Qcaid iSystems Edition

User Guide | V.1 October 2018

Qcaid
iSystems Edition

Contents

1. Introduction

About this guide

This user's guide is a detailed document on Qcaid iSystems Edition's features and functions. The manual includes a description of the interface and its elements to understand the language of the application and the way it works, with the goal of providing users with all the necessary information to acquire the practical knowledge to manage Qcaid iSystems Edition.

Examples of use of Qcaid iSystems Edition may be found in the video tutorials on Qbitia's website. If you have any questions or inquiries, please contact Technical Support.

About Qcaid iSystems Edition

Qcaid iSystems Edition is an innovative service developed to manage the production cycle of trading strategies. Its innovative software simplifies this process and allows users to create all types of automatic strategies without writing a single line of code.

Its user-friendly desktop application provides access to the service, making it easier to design strategies and analyse backtest results. Backtest execution is carried out in dedicated servers housed in specialized data centers. Thus, users have access to a comprehensive algorithmic trading solution without having to worry about storage and management of historical data or servers maintenance.

Another main advantage is that Qcaid iSystems Edition features a drag & drop strategy designer, which enables traders to create mathematical models by placing the strategy elements onto a canvas, thus creating a flow diagram that represents the trading idea in a visual and intuitive way. Qbitia has also innovated in creating a backtester that allows users to test their strategies in past market environments.

Multi-instrument strategies can be designed on Qcaid iSystems Edition, although the strategy can only execute one of the instruments included. Qcaid iSystems Edition also

allows users to create multi-timeframe strategies, although only one type of candle subscription is allowed for the instrument executed by the strategy.

In addition, the position achieved by the strategy can't be higher than 3.

2. User interface

This section describes Qcaid iSystems Edition's user interface. Once the interface elements are explained, the following sections will describe how they work and how to use them.

General features

Qcaid iSystems Edition's user interface consists of main windows dedicated to the different stages of use of the application: strategy editing and backtesting.

Every window is subdivided into several areas and contains a menu with buttons to access different features.

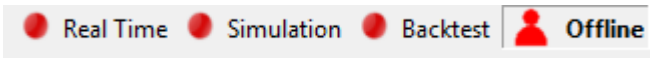
Views may be rearranged or separated from the main window to suit personal preferences or multiple-screen desktops.

All windows share a series of features, as shown in the following table.

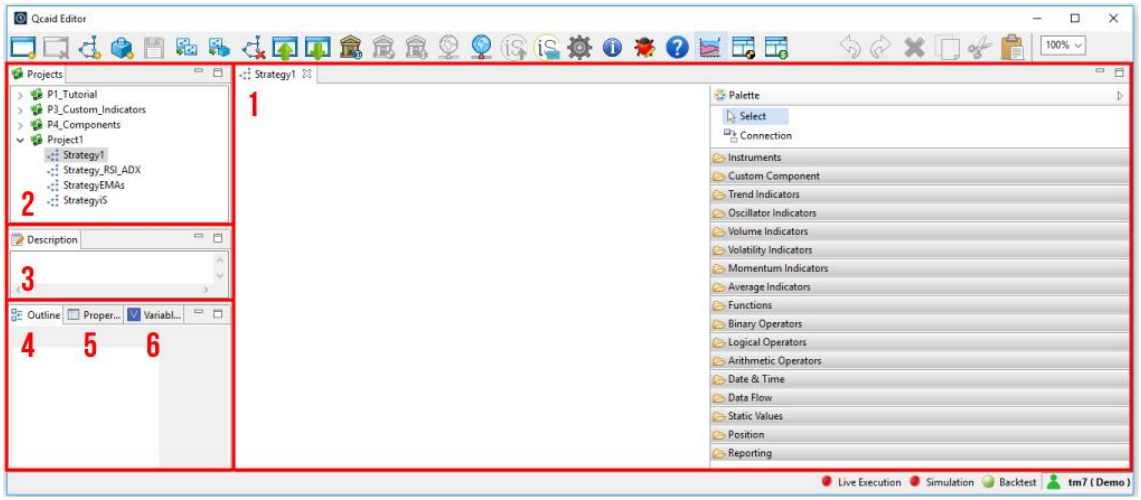
Icon	Action
	Connect to server
	Disconnect from server
	Edit Preferences
	About Qcaid iSystems Edition

	Bug Report
	Help
	Open Editor
	Open Report Window

The indicators at the bottom-left corner of the interface show the state of the connection to the server and service availability.



The features and characteristics of each window are detailed below.



Editing your strategy

The strategy editor is the first window that appears once Qcaid iSystems Edition is started and users log in. Strategies are created and edited in this window.

This window consists of six smaller areas called views:

- The **editing canvas** (*1*) is the main view and displays the diagram of the strategies and components. The diagram is made up of model elements, which are the elements that may be used to design strategies. They are on the right palette grouped by categories. They can be displayed by clicking on them. To add an element to the strategy, click on it and drag it onto the canvas. The palette can be hidden by clicking on the triangular icon at its upper-right corner. The two editing modes are placed at the top of the palette: selection mode and connection mode. Right-click on the canvas to open the same context menu as in the Projects area.

- The **Projects** area (*2*), located in the upper-left corner, displays all strategies and components that have been created, organized by projects. Press the triangular icon beside the name of the project or double-click directly on the name to show or hide its contents. Double-click on the name of a strategy or component to open it.

- The **Description** area (*3*) allows users to include a description of the strategy that they are editing.

- The **Outline** area (*4*) shows a thumbnail of the diagram of the strategy or component, highlighting the part displayed on the canvas.

- The **Properties** area (*5*) displays the properties of the selected item on the canvas and enables users to edit them.

- The **Variables** area (*6*) allows users to create, edit and delete variables. Variables can store integers, decimal values or logical values (true or false).

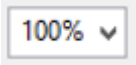
These values can be optimised when backtesting and assigned at the moment of uploading the strategy.

Buttons at the top are specifically used for editing actions. Depending on the item selected in the views, the buttons remain active (in color) or disabled (in gray).

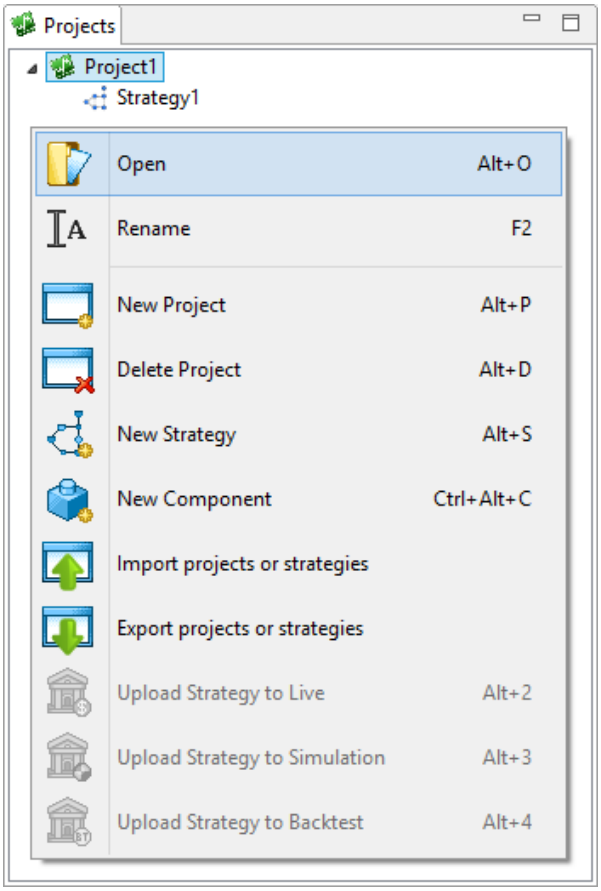
The following table describes the specific menu items in the edit window.

Icon	Action	Comment
	New project	
	Delete project	This action cannot be undone!
	New strategy	
	Create new component	
	Save	
	Create copy in project	It works both with strategies and components
	Convert strategy to component	It removes elements that should not be part of a component and connects inputs and outputs

	Delete strategy	This action cannot be undone!
	Import projects or strategies	
	Export projects or strategies	
	Upload strategy to backtest	
	Upload and publish strategy	
	Instructions to publish strategy on iSystems	
	Undo	It undoes the changes made in the diagram of the strategy
	Redo	It redoes the changes made in the diagram of the strategy
	Delete	It deletes the selected item on the canvas

	Copy selected nodes to the system clipboard	It copies the selected items on the canvas
	Cut selected nodes to the system clipboard	It cuts the selected items on the canvas
	Paste selected nodes from the system clipboard	It pastes the previously copied or cut items
	Zoom	

Context menu



A context menu with the main editing actions appears by right-clicking on the editing canvas or the Projects area

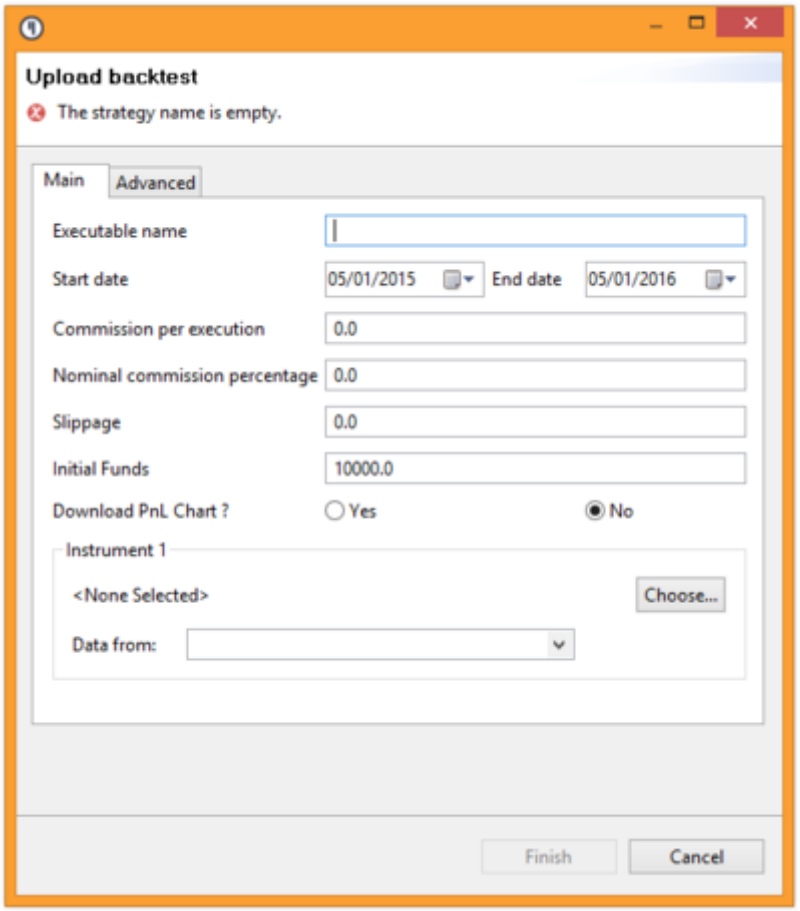
The following table shows the items displayed in the context menu.

Icon	Action	Comment
	Open	It displays or hides the list of strategies when a project is selected
	Rename	
	New project	
	New strategy	
	New component	
	Create copy in project	It works both with strategies and components
	Delete strategy or component	This action cannot be undone!
	Import projects or strategies	

	Export projects or strategies	
	Upload strategy to backtest	

Backtesting

By clicking the button  to upload a strategy to backtest, a window appears to enter the parameters for the backtest.



A message at the top of the window reminds users whether there is a required input field that has not been filled in yet.

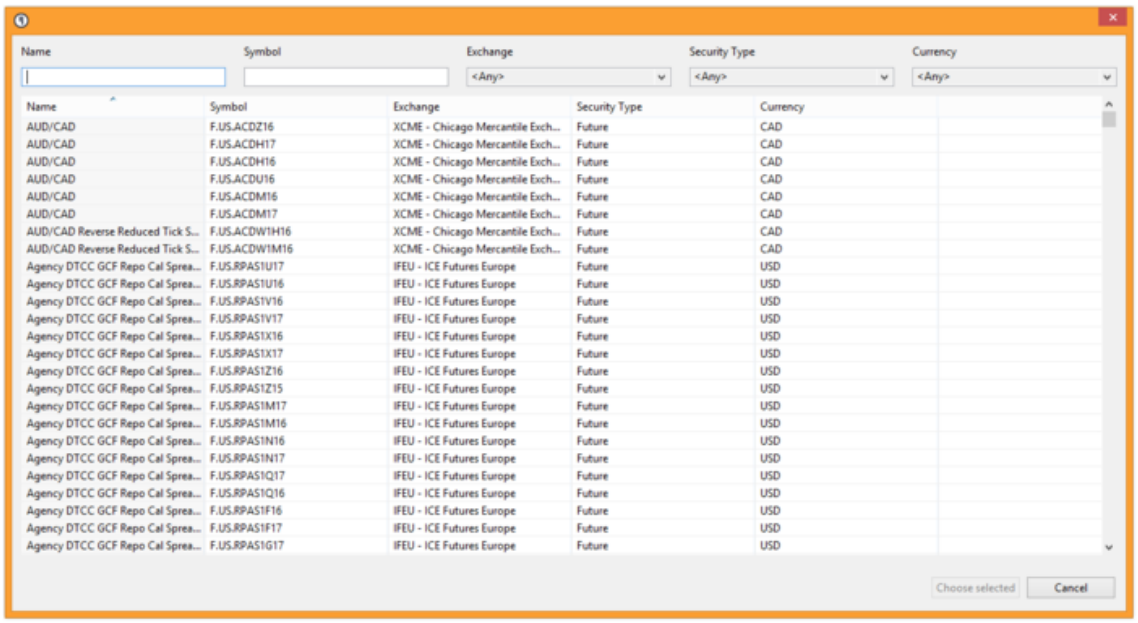
The form has two tabs: 'Main' and 'Advanced'.

In the 'Main' area, users must enter a name for the backtest in the field 'Executable name'. This name does not need to be the same as the name of the strategy, although this practise is highly recommended in order to check and compare its results.

Start and end dates may be entered directly or by clicking on  to select a date.

Users may enter commissions as a "Nominal commission percentage" or as a "Commission per execution", that is, a commission per filled order.

The list of available instruments may be accessed by clicking on the button 'Choose...'.



The fields that may be filled in to filter the search results are displayed at the top of the window. If several filters are combined, only instruments that met every condition will be shown. Once an instrument is selected, click 'Choose selected' to finish.

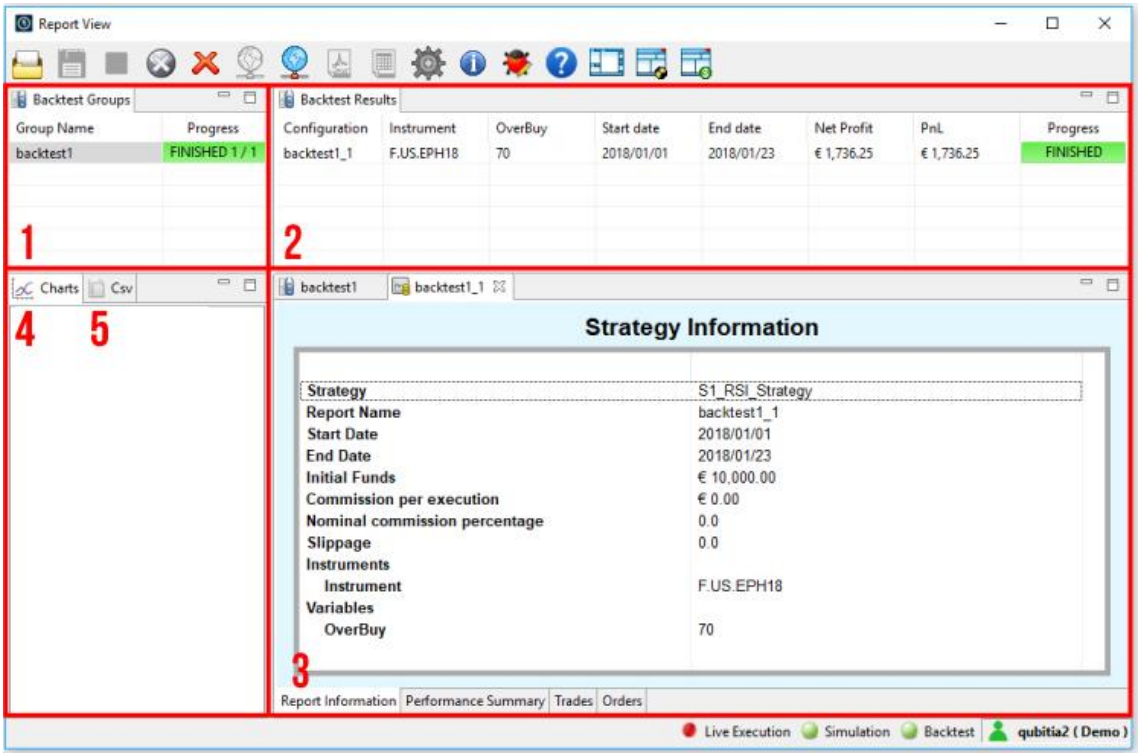
If the strategy contains variables, they will be displayed at the bottom. The 'Test range' option offers the possibility of evaluating a range of values for each variable. In this

case, users must enter the fields 'Start value', 'End value' and 'Step'. The latter parameter represents the increase in the value for each step of the test within that range.

By clicking the 'Advanced' tab, users can choose the currency for their backtest. Qcaid iSystems Edition uses the exchange rates published by the International Monetary Fund the previous day.

Backtest report view

Backtest reports are displayed in a specific window that enables users to analyze their results in detail and even compare them.



The Report View is divided into the following areas:

- The **Backtest Groups** area (*1*) shows the results of backtests whether they are executed or pending. A group of backtests may contain one result or more if a range of values for at least one variable is being tested. Click on a group of

backtests to display the list of backtests from that group. Double-click on a group of backtests which has finished its execution to display a comparison of the results of the group in the reports area.

- The **Backtest Results** area (*2*) displays the backtests included in the group as well as the value of variables with which each of them was executed. Double-click on a backtest report to open the results report in the report area.

- The **Report** area (*3*) displays both backtest reports and report group comparisons. This area allows users to keep multiple reports open simultaneously, which can be accessed by clicking on the tabs located at the top of the area. Every backtest report consists of four sections accessible by clicking on the tabs at the lower part of the area. In addition, backtest reports include performance graphs and CSV files that are displayed in other areas.

- The **Charts** area (*4*) contains the performance graphs of the selected report. The window that displays the selected chart appears just by double-clicking. The 'Equity Curve' chart shows the evolution of profit or loss. The 'Maximum DrawDown' chart displays the performance of the maximum drawdown considering the data from the 'Equity Curve'. If the option was selected at the moment of uploading the backtest, the 'P&L' chart will also be available. This graph shows the evolution of P&L for both open and closed operations. If the backtest includes commissions, it will show its results both with and without commissions. Zoom in on any area of the graph by clicking and dragging the pointer downwards and to the right. Zoom out by clicking and dragging the pointer in another direction.

- The **Csv** area (*5*) includes links to data collected by the CSV elements in the strategy. The number of displayed links is equal to the number of CSV elements. Double-click on the links to save the data as a CSV file on your computer.

The following table displays the specific menu items in the backtests report view:

Icon	Action	Comment
	Open report	
	Save report	
	Stop	
	Close	
	Delete	
	Export to PDF	A report of a specific backtest can be exported to PDF
	Export to CSV	Backtest results or a group of backtests can be exported to PDF

3. Model elements / language

Model elements are all the elements which may be used to design strategies. This section describes the model elements available in Qcaid iSystems Edition.

Qcaid iSystems Edition's model elements may contain name, parameters, input ports and output ports.

As shown in the figure, the **name** is usually at the top of the element. In indicators and variables the name may be edited.

Parameters can be set either by selecting an option in a drop-down list or by entering a numerical value. Numerical values can be integers or decimals.

Input ports are usually located in the upper part of the figure, but in some cases they are placed on the left side or on the main part of the figure.

Output ports are usually at the bottom of the figure, but they may also be placed on the right side.

There are five types of **input** and **output** data: instrument, number, logical type (true or false), date and time interval. Input and output ports must be of the same type to be linked. When an element has several input or output ports, they are labelled. Labels can be placed inside or outside the model element. In addition, a tooltip may appear when the pointer is placed over the port.

All the model elements grouped by their functionality are described in detail below.

Market information

The elements that allow users to select the market information that will be used in the strategy are grouped in the palette under the heading '**Instruments'**. This group includes the element that references market instruments and the elements to select the frequency of use of the information.

Qcaid iSystems Edition allows users to combine different asset classes and different types of data subscriptions in the same strategy.

Instrument

The Instrument element is used to represent any time series available in Qcaid iSystems Edition. When designing a strategy, no asset is specifically referenced. Assets are selected at the moment of uploading a strategy to backtest or execution.

This model element can represent either a market instrument for which orders may be entered or a time series on which no operation can be performed, such as a market index.

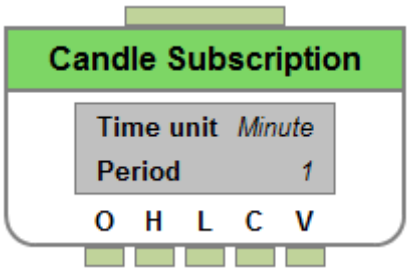
A strategy may include as many instruments as needed, but it must have at least one.

The output of the Instrument can be linked to the input of the subscription elements, which are described below, but it can also be used as a parameter in other elements.

Outputs

Name	Label	Type	Description
Instrument		Instrument	

Candle Subscription



The Candle Subscription element provides data from the components of a candle determined by the parameters set by the user. Minute, hour and day candles are available on Qcaid iSystems Edition.

Candles usually originate from trades. In cases when only BBA data (Best Bid & Best Ask) are available, candles are calculated by using the midpoint. If trading volume information is not available, the value of the corresponding output will be 0.

If there is no operation during the time period of the candle, no candle is generated and the strategy is not recalculated.

Period is the only numerical parameter that cannot be replaced by a variable.

Inputs

Name	Label	Type	Description
Instrument		Instrument	

Outputs

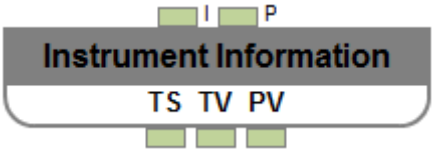
Name	Label	Type	Description
Open	O	Numerical	
High	H	Numerical	
Low	L	Numerical	
Close	C	Numerical	

Volume	V	Numerical	

Parameters

Name	Type	Description
Time unit	Drop-down list	Options: second / minute / hour / day / week / month / year
Period	Integer	

Instrument Information



The Instrument Information element provides the Tick Size, the Tick Value and the Point Value of the linked instrument:

- The Tick Size represents the minimum movement that can be experienced by the price of the trading instrument.
- The Tick Value is the cash value of the Tick Size. Like the Strategy Profit, the Tick Value is expressed in the base currency of the strategy, which is chosen at the moment of uploading the strategy to backtesting or execution.
- The Point Value represents the cash value of one full point increase in the price. The Point Value is the result of dividing the Tick Value by the Tick Size and it is expressed in the currency of the strategy.

In some markets, the Tick Size of an instrument varies according to the trading price. Therefore, an instrument may have different Tick Sizes for different price ranges.

The Instrument Information element has an optional input, Price (P), that sets the price that will be considered to determine the Tick Size regardless of the actual trading price of the instrument. If no input is connected, the last price is considered. The last price can be the last traded price or the midpoint between the last BBA.

Inputs

Name	Label	Type	Description
Instrument	I	Instrument	
Price	P	Price	(Optional) Sets the price that will be considered to determine the Tick Size regardless of the actual trading price of the instrument

Outputs

Name	Label	Type	Description
Tick Size	TS	Numerical	
Tick Value	TV	Numerical	Expressed in the currency of the strategy.
Point Value	PV	Numerical	Calculated by dividing the Tick Value by the Tick Size

Custom Component

Jump input / Jump output

The Jump Input and Jump Output elements are used together to 'jump' from one point of the strategy diagram to another without having to draw a connection line between them. These elements help keep the flowcharts of the strategies clear.

The **Jump Input** element can be linked to the output connection of any element. It is important to enter a descriptive name for each Jump Input, so that it can be easily selected on the Jump Output afterwards.

The **Jump Output** element will return the value coming from the Jump Input that was selected from a dropdown list of all the Jump Inputs in the strategy. Therefore, the data type must be considered when linking it to the next element in the diagram. The same Jump Input can be selected in more than one Jump Output.

Indicators and functions

Qcaid iSystems Edition's palette offers a wide array of technical indicators and functions under the headings 'Trend Indicators', 'Oscillator Indicators', 'Volume Indicators', 'Volatility Indicators', 'Momentum Indicators', 'Average Indicators' and 'Functions'.

The number of input ports of an indicator determines its characteristics. When indicators have two or more, input ports are labelled and can only be linked to Candle Subscription elements. Indicators with a single input port may be linked to any numeric output port. The Offset element is special, since it can be connected both to numerical and logical outputs (true or false).

Indicators may have one or more output ports. When there is more than one, output ports are labelled in order to identify them.

Every indicators includes, at least, the 'Offset' parameter and may also include other decimal, integer and drop-down parameters.

The indicators and functions available in each group are listed below. Some indicators are available in more than one group.

Trend indicators

ADX (Average Directional Movement Index)

The Average Directional Movement Index (ADX) quantifies a trend's strength regardless of whether it is up or down. It ranges from 0 to 100.

ADXR (Average Directional Movement Index Rating)

The Average Directional Movement Index Rating (ADXR) is a smoothed version of the ADX that measures its strength to detect momentum change. It ranges from 0 to 100

Aroon (Aroon)

The Aroon indicator is used to identify trends in an underlying security and the likelihood that the trends will reverse. The indicator has two outputs: D measures the strength of the downtrend and U measures the uptrend.

Aroon Osc (Aroon Oscillator)

The Aroon Oscillator measures the strength of a current trend and the likelihood that it will continue. Results above 0 indicate that an uptrend is present, while results below 0 point to a downtrend.

Avg Price (Average Price)

The Average Price calculates the average between open, close, high and low.

DEMA (Double Exponential Moving Average)

The Double Exponential Moving Average (DEMA), more responsive to market changes than a traditional moving average, is calculated based on both a single exponential moving average (EMA) and a double EMA.

DX (Directional Movement Index)

The Directional Movement Index (DMI or DX) is used to identify when a definable trend is present regardless of its direction. It ranges from 0 to 100.

EMA (Exponential Moving Average)

The Exponential Moving Average (EMA), also known as the Exponentially Weighted Moving Average, gives more weight to the latest data than a simple moving average. Therefore, it reacts faster to recent price changes than the Simple Moving Average.

Heikin Ashi (Heikin Ashi)

The Heikin Ashi candlestick is a weighted version of a candlestick that can be used as an indicator. The Heikin Ashi candlestick reduces market noise and concentrates on the smoother trend of the underlying price action. It is used to identify trending periods, potential reversal points and classic technical analysis patterns

KAMA (Kaufman's Adaptive Moving Average)

Kaufman's Adaptive Moving Average (KAMA) is a trend-following indicator designed to account for market noise or volatility. It is used to identify the overall trend and the time turning points, in addition to filtering price movements.

Linear Reg (Linear Regression)

The Linear Regression indicator is used to determine trend direction by drawing a straight line that best fits the prices between a starting price point and an ending price point.

Linear Reg Angle (Linear Regression Angle)

The Linear Regression Angle is a directional movement indicator which defines a trend at the moment of its birth, calculating the angle of the linear regression channel and, additionally, defining trend weakening.

Linear Reg Intercept (Linear Regression Intercept)

The Linear Regression Intercept gives the value at which the linear regression line crosses the first bar of a time series.

Linear Reg Slope (Linear Regression Slope)

The Linear Regression Slope measures the rise-over-run of a linear regression, which is the line of best fit for a price series. Fluctuating above and below zero, it can measure the direction and strength of a trend.

MACD (Moving Average Convergence/Divergence)

The Moving Average Convergence Divergence (MACD) is a trend-following momentum indicator that shows the relationship between two exponential moving averages of prices. This indicator has three outputs: the MACD (M), which is calculated by subtracting the slow-period EMA from the fast-period EMA, the Signal (S), which is the signal-period EMA of the MACD, and the Histogram (H), which is the difference between the MACD and the Signal.

MACD Ext (Extended MACD)

The Moving Average Convergence/Divergence Extended (MACD Ext) returns the difference between two different-period moving averages. The first moving average (MA) is more responsive to short-term price movements, whereas the second one is a longer medium-term average. The user must select the types of MA: SMA, EMA, WMA, DEMA, TEMA, TRIMA, KAMA, MAMA or T3. This indicator has three outputs: the MACD (M), which is calculated by subtracting the slow-period MA from the fast-period MA, the Signal (S), which is the signal-period MA of the MACD, and the Histogram (H), which is the difference between the MACD and the Signal

MAMA (Mesa Adaptive Moving Average)

The MESA Adaptive Moving Average (MAMA) is a trend-following indicator that adapts to price movement based on the rate change of phase as measured by the Hilbert Transform Discriminator.

Med Price (Median Price)

The Median Price returns the midpoint of the trading range for the day.

Midpoint (Midpoint value over period)

The Midpoint returns the mid-point of highest and lowest values achieved during the given period.

Minus DI (Minus Directional Index)

The Minus Directional Index (Minus DI) is an indicator that defines the trend of a price. It is usually used in combination with the ADX.

Minus DM (Minus Directional Movement)

The Minus Directional Movement (Minus DM) equals the prior low minus the current low, provided it is positive.

MMA (Modified Moving Average)

The Modified Moving Average (MMA) is an average more responsive to price movements. Whereas the first point is calculated the same way as in a simple moving average, subsequent points are calculated by first adding the new price and then subtracting the last average from the resulting sum.

NATR (Normalized Average True Range)

The Normalized Average True Range normalizes the average true range values.

SAR (Parabolic SAR)

The parabolic SAR is used to determine the direction of an instrument's momentum and the point in time when this momentum has a higher-than-normal probability of switching directions.

SMA (Simple Moving Average)

The simple moving average (SMA) is an arithmetic moving average calculated by adding the input for a number of periods and then dividing this total by the number of periods.

STD Dev (Standard Deviation)

The Standard Deviation (STD Dev) measures the dispersion of a set of data from its mean: the further from the mean, the higher it is within the data set.

T3 (T3 Triple Exponential Moving Average)

The T3 Triple Exponential Moving Average is a triple smoothed combination of the DEMA and a EMA.

TEMA (Triple Exponential Moving Average)

The Triple Exponential Moving Average (TEMA) is a combination of a single exponential moving average, a double exponential moving average and a triple exponential moving average. It is usually used for smoothing price fluctuations and filtering out volatility.

True Range (True Range)

The True Range indicator is the range of a candle plus the gap with the previous close if necessary. The value is obtained by taking the highest absolute value among the following calculations: current high less the current low, the absolute value of the current high less the previous close, and the absolute value of the current low less the previous close.

TRIMA (Triangular Moving Average)

The Triangular Moving Average (TRIMA) is a double-smoothed simple moving average that gives more weight to the middle section of the data interval.

TSF (Time Series Forecast)

The Time Series Forecast indicator uses linear regression to predict price movements in the future.

Ty Price (Typical Price)

The Typical Price returns the arithmetic average of the high, low and closing prices.

WCL Price (Weighted Close Price)

The Weighted Close Price returns the average value of candle prices by giving more weight to the close price.

WMA (Weighted Moving Average)

The Weighted Moving Average (WMA) is a type of moving average that assigns a higher weighting to recent price data than does the common simple moving average.

Oscilator indicators.

APO (Absolute Price Oscillator)

The Absolute Price Oscillator displays the difference between two moving averages of different lengths expressed as an absolute value. The user must select the type of MA: SMA, EMA, WMA, DEMA, TEMA, TRIMA, KAMA, MAMA or T3.

ATR (Average True Range)

The Average True Range (ATR), a measure of volatility, is a moving average of the True Ranges.

MOM (Momentum)

The Momentum (MOM) indicator measures the strength and speed of the trend. Positive values show that the current price is higher than the price n-periods back. The higher the value, the stronger and faster the trend.

PPO (Percentage Price Oscillator)

The Percentage Price Oscillator (PPO) is a technical momentum indicator that shows the relationship between two moving averages. It returns a percentage that tells where the short-term average is relative to the longer-term average. The user must select the type of MA: SMA, EMA, WMA, DEMA, TEMA, TRIMA, KAMA, MAMA or T3.

RSI (Relative Strength Index)

The Relative Strength Index (RSI) is a momentum indicator that compares the magnitude of recent gains and losses over a specified time period, providing a relative evaluation of the strength of the instrument's recent price performance.

Stoch (Stochastic Oscillator)

The Stochastic Oscillator (Stoch) is a momentum indicator that compares the closing price of a security to the range of its prices over a certain period of time.

Stoch RSI (Stochastic Relative Strength Index)

The Stochastic Relative Strength Index (Stoch RSI), calculated by applying the Stochastic Oscillator formula to a set of Relative Strength Index (RSI) values rather than standard price data, is used to detect whether the current RSI value is overbought or oversold. It ranges from 0 to 1.

TEMA (Triple Exponential Moving Average)

The Triple Exponential Moving Average (TEMA) is a combination of a single exponential moving average, a double exponential moving average and a triple exponential moving average. It is usually used for smoothing price fluctuations and filtering out volatility.

Ult Osc (Ultimate Oscillator)

The Ultimate Oscillator (Ult Osc) uses the weighted average of three different time periods to reduce the volatility and false transaction signals that are associated with many other indicators that mainly rely on a single time period. It ranges from 0 to 100.

Will R (Williams %R Ratio)

Williams %R is a momentum indicator that measures overbought and oversold levels and is used to establish entry and exit points in the market. It compares the close of a stock to the high-low range over a period of time.

Volume indicators

MFI (Money Flow Index)

The Money Flow Index (MFI) is a momentum indicator that measures the inflow and outflow of money into an instrument over a specific period of time.

OBV (On Balance Volume)

On Balance volume (OBV) is a momentum indicator that uses volume flow to predict changes in price.

Volatility Indicators

ATR (Average True Range)

The Average True Range (ATR), a measure of volatility, is a moving average of the True Ranges.

Bollinger Bands (Bollinger Bands)

The Bollinger Bands are two volatility bands placed above and below a moving average. Volatility is based on the standard deviation, which changes as volatility increases and decreases.

Momentum indicators

CMO (Chande Momentum Oscillator)

The Chande Momentum Oscillator (CMO) is a momentum indicator created by calculating the difference between the sum of all recent gains and the sum of all recent losses and then dividing the result by the sum of all price movement over the period. It ranges from -100 to +100.

MOM (Momentum)

The Momentum (MOM) indicator measures the strength and speed of the trend. Positive values show that the current price is higher than the price n-periods back. The higher the value, the stronger and faster the trend.

ROC (Rate of Change)

The Rate of Change (ROC) is an indicator that measures strength of price momentum by the rate of change.

ROCP (Rate of Change Percentage)

The Rate of Change (ROCP) is a momentum indicator that measures the percentage change in price between the current price and the price n periods back.

ROCR (Rate of Change Ratio)

The Rate of Change Ratio (ROCR) is the speed at which a variable changes over a specific period of time expressed as a ratio between a change in one variable relative to a corresponding change in another.

ROCR 100 (Rate of Change Ratio in 100-Scale)

The Rate of Change Ratio in 100-Scale (ROCR 100) returns the Rate of Change Ratio (ROCR) expressed in a 100-scale.

RSI (Relative Strength Index)

The Relative Strength Index (RSI) is a momentum indicator that compares the magnitude of recent gains and losses over a specified time period, providing a relative evaluation of the strength of the instrument's recent price performance.

Stoch (Stochastic Oscillator)

The Stochastic Oscillator (Stoch) is a momentum indicator that compares the closing price of a security to the range of its prices over a certain period of time.

Stoch RSI (Stochastic Relative Strength Index)

The Stochastic Relative Strength Index (Stoch RSI), calculated by applying the Stochastic Oscillator formula to a set of Relative Strength Index (RSI) values rather than standard price data, is used to detect whether the current RSI value is overbought or oversold. It ranges from 0 to 1.

Average Indicators

DEMA (Double Exponential Moving Average)

The Double Exponential Moving Average (DEMA), more responsive to market changes than a traditional moving average, is calculated based on both a single exponential moving average (EMA) and a double EMA.

EMA (Exponential Moving Average)

The Exponential Moving Average (EMA), also known as the Exponentially Weighted Moving Average, gives more weight to the latest data than a simple moving average. Therefore, it reacts faster to recent price changes than the Simple Moving Average.

KAMA (Kaufman's Adaptive Moving Average)

Kaufman's Adaptive Moving Average (KAMA) is a trend-following indicator designed to account for market noise or volatility. It is used to identify the overall trend and the time turning points, in addition to filtering price movements.

MAMA (Mesa Adaptive Moving Average)

The MESA Adaptive Moving Average (MAMA) is a trend-following indicator that adapts to price movement based on the rate change of phase as measured by the Hilbert Transform Discriminator.

MMA (Modified Moving Average)

The Modified Moving Average (MMA) is an average more responsive to price movements. Whereas the first point is calculated the same way as in a simple moving average, subsequent points are calculated by first adding the new price and then subtracting the last average from the resulting sum.

SMA (Simple Moving Average)

The simple moving average (SMA) is an arithmetic moving average calculated by adding the input for a number of periods and then dividing this total by the number of periods.

T3 (T3 Triple Exponential Moving Average)

The T3 Triple Exponential Moving Average is a triple smoothed combination of the DEMA and a EMA.

TEMA (Triple Exponential Moving Average)

The Triple Exponential Moving Average (TEMA) is a combination of a single exponential moving average, a double exponential moving average and a triple exponential moving average. It is usually used for smoothing price fluctuations and filtering out volatility.

TRIMA (Triangular Moving Average)

The Triangular Moving Average (TRIMA) is a double-smoothed simple moving average that gives more weight to the middle section of the data interval.

WMA (Weighted Moving Average)

The Weighted Moving Average (WMA) is a type of moving average that assigns a higher weighting to recent price data than the common simple moving average.

Functions

Max (Highest Value Over Period)

The Max function returns the maximum value over the last n-period.

Max Index (Index of Highest Value Over Period)

The Max Index function returns the number of values back where there is the maximum value over the last n-period. If the current value is the maximum value over the last n-period, the Max Index equals 0.

Min (Minimum Value Over Period

The Min function returns the minimum value over the last n-period.

Min Index (Index of Lowest Value Over Period)

The Min Index function returns the number of values back where there is the minimum value over the last n-period. If the current value is the minimum value over the last n-period, the Min Index equals 0.

Min Max (Minimum and Maximum Values Over Period)

The Min Max function returns the minimum and maximum values over the last n-period.

Min Max Index (Indexes of Minimum and Maximum Values Over Period)

The Min Max Index function returns the number of values back where there are the minimum and maximum values over the last n-period. If the current value is the minimum/maximum value over the last n-period, the corresponding index equals 0.

Min Max Reset (Minimum and Maximum Values Over Period With Reset)

The Min Max Reset function returns the minimum and maximum values since the last reset. This function can be reset whenever a condition is fulfilled. If the condition linked to the reset input is met, both outputs will be equal to the input value.

Norm (Normalization)

The Norm function normalizes the value between 0 and 100 related to the data of the last n-period. If the value is the minimum in the last n-period, the result will be 0. If the value is the maximum in the last n-period, the result will be 100.

Absolute Value (Absolute Value)

The Absolute Value function returns the non-negative value of its input without regard to its sign (+ or -).

Exp (Exponential)

The Exp function returns the Euler's number *e* raised to the power of the input value. If the argument is positive infinity, then the result is positive infinity. If the argument is negative infinity, then the result is positive zero.

Factorial (Factorial)

The Factorial function returns the product of all positive integers less than or equal to the input value.

Logarithm (Logarithm)

The Logarithm function returns the logarithm of the value to the base specified by the user (the default base is 10).

Module (Module)

The Module function returns the remainder after dividing one number by another.

Natural Logarithm (Natural Logarithm)

The Natural Logarithm function returns the logarithm of the value to the base of the mathematical constant *e*.

Random (Random Number)

The Random function returns a random number that is equal to or higher than 0 and lower than the limit specified by the user.

Root (Root)

The Root function returns the root of the value. The degree of the root can be set by the user.

Round (Round)

The Round function rounds the number by setting a threshold (the minimum rounding increase) and following a rounding behaviour:

- Ceiling. Rounding mode towards positive infinity.
- Down. Rounding towards zero.
- Floor. Rounding towards negative infinity.
- Up. Rounding away from zero.
- Half down. Rounding mode to round towards "nearest neighbor" unless both neighbors are equidistant, in which case round down.

- Half even. Rounding mode towards the "nearest neighbor" unless both neighbors are equidistant, in which case, rounding towards the even neighbor.
- Half up. Rounding towards "nearest neighbor" unless both neighbors are equidistant, in which case rounding up.

Offset (Offset)

The Offset function returns the value of the linked indicator from *n* periods back.

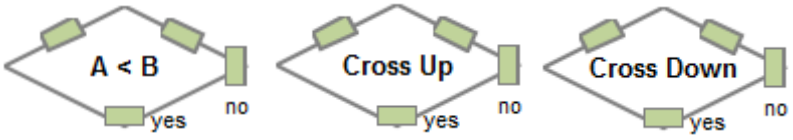
Logical rules

The 'Binary Operators' group includes several comparison operators which can be used to create logical rules, whereas elements in the 'Logical Operators' group allow users to combine those rules.

Binary Operators

Binary operators compare two numerical or duration inputs and offer a logical value as a result of the comparison. The result is provided in the output port with the label 'yes', whereas the output port with the label 'no' provides the complementary value. This complementary value is the equivalent of linking a negation operator to the output port with the label 'yes'.

Binary operators can be divided into two types: conventional comparison operators (<, <=, =, >= y >) and cross operators, both upwards ('Upward Crossover') and downwards ('Downward Crossover').



In addition, comparators may be used with dates and times, in such a way that the earlier date or time is considered 'lower' than the later date or time. For example, the value 10:30:00 is lower than the value 11:00:00, and all time values are equal to or higher than 00:00:00.

Cross operators work differently, because they also check the values that were compared by the operator in the previous calculation of the strategy. These operators send out a signal when they detect a crossing in the values from both inputs, that is, when one value is now higher than the other one. For example, the upward cross operator will send out a signal only when two conditions are met: the left input value was lower than the right one in the previous calculation of the strategy, but it is higher now. If the values from the two input ports are equal, the previous calculation is checked.

Inputs

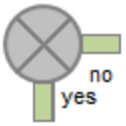
Name	Label	Type	Description
Left		Numerical, interval, date	Cross elements cannot be connected to date inputs
Right		Numerical, interval, date	Cross elements cannot be connected to date inputs

Outputs

Name	Label	Type	Description
yes	yes	Logical	
no	no	Logical	

Logical Operators

Logical operators have a round shape with two output ports. They do not have a discernible input port because the entire figure acts as an input port. Output ports work in the same way as in binary operators. The port labelled as 'yes' provides the result of the operation and the port labelled as 'no' offers the complementary result.



The **AND** element requires at least two logical inputs, but users may connect as many as they wish. The result will be positive only if all entries are positive.

Inputs

Name	Label	Type	Comment
Input		Logical	At least two inputs are required

Outputs

Name	Label	Type	Description
yes	yes	Logical	
no	no	Logical	

The **OR** element requires at least two logical inputs, but users may connect as many as they wish. The result will be positive only if at least one of the entries is positive.

Inputs

Name	Label	Type	Comment
Input		Logical	At least two inputs are required

Outputs

Name	Label	Type	Comment
yes	yes	Logical	
no	no	Logical	

The **XOR** (exclusive or) element requires two logical inputs. The result will be positive only if one of the inputs is positive and the other one is negative.

Inputs

Name	Label	Type	Comment
Input		Logical	At least two inputs are required

Outputs

Name	Label	Type
yes	yes	Logical
no	no	Logical

The **NOT** element requires only one input and has only one output port. The result of the output is always the opposite of the input value.

Inputs

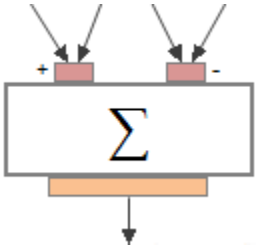
Name	Label	Type	Comment
Input		Logical	Only one input is required

Outputs

Name	Label	Type	Comment
no	no	Logical	Opposite of the input value

Arithmetic operations

Elements in this group are used for basic operations such as addition, subtraction, multiplication and division. Every element has two input ports that may be linked to as many elements as wished.



The **Summator** element enables addition and subtraction operations, depending on the input port used.

For example, if the elements A and B are linked to the input port labelled with the plus sign (+) and the elements C and D are linked to the input port labelled with the minus sign (-), the result will be R = A + B - C - D. If only one input is connected to the minus sign (-), the output will be the opposite of the input (R = -A).

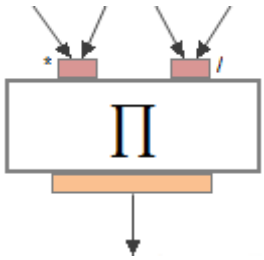
Inputs

Name	Label	Type	Comment

Add	+	Numerical	Any number of inputs
Subtract	–	Numerical	Any number of inputs

Outputs

Name	Label	Type	Comment
output		Numerical	



The **Product** element enables multiplication and division operations.

For example, if the elements A and B are linked to the input port labelled with the multiplication sign and the elements C and D are linked to the input port labelled with the division sign, the result will be R = (A * B) / (C * D), or, in an equivalent way, R = A * B / C / D. If there is only one input linked to the division port, the result will be the opposite of the input (R = 1/A).

Inputs

Name	Label	Type	Comment

Multiply	*	Numerical	Any number of inputs
Divide	/	Numerical	Any number of inputs

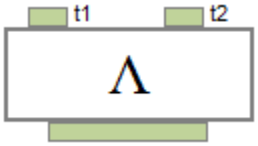
Outputs

Name	Label	Type	Comment
output		Numerical	

Date & time

The Date & time group contains elements to perform operations with dates and time intervals.

Delta Time



The Delta Time element calculates the time interval between two dates. Time interval is always a positive value, regardless of the order in which inputs are connected. It should be noted that dates may contain date and time or only time.

Inputs

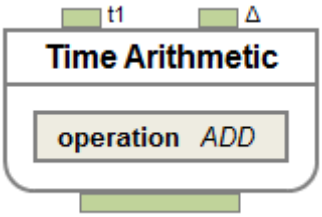
Name	Label	Type	Comment
Time1	t1	Date & time	This input may include date and time or only time

Time2	t2	Date & time	This input may include date and time or only time

Output

Name	Label	Type	Comment
output		Interval	Expressed in milliseconds (ms)

Time Arithmetic



The Time Arithmetic element makes it possible to add a time interval to a date. Therefore, the result will be a new date. In this element, the date must be linked to the first port (t1) and the time interval must be linked to the second one (Δ).

Inputs

Name	Label	Type	Comment
Time	t1	Date & time	
Interval	Δ	Interval	

Output

Name	Label	Type	Comment
output		Date & time	

Current Time

The Current Time element provides date and time of the event being processed with each recalculation of the strategy. The application automatically manages time zone, for example, when making a comparison between Current Time and a Time Value element.

Outputs

Name	Label	Type	Comment
Time		Date & time	Date and time updated at every recalculation of the strategy

Day of Week

This element allows users to check the current day of the week. It will return 'true' or 'false' after verifying that the current day of the week is the same as the one that has been chosen.

If the strategy has more than one instrument, users will have to choose one of them from a drop-down list to set the time zone of the instrument as the time zone of the element.

Parameters

Name	Type	Description
Day of week is	Drop-down list	Options: Monday / Tuesday / Wednesday / Thursday / Friday / Saturday / Sunday
Time Zone	Drop-down list	One of the instruments used in the strategy can be selected

Output

Name	Label	Type	Description
output		Logical	

Day of Month

This element allows users to check the current day of the month. It will return 'true' or 'false' after verifying that the current day of the month is the same as the one that has been entered.

If the strategy has more than one instrument, users will have to choose one of them from a drop-down list to set the time zone of the instrument as the time zone of the element.

Parameters

Name	Type	Description
Day of month is	Integer value	
Time Zone	Drop-down list	One of the instruments used in the strategy can be selected

Output

Name	Label	Type	Description
output		Logical	

Month

This element allows users to check the current month. It will return 'true' or 'false' after verifying that the current month is the same as the one that has been chosen.

If the strategy has more than one instrument, users will have to choose one of them from a drop-down list to set the time zone of the instrument as the time zone of the element.

Parameters

Name	Type	Description
Month is	Drop-down list	Options: January / February / March / April / May / June / July / August / September / October / November / December
Time Zone	Drop-down list	One of the instruments used in the strategy can be selected

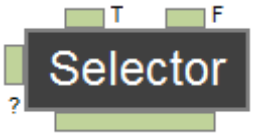
Output

Name	Label	Type	Description
output		Logical	

Data Flow

The Data Flow group includes elements that enable users to control the information that is processed along the strategy's flow chart.

Selector



The Selector is designed to choose between two inputs by checking a control signal (?) that acts as a logical condition. If the condition is true, the output will be the same as the left input (T). If the condition is false, the output will be the same as the right input

(F). The Selector may be viewed as an if-then-else condition: **if** the condition is met, **then** the first input is chosen. **Else**, the second input is chosen.

With the exception of the control input, this element accepts any type of input or output, but they must be of the same type. When an input or output is linked, the application detects its type of data and the other ports automatically require that same type.

Inputs

Name	Label	Type	Comment
Control	?	Logical	
True	T	Any type	It must be of the same type as the False input
False	F	Any type	It must be of the same type as the True input

Outputs

Name	Label	Type	Comment
output		Any type	It must be of the same type as the inputs

Memory

The Memory element enables users to store a certain value whenever a condition is met. The result of the condition is linked to the control input (?), located on the left side of the element. If the condition from the control input is met, the input value will be stored and it will become the new output value. If the condition from the control input is not met, the output will contain the value that was stored the last time the control condition was met.

The input and the output values can be of any type, but both of them must be of the same type. Once one of them is connected, the application requires the other one to be linked to a compatible element.

Inputs

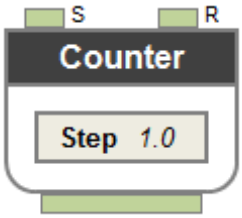
Name	Label	Type	Comment
Control	?	Logical	
Input	T	Any type	

Outputs

Name	Label	Type	Comment

output		Any type	It must be of the same type as the input

Counter



The Counter counts the number of times that the condition linked to the input port (S) is met. In addition, it has a reset input (R) that allows users to restart the counter whenever the reset condition is met.

The 'Step' parameter determines the increase in the counter whenever the signal input condition is met. If the reset condition is met, the output value will be 0.

Inputs

Name	Label	Type	Comment
Signal	S	Logical	
Reset	R	Logical	

Outputs

Name	Label	Type	Comment

output		Numerical	

Filter

The Filter is used to link two elements only if a condition is met. Therefore, the output port will return the value from the input port only if the condition linked to the control input on the left side is met. If the condition is met, output and input will share the same value. Otherwise, the output will return a null result and the elements connected to the output port will not be processed.

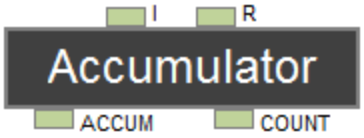
Inputs

Name	Label	Type	Comment
Control	?	Logical	
Input	T	Any type	

Outputs

Name	Label	Type	Comment
output		Any type	It must be of the same type as the input

Accumulator



The Accumulator adds the value linked to the input port (I) each time the element is processed.

This element has two output ports: one returns the accumulated value (ACCUM) and the other one returns the number of values that have been accumulated (COUNT). In addition, it has a reset input (R). If the condition linked to the reset input is met, the outputs will be reset: the accumulated value will be equal to the input value and the counter will return 1.

Inputs

Name	Label	Type	Comment
Value	I	Numerical	
Reset	R	Logical	

Outputs

Name	Label	Type	Comment
Accumulated	ACCUM	Numerical	

Counts	COUNT	Numerical	

Static Values

Elements from this group may be used to add fixed values of any data type to the strategy. The numerical type must be either an integer or a decimal.

Integer Value

The Integer Value element, which requires an integer value, is useful in parameters that expect this numerical type, such as the quantity in an order.

This element has only one parameter. Like in other elements, double-click on the parameter to edit it, or select and edit it in the 'Properties' area. Since a variable cannot be entered as a parameter, the use of a variable instead of a Static Value should be considered.

Outputs

Name	Label	Type	Comment
Value		Numerical	

Parameter

Name	Type	Description

Value	Integer	

Decimal Value

The Decimal Value element allows users to enter a numerical value that may be decimal.

This element has only one parameter. Like in other elements, double-click on the parameter to edit it, or select and edit it in the 'Properties' area. Since a variable cannot be entered as a parameter, the use of a variable instead of a Static Value should be considered.

Outputs

Name	Label	Type	Comment
Value		Numerical	

Parameters

Name	Type	Description
Value	Decimal	

Boolean Value

The Boolean Value element allows users to include a logical value in their strategies.

This element has only one parameter. Like in other elements, double-click on the parameter to edit it, or select and edit it in the 'Properties' area. Since a variable cannot be entered as a parameter, the use of a variable instead of a Static Value should be considered.

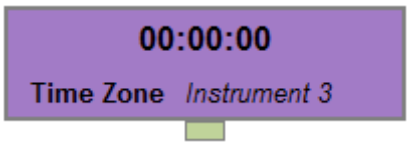
Outputs

Name	Label	Type	Comment
Value		Logical	

Parameters

Name	Type	Description
Value	Logical	

Time Value



The Time Value element allows users to enter a certain time of the day.

This element has two parameters: time and time zone. As shown in the value by default, the first parameter must be specified with hour, minutes and seconds in a 24-hour format using the colon (:) as separator. Only values strictly lower than 24 hours can be entered. In the second parameter, one of the instruments included in the strategy must be selected to set its time zone as the time zone of the Time Value. The instrument is chosen when the strategy is uploaded to backtest or execution. The application automatically carries out calculations taking into account the time zone on each date.

Outputs

Name	Label	Type	Comment
Value		Numerical	

Parameter

Name	Type	Description
Value	Integer	

Duration Value

The Duration Value element calculates a time interval by adding different time units (weeks, days, hours, etc.). There is a parameter for each time unit and its values may be entered by using variables.

Outputs

Name	Label	Type	Comment
Value		Interval	Expressed in milliseconds (ms)

Parameters

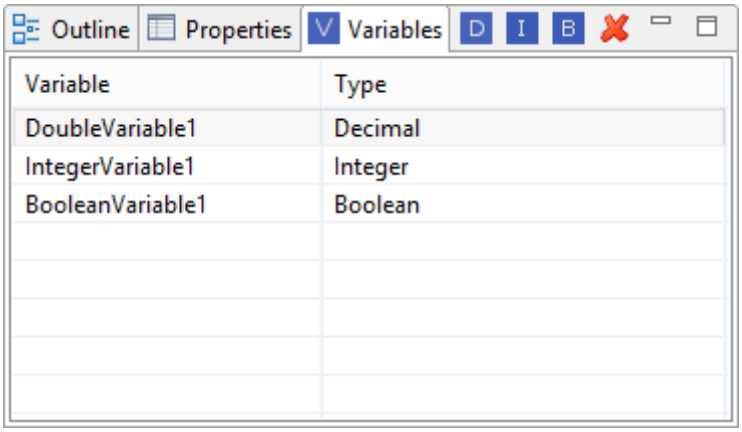
Name	Type	Description
Years	Integer	
Months	Integer	
Weeks	Integer	
Days	Integer	
Hours	Integer	
Minutes	Integer	

Seconds	Integer	
Milliseconds	Integer	

Variables

Variables store integers, decimals or logical values (true/false). Unlike static values, the value is assigned at the moment that the strategy is uploaded to backtest, simulation or execution instead of the moment that the strategy is designed.

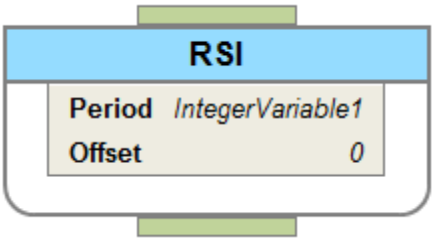
When a strategy is uploaded to backtest, variables can be assigned a range of values to find the most suitable ones.



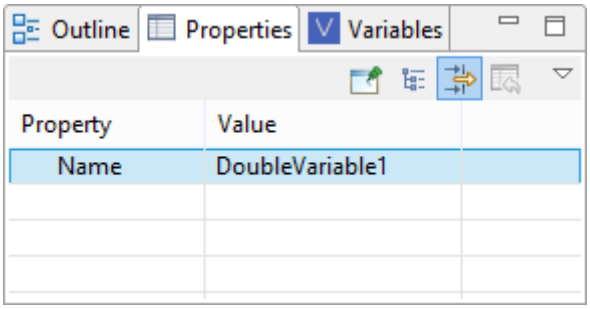
Variables are created in the variables area by clicking on one of the buttons 

. Once created, they can be used in two different ways in the strategy model:

- As a parameter in a model element. In parameters that require integers or decimal values, a variable of the appropriate type may be used instead of a fixed value. A variable can be used as a parameter in more than one model element.



- As a model element in itself, that is, as a graphic element with an output port, just like a fixed value. Variables used as model elements can connect its output port to the input port of as many items as wished, but there can only be one model element for each variable.



This element has only one parameter. Like in other elements, double-click on the parameter to edit it, or select and edit it in the 'Properties' area.

Output

Name	Label	Type	Comment
Value		*	The type of the variable determines the type of output data

Parameters

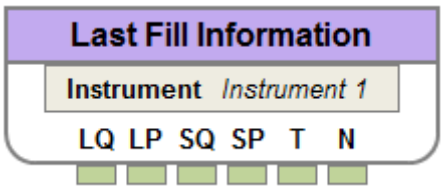
Name	Type	Description

Name	Text	

Position management

Elements in the **Position** group allow users to know and control the market position of their strategies.

Last Fill Information



With each recalculation of the strategy, the Last Fill Information element provides information about filled orders for the instrument selected as a parameter.

If there is a recalculation of the strategy and an order has completely or partially filled since the previous recalculation, this element will display the total quantity (LQ/SQ) achieved since that recalculation. It also shows the trading price (LP/SP). If there have been several filled orders, the price shown will be the weighted average price. The Time (T) output stores date and time from the last filled order. The New Fill (N) output will store a true value to indicate that the order has filled since the last calculation. If the order has not filled, outputs retain the values from the previous filled order, except for the New Fill output, which will have a false value to indicate that the values come from previous filled orders.

Outputs

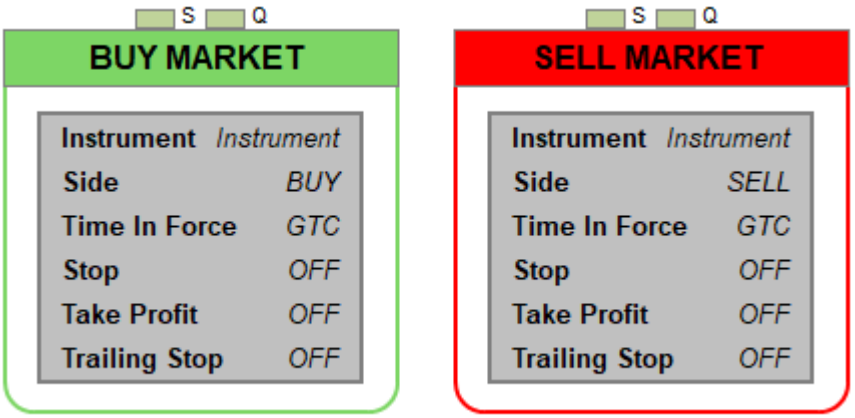
Name	**Label**	**Type**	**Comment**
Long Quantity	LQ	Numerical	

Long Average Price	LP	Numerical	
Short Quantity	SQ	Numerical	
Short Average Price	SP	Numerical	
Time	T	Date & time	Date and time from the last filled order
New Fill	N	Logical	Options: true / false

Parameter

Name	**Type**	**Description**
Instrument	Drop-down list	One of the instruments used in the strategy may be selected

Market Order



Market Order allows users to execute market orders (**Buy Market/Sell Market**) with associated/subordinate **Stop** and **Take Profit** orders.

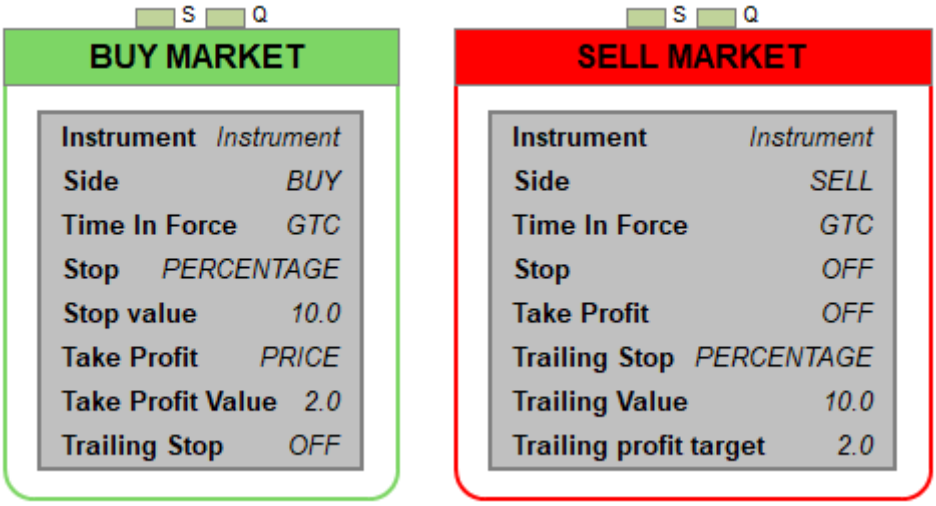
With each recalculation of the strategy, if the input condition (S) is met, a market order with the size set in the quantity input (Q) is sent out.

The Time in Force of the order can be selected to determine how long an order will remain active:

- Good 'til canceled (GTC). This type of order remains active until it is either canceled by the user or the trade is executed.

- Day (DAY). A day order expires if it is not executed on the day the order was placed.

Subordinate orders are automatically sent out when a complete or partial fill is achieved. If the trade comes back partially filled, the corresponding part of the Stop and Take Profit orders will be sent out.



There are two types of Stop orders: fixed and trailing. Both types cannot be active at the same time.

To enable subordinate orders, a margin must be set, either as a price or as a percentage. If the price option is selected, the value must be in the same units as the price reported

by the market. If the percentage option is selected, the value will represent the variation between the current price and the initial execution price.

In **Trailing Stop** orders, values are used differently. The **Trailing Profit Target** value represents the increase in the price (compared with the execution price) required to activate the trailing order. This value is always expressed in price units. In the trailing method, users can choose between price and percentage:

- When using price, the **Trailing Value** represents the maximum decrease in the price (compared with the price reached) that is allowed after the Trailing Stop has been activated.

- When using percentage, the **Trailing Value** represents the maximum decrease in the profit (compared with the highest profit value) that is allowed after the Trailing Stop has been activated. In this case, the value is a percentage of the profit, not of the price. The profit is the difference between the reached price and the initial execution price.

The trailing orders stop is executed by sending an order into the market when the Trailing Value is reached.

Inputs

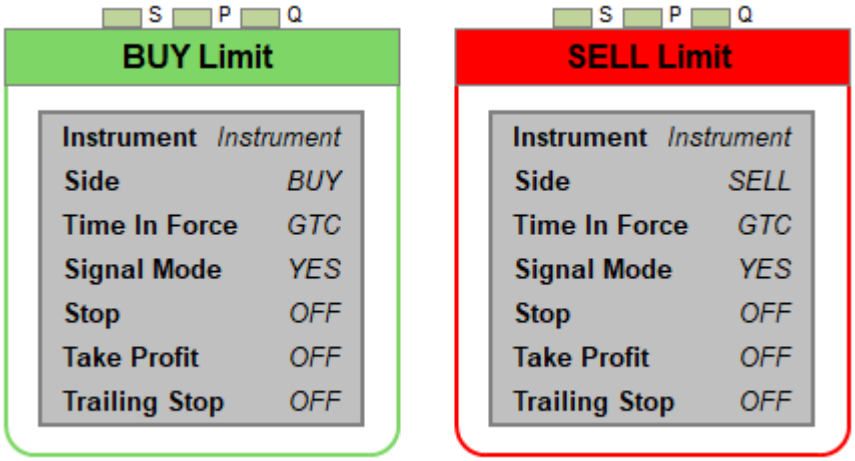
Name	Label	Type	Comment
Signal	S	Logical	Order execution signal
Quantity	Q	Numerical	Order size

Parameters

Name	Type	Description
Instrument	Drop-down list	Instruments used in the strategy may be selected
Side	Drop-down list	Options: BUY / SELL
Time in force	Drop-down list	Options: GTC / DAY
Stop	Drop-down list	Options: OFF / PRICE / PERCENTAGE
Stop Value	Numerical	Price in the same unit as the price reported by the market, or percentage change between the current price and the initial execution price
Take Profit	Drop-down list	Options: OFF / PRICE / PERCENTAGE
Take Profit Value	Numerical	Options: price in the same unit as the price reported by the market, or percentage change between the current price and the initial execution price
Trailing Stop	Drop-down list	Options: OFF / PRICE / PERCENTAGE

Trailing Value	Numerical	Options: maximum decrease in the price compared with the price reached (units), or maximum decrease in the profit compared with the highest profit value (percentage)
Trailing Profit Target	Numerical	Increase in the price compared with the execution price (units)

Limit Order



Limit Order enables users to execute limit orders (**Buy Limit/Sell Limit**) with associated/subordinate **Stop** and **Take Profit** orders.

The Time in Force of the order can be selected to determine how long an order will remain active:

- Good 'til canceled (GTC). This type of order remains active until it is either canceled by the user or the trade is executed.

- Day (DAY). A day order expires if it is not executed on the day the order was placed.

Unlike the Market Order element, Limit Order has one price input and two operating modes.

These two operating modes differ when recalculating the strategy:

- In the signal mode, which can be activated by the parameter with that name, the input signal works as an enabling signal. As long as the input condition is met, instead of sending in a new order every time the strategy is recalculated, the same order remains in the market. Every time the strategy is recalculated, if the input condition is met and there is no order in the market, a new order is sent in. If the element had already sent an order in, the price and the remaining quantity of the order are checked to verify whether they match the current input values. If they are not the same, the order in the market is modified to adapt it to the new price and quantity values.

- In the non-signal mode, a Limit Order works like a Market Order, namely, a new limit order is sent into the market whenever the input condition (S) is met.

Limit Orders are on signal mode by default.

Inputs

Name	Label	Type	Comment
Signal	S	Logical	True or false
Price	P	Numerical	
Quantity	Q	Numerical	

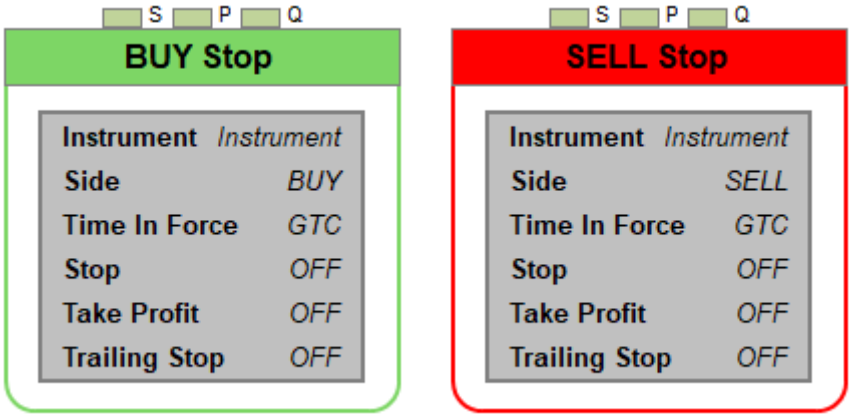
Parameters

Name	Type	Description

Instrument	Drop-down list	Instruments used in the strategy may be selected
Side	Drop-down list	Options: BUY / SELL
Time in force	Drop-down list	Options: GTC / DAY
Signal Mode	Drop-down list	Options: YES / NO
Stop	Drop-down list	Options: OFF / PRICE / PERCENTAGE
Stop Value	Numerical	Price in the same unit as the price reported by the market, or percentage change between the current price and the initial execution price
Take Profit	Drop-down list	Options: OFF / PRICE / PERCENTAGE
Take Profit Value	Numerical	Options: price in the same unit as the price reported by the market, or percentage change between the current price and the initial execution price

Trailing Stop	Drop-down list	Options: OFF / PRICE / PERCENTAGE
Trailing Value	Numerical	Options: maximum decrease in the price compared with the execution price (units), or maximum decrease in the profit compared with the highest profit value (percentage)
Trailing Profit Target	Numerical	Increase in the price compared with the execution price (units)

Stop Order



The Stop Order element allows users to send stop orders (Buy Stop/Sell Stop). Like in other order elements, subordinate Stop Loss and Take Profit orders can be activated.

The Time in Force of the order can be selected to determine how long an order will remain active:

- Good 'til canceled (GTC). This type of order remains active until it is either canceled by the user or the trade is executed.

- Day (DAY). A day order expires if it is not executed on the day the order was placed.

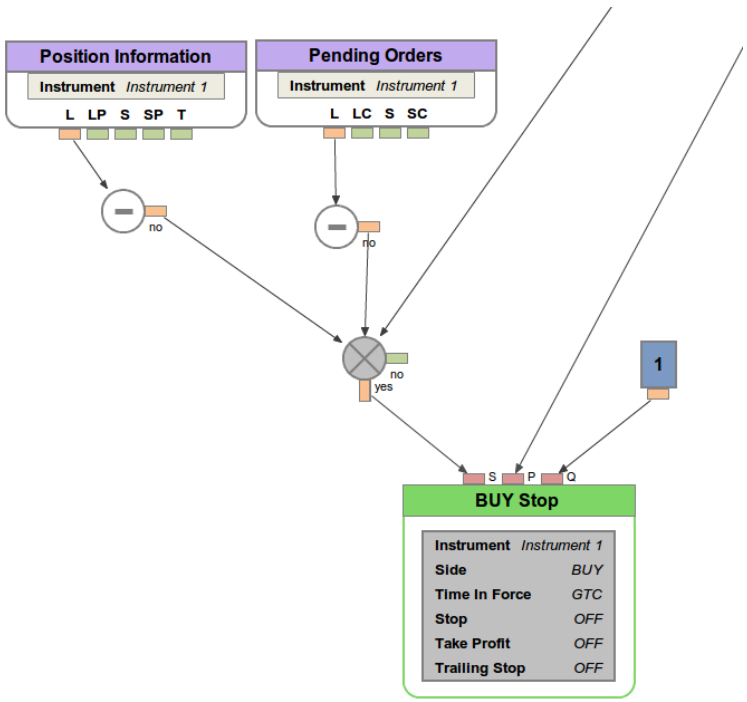
This element works in a similar way to the Limit Order: every time the entry condition is fulfilled, a stop order is launched at the price and with the quantity linked to the corresponding inputs.

The stop order is executed when the market price surpasses the set price. For example, a stop buy is filled when the price is equal to or higher than the price of the stop order.

Please note that:

- When sending the order, if the stop price is already in market, the order will be rejected.
- Some markets cannot manage stop orders. In this case, they are managed by CQG's OMS.
- When the user wishes to keep just one stop order active in the market, the Pending Orders element can be used to detect working orders in the market and to set a condition to prevent the strategy from sending new orders.

The Cancel Pending element can be used to cancel Stop Orders.



Inputs

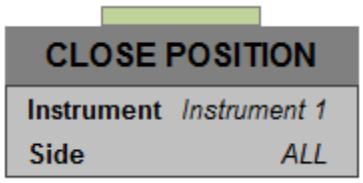
Name	Label	Type	Comment
Signal	S	Logical	True or false
Price	P	Numerical	
Quantity	Q	Numerical	

Parameters

Name	Type	Description
Instrument	Drop-down list	Instruments used in the strategy may be selected
Side	Drop-down list	Options: BUY / SELL
Time in force	Drop-down list	Options: GTC / DAY
Stop	Drop-down list	Options: OFF / PRICE / PERCENTAGE

Stop Value	Numerical	Price in the same unit as the price reported by the market, or percentage change between the current price and the initial execution price
Take Profit	Drop-down list	Options: OFF / PRICE / PERCENTAGE
Take Profit Value	Numerical	Options: price in the same unit as the price reported by the market, or percentage change between the current price and the initial execution price
Trailing Stop	Drop-down list	Options: OFF / PRICE / PERCENTAGE
Trailing Value	Numerical	Options: maximum decrease in the price compared with the execution price (units), or maximum decrease in the profit compared with the highest profit value (percentage)
Trailing Profit Target	Numerical	Increase in the price compared with the execution price (units)

Close Position



Close Position closes position when the input condition is met.

The 'Instrument' parameter allows users to select the instrument whose position will be closed in the strategy.

The 'Side' parameter allows users to choose between long, short, or both, when it comes to closing the position. The element automatically checks the position and sends in a DAY market order with the appropriate size and side (long/short) to close it.

This element also cancels subordinate orders that remain active for the selected instrument. If Long or Short is selected in Close Position, orders that have been entered as a result of the execution of same-side orders (long, short, or all) will be cancelled. For example, if Long is selected, Stop and Take Profit orders that have been entered as a result of the execution of Buy Market or Buy Limit orders will be cancelled.

Subordinate orders are cancelled whether there is a position or not. If Stop and Take Profit orders associated with Market Order and Limit Order elements are used, it is recommended to close the position only with the Close Position element or to wait for its closure by the Stop or Take Profit orders.

Inputs

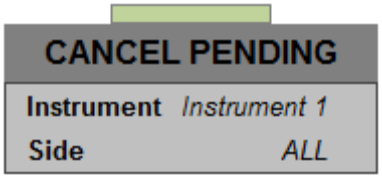
Name	Label	Type	Comment
Signal		Logical	

Parameters

Name	Type	Description

Instrument	Drop-down list	One of the instruments used in the strategy may be selected
Side	Drop-down list	Options: LONG / SHORT / ALL

Cancel Pending



Cancel Pending cancels orders pending execution in the market. They are usually Limit Orders, but it can also be used for Market Orders that, for some reason, are pending execution.

The parameters 'Instrument' and 'Side' are used to determine which orders will be cancelled.

This element does not cancel pending orders that have been sent out as subordinate orders, namely, Stop and Take Profit orders.

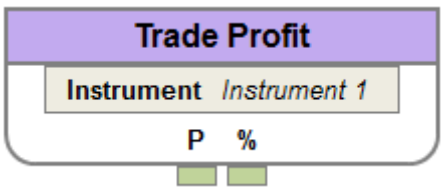
Inputs

Name	Label	Type	Comment
Signal		Logical	

Parameters

Name	Type	Description
Instrument	Drop-down list	One of the instruments used in the strategy may be selected
Side	Drop-down list	Options: LONG / SHORT / ALL

Trade Profit



With each recalculation of the strategy, Trade Profit provides the profit from the open position concerning the selected instrument.

The Profit (P) output stores the profit in the instrument's currency. The calculation takes the size of the order into account.

The Profit Percentage (%) output stores the profit percentage, which is profit per unit (contract, share, etc.) divided by the execution price and multiplied by 100. If the position is the result of different orders or partial fills, the execution price will be the weighted average price.

This element does not take commissions into account.

Outputs

Name	Label	Type	Comment
Profit	P	Numerical	
Percentage Profit	%	Numerical	

Parameters

Name	Type	Description
Instrument	Drop-down list	One of the instruments used in the strategy may be selected

Strategy Profit

With every recalculation of the strategy, Strategy Profit provides the realized profit that the strategy has accumulated.

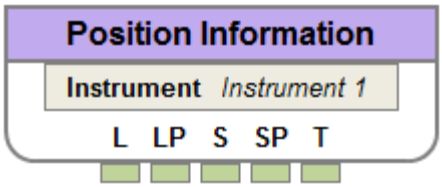
The result is the accumulated profit that has been realized since the start of the strategy. Therefore, the value is modified only when a position is closed. In this case, the profit is expressed in the base currency of the strategy, which is chosen at the moment of uploading the strategy to backtest or execution.

This element does not take commissions into account.

Outputs

Name	Label	Type	Comment
Profit		Numerical	

Position Information



With each recalculation of the strategy, Position Information provides information on the position concerning the instrument chosen as a parameter.

This element enables users to know whether the position is long or short as well as its size. It also stores the date and the time when the position was opened. If the position is modified without closing, the initial opening time of the position does not change.

Outputs

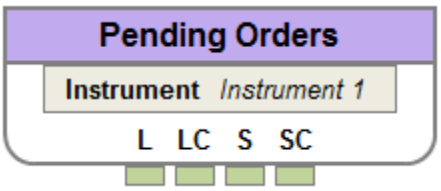
Name	Label	Type	Comment
Long	L	Logical	True if position is long
Long Position	LP	Numerical	It stores position size if the position is long. Otherwise, it equals 0

Short	S	Logical	True if position is short
Short Position	SP	Numerical	It stores position size if the position is long. Otherwise, it equals 0
Time	T	Date and time	Date and time when the position is opened

Parameters

Name	**Type**	**Description**
Instrument	Drop-down list	One of the instruments used in the strategy may be selected

Pending Orders



With each recalculation of the strategy, Pending Orders provides information about orders sent to market that have not been completely executed.

This element enables users to know if there are pending orders (long or short), as well as the quantity pending execution. It includes all the orders that have been created but not completed or cancelled. It also includes Stop, Take Profit and Trailing Stop orders created when the initial execution order completely or partially fills.

Outputs

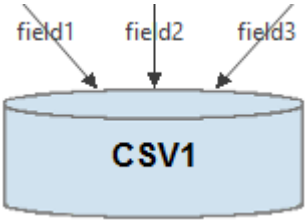
Name	Label	Type	Comment
Long	L	Logical (true/false)	True if position is long
Long Contracts	LC	Numerical	It stores quantity pending execution if the position is long. Otherwise, it equals 0
Short	S	Logical (true/false)	True if position is short
Short Contracts	SC	Numerical	It stores quantity pending execution if the position is short. Otherwise, it equals 0

Parameters

Name	Type	Description
Instrument	Drop-down list	One of the instruments used in the strategy may be selected

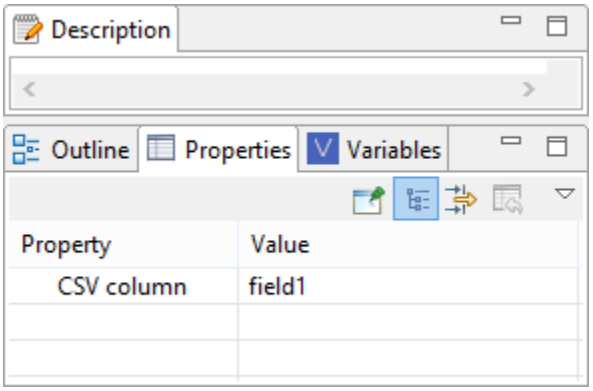
Reporting

CSV

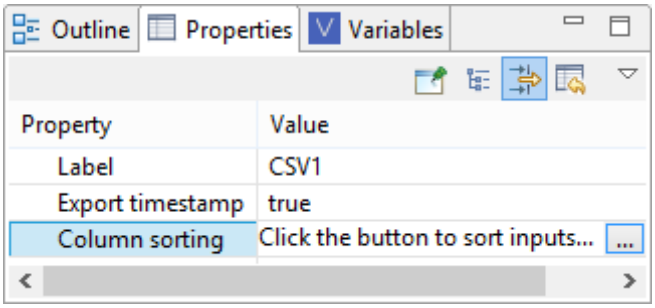


The CSV element allows users to store output data from any element in the strategy during a **backtest** to save it in a CSV file. Therefore, outputs from any element may be connected to the CSV element. With each recalculation of the strategy, a new row with the values from all the linked outputs will be added to a data table.

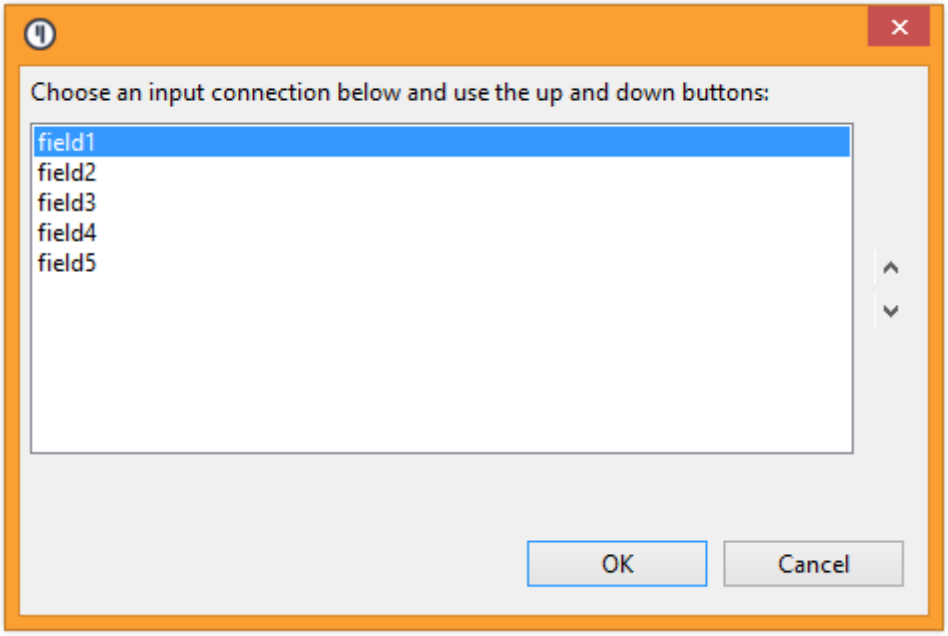
The only parameter displayed in the figure of this element is its label. Every link to the CSV element also has a label that will be the name of the column in the CSV file. The name of the connecting link may be modified by selecting the link and editing the name in the 'Properties' area. Click on the connecting link in 'Select' mode to select it.



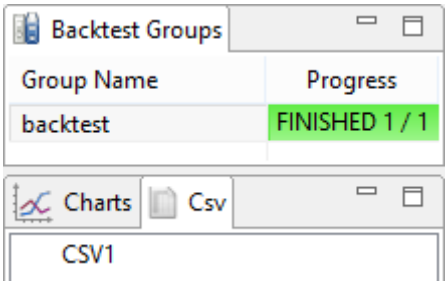
In the Properties area, users may choose to save date and time from every input ('Export timestamp') or to sort the columns in the CSV file ('Column sorting'). When 'Column sorting' is selected, a button ... appears in the 'Value' column. Click on it to open the column for column sorting.



Select a field and scroll down the list by clicking the arrows on the right to change the field's position. Once finished, click 'OK' to save it.



After finishing a backtest, the results stored in the CSV element can be accessed from the Csv area in the Report View. Each CSV element in the strategy will have its corresponding input in the Csv area. Inputs are identified with the label of the CSV element. Double-click on the selected input and choose the location where you wish to save the CSV file.



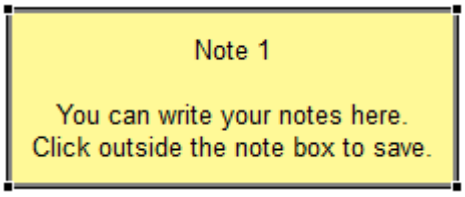
Inputs

Name	Label	Type	Comment
Value		Any type	It accepts any number of inputs of any type

Parameters

Name	Type	Description
Name	Text	

Annotation



The Annotation element allows users to add their notes directly to the strategy on the editor canvas.