menu](#)^[97]
- A chart window's [contextual menu](#)^[128]
- A chart window's [Quote Panel](#)^[121]
- A chart window [Quotes Panel's contextual menu](#)^[121]

You can request [Buy/Sell market orders](#)^[1153], [Entry Stop Buy/Sell entry orders](#)^[1153], [Entry Limit Buy/Sell entry orders](#)^[1153], [One Cancels Other \(OCO\)](#)^[1154], [If/Then](#)^[1153], and [If/Then OCO orders](#)^[1153].

Please click on the order type's name or continue reading to learn more about each type of order available in VT Trader.

Market Orders

A *Market Order* is executed immediately at the currently quoted market price. The available market order types include: *Buy* and *Sell*.

The screenshot shows a 'New Order(s)' dialog box with the following fields and values:

- Instrument:** EUR/USD
- Order Type:** Market Order
- Buy/Sell:** Buy
- Rate:** 1.36821 (with a red downward arrow)
- Lots:** 1
- Total Amount:** 1.0 / 100,000.00 EUR
- Buttons:** Buy, Cancel
- Checkbox:** Keep Window Open (unchecked)

Entry Orders

An *Entry Order* is executed the moment the market price reaches the order's specified price. The available entry order types include: *Entry Stop Buy*, *Entry Limit Buy*, *Entry Stop Sell*, and *Entry Limit Sell*.

- An *Entry Stop Buy* order is placed above current market price. A *Buy* position will be created when the *Ask* price touches the order price.
- An *Entry Limit Buy* is placed below the current market price. A *Buy* position will be created when the *Ask* price touches the order price.
- An *Entry Stop Sell* order is placed below current market price. A *Sell* position will be created when the *Bid* price touches the order price.
- An *Entry Limit Sell* is placed above the current market price. A *Sell* position will be created when the *Bid* price touches the order price.

The screenshot shows a 'New Order(s)' dialog box with the following configuration:

- Instrument: EUR/USD
- Order Type: Entry
- Order Expiry: GTC
- Entry Type: Entry Stop Buy
- Rate: 1.3715
- Lots: 1
- Trailing:

Total Amount: 1.0 / 100,000.00 EUR

Buttons: Submit, Cancel

Checkbox: Keep Window Open

* The *Trailing* option is only available if your broker supports this functionality. The *Trailing* option can be applied to *Entry Stop Buy/Sell* orders only. While *enabled*, this option allows an entry stop order to automatically change its rate to “follow” behind price by predetermined number of pips (*defined by the distance between the entry stop’s Rate and the market price at the time the entry order is requested*). The entry stop order will follow behind price as the price moves away from the entry order; however, the entry order will remain “fixed” as price approaches it. This process repeats until such time as the entry stop order is executed or canceled.

One Cancels Other (OCO) Orders

A *One Cancels Other (OCO)* order is two separate *entry orders* “linked” together that are requested as a single order. When either of the two orders is executed, the other order is canceled. *OCO* orders must be requested using the same account on the same instrument (*i.e. EUR/USD*). The most common form of a *OCO* order is an *entry limit order* and an *entry stop order* “linked” together. However, for more advanced order control VT Trader allows any types of *entry orders* to be linked together to form a *OCO* order. The only restriction is that the *entry orders* that form the *OCO* order must be on opposite sides of the current market price.

The screenshot shows the 'New Order(s)' dialog box with the following configuration:

- Instrument: EUR/USD
- Order Type: OCO
- Order Expiry: GTC
- Entry Type: Entry Stop Buy (Rate: 1.37101, Lots: 1)
- Entry Type: Entry Limit Buy (Rate: 1.36501, Lots: 1)
- Total Amount: 1.0 / 100,000.00 EUR
- Total Amount: 1.0 / 100,000.00 EUR
- Keep Window Open:
- Buttons: Submit, Cancel

If/Then Orders

An *If/Then Order* is two separate *entry orders* “linked” together that are requested as a single order. When the “*If*” order is executed, the “*Then*” order becomes an active entry order. *If/Then* orders must be requested using the same account on the same instrument (*i.e.* EUR/USD).

The screenshot shows the 'New Order(s)' dialog box with the following configuration:

- Instrument: EUR/USD
- Order Type: If/Then
- Order Expiry: GTC
- Entry Type: Entry Stop Buy (Rate: 1.37123, Lots: 1)
- Entry Type: Entry Stop Buy (Rate: 1.37423, Lots: 1)
- Total Amount: 1.0 / 100,000.00 EUR
- Total Amount: 1.0 / 100,000.00 EUR
- Keep Window Open:
- Buttons: Submit, Cancel

If/Then OCO Orders

An *If/Then OCO Order* is three separate *entry orders* “linked” together that are requested as a single order. When the “*If*” order is executed, the “*Then*” OCO order becomes an active entry order pair. *If/Then*

OCO orders must be requested using the same account on the same instrument (*i.e.* EUR/USD).

The screenshot shows a 'New Order(s)' dialog box with the following fields and values:

Field	Value
Instrument:	EUR/USD
Order Type:	If/Then OCO
Order Expiry:	GTC
Entry Type:	Entry Stop Buy
Rate:	1.37136
Lots:	1
Entry Type:	Entry Stop Buy
Rate:	1.37436
Lots:	1
Entry Type:	Entry Limit Buy
Rate:	1.36836
Lots:	1

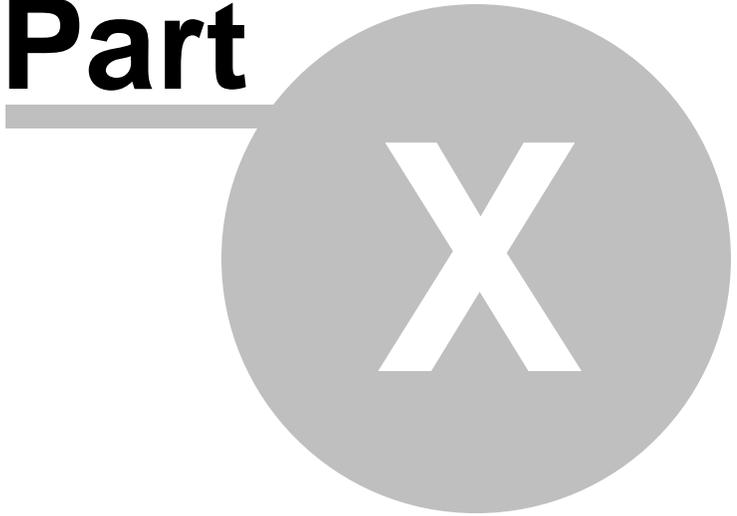
Total Amount: 1.0 / 100,000.00 EUR
1.0 / 100,000.00 EUR
1.0 / 100,000.00 EUR

Keep Window Open

Submit Cancel

"How To" Tutorials

Part



10 "How To" Tutorials

10.1 How To Build An Indicator

I. Description of Indicator's Logic

Before we can create a technical indicator, we must define what we want our indicator to accomplish. For this walk-through, let's create a simple Moving Average Convergence Divergence (*i.e.* MACD) indicator.

The MACD indicator must include the following functionality:

1. Calculate the MACD indicator, including the Fast Line, Signal Line, and Histogram ... and ...
2. Display the MACD indicator in the its own frame in the chart window

II. How to Construct the Indicator

You should be able to construct the MACD indicator if you follow these step-by-step instructions. Line-by-line explanations of the code and input/output variables used will also be provided.

As you work your way through each of the steps below, it is recommended that you refer to the [Indicator Editor Window](#)^[184] section of this help manual for detailed explanations of each of the GUI tabs and properties you will need to define while constructing your indicator.

Step 1: Create a New Indicator File

Create a new indicator file using VT Trader's Ribbon -> Technical Analysis menu -> Indicators group -> Indicators Builder command -> [New] button. This will open an indicator editor window so you can begin constructing your new indicator.

Step 2: Define the Indicator's General Properties

In the editor window's General tab, type the following text for each field:

<p>Name: Moving Average Convergence/Divergence (MACD)</p> <p>Function Name Alias: vt_MACD</p> <p>Label Mask: MACD (%FastPeriods%,%SlowPeriods%,%SigPeriods%) Fast = %Fast% Signal = %Signal%</p>

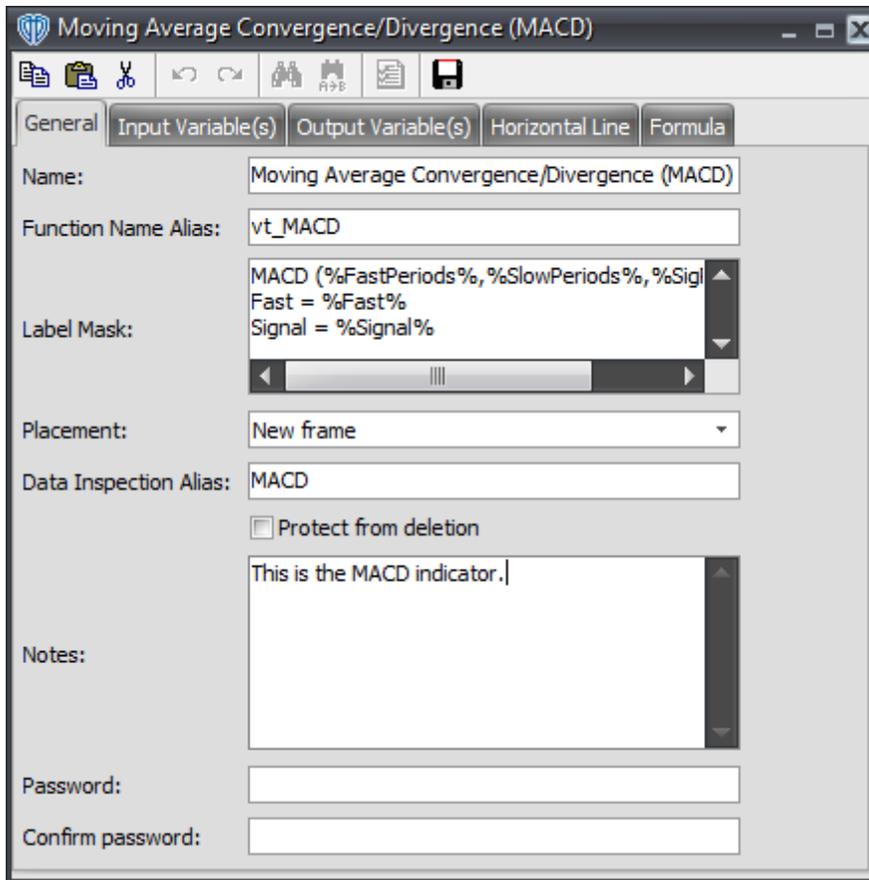
Protect From Deletion:
disabled (no check mark)

Notes:
This is the MACD indicator.

Password:
leave text box empty

Confirm Password:
leave text box empty

If you have completed this step successfully, the editor's General tab should look similar to this:



Step 3: Define the Indicator's Input Variables

Input variables are included in the indicator's properties window that is shown when you attach the indicator to your chart. Input variables allow you to adjust the values of the variables without the need to edit the indicator's programming code.

For our MACD indicator, we need to create input variables defining the data used to calculate the MACD

(i.e. the price data – close, high, low, close, etc.), the fast moving average's periods, the slow moving average's periods, and the signal line's periods.

In the editor window's Input Variable(s) tab, create the following variables:

Define the MACD Price Data:

Click the [New] button...
Read Only: disabled (no check mark)
Name: macd_price
Display Name: Price
Type: Price
Default: Close

Define the MACD Fast Moving Average's Periods:

Click the [New] button...
Read Only: disabled (no check mark)
Name: macd_fast_periods
Display Name: Fast MA Periods
Type: Integer
Default: 12

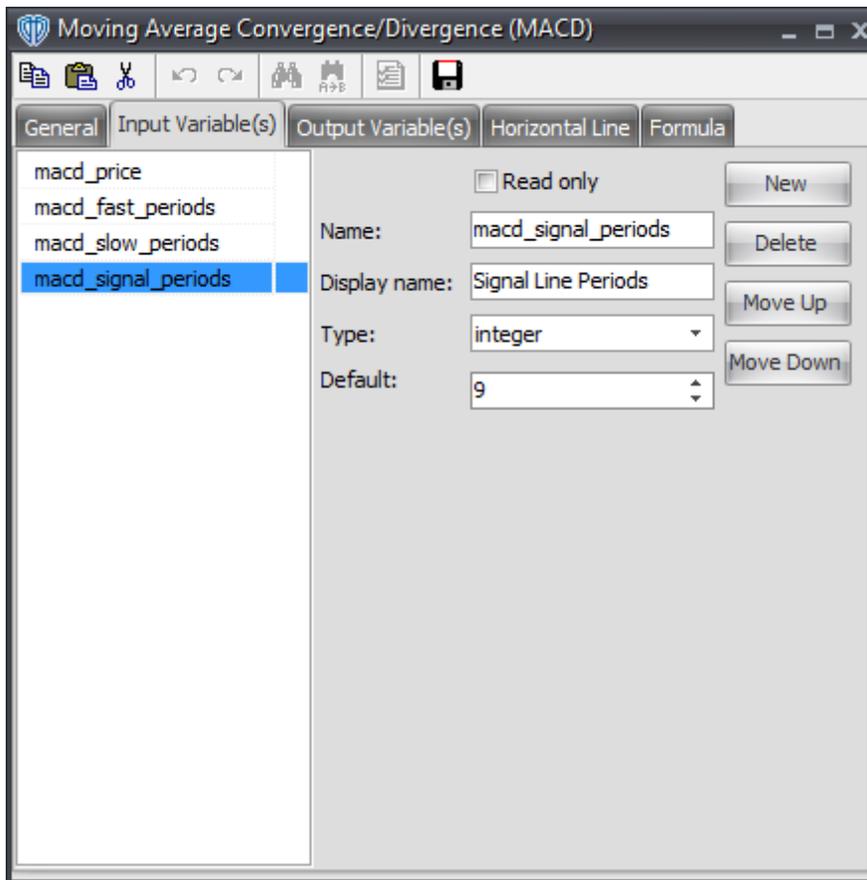
Define the MACD Slow Moving Average's Periods:

Click the [New] button...
Read Only: disabled (no check mark)
Name: macd_slow_periods
Display Name: Slow MA Periods
Type: Integer
Default: 26

Define the MACD Signal Line's Periods:

Click the [New] button...
Read Only: disabled (no check mark)
Name: macd_signal_periods
Display Name: Signal Line Periods
Type: Integer
Default: 9

If you have completed this step successfully, the editor's Input Variable(s) tab should look similar to this:



Step 4: Define the Indicator's Output Variables and Horizontal Lines

Output variables allow you to display a variable's data plot in the chart window. Horizontal lines allow you to display reference lines, such as overbought and oversold levels, for the indicator's data plot(s) in the chart window.

For our MACD indicator, we need to create output variables to display the MACD indicator's Fast Line, Signal Line, and Histogram and we need to create a horizontal line to reference the zero level.

In the editor window's Input Variable(s) tab, create the following variables:

Display the MACD Fast Line:

Click the [New] button...

Var Name: Fast

Name: (Fast Line)

Line Color: Blue

Line Width: 1

Line Style: Solid

Hide in Inspect: disabled (no check mark)

Display the MACD Signal Line:

Click the [New] button...

Var Name: Signal

Name: (Signal Line)

Line Color: Red

Line Width: 1

Line Style: Solid

Hide in Inspect: disabled (no check mark)

Display the MACD Histogram:

Click the [New] button...

Var Name: Histogram

Name: (Histogram)

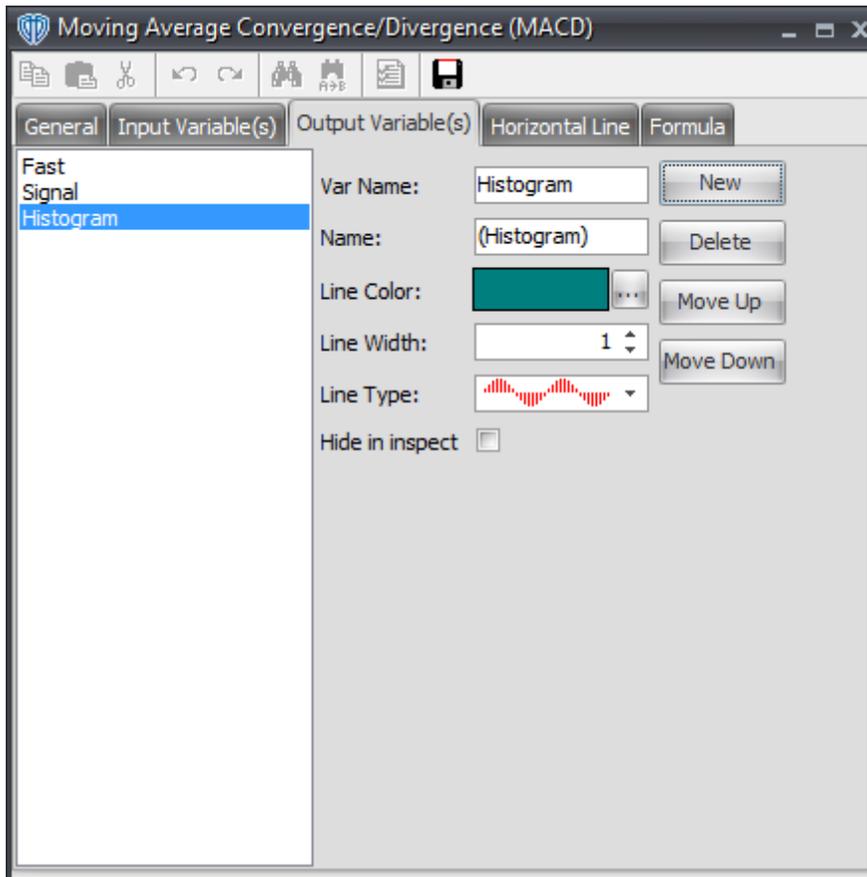
Line Color: Dark Green

Line Width: 1

Line Style: Histogram

Hide in Inspect: disabled (no check mark)

If you have completed this step successfully, the editor's Output Variable(s) tab should look similar to this:



In the editor window's Horizontal Line tab, create the following variables:

Display the Zero Level:

Click the [New] button...

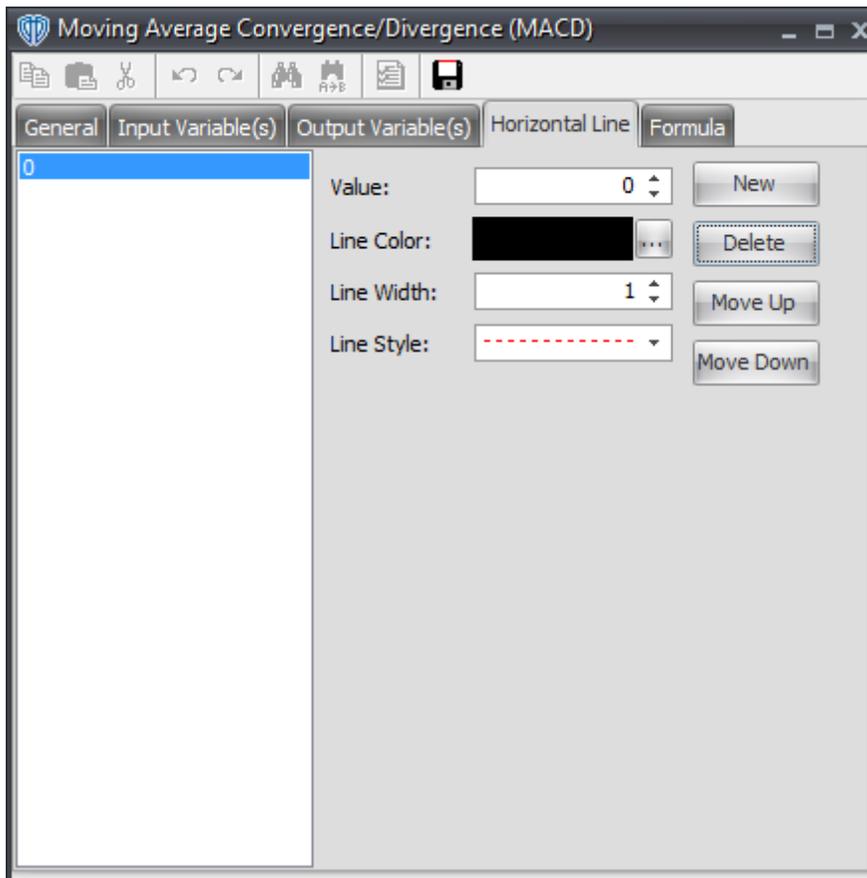
Value: 0

Line Color: Black

Line Width: 1

Line Style: Dashed

If you have completed this step successfully, the editor's Horizontal Line tab should look similar to this:

**Step 5: Create the Indicator's Formula Code**

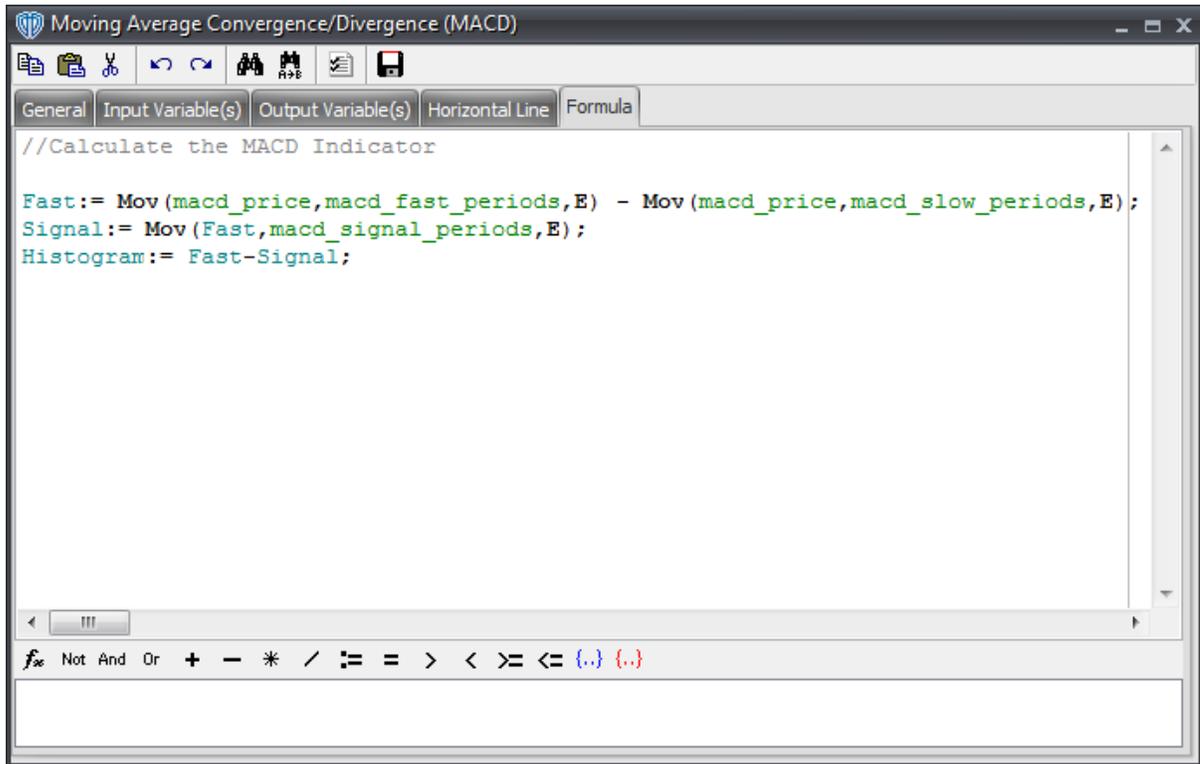
The formula code is the "meat and potatoes" of an indicator. The formula code is used to define the indicator's calculation logic.

In the editor window's Formula tab, copy and paste the following formula script:

```
//Calculate the MACD Indicator  
  
Fast:= Mov(macd_price,macd_fast_periods,E) - Mov(macd_price,macd_slow_periods,E);
```

```
Signal:= Mov(Fast,macd_signal_periods,E);  
Histogram:= Fast-Signal;
```

If you have completed this step successfully, the editor's Formula tab should look similar to this:

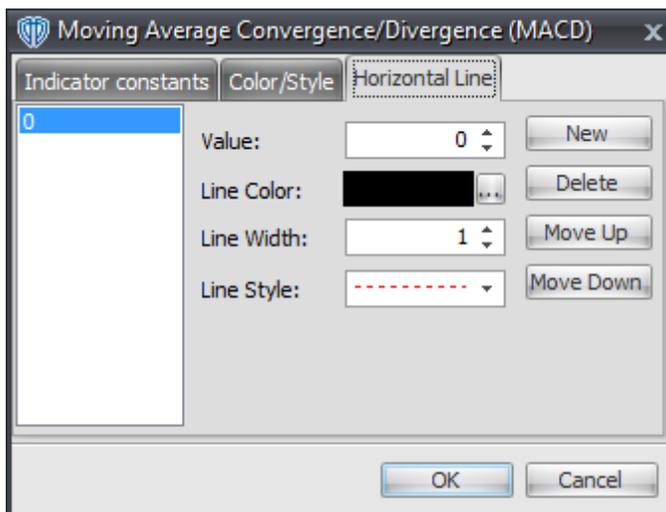
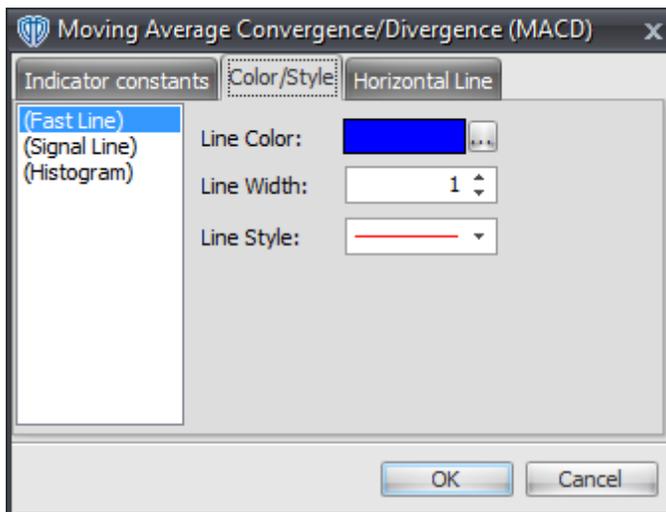
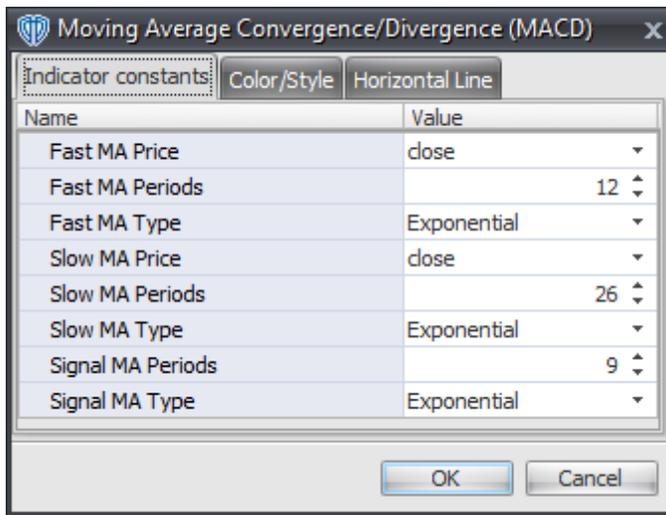


Step 6: Save the MACD Indicator

Click the Save icon in the editor window's toolbar to finish building your MACD indicator. If everything has been done correctly you should receive no errors and the system should save.

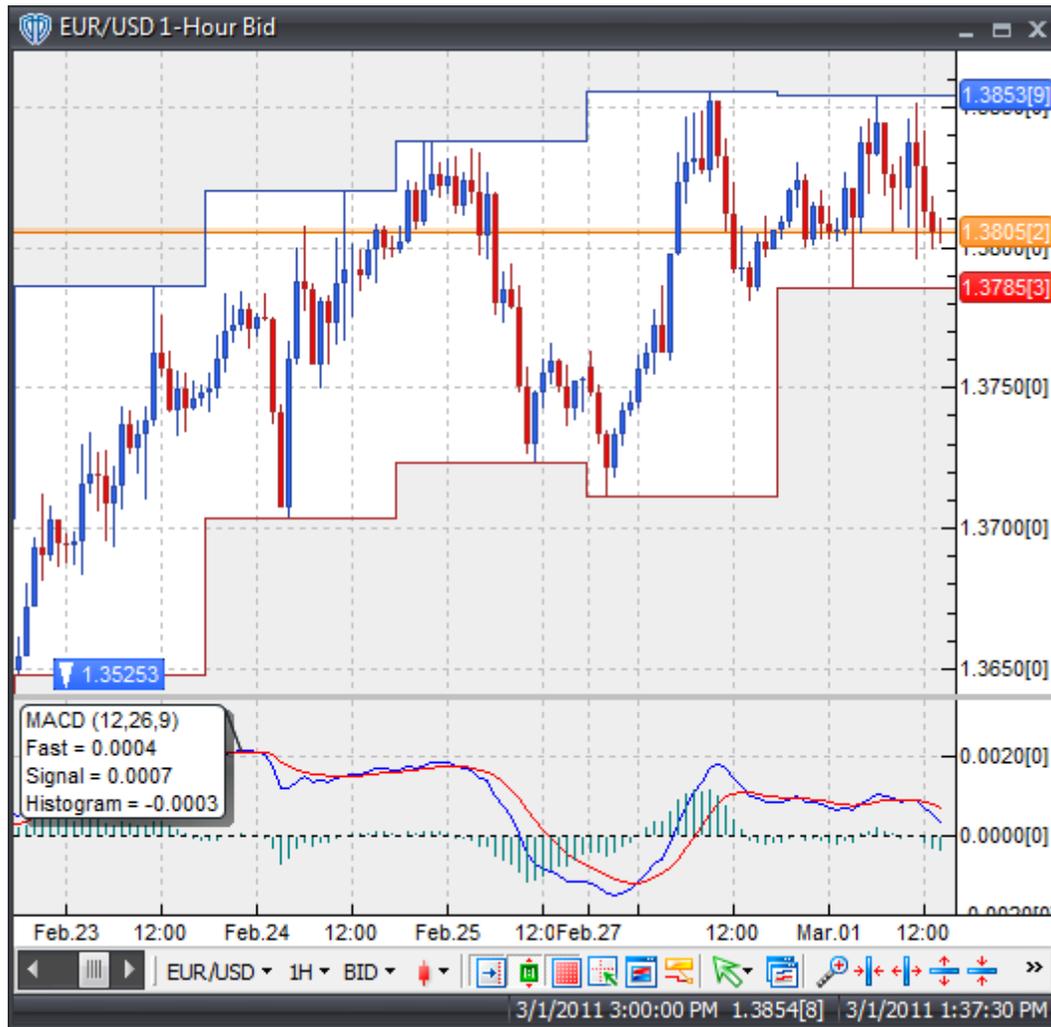
Step 7: Attach the MACD Indicator to a Chart

To attach the indicator to a chart, select the *Add Indicator* option from the chart's contextual menu, select *Moving Average Convergence/Divergence (MACD)* from the indicators list, and click the [Add] button. The indicator's properties window will be shown. You will be able to make any adjustments to the input variables that you created for the indicator from the Indicator Constants, Color/Style, and Horizontal Line tabs.



Once you are satisfied with the values of the indicator's properties click the [OK] button to add the indicator to your chart window. The MACD indicator should similar to the screenshot below when

attached to one of your chart windows:



III. Formula Code Line-by-Line Explanations

To gain a better understanding of how the MACD indicator works let's examine its formula code line-by-line. It is recommended that you refer to the [Scripting Language](#)^[329] section of this help manual for detailed explanations of the scripting language's syntax and internal functions.

Line 1:

```
Fast:= Mov(macd_price,macd_fast_periods,E) - Mov(macd_price,macd_slow_periods,E);
```

Line 1 calculates the Fast Line of the MACD indicator. The MACD Fast Line is the difference between the Fast variable's value and the Signal variable's value. It is calculated by subtracting the value of a slow exponential moving average from the value of a fast exponential moving average. The resulting value is returned and stored as the Fast variable.

The fast exponential moving average is calculated using the internal `mov(data array, periods, method)` function that requires the `macd_price` and `macd_fast_periods` input variables along with the exponential moving average constant (E) as its arguments.

The slow exponential moving average is calculated using the internal `mov(data array, periods, method)` function that requires the `macd_price` and `macd_slow_periods` input variables along with the exponential moving average constant (E) as its arguments.

Line 2:

```
Signal:= Mov(Fast,macd_signal_periods,E);
```

Line 2 calculates the Signal Line of the MACD indicator. It is calculated by smoothing the Fast variable with an exponential moving average. The resulting value is returned and stored as the Signal variable.

The moving average is calculated using the internal `mov(data array, periods, method)` function that requires the Fast variable's value and the `macd_signal_periods` input variable along with the exponential moving average constant (E) as its arguments.

Line 3:

```
Histogram:= Fast-Signal;
```

Line 3 calculates the MACD Histogram. The MACD Histogram is the difference between the Fast variable's value and the Signal variable's value. It is calculated by subtracting the Signal variable's value from the Fast variable's value. The resulting value is returned and stored as the Histogram variable.

10.2 How To Build A Trading System

I. Description of Trading System's Logic

Before we can create a trading system, we must define what we want our trading system to accomplish. For this walk-through, let's create a simple Moving Average Convergence Divergence (*i.e.* MACD) trading system.

The MACD trading system must include the following functionality:

1. Calculate the MACD indicator, including the Fast Line, Signal Line, and Histogram
2. Display the MACD indicator in the its own frame in the chart window
3. Provide visual and audio alerts when the MACD Fast Line crosses above/below the MACD Signal Line

4. Provide a visual status of the MACD trend direction (*i.e. the Fast Line is above or below the Signal Line*)
5. Request buy/sell market orders at the close of each bar when the MACD Fast Line crosses above/below the MACD Signal Line

II. How to Construct the Trading System

You should be able to construct the MACD trading system if you follow these step-by-step instructions. Line-by-line explanations of the code and input/output variables used will also be provided.

As you work your way through each of the steps below, it is recommended that you refer to the [Trading System Editor Window](#)^[207] section of this help manual for detailed explanations of each of the GUI tabs and properties you will need to define while constructing your trading system.

Step 1: Create a New Trading System File

Create a new trading system file using VT Trader's Ribbon -> Technical Analysis menu -> Trading Systems group -> Trading Systems Builder command -> [New] button. This will open a trading system editor window so you can begin constructing your new trading system.

Step 2: Define the Trading System's General Properties

In the editor window's General tab, type the following text for each field:

Name:

MACD Fast / Signal Crossover System

Function Name Alias:

vttrs_MacdFastSignalCross

Label Mask:

MACD Fast / Signal Crossover System

Protect From Deletion:

disabled (no check mark)

Notes:

This is a MACD fast line / signal line cross over trading system.

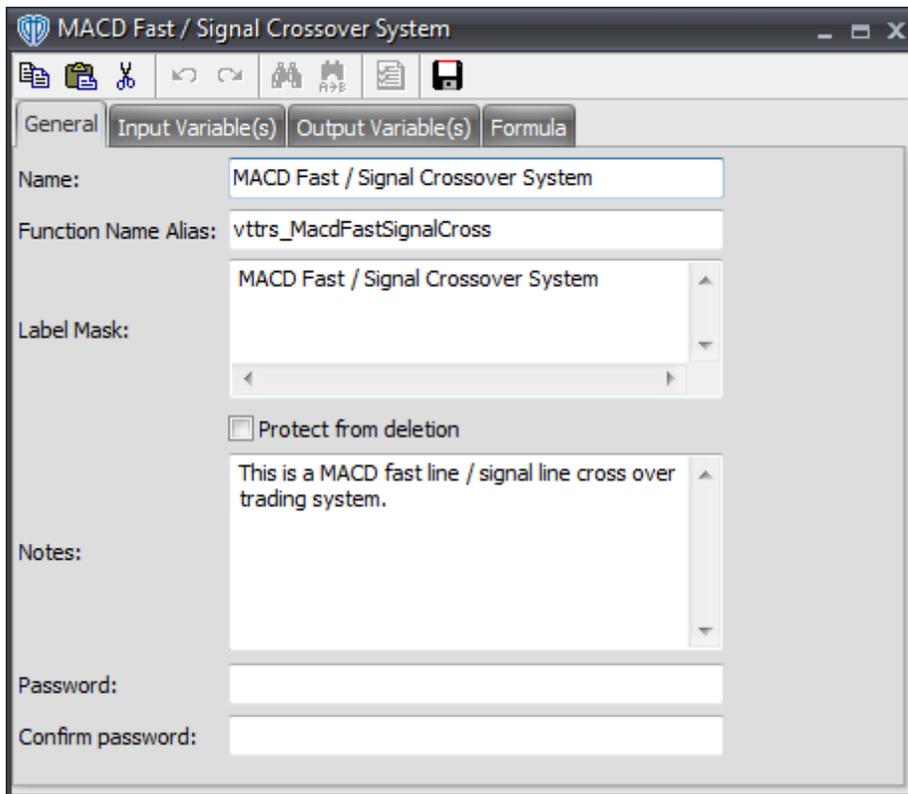
Password:

leave text box empty

Confirm Password:

leave text box empty

If you have completed this step successfully, the editor's General tab should look similar to this:



Step 3: Define the Trading System’s Input Variables

Input variables are included in the trading system’s properties window that is shown when you attach the trading system to your chart. Input variables allow you to adjust the values of the variables without the need to edit the trading system’s programming code.

For our MACD trading system, we need to create input variables defining the data used to calculate the MACD (*i.e. the price data – close, high, low, close, etc.*), the fast moving average’s periods, the slow moving average’s periods, and the signal line’s periods.

In the editor window’s Input Variable(s) tab, create the following variables:

Define the MACD Price Data:

Click the [New] button...
 Read Only: disabled (no check mark)
 Name: macd_price
 Display Name: MACD Price
 Type: Price
 Default: Close

Define the MACD Fast Moving Average’s Periods:

Click the [New] button...
 Read Only: disabled (no check mark)

Name: macd_fast_periods
Display Name: MACD Fast MA Periods
Type: Integer
Default: 12

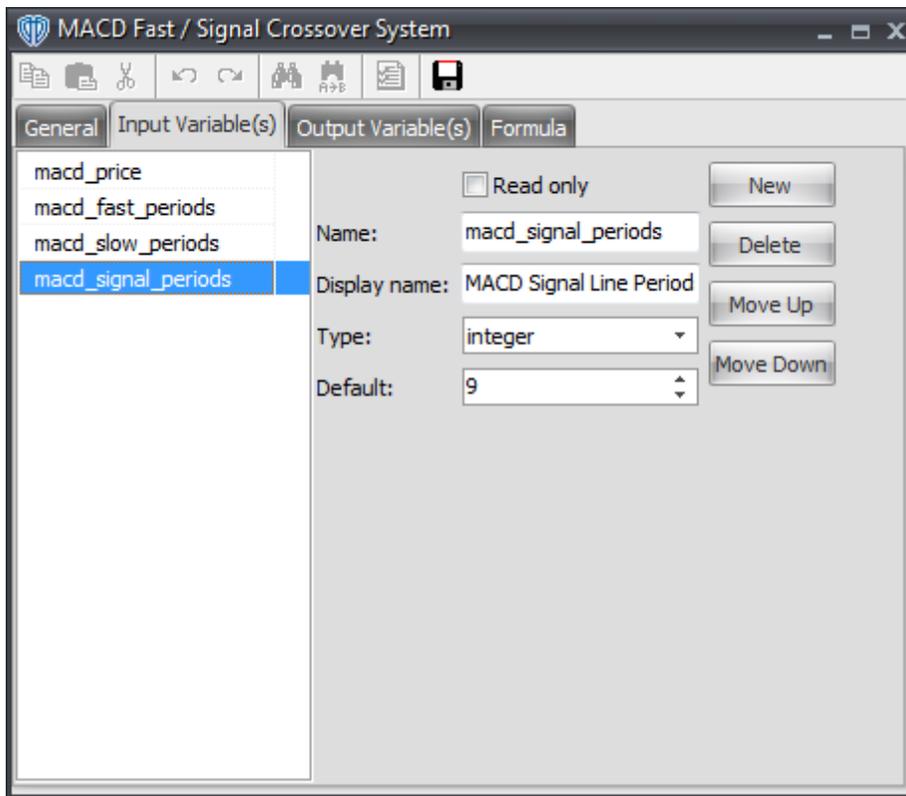
Define the MACD Slow Moving Average's Periods:

Click the [New] button...
Read Only: disabled (no check mark)
Name: macd_slow_periods
Display Name: MACD Slow MA Periods
Type: Integer
Default: 26

Define the MACD Signal Line's Periods:

Click the [New] button...
Read Only: disabled (no check mark)
Name: macd_signal_periods
Display Name: MACD Signal Line Periods
Type: Integer
Default: 9

If you have completed this step successfully, the editor's Input Variable(s) tab should look similar to this:



Step 4: Define the Trading System's Output Variables

Output variables allow you to display a variable's data plot in the chart window, define visual/audio alerts properties of the variable, and/or define the buy/sell market order request behavior.

For our MACD trading system, we need to create output variables to:

1. Display the MACD indicator's Fast Line, Signal Line, and Histogram
2. Create visual and audio alerts when the MACD Fast Line crosses above/below the MACD Signal Line
3. Display the MACD trend direction (*i.e. the Fast Line is above or below the Signal Line*)
4. Request buy/sell market orders at the close of each bar when the MACD Fast Line crosses above/below the MACD Signal Line

In the editor window's Input Variable(s) tab, create the following variables:

Display the MACD Fast Line:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: Fast

Name: MACD Fast Line

Description: MACD Fast Line

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: enabled (check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: disabled (no check mark)

In the Indicator Output tab, complete the options as follows:

Line Color: Blue

Line Width: 1

Line Style: Solid

Placement: Additional Frame 1

Click the [OK] button...

Display the MACD Signal Line:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: Signal

Name: MACD Signal Line

Description: MACD Signal Line

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: enabled (check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: disabled (no check mark)

In the Indicator Output tab, complete the options as follows:

Line Color: Red

Line Width: 1

Line Style: Solid

Placement: Additional Frame 1

Click the [OK] button...

Display the MACD Histogram:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: Histogram

Name: MACD Histogram

Description: MACD Histogram

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: enabled (check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: disabled (no check mark)

In the Indicator Output tab, complete the options as follows:

Line Color: Dark Green

Line Width: 1

Line Style: Histogram

Placement: Additional Frame 1

Click the [OK] button...

Define MACD Fast Line Crosses Above MACD Signal Line Alert Properties:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: LongAlert

Name: Long Alert

Description: MACD Fast Line crosses above MACD Signal Line

Graphic Enabled: enabled (check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: enabled (check mark)

Alerts Enabled: enabled (check mark)

Trading Enabled: disabled (no check mark)

In the Graphic tab, complete the options as follows:

Symbol: Up Arrow

Size: Medium

Color: Blue

Symbol Position: Below Price Plot

In the Alerts tab, complete the options as follows:

Alert Message: Long Alert! MACD Fast Line crossed above MACD Signal Line.

Alert Sound: ringin (*or any other sound you prefer)
Click the [OK] button...

Define MACD Fast Line Crosses Below MACD Signal Line Alert Properties:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: ShortAlert

Name: Short Alert

Description: MACD Fast Line crosses below MACD Signal Line

Graphic Enabled: enabled (check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: enabled (check mark)

Alerts Enabled: enabled (check mark)

Trading Enabled: disabled (no check mark)

In the Graphic tab, complete the options as follows:

Symbol: Down Arrow

Size: Medium

Color: Red

Symbol Position: Above Price Plot

In the Alerts tab, complete the options as follows:

Alert Message: Short Alert! MACD Fast Line crossed below MACD Signal Line.

Alert Sound: ringin (*or any other sound you prefer)

Click the [OK] button...

Define MACD Up Trend (i.e. Fast Line > Signal Line):

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: UpTrend

Name: MACD Up Trend

Description: MACD Fast Line > MACD Signal Line

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: enabled (check mark)

Indicator Output: disabled (no check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: disabled (no check mark)

In the Trends tab, complete the options as follows:

Display Vertical Lines: enabled (check mark)

Background: Blue

Pattern: Solid

Symbol: Up Arrow

Symbol Color: White

Click the [OK] button...

Define MACD Down Trend (i.e. Fast Line < Signal Line):

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: DownTrend

Name: MACD Down Trend

Description: MACD Fast Line < MACD Signal Line

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: enabled (check mark)

Indicator Output: disabled (no check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: disabled (no check mark)

In the Trends tab, complete the options as follows:

Display Vertical Lines: enabled (check mark)

Background: Red

Pattern: Solid

Symbol: Down Arrow

Symbol Color: White

Click the [OK] button...

Define Basic Automated Trading Logic to Open A Buy Trade:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: OpenBuy

Name: Open Buy

Description: In Auto-Trade Mode, it requests a BUY market order to open a BUY trade

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: disabled (no check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: enabled (check mark)

In the Trading tab, complete the options as follows:

Trading Action: Buy

Click the [OK] button...

Define Basic Automated Trading Logic to Close A Buy Trade:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: CloseBuy

Name: Close Buy

Description: In Auto-Trade Mode, it requests a SELL market order to close a BUY trade

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: disabled (no check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: enabled (check mark)

In the Trading tab, complete the options as follows:

Trading Action: Sell

Click the [OK] button...

Define Basic Automated Trading Logic to Open A Sell Trade:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: OpenSell

Name: Open Sell

Description: In Auto-Trade Mode, it requests a SELL market order to open a SELL trade

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: disabled (no check mark)

Alerts Enabled: disabled (no check mark)

Trading Enabled: enabled (check mark)

In the Trading tab, complete the options as follows:

Trading Action: Sell

Click the [OK] button...

Define Basic Automated Trading Logic to Close A Sell Trade:

Click the [New] button...

In the Name tab, complete the options as follows:

Var Name: CloseSell

Name: Close Sell

Description: In Auto-Trade Mode, it requests a BUY market order to close a SELL trade

Graphic Enabled: disabled (no check mark)

Highlights Enabled: disabled (no check mark)

Trends Enabled: disabled (no check mark)

Indicator Output: disabled (no check mark)

Alerts Enabled: disabled (no check mark)

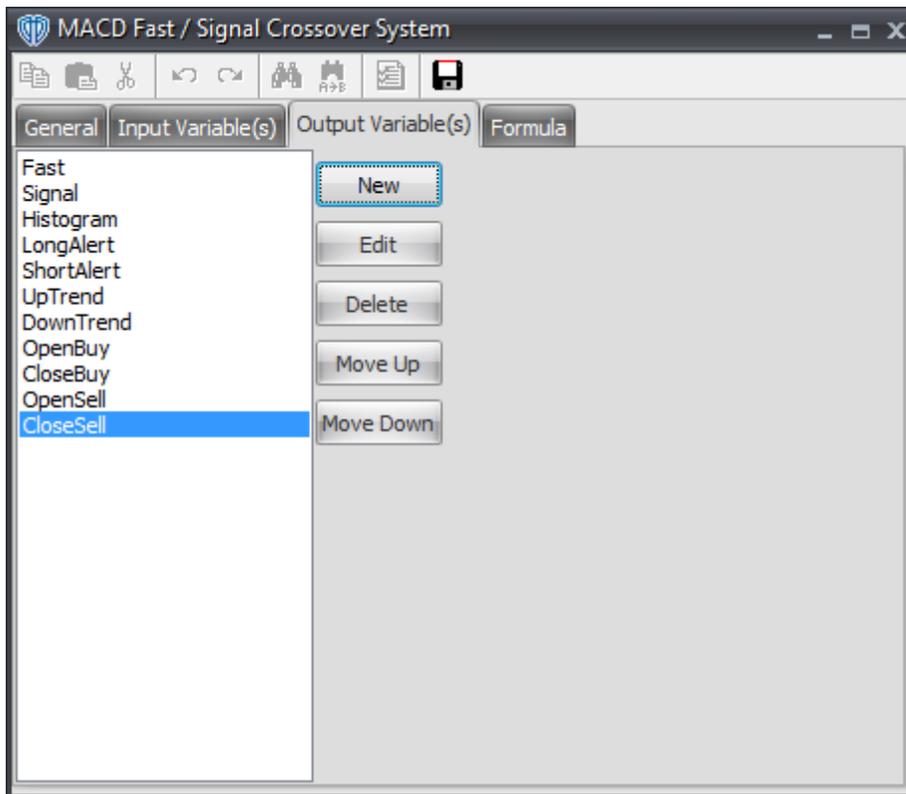
Trading Enabled: enabled (check mark)

In the Trading tab, complete the options as follows:

Trading Action: Buy

Click the [OK] button...

If you have completed this step successfully, the editor's Output Variable(s) tab should look similar to this:



Step 5: Create the Trading System's Formula Code

The formula code is the “meat and potatoes” of a trading system. The formula code is used to define the trading system's logic – including calculating any required indicators, conditional logic statements for alerts/signals, and the basic automated trading logic.

In the editor window's Formula tab, copy and paste the following formula script:

```
//Calculate the MACD Indicator

Fast:= Mov(macd_price,macd_fast_periods,E) - Mov(macd_price,macd_slow_periods,E);
Signal:= Mov(Fast,macd_signal_periods,E);
Histogram:= Fast-Signal;

//Define Alert Conditions

LongAlert:= Cross(Fast,Signal);
ShortAlert:= Cross(Signal,Fast);

//Define MACD Fast/Signal Trend Direction

UpTrend:= Fast > Signal;
DownTrend:= Signal > Fast;

//Define Basic Automated Trading Logic
```

```

/* Only Used While System is in Auto-Trade Mode

OpenBuy:= BuyPositionCount()=0 AND LongAlert=1;
CloseBuy:= BuyPositionCount()>0 AND ShortAlert=1;

OpenSell:= SellPositionCount()=0 AND ShortAlert=1;
CloseSell:= SellPositionCount()>0 AND LongAlert=1;

```

If you have completed this step successfully, the editor's Formula tab should look similar to this:

```

MACD Fast / Signal Crossover System

//Calculate the MACD Indicator
Fast:= Mov(macd_price,macd_fast_periods,E) - Mov(macd_price,macd_slow_periods,E);
Signal:= Mov(Fast,macd_signal_periods,E);
Histogram:= Fast-Signal;

//Define Alert Conditions
LongAlert:= Cross(Fast,Signal);
ShortAlert:= Cross(Signal,Fast);

//Define MACD Fast/Signal Trend Direction
UpTrend:= Fast > Signal;
DownTrend:= Signal > Fast;

//Define Basic Automated Trading Logic
/* Only Used While System is in Auto-Trade Mode
OpenBuy:= BuyPositionCount()=0 AND LongAlert=1;
CloseBuy:= BuyPositionCount()>0 AND ShortAlert=1;

OpenSell:= SellPositionCount()=0 AND ShortAlert=1;
CloseSell:= SellPositionCount()>0 AND LongAlert=1;

```

Step 6: Save the MACD Trading System

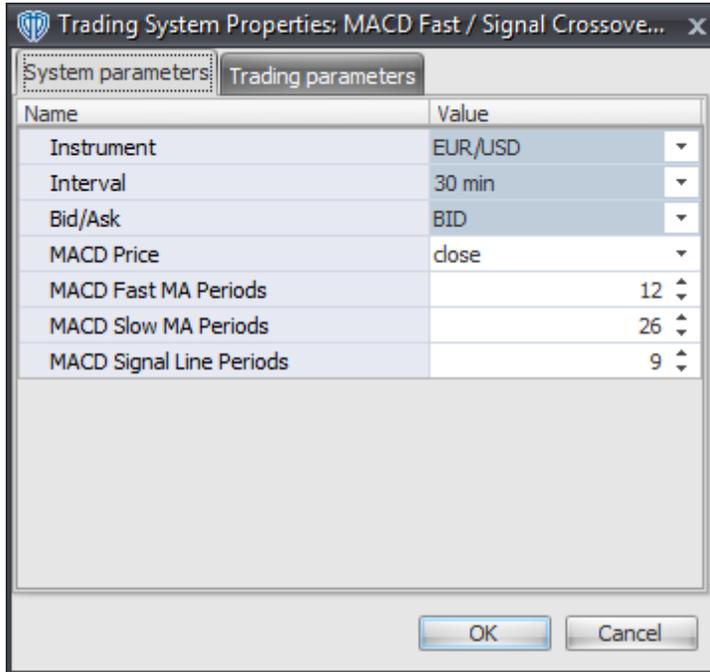
Click the Save icon in the editor window's toolbar to finish building your MACD trading system. If everything has been done correctly you should receive no errors and the system should save.

Step 7: Attach the MACD Trading System to a Chart

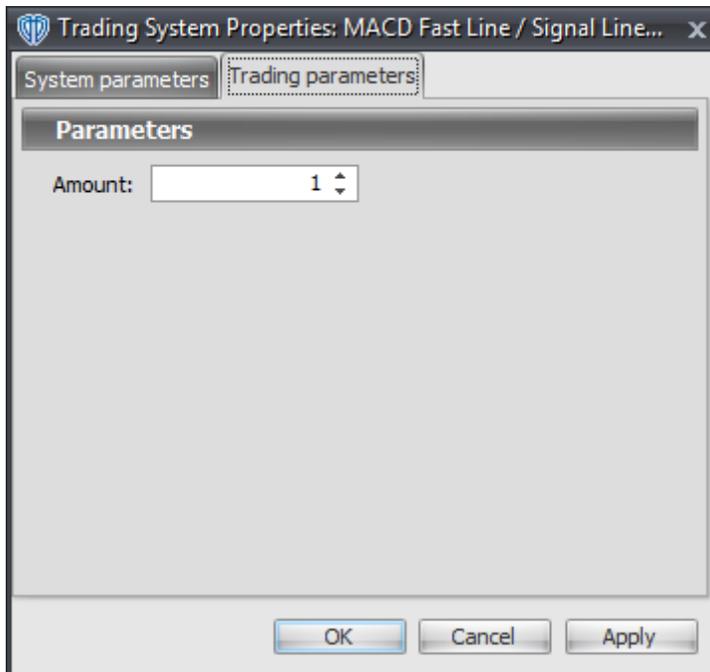
To attach the trading system to a chart, select the *Add Trading System* option from the chart's contextual menu, select *MACD Fast / Signal Crossover System* from the trading systems list, and click

the [Add] button. You'll need to read and agree to the disclaimer before proceeding.

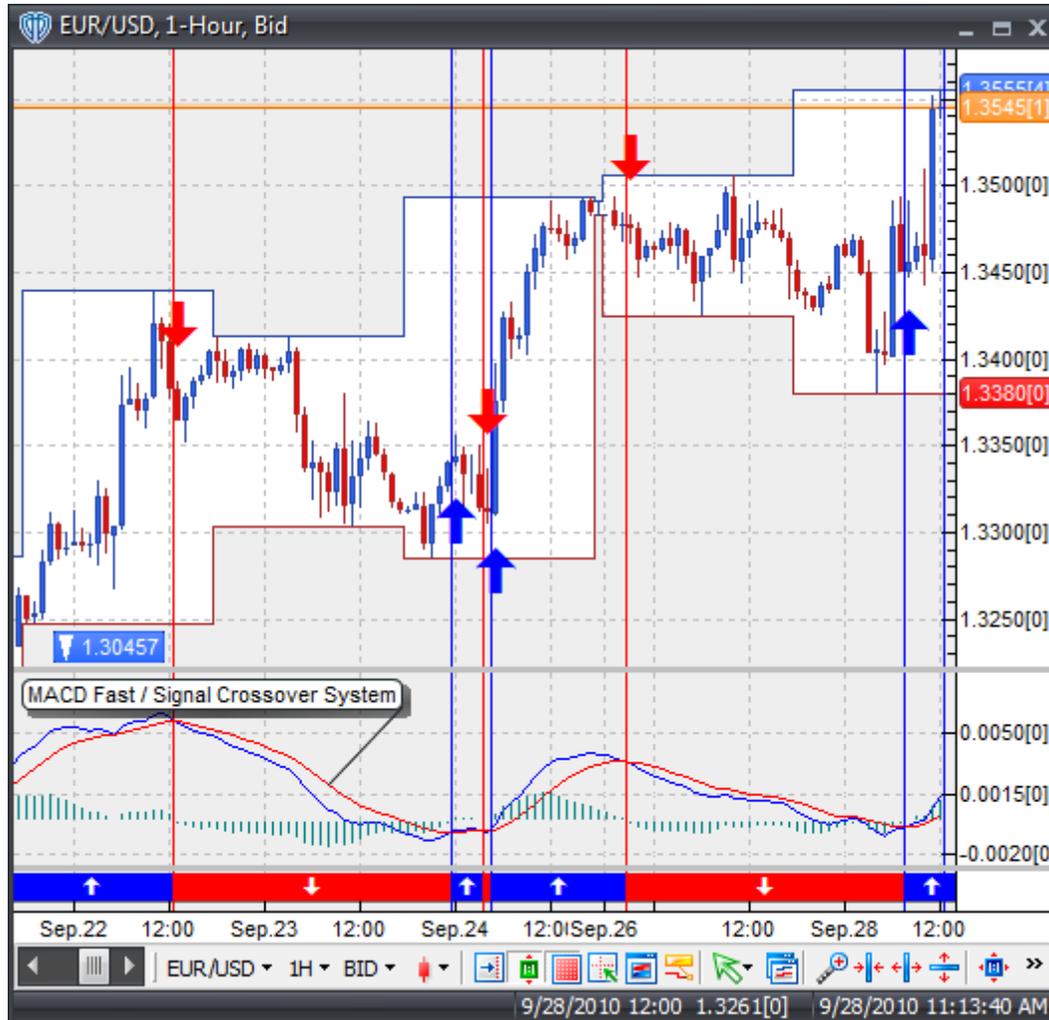
Once you've agreed to the disclaimer, the trading system's properties window will be shown. You will be able to make any adjustments to the input variables that you created for the trading system from the System Parameters tab.



Before clicking the [OK] button, you should open the Trading Parameters tab and configure the *Amount* property that will be used if/when you start the trading system in *Auto-Trade* mode.



Once you are satisfied with the values of the trading systems properties click the [OK] button to add the system to your chart window. The MACD trading system should similar to the screenshot below when attached to one of your chart windows:



The MACD trading system is attached to the chart in *Recommendation* mode. This means it will provide your alerts/signals, but it will not request any automated trading orders. You must enable the trading system's *Auto-Trade* mode if you want the system to perform automated trading actions.

To enable a trading system's *Auto-Trade* mode, you must activate the trading system label's contextual menu by right-clicking with the mouse while the cursor is positioned over the trading system's label and choose *Start Auto-Trade Mode*. If *Auto-Trade* mode is successfully started, you will see the text *(Trading System Running)* appear in the chart window's top caption bar.

To stop a trading system's *Auto-Trade* mode, you must activate the trading system label's contextual menu by right-clicking with the mouse while the cursor is positioned over the trading system's label and choose *Stop Auto-Trade Mode*. If *Auto-Trade* mode is successfully stopped, you will see the text *(Trading System Running)* disappear from the chart window's top caption bar.

III. Formula Code Line-by-Line Explanations

To gain a better understanding of how the MACD trading system works let's examine its formula code line-by-line. It is recommended that you refer to the [Scripting Language](#)^[329] section of this help manual for detailed explanations of the scripting language's syntax and internal functions.

Line 1:

```
Fast:= Mov(macd_price,macd_fast_periods,E) - Mov(macd_price,macd_slow_periods,E);
```

Line 1 calculates the Fast Line of the MACD indicator. The MACD Fast Line is the difference between the Fast variable's value and the Signal variable's value. It is calculated by subtracting the value of a slow exponential moving average from the value of a fast exponential moving average. The resulting value is returned and stored as the Fast variable.

The fast exponential moving average is calculated using the internal `mov(data array, periods, method)` function that requires the `macd_price` and `macd_fast_periods` input variables along with the exponential moving average constant (E) as its arguments.

The slow exponential moving average is calculated using the internal `mov(data array, periods, method)` function that requires the `macd_price` and `macd_slow_periods` input variables along with the exponential moving average constant (E) as its arguments.

Line 2:

```
Signal:= Mov(Fast,macd_signal_periods,E);
```

Line 2 calculates the Signal Line of the MACD indicator. It is calculated by smoothing the Fast variable with an exponential moving average. The resulting value is returned and stored as the Signal variable.

The moving average is calculated using the internal `mov(data array, periods, method)` function that requires the Fast variable's value and the `macd_signal_periods` input variable along with the exponential moving average constant (E) as its arguments.

Line 3:

```
Histogram:= Fast-Signal;
```

Line 3 calculates the MACD Histogram. The MACD Histogram is the difference between the Fast variable's value and the Signal variable's value. It is calculated by subtracting the Signal variable's value from the Fast variable's value. The resulting value is returned and stored as the Histogram variable.

Line 4:

```
LongAlert:= Cross(Fast,Signal);
```

Line 4 defines the "MACD Fast Line crosses above MACD Signal Line" conditional logic. The internal `cross(data array 1, data array 2)` function is used for this purpose. The `cross()` function returns a true (1) value during/for each bar/candle when the data array 1 (*i.e. MACD Fast Line*) crosses above the data

array 2 (*i.e. MACD Signal Line*); it returns a false (0) value during/for all other bars/candles. The resulting value is returned and stored as the LongAlert variable.

Line 5:

```
ShortAlert:= Cross(Signal,Fast);
```

Line 5 defines the "MACD Fast Line crosses below MACD Signal Line" conditional logic. The internal cross(data array 1, data array 2) function is used for this purpose. The cross() function returns a true (1) value during/for each bar/candle when the data array 1 (*i.e. MACD Signal Line*) crosses above the data array 2 (*i.e. MACD Fast Line*); it returns a false (0) value during/for all other bars/candles. The resulting value is returned and stored as the ShortAlert variable.

Line 6:

```
UpTrend:= Fast > Signal;
```

Line 6 defines the "MACD Up Trend" conditional logic. A simple comparison of the Fast variable's value to the Signal variable's value using the "greater than" rational operator is used for this purpose. The result of the comparison returns a true (1) value during/for each bar/candle when the Fast variable's value is greater than the Signal variable's value; it returns a false (0) value during/for all other bars/candles. The resulting value is returned and stored as the UpTrend variable.

Line 7:

```
DownTrend:= Signal > Fast;
```

Line 7 defines the "MACD Down Trend" conditional logic. A simple comparison of the Fast variable's value to the Signal variable's value using the "greater than" rational operator is used for this purpose. The result of the comparison returns a true (1) value during/for each bar/candle when the Signal variable's value is greater than the Fast variable's value; it returns a false (0) value during/for all other bars/candles. The resulting value is returned and stored as the DownTrend variable. * This line of formula code could have also been written as...

```
DownTrend:= Fast < Signal;
```

... if it is a more comfortable format for you.

Line 8:

```
OpenBuy:= BuyPositionCount()=0 AND LongAlert=1;
```

Line 8 defines the condition logic necessary to generate and help control the number of automated order requests used to open a buy trade.

The BuyPositionCount() function returns the number of open buy positions for the respective instrument and account that the trading system is assigned to. If the BuyPositionCount()'s returned value is equal to zero (*indicating that there are no open buy positions*) and the LongAlert variable's value is equal to 1, then the OpenBuy variable's value will be equal to 1, otherwise it will be equal to 0.

The trading action (*buy or sell market order*) requested by the OpenBuy variable is defined in the trading system editor's UI.

Line 9:

```
CloseBuy:= BuyPositionCount(>0 AND ShortAlert=1;
```

Line 9 defines the condition logic necessary to generate and help control the number of automated order requests used to close a buy trade.

The BuyPositionCount() function returns the number of open buy positions for the respective instrument and account that the trading system is assigned to. If the BuyPositionCount()'s returned value is greater than zero (*indicating that there is at least one open buy position*) and the ShortAlert variable's value is equal to 1, then the CloseBuy variable's value will be equal to 1, otherwise it will be equal to 0.

The trading action (*buy or sell market order*) requested by the CloseBuy variable is defined in the trading system editor's UI.

Line 10:

```
OpenSell:= SellPositionCount(=0 AND ShortAlert=1;
```

Line 10 defines the condition logic necessary to generate and help control the number of automated order requests used to open a sell trade.

The SellPositionCount() function returns the number of open sell positions for the respective instrument and account that the trading system is assigned to. If the SellPositionCount()'s returned value is equal to zero (*indicating that there are no open sell positions*) and the ShortAlert variable's value is equal to 1, then the OpenSell variable's value will be equal to 1, otherwise it will be equal to 0.

The trading action (*buy or sell market order*) requested by the OpenSell variable is defined in the trading system editor's UI.

Line 11:

```
CloseSell:= SellPositionCount(>0 AND LongAlert=1;
```

Line 11 defines the condition logic necessary to generate and help control the number of automated order requests used to close a sell trade.

The SellPositionCount() function returns the number of open sell positions for the respective instrument and account that the trading system is assigned to. If the SellPositionCount()'s returned value is greater than zero (*indicating that there is at least one open sell position*) and the LongAlert variable's value is equal to 1, then the CloseSell variable's value will be equal to 1, otherwise it will be equal to 0.

The trading action (*buy or sell market order*) requested by the CloseSell variable is defined in the trading system editor's UI.

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