



## IVGraph Live Service Contents

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## Introduction

IVGraph Live 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 and real time data feed, 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 futures, 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.

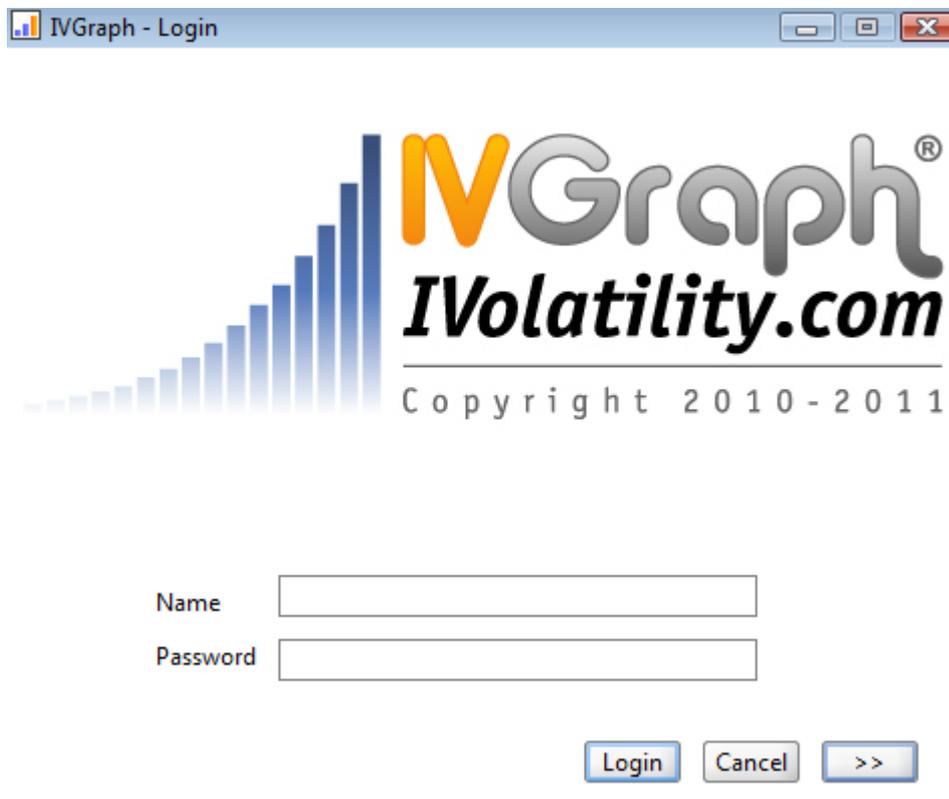
Easy to use, IVGraph Live provides boundless opportunities for analyzing historical volatilities, doing custom research of the market, thus finding the right time and candidates for trading.

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

Minimal System requirements: Java 1.5 or higher.

## Getting Started

To launch the IVGraph Live, load the application, enter your User Name and Password (the same as you use at ivolatility.com) into the dialog window and set up proxy connection settings if necessary.



IVGraph - Login

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**IVolatility.com**  
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Name

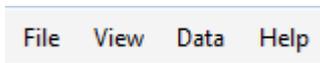
Password

Login Cancel >>

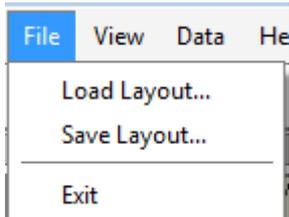
## User Interface

### Main menu

The main menu is located at the top of the program application window, right under the title bar.



### File

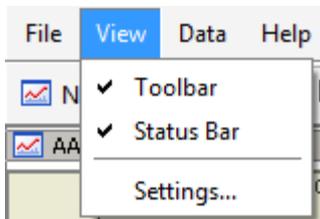


**Load Layout:** Load the existent layout.

**Save Layout:** Save the current layout.

**Exit:** Exit the application.

### View



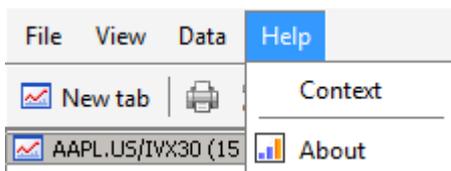
**Toolbar:** Enable/disable the toolbar.

**Status Bar:** Enable/disable the status bar.

**Settings:** Display application settings

### Data

### Help



**Context:** Show the help guide.

**About:** Show the information about the current version of IVGraph Live.

## Toolbar



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

-  **New tab** Create a chart on a new tab (see Creating charts). Hotkey: Ctrl-T.
-  Print the current tab
-  Display settings of the current tab(see Chart Settings). Hotkey: Ctrl-D.
-  Switch the pointer mode: simple pointer or crosshair
-  Draw a vertical line
-  Draw a horizontal line
-  Draw a single trend line
-  Draw a parallel trend lines
-  Draw Fibonacci Levels
-  Draw Fibonacci Arcs
-  Add a technical indicators (see Technical Indicators)
-  Add a mark (see Marks)
-  Zoom in and out the current tab
-  Draw all price charts in the current window with candles, bars or lines.
-  **Add chart** Add a chart to the current tab. Hotkey: Ctrl-G.



## Application settings

To open the application settings window go to View – Settings.

General settings:

- Chart Update Interval
- Sleep mode
- Sleep mode – interval

Default chart settings:

- Show grid
- Background color
- Foreground color
- Grid color
- Offline mode
- Autoscrolling
- Show last value
- Chart type
- Interval
- Bar up color
- Bar down color
- Bull candle color
- Bear candle color
- Line color

## Working with layouts

A layout is an .rcf file which keeps all the information about charts. Each layout can contain tabs, viewports and charts.

To save the current layout use File – Save Layout. To open an existent layout use File – Load Layout.

If you're working on several workstations then you can save the layout and open it on another workstation to see your IVGraph Live workspace.

## Working with tabs and viewports

Each layout contains a number of tabs, which names are represented above the bottom of the IVGraph Live window. You can switch between different tabs by pressing their names. To create a new tab in the current layout use New Tab button on the toolbar. To close the current tab press the cross button on the right top of the tab.

Each tab consists of a few viewports. To create a new viewport press Add chart button on the toolbar.





## Working with charts

You can easily plot any kind of data including equity prices, historical volatilities, implied volatility 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.

### Historical data

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

| Dataset  | Projection                 | Description  |
|--|----------------------------|--|
| <b>Price</b>   | 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 specified period of dates   |
| <b>Volume</b>  | 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                  |
| <b>Volatility</b>  | HV Close to Close          | Close-to-close historical volatility for 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.</i></p> <p><i>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.</i></p> <p><i>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> |                            |  |
|  | IV Index                   | Time series of Implied Volatility Index for a set  |





|  |  |   |
|--|--|---|
|  |  | of standard terms: 20, 30, 60, 90, 120, 150, 180, 270, 360. |
| <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> |  |   |

The following historical projections are available for futures:

| Dataset           | Projection                 | Description  |
|-------------------|----------------------------|--|
| <b>Price</b>      | Close Price                | Close prices chart for a specified period of dates   |
|                   |                            |  |
| <b>Volume</b>     | Future Volume              | Daily future volume chart  |
|                   | Total Option Volume        | Daily total option volume per all futures with the same series ( <b>not for individual future contract</b> ) chart.        |
|                   | Total Option Open Interest | Daily total option open interest per all futures with the same series ( <b>not for individual future contract</b> ) chart. |
| <b>Volatility</b> | HV Close to Close          | Close-to-close historical volatility for set of standard terms: 10, 20, 30, 60, 90, 120, 150, 180 days                     |
|                   | IV Index                   | Time series of Implied Volatility Index for a set of standard terms: 20, 30, 60, 90, 120, 150, 180, 270, 360.              |

### Intraday data

In the current version we provide the following intraday data both for futures and stocks:

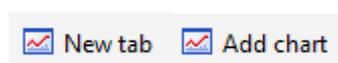
- Price
- Trading Volume
- IV Index with 30 days term

Price and IV Index datasets are available as candles and linear plots.

The data is 15 minutes delayed and we show last 3000 candles.

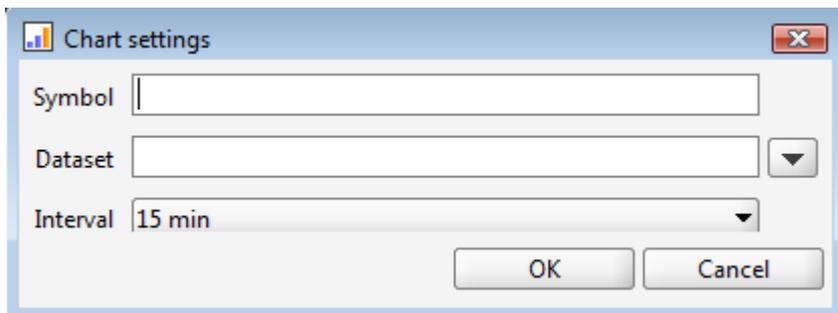
### Creating charts

To create a chart on a new tab click New tab button on the toolbar or press Ctrl-T. To add a new chart to the existent tab click Add chart or press Ctrl-G.



After that you will see the following window:





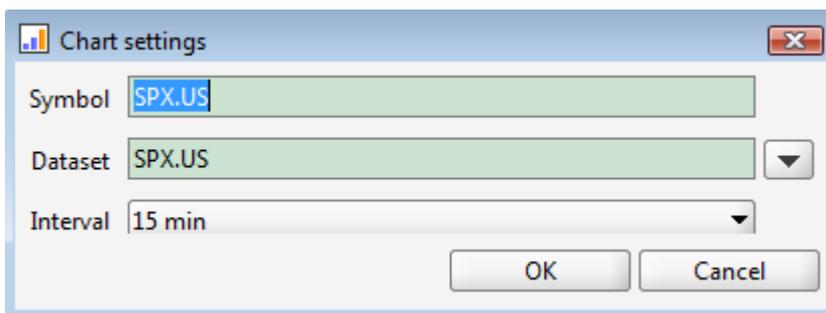
In the symbol field you should enter the symbol of the security. Then you should select the data projection in the Dataset field. Then select the interval between the points of the data.

To view all available datasets press down arrow on the keyboard or click on the down arrow near the dataset field.

The symbol of the security in the dataset field means that the price data projection is selected.

- Stock Price

To add a stock price chart enter the stock symbol in the Symbol field, select the interval, then click OK.



- Future Price

To add a future prices chart enter the root symbol in the Symbol field, in the dropdown list select the security with symbol <root>/FUTURES, in the Dataset field select the future contract then select the interval and click OK.

- Volatilities

To add a volatility chart enter the symbol of security (<root>/FUTURES for futures), select the volatility in the Dataset field.

- Volumes

Volumes are available as the indicators (see Technical indicators).

**Working with candle chart**

Most of the data in the current version of IVGraph Live could be represented as candlesticks, bars or linear plot drew using open, high, low or close values.

Candle chart visualizes open , high, low and close values for each time period.

Using buttons on the toolbar you can switch the type of the chart: 

### Reading the data

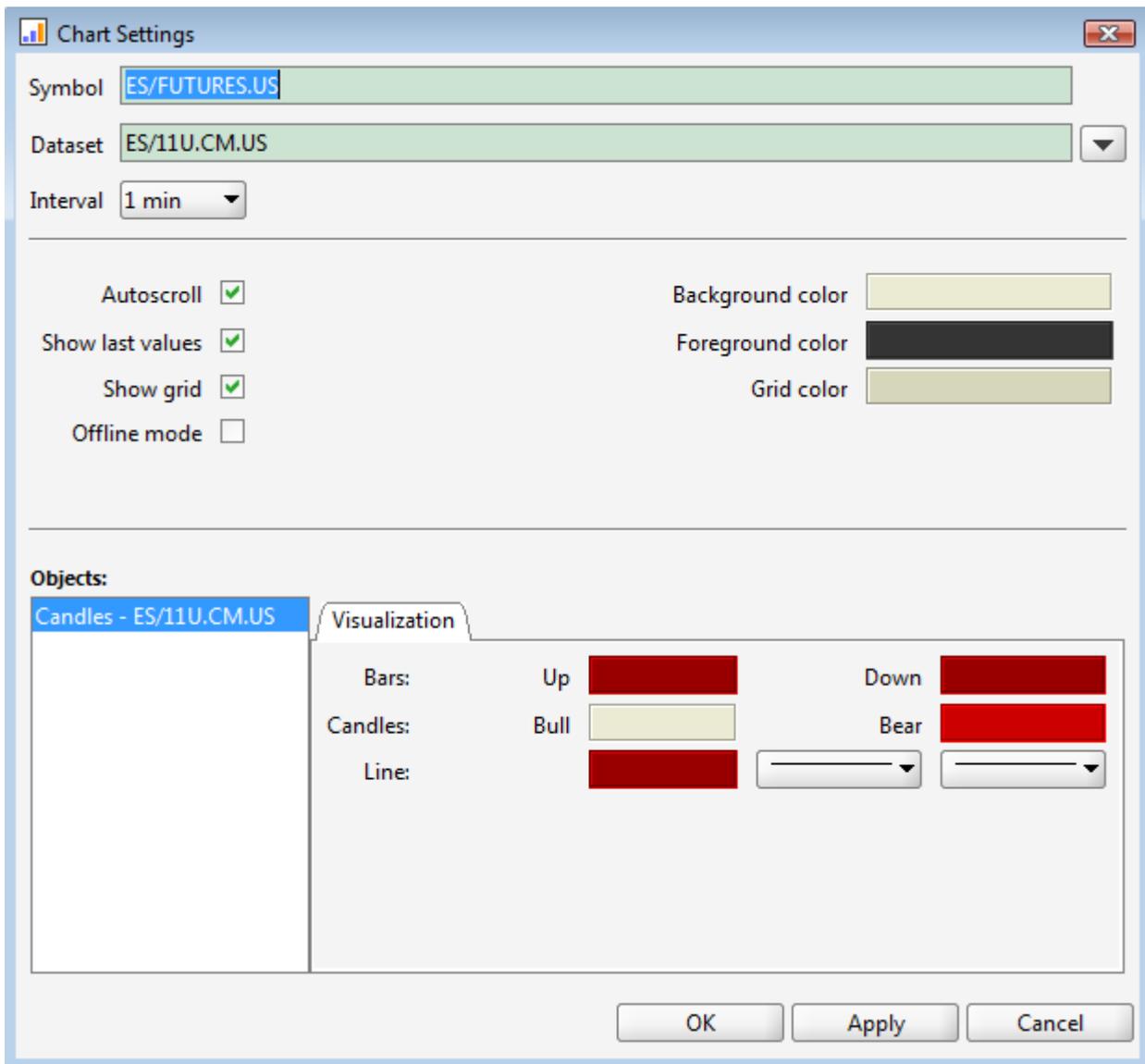
Numerical data are available for viewing from the cursor. Simply hover the cursor to the plot and a context window displaying the value of the series at the corresponding time will pop-up.

To switch the cursor to cross mode for a more convenient view select Crosshair on the toolbar:



### Chart settings

To open chart settings screen click on the Chart settings button on the toolbar or click the right button and select Chart settings from context menu or press Ctrl-D.



On this screen you can change the main instrument on the tab, the interval and an appearance of the chart.

The following plot properties are editable:



- Autoscroll
- Show last values
- Show grid
- Offline mode
- Background color
- Foreground Color
- Grid color
- Bars color
- Candles color
- Line color
- Line type

### **Printing and saving charts**

To print a current tab press Print Viewports button on the toolbar.

To save a chart as image click the right button on the chart and select Save as Image in the context menu.

## **Analytics**

A number of instruments such as technical indicators, volumes, 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.

### **Horizontal and vertical lines**

Vertical or horizontal lines are available on the toolbar. Click on the horizontal/vertical line button and fix the point on the chart where the line should be plotted.

Being plotted the line could be moved by drag and drop. To change the properties of a plotted line, go to the Chart Settings window and select the line.

To delete the line click the right button on it and select delete in the context menu.

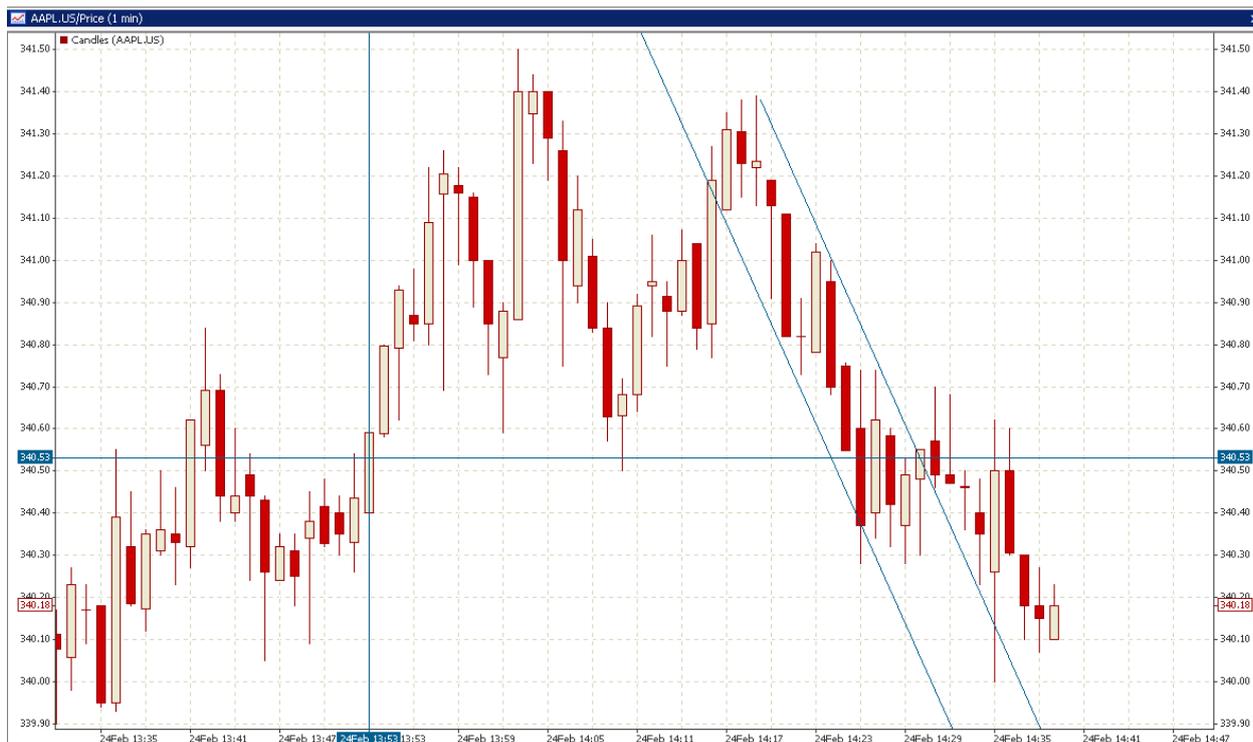
### **Trend lines**

You can add trend lines to the viewport area. On the toolbar select line. 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 points on the line. To change the properties of a plotted trend line, go to the Chart Settings window and select the trend line.

To delete the line click the right button on it and select delete in the context menu.





### Fibonacci levels

You can add Fibonacci lines to the viewport area. To add the Fibonacci line select it on the toolbar. After that fix the 0% vertical level point and then 100% level point.



Being plotted the levels graph could be moved by moving the 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 Chart Settings window and select the Fibonacci levels.



To delete the Fibonacci levels click the right button on them and select delete in the context menu.

### Marks

While analyzing the historical or intraday charts you can add the following marks to any place on the chart:

 Thumbs up

 Thumbs down

 Arrow up

 Arrow down

 Arrow left

 Arrow right

 Stop sign

 Check sign

 Left price label

 Right price label



To delete the marks click the right button and select delete in the context menu.

### **Technical Indicators**

To add a technical indicator click on the Add Indicator button on the toolbar and select the indicator from the drop-down menu. In the following dialogs specify the parameters of indicator, select the argument and set the line type and color.

To change parameters of the indicator go to Chart settings, select the indicator and change the values.

#### The list of available indicators

##### **A/D.** Accumulation/Distribution

A momentum indicator that attempts to gauge supply and demand by determining whether investors are generally "accumulating" (buying) or "distributing" (selling) a certain stock by identifying divergences between stock price and volume flow. It is calculated using the following formula:

$$A/D = ((\text{Close} - \text{Low}) - (\text{High} - \text{Close})) / (\text{High} - \text{Low}) * \text{Period's volume}$$

Parameters:

##### **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.

##### **ATR.** Average True Range.

A measure of volatility introduced by Welles Wilder in his book: *New Concepts in Technical Trading Systems*.

The true range indicator is the greatest of the following:

- current high less the current low.
- the absolute value of the current high less the previous close.
- the absolute value of the current low less the previous close.

The average true range is a moving average of the true ranges.





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

**Bears.** Bears Power.

Technical indicator Bears Power, designed by Alexander Elder, assesses the balance of the bears power and indicates possible trend direction change. The indicator is based on the difference of the minimal L price and 13-grade EMA exponential moving average.

Bears Power is normally used with trend indicators. Purchase signal appears once the trend indicator is going up and the bears power below zero are growing.

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

**BB.** Bollinger Bands.

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.

Deviation - number of standard deviations for bands building.

Shift – MA time shift in days

**Bulls.** Bulls Power.

The indicator is based on the difference between the maximal rate and 13-period exponential moving average (H - EMA).

Bulls Power is mostly used in combination with moving average or another trend indicator. The sell signal appears once the trend indicator has a decelerating direction and the bulls power indicator is above the zero level and is decreasing.

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

**CHO.** Chaikin Oscillator.

An oscillator created by subtracting an EMA with bigger period from a EMA with smaller period of the accumulation/distribution line.

*Parameters.* Periods are the number of days for calculating an exponential moving average.

**CCI.** Commodity Channel Index.

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.

**DeM.** DeMarker

DeMarker compares the most recent price action to the previous period's price in an attempt to measure the demand of the underlying asset. This indicator is generally used to identify price



exhaustion and can also be used to identify market tops and bottoms. This oscillator is bounded between -100 and +100 and, unlike many other oscillators, it does not use smoothed data.

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

### **Envelopes.**

Envelopes Technical Indicator is formed with two Moving Averages one of which is shifted upward and another one is shifted downward. The selection of optimum relative number of band margins shifting is determined with the market volatility: the higher the latter is, the stronger the shift is.

Envelopes define the upper and the lower margins of the price range. Signal to sell appears when the price reaches the upper margin of the band; signal to buy appears when the price reaches the lower margin.

The logic behind envelopes is that overzealous buyers and sellers push the price to the extremes (i.e., the upper and lower bands), at which point the prices often stabilize by moving to more realistic levels. This is similar to the interpretation of Bollinger Bands.

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

Deviation – deviation from average

Shift – MA time shift in days

### **Gator.** Gator Oscillator.

Gator Oscillator is based on the Alligator and shows the degree of convergence/divergence of the Balance Lines (Smoothed Moving Averages). 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.* Gator's Jaw, Teeth and Lips are periods and shifts for building the three balance lines

### **Momentum.**

The Momentum indicator is a speed of movement (or rate of change) indicator, that is designed to identify the speed (or strength) of a price movement.

*Parameters.* Period is a number of days for calculating a momentum.

### **MA.** Moving Average.

In the dialog window you can select from the following MA types:

- **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.

**MACD.** Moving Average Convergence/Divergence.

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.

**OBV.** On Balance Volume.

On Balance Volume Technical Indicator (OBV) is a momentum technical indicator that relates volume to price change. The indicator, which Joseph Granville came up with, is pretty simple. When the security closes higher than the previous close, all of the day's volume is considered up-volume. When the security closes lower than the previous close, all of the day's volume is considered down-volume.

*Parameters.* Period is a number of days for calculating an OBV.

**SAR.** Parabolic SAR.

Parabolic SAR Technical Indicator was developed for analyzing the trending markets. The indicator is constructed on the price chart. This indicator is similar to the Moving Average Indicator with the only difference that Parabolic SAR moves with higher acceleration and may change its position in terms of the price. The indicator is below the prices on the bull market (Up Trend), when it's bearish (Down Trend), it is above the prices.

**ROC.** Rate Of Change.

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.** Relative Strength Index.

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.

### **%R.** Williams' Percent Range.

Williams' Percent Range Technical Indicator (%R) is a dynamic technical indicator, which determines whether the market is overbought/oversold. Williams' %R is very similar to the Stochastic Oscillator. The only difference is that %R has an upside down scale and the Stochastic Oscillator has internal smoothing.

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

### **Volume and Open Interest indicators**

In the current version we provide a volume, total options volume and total options open interest data as the indicators of the security price chart. To add a volume data you should plot the price chart(see creating charts), click the Add indicator button on the toolbar and select one of the volumes datasets.

The following datasets are available

- for stocks:

|                             |   |
|-----------------------------|---|
| Volume                      | Daily stock volume chart  |
| Total Options Volume        | Daily total option volume per equity chart. Available for calls, puts or total        |
| Total Options Open Interest | Daily total option open interest per equity chart. Available for calls, puts or total |

- for futures:

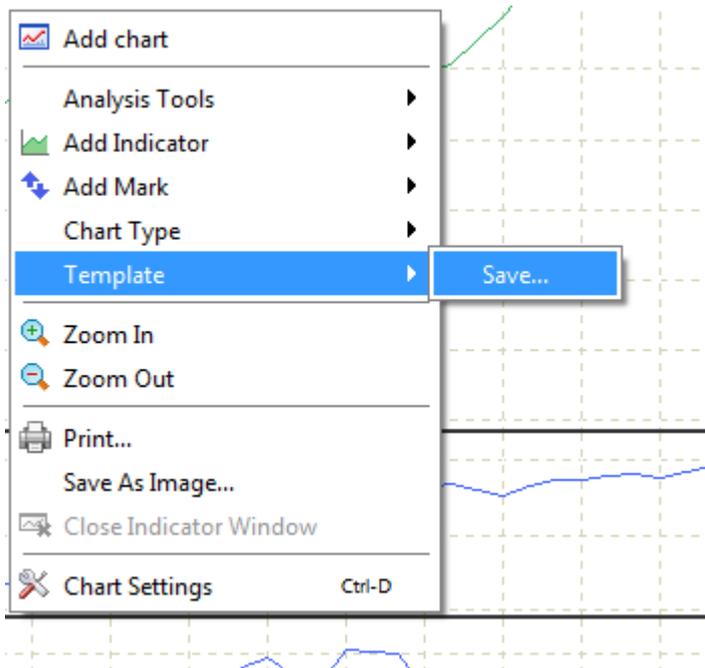
|                            |  |
|----------------------------|--|
| Volume                     | Daily future volume chart  |
| Total Option Volume        | Daily total option volume per all futures with the same series ( <b>not for individual future contract</b> ) chart.        |
| Total Option Open Interest | Daily total option open interest per all futures with the same series ( <b>not for individual future contract</b> ) chart. |

For all instruments we provide an intraday trading volume charts with 15 minutes delay.

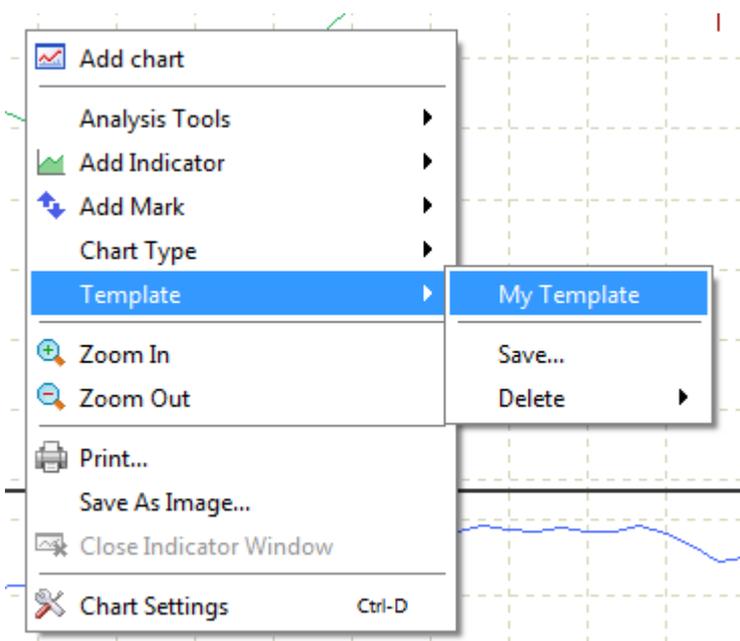
## **Working With Templates**

In the current version for any chart you can save the template with appearance settings and data with added indicators. At any moment you can apply this template to other instrument and view the data with pre-saved indicators and appearance settings.

To save the template make the right click on the chart, select Template – Save in the context menu. Then in the new dialog window select the instrument for which you want to save the template and enter the name of template.



To apply the template make the right click on the chart, select Template in the context menu and select the template that you want to apply. In the new dialog window select the instrument to apply the template.



To delete the template make the right on the chart, select Template – Delete in the context menu and select the template that you want to delete.

