



## IV Graph Service Contents

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## Introduction

IVGraph is an interactive graphical service designed to help equity and option traders to analyze market and seek for different trading opportunities.

Now one can plot any kind of data provided by unique IVolatility historical database, which includes implied and historical volatilities, prices, volumes and a lot more. Fully customizable interface allows users to create their own workspace with favorite equities and options, plot different parameters either on the same chart or have separate windows, arrange charts the way they like, apply technical analysis and take advantage of many other features.

Easy to use, IVGraph provides boundless opportunities for analyzing historical volatilities, doing custom research of the market, thus finding the right time and candidates for trading.

Current version covers stocks, indices, futures and options from US markets.

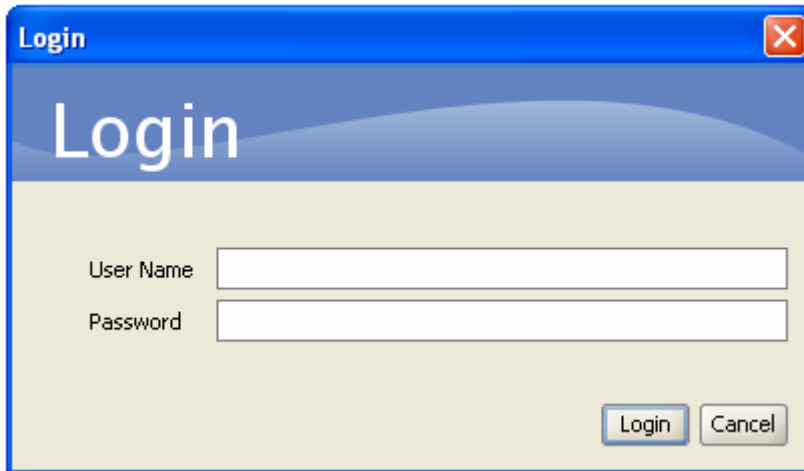
Minimal System requirements: Java 1.5 or higher.





## Getting started

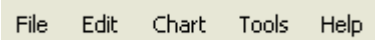
To launch the IV Graph, load the application and enter your User Name and Password (the same as you use at ivolatility.com) into the dialog window.



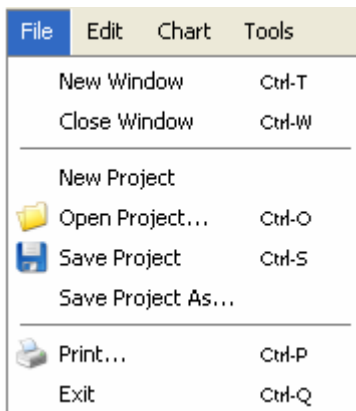
## User interface

### Main menu

The main menu is located at the top of the program application window, right under the title bar. It contains all available commands and functions.



### File



**New window:** Create a new window.

**Close window:** Close the current window.

**New project:** Create a new project.

**Open project:** Open an existent project.

**Save project:** Save the current project.

**Save project as:** Save the current project with another name.

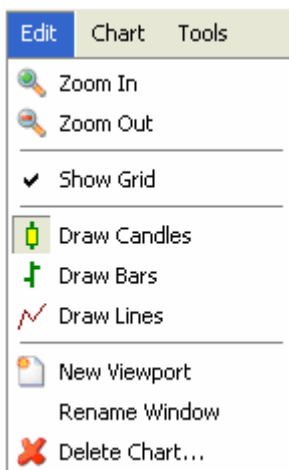
**Print:** Print the current window.

**Exit:** Exit the application.





## Edit



**Zoom in/ Zoom out:** Zoom in and out the current window.

**Show grid:** Show or hide grid in the current window.

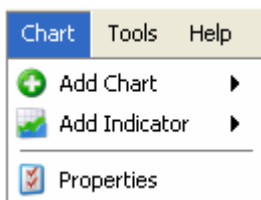
**Draw Candles/ Draw Bars / Draw lines:** Draw all price charts in the current window with candles, bars or lines.

**New viewport:** Create a new viewport in the current window.

**Rename window:** Rename the current window.

**Delete chart:** Display a window where you can select the chart to delete.

## Chart

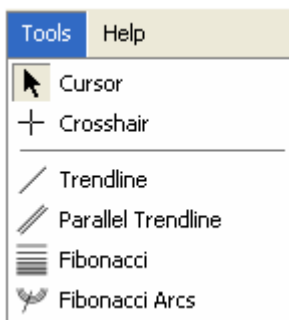


**Add chart:** Add a chart (see Creating charts).

**Add indicator:** Add an indicator (see Technical Indicators).

**Properties:** Display properties of the current window.

## Tools



**Cursor:** View the chart in the cursor mode (see Reading the Data).

**Crosshair:** View the chart in the cross mode.

**Trendline:** Add a trend line (see Trend Lines).

**Parallel Trendline:** Add a parallel trend line.

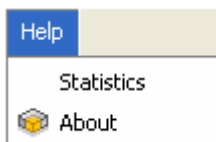
**Fibonacci:** Add Fibonacci Levels (see Fibonacci Levels Trend Lines).

**Fibonacci Arcs:** Add Fibonacci Arcs.





## Help



**Statistics:** The statistics of loaded securities for current user.

**About:** Show the information about the current version of IV Graph.

## Control panels

### Standard panel



Standard panel is located under the main menu. It contains the most important and recently used commands and functions.



Open an existent project.



Save the current project.



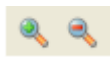
Create a new viewport in the current window.



Display properties of the current window.



Print the current window.



Zoom in and out the current window.



Draw all price charts in the current window with candles, bars or lines.

### Security panel



Security panel is located under the Standard panel.

To create a new stock or index chart, select **Equities** lookup mode. Then specify the security

using  button and press Draw Chart button.

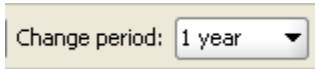
To create a futures chart select **Futures** lookup mode and specify the security. Type a slash (‘/’) after the name of the underlying (e.g. ED/, for Eurodollar) to see the list of its futures. Finally, press Draw Chart button.

**NB:** If you wish to draw the front contract price of the particular futures contract, you do not need to type a slash after the name of its underlying.

Press Option Chain to build an option dataset (e.g. option price). See all the details in Creating charts chapter.





To change the time period of a plotted chart use  button.

## Working with projects

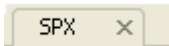
A project is an .ivgp file which keeps all the information about charts. Each project can contain windows, viewports and charts.

To create a new project, go to the File menu, then select New Project. To save the current project use File – Save Project. To save the current project with another name use File – Save Project As.


To open an existent project use File – Open Project.

## Working with window and viewports

Each project contains a number of windows, which names are represented under the standard panel. You can switch between different windows by pressing their names. To create a new window in the current project use File – New Window. To close the current window use File – Close Window or just press the cross button next to the name of the window.



To rename the current window double-click on its name.

Each window consists of a few viewports. To create a new viewport press  button on the Standard Panel. To close the viewport right-click on it and select Close Viewport from a drop-down menu.

## Working with charts

### Creating charts

You can easily plot any kind of data including equity prices, implied and historical volatilities, IV Index, and a lot more.

You can check more detailed IVolatility Guide at [http://www.ivolatility.com/doc/IVolatility\\_Data\\_detailed.pdf](http://www.ivolatility.com/doc/IVolatility_Data_detailed.pdf) to learn how our data support investing and trading analysis. Here we will provide a short description of the data to help quickly get acquainted how to use different datasets.

In the current version, the following historical projections are available for equities:

Dataset	Projection	Description
Price	Open Price	Open prices chart for a specified period of dates
	Close Price	Close prices chart for a specified period of dates
	High Price	High prices chart for a specified period of dates
	Low Price	Low prices chart for a specified period of dates
	Candle Price	Japanese candlestick chart for a specified period of dates
	Daily Return	Line chart of daily returns
Stock Volume	Stock Volume	Daily stock volume chart
	Total Option Volume	Daily total option volume per equity chart. Available for calls, puts or total
	Total Option Open Interest	Daily total option open interest per equity chart. Available for calls, puts or total
	Put/Call ratio	A ratio of the trading volume of put options to call options





<b>Volatility</b>	HV Close-to-Close	Close-to-close <b>historical</b> volatility for set of standard terms: 10, 20, 30, 60, 90, 120, 150, 180 days
	HV High-to-Low	Time series of high-to-low, also known as Parkinson, <b>historical</b> volatility for a set of standard terms: 10, 20, 30, 60, 90, 120, 150, 180 days
<p><i>Historical Volatility reflects the past price movements of the underlying asset, while implied volatility is a measure of market expectations regarding the asset's future volatility. Historical volatility is also referred to as the asset's actual or realized volatility.</i></p> <p><i>Each equity has a unique level of volatility that changes over time. When historical volatility is high, it says that the stock has been showing extreme fluctuations in price. When it is low, it suggests quiet or sideways trading. Comparing it to the historical volatility of other stocks and indexes allows one to estimate whether the stock or index is relatively volatile.</i></p> <p><i>Although volatility always changes, most indexes and stocks can be assigned an average value, since their volatility tends to fluctuate around some normal or average value over long periods of time. To determine what volatility level is normal for a particular stock or index, traders must consider historical volatility across different time frames. Furthermore, viewing the historical volatility of a stock or index over time can help to determine whether the volatility is rising or falling. For example, if the 10-day historical volatility of a stock is 15% and the 120-day is 45%, the stock has recently witnessed a sharp decline in volatility. Studying changes in the volatility of an asset can help identify a normal volatility range, deviations from it, and subsequently, trading opportunities.</i></p> <p><i>Option premiums rise when market participants expect greater stock volatility. When the historical volatility of a stock or index is high, there is a tendency for the market to drive option premiums higher as well. One can expect a stock or index that has high historical volatility to exhibit high volatility in the future, and the option premiums will reflect those expectations.</i></p>		
	<b>IV Index</b>	Time series of Implied Volatility Index for a set of standard terms: 20, 30, 60, 90, 120, 150, 180, 270, 360. Available for calls, puts or total
<p><i>IVX is VIX-like measure: an expected stock volatility over a future period. But unlike VIX, we provide an IVX number not just for key stock indices but for each optionable name in US, Europe and Canada. The IVX is calculated by using a proprietary weighting technique factoring the Delta and Vega of each option participating in IVX calculations. In total, we use 4 ATM options within each expiration to calculate the Implied Volatility Index of each stock. This IV Index is normalized to fixed tenors (30, 60, 90, 120, 150, 180, 360, 720 days) using a linear interpolation by the squared root of time. The fundamental nature of IVX is the same as VIX but we calculate IVX for every optionable name and for different maturities.</i></p> <p><i>IVX is a great tool for volatility studies looking for a single volatility value as well as studies reviewing historic stock volatility and mean reversal principles.</i></p>		
<b>IV Surface</b>	IV by OTM/DTE	Time series of implied volatility defined by specified % out-of-the-money strike (from -50% to +50% from spot with 10% step) and fixed term to expiration (from 1m to 24 m)
	IV Skew by Moneyness	Skew time series chart, where skew is calculated as the difference between symmetric points around ATM point for the fixed terms to expiration
<p><i>A surface normalized by moneyness and maturity.</i></p> <p><i>Terms: 1, 2, 3, 4, 5, 6, 12, 24 months</i></p> <p><i>Moneyness: (-50%, -40%, -30%, -20%, -10%, 0% (OTM puts), 0%, 10%, 20%, 30%, 40%, 50% (OTM calls)</i></p> <p><i>Surface by moneyness allows historical analysis of implied volatility, i.e. to compare the current option price (IV) with the same moneyness and days remaining to expiration, that was observed in the past.</i></p>		
	IV by Delta/DTE	Time series of implied volatility of option with specific delta (from 0.1 to 0.9) and term to expiration (from 1m to 24 m).
	IV Skew by Delta	Skew time series chart, where skew is calculated as the difference between symmetric points around 0.5 delta point for the fixed terms to expiration
<p><b>Volatility Surface by Delta:</b></p> <p><i>A surface normalized by delta and maturity</i></p>		







Terms: 1,2,3,4,5,6, 9, 12,24 months

Deltas: (from 0.1 to 0.9 with step 0.05)

Surface by Delta is the most accurate way to analyze historical behavior of particular option or volatility skew with a given delta.

Additionally, the following historical projections are available for futures:

Dataset	Projection	Description
<b>Price</b>	Future Price	Future midmarket prices chart for a specified period of dates
	Daily Return	Line chart of daily returns
<b>Stock Volume</b>	Future Volume	Daily future volume chart
	Total Option Volume	Daily total future option volume chart. Available for calls, puts or total
	Total Option Open Interest	Daily total future option open interest chart. Available for calls, puts or total
	Put/Call ratio	A ratio of the trading volume of put future options to call future options
<b>Volatility</b>	HV Close-to-Close	Time series of close-to-close historical volatility for set of standard terms
	IV Index	Time series of Implied Volatility Index for a set of standard terms. Available for calls, puts or total
<b>IV Surface</b>	IV by OTM/DTE	Time series of implied volatility surface point fixed by specified moneyness and term to expiration
	IV Skew by Moneyness	Skew time series chart, where skew is calculated as the difference between symmetric points around ATM point for the fixed terms to expiration

The following historical datasets projections are available for options:

Dataset	Projection	Description
<b>Option Price</b>	Option Price	Option midmarket prices chart for a specified period of dates
<b>Option Volume</b>	Individual Option Volume	Daily volume chart for an individual option contract.
	Individual Option Open Interest	Daily open interest chart for an individual option contract
<b>Raw IV</b>	Raw IV	Implied volatility time series chart for an individual option contract

To build a chart, select Chart menu, then select Add Chart submenu. In this submenu select the dataset and projection.

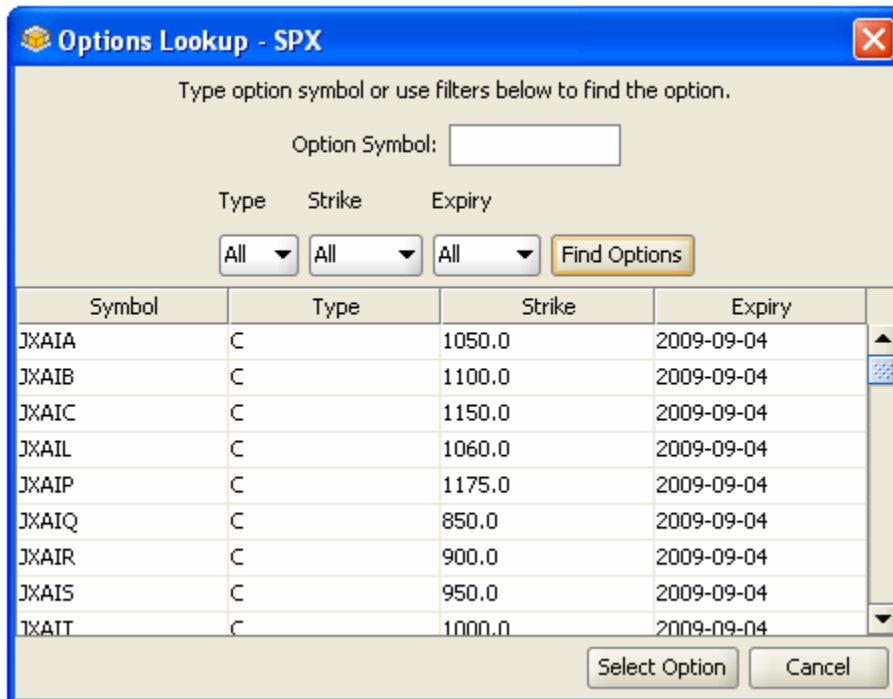






Then enter the security and the viewport where you want to place the chart and specify the parameters. Alternatively, you can create a chart using Draw Chart button from the security panel.

To build an option dataset specify option symbol. To do that, at first select the stock in the list of the loaded instruments. Click the Lookup button to enter the Option Lookup Dialog.



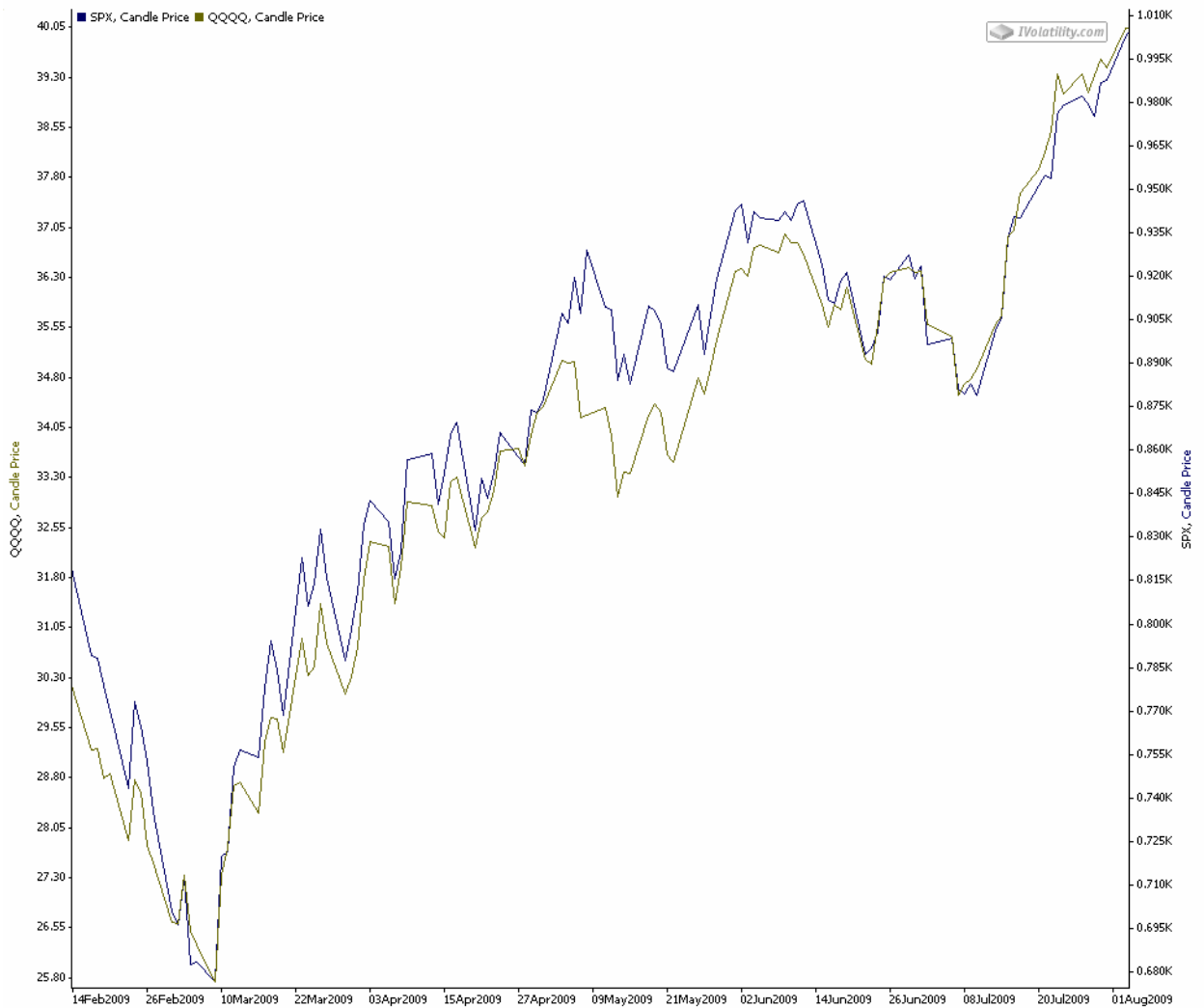
Here a desired option symbol can be selected by specifying option parameters: Type (call, put), Strike (the list of strikes in the combo-box depends on the stock symbol loaded) and Expiration (the list of expirations in the combo-box depends on the stock symbol loaded). The option symbol can be added to the list of instruments by selecting the corresponding symbol in the list of matches and pressing OK thereafter.

After it press Draw Chart button from the security panel and specify the parameters of the chart.

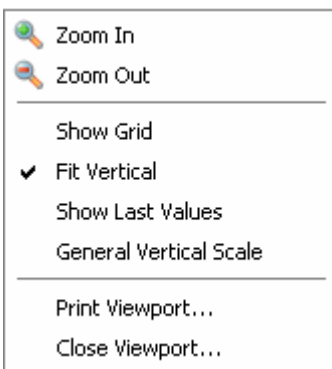
### Scales


In the current version, you can plot time-series charts. The horizontal scale is always the time scale. The vertical one is the value scale with the corresponding units. If there is only one chart at the viewport or all the charts at the viewport belong to the same dataset then the viewport has a single vertical scale. Otherwise the vertical scale becomes multiple and you can switch between scales by clicking the right button on a scale.





You can always switch between general vertical scale mode and separate scales mode by pressing the right button on the viewport and selecting General Vertical Scale from the drop-down menu.



For zooming in and out, press the corresponding button  on the window's control panel, or choose the corresponding command from the drop-down menu.

### Reading the Data




Numerical data are available for viewing from the cursor. Simply hover the cursor to the plot and a context window displaying the value of the series at the corresponding time will pop-up.

To switch the cursor to the cross mode for a more convenient view go to the Tools menu, then select Crosshair. Use Tools-Cursor to return back to cursor mode.




## Customizing charts

### Working with Candle chart

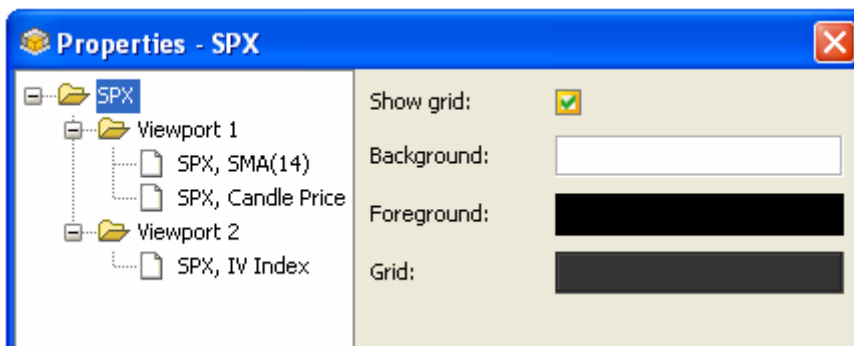
Candle chart visualizes open, high, low and close values for each date. Using buttons on the window's control panel you can switch the type of Candle plot renderer between usual Japanese candlesticks, bars or just linear plot drew using close values:   .

### Changing background and plots appearance

All appearance settings are in the Properties window. To open it go to the Chart menu, then select Properties or click the  button on the window's control panel.

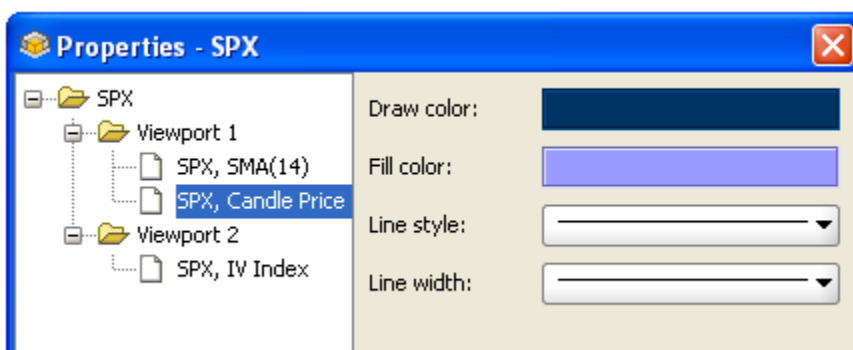
This window consists of two sections. On the left you can see opened viewports' structure and the list of plotted charts and indicators for each viewport. Selecting window, viewport, chart or indicator you will see its appearance properties on the right and will be able to change it.

You can also decide whether to show or not to show grid for each window, and choose background, foreground and grid colors.



The following plot properties are editable:

- Draw color
- Fill color (for candlestick charts only)
- Line style
- Line width



### Moving charts

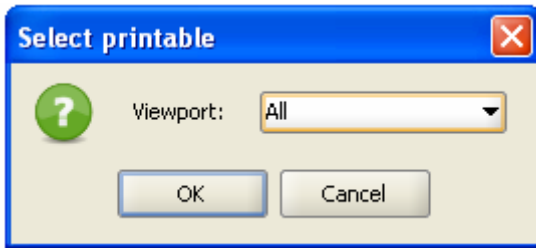
Users can change the location (the parental inner window) of any time series plot. Moving a plot implies deleting the plot from its original location and inserting it to some other.

- Left-click on a plot
- Drag the mouse arrow to another inner window while holding the left mouse button
- Release the mouse button

The plot will be placed into the new location with the best scaling options applied.

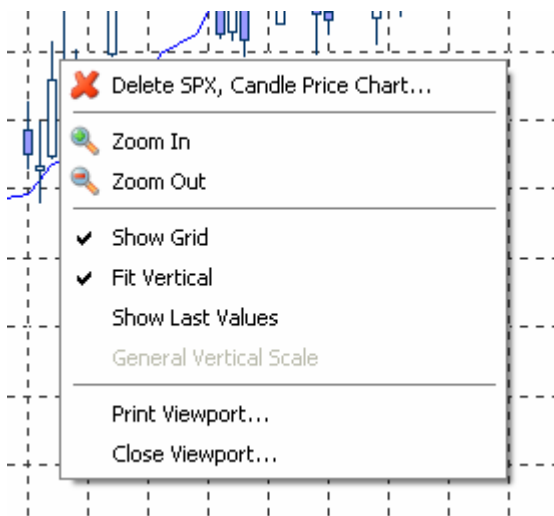
## Printing charts

To print a viewport or the whole window, go to File menu then choose Print. In the opened window select the viewport you would like to print and press OK. Select All if you would like to print the current window.

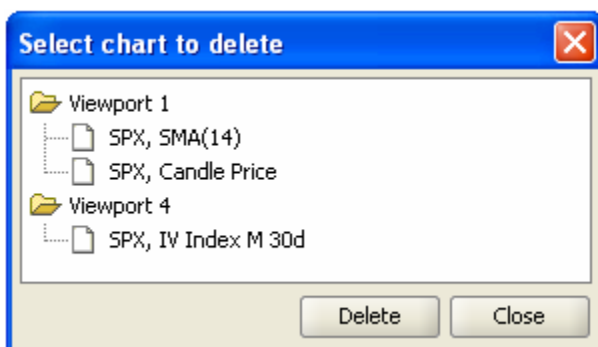


## Deleting charts

To delete a plot, right-click on it and select Delete from the drop-down menu.



Alternatively, you can go to the Edit menu and then choose Delete Chart. In the opened window select the plot you would like to delete and press Delete button at the bottom of the window.



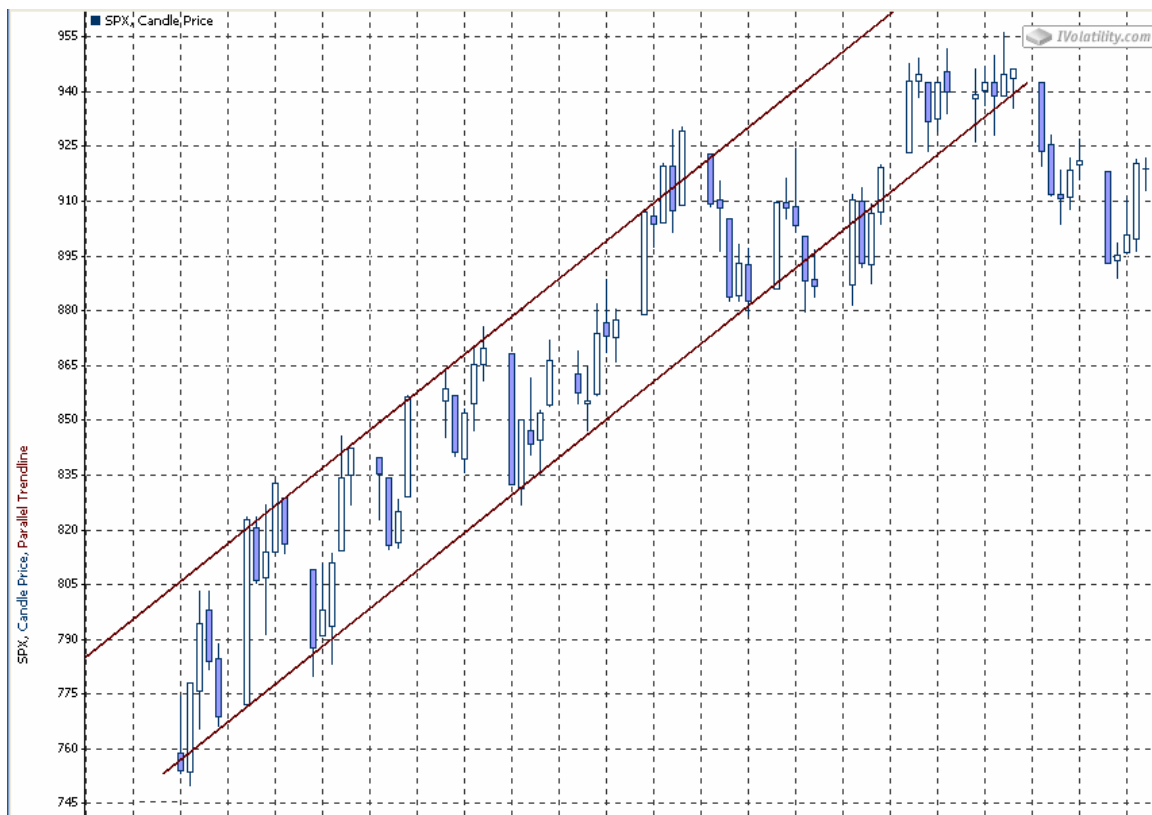
## Analytics

A number of instruments such as technical indicators, trend lines and Fibonacci levels are provided for analytical purposes. These instruments are applied directly to charts and provide a possibility to forecast future price dynamics.



## Trend Lines

You can add trend lines to the viewport area. Go to the Tools menu and then select Trendline. Fix the first point of the line and then the second point. In the similar way, you can add a parallel trend line.



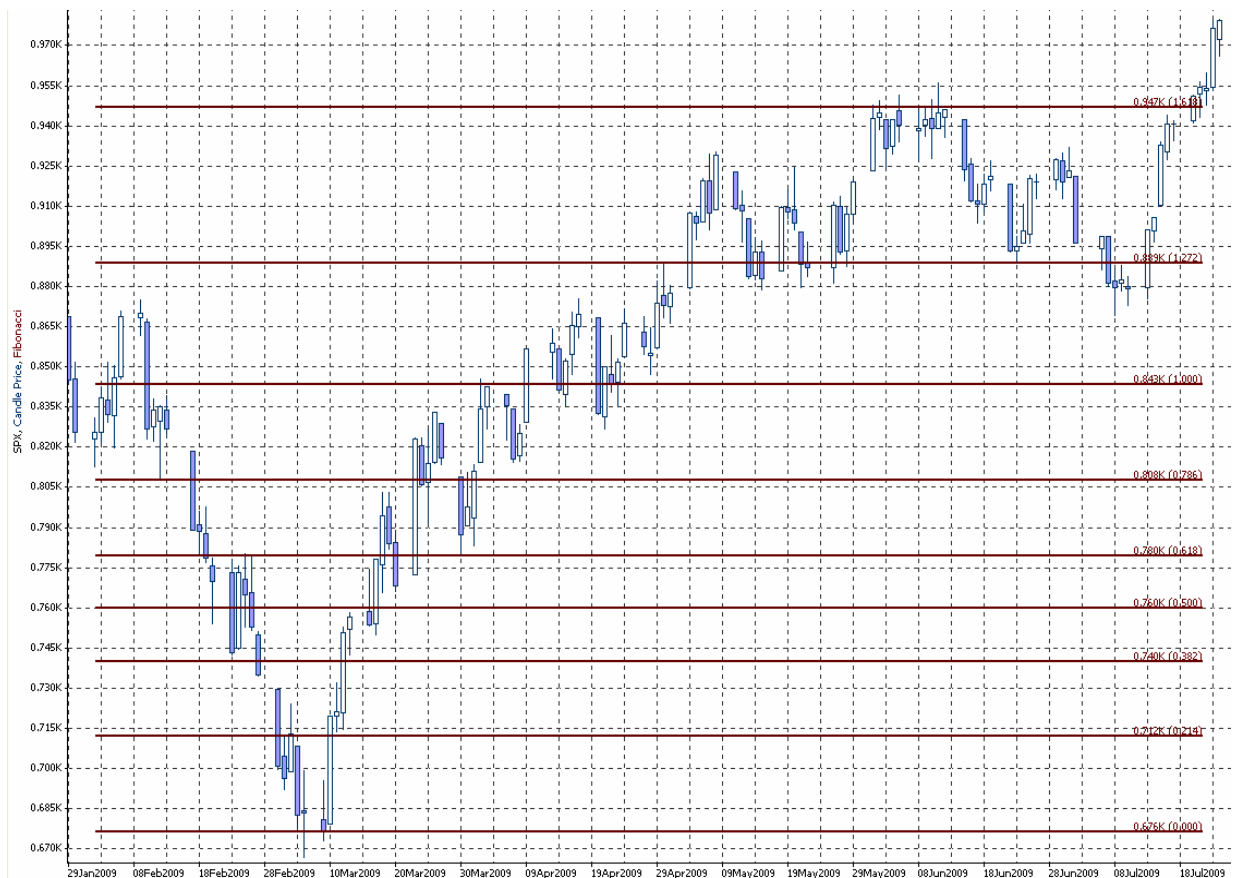
Being plotted the line could be moved by moving the red points on the line. To change the properties of a plotted trend line, go to the Properties window (Chart – Properties) and select the trend line at the left part of the window.

**NB:** Trend lines could be applied only if the viewport has separate scales (rather than general one). If the current viewport has a general scale, just switch to a separate scale to build a trend line.

## Fibonacci Levels

You can add Fibonacci levels to the viewport area. Go to the Tools menu and then choose Fibonacci. After that fix 0% vertical level point and then 100% level point:



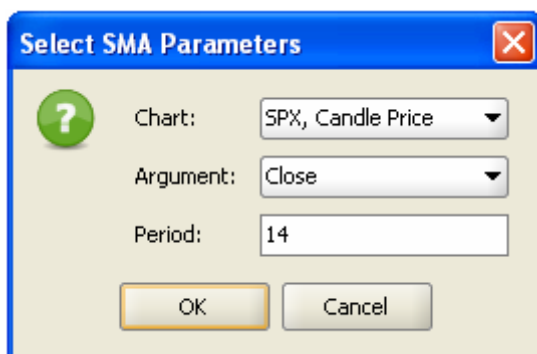


Being plotted the levels graph could be moved by moving the red points on the line. In the similar way, you can add Fibonacci arcs. To change the properties of the plotted Fibonacci levels, go to the Properties window (Chart – Properties) and select the Fibonacci levels at the left part of the window.

**NB:** Fibonacci levels could be applied only if the viewport is in separate scales mode (rather than in general mode). If the current viewport has a general scale, just switch to a separate scale mode to build a Fibonacci level.

### Technical Indicators

To add a technical indicator, go to the Chart menu and select Add Indicator submenu. Then select an indicator from the drop-down menu. In the following dialog, specify the argument, the indicator parameters and viewports where the indicator will be plotted.



The list of available indicators

- SMA. Simple moving average.





*Parameters. Period* is a number of days in the time frame.

- **SMMA.** Smoothed moving average.

*Parameters. Period* is a number of days in the smoothing period.

- **EMA.** Exponential moving average.

*Parameters. Period* is a number of days in the time frame.

- **LWMA.** Linear weighted moving average.

*Parameters. Period* is a number of days in the smoothing period.

- **CCI.** Commodity Channel Index. The CCI is designed to detect the beginning and the ending market trends. CCI represents the position of the current price relative to the average of price over a recent period.

*Parameters. Period* is a number of days for calculating a moving average and standard deviation.

- **ROC.** Rate of Change Indicator. It is very similar to the Momentum indicator, but for the calculations of this indicator the price difference is taken, so it is less by 100.

*Parameters. Period* is a number of days you look in the past.

- **RSI.** The Relative Strength Index. The RSI oscillates in a range between 0 and 100 representing the magnitude of the stock's recent gains in comparison to the magnitude of its recent losses.

*Parameters. Period* is a number of days in the time frame.

- **Momentum.** The Momentum Technical Indicator. Measures the amount of a security's price change over a given time period.

*Parameters. Period* is a number of days you look in the past.

- **BB.** Bollinger Bands. Same period is used for calculating a moving average and standard deviation.

*Parameters. Period* is a number of days for calculating a moving average and standard deviation.

STD# - number of standard deviations for bands building.

- **Alligator.** Alligator Technical Indicator is a combination of balance lines. The blue line (Alligator's Jaw) is the balance line for the timeframe that was used to build the chart. The red line (Alligator's Teeth) is the balance line for the value timeframe of one level lower. The green line (Alligator's Lips) is the balance line for the value timeframe, one more level lower. Gator Oscillator is usually drawn in a separate window; it shows the degree of convergence/divergence of the balance lines. The top bar chart is the absolute difference between the values of the blue and the red lines. The bottom bar chart is the absolute difference between the values of the red line and the green line, but with the minus sign, as the bar chart is drawn top-down.

*Parameters. Alligator's Jaw, Teeth and Lips* are periods and shifts for building the three balance lines.

- **ADX.** The average directional movement index. It is plotted together with positive and negative directional indicator lines. Same period is being used for calculating directional indicators and the average directional movement index.

*Parameters. Period* is a number of days for calculating moving averages.

- **MACD.** Moving Average Convergence/Divergence is the next trend-following dynamic indicator. It indicates the correlation between two price moving averages. We offer to plot five charts related to MACD – two exponential moving averages for different terms, difference between them i.e.






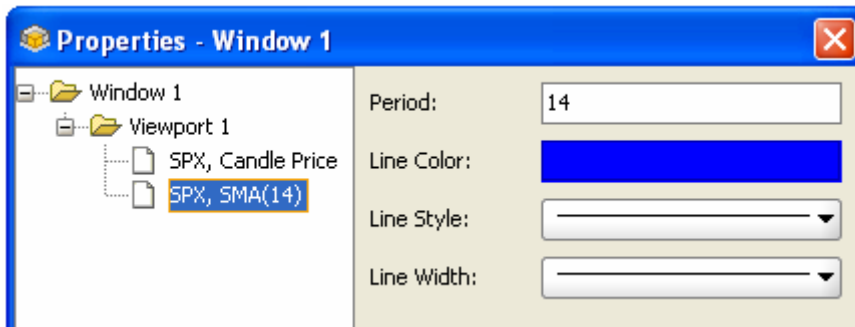


MACD directly, simple moving average of MACD i.e. MACD signal and histogram of difference between MACD and its signal.

Parameters. First and second EMA periods are the number of days for each of EMA calculations, SMA period is a number of days for SMA calculation.

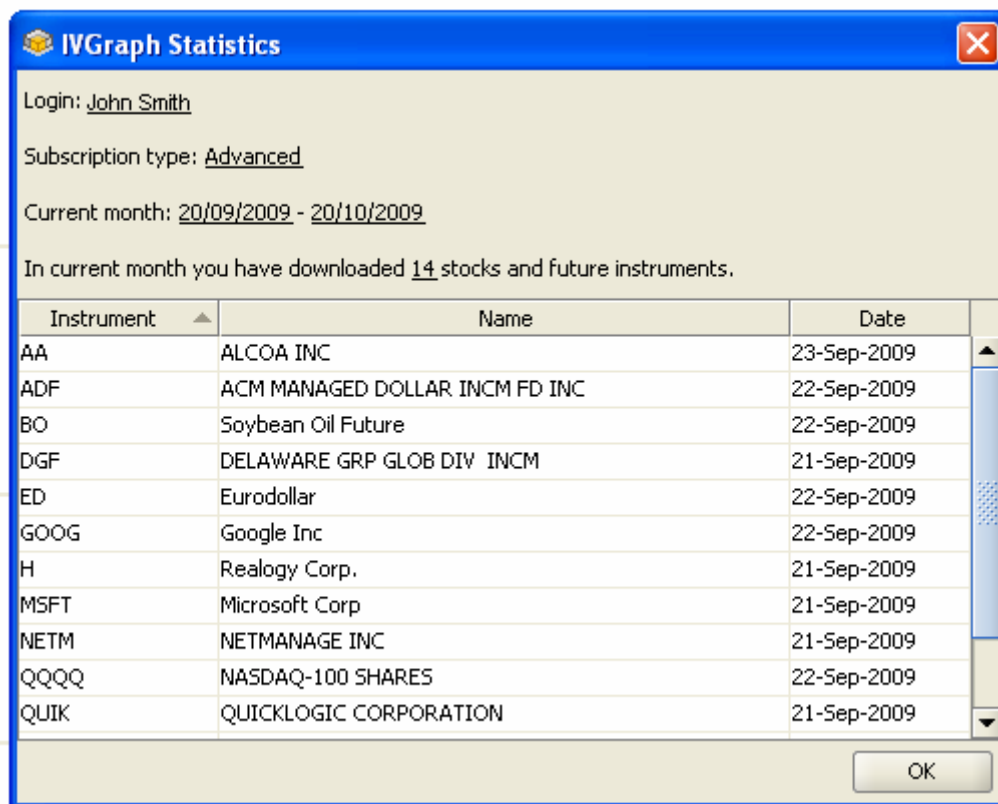
### Changing indicator parameters

You can change the parameters of the indicator once it was plotted. Go to the Chart menu, then choose Properties or click the  button on the window's control panel. In the Properties window select the indicator at the left part, and change its parameters at the right part of the window.



### User statistics

This window allows you to see the list of loaded securities during the current month. Once you press the name of the column, the table will immediately be sorted by this column.



Instrument	Name	Date
AA	ALCOA INC	23-Sep-2009
ADF	ACM MANAGED DOLLAR INCM FD INC	22-Sep-2009
BO	Soybean Oil Future	22-Sep-2009
DGF	DELAWARE GRP GLOB DIV INCM	21-Sep-2009
ED	Eurodollar	22-Sep-2009
GOOG	Google Inc	22-Sep-2009
H	Realogy Corp.	21-Sep-2009
MSFT	Microsoft Corp	21-Sep-2009
NETM	NETMANAGE INC	21-Sep-2009
QQQQ	NASDAQ-100 SHARES	22-Sep-2009
QUIK	QUICKLOGIC CORPORATION	21-Sep-2009

