Etasoft
Building blocks of integration

Manual - Forex Generator version 7.x

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Main website http://www.forexgenerator.com

Purpose

This document is called "Forgotten Manual" because most traders do not read manuals. If you are like most you are missing out on some of the important features of the Forex Generator. Don't be like most – read this manual.

Forex Generator is designed to help you create Forex Expert Advisors, Custom Indicators and Scripts for MetaTrader™ platform. You can test your ideas without programming. Generated Expert Advisor, Custom Indicators and Scripts can help with trading or trade in automated mode.

Diagram based interface offers incredible flexibility. It allows you to create complex trading setups. But do not be overwhelmed by all the possibilities. Always start small. First create simple diagram that just executes orders. Once you get it working – build on it.

Start diagram with just few basic blocks. Then generate Expert Advisor or Script. Test it make sure it works the way you expect. Add few more blocks. Test it again. Repeat. Grow it. Test it. Repeat.

Requirements

Minimum Requirements	
Software	Windows Vista, Server 2003 or Windows 7/8/10.
Hardware	Pentium 1GHz, RAM 2Gbt.

Important

Generator uses MetaTrader compiler to produce code. Compiler is on your computer and it came from your Forex broker. Generator has no control over the version of compiler you have and cannot be liable for any defects due to version differences and most recent MT updates.

MetaTrader software gets updated from time to time. Most updates are stable and do not break generated code. But some MetaTrader updates may result in breaking changes.

We release new versions of Generator in order to keep up with the update process. MT4 is much more stable and recommended over MT5 at this time (mid 2019).

Important point: test your generated code.

Print to Log

If you created diagram but do not understand how blocks work and why some blocks execute then "Print to Log" block is your friend.

1. Use "Print to Log" block between other blocks. Print unique messages into MetaTrader Log.
2. Start EA back test in Visual Mode. Then run-pause-run until you get "Print to Log" messages produced in the MT Log.
3. Trace the steps EA made based on how chart moved.

Slow Visual Mode execution in back test with "Print to Log" between blocks gives you insight into your EA.
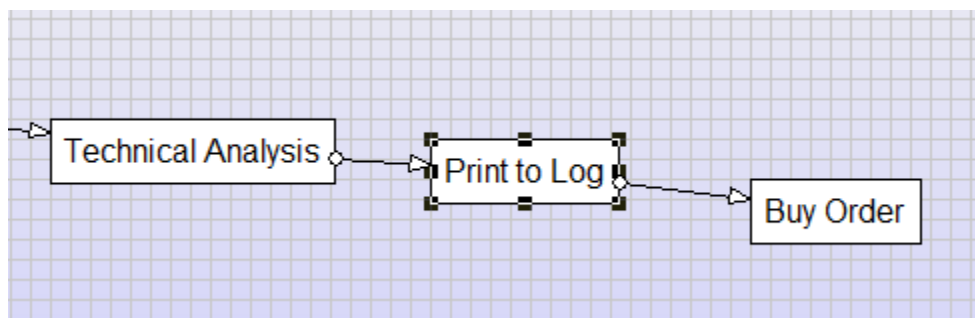
Another useful aid is "Print Functions to Chart" block. It lets you display current values of selected indicators on the screen. This is useful in combination with "Print to Log".

It is important to test your EA before using it for live trading.

I found a bug in the Generator

You have created EA with over 70 blocks and find that one block does not work correctly. You suspect a bug in a block. Problem is that large diagrams are hard to test. Then test block in a small diagram.

1. Create small diagram with just 5-8 blocks.
2. Include block that you think is "broken".
3. Run that small EA in MT terminal and see if block still does not work.
4. It is hard to diagnose "broken" blocks in large diagrams. You may think that problem is in one part of the diagram when it is really somewhere else. Small tests isolate your problem.

Please contact support if block does not work in your small test diagram.

MT4 and MT5 Integration

For integration you need two things: **compiler** and **output path** for generated files.
Both are important.

MT4 compiler is inside metaeditor.exe program distributed as part of main MT4 terminal installation. Before you start your first diagram make sure to enter compiler and choose MT version using Options screen.

Forex Generator supports both MT4 and MT5 terminals. Depending on what version of the terminal you choose you will get different set of building blocks. Therefore it is important that your "Generator mode" matches terminal you are using. If they do not match generated code will fail or produce incorrect trades and cause problems.

If you do not setup compiler Generator will not be able to create Expert Advisor, Custom Indicators or Script for you.

You also need to setup output path for the compiled EAs, scripts and indicators. On Windows 7,8 and 10 it is inside C:\Users\ folder under your username. Full path is rather long and on certain versions of Windows some directories are hidden.

Alternative way to find this folder is to type %AppData% in Windows Explorer window and press Enter. It should open into C:\Users\your_name_\AppData folder. Then you should be able to find \Roaming\MetaQuotes\...etc.

Type %AppData% and press Enter.
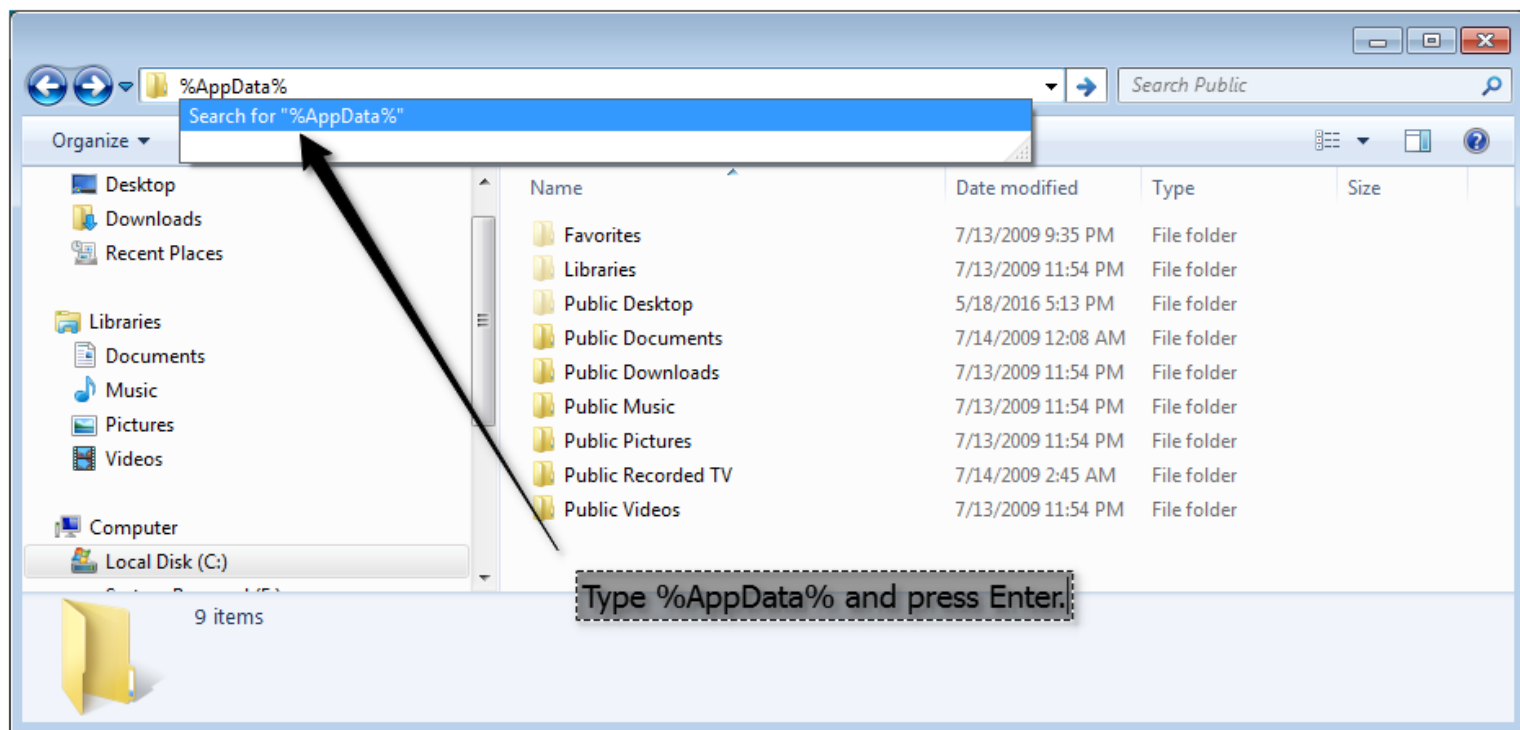
That is alternative way to find MQL4 folder. It will open folder with subfolders to navigate to \MetaQuotes\... and from there you should be able to find MQL4 folder.

Main Screens
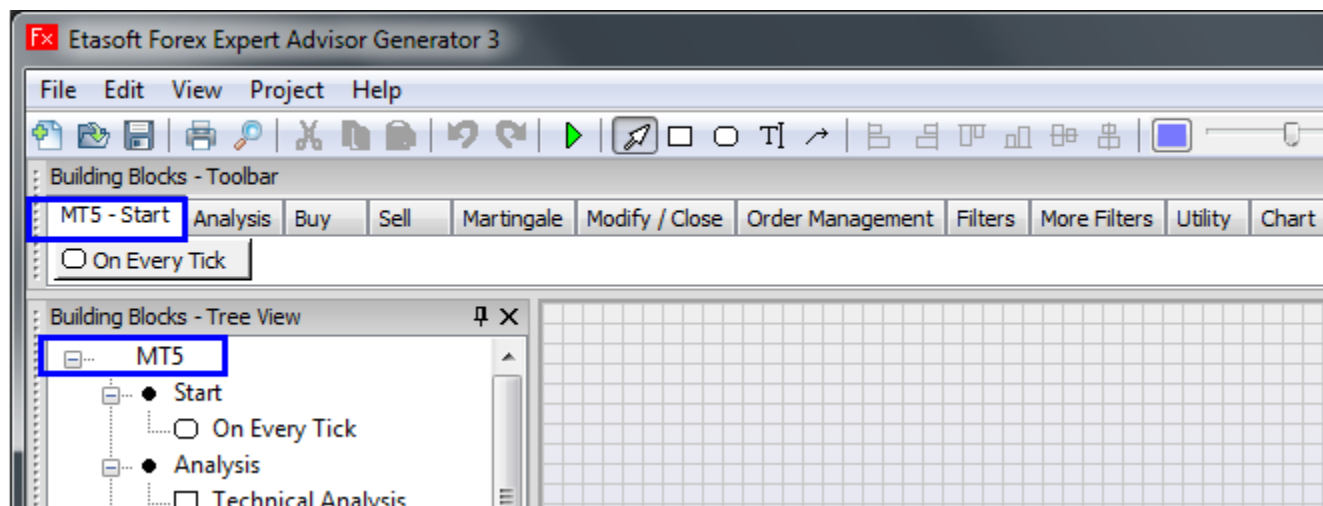
Target terminal is indicated on the main screen.

Central part of the program is a diagram that helps you setup Expert Advisor and generate final compiled EA file.
1. Top pane allows you to drop building blocks on to main diagram.
2. Central pane contain diagram.
3. Left pane contains properties and short description for selected block.
4. Bottom pane contains results for generated EA. Professional Edition also shows generated source code in "Source Code" tab.
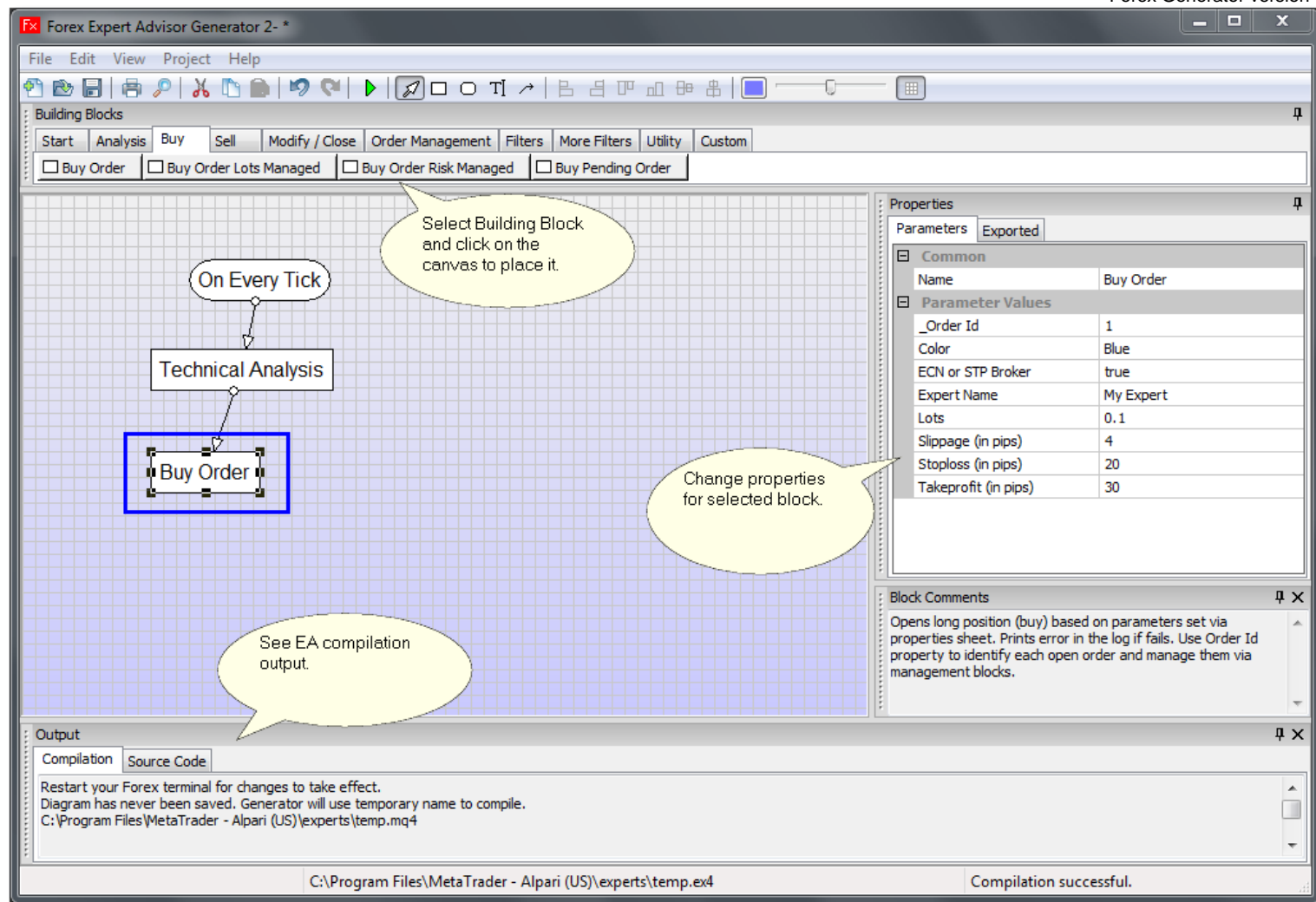
Main program screen contains most information you need to setup EA.

All diagrams you build have to start with rounded block. Starting from it EA Generator will produce output EA file. All other blocks connect down from rounded block. Rounded block is the first function that will start Expert Advisor once it runs in the Forex terminal.

We recommend you to use "On Every Tick" block in almost all setups. This is important if you are accessing current bar values in your blocks down below. "On Every New Bar" or "Once Per Bar" executes other blocks connected to it only when new bar starts forming in the chart, and therefore current bar (bar with index 0) is not fully formed yet.

Once you have rounded block on the diagram drop other blocks below it and connect them using a line from toolbar. You can draw a line following these steps:
1. Select line tool.
2. Select rounded tool.
3. Click left button of the mouse.
4. Move mouse pointer over second block.
5. Click on the second block by pressing left mouse button.

This should draw a line with arrow pointing from rounded block down to second block.

There are some useful shortcut keystrokes:
1. You can delete object from the diagram by simply pressing "Delete" key on your keyboard.
2. Generate EA using "F7" key.
3. Generate Script using "F5" key.
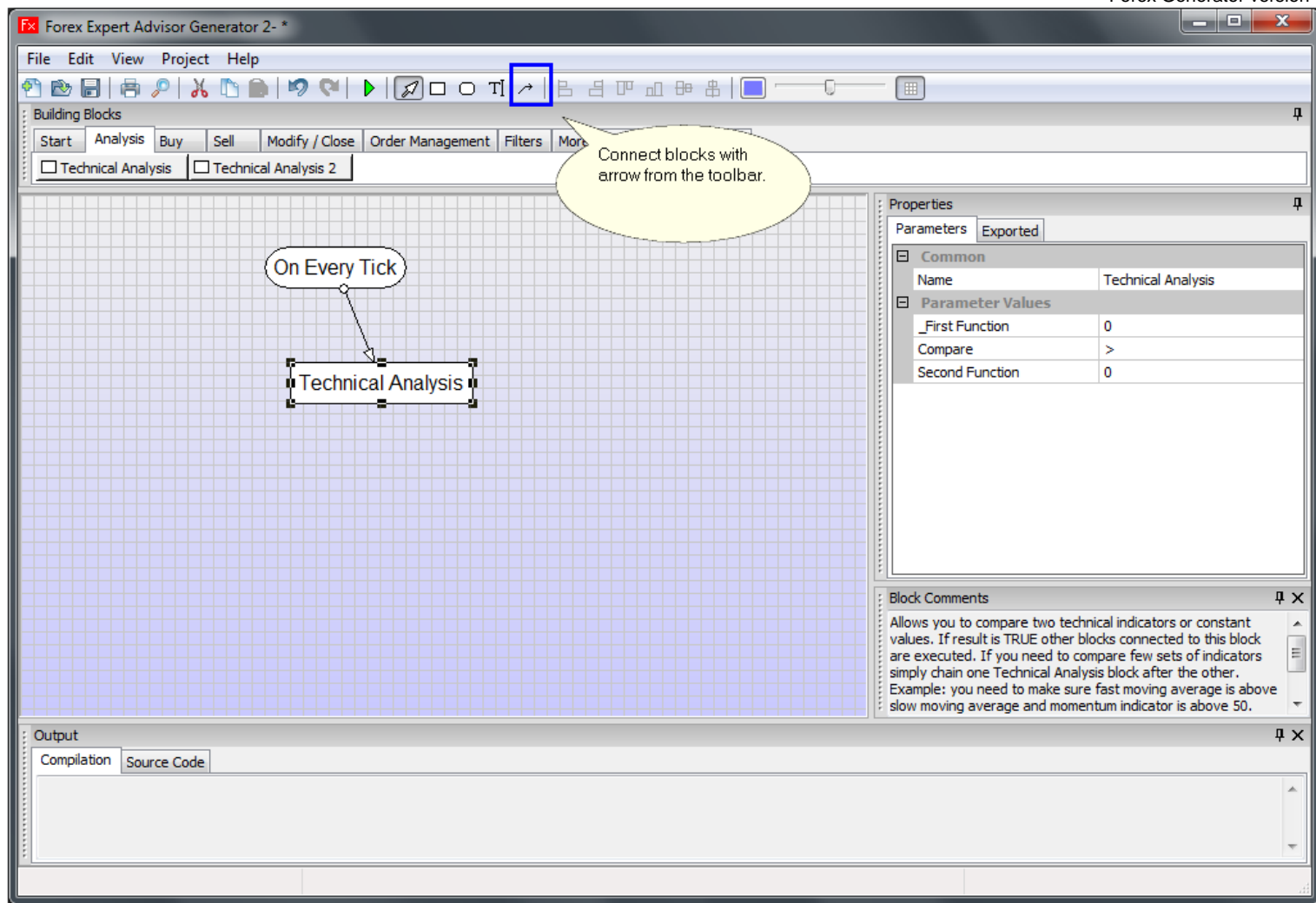
Use arrows to connect building blocks.

One of the most important building blocks is a Technical Analysis block. It allows you to compare two indicators, bars or constant values. You can setup Technical Analysis block using properties "_First Function" and "Second Function" in property sheet. Once you click on any of those properties small button with three dots will appear in the corner of the field. Once you press it, pop up window will allow you to setup the expression.

You can compare two moving averages or compare current bar value with previous bar closing value, etc.
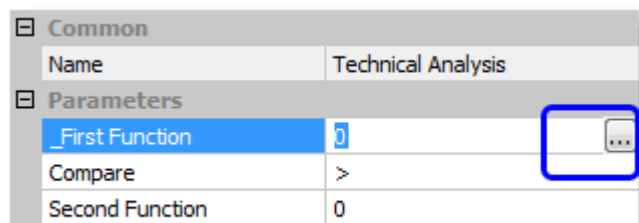
Use "…" button to setup Technical Block expression.

Tip: Instead of using "…" button you can also edit property manually and enter indicator function or other expression by hand. It is not recommended unless you know MQL and have some programming knowledge.

Once you have Technical Analysis block setup attach other blocks to it.

You can setup various technical indicators using this screen. In this example we are using Moving Average indicator that comes with the terminal. You can name exported variables and they will show up in the input parameters list when EA is used in the terminal.

Almost everything you enter in the Generator is case-sensitive. So MODE_SMA is not the same as mode_sma, and PRICE_CLOSE is not the same as price_close. If you make this seemingly small mistake, nothing will work and you will probably get number of compilation errors.

Restrictions for exported variables:
1. Exported variable name can not start with the number and must contain only letters and numbers.
2. Most special symbols (except "_" underscore) are not allowed in exported variable name.
3. Exported variable name should be unique within Expert Advisor. In other words, you can not have two variables named "period", but you can have one variable named "period1" and another named "period2".
4. MQ4/MQ5 reserved words can not be used as variable names. Such as "double" or "string" or "int".
5. Avoid using accent characters (non-English letters).

As you can see, the list of restrictions for variable names is rather long. One easy way to avoid some of the problems is to use 2-3 letter prefix for your variable names. Example: myPeriod, myShift, myMethod, etc. Here prefix "my" is used to form unique names that do not conflict with the rules above. Instead of "my" you can use initials of your first and last name as prefix.

You can also access values of the current and number of previous bars, and compare them to values of other bars or indicator values.

Import Other Custom Indicators

EA Generator can import some of the custom indicators found on the Internet. Use "Import Custom Indicator" menu and after import selected custom indicator will appear in the "Expression" drop down list. EA Generator can import original custom indicators with source code from files with extension "*.mq4" or "*.mq5".

EA Generator can not import custom indicators that are already compiled and have extension "*.ex4". Compiled custom indicators do not return information on how many and what parameters they use. That's why EA Generator can not import them from "*.ex4" files.

You can still call compiled custom indicators via Technical Analysis block, but you need to manually enter call syntax in a form of: double iCustom(string symbol, int timeframe, string name, ..., int mode, int shift). See below for sample.
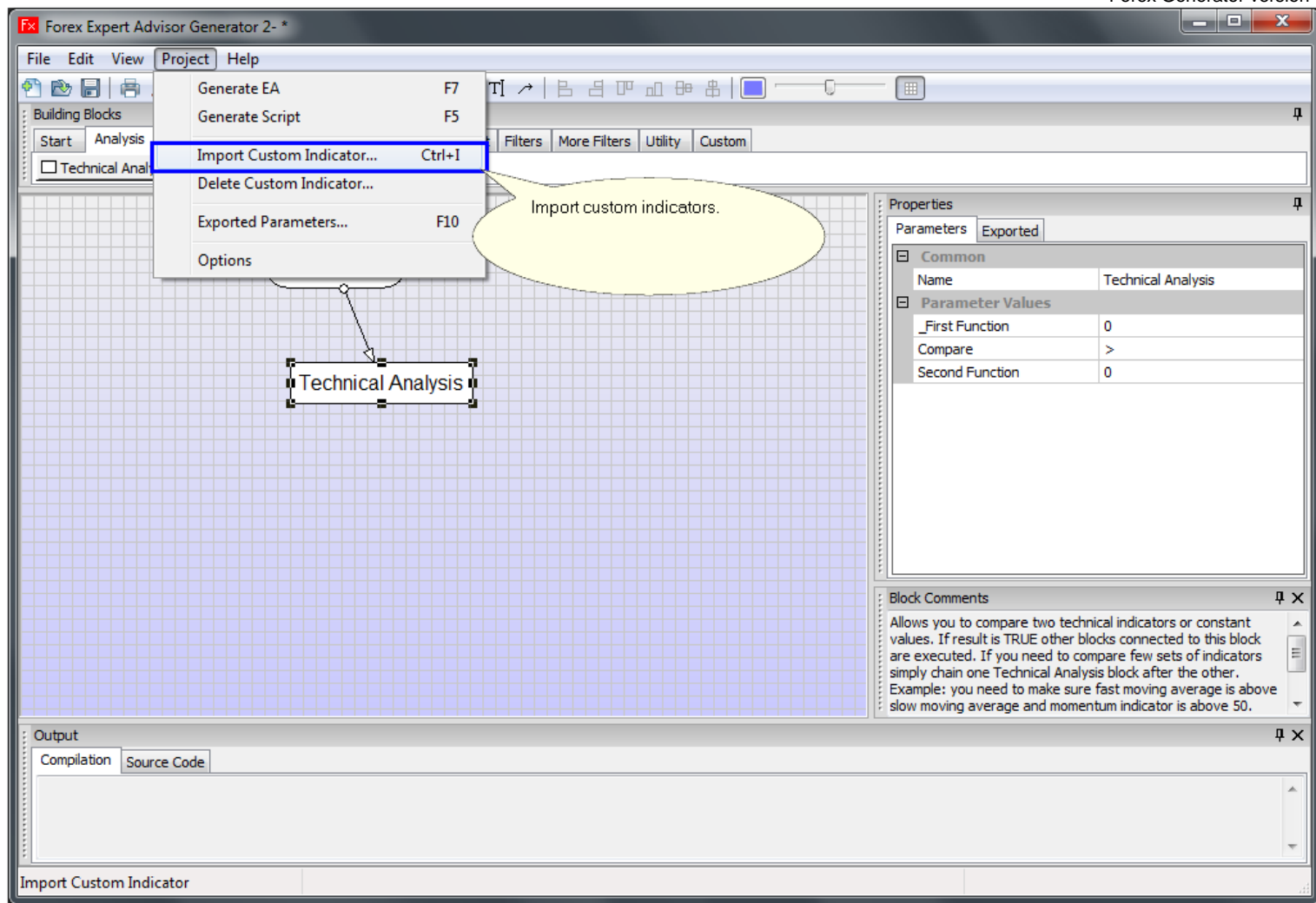
After you import custom indicator into EA Generator make sure to copy your custom indicator source code file "*.mq4" into "..\indicators" folder.

Problem with most custom indicators found online is that they come with zero documentation. If you drop them on the chart they show some graphical information but what values they return is not documented. Without knowing what values they return it is not possible to understand how to integrate them into your EA. Some custom indicators are simply not designed to be used via Expert Advisor. Since most custom indicators found on Internet forums are free they come with no support. Authors of the custom indicators are usually only interested in developing indicators but not documenting or supporting them.
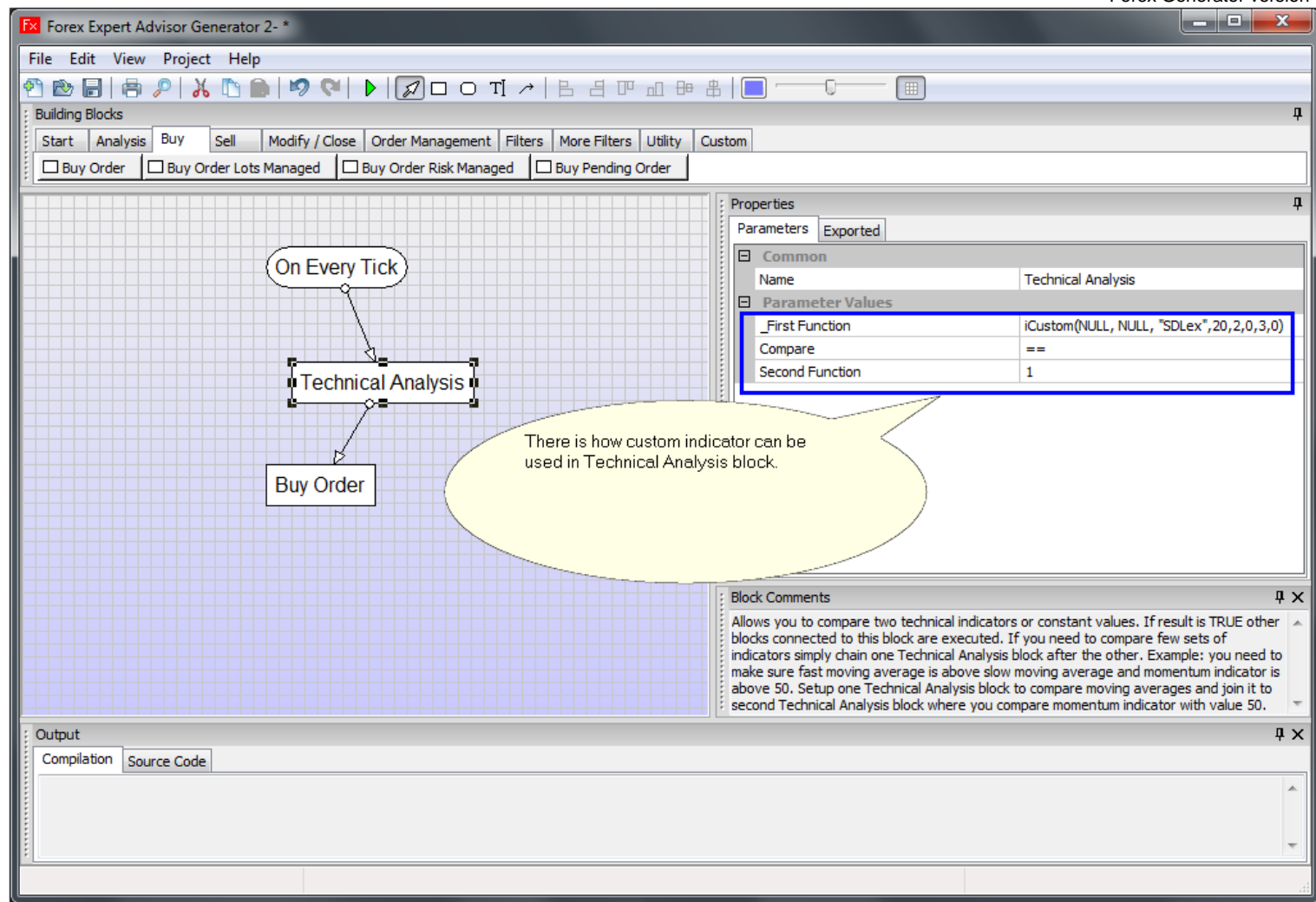
There is how custom indicator might be called from Expert Advisor.
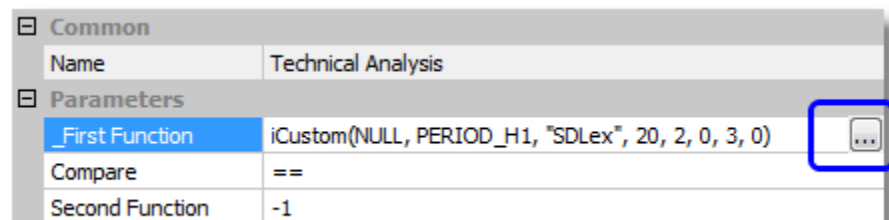
Use "…" button next to property value to setup exact syntax for the call.

There are a lot of custom indicators on the Internet. Most indicators have no documentation on how to use them in EA. Because some can not be used in EA since they do not return any meaningful values for EA to use.

Most indicators designed in a way to return different value based on your request. You send different request by providing different value for parameter called "mode". Mode can have values from 0 to 7 (inclusive). For example: let say you have an indicator that shows two lines on the chart (one slow and one fast line) now if you pass "mode" = 0 then indicator will return current value of the slow line and if you pass "mode" = 1 then indicator will return current value of the fast line. It is that simple.

One way to see actual values indicator returns is to use "Print Functions to Chart" block. There are steps on how to do it:

1. Import custom indicator.
2. Create another new EA in Forex Generator. Blank project that should have only "On Every Tick" block.
3. Add and connect to it "Print Functions to Chart" block.
4. Setup "Print Functions to Chart" so it would print actual values from the indicator on the chart.
5. Setup various combinations of functions in "Print Functions to Chart" using different "modes".

6. Run new EA in demo account in MT4 and see what values come back from the indicator and are displayed on the chart. That way you can decide what value you need.
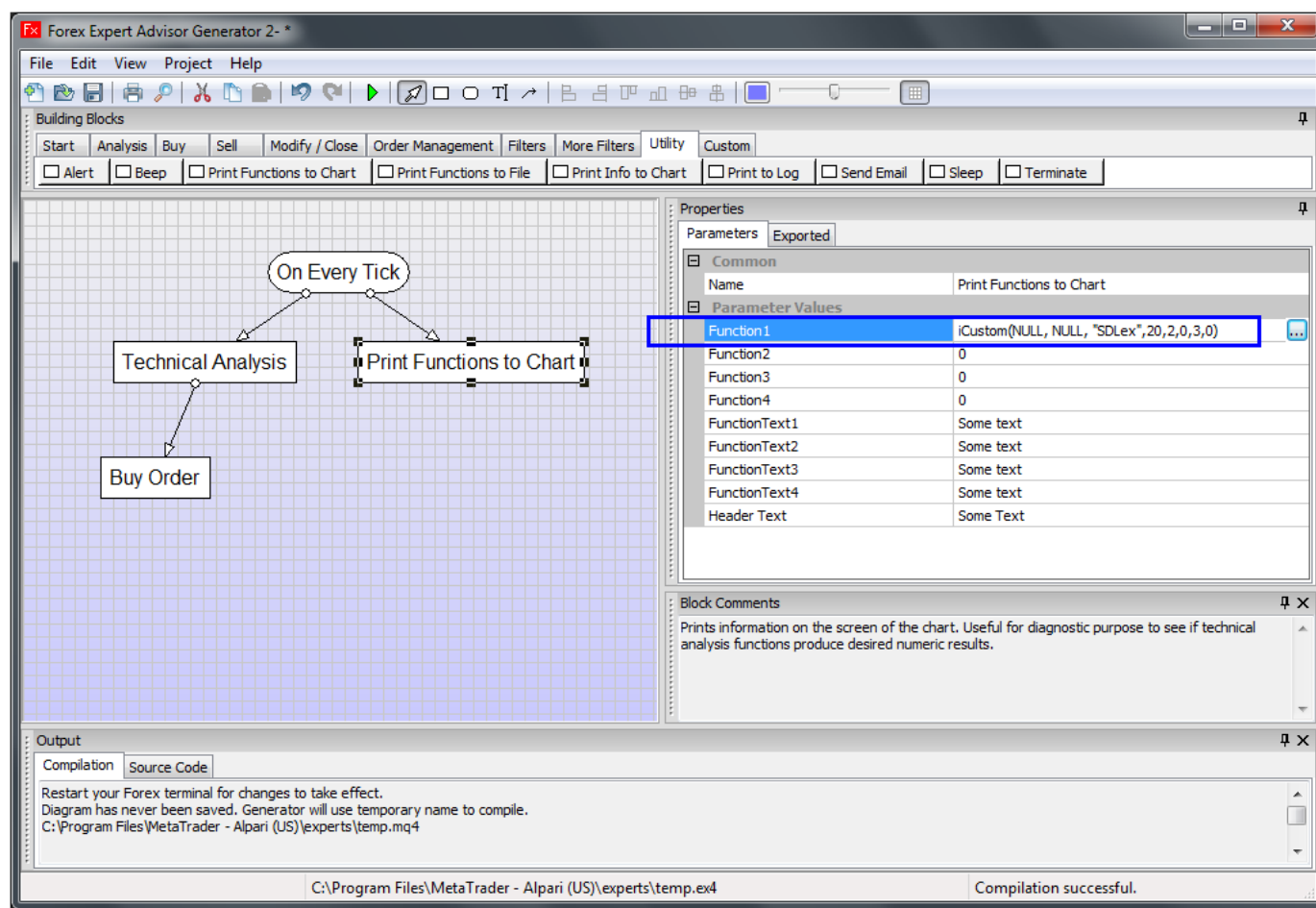
Use "Print Functions to Chart" to see what values indicator returns.

Another way is to have someone with programming skills look into source code for the indicator and find used Line index value as well. It is not difficult. There is part of simple custom indicator below:

```
#property indicator_color1 Red

//Input parameters
extern int nobs   =1000; //Number of bars to smooth
extern int lambda =1600; //Higher lambda leads to the smoother data

//Indicator buffers
double hpf[];

int init()
{
    SetIndexBuffer(0,hpf);
    SetIndexStyle(0,DRAW_LINE);
    return(0);
}
```

It uses Line index = 0.
Look for SetIndexBuffer().

Sometimes Line index is easy to spot in the *.mq4 custom indicator source code. Look for SetIndexBuffer() function in custom indicator source code. There might be many SetIndexBuffer() functions. In that case it is not so simple to understand which one you need.

How to Combine Blocks

You can combine blocks so they would execute one after the other or would execute independent of each other. If you chain one

block after the other then EA Generator will produce code in a way that blocks will execute in sequence. And if block in sequence fails with error or conditions for its execution are not met, other blocks below it will not run.
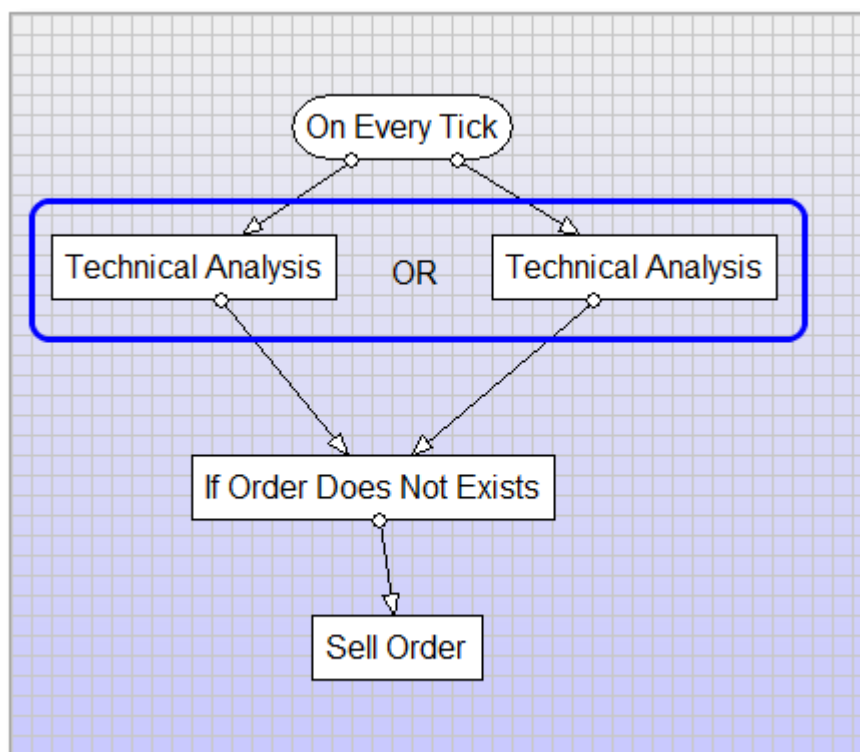
In this diagram both Technical Analysis blocks will be executed in generated EA. If any one of the Technical Analysis blocks meets conditions following below blocks will be executed as well.
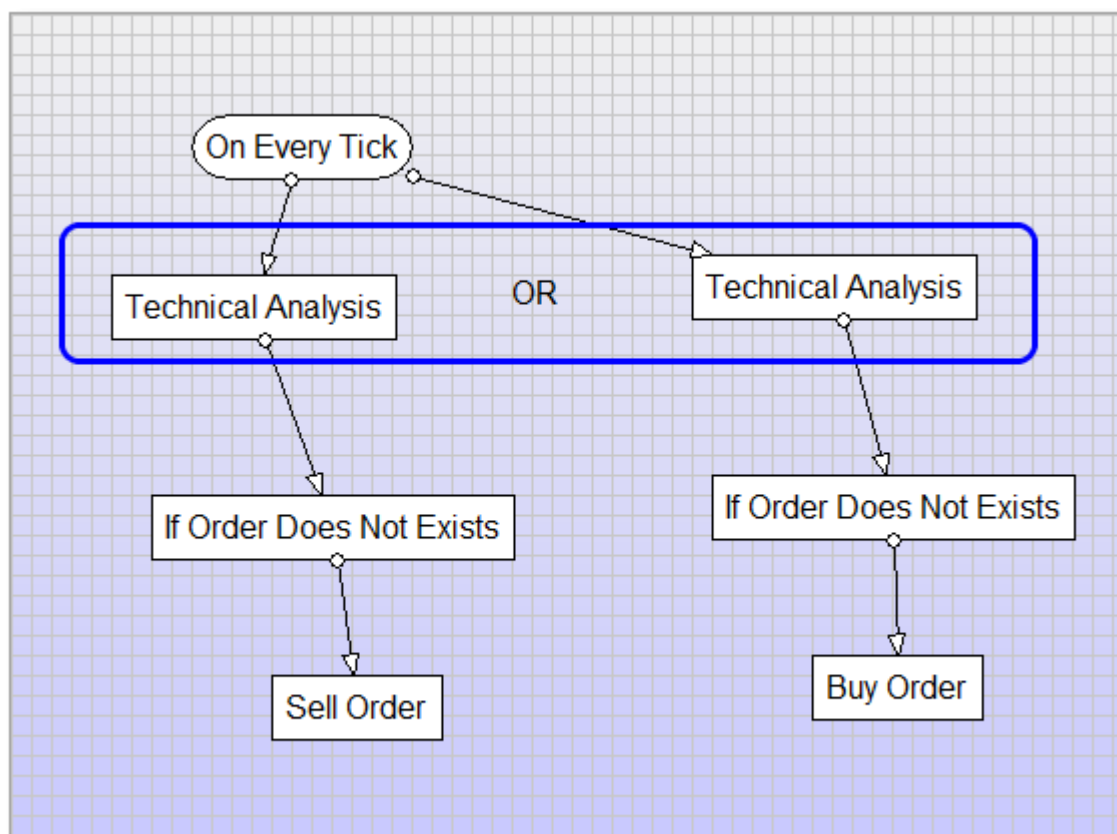
In this diagram if any one of the Technical Analysis blocks meets conditions following below chains of blocks will be executed. It is also possible that both chains will execute if both Technical Analysis blocks meet conditions.
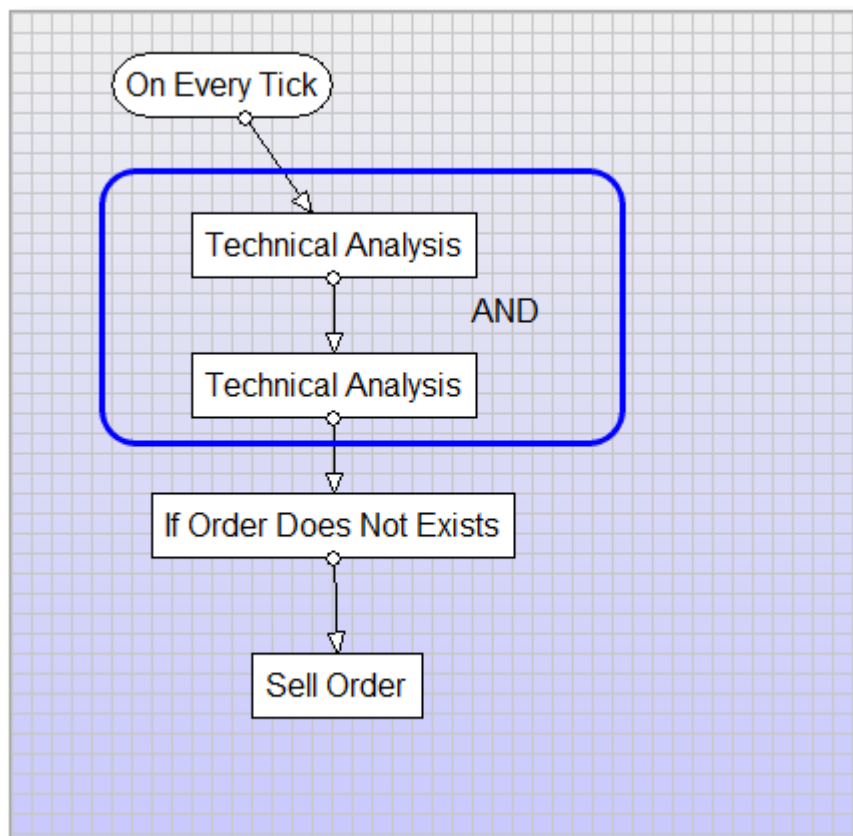
In this diagram only first Technical Analysis block will be executed and if it meets conditions then second Technical Analysis block will execute, and if it meets conditions as well then following block will execute, and so on.
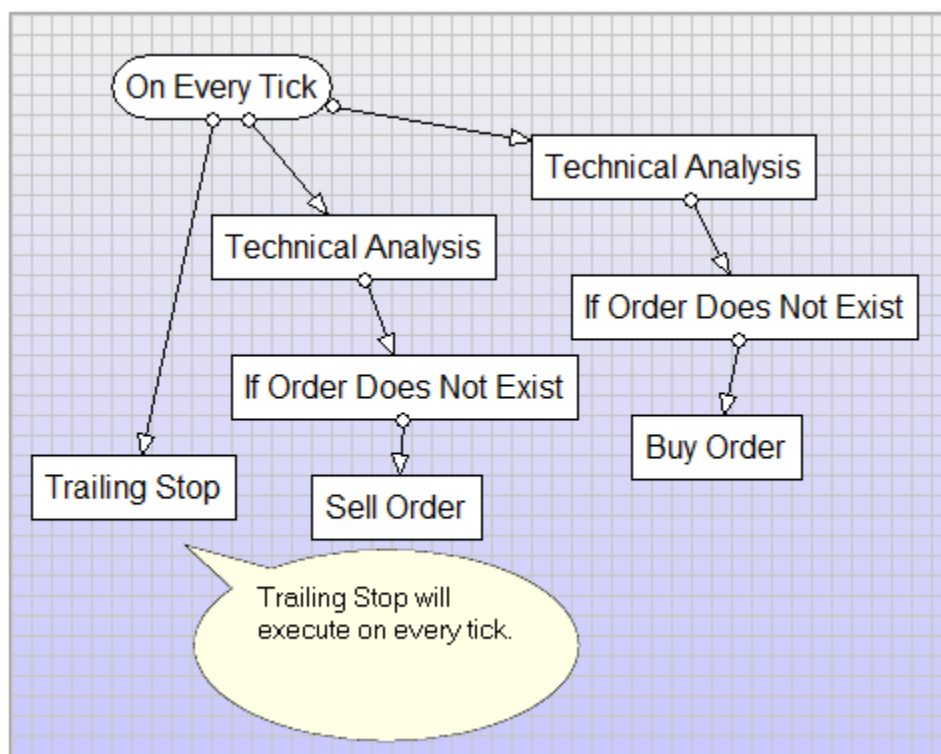
In this diagram setup is more complete with Trailing Stop attached to rounded block so it would execute every time EA is executed in the terminal.

This helps you to setup various trading scenarios where blocks can be combined in different ways to generate conditional code. If you want certain blocks to execute every time generated EA is executed in the terminal, connect those blocks to the first rounded

block. Typical blocks that should be executed all the time are Trailing Stop, Crawling Stop and other order management blocks. They should all be connected closer to the rounded block.
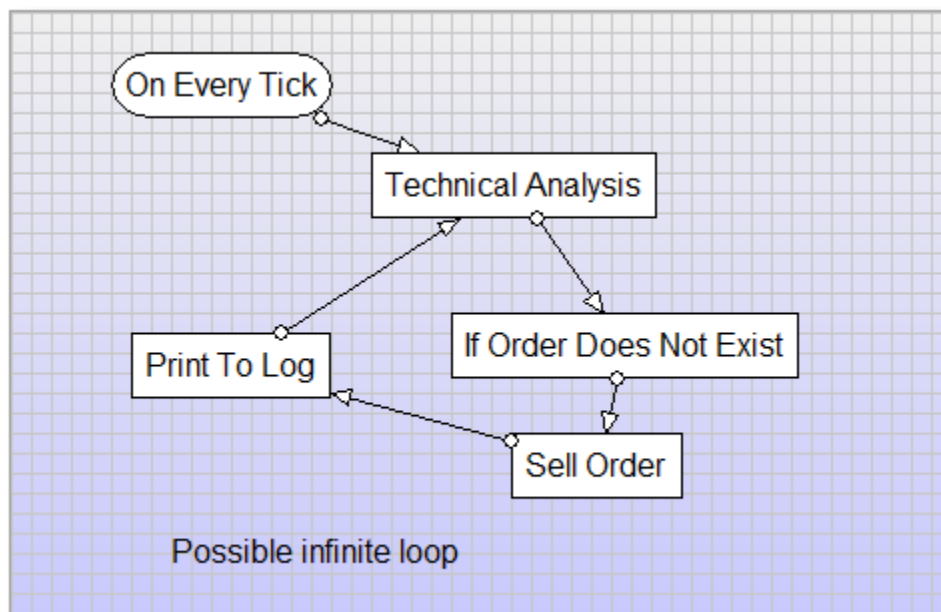
In this diagram we have connected blocks in the circle. EA Generator will produce output file but if resulting EA is started in the terminal it might be running in infinite loop (notice how arrows are connected in circle). While in some very rare cases it might be desired behavior we recommend to avoid these setups and always draw arrows down and never make infinite loops.

Avoid infinite loops. When number of blocks in the diagram grows it becomes harder to spot infinite loop. One simple way to avoid infinite loops is to have rounded block at the top and attach all blocks downwards. That way any arrows that go up will indicate start of infinite loop. Infinite loop may cause your EA to run very slow or freeze.

You can change names of the blocks in the diagram. You can also add text labels in the diagram that could help you to identify what each block chain is setup for.

Use menu "Edit" to perform various operations on the diagram. You can cut, copy and paste blocks in the diagram. There are also operations for undo and redo changes made to the diagram. Changes made to the property sheet and Options screen can not be undone or redone using "Edit" menu "Undo"/"Redo".

Order Id

Most order execution and order management blocks contain "Order Id" property. This property sets unique identifier number for new order so later those order(s) could be identified by order management blocks and handled separately from other orders.

Using different "Order Id" you can separate long (buy) positions from short (sell) positions. "Order Id" is most useful property when it comes to order execution and management in scenarios when you have more than one order open at one time. Let's say you have scenario where you open two orders at once, one with smaller stop loss and take profit than the other. Now you can setup Trailing Stop to trail only second order, simply use different "Order Id" for both orders and set Trailing Stop with "Order Id" from the second order.
"Order Id" is important when you want to use "Close Order" block in cases when you have more than one order open at a time. Then you can identify what specific order to close.

If you ever programmed MT4 or MT5 you have probably came across so called "magic number". "Order Id" is the same as "magic number". We have used a term "Order Id" because it is easier to understand main purpose of this numeric identifier and its use in the Generator.

If you create Expert Advisor or Script that manages orders you open manually (example: EA that does trailing stop, trade up or break even on your orders), in that EA set "_Order Id" = 0 on all blocks. This way Expert Advisor will "see" orders you entered manually and will be able to manage them.
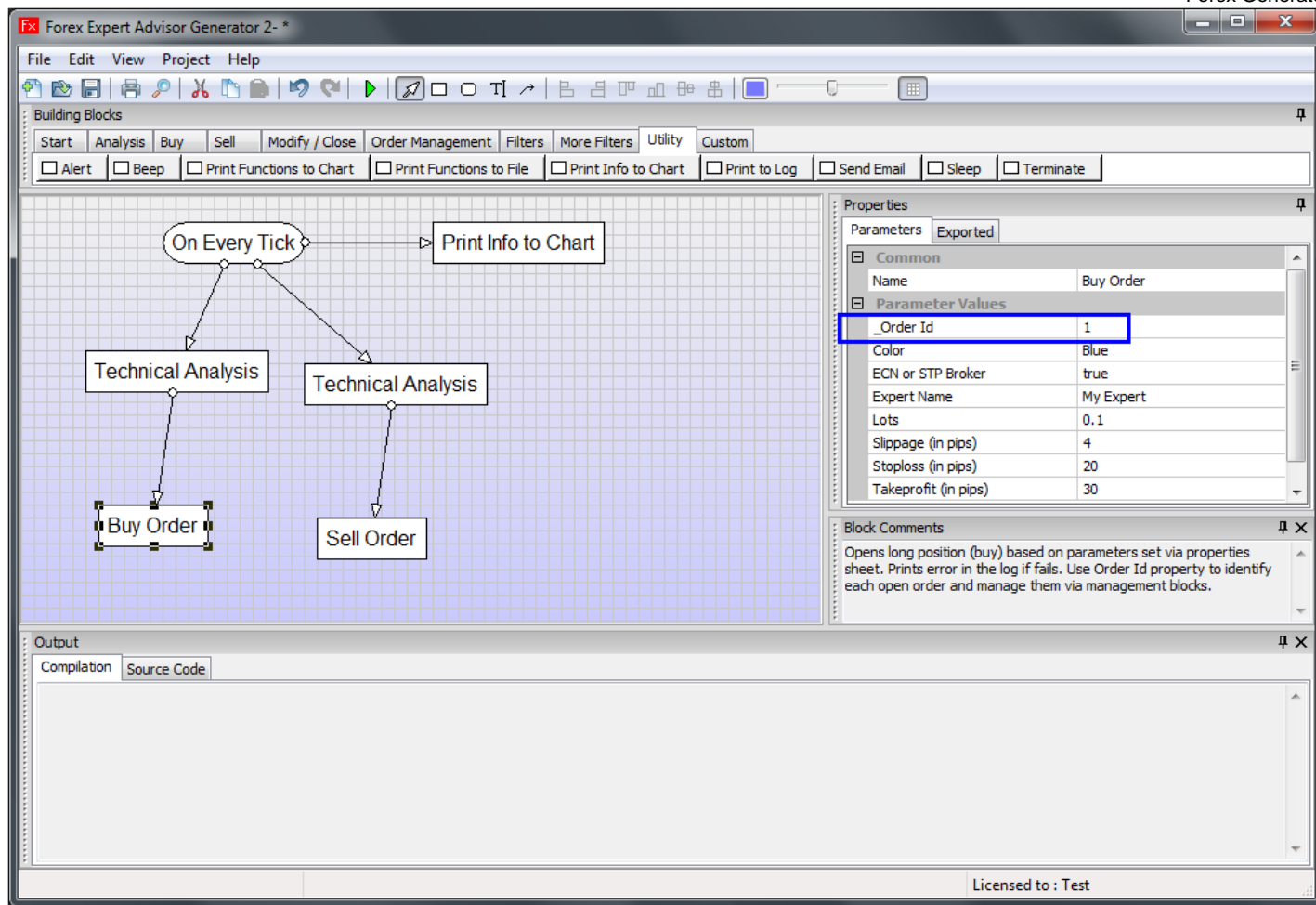
Use "Order Id" to identify orders in cases when you have more than one order open at a time.

Usually it is best to start your EA small and then build on it. Use incremental development technique – add few blocks to the diagram, compile EA, test it in the terminal. If it works, then add few more blocks. In initial stages use various diagnostic blocks that print messages to the log or on the screen when EA runs in the terminal. This helps to see that EA is actually working.

Finding Orders with Order Id

Once you start to work with more than one order at a time understanding and using Order Id becomes essential. Before taking any action on list of orders or deciding to open close more orders you need to find out if you have any orders with specific Order Id already.

Simplest situation would be when you get signal from Technical Analysis blocks and would like to open more orders but only if there are no orders open already. In that case you place block that checks for "existence" of orders with specific Order Id just before you take actions.

Forex Generator contains number of blocks that check if there are already orders with specific Order Id. All of those blocks work with current pair of the chart. They do not check other currency pairs for open orders on them.

If No Order Exist - is most generic one. It simply checks if there is no market or pending order already.
If Order Exists - checks for market orders. Uses both Order Id and Order Type.
If Order Does Not Exist - checks if market orders do not exist. Uses both Order Id and Order Type.
Exist – is similar to If Order Exists but it can check set of Order Ids not just one Order Id.
Do Not Exist – is similar to If Order Does Not Exist but can also check set of Order Ids.

Orders

If "ECN or STP Broker" parameter is set to "True" market orders are executed in two steps: order is sent and then it is modified. One box such as "Buy Order" represents two operations. This is done because some ECN/STP brokers do not allow Stoploss and Takeprofit to be sent at once, order has to be sent and then modified. But you do not need two boxes: one to open order and one to modify it, single "Buy Order" or "Sell Order" box does both operations internally. If "ECN or STP Broker" parameter is set to

"False" market orders are executed in one step (via OrderSend).

Most order execution errors relate to the broker specific minimal Stoploss or Takeprofit. When testing new EA set high values for Stoploss and Takeprofit. Some Forex brokers do not allow small values and will keep on throwing errors at you if Stoploss and Takeprofit values are below they allowed limit.

Pending orders also have special parameter Expiration. It is a number of minutes for the order to be pending. If you want it to be good for an hour set it to 60. Want it to be good for 24 hours: 60 times 24 = 1440. Some brokers do not support expiration of pending orders. In that case you have to leave it at zero since any other value will cause error.

Price Offset is special parameter that can have negative value depending on what type of pending order you want to create. BUY LIMIT and ASK LIMIT may have negative offset values. Let's say you want to open BUY LIMIT order that is 5 pips below current Asking price. Simply enter -5 in the property sheet.

Using Generated EA

Use "Generate EA.." menu to generate EA based on the diagram. If you setup compiler via Options screen EA Generator will create and compile EA in ../terminal_directory/experts folder. After compilation restart your MetaTrader™ platform and your Expert Advisor will be imported and show up in the list of Expert Advisors in MetaTrader™.
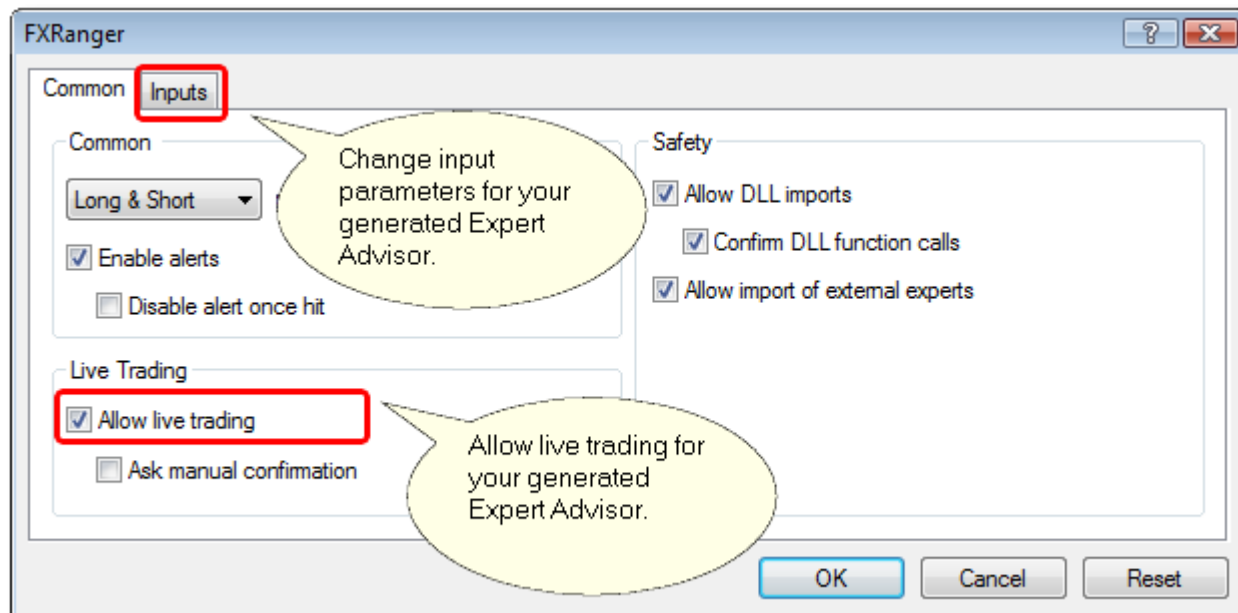
Once you drag and drop your Expert Advisor on the selected chart in MetaTrader™ platform make sure to check "Allow live trading". Otherwise Expert Advisor will not be allowed to open new orders.
Generated EA uses symbol pair that is displayed on the chart. So if you start EA on the chart for EURUSD then it will use that pair for all the orders and technical analysis functions.

General Guide on Building Blocks

Expert Advisor you are building may be used to assist you in trading or trade by itself in automated mode. Depending on this you have to choose what building blocks to include and how to arrange them.

EA Generator comes with number of building blocks grouped based on they functionality:

1. Events. Those are main blocks that start EA execution. You can have only one Event block in your diagram.
2. Signals contain technical analysis blocks. Technical Analysis blocks where you make a decision to open, modify or close traded positions.
3. Order execution blocks open, modify or close positions. You can choose to use Risk Managed blocks where you can setup Risk parameter in percentage and Lots will be calculated based on that number and Free Account Margin.
4. Order management blocks perform various automated management tasks, such as trailing stops, etc.
5. Filters perform additional filtering before your EA gets to technical analysis and order execution. You can limit your EA execution to certain days of the week, certain hours and limited spreads.
6. Utility blocks help with other extra tasks such as output extra information in the log, on the chart or sound beep.
7. Custom code blocks give you ability to add your own functions and blocks of MQL to the diagram.

Signals and Filters are special blocks because they execute other connected blocks only if conditions are met. This allows you to setup processing to execute certain blocks only under special circumstances.

Some blocks in Order Management group also act as filters. They start with word "If" or "Check". Such blocks are "If Order Exists" or "If Order Does Not Exist". Those are useful in cases when you want to check if certain order(s) are open and take special actions on them. Example: check if order with specific Order Id is still open and then close or modify it.

Some Expert Advisors get very complex and when you run them in backtest it is impossible to understand why they work the way they work. There are few diagnostics building blocks that can help you with that:
1. If you are using MT4, run backtested EA in Visual Mode, and pause it at critical moments when trades are made, modified or closed.
2. If you are not sure indicators give you right signals use block "Print Functions to Chart" to see what values they return.
3. If you not sure certain parts of the diagram gets executed or not, or just want to check processing flow, use blocks "Print to Log". Place those blocks in critical spots in the diagram. Once backtested EA is paused, check "Experts" tab for your log entries.
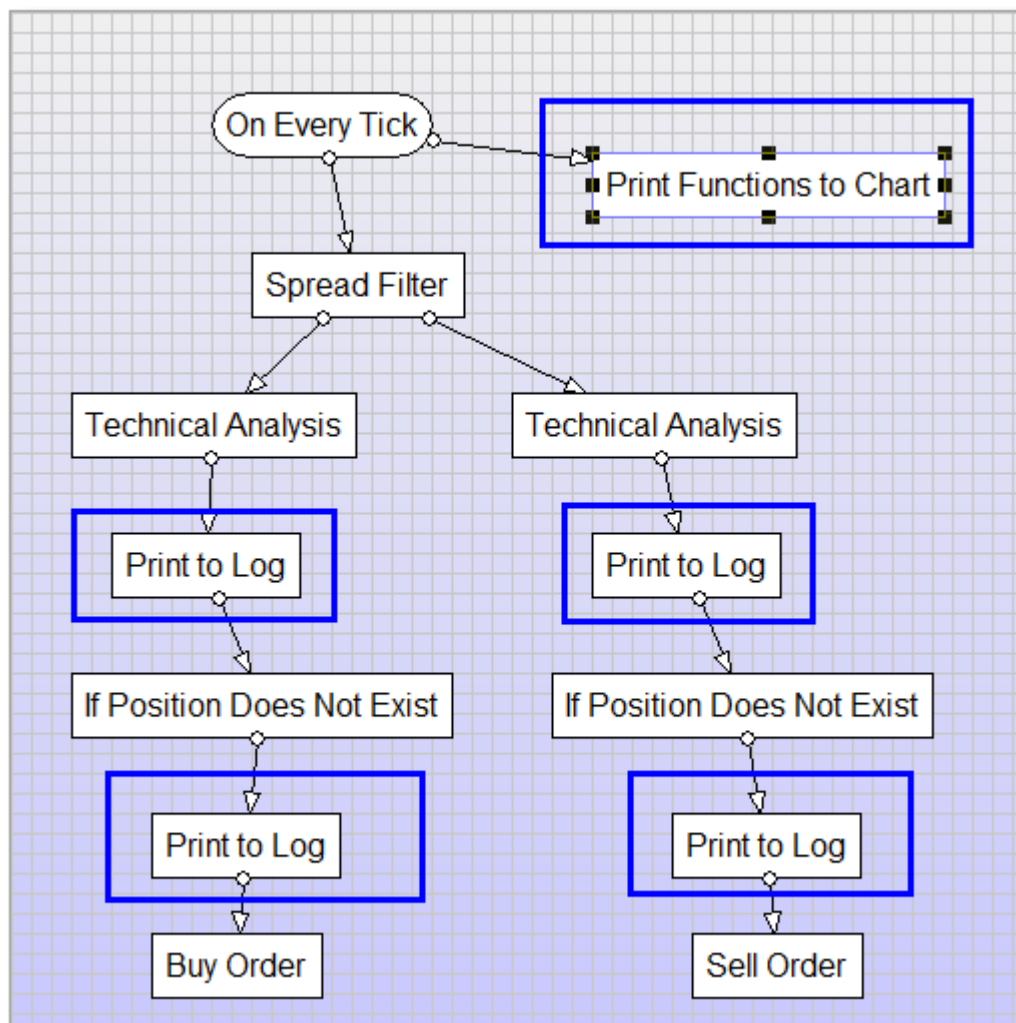
Diagram uses number of diagnostic blocks to test how Expert Advisor is executed.

Blocks like "Trailing Stop", "Break Even" or "Trade Up" have to be attached directly or almost directly to the "On Every Tick". These blocks monitor every tick and perform order management on already open orders. If they are not attached in a way to run on every tick, they might miss an opportunity to open more trades (in case of "Trade Up"), or miss break even opportunity (in case of "Break Even"), etc.
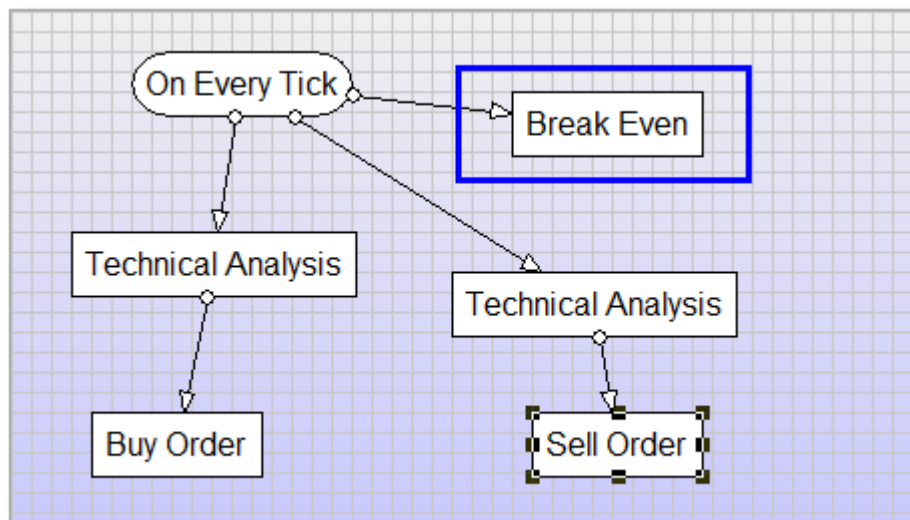
"Break Even", "Trailing Stop", "Trade Up", "Trade Up Trailing", etc. all should be attached to execute on every tick.
Note: If you use "Break Even" you do not need "Trailing Stop" in the same diagram since "Break Even" also trails orders.

Special Warnings

There are some of the most common issues that come up when building and testing your Expert Advisor:

1. You may try to open two orders one for long (buy) and one for short (sell) position but Expert Advisor opens only one of them. This is probably because your broker does not allow hedging. Check the log for Expert Advisor (look under Expert tab in the Forex terminal).
2. Set "Detect Broker Digits" to True or make sure to setup 5-digit broker support on rounded block in the diagram if you are using broker that uses 5 digits after the decimal point to represent currency values.
3. When using Stoploss and Takeprofit values make sure to set them above broker limit. Example: some brokers limit how small your Stoploss can be. If you set it to 2-3 pips your broker may not accept values that small and your order will be open but will not have any Stoploss or TakeProfit set.
4. Some brokers increase spreads when there is heavy trading and currencies fluctuate widely. If you are scalping or using other trading strategies that are very sensitive to spreads use "Spread Filter" block before you open a position. This will reduce your chance to open the position at a specific moment because EA will wait for spreads to calm down. But EA will not open position when spreads are huge and all your profits are eaten away by broker spreads.
5. I am using moving averages and want to open position when they cross. Why does generated EA open a Buy position? Here was no crossing!

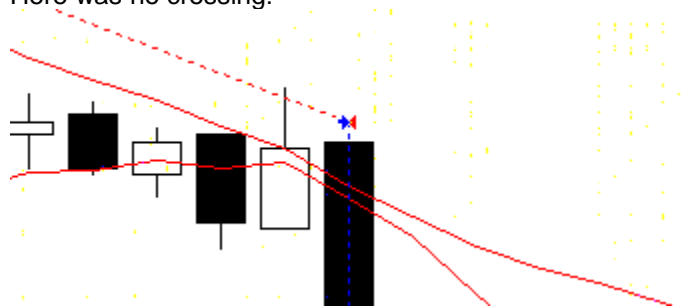There was crossing, but it has disappeared. The chart reflects indicator values on already formed bars and you can see their changes in a bar development process only using a visual testing mode or in real operation. Believe me, there was an intersection at the moment of position opening. If you wish, you can make the EA so, that positions will be opened upon the signals of formed bars. In such a case all signals will be visible on a chart. Use "Shift" parameter in Technical Analysis block and set it to 1 to access previous bar. If you set "Shift" to 0 you will access current bar that is still moving. Using already formed bars (not current bar) has a negative side effect - you might be too late for a trade because you are waiting for the bar to form before you make a decision to trade.

EA Generator produces Expert Advisor and shows "compilation successful" message but when I run it in terminal it does not work. What do I do now?
Simplify, simplify, simplify...
1. If you use pending orders change them to non-pending open market orders.
2. If you use a lot of indicators for opening and closing positions change it to use only one simplest indicator.
3. If your broker uses 5 digits after decimal point, make sure to check that option in EA Generator.
4. Restart your MT terminal for changes to EA take effect.
Once you have simplest EA working, build on it by adding more indicators. But test every additional feature you add.
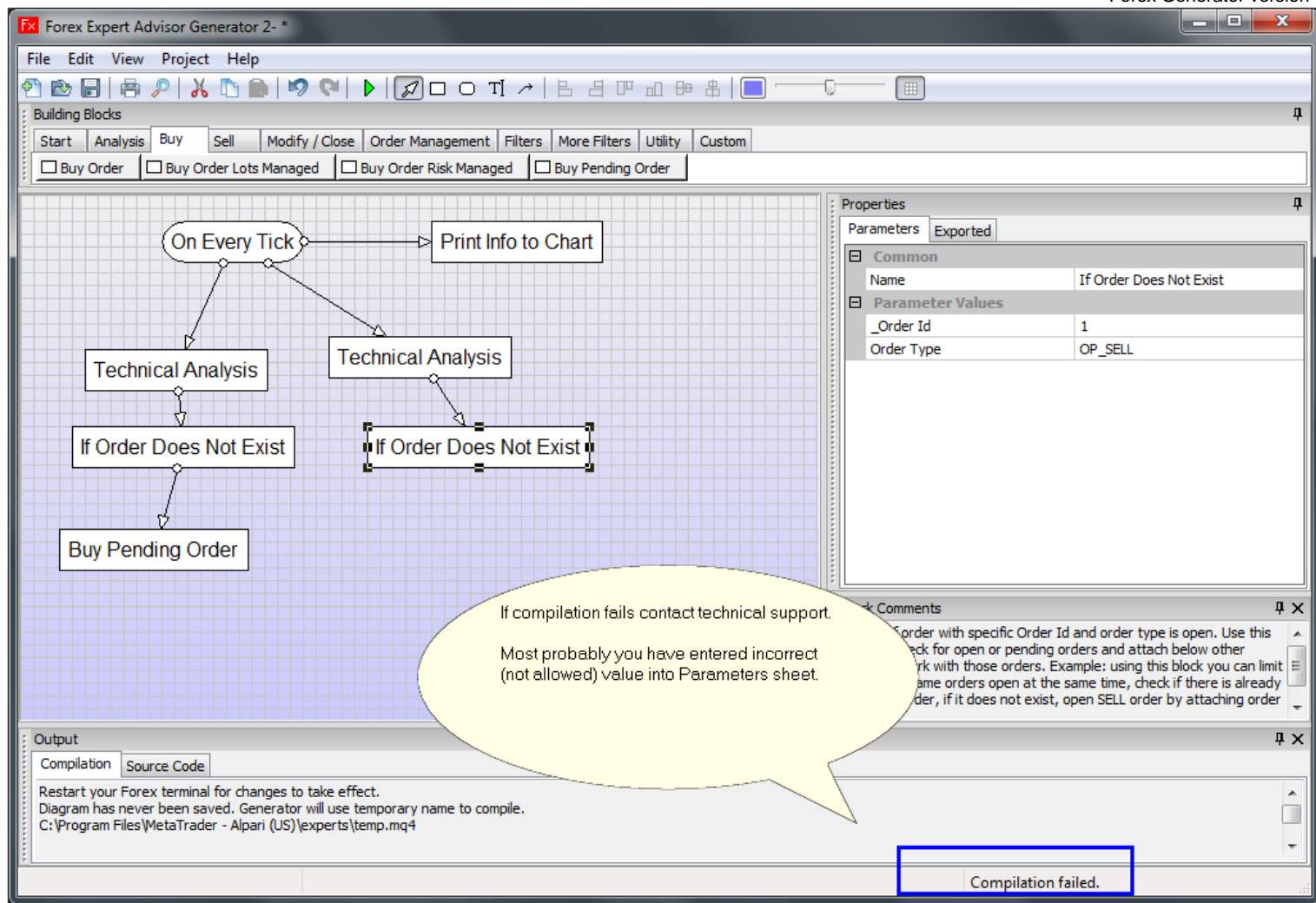
EA Generator shows "Compilation failed" when I press "Generate EA" button.
This is critical error. Most values you enter in property sheet are validated and should not cause compilation to fail. Some values in technical analysis block are not validated and can be manually edited and this could be source of errors. There might be some parameters that escape validation and cause compilation error.

Please email your diagram saved in a file with *.ea4 or *.ea5 extension. You can find our support email on our website support page.

License

Initially installed product comes as time limited trial. If trial license expires you can purchase retail version online. Single retail license allows time unlimited product use on one computer. After the purchase permanent license key will be sent to you by email, enter your new license key in the dialog screen under Help->License menu. This will remove time limit and turn product into retail version.
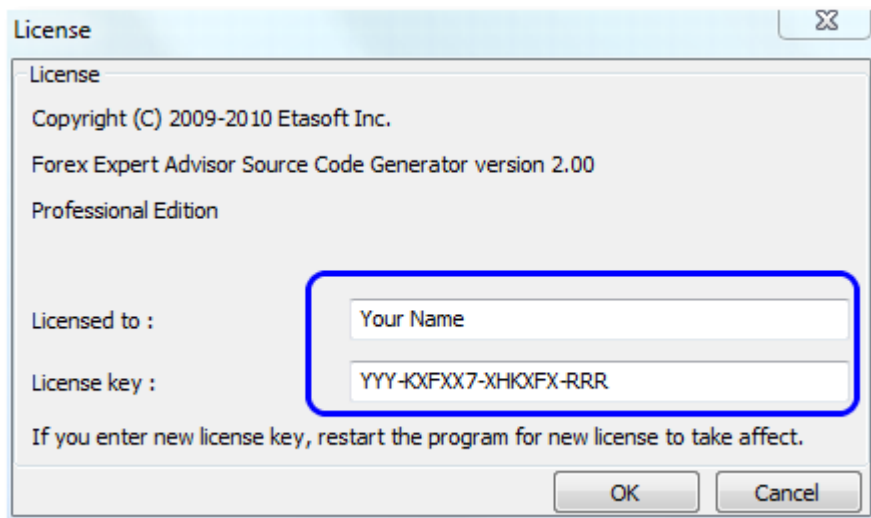
Make sure you enter both license key and who product is licensed to. This information will be in the email you receive after the purchase.

Product comes in two Editions: Standard and Professional. Professional Edition does everything Standard Edition can do and also shows generated source code and produces *.mq4 or *.mq5 files.
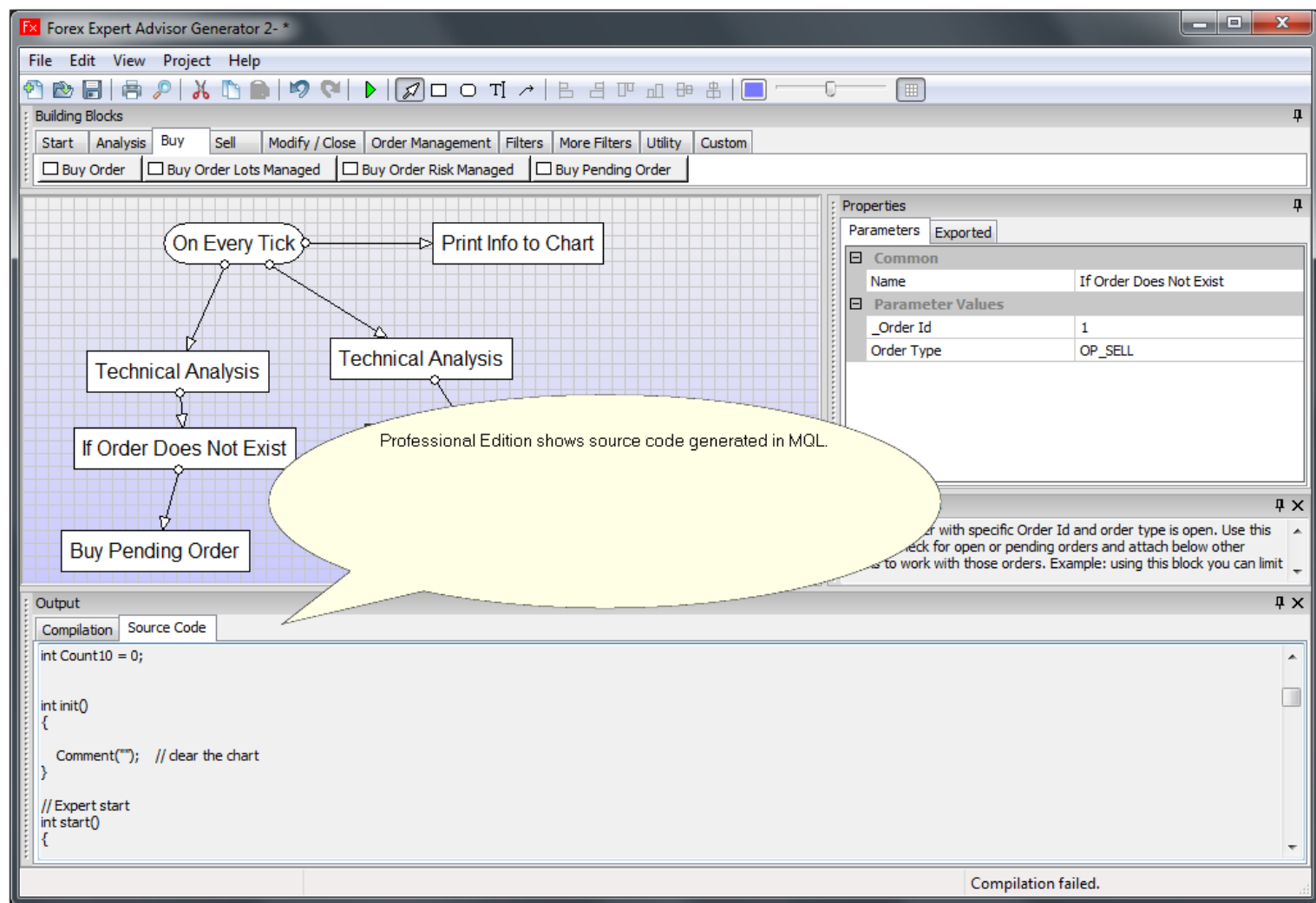
Professional Edition creates both compiled and original source code files. It also shows source code in "Source Code" tab.

Cross Up and Cross Down

Blocks Cross Up and Cross Down provide easier way to check if few indicator lines crossed. They are simplified versions of Technical Analysis blocks. This chapter below describes how cross up and cross down can be done with Technical Analysis blocks.
Question: when to use Cross Up and Cross Down blocks and when to use Technical Analysis blocks?
Answer: If you need finer control over how indicators are used then Technical Analysis blocks are only way. Understanding Technical Analysis blocks is essential to effective use of the software.

In many technical analysis blocks there are cases when you want to check when indicator crossed certain value going up or going down. This is especially true when working with Moving Averages. You want to know if faster moving Moving Average crossed slower one from the bottom going up or from the top going down and based on that trading decision would be made.
Same applies to many other indicators like RSI, CCI or Stochastics. Basic idea is very simple: you use current and previous bar values of the indicator and compare them. There is example with Stochastics:

1. Use "On Every Tick" round block.
2. Use "Technical Analysis 2".
3. Check Stochastics for previous bar and then check Stochastics for current bar.
If previous Stochastics value was above and current value is below some line (fixed number) then it is cross down (going down).
If previous Stochastics value was below and current value is above some line (fixed number) then it is cross up (going up).

There is also screenshot of similar setup with Moving Average (MA):
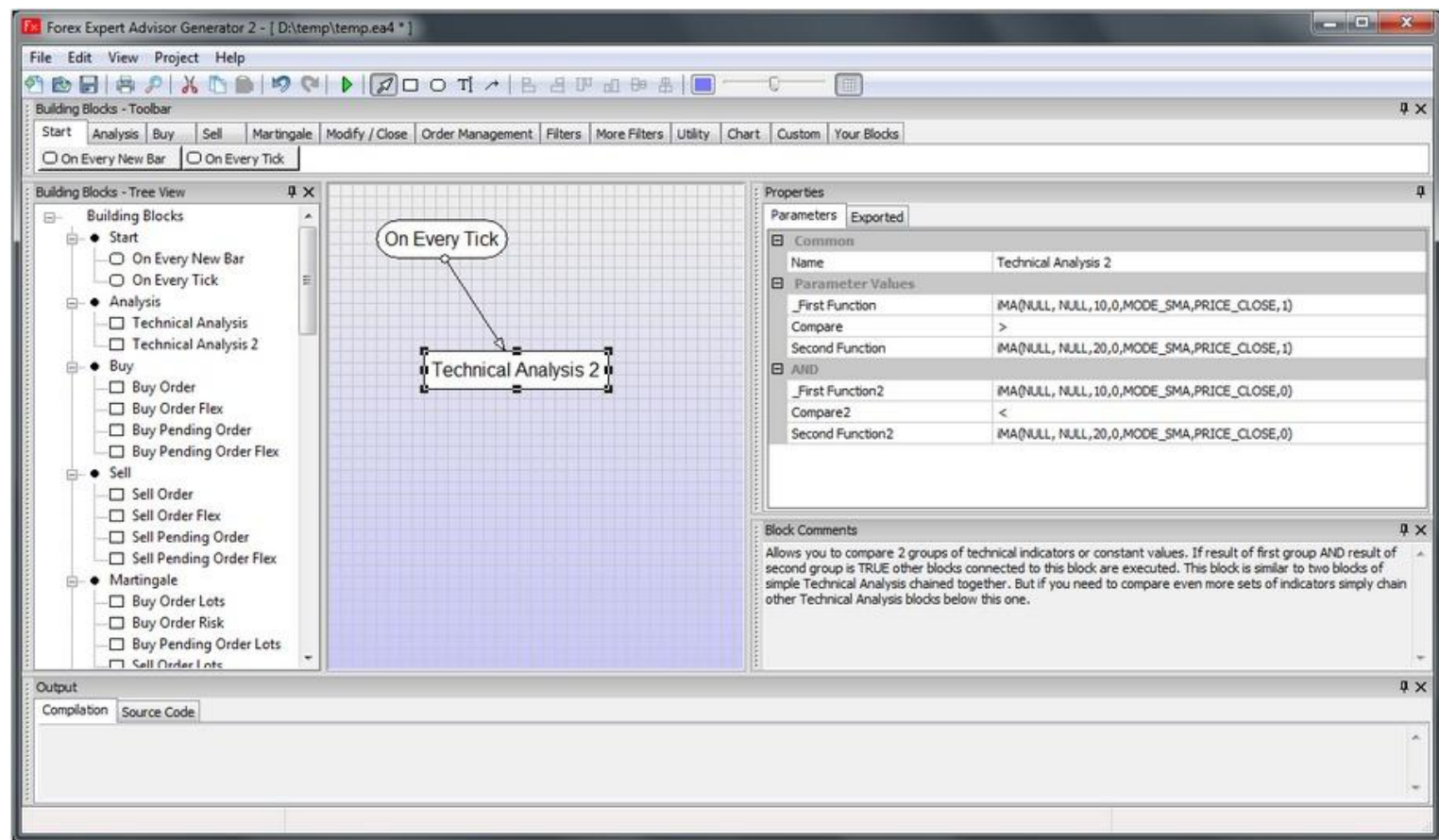
In this example only one "Technical Analysis 2" is used. For both cross up and cross down you would need two "Technical Analysis 2" blocks. One block would have reversed "Compare" and "Compare2" parameters in order to check for indicator line crossing in opposite direction.

Reducing Blocks

When creating your diagram try to keep number of blocks to the minimum. Large diagrams take more time to generate, and create big resulting MT4 Expert Advisors. One way of reducing number of blocks is by using "Technical Analysis 2" or "Technical Analysis 3" instead of two or three simple "Technical Analysis" blocks.
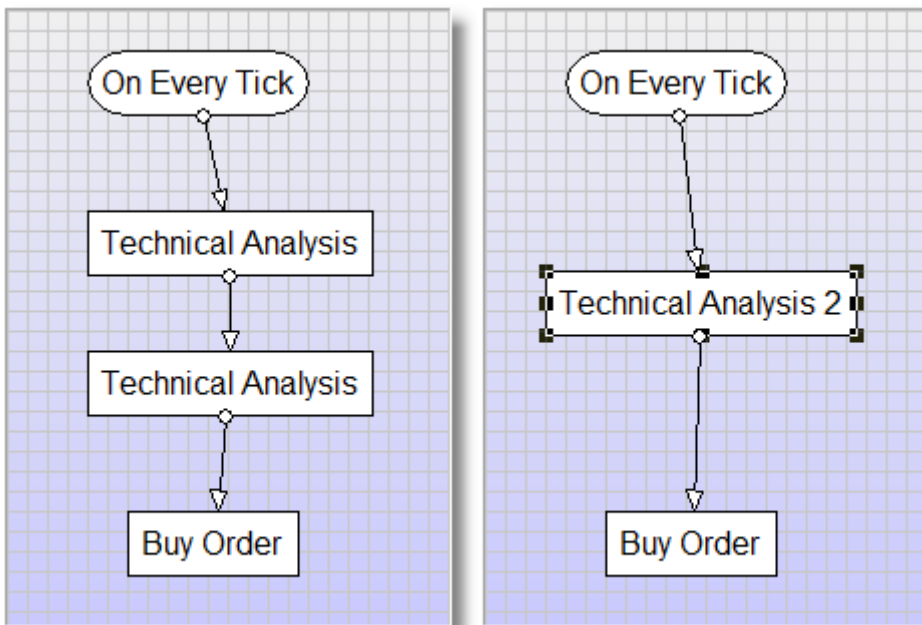
Those two diagrams functionally produce the same result but one uses more blocks.
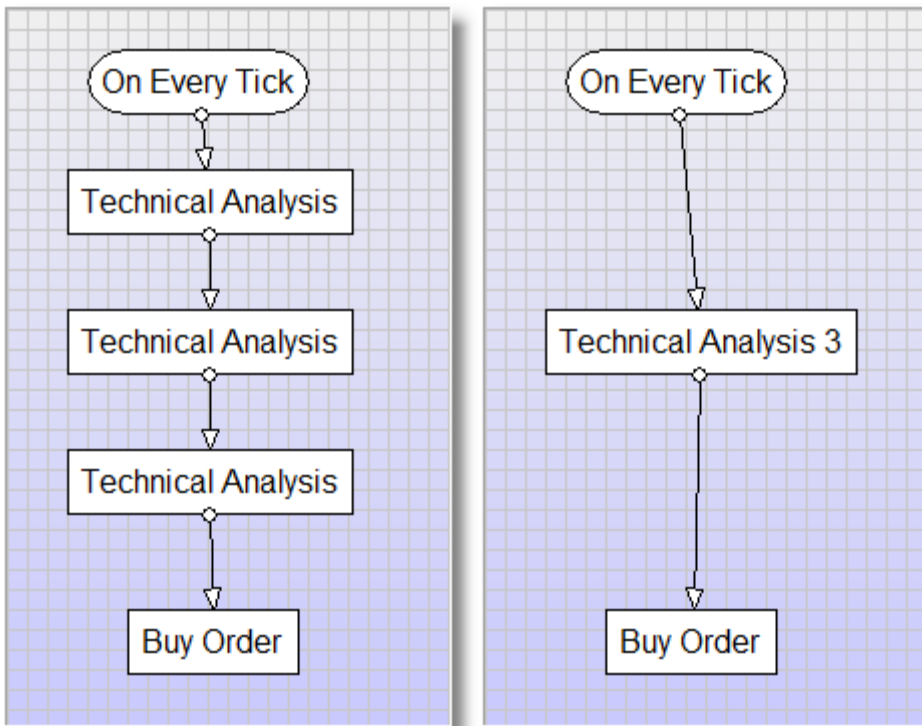
Resulting EA from those two diagrams will work the same way.

EA Example 1 - Diagram Using Moving Averages

This setup is provided for illustration purposes on how to use EA Generator and it is not a final profitable Expert Advisor.

MT5 specific: Diagrams below use building blocks specific to MT4. The differences between MT4 and MT5 block names are minor but important. One important point: blocks "If Order Does Not Exist" in MT4 in most cases have to be replaced with blocks "If Position Does Not Exist". See chapter on MT5 and MT4 differences for details.

This simple setup executes BUY order once fast moving average crosses slow moving average. Setup also prevents opening more BUY orders if one is already open. So EA would not be opening orders endlessly on every tick one after the other once conditions are right.
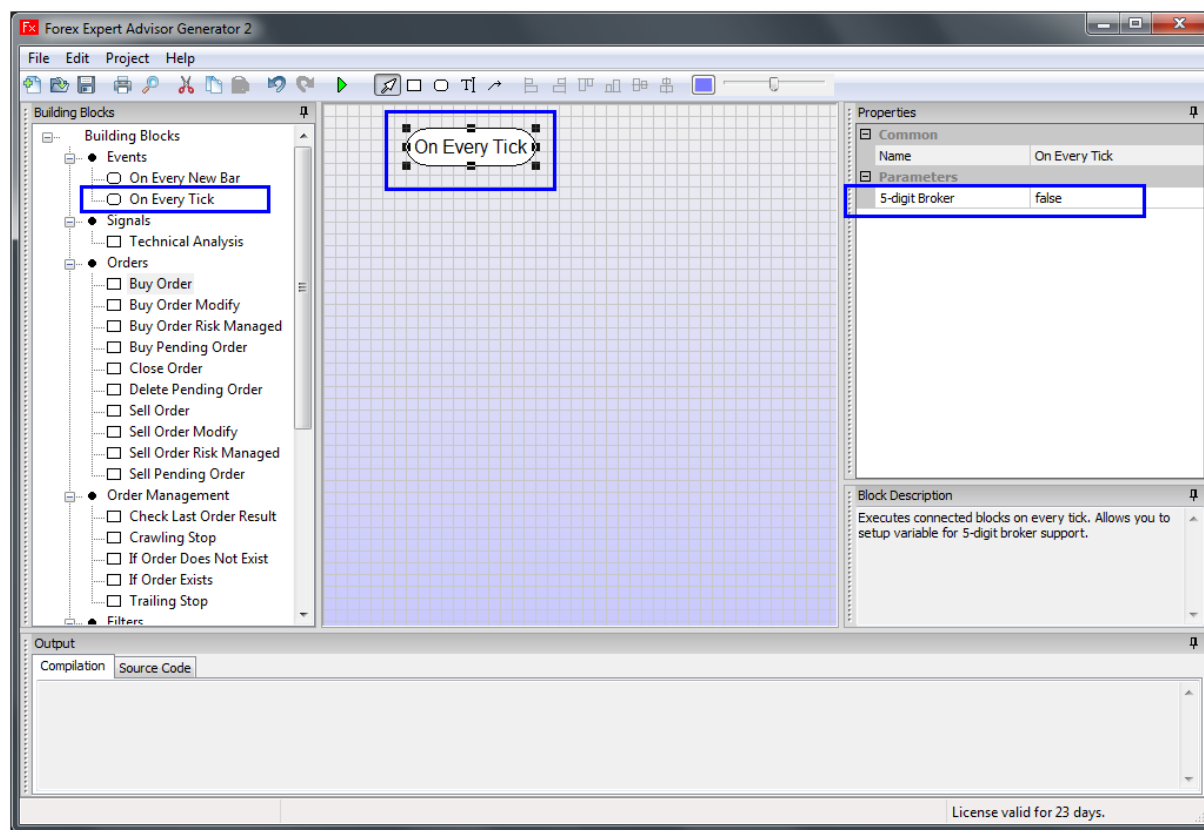
We start with "On Every Tick" block that marks a point where our EA will start executing on every new tick. You can also setup a parameter based on your broker support for currency representation. If broker supports 5 digits after decimal point, setup "5-digit Broker" parameter to "true".

This setup is just an example on how to setup basic building blocks and use Technical Analysis and Buy Order blocks together. It is not a full trading system.
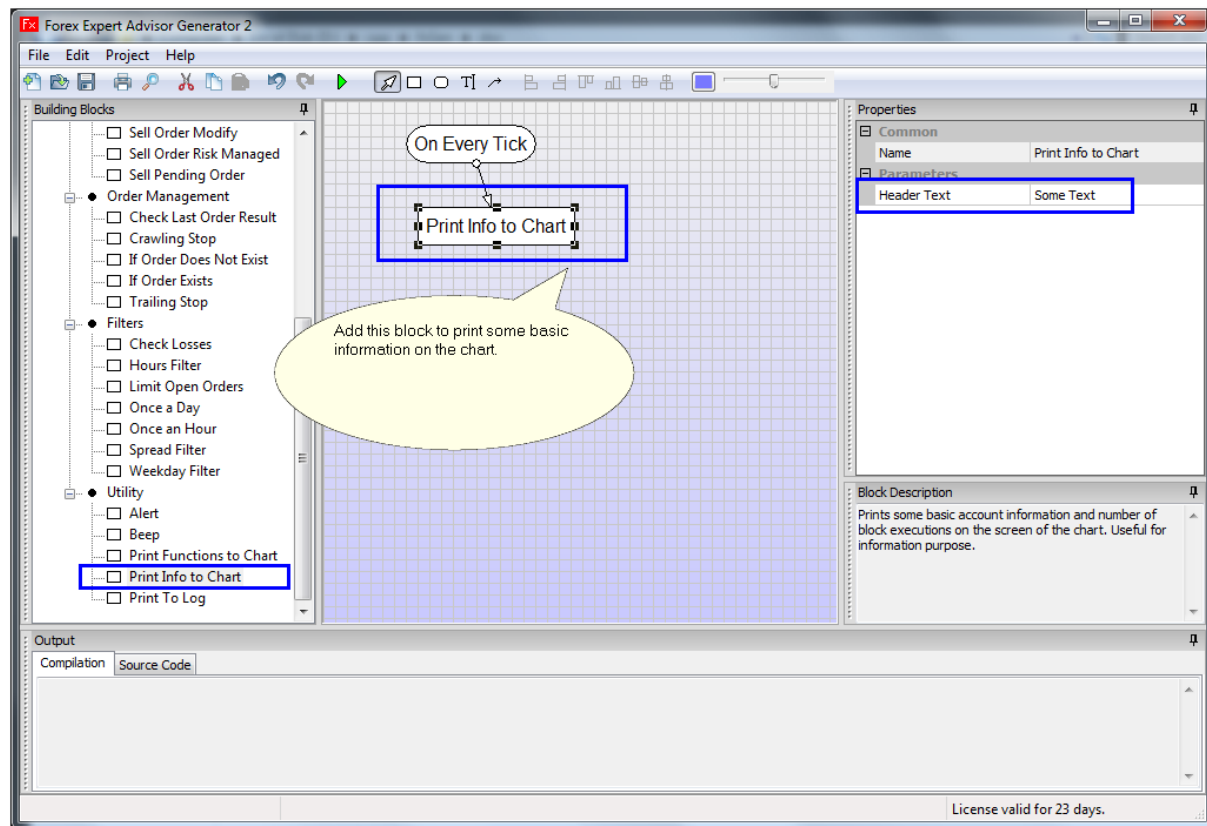
Add block "Print Info To Chart" to get some basic information displayed on the chart.
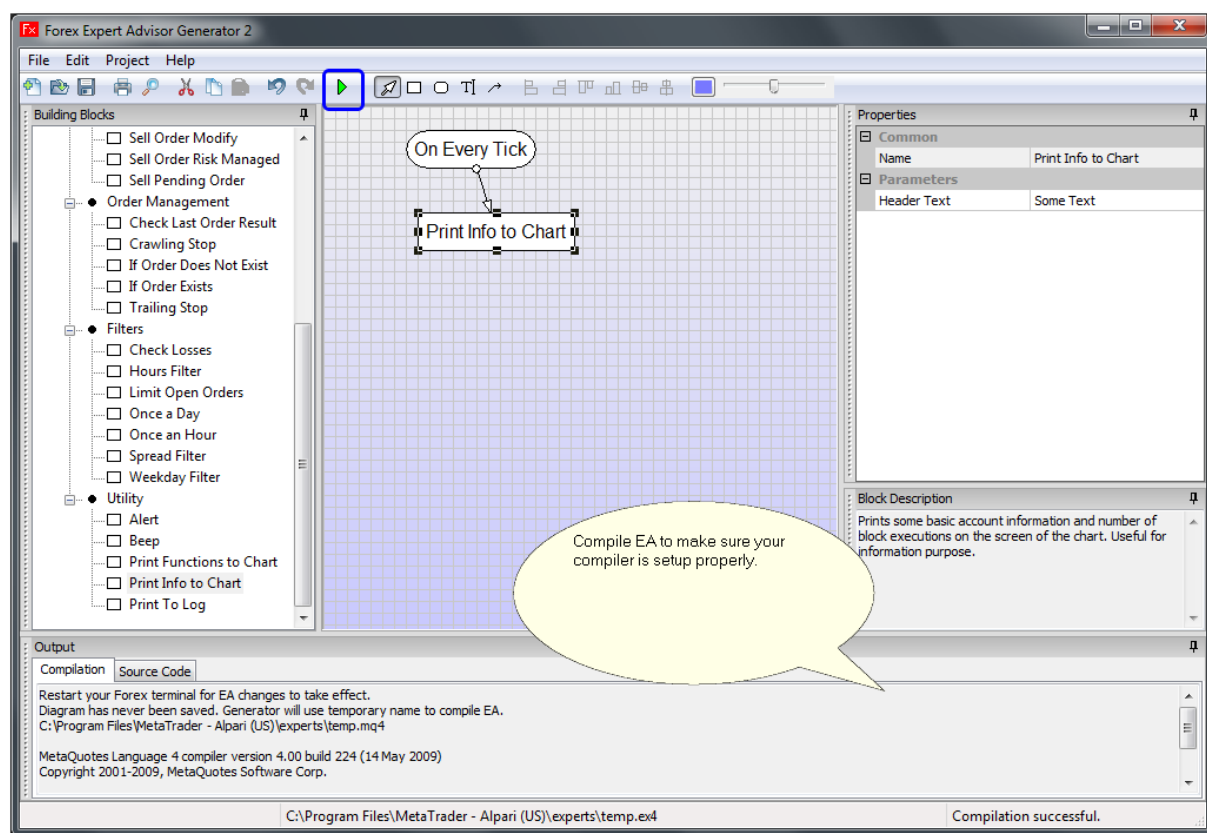
Press button "Generate EA" to make sure you have compiler setup via Options screen and your EA gets compiled successfully.
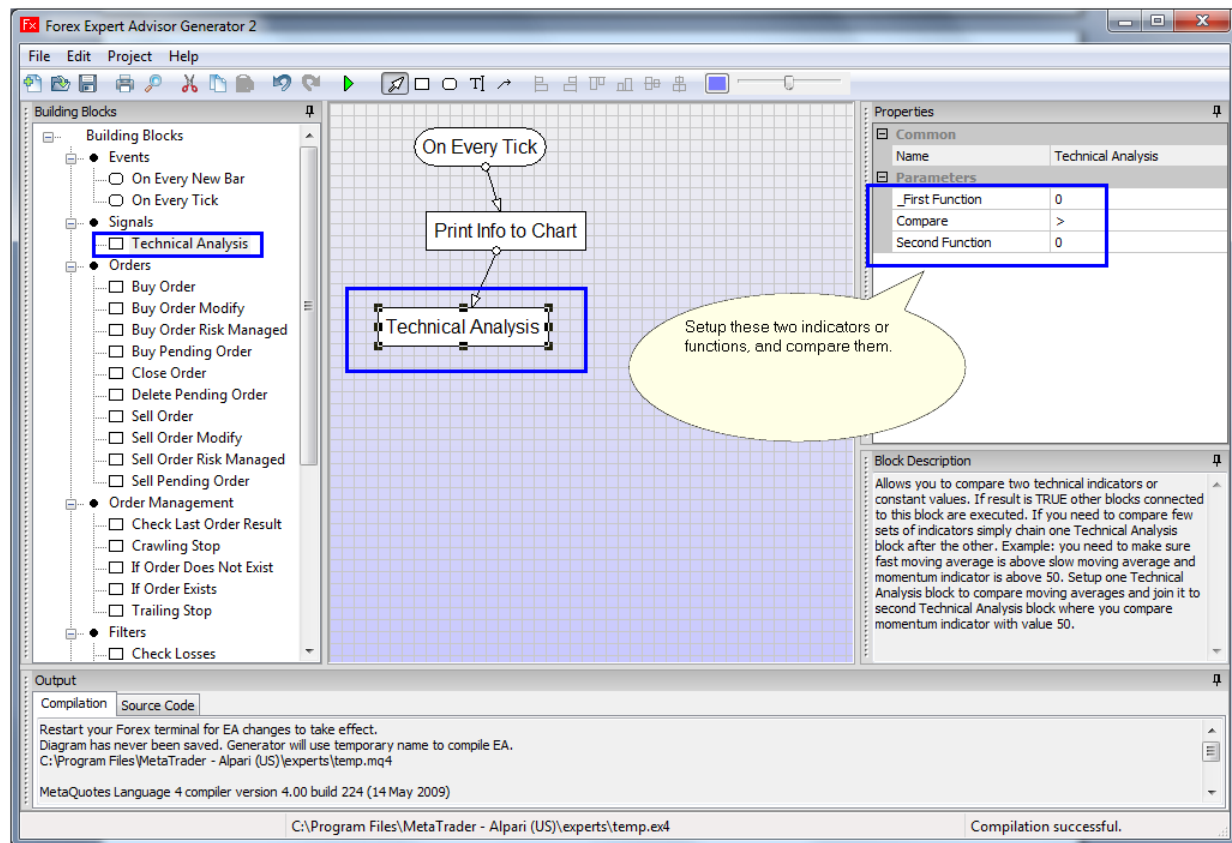
Add "Technical Analysis" block. This is where decision will be made to open BUY position or not.
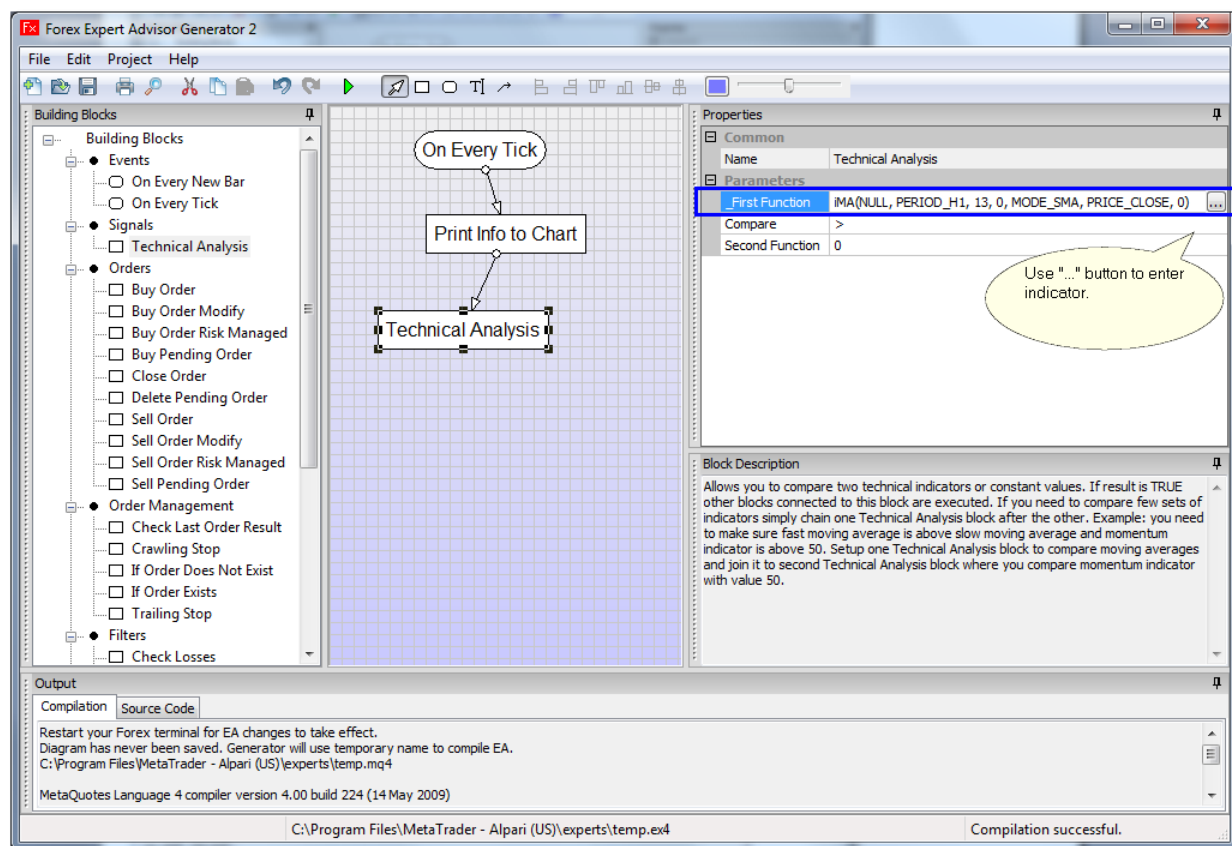
Use "…" button to setup each function.

Setup indicator we use. In this case it is moving average.

If fast moving average is above slow moving average, it is our setup so let's execute other connected blocks below.
Use "…" button to modify indicator function parameters.
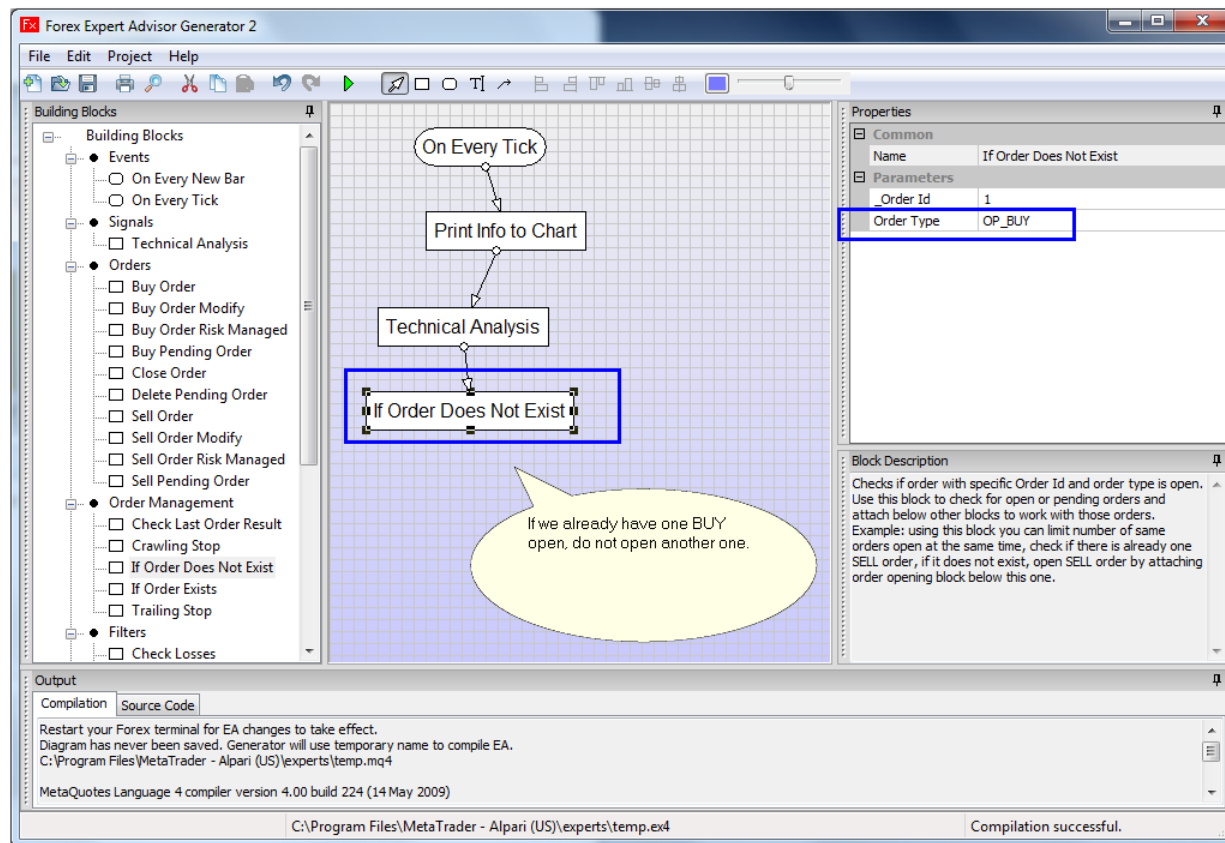
We do not want to continue opening more BUY positions if one is already open. "If Order Does Not Exist" checks for existing BUY positions and only executed connected blocks if there is no other BUY open at the same time.
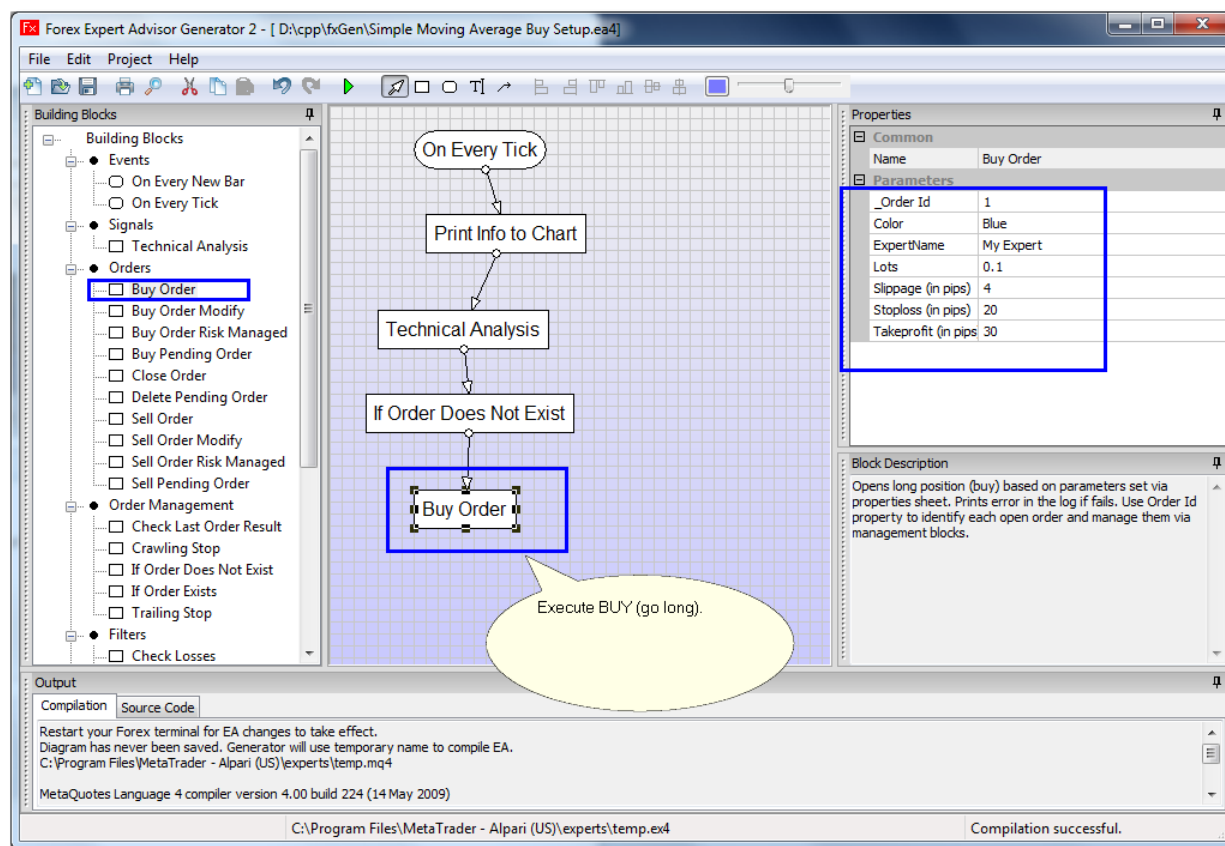
Setup BUY (go long) order execution block with specific lot size, Stoploss and Takeprofit.

Here is our simple setup in action in Forex terminal.
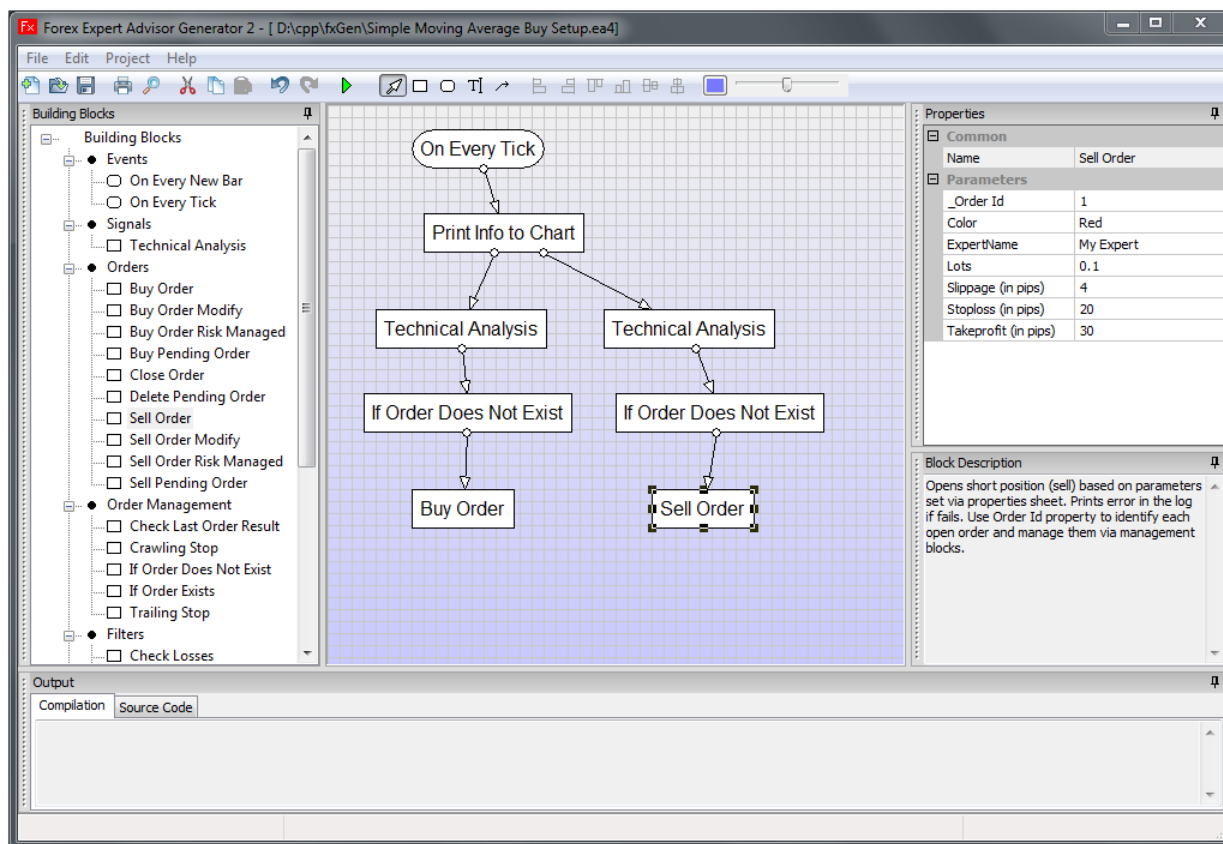
That is the same setup as before but this time we have added another branch where we make a SELL if fast moving average crosses down below slow moving average.

EA Example 2 - Diagram Using Custom Indicators

This setup is provided for illustration purposes on how to use EA Generator and it is not a final profitable Expert Advisor.

MT5 specific: Diagrams below use building blocks specific to MT4. The differences between MT4 and MT5 block names are minor but important. One important point: blocks "If Order Does Not Exist" in MT4 in most cases have to be replaced with blocks "If Position Does Not Exist". See chapter on MT5 and MT4 differences for details.

This is more complicated sample that uses custom indicators and pending orders. Again we start with "On Every Tick" block and add other blocks below it.
In this case we use pending orders for BUY LIMIT and SELL LIMIT. Idea behind this setup is that once our custom indicator signals BUY (go long) or SELL (go short) setup, we open only one pending order 5 pips below current price and we expect market to fluctuate a bit in opposite direction than we expected and pending order kick-in to become open market order.
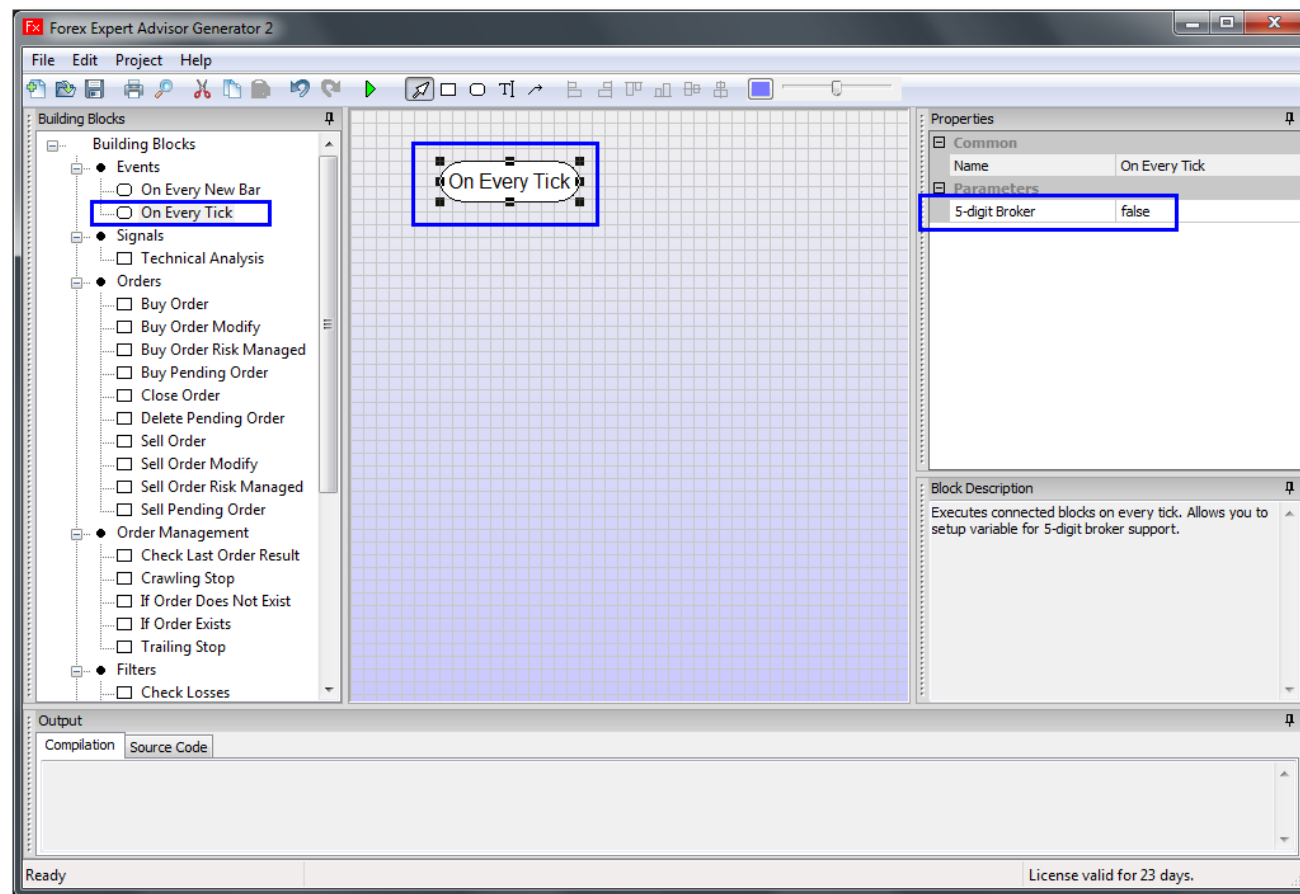

We start with "On Every Tick" block that marks a point where our EA will start executing on every new tick. You can also setup a parameter based on your broker support for currency representation. If broker supports 5 digits after decimal point, setup "5-digit Broker" parameter to "true".
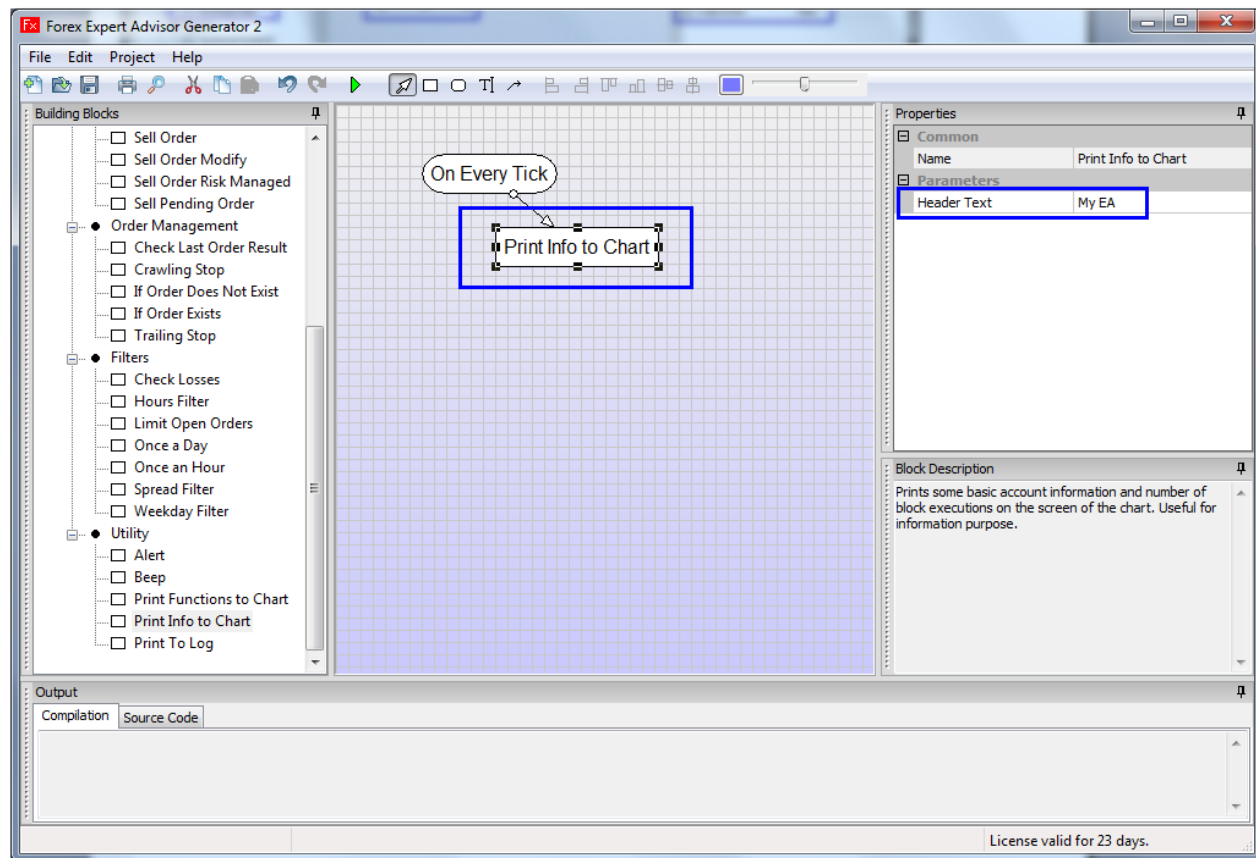
Add block "Print Info To Chart" to get some basic information displayed on the chart.
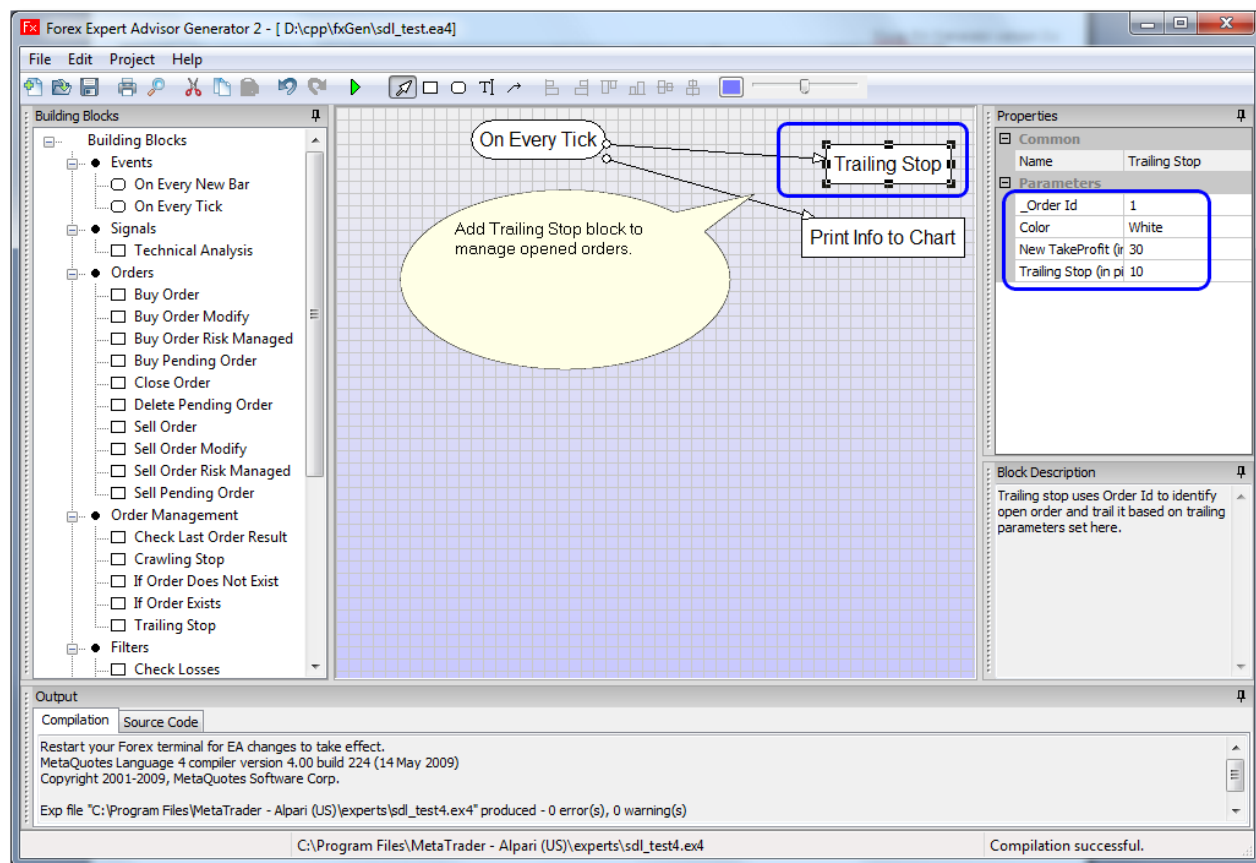
Add "Trailing Stop" block to manage opened orders.
We want to run "Trailing Stop" block on every tick so it is attached directly to "On Every Tick" block. Tailing stop checks if there are any open market non-pending orders and tries to trail currency prices, maximize profits and minimize risk. In some scenarios trailing stops are not effective. It all depends on your specific trading setup.

You can also use Order Id property to trail only specific orders. Let say your EA opens two orders when it gets market signal via Technical Analysis block. You use one Order Id for the first order and use another Order Id for the second order. Now you can use trailing stops on the first order and do not use trailing stops on the second order.

Add two Technical Analysis blocks. Each block is directly connected to "On Every Tick" so it will execute on every tick. But each Technical Analysis block will execute other blocks we later connect to them only if conditions are met and custom indicator signals us that it is time to do so.
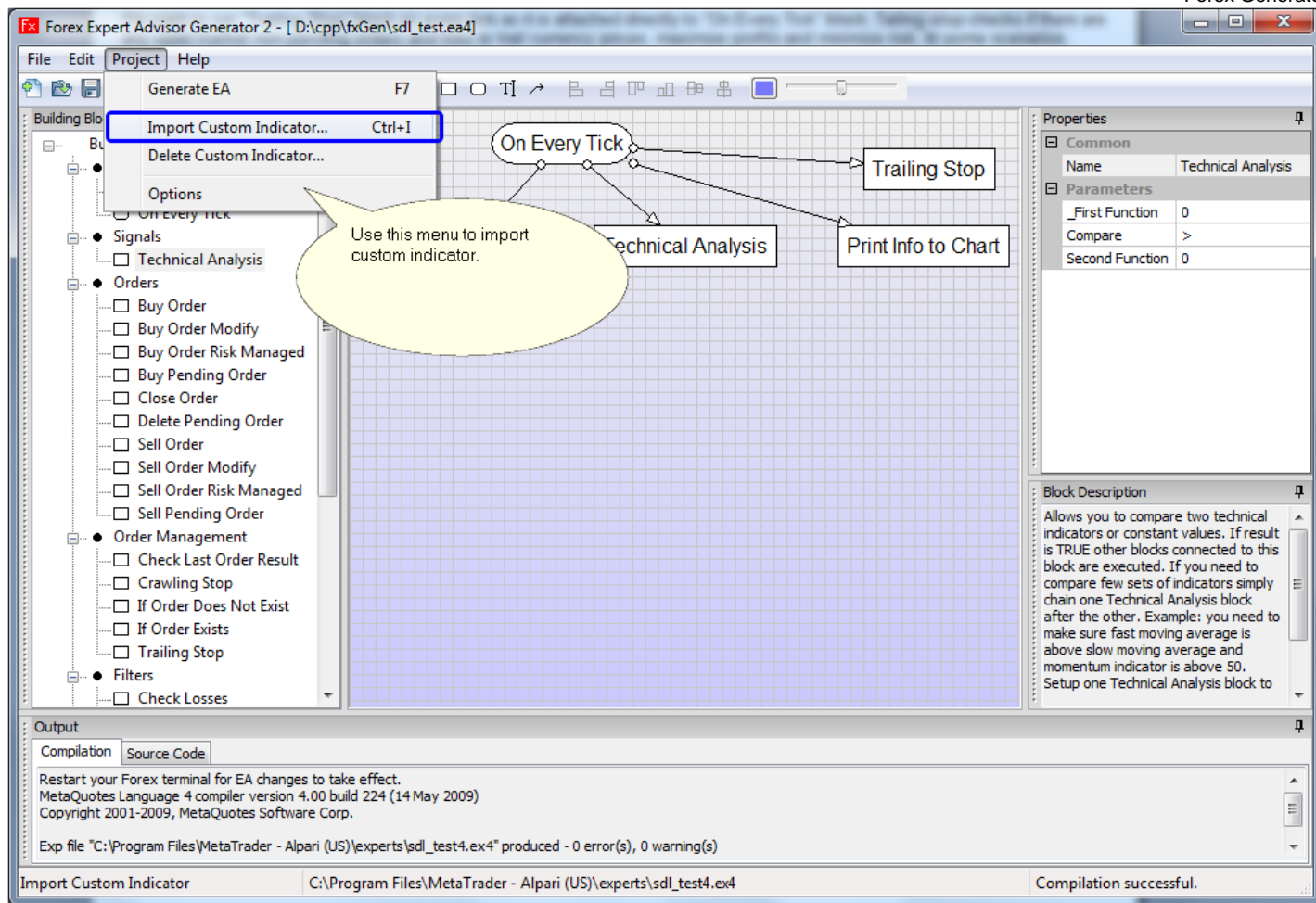
You can import custom indicators via "Import Custom Indicator" menu.

Once you import custom indicator it will be accessible via "…" button available on "_First Function" and "Second Function" properties on Technical Analysis block.
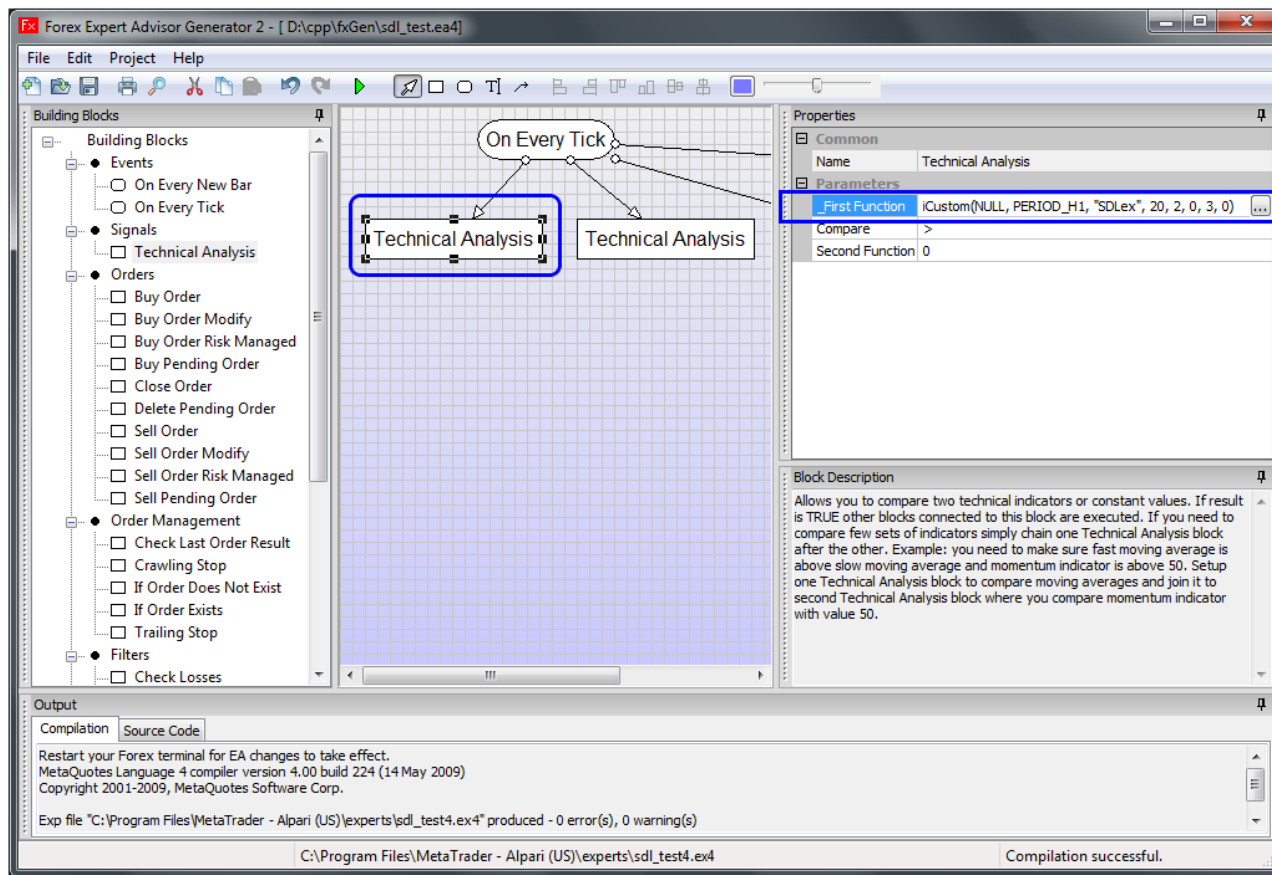
Use "…" button to add custom indicator call to the Technical Analysis block.

Problem with most custom indicators found online is that they come with zero documentation. If you drop them on the chart they show some graphical information but what values they return is not documented. Without knowing what values they return it is not possible to understand how to integrate them into your EA. Some custom indicators are simply not designed to be used via Expert Advisor. Since most custom indicators found on Internet forums are free they come with no support. Authors of the custom indicators are usually only interested in developing indicators but not documenting or supporting them.

Our indicator is very simple. It returns 1 when there is time to buy (go long) and -1 when there is time to sell (go short). It also changes color indicating it on the chart. Because of this simplicity there is only one Technical Analysis block for buy and one Technical Analysis block for sell detection.

We setup "If Order Does Not Exist" blocks to make sure we do not have already open orders of the same type. This prevents us from keep on opening more orders of the same type. Because we are working with pending orders we may have orders that are still pending and orders that are already been filled. We want to make sure we do not open any new orders neither pending nor market orders. That's why two "If Order Does Not Exist" blocks are used. First prevents open market orders and second prevents more pending orders.

This "If Order Does Not Exist" block prevents more pending orders to be open.

Close any SELL orders we had open already since market signal changed direction.
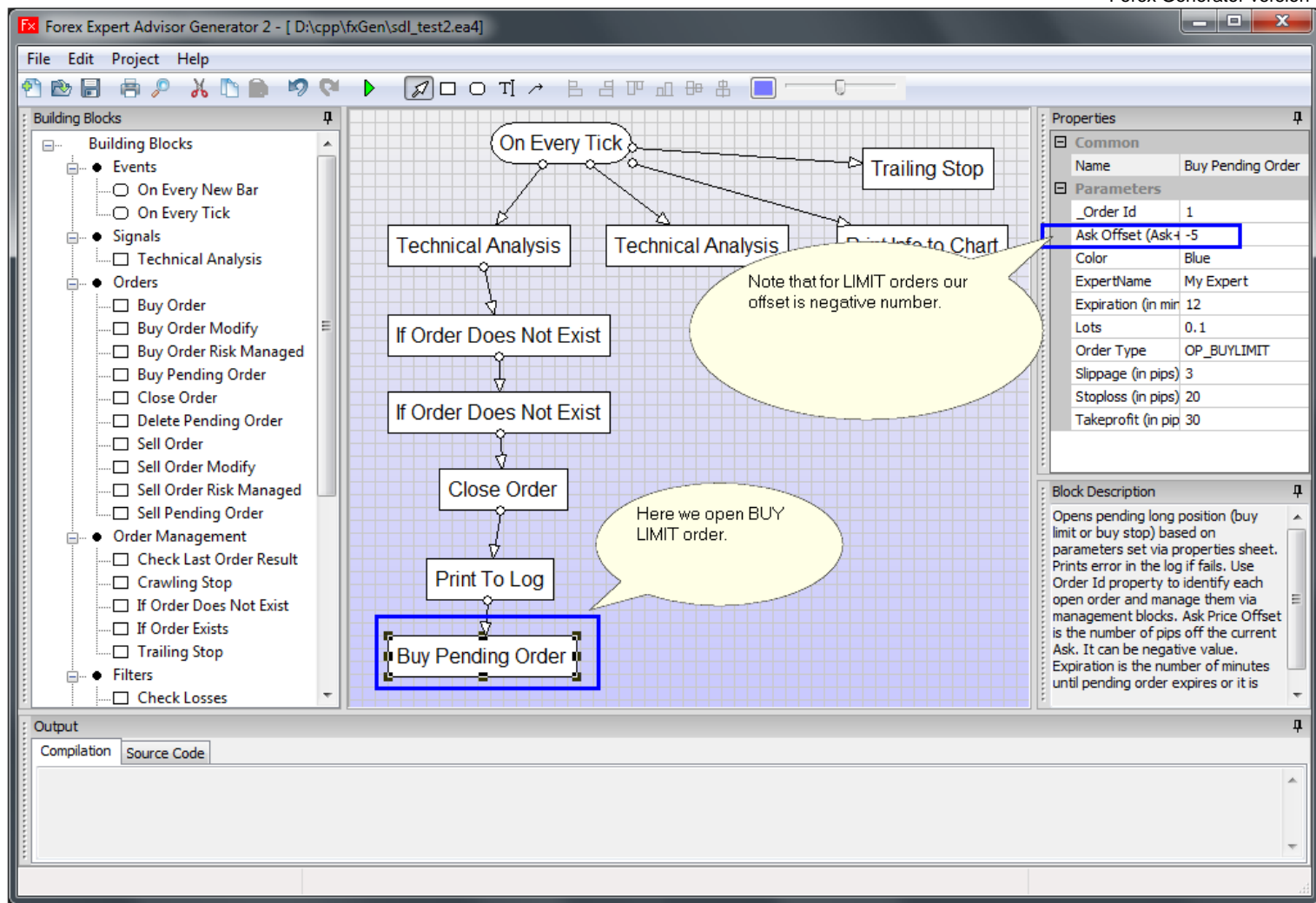
Please note that for LIMIT orders our Ask Offset parameter is negative number. Another important parameter is Expiration. It is number of minutes how long pending order will be pending until it is filled or expires.

We setup second branch of the diagram based on the first. It is mirror image of the existing branch with order types reversed, example: where we have OP_BUYLIMIT we use OP_SELLLIMIT, etc.

You can add some text objects to the diagram to explain its execution better.

Forex Expert Advisor Generator 2 - [D:\cpp\fxGen\sdl_test4.ea4]

File   Edit   Project   Help

Building Blocks

- Building Blocks
  - ● Events
    - ○ On Every New Bar
    - ○ On Every Tick
  - ● Signals
    - ☐ Technical Analysis
  - ● Orders
    - ☐ Buy Order
    - ☐ Buy Order Modify
    - ☐ Buy Order Risk Managed
    - ☐ Buy Pending Order
    - ☐ Close Order
    - ☐ Delete Pending Order
    - ☐ Sell Order
    - ☐ Sell Order Modify
    - ☐ Sell Order Risk Managed
    - ☐ Sell Pending Order
  - ● Order Management
    - ☐ Check Last Order Result
    - ☐ Crawling Stop
    - ☐ If Order Does Not Exist
    - ☐ If Order Exists
    - ☐ Trailing Stop
  - ● Filters
    - ☐ Check Losses
    - ☐ Hours Filter
    - ☐ Limit Open Orders
    - ☐ Once a Day

Diagram blocks:

On Every Tick → Trailing Stop

- Technical Analysis — BUY / Technical Analysis — SELL / Print Info to Chart
- If Order Does Not Exist / If Order Does Not Exist
- If Order Does Not Exist / If Order Does Not Exist
- Close Order / Close Order
- Print To Log / Print To Log
- Buy Pending Order / Sell Pending Order
- Beep / Beep

Properties

Block Description

Output — Compilation | Source Code

Restart your Forex terminal for EA changes to take effect.
MetaQuotes Language 4 compiler version 4.00 build 224 (14 May 2009)
Copyright 2001-2009, MetaQuotes Software Corp.

Exp file "C:\Program Files\MetaTrader - Alpari (US)\experts\sdl_test4.ex4" produced - 0 error(s), 0 warning(s)

C:\Program Files\MetaTrader - Alpari (US)\experts\sdl_test4.ex4   Compilation successful.

Compile your EA using "Generate EA" button or menu.

Compile your finished EA using "Generate EA" button or menu.

EA Example 3 - Diagram Using Bollinger Bands

This setup is provided for illustration purposes on how to use EA Generator and it is not a final profitable Expert Advisor.

MT5 specific: Diagrams below use building blocks specific to MT4. The differences between MT4 and MT5 block names are minor but important. One important point: blocks "If Order Does Not Exist" in MT4 in most cases have to be replaced with blocks "If Position Does Not Exist". See chapter on MT5 and MT4 differences for details.

The Bollinger Trending System with ADX Filter strategy buys, goes long, when price breaks out above the second standard deviation Bollinger Band and confirms entries with the ADX index (ADX above 20). It sells, goes short, when price breaks below the bottom of the second standard deviation Bollinger Band and confirms entries with the ADX index (ADX above 20). When the strategy crosses back across the first standard deviation the strategy exits the trade. It works best in trending markets.

This is more complicated sample that uses two indicators. There is first indicator to signal trade and second indicator to confirm it. Strategy also uses separate logic and one of the indicators to close any opened positions.

Again we start with "On Every Tick" block and add other blocks below it.
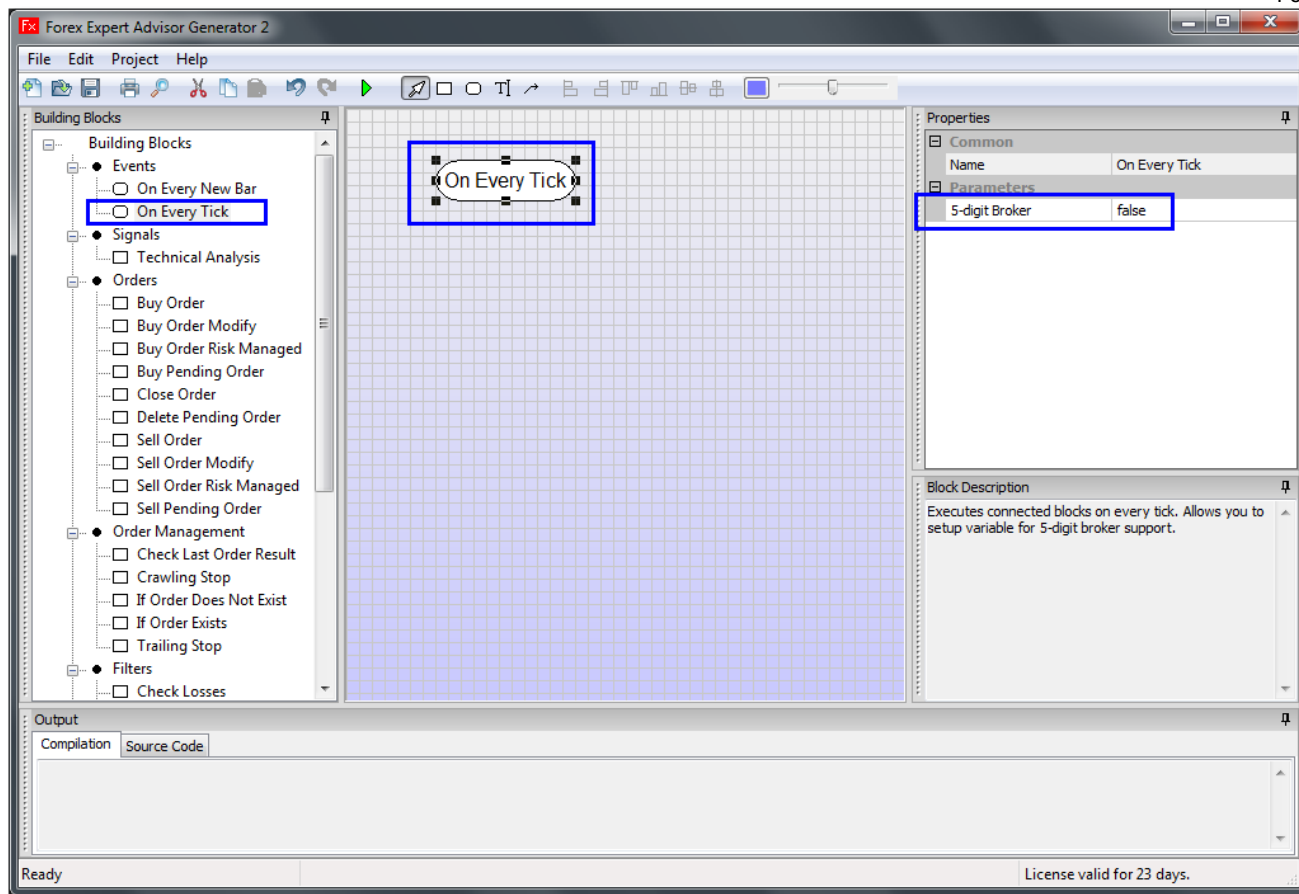
We start with "On Every Tick" block that marks a point where our EA will start executing on every new tick. You can also setup a parameter based on your broker support for currency representation. If broker supports 5 digits after decimal point, setup "5-digit Broker" parameter to "true".

There is our simplified setup using Bollinger Bands without closing signals indicated on the chart.
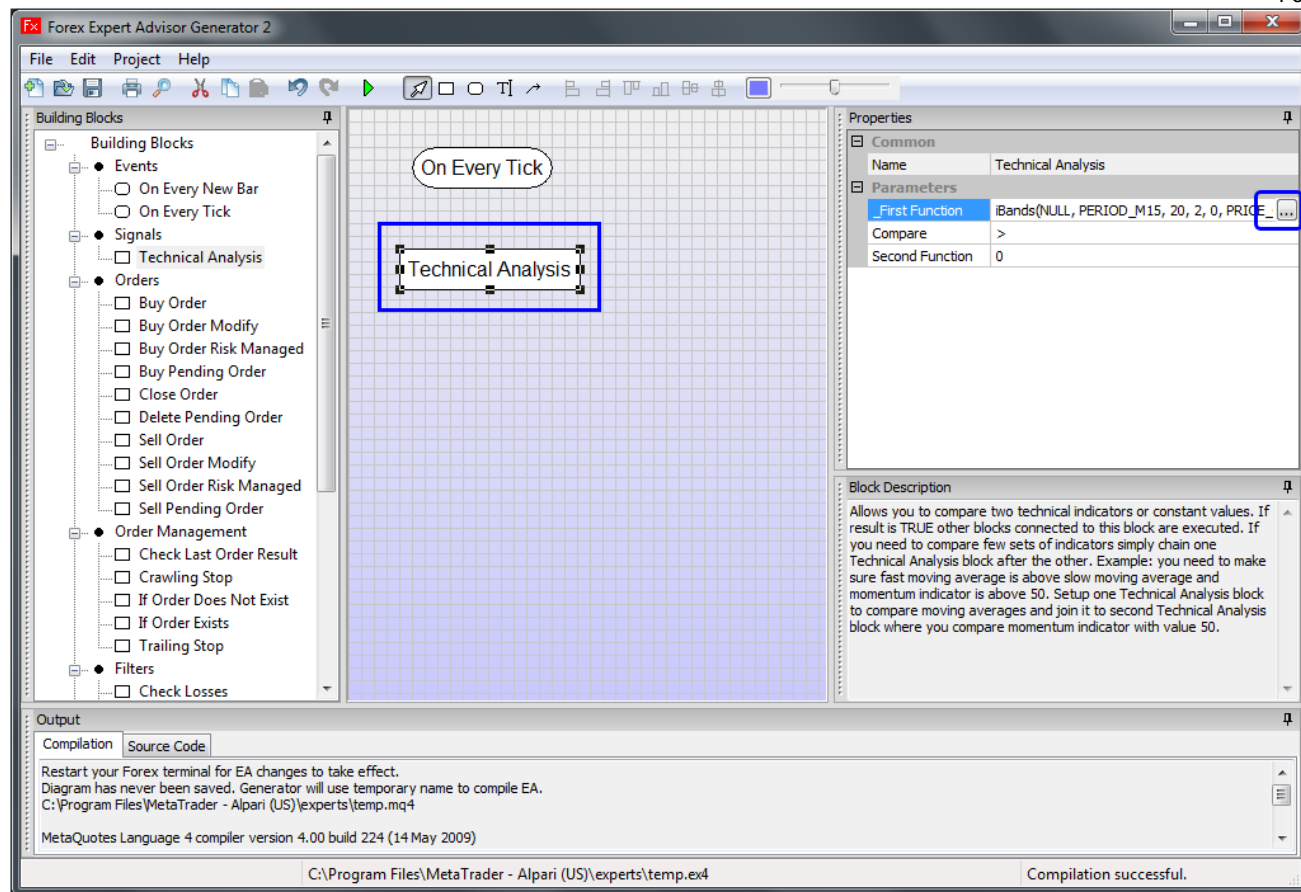
We use Technical Analysis block to compare second deviation of Bollinger Bands upper line to current high value of the bar.
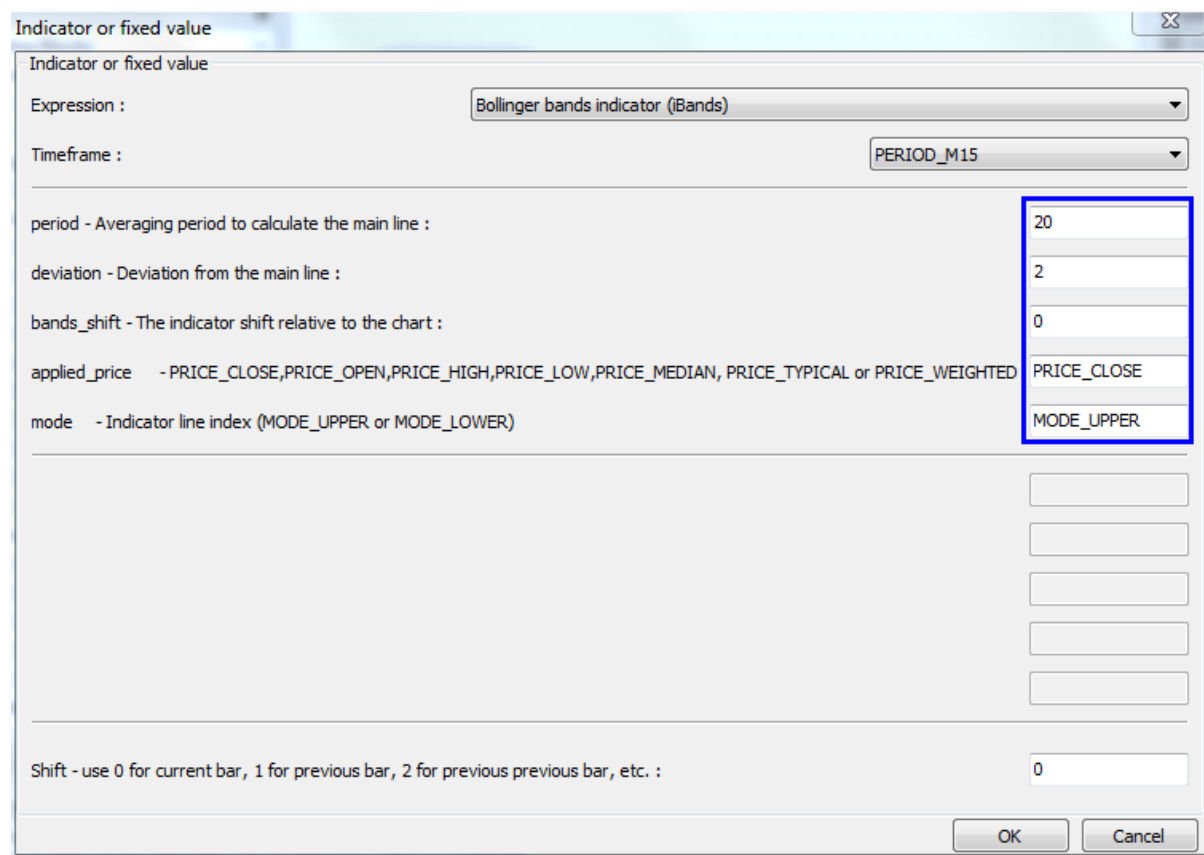
There is our Bollinger Bands indicator setup.
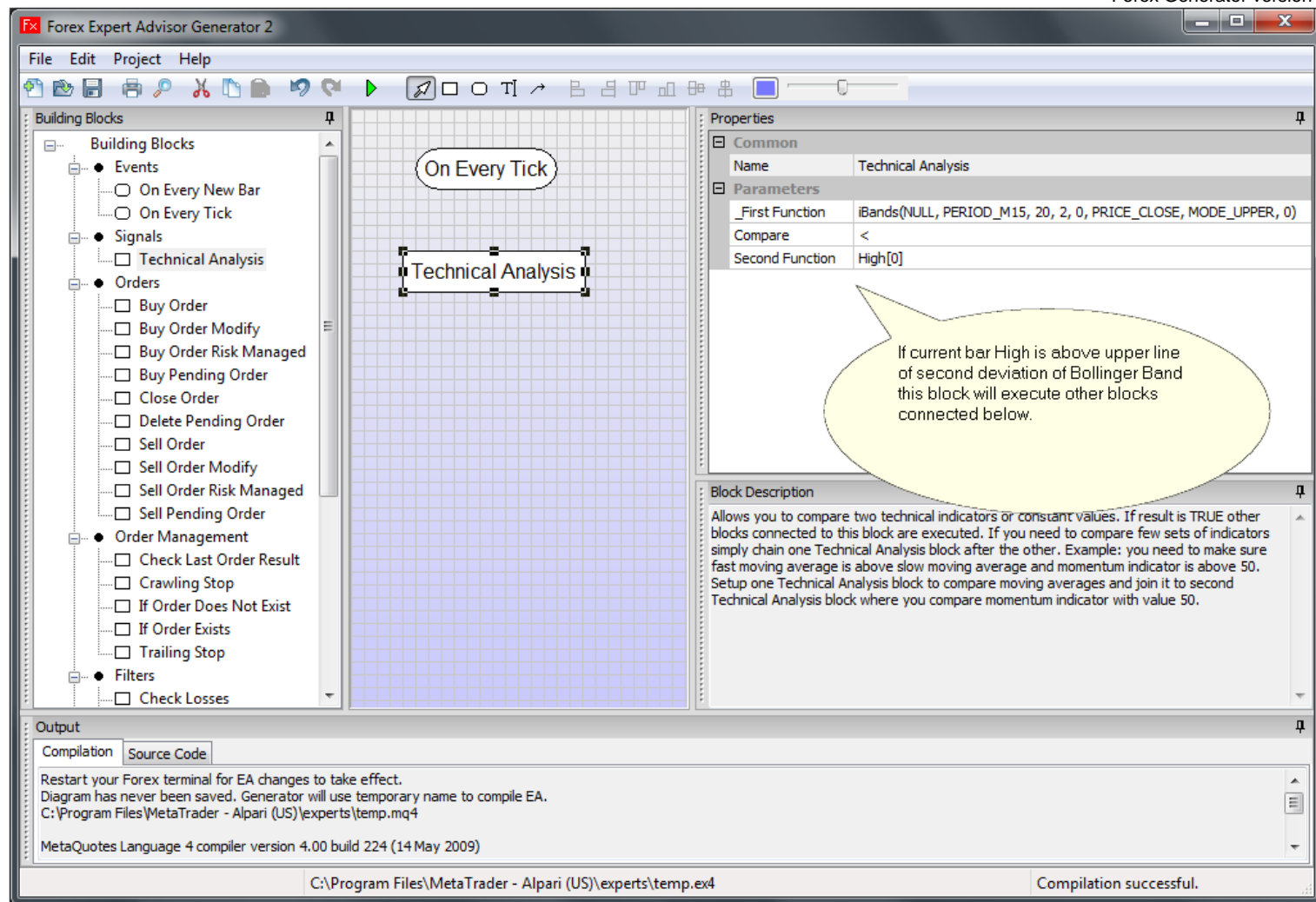
We compare current High value of the bar to return from Bollinger Bands indicator. You can also compare current close value (Close[0]), previous close (Close[1]) or previous high (High[1]) values of the bar.
This is just an example. You can use other indicators of your choice.

We take result of ADX indicator and compare it to 20. If it is above that value, there is possibility of a trend and that confirms our initial signal that come from Bollinger Bands.

There we check if BUY order is already open and if it is not, we execute buy order.

There we setup buy order (go long). Risk parameter is a percentage based on Free Account Margin.

There we add another Technical Analysis block. This one is for order closing.

In second Technical Analysis block we use first deviation. You can also use other indicators or parameters to close the order.

If current bar Low is below Bollinger Bands first deviation, close any buy positions we might have.
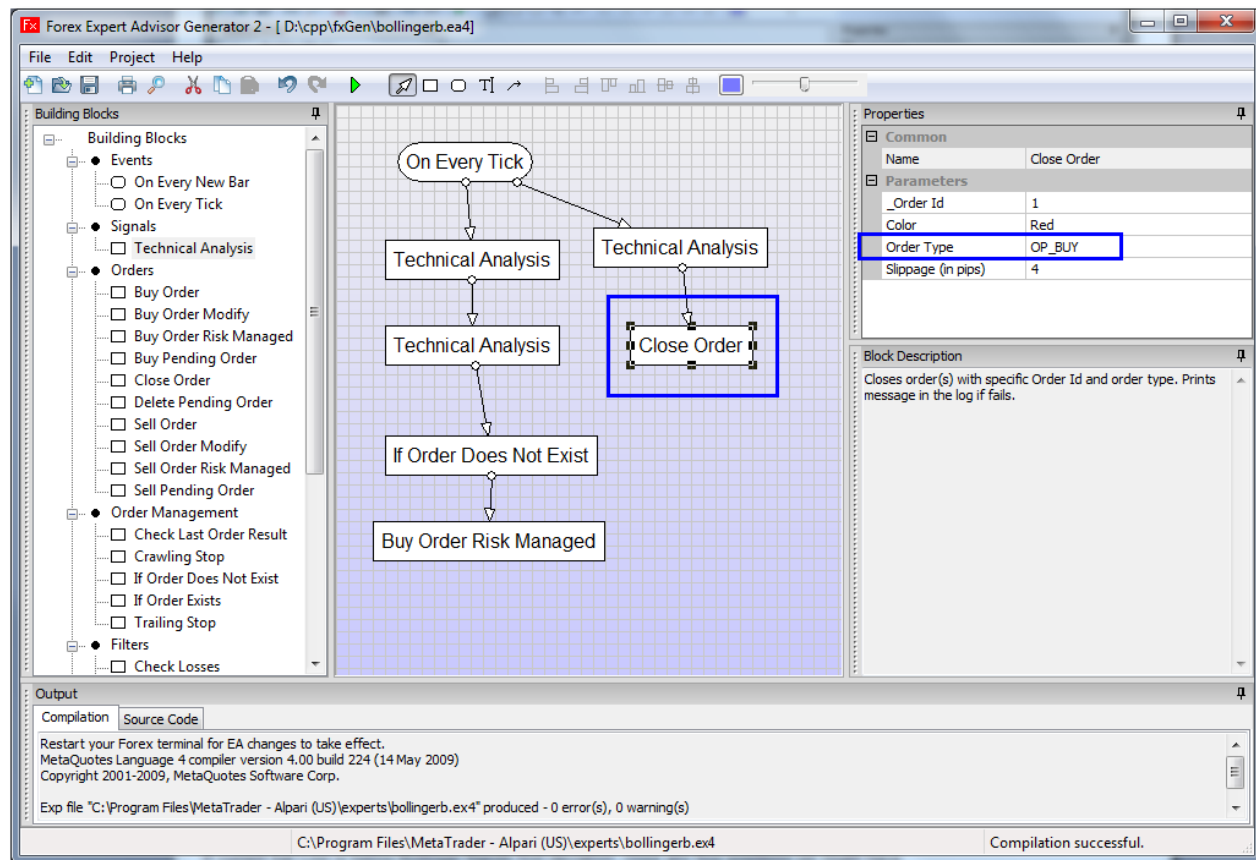
We add block that closes any open buy positions.
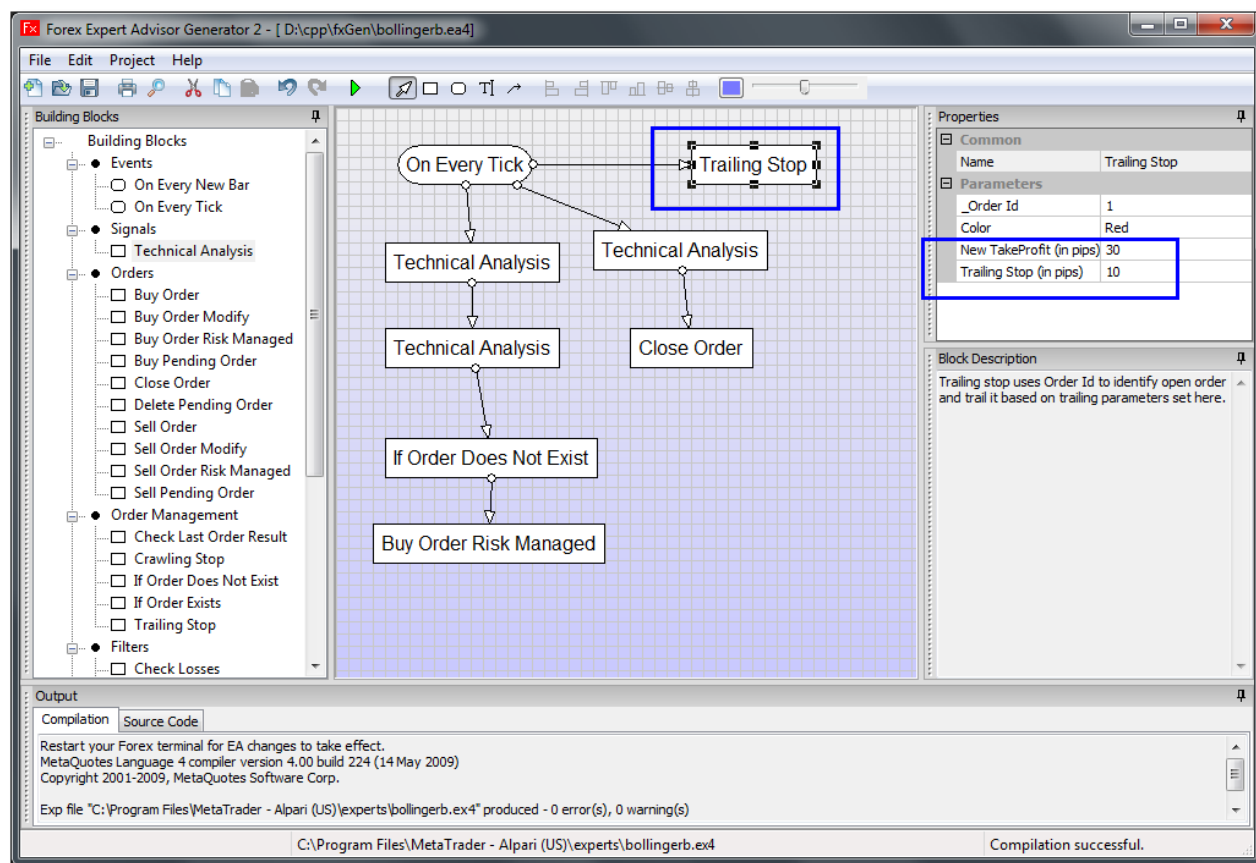
We add trailing stop block that will manage all open orders.
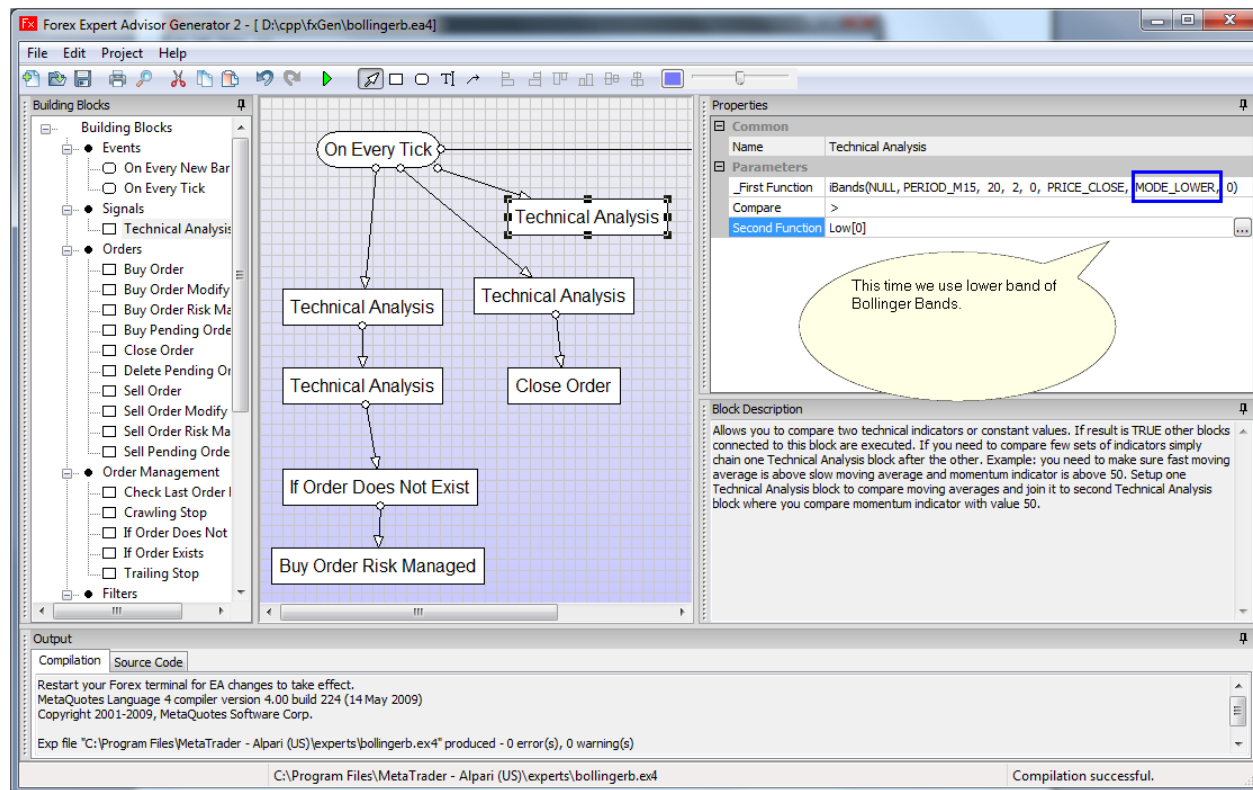
We add yet another Technical Analysis block that will be used for opening sell orders. Now we add more blocks that essentially mirror first part of the setup. But now where we had OP_BUY we use OP_SELL and where we had MODE_UPPER parameter for Bollinger Bands we use MODE_LOWER, etc.
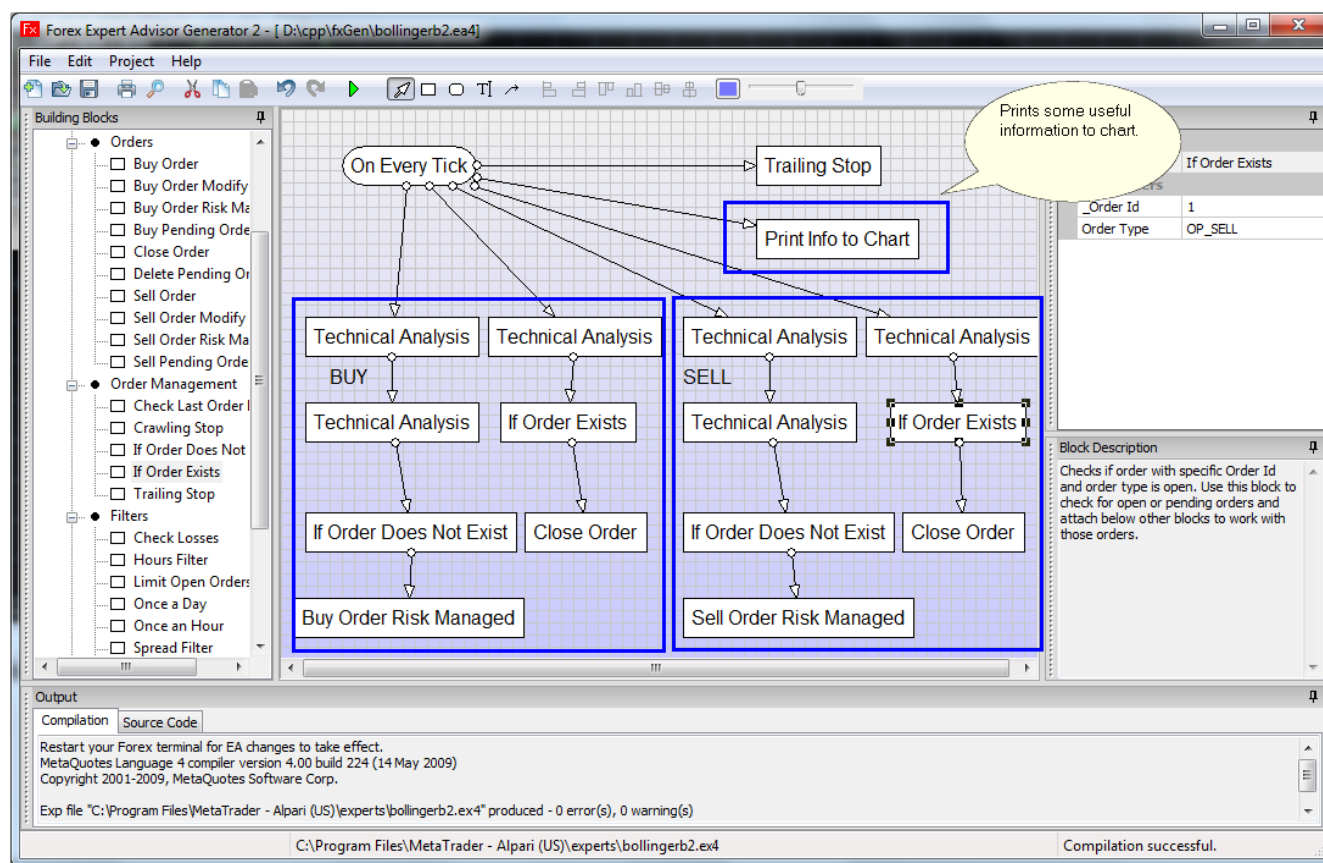
There is complete setup.

EA Example 4 - Diagram Using Parabolic SAR

This setup is provided for illustration purposes on how to use EA Generator and it is not a final profitable Expert Advisor.

MT5 specific: Diagrams below use building blocks specific to MT4. The differences between MT4 and MT5 block names are minor but important. One important point: blocks "If Order Does Not Exist" in MT4 in most cases have to be replaced with blocks "If Position Does Not Exist". See chapter on MT5 and MT4 differences for details.

Enter long position when the current price touches Parabolic SAR indicator from below and it changes its direction. Enter short position when the current price touches Parabolic SAR indicator from above and it changes its direction.

This is simple setup that relies on just one indicator. What is different about this setup – it opens one type of position and does not open same type of position again until opposite position has been open. Example: if buy (go long) has been open, and it takes profit or stop loss, no more buy positions will be open. It will wait for sell (go short) and open only sell position. Once sell position is open, it takes profit or stop loss, and now waits for a chance to open buy position.
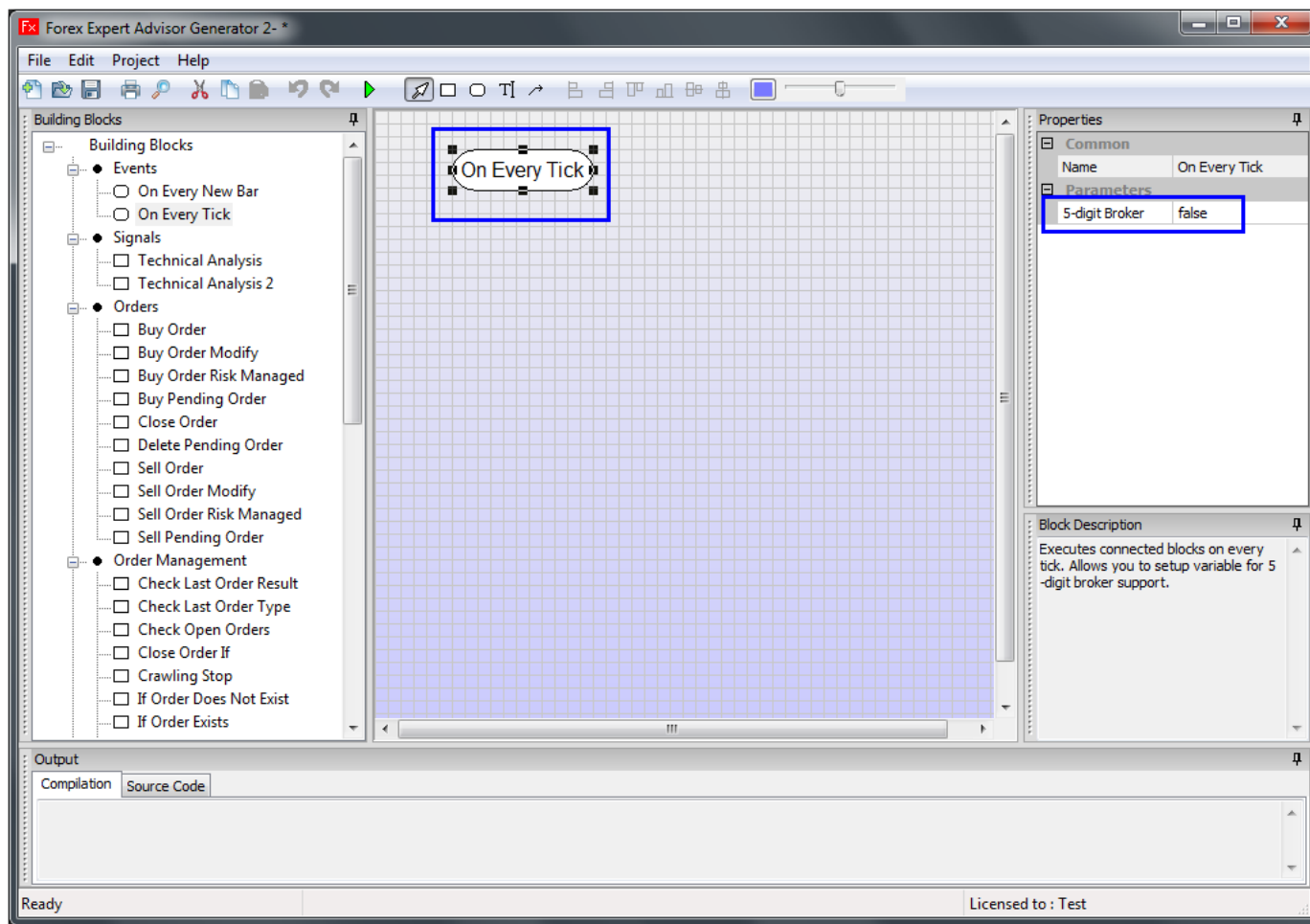
We start with "On Every Tick" block that marks a point where our EA will start executing on every new tick. You can also setup a parameter based on your broker support for currency representation. If broker supports 5 digits after decimal point, setup "5-digit Broker" parameter to "true".

In two Technical Analysis blocks we will compare values or previous closing bars with values of Parabolic SAR. If iSAR indicator value 2 bars ago is greater than closing bar value 2 bars ago AND iSAR indicator value 1 bar ago is lower than closing bar value 1 bar ago that means Parabolic SAR has reversed and will start going up (go long buy signal).
Opposite is good for signal reversal. We go short sell when iSAR indicator value 2 bars ago is lower than closing bar value 2 bars ago AND iSAR indicator value 1 bar ago is greater than closing bar value 1 bar ago that means Parabolic SAR has reversed and will start going down.

There is our strategy on the chart with red dots provided by Parabolic SAR indicator.
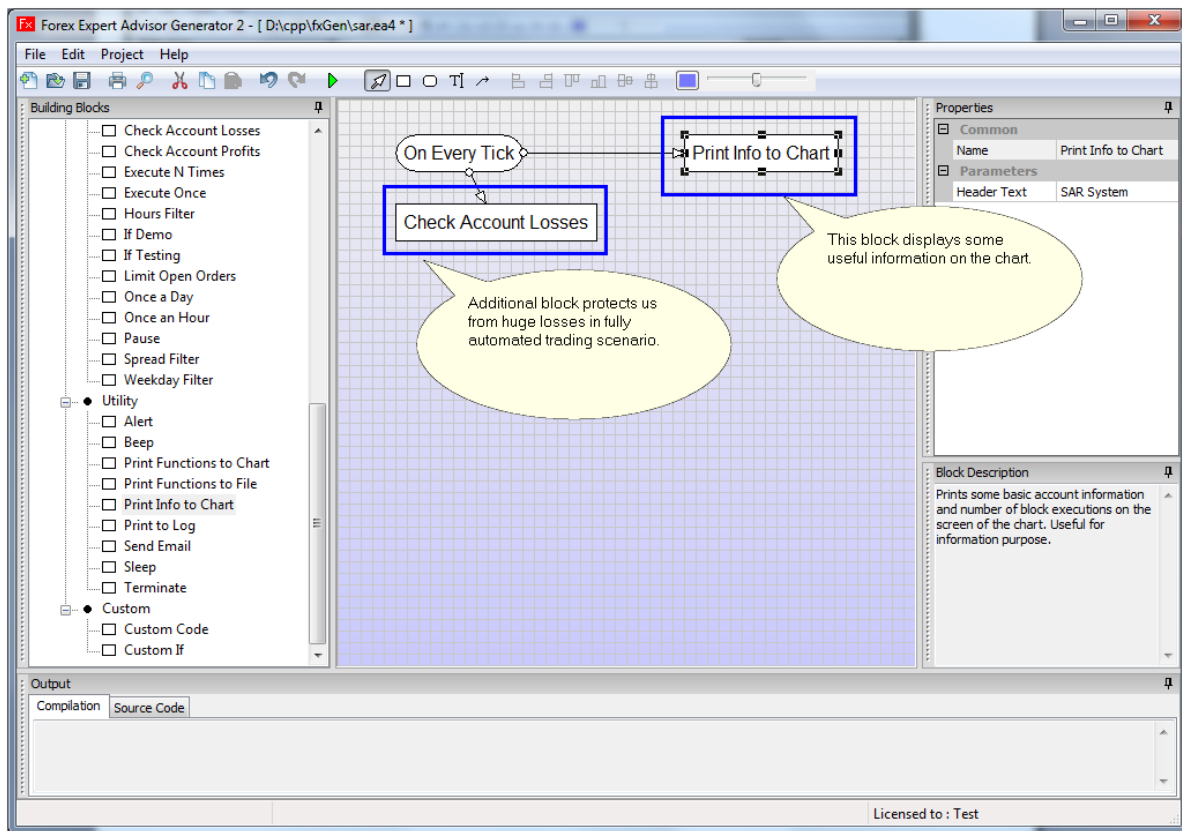
We start with some utility blocks that help us to protect account from huge losses and also display useful information on the chart.
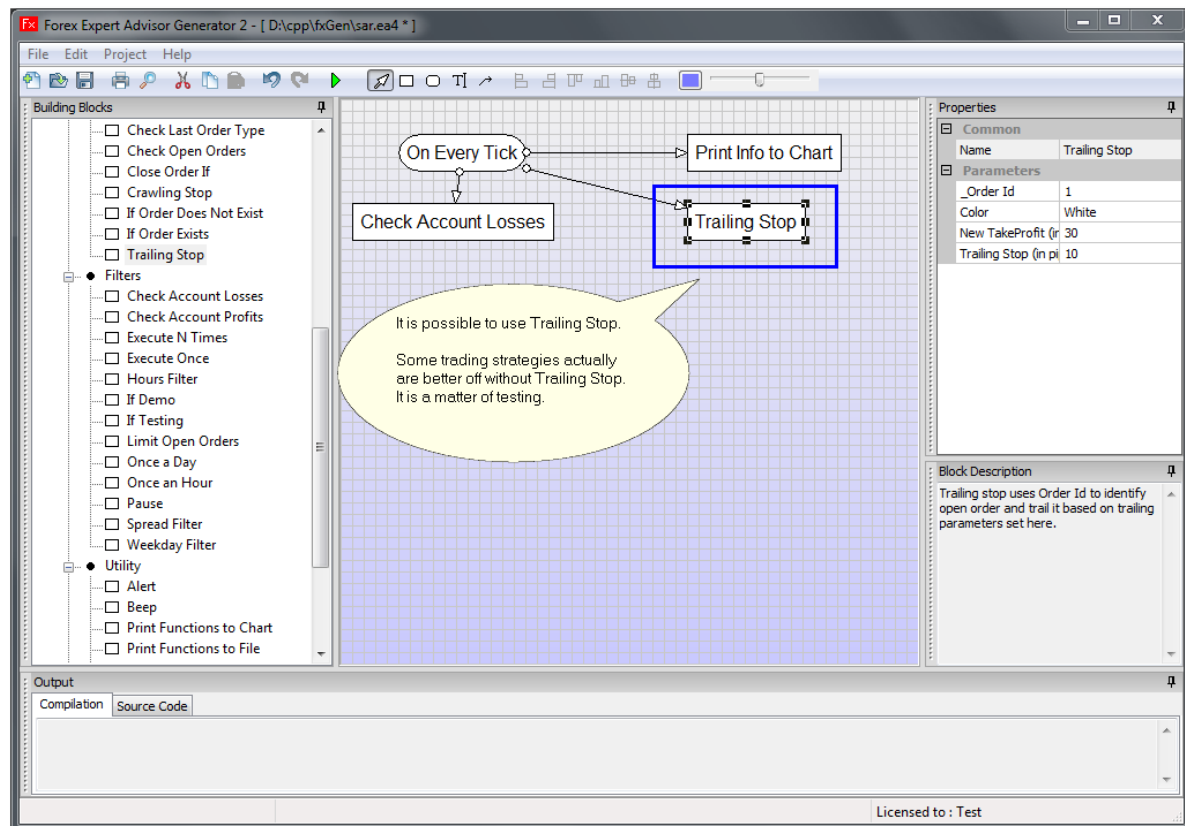
It is possible to use Trailing Stop. But some trading strategies actually are better off without Trailing Stop. It is a matter of testing to see if Trailing Stop is worth having in any particular setup.

Compare value of close 2 bars ago and Parabolic SAR indicator value 2 bars ago.

Shift parameter allows us to take Parabolic SAR indicator value 2 bars back from current bar.

Compare previous close with previous (1 bar ago) iSAR to see if it has reversed.

"Check Last Order Type" can be used to determine type of last open order from list of orders in history. If the last order in history is the same as "Order Type" then other blocks attached below will be executed.

This setup can work without "Check Last Order Type" block. When testing this setup initially do not use "Check Last Order Type" block and you should see more buy and sell orders executed.
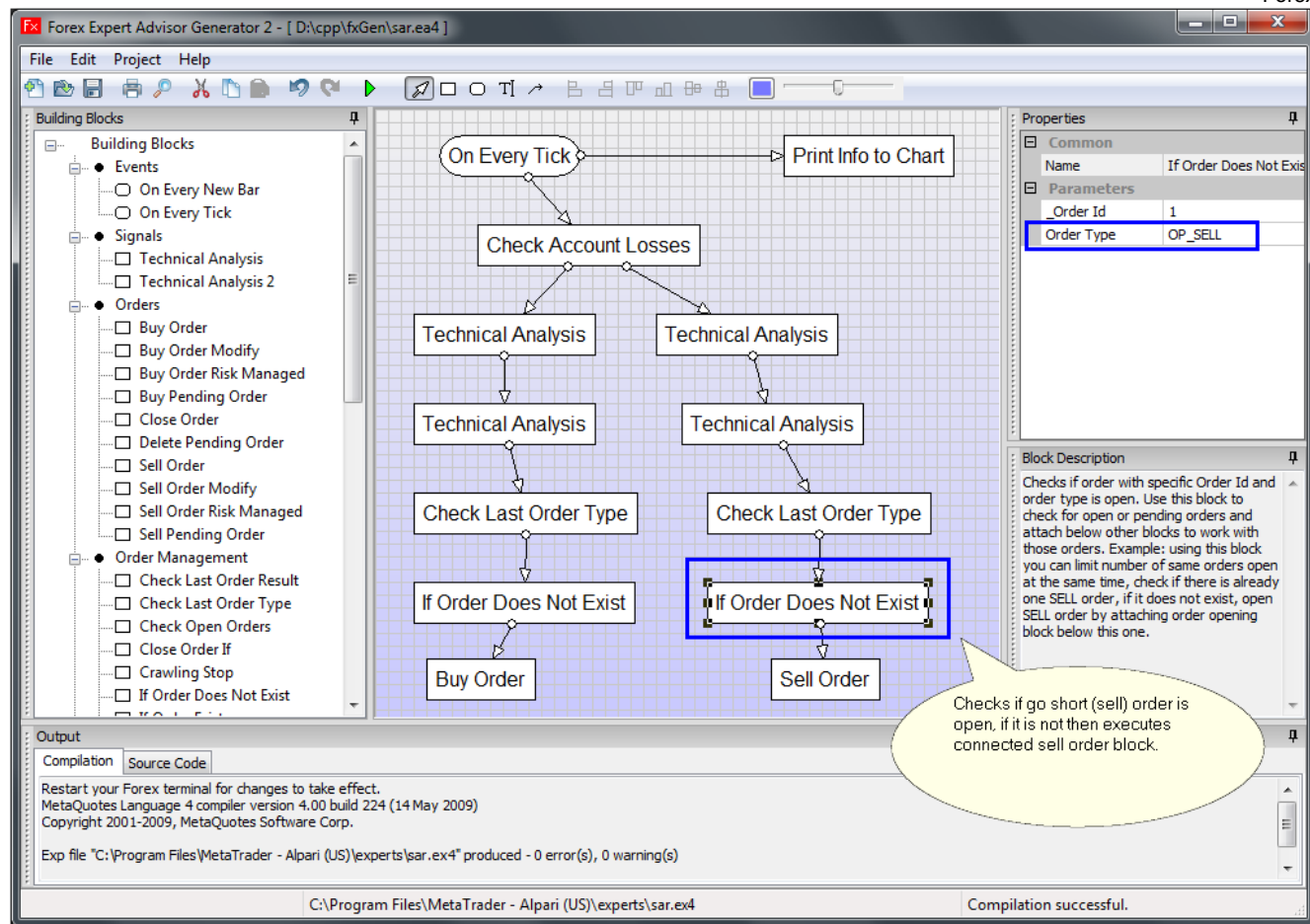
There is our final trading strategy.

Brokers and Accounts

One and the same Expert Advisor may give different trading results depending on what Forex broker and account it is running on. So you might have developed and tested your EA using one broker and it worked fine. You moved it to a different broker and results are terrible: some orders do not execute, cannot place tight stoploss, you are getting many requotes, etc.

That is unfortunate truth – brokers supply very different execution environments. While they all MetaTrader™ based but they all somewhat a little different. Forex brokers implement different rules and there are some specifics you might find:

1. Brokers have different spreads. That's obvious. But if you are scalping or using other method where even loss of one pip per trade means your EA is no longer profitable, spreads become very important.

2. No hedging. Broker will not allow you to open another opposite position. Not even pending position. Let say you have opened buy (go long) position, you see it is losing, so you try to open another position, this time sell (go short) just to compensate for the losses. Broker that does not allow hedging will block second request.
    This might even have some extreme forms: you try to open two pending positions one: buy_stop and another sell_stop. So if market moves in either direction you close one of them. If your Forex broker does not allow hedging, second pending order will not be accepted, and you will end up with one pending order.

3. FIFO. First-In, First-Out. Basically, if you open more than one position on a currency pair, you must close the first before closing the second one. That's the NFA's not-so-straightforward way of preventing hedging. If you only have one order open at a time, this is not a problem. If you open and close many orders, this can be a serious issue.

4. Brokers have minimal stoploss and takeprofit requirements. If you set them too low you will get errors in the log (Experts tab in the terminal).

5. If you use pending orders brokers have additional requirements for order expiration and price offset. Pending order expiration can not be too short. Some brokers reject pending orders that are valid only for a few minutes. Price (Ask/Bid) for the pending order can not be too close to current market price.

6. 5-digit brokers work slightly different than 4-digit brokers.

7. ECN brokers have some specifics too.

How EA Generator can help you?
EA Generator tries to create resulting EA code in a way that it would work on as many different brokers as possible.

Some strategies are much harder to implement. There are some tips:

1. If you are scalping and/or opening many orders requotes become serious problem. Also during heavy trading hours brokers tend to widen spreads and radically minimize your chances for success. You can use "Spread Filter" block just before you open any order to make sure that spreads are below expected reasonable value.
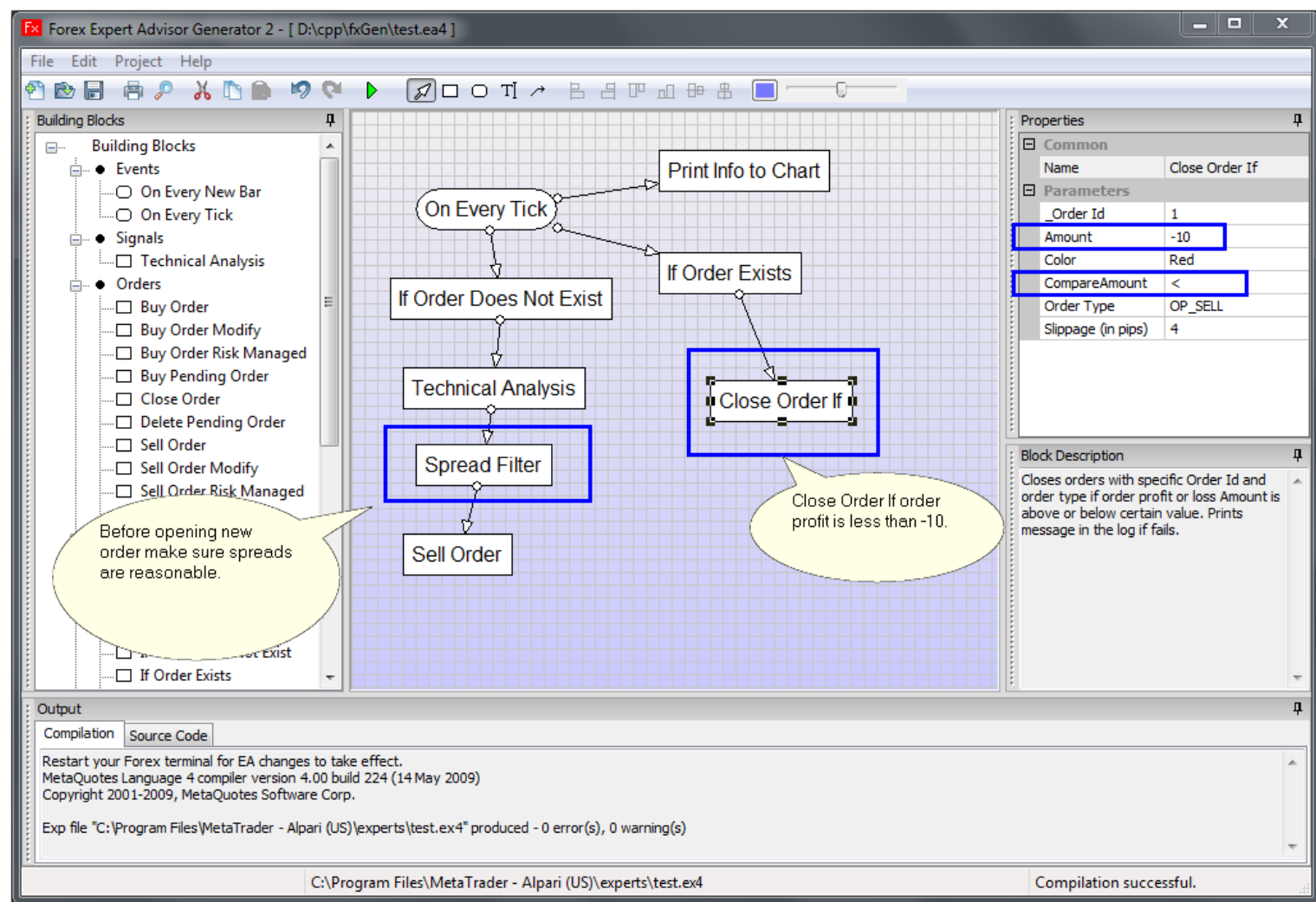
There are some of the techniques shown in the diagram.

2. If you suspect that broker is cheating and using stop hunting technique to close your orders with occasional sudden spike you can set stoploss parameter on your orders to very high value (like 100-300 pips). But then you need a method to close orders inside EA. One way to do it is use "Close Order If" block as stealth stoploss. It can close positions that drop below certain fixed amount. The danger is that once EA is left unattended power failure or some other technical problem like lost Internet connection will close terminal or turn off EA and stealth stoploss will never run.
Stealth stoploss might work but the best solution is simple – do not use broker that you know is stop hunting.

Warning: "Close Order If" may not work if you trade using multiple orders and your broker forces FIFO rules mentioned above.

Most building blocks use pips to indicate amounts. But "Close Order If" and "Check Last Order Result" blocks use parameter Amount. Amount is indicated as "Profit" in MT terminal.

Currency Pair Sandbox and Order Id

This chapter applies in cases when you have more than one EA running on different currency pairs (different charts) at the same time.

While you might be using Order Id to select orders you want to work with, first question that comes to mind is usually: I know I can work with specific order using Order Id but what happens if I have same EA running on two charts (two different currency pairs). Will one EA "see" orders of the other EA and somehow interfere with them? Let say both EAs use same Order Id will they clobber each others processing? Short answer is no. EA will not "see" orders of the same EA on other currency pair even if _OrderId is the same.

The answer is no because each EA runs in isolation. Think - separate "sandbox" for each EA on each currency pair. Forex Generator automatically creates code in a way to isolate EAs on each currency pair.

Example 1: lets say you have one EA started on 5 different currency pairs using only _OrderId = 1. They all will "see" only its own orders. At the moment you have EA with no orders open on EURUSD, you do "If Order Exists" with _OrderId = 1 in it and it will find no orders. While at the same time 4 other instances of the same EA will be running orders on other currency pairs.

Example 2: you start two instances of EA both using _OrderId = 1 on the same currency pair but different timeframes. This is different because now both instances of the same EA use same _OrderId and same currency pair. This time EAs will "see" each others orders because both use same _OrderId AND same currency pair. This time only timeframe is different and that is not enough to isolate two instances of EAs.

This is done on purpose so EA development would be more predictable and easier. For most part you do not have to worry about other EAs running on other currency pairs. Only thing to remember is that all the EAs use same account information. So if you use let say Account Margin in your blocks just keep in mind that Account Margin is shared by all EAs running on different pairs. Any block that works with account information will affect EAs running in parallel.

First it is best to test your strategy on single EA running without other EAs executing at the same time.

This "sandbox" type execution model has one negative side effect: with Forex Generator you can not easily develop EAs that use some form of currency arbitrage. But if you are into currency arbitrage you need much more advanced tools than Forex Generator anyway.

Just keep in mind that currency arbitrage is prohibited by many brokers. Read fine print of your broker agreement.

Scripts vs. Expert Advisors

Basic difference is that Expert Advisors in MT4 are executed on every tick and Scripts execute once only when you start them using some shortcut keystroke or drop script on the chart.
Scripts are used for semi-automated trading. Use them when you need to run few commands at once. Example: you want to open 2-5 positions at once or you want to close multiple positions at once.

Having good set of scripts can help you trade more effectively. You can use combination of scripts and Expert Advisor to run semi-automated trading. Semi-automated trading could be good option in cases when there is no strict system when to open orders (the system is based on human expertise). But there is clear system on how to manage opened orders and when to close them.
Example: create scripts to open orders and use them to start trades, and then start Expert Advisor to manage and close trades. Other combinations also possible: let Expert Advisor open orders then use scripts to close orders.
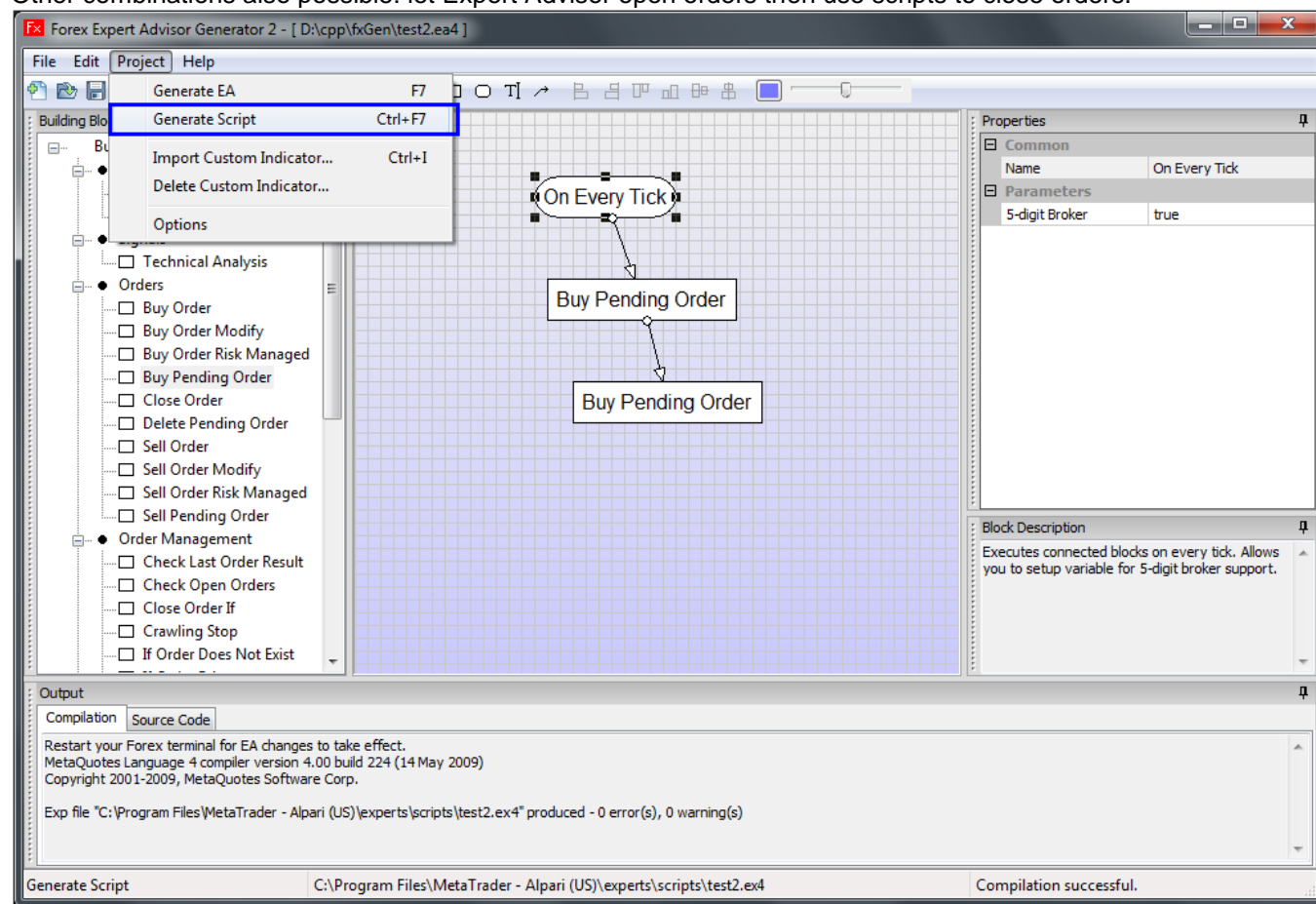
Scripts are easy to generate using "Generate Script" menu. This simple script opens few pending orders at once.

Some building blocks do not work well in scripts because they have to be executed repeatedly to produce desired outcome.
Example: Trailing Stop, Crawling Stop, Execute N Times, Pause blocks do not work well in Scripts. All of these blocks rely on repeated execution by the terminal, and terminal repeatedly executes Expert Advisors not Scripts.

If you find yourself in situation when you need Trailing Stop or some other order management but still want to use Scripts most of a time, build Expert Advisor that simply runs required order management but execute this Expert Advisor only when you need it. In this case EA will work as a helper in semi-automated mode.

There are many additional blocks that help you manage and log execution. "Print Info to Chart" and "Print Functions to File" are useful to see what is going on and log actual indicator values into exported text file.
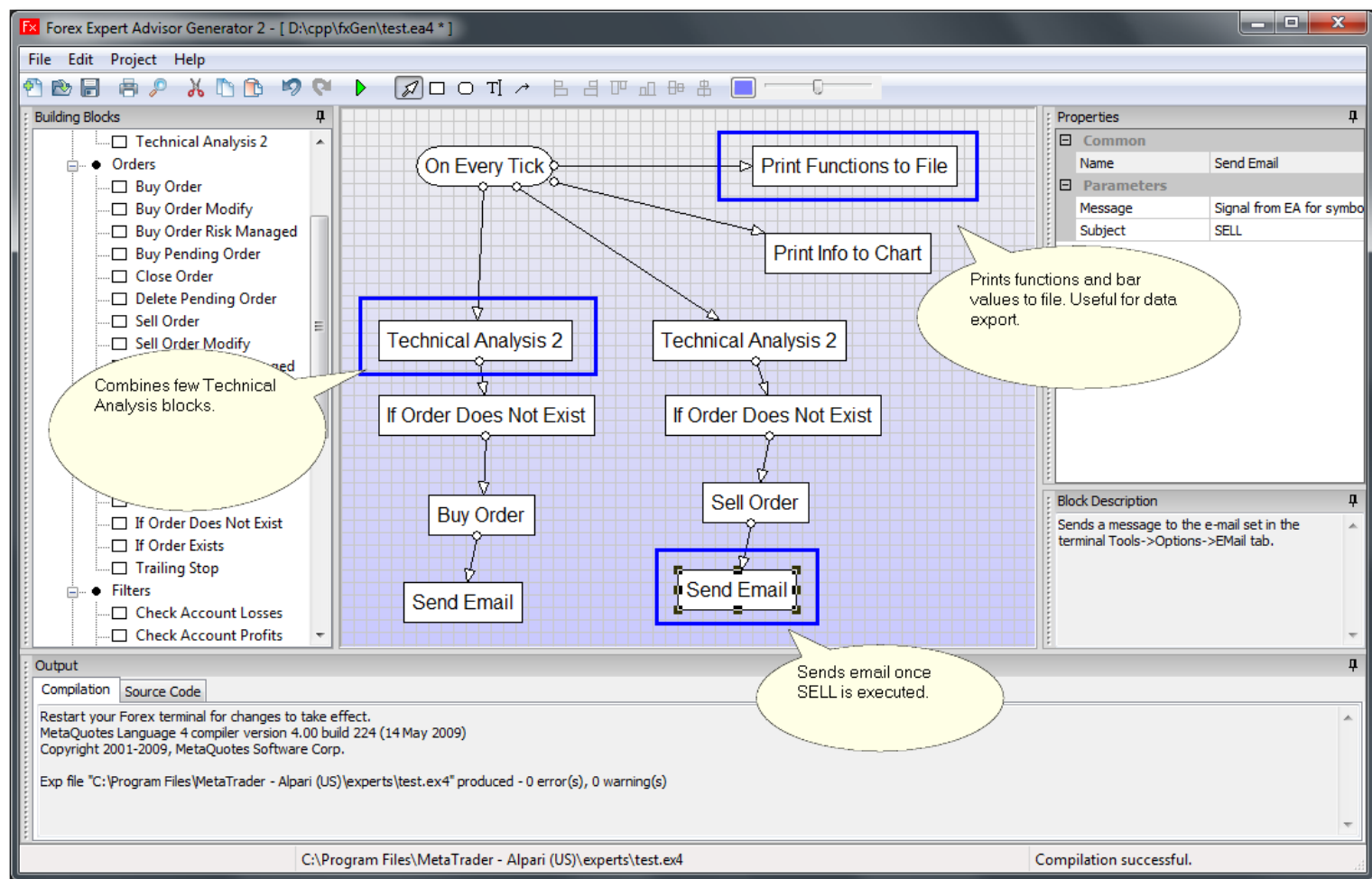
Additional blocks that help log and display information.

Testing EA

When testing EA use both Strategy Tester for back testing and demo account for forward testing in the terminal.

Some building blocks do not work well in back testing and can only be tested in demo (forward) testing. Back testing is a simulation. Functions like local time, market price spread and history are simulated and artificially created in terminal during back testing. If you want more accurate results use demo (forward) testing.

Sometimes when you run strategy in Strategy Tester it may not be obvious why certain trades have been placed. Use Visual Mode to see exactly what is going on. Place all the indicators you use when running Strategy Tester in Visual Mode. Then stop at the point when trades are placed. It is best to use small date time periods for initial testing - one to two days.

If you run Strategy Tester all the way thru all the trades to the end without stopping, and then scroll the chart back sometimes it looks like EA entered trade for no reason. You need to run it in Visual Mode in Strategy Tester and stop at exactly the point when trade is entered. Make sure to have indicators open on chart when in Visual Mode.
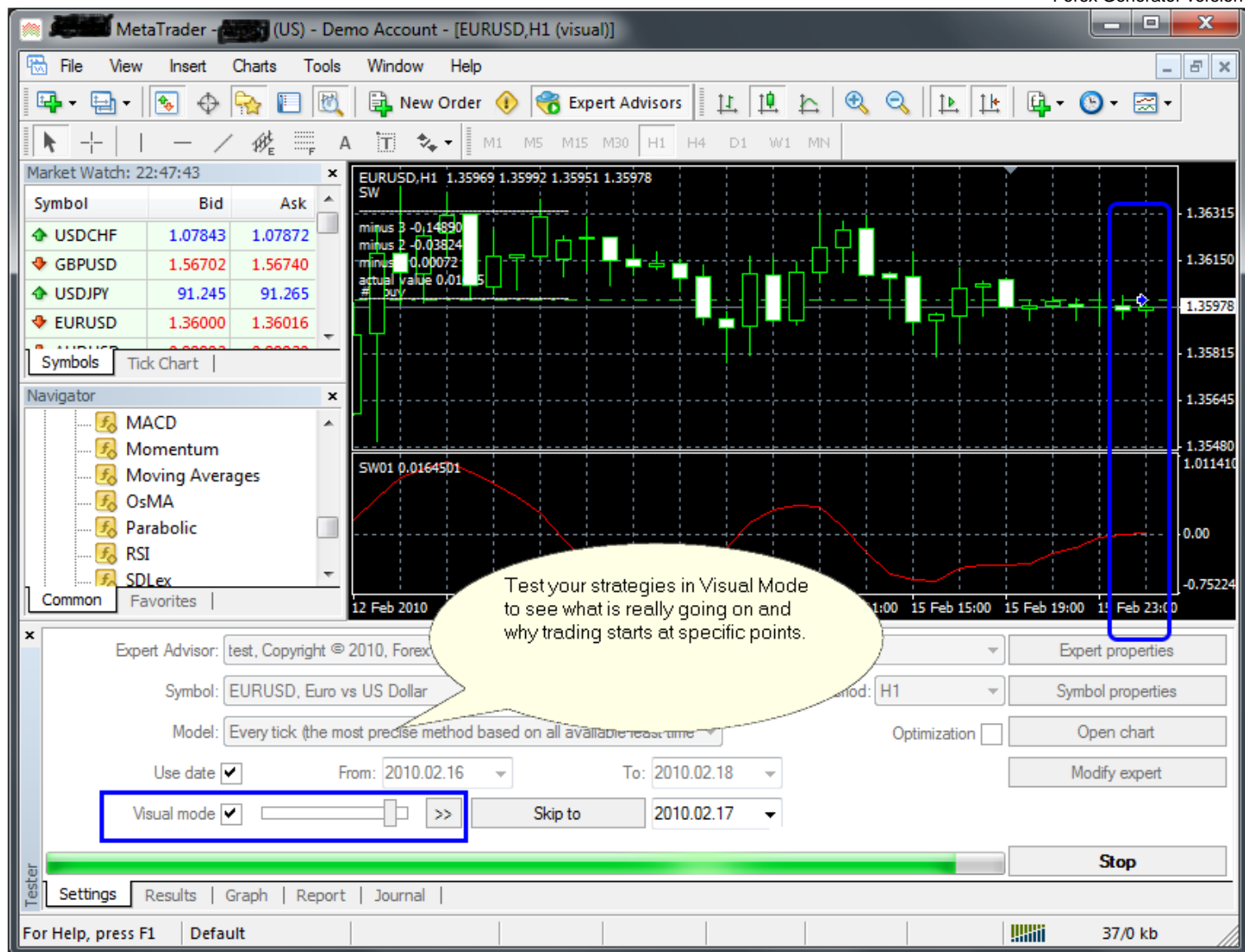
When it is not clear why EA opens trades use visual mode in Strategy Tester.

If you are testing EA in demo (forward) testing mode initially place a lot of "Print to Log" blocks in your diagram. This will help you see what blocks have executed and what blocks have not. Log is produced in the "Experts" tab in the terminal. Also use "Print Info to Chart" or similar blocks to print diagnostic information directly to the chart.

Custom Code

Professional Edition license of Generator produces both source code in MQL and compiled file with extension *.ex4. Every time you run "Generate EA" or "Generate Script" current source code in *.mq4 file is overwritten and new source code is generated.

If you want to add your own custom code you can take one of two steps:

1. Rename generated file and customize it from that point on. Now if you decide to change something in the original diagram and regenerated EA or Script you will have to move your code back into regenerated version manually. This is forward-only approach to development, and should be used most of a time since it gives you full control over final result.

2. Instead of taking generated MQL file and adding your own custom code you can enter your own MQL into custom generator blocks "Custom Code" or "Custom If" in the diagram and that way every time diagram is regenerated your code will not be overwritten and lost. Your code will become part of the diagram.
   This approach should be used only if your custom code is really small (4-8 lines of code).

3. If you have larger blocks of custom code use Project - Code Library menu. You can add custom code that becomes individual block and gets added to the toolbar as reusable building block. This is for blocks of code up to 10-20 lines.

This chapter covers some of steps on how to use second approach.
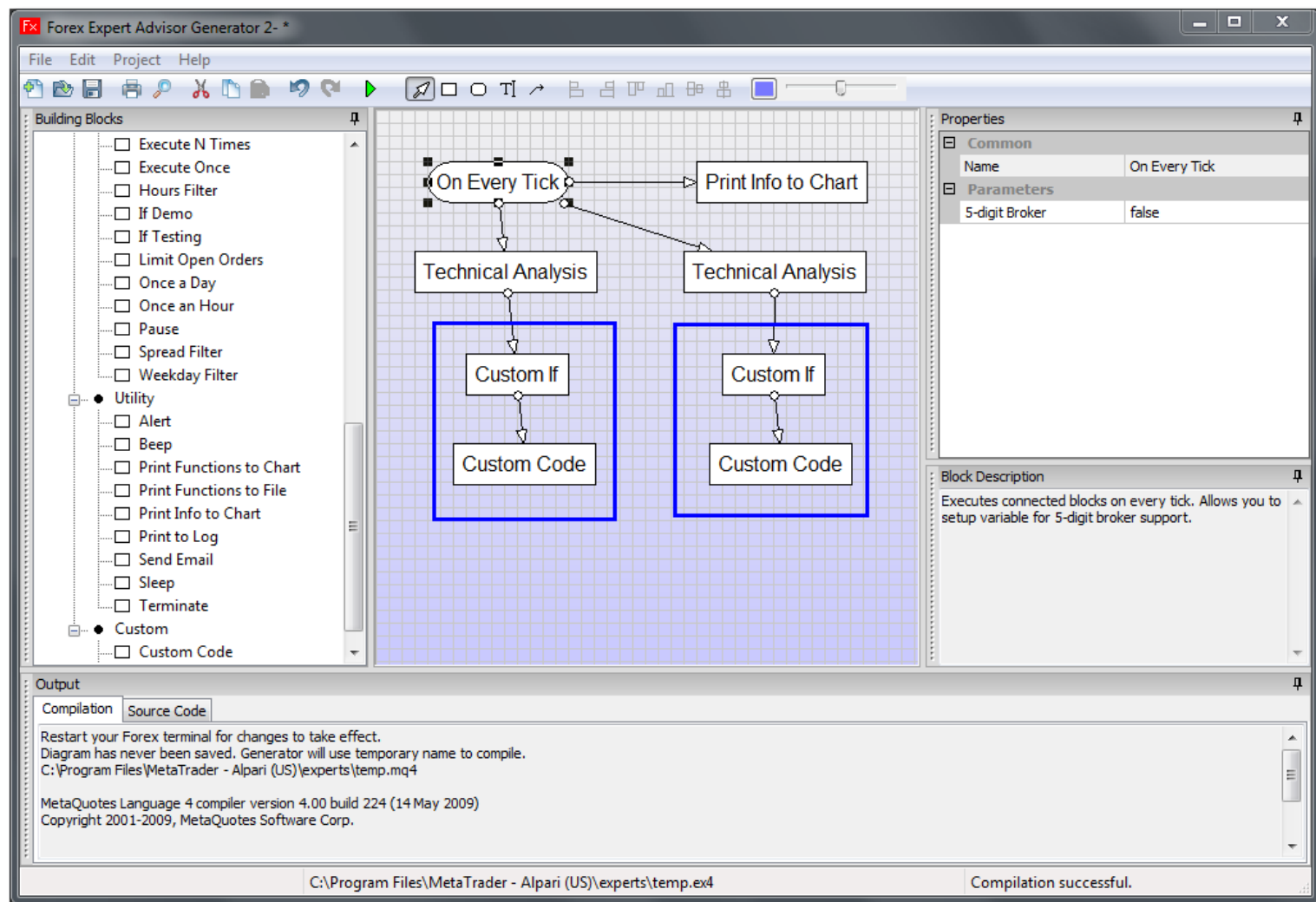
There are custom MQL code blocks and custom "if" statements.

Warning: do not use "Custom Code", "Custom If" and "Utility Code" unless you have programming experience and know MQ language. "Custom Code", "Custom If" and "Utility Code" blocks are designed to hold small chunks of code. Generator can not check syntax of the code you place into those blocks.

Inside Custom Code block you can place your own code in MQ language. However function name and braces "{ }" are created by the Generator. Function naming is left for the Generator because otherwise it would not be able to call the function based on arrows pointing to the block.

If you need to have complete control over function names and parameters use Utility Code blocks. Utility Code blocks are treated different from any other block on the diagram. Since generator does not create function names for functions inside Utility Code blocks they should not be connected via arrows to any other blocks. They are stand-alone pieces of your own custom code.

Essentially use of Custom Code vs. Utility Code is a trade off:

1. When you use Custom Code you can draw arrows to it and it will be called from the diagram based on those arrows. But you can not create function name and pass any special parameters to the function. Your code gets wrapped with function name and "{ }" brackets created by Generator.
2. When you use Utility Code you can not draw arrows to it. If you draw arrows anyway, those arrows to and from Utility Code will not be used by the Generator. But inside Utility Code you can have any number of functions and pieces of independent code. You can name functions, have them accept number of different parameters and have various return values.

Custom Code gets executed as part of the diagram because Generator creates function names for your code. Utility Code gives you more freedom but you have to call it yourself from within some other block in the diagram.
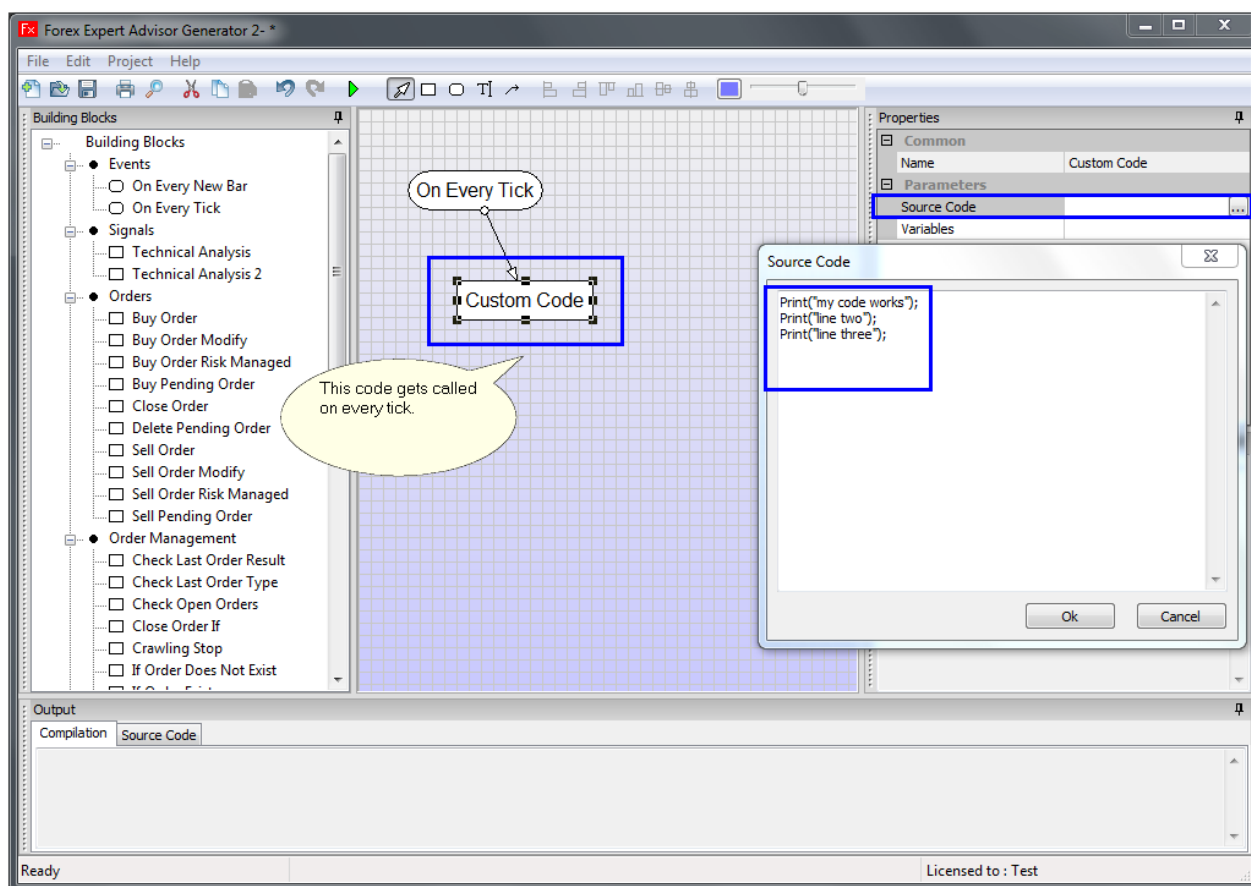
You can enter your own MQ code that gets wrapped into the custom function that is called based on how arrows are arranged.
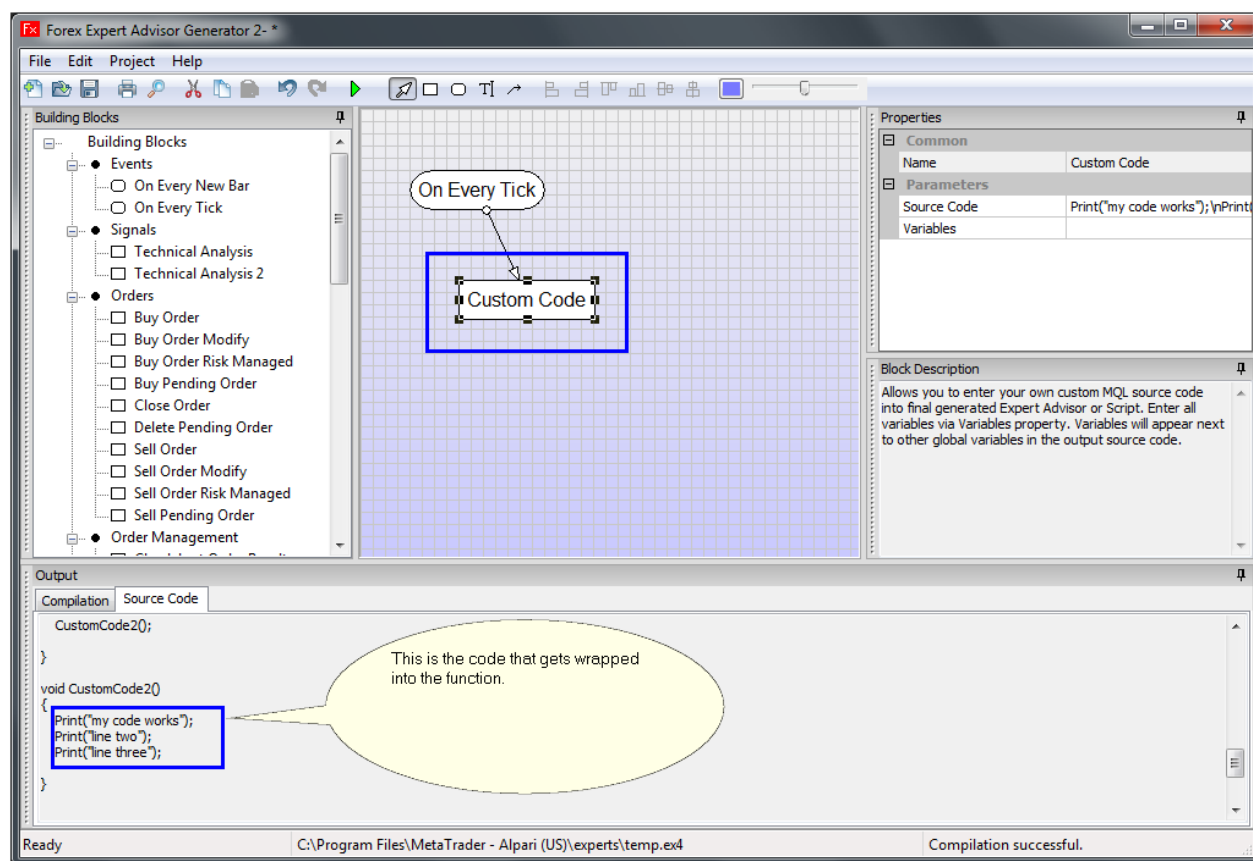
There is resulting custom code.
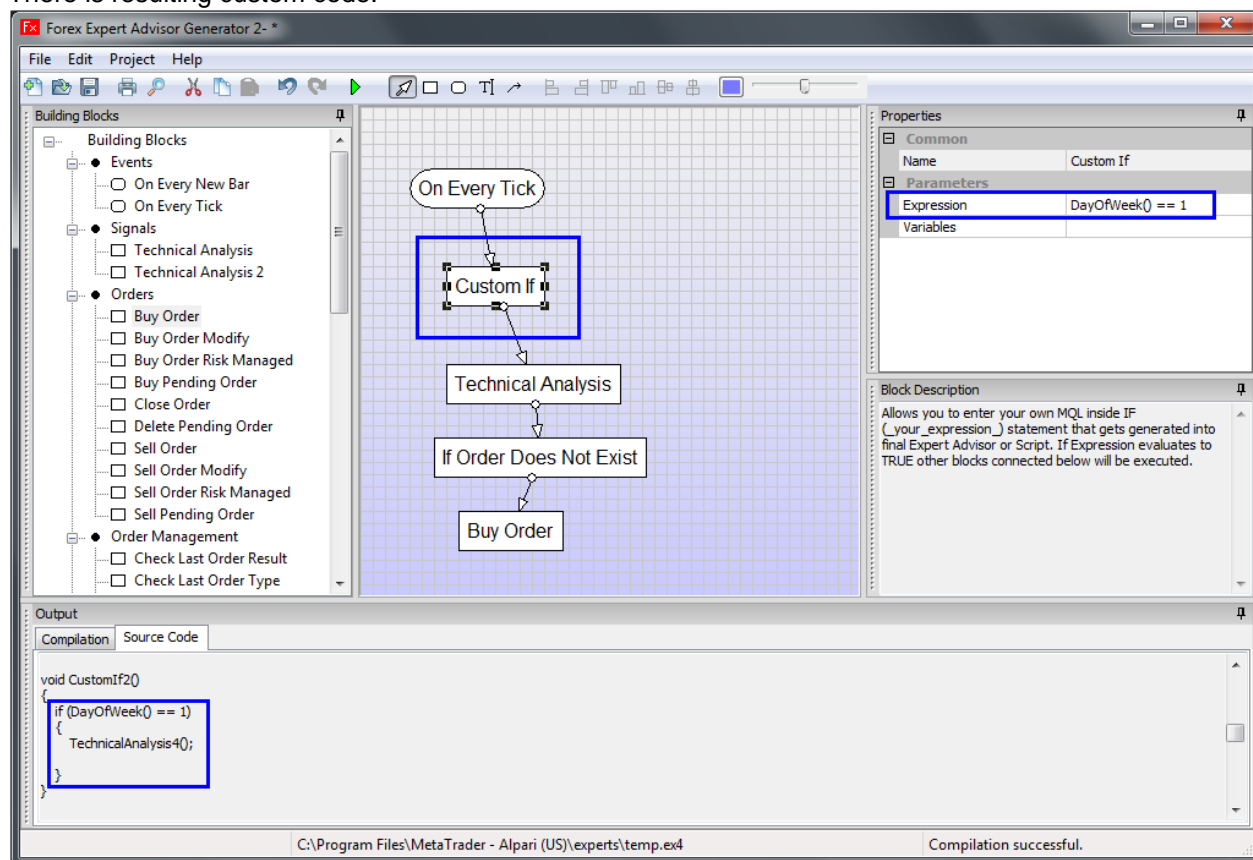
There is "Custom If" block example. It simply checks if it is Monday and then executes Technical Analysis block below. "Custom If" can compare indicator values, call external functions and compare results, etc. Result of a parameter called an "Expression" should always evaluate to Boolean value True or False.
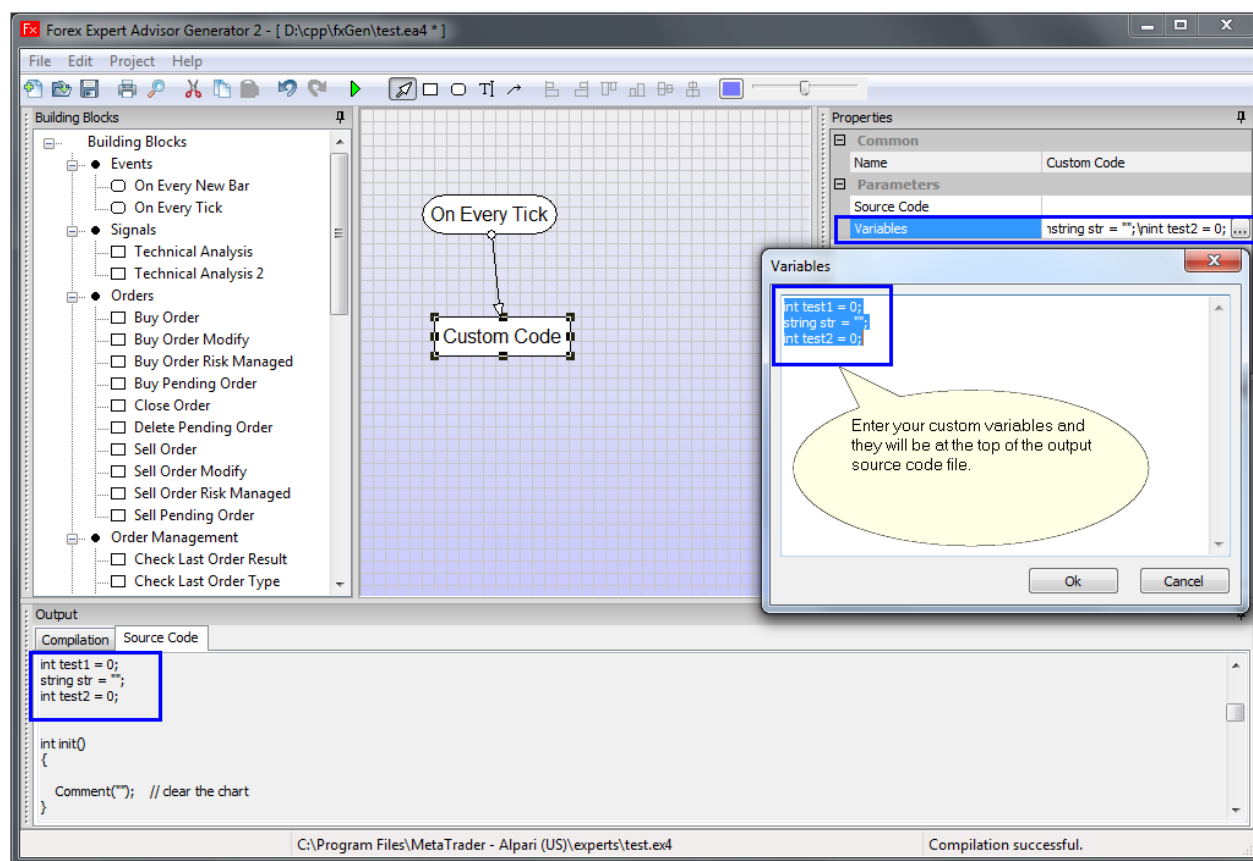
In both "Custom Code" and "Custom If" you can enter variables that are used by those blocks.
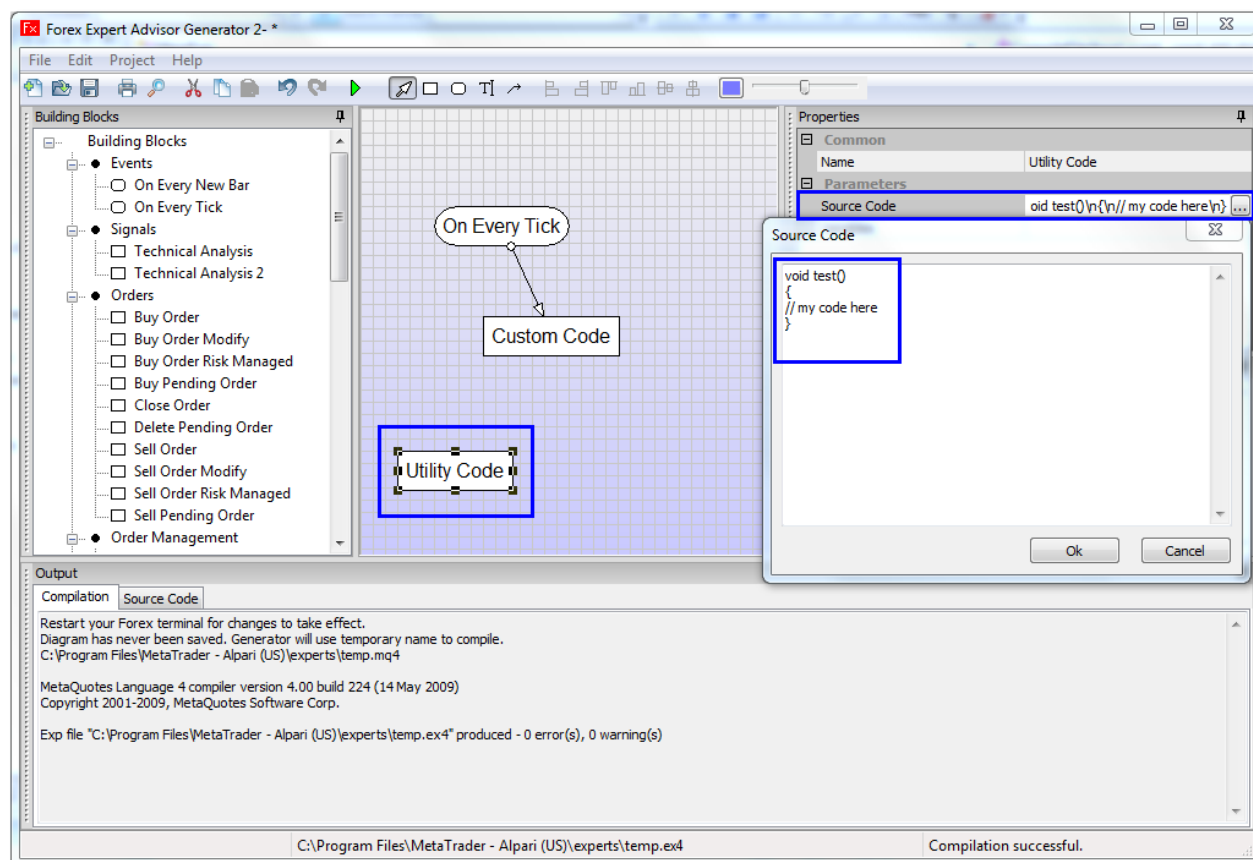
You can also include complete functions and full code blocks via "Utility Code". Generator will not create function name and

wrapping "{ }" brackets for it. So you have to provide full function.
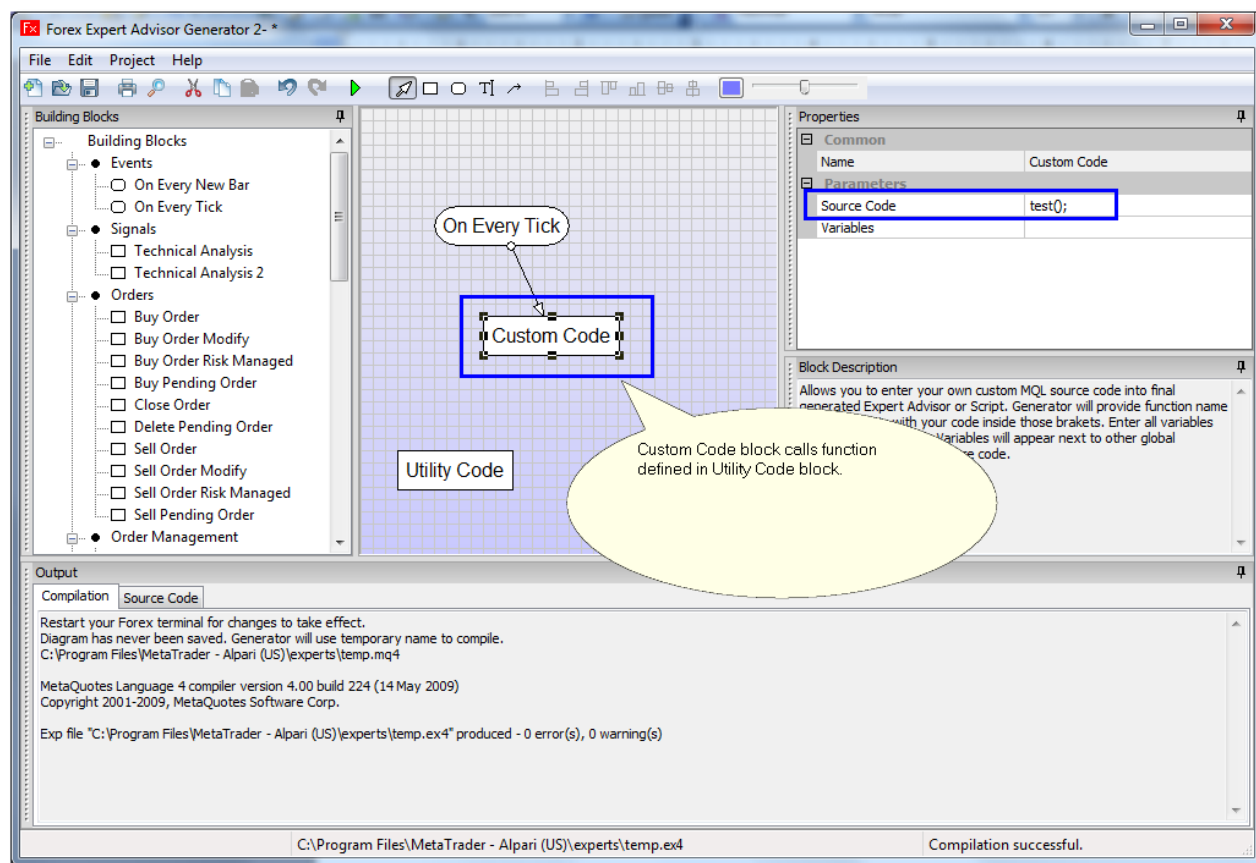
You can call Utility Code functions from Custom Code or Custom If blocks.
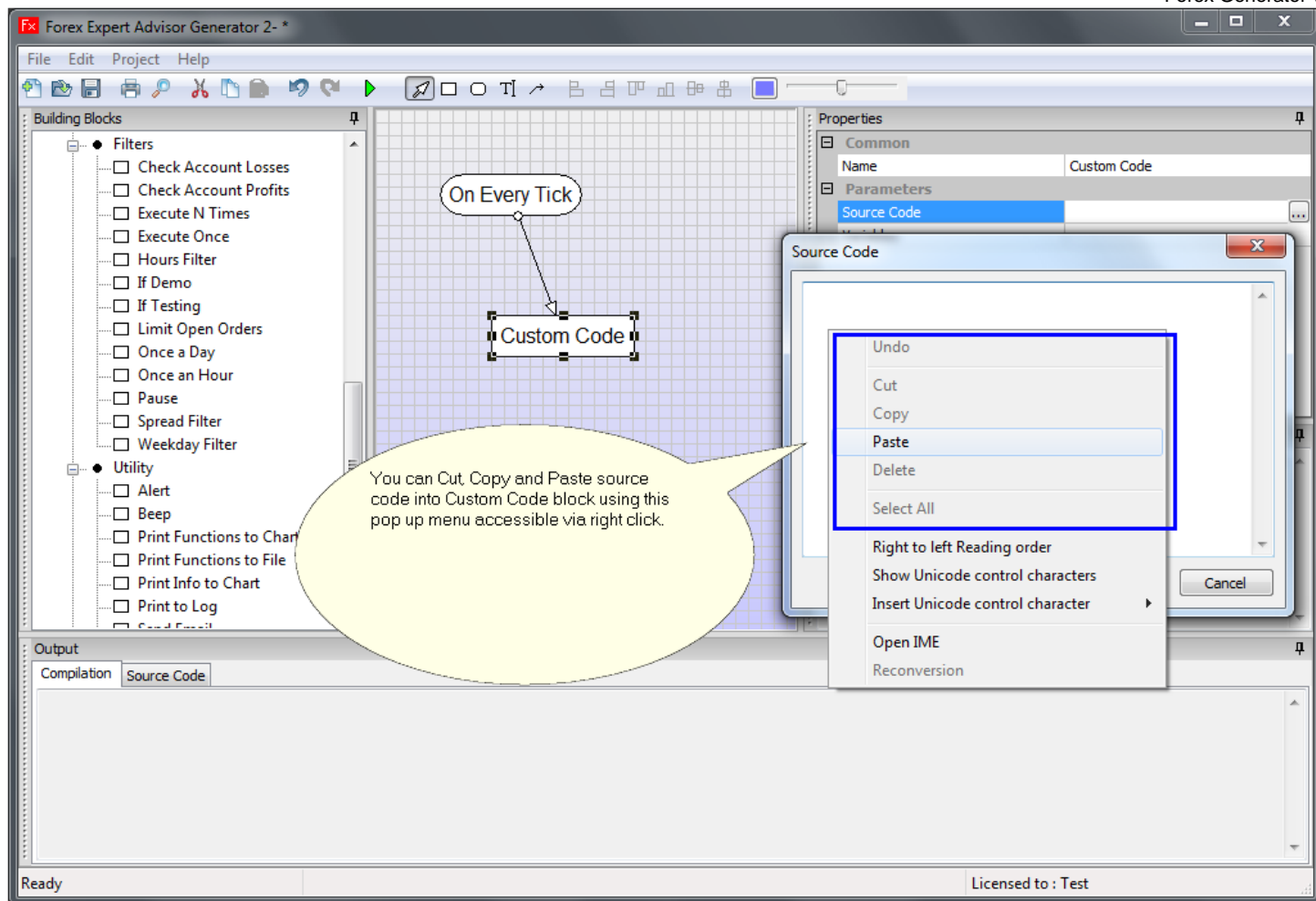
You can also cut, copy and paste source code into Source Code window. Simply right click on it to get to pop up menu with options.

Another option for code reuse is Code Library feature. You can add your own custom blocks to the set of existing blocks. Those blocks work as if they are "Utility Code" or "Custom Code" blocks but you can have them setup on the toolbar as separate selectable building blocks.

Those blocks when dropped on the diagram are independent pieces of code (same as "Utility Code" or "Custom Code" blocks). "Utility Code" blocks should not be connected using lines. Instead call them from "Custom Code" blocks. Using Code Library you can have number of common code blocks that are used in number of your EA setups ready for you whenever you start new diagram.
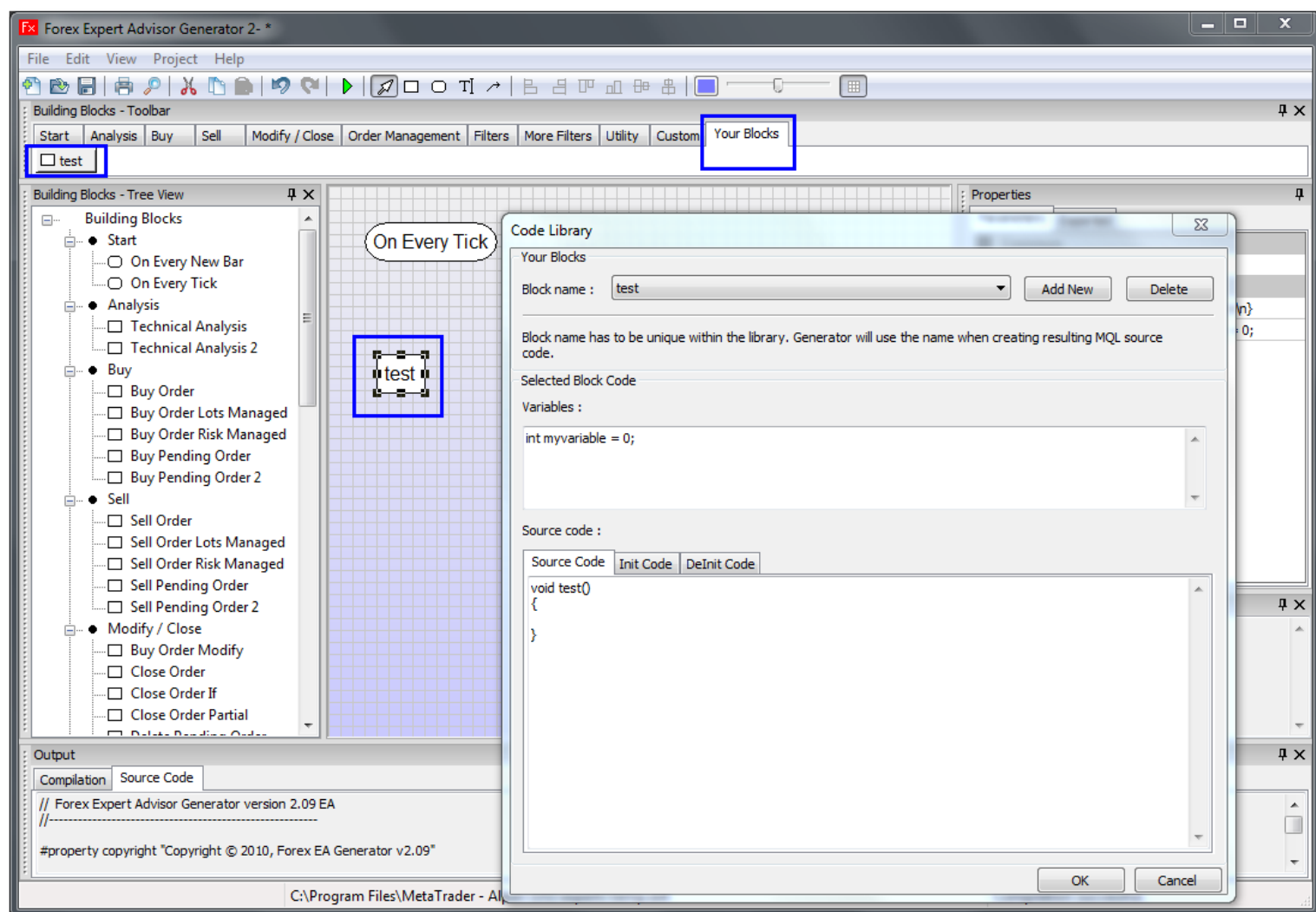
Use Project->Code Library menu to add your own custom utility blocks.

Martingale and Semi-Martingale

There are number of different risk management scenarios possible. Generator creates some scenarios via "Buy Order Risk Managed" and "Sell Order Risk Management" blocks. Both blocks are rather complex and contain number of parameters that interplay to calculate final risk value and lot size for current order. Using those blocks you can setup Martingale or Semi-Martingale system or some combination of both.

Martingale risk management is typically used to double the lot size (double the risk) on loss until profit is reached. Once profit is reached risk gets reset to initial value and it all starts again. Building blocks provide facility to double risk on profits too.
If you want to reduce risk use fractions in "Risk Multiply On Loss" or "Risk Multiply On Profit" parameters. Example: value 0.5 will reduce risk 2 times.

Martingale use requires you to have large account balance and increases possibility to have full account loss. Use with caution.

Martingale risk management checks previous just closed order for result and if order opened with loss it increases or reduces risk. In this screenshot it doubles down until profit is reached, at which point it resets the risk to initial value set in Risk parameter.

Semi-Martingale risk management is similar to Martingale but risk and lot size is increased more gradually. Instead of multiplying risk it adds or removes certain fixed percentage to or from current risk. Use negative values for "Risk Change On Loss" or "Risk Change On Profit" if you want to reduce risk.
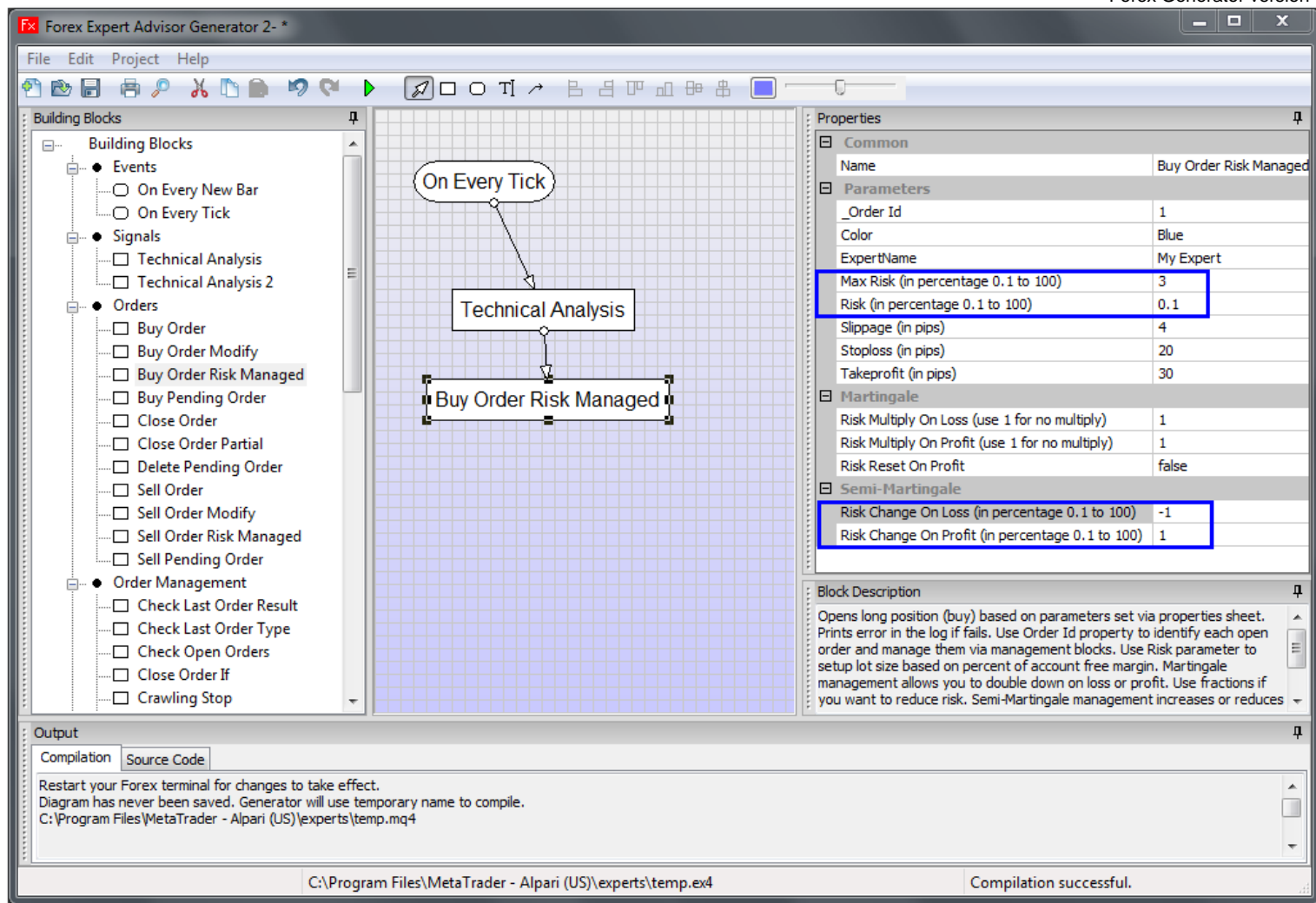
This Semi-Martingale setup reduces risk on loss and increases risk on profit. Notice negative number in "Risk Change On Loss".

Understanding Pending Orders

There are 4 pending order types in MT4. Usually pending orders are set at some offset from the current price. Pending order becomes market order when conditions based on pending order type are met. Pending orders can not be closed instead they are deleted. That is subtle but important difference.

Brokers set certain limits on how close pending order can be created to current price. Usually pending orders can not be created closer than 3-4 pips. If you try to create pending order that is too close to current price you will get "Invalid stops..." error in Experts tab.

Because there are 4 types of pending orders to open all the possible combinations you might need to use negative values on Offset, Stoploss and Takeprofit depending on pending order type. If you set Offset, Stoploss or Takeprofit incorrectly you most likely get "Invalid stops..." error in Experts tab. Once you get this error try setting negative values on Offset, Stoploss and Takeprofit. Use reasonable values such as -40 or -50 and do not use -2 or -3.

Understanding History

In many EAs you want to act on signals but also use information about already closed orders. One simple example: you want to open BUY based on the signal only if last closed order was not BUY (you do not want to repeatedly open same type of order if it has been recently closed).

This is done using "Check Last..." blocks from History group. Most generic and useful of them is "Check Last Order Id". It checks if last closed order has specific Order Id.

History tab is preserved even when EA is restarted. This is important if you use blocks that access History tab. Such as for example "Check Last Order Result", or any other block named "Check Last..".

Those blocks check last closed order. If you restart EA, same last closed order is still in History. This is because History is not cleared when EA is restarted.

So if you just check last closed order result and use Terminate block to terminate EA then obviously it will seem that EA can not start after restart. When in fact it checks history, finds closed order and gets terminated as soon as it starts.

History tab is shared by all EAs. If you have few EAs running at once and they both use "Check Last.." blocks then EAs will "see" each others orders in History. In some scenarios this might be exactly what you want. But keep this feature of History in mind. Read chapter called "Currency Pair Sandbox snd Order Id" to understand how Forex Generator builds EAs for execution on multiple currency pairs.

History blocks while seemingly simple actually are not easy to work with. This is because you have EA that not just reacts to current conditions but also works with what happened in past. Extra testing is required when working with EA that uses History. It helps to setup simple diagram with just 5-7 blocks and see how it runs before you try to setup more complex scenario.

Understanding Virtual Stoploss and Virtual Takeprofit

Virtual Stoploss and Virtual Takeprofit setup and monitor stoploss or takeprofit inside EA instead of stoploss or takeprofit being set with the broker. Let say you have open an order but do not set its stoploss intead you use Virtual Stoploss connected to "On Every Tick" block and set its Stoploss parameter to 20. Now once market price moves 20 pips away from original order open price Virtual Stoploss will trigger. So these two blocks close order once market price moves set number of pips.

Virtual Stoploss Trigger and Virtual Takeprofit Trigger are similar blocks but instead of closing original order they simply execute (trigger) other blocks connected to them. This is very useful when you want some EA operation triggered based on price action related to previously open orders.
If Gap block is in essence a logical combination of Virtual Stoploss Trigger and Virtual Takeprofit Trigger. If Gap triggers connected blocks when price moves in set number of pips in any direction from original order.

Example: let say you want to open Buy order and if market price moves against it 20 pips you want to open Sell order. In this case use "On Every Tick" -> "Virtual Stoploss Trigger" -> "Sell Order" to trigger execution of the Sell Order once price moves 20 pips against your Buy.

Virtual Stoploss Trigger and Virtual Takeprofit Trigger are very powerful but rarely used blocks.

Understanding Hours

Forex market is open 24 hours on regular days. But most EAs trade only at certain hours in that 24 hour period. Running EA at the "wrong" hours (not the hours it was programmed for) is a recipe for disaster.

Forex Generator comes with number of time filtering blocks. Example: Hours Filter, Hours Filter as List, Weekday Filter, At Certain Time, etc. Blocks that have hours as parameters operate on 24-hour clock. This is similar to what is called as "military time" in US.

Example: 1 PM is 13 and 5PM is 17, 9PM is 21 and so on. So if you want your EA to trade from 2AM till 6PM you would setup Hours Filter block to have From parameter set to 2 and To parameter set to 18. Hours Filter as List block is even easier to use as you simply list all the hours you want EA to trade separated by commas.

Understanding Pending Orders

There are 4 pending order types in MT4. Usually pending orders are set at some offset from the current price. Pending order becomes market order when conditions based on pending order type are met. Pending orders can not be closed instead they are deleted. Subtle but important difference.

Brokers set certain limits on how close pending order can be created to current price. Usually pending orders cannot be created closer than 3-4 pips. If you try to create pending order that is too close to current price you will get "Invalid stops..." error in Experts tab.

Because there are 4 types of pending orders to open all the possible combinations you might need to use negative values on Offset, Stoploss and Takeprofit depending on pending order type. In the example below all Offset, Stoploss and Takeprofit are negative. If you set Offset, Stoploss or Takeprofit incorrectly you most likely get "Invalid stops..." error in Experts tab.

Understanding Flexible Stoploss and Takeprofit

There are many EAs where you do not want to set stoploss and takeprofit to fixed values in pips. Situation when stoploss and takeprofit is set based on some formula that takes into consideration some of current market conditions. Simplest example would be where you want to set stoploss to lowest low of the past 10 bars.

In all those cases use blocks that have "..Flex" in they name. That would be "Buy Order Flex", "Sell Order Flex" or "Modify Order Flex".

"..Flex" stands for flexible. That means stoploss and takeprofit is flexible and set based on provided formula at the time of execution. Let say you have "Buy Order Flex" and when that block runs it opens Buy and sets stoploss to lowest low of the past 10 bars. Once stoploss is set it is no longer changing. So formula is used only at the time of block execution, it is not going to constantly update stoploss if lowest low keeps on changing. If you need stoploss constantly updated on very tick use other blocks like Trailing Stop or similar.

Now getting formula right is usually the hardest part. This is where your math skills and chapters on Bar Values should help you. Also use "Print Functions to Chart" block to see what values come back. "Print Functions to Chart" is invaluable and at the same time simple block. You setup EA with just few blocks including "Print Functions to Chart" and see what gets printed on the chart during EA execution.

Example:
Get the highest value on the 10 consecutive bars in the range from the previous bar to the 10th index inclusive on the current chart:
High[iHighest(NULL,0,MODE_HIGH,10,1)]
Get the lowest value on the 10 consecutive bars in the range from the previous bar to the 10th index inclusive on the current chart:
Low[iLowest(NULL,0,MODE_HIGH,10,1)]

"..Flex" blocks when setup incorrectly cause "Invalid stops" error in the MT terminal. Typical cause is that you assumed common cases but forgot about edge cases. Always think about edge cases!
Example: you setup stoploss to be lowest low of the previous bar. It works 95% of a time but sometimes you get "Invalid stops" error. Confusing. This is because your broker does not allow stoploss to be smaller than 4 pips and in some cases your formula returns lowest low that is less than 4 pips away from the current market price, EA tries to open order with stoploss less than 4 pips and broker rejects the order. Test your math with "Print Functions to Chart" block and see what values are on the chart just before order execute.

Multiple Orders Problem

Let say you setup simple diagram with "On Every Tick" block having two branches. Each branch with a "Technical Analysis 2" blocks to check for moving average cross up/down each having attached "Sell Order" or "Buy Order" to it. You are using moving averages to check for cross on current bar. You expect to see single order open when cross happens.

Instead you are sometimes getting multiple orders open on what appears as single cross. This is usually called "multiple order" problem. While this may seem like a defect in the EA, it is not. It is because of current value of moving average changing you are getting multiple crossing signals for the setup that suppose to report only one cross up or cross down.

In other words, it is because of the way terminal works - current values are not "frozen", they are changing.

If you use current bar for indicator calculation understand that current bar is not "frozen" and it is changing all the time until new bar starts to form at that point current bar gets frozen and is no longer changing. Same applies to Close, Low and High values. So for example current Close, Low and current High are not fixed.

Because current bar is not frozen what you see on the chart as single "cross up / cross down" might be multiple cross ups and cross downs. Therefore EA receives multiple "cross up / cross down" signals. From EAs point of view there have been multiple signals (multiple cross ups or downs).

Now there are few ways to prevent multiple orders opening in this case.
You can:
1. Tell EA to check if there are other orders already open with that same OrderId and OrderType and then do not open anymore orders if such already exists. This is usually done with "If Order Does Not Exist" block.

2. Tell EA to open new orders only once per bar. So if EA gets "cross up / cross down" signal it will open new order only once per bar. This is done by placing "Once per Bar" block after your technical analysis and just before where you open new order.
You can also check how many signals EA receives by placing "Print to Log" block after technical analysis that does "cross up / cross down" check. "Print to Log" block will print your message into Experts tab. That way you can see if EA is really getting multiple signals and how many signals it gets.

3. Do not use current bar values. Instead use previous bar values. Since previous bar is "frozen" it will only report single cross up or cross down. While in some cases it is viable solution in many cases EA strategies rely on most current signals from the market. In those cases you can not wait for bar to become "frozen" and can not use previous bar values because by the time you will detect the signal it will be too late.

If you backtest, use Visual Mode and pause just before "cross up / cross down", then go slow and see how many entries appear in Experts tab.

Multiple Arrows Problem

Let say you setup simple EA that will place arrow on the chart when two indicators cross up or cross down based on current bar values. Seems simple. You place two "Technical Analysis 2" blocks and two Arrow blocks on the diagram and connect them. But once you start this EA you notice that it paints multiple arrows on the same bar. What is going on?

This is same problem as described in previous chapter called Multiple Orders.

In short: EAs run on ticks, not on bars. Tick is single price change. Bars are useful visualization. You are getting multiple arrows since your indicators cross multiple times on single bar because current bar values are not "frozen". See previous chapter called Multiple Orders for more detailed explanation.

Exported Parameters

Since version 2.05 Forex EA Generator lets you choose what parameters can be exported from Expert Advisor and available in MT terminal "Inputs" screens. Once you have rounded block connected to other blocks use "Project->Exported Parameters" menu to change what EA parameters can be customizable via terminal screens.
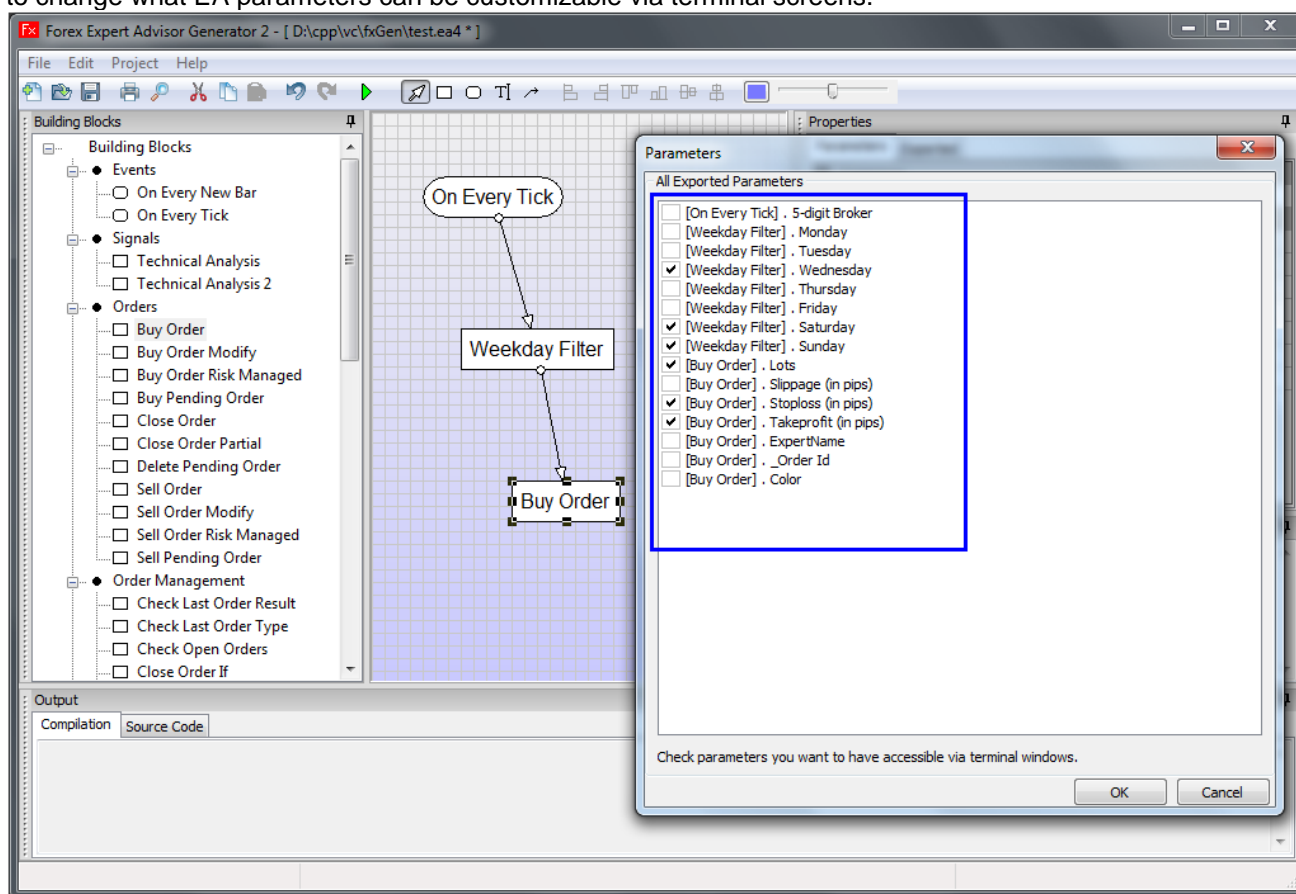
Use "Project->Exported Parameters" menu to export parameters from Expert Advisor and make them available via Forex terminal.
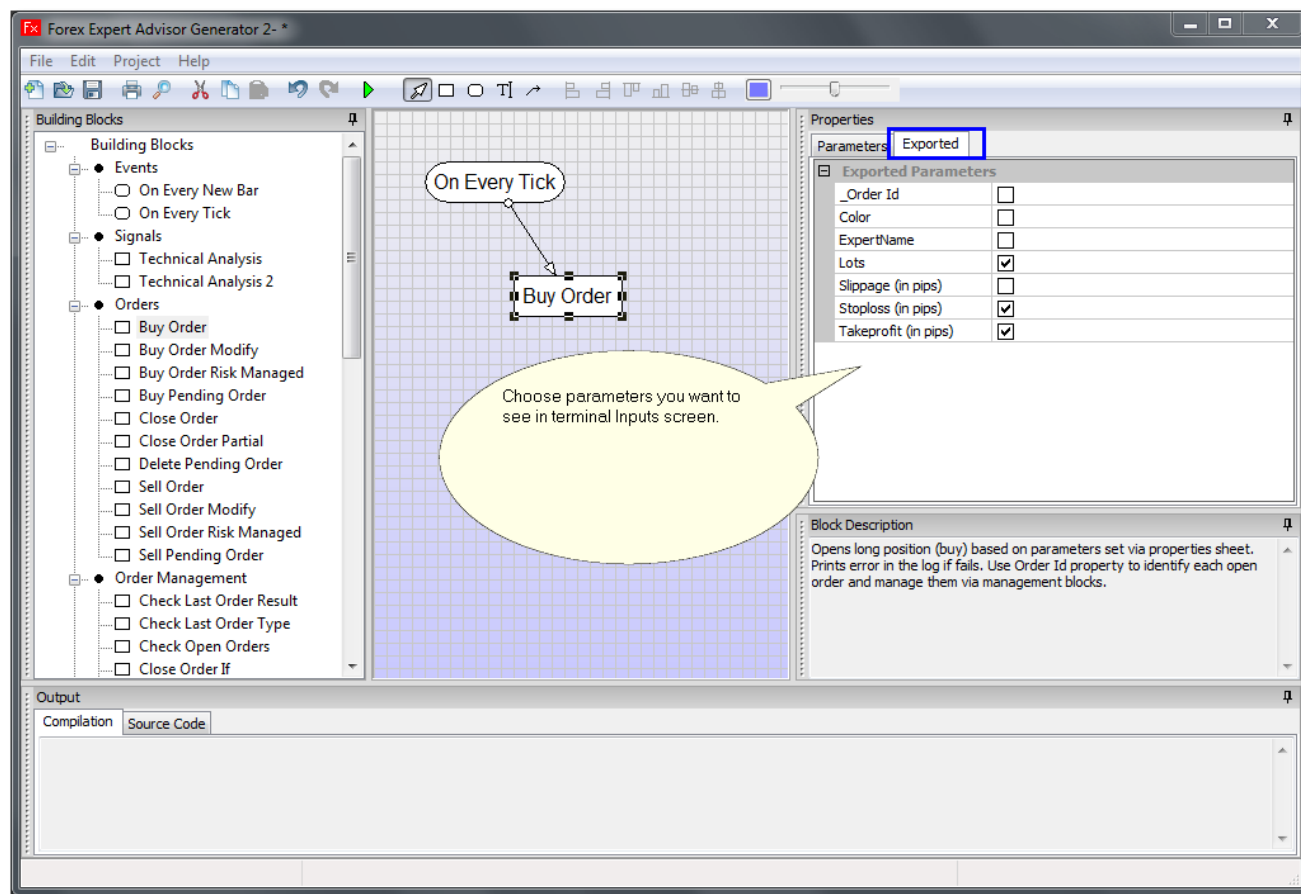
Another way to change exported parameters is via "Exported" tab right on the main program screen.

Bar Values in MT5

In MT5 Generator provides functions to access current, previous, previous previous, etc. bar values. Example: to access current bar close value use Close(0) in Technical Analysis block. If you want to access previous bar value use Close(1). Previous previous close bar value is Close(2). Same applies to Low, High and Open. Current high is High(0) and previous bar high value is High(1), etc.

If you want to access low value of the bar 5 bars ago use Low(5). If you need close value of the bar 10 bars ago, it is Close(10).

If you want to add or subtract some amount of pips from close, low, high or open use *Point() function to convert pips to price point values.

Example 1: you want to add 20 pips to previous bar close value: Close(1) + 20 * PipValue * Point().

Example 2: you want to substract 30 points from current bar low value: Low(0) – 30 * PipValue * Point().
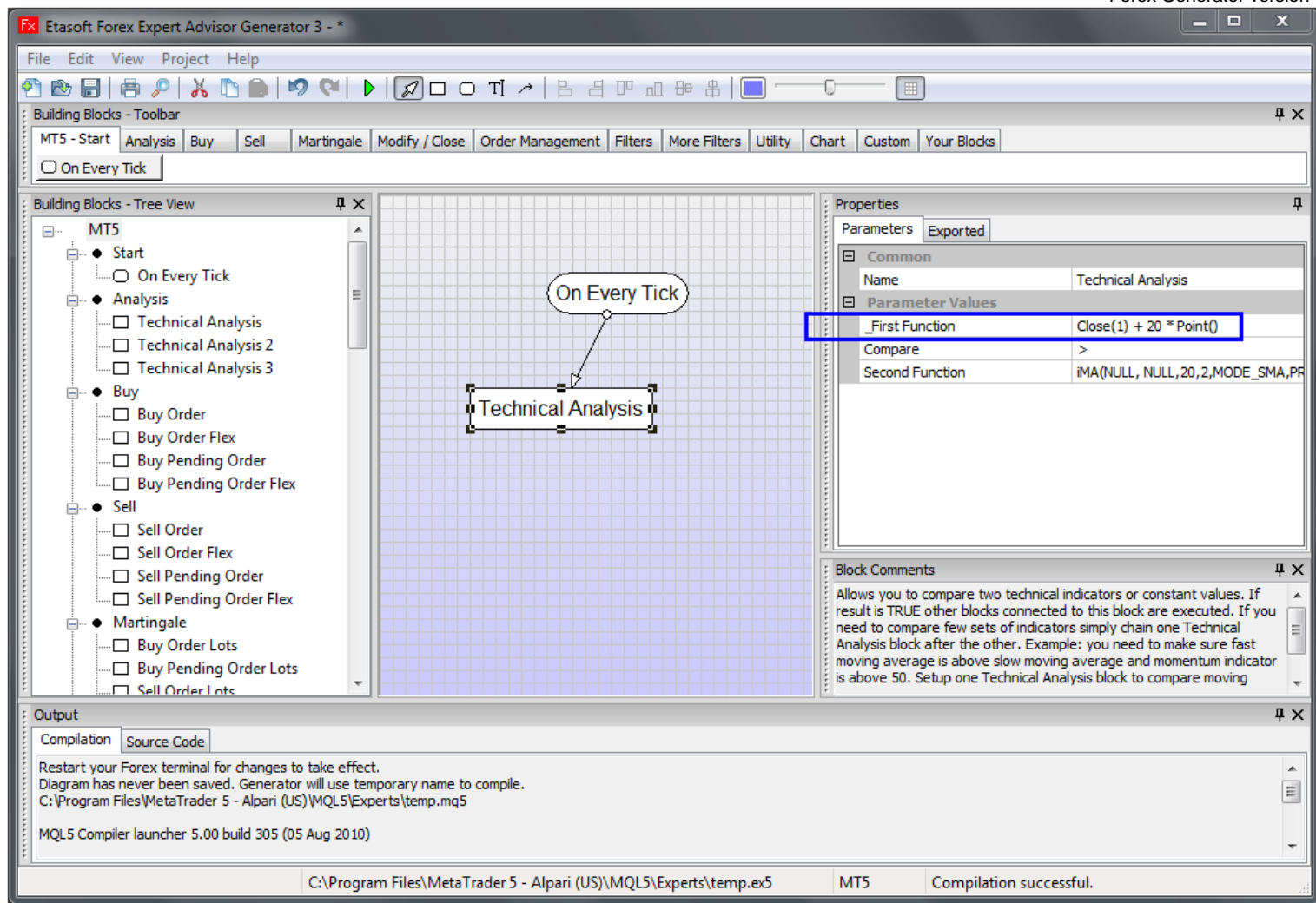
In this example on how bar values can be used in MT5 we forgot to place "PipValue" variable. This still works if you use 4-digit brokers. But will not work on 5-digit brokers. "PipValue" variable adjusts pips based on what type of broker you use. If it is missing then EA can only be used on brokers that quote currencies in 4-digits (2-digits for some currencies) but not on 5-digit (3-digit) brokers.

"PipValue" variable is basically a bridge that allows EA to work with both 5-digit and 4-digit brokers. If you miss it, your EA will not work when you use it on 5-digit brokers.

Bar Values in MT4

In MT4 you can use the same functions to access bar values but instead of ( ) braces you would use [ ] braces.
Example 1: previous bar close value is Close[1].
Example 2: previous previous bar low value is Low[2].
Example 3: current bar high value is High[0].

You need PipValue variable and Point (without ( ) braces) when adding or subtracting pips to bar values. There is an example if you want to add 20 pips to previous bar close value:
Close[1] + 20 * PipValue * Point

Example: you want to find the difference between high and low values of the previous bar and make a decision to trade or not.
High[1]-Low[1] gives a difference in price in the currency of the BAR high low.
(High[1]-Low[1]) / (PipValue * Point) gives same difference but in pips.
If you want to compare this to value of 100 pips in Technical Anlaysis block you would enter:
_FirstFunction as (High[1]-Low[1]) / (PipValue*Point)
SecondFunction as 100
Compare as < or > depends should it be less than 100 pips or more than 100 pips.

Get the highest value on the 10 consecutive bars in the range from the previous bar to the 10th index inclusive on the current

chart:
High[iHighest(NULL,0,MODE_HIGH,10,1)];
Get the lowest value on the 10 consecutive bars in the range from the previous bar to the 10th index inclusive on the current chart:
Low[iLowest(NULL,0,MODE_HIGH,10,1)];

Almost everything you enter in the Generator is case-sensitive. So LOW is not the same as Low. If you enter LOW(1) instead of Low(1) it is not going to work. If something does not work, recheck the syntax. Make sure you have entered values, braces, special symbols the way they should be.

Bar Values in MT4 For Other Timeframes

With Close[0], Open[0], Low[0] and High[0] you can access bar values of the current chart timeframe. You can also access bars for other timeframes using other set of functons: iClose, iOpen, iLow and iHigh.

For example:
iHigh(NULL, PERIOD_D1, 1)
and
iHigh(NULL, PERIOD_D1, 0)

First will give you previous daily bar high and second will give you current daily bar. If you want to see if overall daily price is moving up or down. In other words, is current bar greater that previous bar:

iHigh(NULL, PERIOD_D1, 0) > iHigh(NULL, PERIOD_D1, 1)

PERIOD_D1 gives you daily bar. You can get other timeframe bar values by substituting PERIOD_D1 with :
PERIOD_M1   1 minute.
PERIOD_M5   5 minutes.
PERIOD_M15   15 minutes.
PERIOD_M30   30 minutes.
PERIOD_H1   1 hour.
PERIOD_H4   4 hour.
PERIOD_D1   Daily.
PERIOD_W1   Weekly.
PERIOD_MN1   Monthly.

Example 1: Get Close bar value of previous hour:

iClose(NULL, PERIOD_H1, 1)

Example 2: Get the highest value on the 10 consecutive bars in the range from the previous bar to the 10th index inclusive on the current chart:

High[iHighest(NULL,0,MODE_HIGH,10,1)]

Here 10 is 10th bar and 1 is previous bar.

Example 3: Get the lowest value on the 10 consecutive bars in the range from the previous bar to the 10th index inclusive on the current chart:

Low[iLowest(NULL,0,MODE_HIGH,10,1)]

My Diagram Does Not Work. What's Wrong?

You have got excited about the opportunity to build your own EAs without much programming involved. Dropped 40 blocks on the diagram, connected them but it does not work the way you expect. What's wrong? Why it does not work the way it should?

Now diagram has too many blocks to understand and find where the problem is. Best way to approach any new trading setup is to start small. Start with 5 to 7 blocks. Make sure it works then grow it slowly by adding more blocks. Make backup copies of the diagram as work progress. If you add some blocks, and you can not find why suddenly it does not work, you can always take last backup copy and start from that point again.

1. First place to check when your EA does not work the way it should is to check "Experts" tab in the terminal.
2. Make sure that you have EA execution enabled, and live trading is allowed.

3. If "Experts" tab does not list any errors you need to place more "Print to Log" blocks into the diagram. Use "Print Functions to Chart" block to see some indicator values on the chart as EA is executed.
4. Run EA backtest in Visual Mode (available in MT4). Pause execution at critical moments. Check "Experts" tab for "Print to Log" output.
5. You can place number of graphical objects on the chart to give you some visual clues. Use "Vertical Line" and "Arrow" blocks. "Arrow" block with Arrow Type set to SYMBOL_LEFTPRICE, SYMBOL_ARROWUP and SYMBOL_ARROWDOWN are most useful.
   Use "Arrow" block with Arrow Type set to SYMBOL_LEFTPRICE just before the block that runs when it is not suppose to run. Example: if you have SELL block that runs when it should not run, place "Arrow" block with Arrow Type set to SYMBOL_LEFTPRICE just before it (but after "Technical Analysis" blocks). That way once EA runs SELL you will have price printed right on the chart.

Keep in mind that charts in the terminal are by default based on Bid. That is important to understand. Especially for currency pairs that have wide spreads. The current price shown on an MT4 chart is the bid price. When looking at a price bar or candle, you need to add the spread to the high bid price to know what the high ask price would have been, or add the spread to the low bid price to know what the low ask would have been.
If you are in a sell (in at the Bid out at the Ask), you would not see the candle reach your stop loss if you are taken out of the trade.

Sometimes it is hard to understand why diagram generated EA works the way it does. The easiest way to decipher these types of diagrams is actually rather simple. Take a piece of paper and write diagram as bunch of IF statements. Each Technical Analysis block is essentially an IF.
Let say you are comparing bar values of Close in "Technical Analysis 2" blocks and trading based on that. Something like this:
IF Close[1] < Close[2] AND ... THEN open
IF Close[1] < Close[0] AND ... THEN close

Now instead of Close[0], Close[1] and Close[2] you will insert actual numbers. Example: instead of Close[0] you will write 1.4567, and so on. Make sure those are reasonable values.
Rewrite diagram text like this:

IF 1.4567 < 1.4444 AND ... THEN open
IF 1.4567 < 1.4555 AND ... THEN close

Run all "IF" statements of the diagram with actual numbers and see which ones of the "IF" conditions trigger. Mark them on paper. You might want to repeat this 15-20 times with different numbers to make sure all kinds of scenarios are covered.

Understanding On Every New Bar block

Diagrams start EA or Script execution from rounded blocks. Your diagram can only have one rounded block. We recommend use "On Every Tick" block for almost all diagrams.
The difference between blocks "On Every Tick" and "On Every New Bar" is huge. "On Every New Bar" is basically an extra filter on "On Every Tick" block. "On Every New Bar" receives all the ticks (the same way "On Every Tick" block does) but it executes connected blocks only when new bar starts. It basically means that if you use "On Every New Bar" block you are missing many ticks. You are missing information coming from the broker in a form of ticks.
If you are watching a movie would you like to watch it all or just watch 1 minute of the movie out of every 5 minutes (watch 1 minute and skip 4 minutes, watch another 1 minute skip some more, etc.)? That is basically the difference.

Some building blocks do not even work accurately when connected to "On Every New Bar" instead of "On Every Tick". Examples are "Trailing Stop" and "BreakEven" blocks. They need to run on every tick to be most accurate.

In some cases you want to start some action when new bar starts. You can still do it without "On Every New Bar" block. Just use "Once per Bar" block connected to "On Every Tick". When used together "On Every Tick" and "Once per Bar" produce same effect as single "On Every New Bar" block. The difference is that you can also attach other blocks directly to "On Every Tick" block. That way you get the best of both worlds. You can run part of diagram on every tick while running some blocks only when new bar starts.

Diagram Execution

Let's say you have "On Every Tick" block on the diagram. Now all the other blocks directly connected to "On Every Tick" will run on every tick.
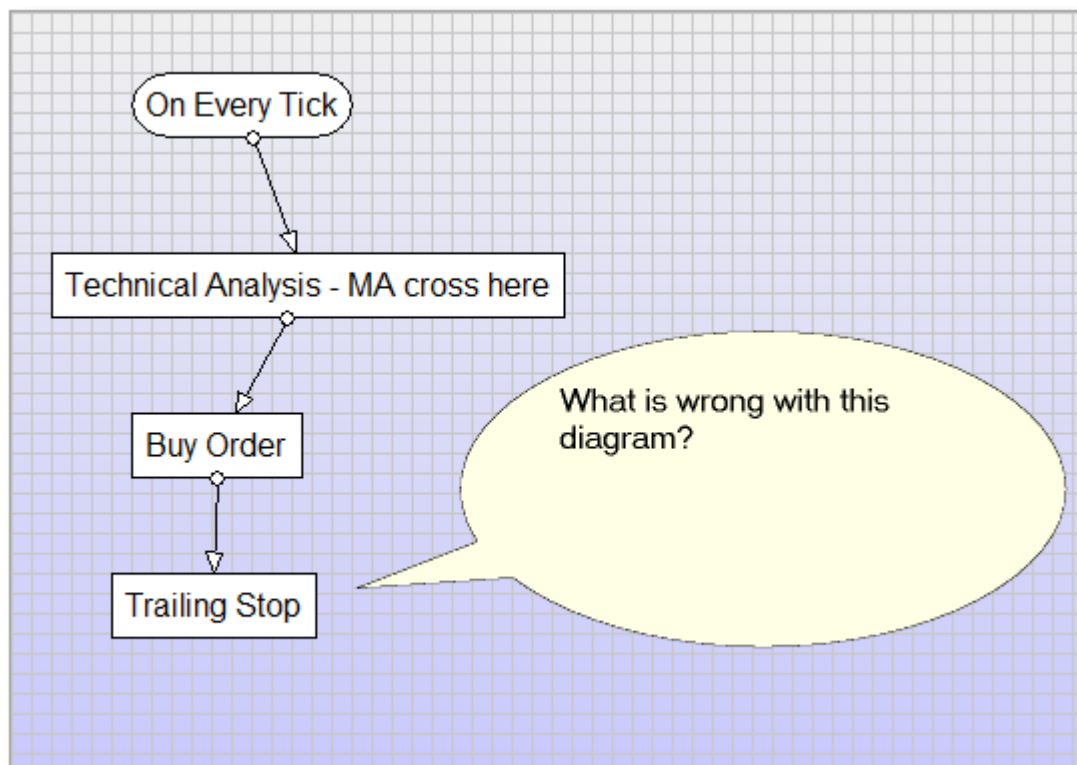
Simple diagram that runs on every tick, checks if Moving Averages just crossed, executes Buy Order and runs Trailing Stop.

The diagram is not going to run the way you expect. The problem is that "Trailing Stop" block is connected to the wrong place. For "Trailing Stop" to execute on next bar Moving Averages need to cross again. This will probably not going to happen for the next 10-20 bars or more. So your "Trailing Stop" will not execute for long time missing many ticks in between.
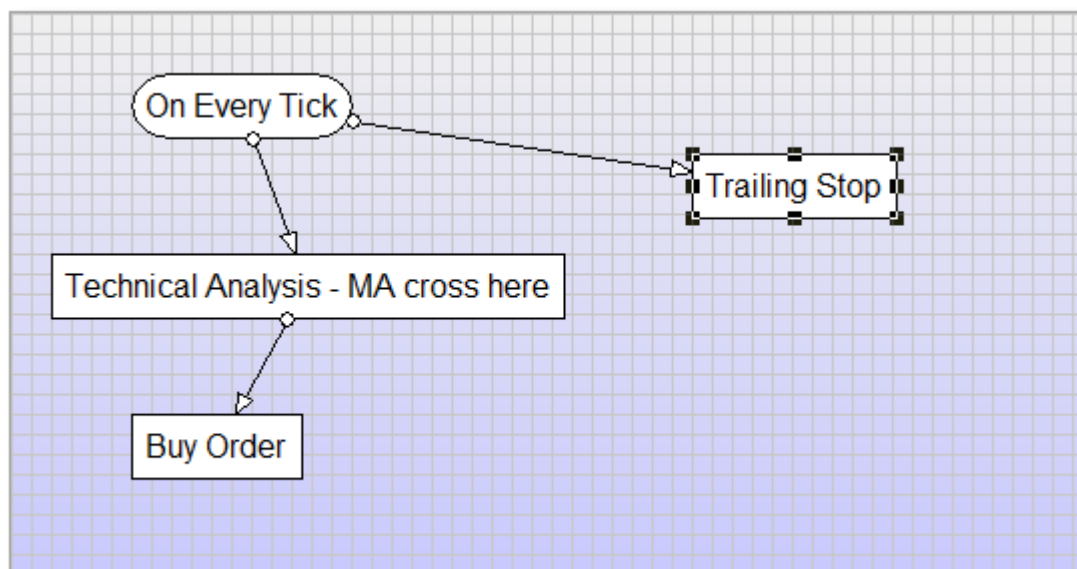
There is corrected diagram. Now "Trailing Stop" will run on every tick not just when Moving Averages cross.
General observation that might help you understand why certain blocks run more often than others – if you have many blocks between "On Every Tick" block and some "A" block, that "A" block will run only if every block on the way will also run because some blocks work as filters and run only under certain market conditions chances greatly reduce for the "A" block to run further away it is from "On Every Tick" block.
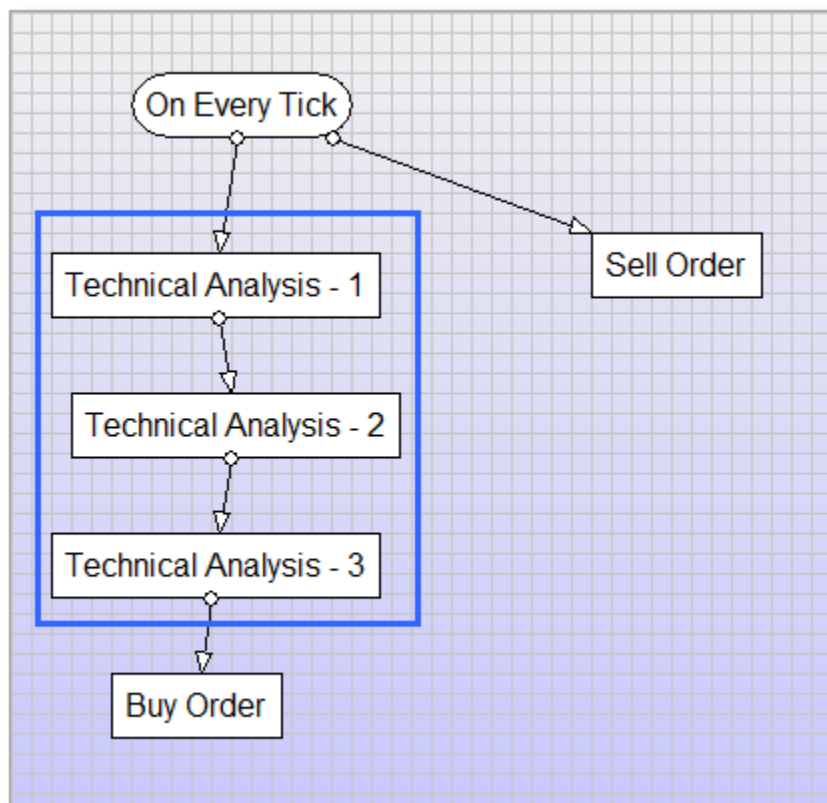
In this diagram "Sell Order" will execute on every tick but "Buy Order" will execute only when specific market conditions are met. Conditions are set via three "Technical Analysis" blocks. Obvious that "Sell Order" will execute much more often than "Buy Order".

If you have all the blocks in the diagram but generated EA does not run properly it is likely because blocks are connected incorrectly. You can check execution of EA by inserting "Print to Log" blocks in between other blocks in the diagram. "Print to Log" will output text into Experts tab in the terminal and help you understand order of execution of the blocks inside the diagram.

Before Going Live

Before you start using generated EA for live trading there are some important points to consider:

1. Make sure you have both backtested and demo (forward) tested your EA for at least 2 weeks.
2. After you start trading live using your EA, do not leave it unattended for the first 2 weeks of live trading. That means, monitor your EA trading and do not leave it running by itself.
3. Use various blocks and techniques that protect your profits or minimize losses. Example: use Stoploss, do not set it to zero.
4. There are number of blocks that can stop EA execution if certain losses are reached. Those blocks are helpful when you start running EA in fully automated (unattended) mode. Such as running overnight or running during the day when you are busy at your day job.
5. There are blocks that do not trade if spreads increase. Spreads eat your profits when you are using non-ECN broker. Spreads increase during high volatility. If your strategy depends on low spread values use blocks that check for spreads and do not open new trades at the moments when spreads increase.

MT5 and MT4 Differences

Visually MT5 might not seem that different from MT4 when you look at it. You have mostly the same screens and some additional features. But MT5 is very different in terms of programming. Make sure you understand terms: orders, positions and deals before creating EAs in MQL5.
MT5 supports "netting" and "hedging" account types. EA may work differently depending on which type of account is used for trading.

Custom Indicator Mode

Since Forex Generator version 4 you can also build custom indicators using "Custom Indicator Mode". Simply switch to this mode using Options screen.
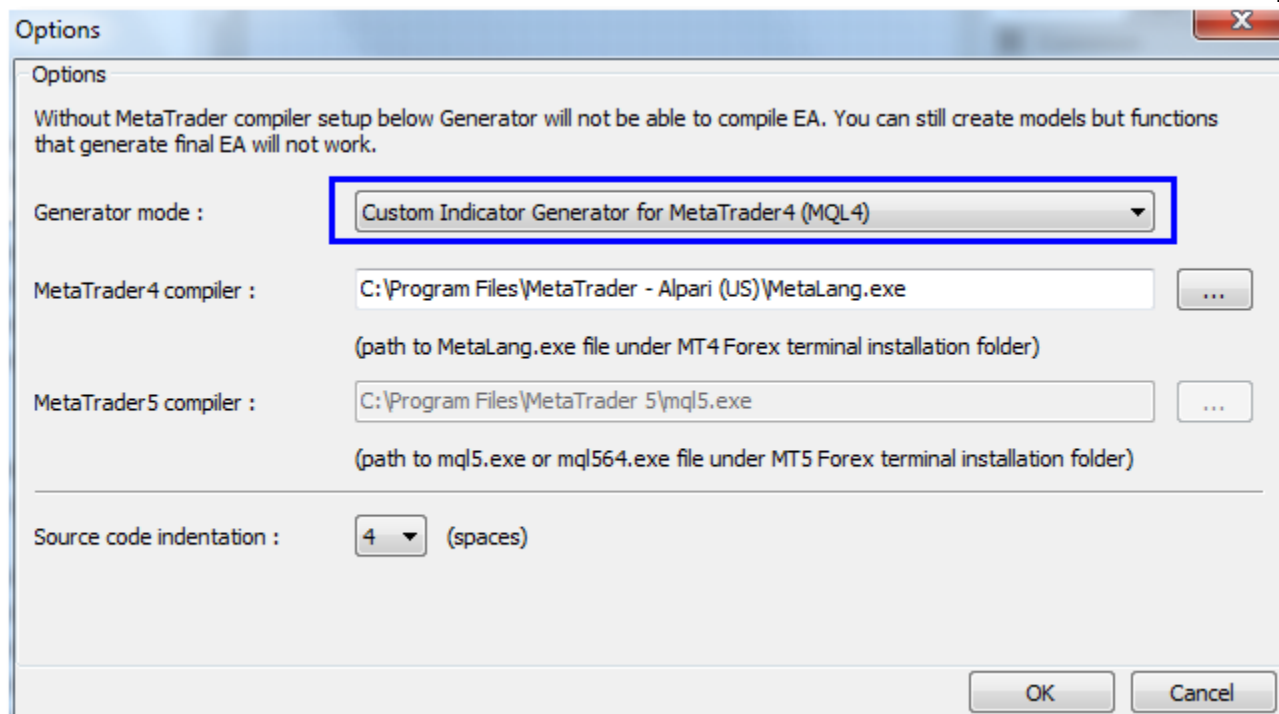
You can switch to Custom Indicator Generator mode using Options screen.

Indicators differ in number of ways how they work inside the terminal. Indicators are executed different than Expert Advisors (EA). Once you drop EA on the chart it starts executing main body of code on the first tick. But indicator dropped on the chart execute (recalculate) its values on all bars prior to this one. Therefore while EA may use formulas like Close[0] to access current bar's close value or High[1] to access previous bar high value, indicator can not use fixed index but has to use current or current+1 value. So inside indicator values of bars are relative to current bar and can be accessed as Close[current] for current close or High[current+1] for previous bar's high, and so on.

Examples:
Close[current] is current bar's close.
Close[current+1] previous bar's close.
Close[current+2] previous previous bar's close.
Close[current+3] previous previous previous bar's close.
Open[current] is current bar's open.
Open[current+1] is previous bar's open.
Open[current+2] is previous previous bar's open.

Same applies to the indicators. So instead of "Shift" parameter being set to zero (0) it should be set to word "current" (no quotes).

Shift is set to current bar. Only problem with using word "current" bar in Shift is that it can not be exported as parameter variable.

Expert Advisors usually rely on signals from indicators therefore they mostly contain signal processing and order management code that is not very math intensive because calculations are done inside indicators outside of EA. Custom Indicators are usually more complex in terms of mathematical calculations than average Expert Advisor. Creating custom indicator in most cases requires more math skills or some background in computer science.

Since Custom Indicators (CI) execute on every previous bar once CI is dropped on the chart special care is required in using blocks like Send Email, Alert and Beep. If you set Technical Analysis block incorrect and it will execute attached Send Email on every bar, as a result you will get as many emails as many bars are displayed on the screen. It could be 50 to a 100 emails at once. Same applies to Alert and Beep. Alert will be repeatedly displayed and beep will sound constantly. Instead of using Send Email, Alert and Beep try using Print to Log block first, and see what does get printed in the log.

While Expert Advisor development required extensive use of "Technical Analysis" and "Technical Analysis 2" blocks most Custom Indicators (CI) need blocks called "Chart Line", "Histogram", "Dotted Line", etc.

Custom Indicators "export" values that can be used in EAs. Only blocks that are in "Indicator" tab export those values and calculations to EAs. Other blocks like Vertical Line or Horizontal Line do not export they values as return parameters from custom indicator.
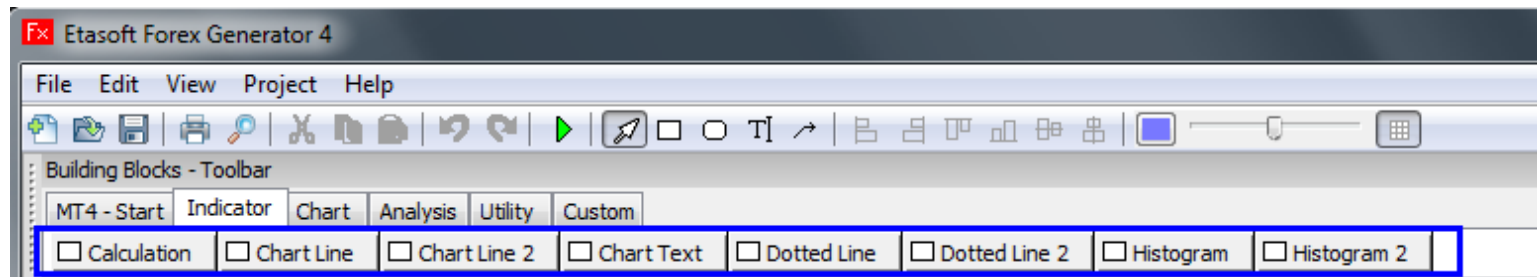
"Calculation" is only block in "Indicator" tab that does not display any information on the chart. It is used to create calculations

inside custom indicator. Those calculations can be used in your Expert Advisors or Scripts. Other blocks from "Indicator" section return result of the calculations as well and can be used in Expert Advisors but they also display some graphical information on the charts.

You need have Forex Generator Professional Edition to create indicators that can be used in Forex Generator EAs. Standard Edition does not produce *.mq4 files therefore indicators created with it can not be imported into Forex Generator EAs.

CI Example 1 – High Low as Histogram

We start our examples with the simplest Custom Indicator (CI) you can build in minutes. The first one is histogram type indicator that simply shows difference between High of current bar (High[current]) and Low of the current bar (Low[current]). It is not very useful but shows basics of how to create custom indicator.

We build it using only two blocks from the list of available blocks. That is "On Every Tick" and "Histogram". "On Every Tick" block holds general indicator parameters such as "Indicator Name", "Indicator Window", etc. "Histogram" block helps us setup simple single color histogram on the chart or separate section of the window next to the main chart.

There is our indicator open on EURUSD chart. As you can see this is simple histogram type indicator with only one type of graphical information in it. Indicators may have number of lines and graphic objects. We start small and show how to built simple things first.

One indicator can contain few histograms and lines all packaged together.

Internally each histogram or chart line gets unique index assigned to it. Forex Generator manages this for you automatically and assigns unique index to each histogram or chart line you place in the indicator diagram. But MT4 terminal limits number of buffer indices to 8 (internally they are presented by numbers from 0 to 7). That basically means you should limit your indicator to 8 chart lines or histograms in one indicator.

If you place more than 8 histograms or chart lines your indicator will most likely still work, but Expert Advisors or Scripts that use your new indicator will only be able to access calculations for the first 8 histograms or chart lines of your indicator.

This limitation is lifted for MT5 terminal. You can have unlimited number of histograms or chart lines per indicator and access them all from EA or Script.
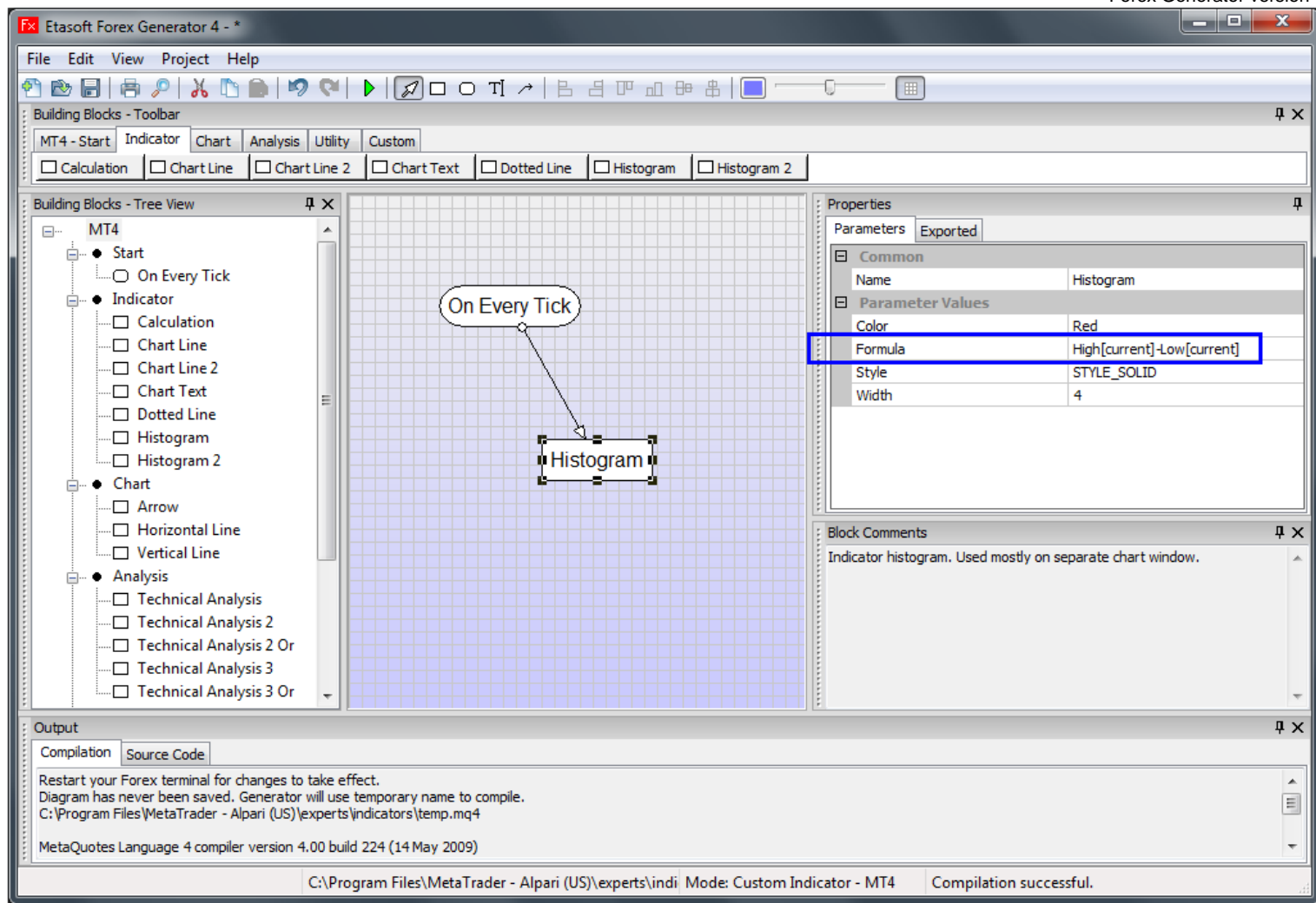
Blue square indicates actual indicator setup. We simply selected to add Histogram block then we took High of current bar and subtracted Low of current bar (High[current]-Low[current]).

CI Example 2 – Detrend Price Oscillator as Chart Line

This second example is different since it uses "Chart Line" instead of "Histogram". It is called "Detrended Price Oscillator". It tries to capture the short-term trend changes. Indicator's cross with zero is the best indication of such change.
Indicator takes current bar close value and subtracts current Moving Average (iMA) with specific parameters. This setup is also very simple. Main difficulty is to get Moving Average parameters entered correctly.
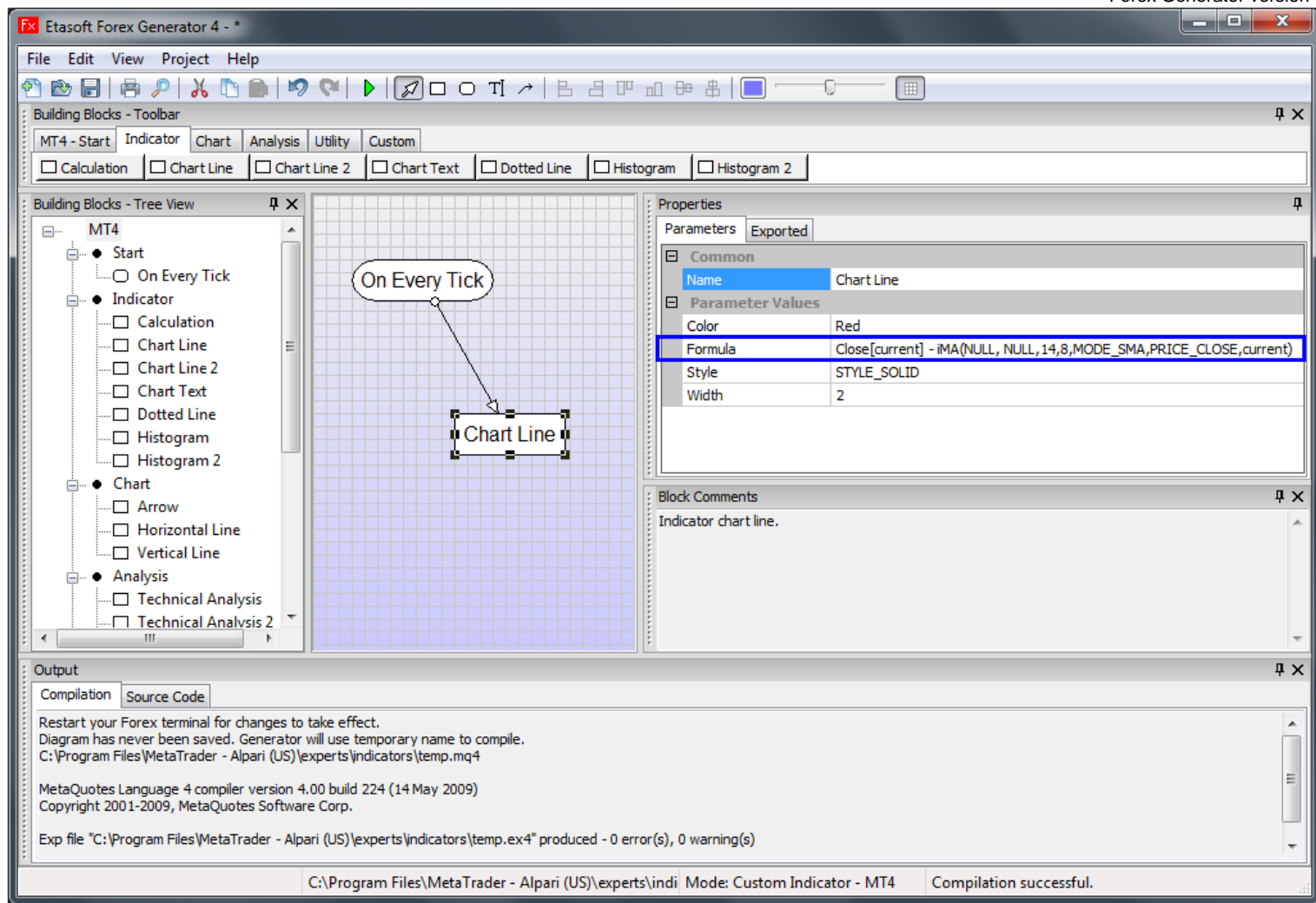
Whole formula is Close[current] - iMA(NULL, NULL,14,8,MODE_SMA,PRICE_CLOSE,current) .

You can enter this expression easier by using ".." button displayed next to the Formula parameter. Click on ".." button. In the new screen simply select "iMA" indicator from the drop down list and enter all the parameters for Moving Average. Then click OK in that dialog. Once you get expression back into main screen, add "Close[current]-" before the "iMA(…)" expression.

There is our new "Detrend" indicator in action.

Most indicators require more mathematical skills and testing until you get them right. Every time you create new Custom Indicator (CI) keep in mind that they get executed different from EAs or Scripts.

CI Example 3 – Support and Resistance as Dotted Line

This example is a bit more involved. Indicator displays support and resistance levels. It shows them directly on the chart, providing an easy help when you want to set stop-loss or take-profit level, or when you want to see the next market target. This indicator uses the standard Fractals indicator. Then two separate dotted lines are used to draw indicator's support and resistance levels on the chart.
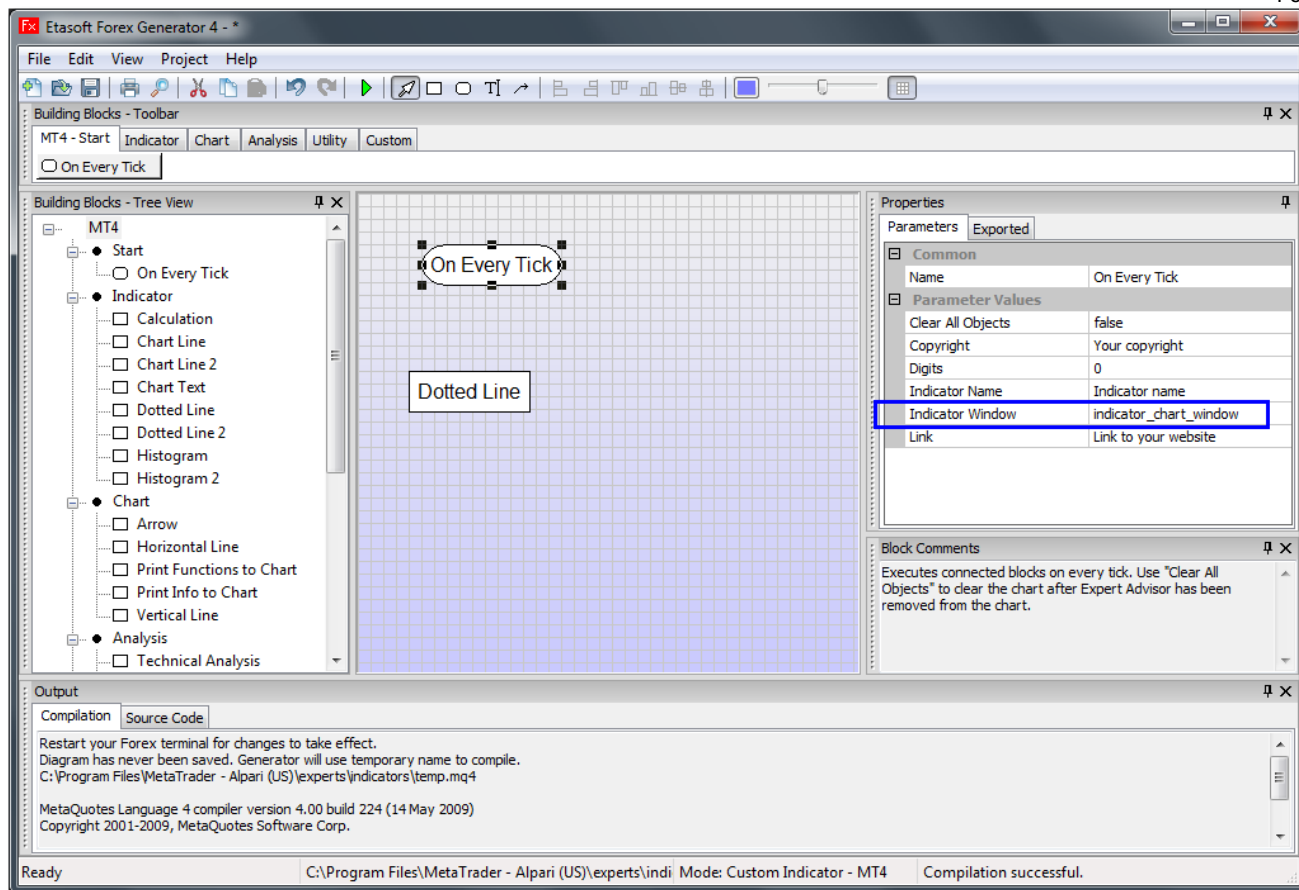
Set new indicator to be displayed in the same chart (indicator_chart_window value). Next we place "Dotted Line" block on the diagram and sets its parameters.
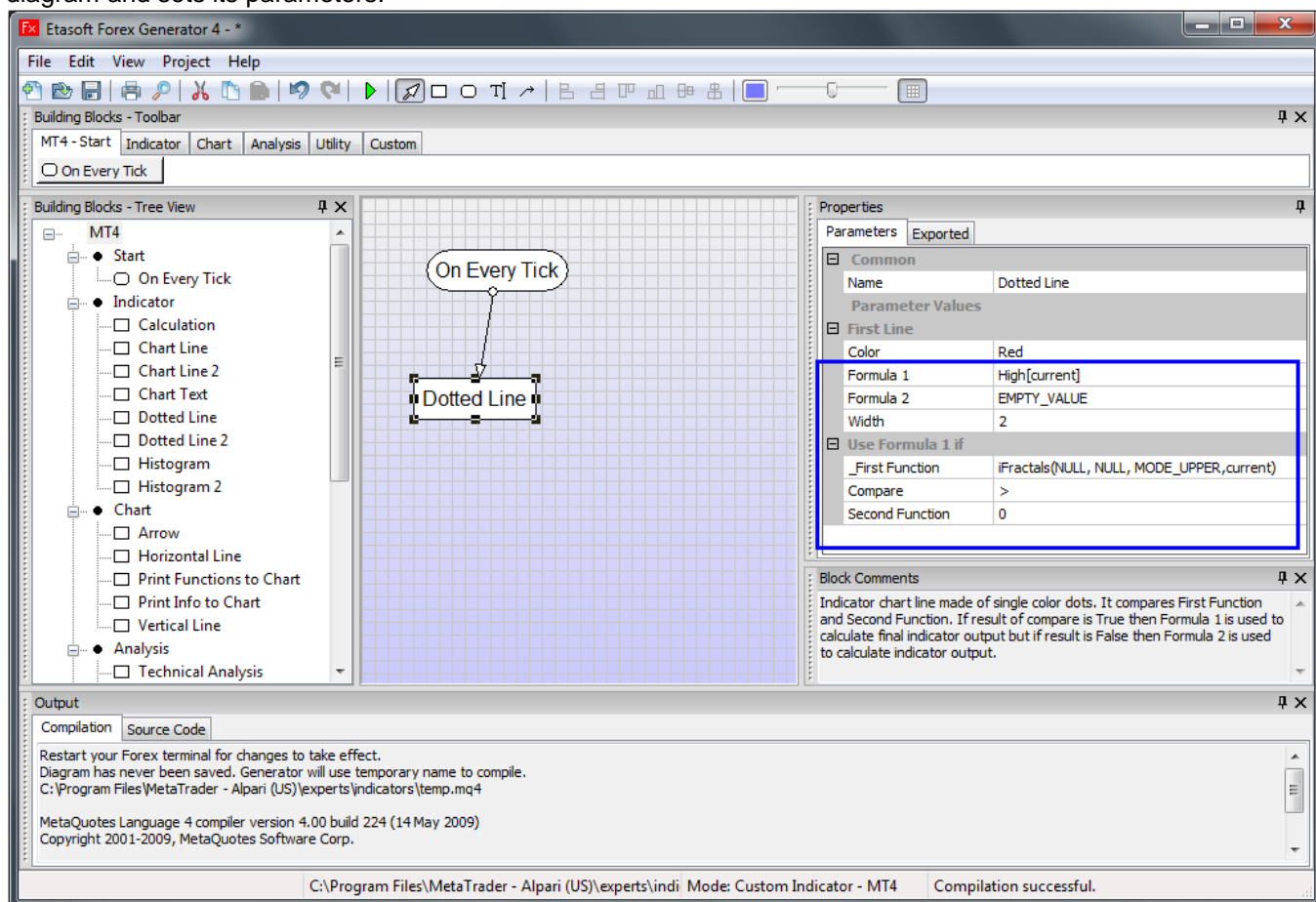
There is setup for dotted line that will be displayed as red upper line.
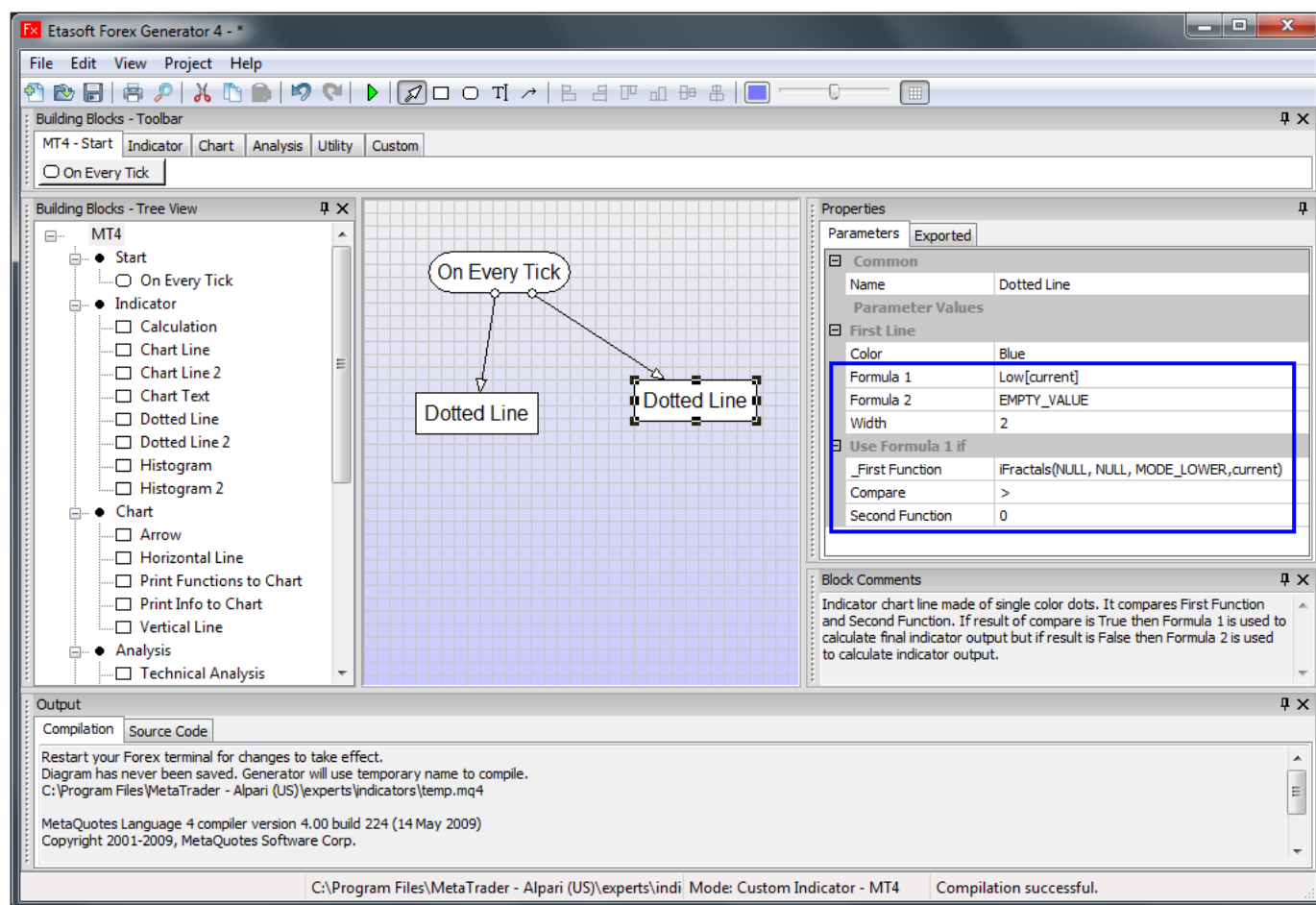
These are parameters for lower dotted line.

"Dotted Line" block can be seen as Technical Analysis block and Dot Line combined into one block. Technical Analysis block consists of _First Function, Compare and Second Function parameters. If result of _First Function compare to Second Function is True then dot is placed based on value from Formula 1 otherwise dot is placed based on value from Formula 2. If you do not want dot to be placed at all use text EMPTY_VALUE.

Output of current indicator without any changes produces disconnected dots at the support and resistance levels. While this is useful it can be improved even more.

We copy previous bar value using Buffer variable. Full expression is Buffer2[current+1] on Red block (first block placed on the diagram) and Buffer3[current+1] on the Blue block (second block placed on the diagram).

There is final support and resistant custom indicator in action.

CI Example 4 – Spread as Chart Text

There is another simple but useful indicator that displays spread on the main chart window. The spread is redrawn after each tick, ensuring the most current spread value. This can be useful for brokers with variable spreads or with spreads that are widened often.

There is resulting indicator.
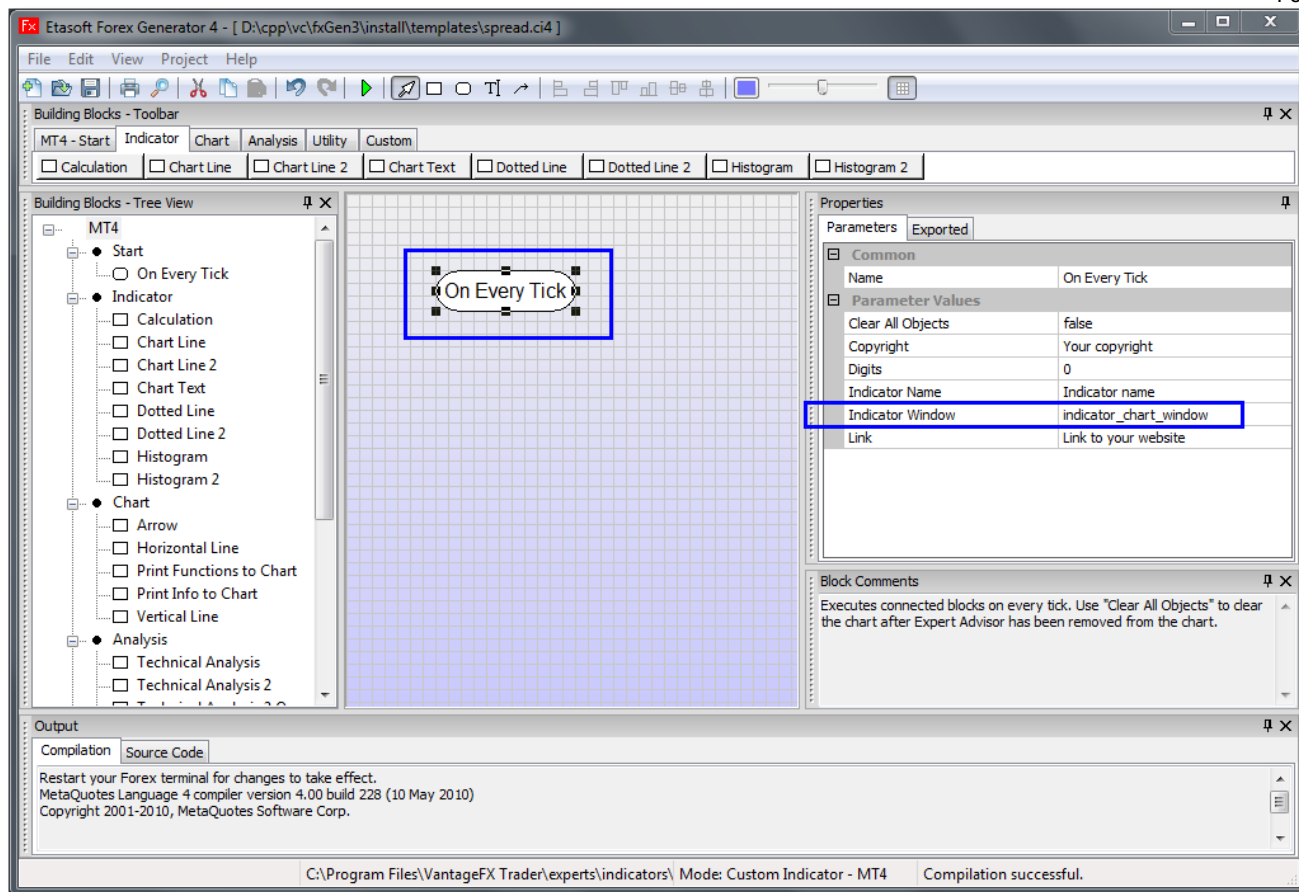
We set indicator to be placed on the main chart window (not the separate window below main window).
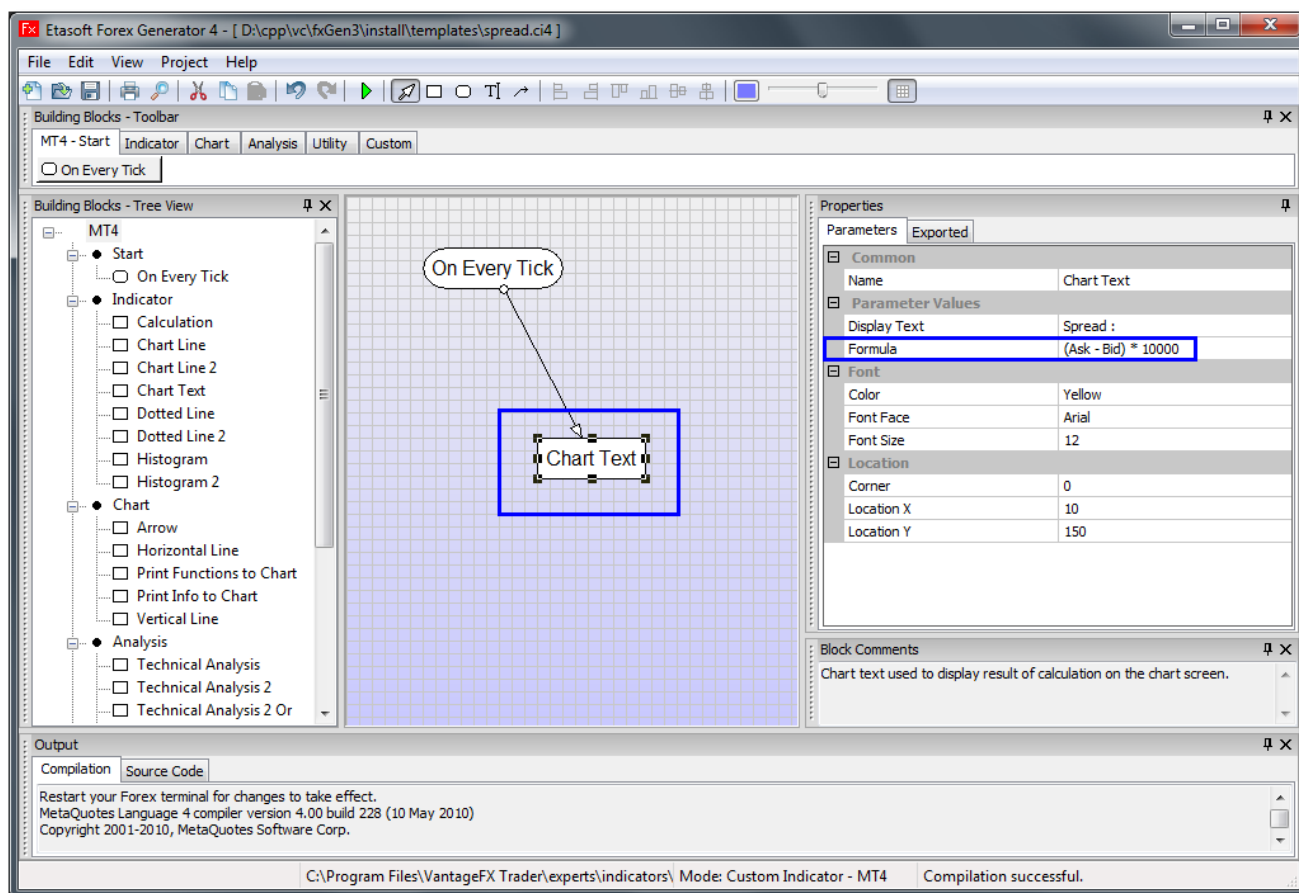
Formula parameter for this indicator is (Ask – Bid) * 10000. We simply take spread and adjust decimal point.

CI Example 5 - Moving Average as Two Color Line

There is standard simple Moving Average (MA) but with different colors when direction has changed.
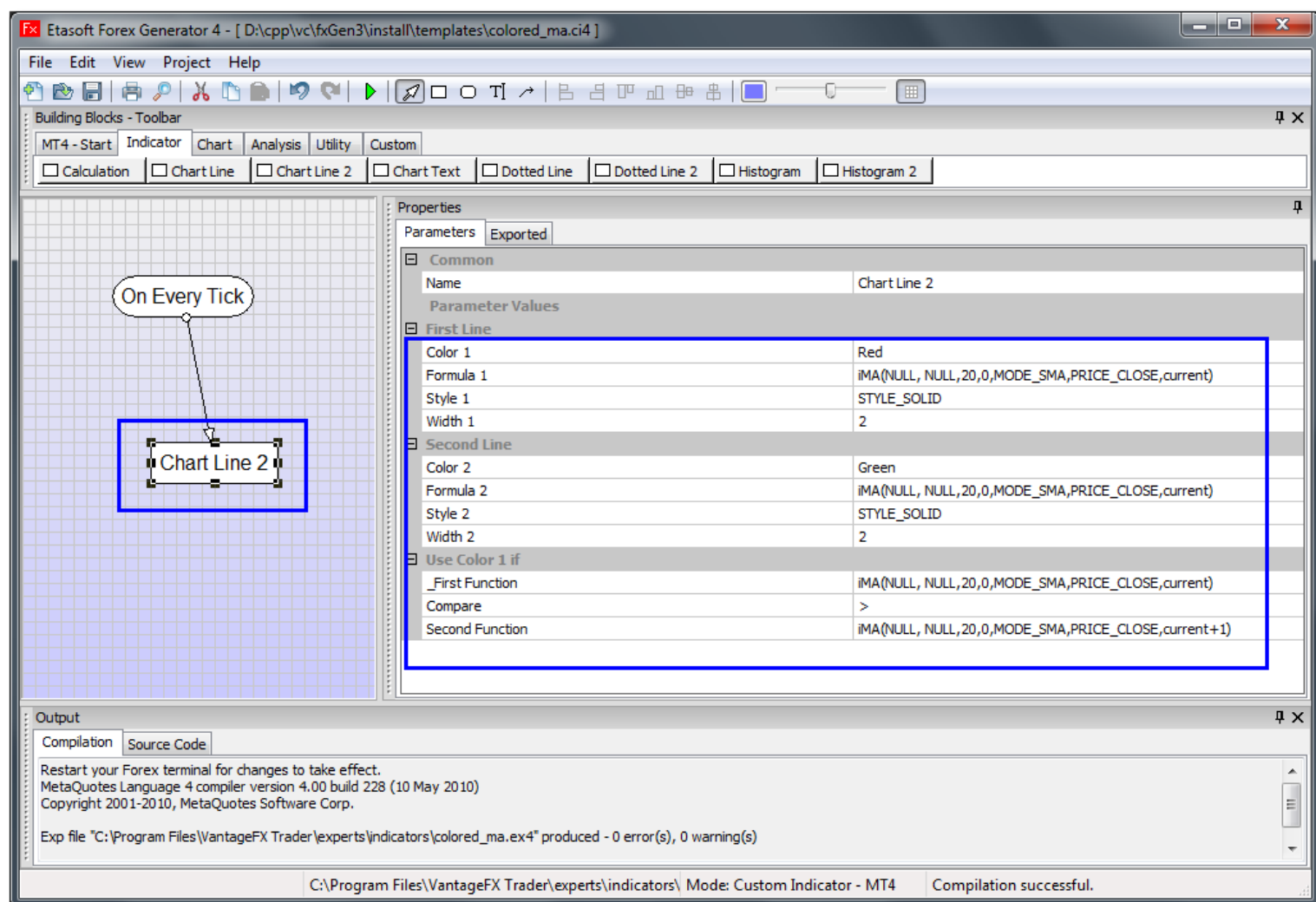
We use two moving averages (current and previous). Current is iMA(NULL, NULL,20,0,MODE_SMA,PRICE_CLOSE,current) and previous is calculated as iMA(NULL, NULL,20,0,MODE_SMA,PRICE_CLOSE,current+1).

There is our new indicator in action.

CI Example 6 – MACD as Two Color Histogram

Indicator displays Moving Averages Convergence/Divergence MACD as two color histogram. We use "Histogram 2" block and take two moving averages: fast SMA and slow SMA. You can change this indicator to use EMA or any other mode or type of moving average.

We calculate Moving Averages Convergence/Divergence and scale it 100 times so it would not look too small on the chart.
(iMA(NULL, NULL,14,0,MODE_SMA,PRICE_CLOSE,current)-iMA(NULL, NULL,24,0,MODE_SMA,PRICE_CLOSE,current))*100
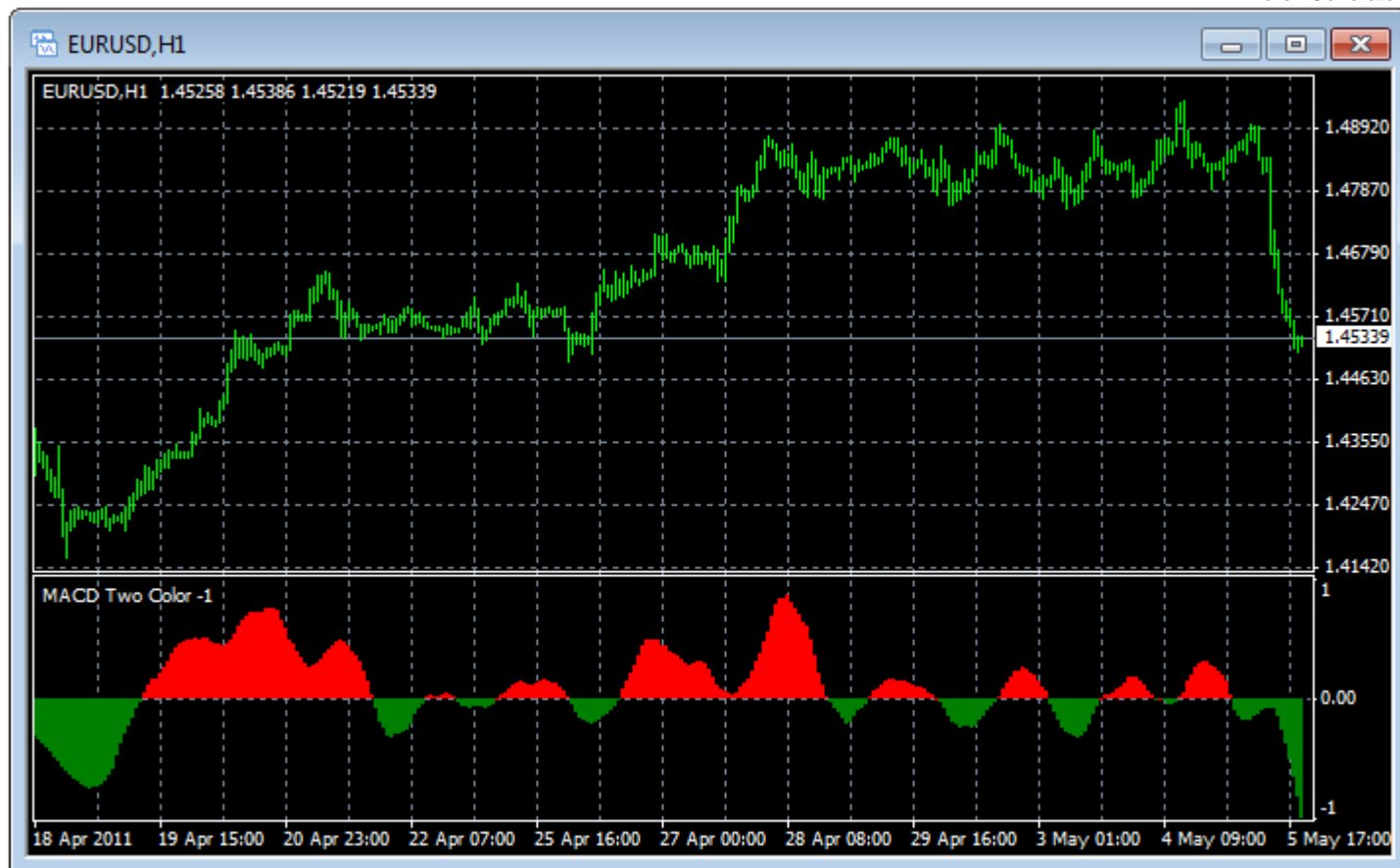
There is our new MACD indicator as two color histogram.

CI Example 7 – iTrend as Two Histograms

iTrend shows in the manner of two-color histogram trend direction and trend power. The iTrend's basic signals - zero line crossing, reaching new maximum or minimum, divergence and convergence.

There are number of resources online that discuss this indicator. This is simplified version of the well known indicator as it uses number of fixed (hardcoded) values and does not allow much customization. But you can modify it to export variables.

We use two Histogram blocks to create this Custom Indicator.
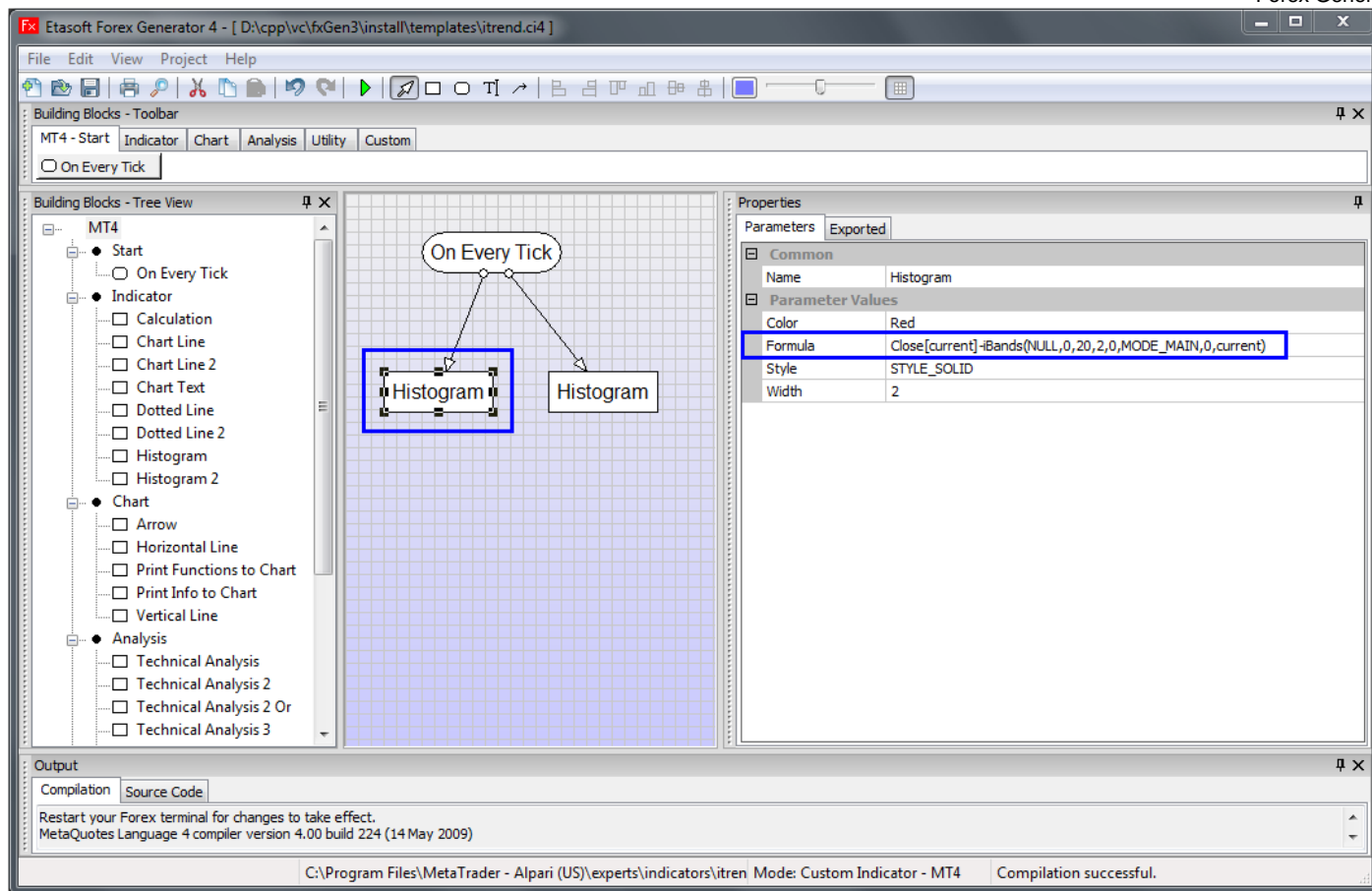
Formula is Close[current]-iBands(NULL,0,20,2,0,MODE_MAIN,0,current) .
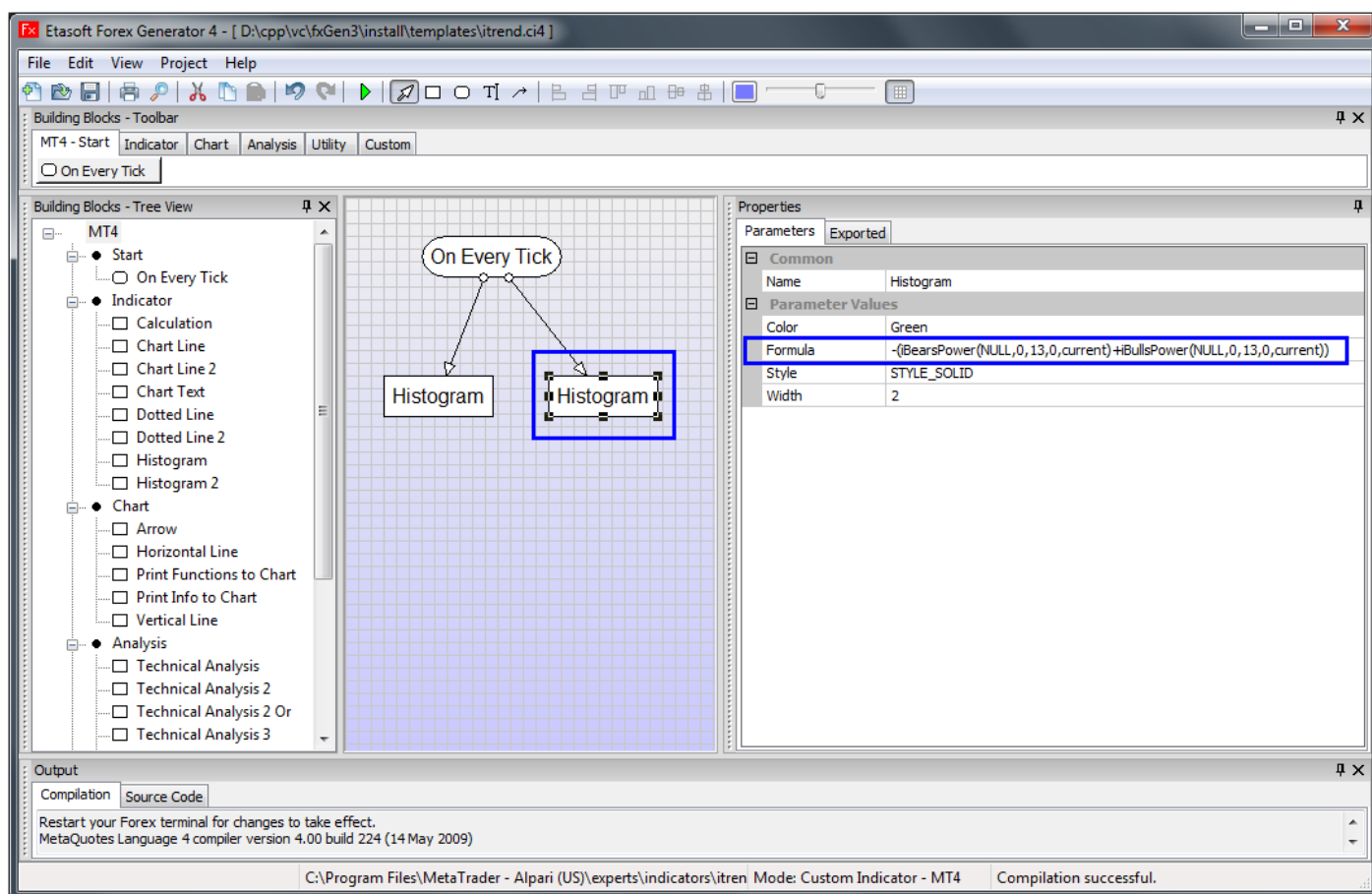
Formula is -(iBearsPower(NULL,0,13,0,current)+iBullsPower(NULL,0,13,0,current)) .

There is our iTrend indicator.

CI Example 8 – Moving Average Crossing as Arrow Tags

Indicator simply shows how to use Technical Analysis blocks to create simple indicator that displays special arrows in a form of price tags next to each crossing of the Moving Average (iMA).
First we add "On Every Tick" block in "Custom Indicator Generator Mode – MT4". Change parameter called Indicator Window to "indicator_chart_window" since indicator will be displayed on the main chart window.
Then we add two "Technical Analysis 2" blocks and set _First Function, Compare and Second Function parameters based on Moving Average Cross up-Cross Down scenarios.

There is cross up scenario.

There is cross down scenario.

There are number of different arrow types you can use. For this scenario we use SYMBOL_LEFTPRICE arrow type. Arrow will be displayed on current Close (see Close[current] function set in Price parameter).

There are special arrows displayed on Close of each Moving Acerage cross.

Integrating Your Custom Indicator into Expert Advisor

Once you built Custom Indicator in Forex Generator you can use it in your Expert Advisors or Scripts. Use "Import Custom Indicator" menu to import your indicator so it could be used in EA. Since Custom Indicator can have number of different lines or histograms inside you need to be able to reference each line or histogram it has. This is done via "mode – line index" parameter.

Every line or histogram you place in Custom Indicator diagram gets its "mode – line index" parameter assigned automatically. Example: if you place "Chart Line" on the diagram its "mode – line index" parameter will have value of zero (0). If you decide to have second "Chart Line" on the chart, its "mode – line index" parameter will have value of one (1), and so on until you reach maximum of 8 lines for MT4 terminal.

Some blocks take and use two "mode – line index" parameter values. Blocks "Chart Line 2", "Histogram 2" and "Dotted Line 2" may contain two colors, since each color is based on separate calculation, you can access each calculation from your Expert Advisor. Therefore if you place block "Chart Line 2" or "Histogram 2" or "Dotted Line 2" on the diagram it will return values if "mode – line index" parameter is zero (0) or one (1).

Let's say we start new Custom Indicator and place "Chart Line" and then "Histogram 2" into our diagram. Then we connect lines and built our Custom Indicator. Since "Chart Line" was placed on the diagram first it can be accessed from your EA using "mode – line index" of zero (0). "Histogram 2" was placed after and its both calculations can be accessed via "mode – line index" values of 1 and 2.

This screen shows where to place "mode – line index" parameter for your Custom Indicator that you have built.

Third Party Custom Blocks

Other companies and developers can create custom blocks for Forex Generator and sell or distribute them. Typically those blocks contain extension *.def or *.fxBundle. You can import or delete blocks using "Import Blocks" or "Delete Blocks" menu.

If you know MQL programming language you can also create custom blocks for Forex Generator. Look for FXG Block Editor tool. It is free.
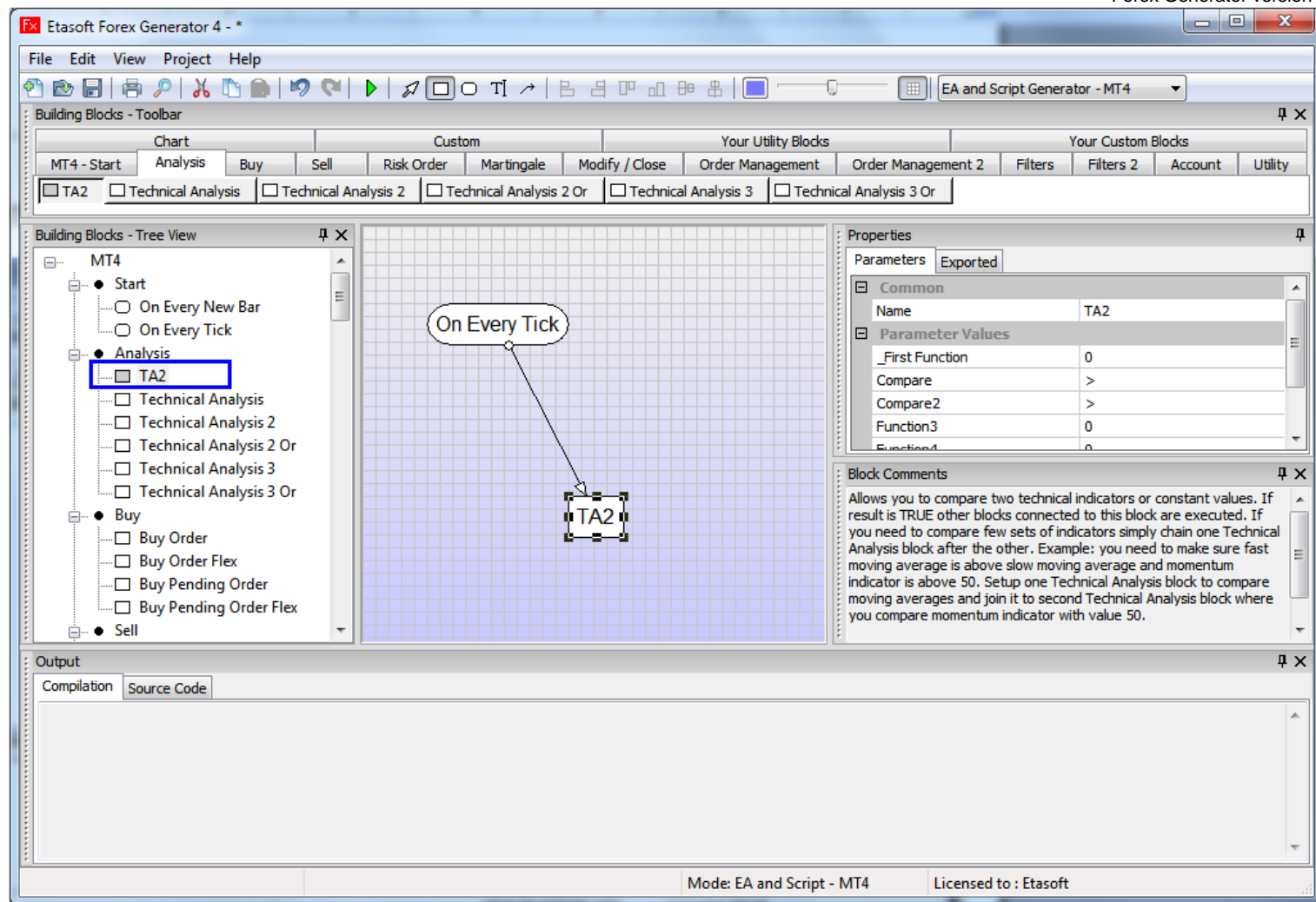
Built-in blocks are displayed with white rectangular and third party or additional (optional) blocks are displayed with grey rectangular in the toolbar.

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In no event will Etasoft Inc. be liable for any damages whatsoever, including direct, indirect, special, consequential, incidental, exemplary, punitive or other damages such as lost profits or revenue, business interruption, data loss, costs of replacement goods or damages to your computer equipment arising out of or in connection with the use of, or inability to use this software or the information contained. Please use at your own risk.

Limited Support

Forex Generator support staff provides support regarding the product but does not create EAs, Scripts or Custom Indicators for you. MetaTrader terminal features and custom indicators are supported only as much as they relate to the Generator.

If you have found Custom Indicator that you like on the Internet and indicator has zero documentation on how to use it, Forex Generator support staff cannot help you. Since whoever programmed Custom Indicator did not care enough to put at least some documentation about it maybe they should never release it to the public in the first place.

Sometimes Custom Indicators are collaborative work where different ideas have been tried from number of people. They all posted different versions of the indicator with the same name. Now it is unclear how each one of them works/integrates because there is zero documentation and many versions of slightly different indicator.

Some custom indicators contain subtle bugs or unclear features. Forex Generator support staff can not investigate them. If you need support about some custom indicator try to contact its author.

Appendix A. List of Blocks for EA and Script Generator - MT4

New blocks added to version 6 or later marked in this color.

Alert
Produces pop up window on the terminal. Useful to inform when signal or special conditions have been triggered. Mostly used in semi-automated trading scenario when EA and trader work together.

Arrow
Draws arrow on the chart at the time of execution. Use "Clear All Objects" to remove all lines and arrows from the chart. Most useful arrow types are SYMBOL_ARROWUP,SYMBOL_ARROWDOWN and SYMBOL_LEFTPRICE.

At Certain Time
Executes connected blocks once a day at certain hour (24 hour clock) and minute (from 0 to 59). Good for trading on larger timeframes or if you want to execute certain processing at specific time. Example: use it if you want to close all open orders at 5 PM (17:00 hour in 24 hour clock). Clock is based on local time.

Beep
Produces sound. Useful to inform when order was open or closed.

Break Even
Break Even uses Order Id to identify open order and performs partial close based on Break Even Point parameter. Break Even Point can be reached only once. When point is reached then Break Even block leaves number of lots set in Leave Lots parameter and closes the rest. Example: if you opened original order with 0.4 lots and set Break Even parameter Leave Lots to 0.2 then at Break Even Point this block will close 0.2 lots and leave 0.2 lots still open. This block checks for minimal lots value allowed by your broker. Example: if your broker has minimal lots value set at 0.1 then if you set Leave Lots to 0.05 you will get an error because Break Even block can not close orders below allowed broker minimal lots value. Example 2: if you set Leave Lots to 0.1 but original order has 0.15 lots again Break Even can not close rest of 0.05 lots (0.15-0.1) because your broker has minimal lots value at 0.1.

Buy Order
Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Set ECN Broker=False if you want Stoploss=0 or Takeprofit=0.

Buy Order Flex
Opens long position (buy) based on parameters set via properties sheet. Flexible SL and TP set via indicator or function. Prints

error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks.

Buy Order Lots
Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup initial lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots.

Buy Order Modify
Modify long (buy) order with specific Order Id and order type. Prints message in the log if fails. If "Use Ask" is TRUE will use Ask to set stoploss and takeprofit from otherwise if it is FALSE will use original order open price to set stoploss and takeprofit from.

Buy Order Modify Flex
Modify long (buy) order with specific Order Id and order type. Prints message in the log if fails. Stoploss and Takeprofit are indicator or bar values.

Buy Order Risk
Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Risk parameter to setup lot size based on percent of account free margin. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce risk. Semi-Martingale management increases or reduces risk depending on last order result. If last order was (non-)profitable you can change risk for new order. If you want to reduce risk use negative values in Risk Change parameters. Use positive values to increase risk.

Buy Order Risk Fixed
Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Buy Order Risk Flex
Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss is flexible and set via indicator. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Buy Order Varying
Opens buy market position with varying lots based on parameters set via properties sheet. Varying Lots parameter is a sequence of lots. Each time block runs it uses next lot size from the sequence. This way you can have different lots based on how many times same block runs. Reset lots using Reset Varying Lots block. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Set ECN Broker=false if you want Stoploss=0 or Takeprofit=0.

Buy Pending Order Lots
Opens long pending position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup initial lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Buy Pending Order
Opens pending long position (buy limit or buy stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Buy Pending Order Flex
Variation of pending order where Stoploss and Takeprofit are not fixed values. Flexible SL and TP set via indicator or function.

Opens pending long position (buy limit or buy stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Buy Pending Risk Fixed

Opens pending long position (buy limit or buy stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss is flexible and set via indicator. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Check Account Losses

Checks current account balance and compares to account balance when advisor started. Executes attached blocks if current account loss did not exceed (<) or exceed (>) set maximum allowed loss amount. Use this block at the beginning of the whole chain of blocks. This block is useful as protection from total account loss in scenarios when EA runs in fully automated mode. Use Terminate block if you want to stop EA execution completely.

Check Account Profits

Checks current account balance and compares to account balance when advisor started. Executes attached blocks if current account profit did not exceed (<) or exceed (>) set maximum amount. Use this block at the beginning of the whole chain of blocks. This block is useful as a way to lock in some profits in scenarios when EA runs in fully automated mode. Use Terminate block if you want to stop EA execution completely.

Check Account Stoploss

Calculates maximum stoplosses of all open orders for the account. You can use it to check your maximum exposure for the account. Example: do not open new orders if your maximum exposure gets too high.

Check Equity

Checks Equity and compares it to set amount. Mostly used to close all positions when certain equity amount is reached.

Check History Count

Checks the number of closed orders in the account history loaded into the terminal. The history list size depends on the current settings of the "Account history" tab of the terminal. Example: this block with default settings executes connected blocks if history has more than 10 orders.

Check Last Order Result

Calculates result Amount (in money) for last closed order. You can compare last order result if it is above/below zero or some value and make a decision what to do next by attaching other blocks below. Amount (in money) above zero is profit, below zero negative amount is loss. Usage example: if last order was negative due to stoploss, open another order in opposite direction.

Check Last Order Id

Checks the Order Id of last closed order. If last closed Order Id matches last closed order parameters other connected blocks below are executed. This is mostly used to limit number of open positions of certain type. Usage example: if last order had specific OrderId open only sell (go short) position.

Check Last Order Lots

Calculates lots for last closed order. You can compare last order lots if it is above/below some value and make a decision what to do next by attaching other blocks below. This can be used to limit your risk. Usage example: if last order lots has exceeded your maximum lots value allowed per order - do not open any more orders. This block is useful with Martingale and other risk management blocks where your lots amount varies per each order.

Check Last Order Type

Checks the type of last closed order. If last closed type and Order Id matches last closed order parameters other connected blocks below are executed. This is mostly used to limit number of open positions of certain type. Usage example: if last order was buy (go long) open only sell (go short) positions. You are in trend, you open buy position, but once postion hit takeprofit, do not open more buy positions, wait for trend reversal and opportunities to sell.

Check Margin Level
Checks Margin level percentage. Mostly used to avoid margin calls. Margin level percentage is Equity divided by Used Margin times 100.

Check Max Stoploss
Calculates maximum stoplosses of all open orders with that Order Id. You can use it to check your maximum exposure for the orders with specific Order Id. Example: do not open new orders if your maximum exposure gets too high.

Check Open Orders
Calculates profit or loss Amount for current market orders with specific Order Id and order type. You can compare result if it is above/below zero or some value and make a decision what to do next by attaching other blocks below. Amount above zero is profit, below zero negative amount is loss. Usage example: if it is 5 PM and calculated profit from open orders is above certain amount, exit all the positions and lock in all the profits.

Check Open Orders All
Calculates profit or loss Amount for current market orders. You can compare result if it is above/below zero or some value and make a decision what to do next by attaching other blocks below. Amount above zero is profit, below zero negative amount is loss. Usage example: if it is 5 PM and calculated profit from open orders is above certain amount, exit all the positions and lock in all the profits.

Check Open Order List
Calculates profit or loss Amount (in money) for current market orders with specific Order Id in the list. So if Order Id is in the Order Id List that order current profit or loss will be used for calculation. You can compare result if it is above/below zero or some value and make a decision what to do next by attaching other blocks below. Amount above zero is profit, below zero negative amount is loss. Usage example: if it is 5 PM and calculated profit from open orders is above certain amount, exit all the positions and lock in all the profits.

Check Order Count
Checks number of orders you have open. If number of open orders is greater than Maximum Open Orders other connected blocks are executed. Use Order Id parameter to only check specific orders.

Clear All Objects
Use this block to remove all lines, arrows, etc. from the chart. It does not remove comment text from the chart.

Close All
Close all orders with specific order type. Prints message in the log if fails.

Close Order
Closes orders with specific Order Id and order type. Prints message in the log if fails.

Close Order If
Closes orders with specific Order Id and order type. But only if order profit or loss amount is above or below certain value. Amount is current unrealized net profit value in money without swaps or commissions. Amount can be negative if it is a loss. Prints message in the log if fails.

Close Order Partial
Closes orders with specific Order Id and order type. Allows to close part of the order to reduce risk. Prints message in the log if fails.

Crawling Stop
This block is similar to a typical trailing stop but it uses time interval to trail the open order(s). Crawling stop uses Order Id to identify open order and trail it based on trailing parameters set here. Trailing works best if original order stoploss is less than TrailingStop+TrailingGap.

Cross Down
Check if indicators crossed down. Execute other blocks connected to it. This block is mostly used for moving averages and various momentum indicators (RSI, Stochastics, etc.). Must use [current] or [current+1] or [current+2] or similar in indicator function in Shift parameter.

Cross Up
Check if indicators crossed up. Execute other blocks connected to it. This block is mostly used for moving averages and various momentum indicators (RSI, Stochastics, etc.). Must use [current] or [current+1] or [current+2] or similar in indicator function in

Shift parameter.

Custom Code

Allows you to enter your own custom MQL source code into final generated Expert Advisor or Script. Generator will provide function name and { } brakets with your code inside those brakets. Enter all variables via Variables property. Variables will appear next to other global variables in the output source code.

Custom If

Allows you to enter your own MQL inside IF (_your_expression_) statement that gets generated into final Expert Advisor or Script. If Expression evaluates to TRUE other blocks connected below will be executed.

Delete Pending Order

Delete pending order with specific Order Id and order type. Prints message in the log if fails.

Do Not Exist

Checks if market or pending orders with specific Order Ids do not exist (are not open or pending). Order Id List parameter is a list of order Ids that we check. Each Id in the list is separated by comma. Use this block to check for open or pending orders and attach below other blocks to work with those orders.

Execute Nth Time

Executes connected blocks only after this block got executed set number of times. If terminal is restarted this block will run up to set number of times again until Execute Count is reached and then it will execute connected blocks. This block is usually used as part of other chain of blocks. This block is basic filter. For example: you want number of blocks to execute only on second cross up. You do not want them to run on the first cross up. This block will help you do that.

Execute N Times

Executes connected blocks only set number of times. If terminal is restarted this block will run up to set number of times again. This block is usually used as part of other chain of blocks.

Execute N Times With Reset

Executes connected blocks only set number of times. If terminal is restarted this block will run up to set number of times again. This block is usually used as part of other chain of blocks. You can reset execution count to starting value. Additional parameters allow you to compare two technical indicators or constant values. If result is TRUE execution value is reset.

Execute Once

Executes connected blocks only once. If terminal is restarted this block will run again once. This block is usually used as part of other chain of blocks.

Exist

Checks if market or pending orders with specific Order Ids exist (are open or pending). Order Id List parameter is a list of order Ids that we check. Each Id in the list is separated by comma. Use this block to check for open or pending orders and attach below other blocks to work with those orders.

Expire Order Trigger

If market order with specific Order Id and Order Type has passed expiration time set in minutes connected blocks are executed. Expiration time is number of minutes between the time when order was open vs. current time. This block can be used to trigger some actions on orders that are hanging too long.

Expire Pending Order

Delete pending order with specific Order Id and Order Type if it passed expiration time set in minutes. Prints message in the log if fails. Some brokers allow to set expiration time right on the pending order. But many brokers do not support pending order expiration by default. You can use this block and have pending order expiration even on brokers that do not support expiration. Expiration time is number of minutes between the time when pending order was placed vs current time.

Expire Pending Trigger

If pending order with specific Order Id and Order Type has passed expiration time set in minutes connected blocks are executed. Expiration time is number of minutes between the time when pending order was placed vs current time. This block is similar to Expire Pending Order block.

Hedge

Performs basic hedging. Opens orders opposite to current market order identified by Order Id. Warning: not all brokers allow hedging and this block will fail on such broker. Risk Lots parameter is percentage that is used to calculate new lots based on

current order lots. If Risk Lots is 0.5 that means 50% of current order lots will be used to open new order. Example: if current BUY order has 0.4 lots then Hedge with Risk Lots 0.5 will open SELL order with 0.2 lots. Example 2: if current SELL order has 0.7 lots then Hedge with Risk Lots of 2 will open BUY order with 1.4 lots (2 times 0.7 is 1.4). If you want to keep the same lots then set Risk Lots to 1.

Horizontal Line

Draws horizontal line on the chart at the time of execution. Use "Clear All Objects" to remove all lines from the chart.

Hours Filter

Executes connected blocks only if time is between defined hours (uses 24 clock). Clock is based on local time.

Hours Filter As List

Executes connected blocks only if hour is in the list of set hours (uses 24 clock). Clock is based on local time.

If Currency Pair

Executes other connected blocks below if EA runs on currency pair set in this block. This block is useful to have when you want some actions to be taken in case if EA runs on specific currency pair.

If Demo

Executes other connected blocks below if EA runs on a demo account.

If Gap

IfGap uses Order Id to identify open order and checks if current price moved away from it number of pips. If current price moved set number of pips from original order, other attached blocks get executed. This block can be used to trade up, trade down or any other scenarios when you need to take action once price moves in certain direction preset number of pips. Gap parameter might need to be negative in cases when you wait for price drop gap. Gap might be negative if you are hedging.

If Gap Flex

This block is similar to block If Gap, but uses indicator instead of fixed pips based gap. IfGap Flexible uses Order Id to identify open order and checks if current price moved away from it the value set by indicator. If current price moved to value returned by indicator from original order, other attached blocks get executed. This block can be used to trade up, trade down or any other scenarios when you need to take action once price moves in certain direction set by indicator.

If Highest Bar

Allows you to check if specific bar is highest of number of previous bars. Number of Bars is the number of bars to look back for the highest bar. Starting from Bar is a parameter where to start search from. Bars are counted backwards: current is current bar, current+1 - previous bar, current+2 - previous previous bar and so on. Bar parameter holds the index of the bar that you check if it is the highest. Example: this block can be used to check if previous bar has been highest of all past 10 bars.

If Lowest Bar

Allows you to check if specific bar is lowest of number of previous bars. Number of Bars is the number of bars to look back for the lowest bar. Starting from Bar is a parameter where to start search from. Bars are counted backwards: current is current bar, current+1 - previous bar, current+2 - previous previous bar and so on. Bar parameter holds the index of the bar that you check if it is the lowest. Example: this block can be used to check if previous bar has been lowest of all past 10 bars.

If No Order Exist

Checks if there is any open or pending order for current currency pair. Use this block to check for open or pending orders and attach below other blocks to work with orders.

If Order Does Not Exist

Checks if order with specific Order Id and order type is open. Use this block to check for open or pending orders and attach below other blocks to work with those orders. Example: using this block you can limit number of same orders open at the same time, check if there is already one SELL order, if it does not exist, open SELL order by attaching order opening block below this one.

If Order Exists

Checks if order with specific Order Id and order type is open. Use this block to check for open or pending orders and attach below other blocks to work with those orders.

If Testing

Executes other connected blocks below if EA runs in testing mode.

If Trade Context Not Busy

Executes other connected blocks below if EA has a trade context not busy. Useful to check if you have few EAs running at the same time since MT4 can not execute trades from more than one EA at exactly same time.

Limit Open Orders

Limits number of orders you can have open at one time to the fixed maximum number. Use Order Id parameter to only limit specific orders. Use this block just before blocks where you open new orders.

MessageBox

Produces pop up window on the terminal and waits for user input. Mostly used in semi-automated trading scenario when EA and trader work together. IMPORTANT: function does not work in Strategy Tester.

Once a Day

Executes connected blocks once a day. Good for trading on larger timeframes.

Once an Hour

Executes connected blocks once an hour at certain minute (from 0 to 59). Clock is based on local time.

Once Per Bar

Executes connected blocks when new bar starts.

Once Per Minutes

Executes connected blocks only after number of minutes have passed. But does not execute connected blocks if more than set minutes have passed. So it waits for exact number of minutes passed and runs connected blocks. If because of other blocks used before this one, more time passes than number of minutes set, Once Per Minutes block will not execute connected blocks. In most cases it is a bad idea to use Once Per Minutes block. Order execution should be market driven and not time (pause) driven. This block works best with "On Every Tick" rounded block. If you use "On Every New Bar" it may not work because new bars may appear less frequent than set pause.

On Every New Bar

Executes connected blocks on every new bar (not every tick). Detects digits used by broker or allows you to setup 5-digit broker support. Use "Clear All Objects" to clear the chart after Expert Advisor has been removed from the chart.

On Every Tick

Executes connected blocks on every tick. Detects digits used by broker or allows you to setup 5-digit broker support. Use "Clear All Objects" to clear the chart after Expert Advisor has been removed from the chart.

Open Reverse Order

Opens order opposite to last closed order identified by Order Id. Uses Account History to find last closed order based on Order Id. Risk Lots parameter is percentage that is used to calculate new lots based on last closed order lots. If Risk Lots is 0.5 that means 50% of last closed order lots will be used to open new order. Example: if current BUY order has 0.4 lots then Open Reverse with Risk Lots 0.5 will open SELL order with 0.2 lots. Example 2: if current SELL order has 0.7 lots then Open Reverse with Risk Lots of 2 will open BUY order with 1.4 lots (2 times 0.7 is 1.4). If you want to keep the same lots then set Risk Lots to 1.

Print Functions to Chart

Prints information on the screen of the chart. Useful for diagnostic purpose to see if technical analysis functions produce desired numeric results.

Print Functions to File

Writes information to the file. Useful for diagnostic purpose to see if technical analysis functions produce desired numeric results. Also useful if you just want to export some information into the file. File is created in terminal_directory\experts\files folder. If file exists new output will be appended.

Print Info to Chart

Prints some basic account information and number of block executions on the screen of the chart. Useful for information purpose.

Print Risk to Chart

Prints lot size calculation result to chart. Useful for manual or semi-automated trading. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Print Risk to Chart Flex

Prints lot size calculation result to chart. Useful for manual or semi-automated trading. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Print to Log

Produces record in the "Experts" tab on the terminal. Useful to debug and see how EA setup works. Mostly used in semi-automated trading or in development scenarios when EA and trader work together.

Reduce Loss

Reduce Loss uses Order Id to identify open order and performs partial close based on Reduce Loss Point parameter. Reduce Loss Point can be reached only once. When point is reached then Reduce Loss block leaves number of lots set in Leave Lots parameter and closes the rest. This block is similar (opposite) to Break Even block. Example: if you opened original order with 0.4 lots and set Reduce Loss parameter Leave Lots to 0.2 then at Reduce Loss Point this block will close 0.2 lots and leave 0.2 lots still open. This block checks for minimal lots value allowed by your broker. Example: if your broker has minimal lots value set at 0.1 then if you set Leave Lots to 0.05 you will get an error because Reduce Loss block cannot close orders below allowed broker minimal lots value. Example 2: if you set Leave Lots to 0.1 but original order has 0.15 lots again Reduce Loss cannot close rest of 0.05 lots (0.15-0.1) because your broker has minimal lots value at 0.1.

Reset Order Varying

Resets varying lots for future orders with specific Order Id. This block works with blocks "Buy Order Varying", "Sell Order Varying", etc.

Reset Order Varying All

Resets all varying lots for future orders with Order Ids from 0 to 100. This block works with blocks Buy Order Varying, Sell Order Varying, etc.

Screenshot

Produces partial screenshot of the terminal window as image. Useful for reporting and monitoring. File Name parameter should have no extension since it always defaults to *.gif. Screenshots get created in \experts\files folder.

Sell Order

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Set ECN Broker=False if you want Stoploss=0 or Takeprofit=0.

Sell Order Flex

Opens short position (sell) based on parameters set via properties sheet. Flexible SL and TP set via indicator or function. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks.

Sell Order Lots

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots.

Sell Order Modify

Modify short (sell) order with specific Order Id and order type. Prints message in the log if fails. If "Use Bid" is TRUE will use Bid to set stoploss and takeprofit from otherwise if it is FALSE will use original order open price to set stoploss and takeprofit from.

Sell Order Modify Flex

Modify short (sell) order with specific Order Id and order type. Prints message in the log if fails. Stoploss and Takeprofit are indicator or bar values.

Sell Order Risk

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Risk parameter to setup lot size based on percent of account free margin. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce risk. Semi-Martingale management increases or reduces risk depending on last order result. If last order was (non-)profitable you can change risk for new order. If you want to reduce risk use negative values in Risk Change parameters. Use positive values to increase risk.

Sell Order Risk Fixed

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Sell Order Risk Flex

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss is flexible and set via indicator. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Sell Order Varying

Opens sell market position with varying lots based on parameters set via properties sheet. Varying Lots parameter is a sequence of lots. Each time block runs it uses next lot size from the sequence. This way you can have different lots based on how many times same block runs. Reset lots using Reset Varying Lots block. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Set ECN Broker=false if you want Stoploss=0 or Takeprofit=0.

Sell Pending Order Lots

Opens short pending position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Pending Order

Opens pending short position (sell limit or sell stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Pending Order Flex

Variation of pending order where Stoploss and Takeprofit are not fixed values. Flexible SL and TP set via indicator or function. Opens pending short position (sell limit or sell stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Order Risk

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Risk parameter to setup lot size based on percent of account free margin. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce risk. Semi-Martingale management increases or reduces risk depending on last order result. If last order was (non-)profitable you can change risk for new order. If you want to reduce risk use negative values in Risk Change parameters. Use positive values to increase risk.

Sell Pending Order Lots

Opens short pending position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Pending Order

Opens pending short position (sell limit or sell stop) based on parameters set via properties sheet. Prints error in the log if fails.

Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Pending Order Flex

Variation of pending order where Stoploss and Takeprofit are not fixed values. Flexible SL and TP set via indicator or function. Opens pending short position (sell limit or sell stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Pending Risk Fixed

Opens pending short position (sell limit or sell stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type. Use Balance Risk parameter to setup lot size based on percent of account free margin or some other formula. Formula may contain AccountEquity() instead of AccountFreeMargin(). Other formulas are also possible in Risk Balance parameter. Stoploss is flexible and set via indicator. Stoploss can not be zero. If Stoploss is set to zero calculations will fail.

Send Email

Sends a message to the e-mail set in the terminal Tools->Options->EMail tab.

Sleep

Suspends execution of the current expert for the specified interval. Should be used for short intervals only. If you need to wait for minutes for some blocks to run use "Once Per Minutes" block instead. "Once Per Minutes" block does not suspend the EA.

Spread Filter

Checks current spread for current currency pair. Executes attached blocks if spread is less than maximum set spread. Use this block just before blocks where you open new orders. Some brokers widen spreads during high volatility, this block allows you to avoid trading when spreads increase to unacceptable values.

Technical Analysis

Allows you to compare two technical indicators or constant values. If result is TRUE other blocks connected to this block are executed. If you need to compare few sets of indicators simply chain one Technical Analysis block after the other. Example: you need to make sure fast moving average is above slow moving average and momentum indicator is above 50. Setup one Technical Analysis block to compare moving averages and join it to second Technical Analysis block where you compare momentum indicator with value 50.

Technical Analysis 2

Allows you to compare 2 groups of technical indicators or constant values. If result of first group AND result of second group is TRUE other blocks connected to this block are executed. This block is similar to two blocks of simple Technical Analysis chained together. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Technical Analysis 3

Allows you to compare 3 groups of technical indicators or constant values. If result of first group AND result of second group AND result of third group is TRUE other blocks connected to this block are executed. This block is similar to three blocks of simple Technical Analysis chained together. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Technical Analysis 2 Or

Allows you to compare 2 groups of technical indicators or constant values. If result of first group OR result of second group is TRUE other blocks connected to this block are executed. This block is similar to two blocks of simple Technical Analysis connected to the same resulting block together. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Technical Analysis 3 Or

Allows you to compare 3 groups of technical indicators or constant values. If result of first group OR result of second group OR result of third group is TRUE other blocks connected to this block are executed. This block is similar to three blocks of simple

Technical Analysis connected to the same resulting block. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Terminate

Terminates (stops) execution of EA for future ticks until terminal is restarted in order for EA to run again. Useful if you want to stop any execution of EA under special circumstances.

Trade Up

Single Trade up. Trade Up uses Order Id to identify open order and opens additional order if current price moved away from original order number of pips set in TradeUpPoint. Lots parameter is new order volume to open once Trade Up Point is reached. Trade Up Point might be reached only one time as price moves in right direction and number of pips get collected. If New TakeProfit is set to zero then original order takeprofit is used. If New StopLoss is set to zero then original order stoploss is used. Important: this block works with single order at a time.

Trade Up Flex

Single Trade up Flexible. Trade Up uses Order Id to identify open order and opens additional order if current price moved away from original order by indicator value set in TradeUpPoint. Lots parameter is new order volume to open once Trade Up Point is reached. Trade Up Point might be reached only one time as price moves in right direction and number of pips get collected. If New TakeProfit is set to zero then original order takeprofit is used. If New StopLoss is set to zero then original order stoploss is used. Important: this block works with single order at a time.

Trade Up Trailing

Trade up with trailing stoploss. Trade Up uses Order Id to identify open order, opens additional order and modifies the rest based on Trailing Gap parameter. Lots parameter is new order volume to open once Trade Up Point is reached. Trade Up Point might be reached few times as price moves in right direction and number of pips get collected. If New TakeProfit is set to zero then original order takeprofit is used. This block is similar to Trailing Stop block but it is not just moving order's stoploss closer, it also adds to original position as price moves.

Trailing Stop

Trailing stop uses Order Id to identify open order and trail it based on trailing parameters set here. It starts trailing once price moves distance TrailingStop+TrailingGap. Then it moves trailing stop based on TrailingStop but leaves TrailingGap. Using those two parameters you can change trailing behaviour significantly. Set NewTakeProfit to zero if you want to keep original takeprofit value. Trailing works best if original order stoploss is less than TrailingStop+TrailingGap.

Trailing Stop Simple

This block uses price action to trail the open orders. It is similar to a Trailing Stop block (as it uses price action to trail orders) but does not have Trailing Gap parameter. Simple Trailing Stop uses Order Id to identify open order and trail it based on trailing parameters set here. Original order stoploss can be zero (means, infinite stoploss) or should be close to Trailing Stop parameter value. Most brokers do not allow Trailing Stop that is smaller than 4 pips.

Trailing Stop Flex

This block is similar to typical Trailing Stop but TrailingStop parameter is an indicator and not fixed value in pips. Trailing stop uses Order Id to identify open order and trail it based on trailing parameters set here. It starts trailing once price moves distance TrailingStop+TrailingGap. Then it moves trailing stop based on TrailingStop but leaves TrailingGap. Using those two parameters you can change trailing behaviour significantly. Set NewTakeProfit to zero if you want to keep original takeprofit value. Trailing works best if original order stoploss is less than TrailingStop+TrailingGap.

Utility Code

Allows you to enter your own custom MQL source code into final generated Expert Advisor or Script. Your code will be placed in the generated source file as is. Enter all variables via Variables property. Variables will appear next to other global variables in the output source code.

Vertical Line

Draws vertical line on the chart at the time of execution. Use "Clear All Objects" to remove all lines from the chart.

Virtual Stoploss

This block closes orders once they reach certain stoploss level (in pips). It is called virtual stoploss because stoploss is not set with the broker and invisible to the broker. EA has to be running to execute stoploss. Original order must be open with higher stoploss or without stoploss at all (zero stoploss) to use Virtual Stoploss. Virtual Stoploss is a close cousin to Virtual Takeprofit block.

Virtual Stoploss Trigger

This block triggers (executes) other connected blocks once any of current orders reach certain stoploss level (in pips). It is called virtual stoploss trigger because stoploss is not set with the broker and invisible to the broker. EA has to be running to execute stoploss trigger. Original order must be open with higher stoploss or without stoploss at all (zero stoploss) to use Virtual Stoploss Trigger. Virtual Stoploss Trigger is very similar to Virtual Stoploss block.

Virtual Takeprofit
This block closes orders once they reach certain takeprofit level (in pips). It is called virtual takeprofit because takeprofit is not set with the broker and invisible to the broker. EA has to be running to execute takeprofit. Original order must be open with higher takeprofit or without takeprofit at all (zero takeprofit) to use Virtual Takeprofit. Virtual Takeprofit is a close cousin to Virtual Stoploss block.

Virtual Takeprofit Trigger
This block triggers other blocks connected to it once at least one of them reach certain takeprofit level (in pips). It is called virtual takeprofit trigger because takeprofit is not set with the broker and invisible to the broker. EA has to be running to execute takeprofit trigger. Original order must be open with higher takeprofit or without takeprofit at all (zero takeprofit) to use Virtual Takeprofit Trigger. Virtual Takeprofit Trigger is similar to Virtual Takeprofit block.

Weekday Filter
Allows trades only on certain days. Connect other blocks to this block if you want them to be executed only on specific days of the week.

Appendix B. List of Blocks for EA and Script Generator - MT5

Alert
Produces pop up window on the terminal. Useful to inform when signal or special conditions have been triggered. Mostly used in semi-automated trading scenario when EA and trader work together.

Arrow
Draws arrow on the chart at the time of execution. Use "Clear All Objects" to remove all lines and arrows from the chart. Most useful arrow types are SYMBOL_ARROWUP,SYMBOL_ARROWDOWN and SYMBOL_LEFTPRICE.

At Certain Time
Executes connected blocks once a day at certain hour (24 hour clock) and minute (from 0 to 59). Good for trading on larger timeframes or if you want to execute certain processing at specific time. Example: use it if you want to close all open orders at 5 PM (17:00 hour in 24 hour clock). Clock is based on local time.

Beep
Produces sound. Useful to inform when order was open or closed.

Break Even
Break Even uses Order Id to identify open order, performs partial close and modifies the rest based on Trailing Gap parameter. Break Even Risk is the percentage of Lots to close once Break Even Point is reached. Break Even Point might be reached few times as price moves in right direction and number of pips get collected. If New TakeProfit is set to zero then original order takeprofit is used. This block is similar to Trailing Stop but it is not just moving order's stoploss closer, it is also closing part of the order as it moves. If Trail Once is set to true, then trailing and break even will be performed no more than once per position. You probably do not need Trailing Stop block in the diagram if you use this block, since it already performs trailing.

Buy Order
Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks.

Buy Order Flex
Opens short position (sell) based on parameters set via properties sheet. Flexible SL and TP set via indicator or function. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks.

Buy Order Lots
Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup initial lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots.

Buy Pending Order

Opens pending long position (buy limit or buy stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Buy Pending Order Flex

Variation of pending order where Stoploss and Takeprofit are not fixed values. Flexible SL and TP set via indicator or function. Opens pending long position (buy limit or buy stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Buy Pending Order Lots

Opens long position (buy) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup initial lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots.

Check Account Profits

Checks current account balance and compares to account balance when advisor started. Executes attached blocks if current account profit did not exceed (<) or exceed (>) set maximum amount. Use this block at the beginning of the whole chain of blocks. This block is useful as a way to lock in some profits in scenarios when EA runs in fully automated mode. Use Terminate block if you want to stop EA execution completely.

Check Equity

Checks Equity and compares it to set amount. Mostly used to close all positions when certain equity amount is reached.

Check Last Order Type

Checks the type of last closed order. If last closed type and Order Id matches last closed order parameters other connected blocks below are executed. This is mostly used to limit number of open positions of certain type. Usage example: if last order was buy (go long) open only sell (go short) positions. You are in trend, you open buy position, but once postion hit takeprofit, do not open more buy positions, wait for trend reversal and opportunities to sell.

Check Margin Level

Checks Margin level percentage. Mostly used to avoid margin calls. Margin level percentage is Equity divided by Used Margin times 100.

Check Open Positions

Calculates profit or loss Amount for current orders with specific Order Id and order type. You can compare result if it is above/below zero or some value and make a decision what to do next by attaching other blocks below. Amount above zero is profit, below zero negative amount is loss. Usage example: if it is 5 PM and calculated profit from open orders is above certain amount, exit all the positions and lock in all the profits.

Check Order Count

Checks number of orders you have open. If number of open orders is greater than Maximum Open Orders other connected blocks are executed. Use Order Id parameter to only check specific orders.

Check Position Lots

Checks if position has number of Lots open. If it is true then connected blocks are executed. This block might be used to limit size of the position you have in situations when multiple orders could be executed in sequence and you do not want to have position with too many lots.

Clear All Objects

Use this block to remove all lines, arrows, etc. from the chart. It does not remove comment text from the chart.

Close Position

Closes position with specific Order Id and order type. Prints message in the log if fails.

Close Position If

Closes position with specific Order Id and order type. But only if position profit or loss amount is above or below certain value. Amount parameter is current unrealized net profit value. Amount parameter can be negative if it is a loss. Prints message in the log if fails.

Close Position Partial

Closes position with specific Order Id. Allows to close part of the order to reduce risk. Prints message in the log if fails.

Custom Code

Allows you to enter your own custom MQL source code into final generated Expert Advisor or Script. Generator will provide function name and { } brakets with your code inside those brakets. Enter all variables via Variables property. Variables will appear next to other global variables in the output source code.

Custom If

Allows you to enter your own MQL inside IF (_your_expression_) statement that gets generated into final Expert Advisor or Script. If Expression evaluates to TRUE other blocks connected below will be executed.

Delete Pending Order

Delete pending orders with specific Order Id and order type. Prints message in the log if fails.

Execute N Times

Executes connected blocks only set number of times. If terminal is restarted this block will run up to set number of times again. This block is usually used as part of other chain of blocks.

Execute Once

Executes connected blocks only once. If terminal is restarted this block will run again once. This block is usually used as part of other chain of blocks.

Horizontal Line

Draws horizontal line on the chart at the time of execution. Use "Clear All Objects" to remove all lines from the chart.

Hours Filter

Executes connected blocks only if time is between defined hours (uses 24 clock). Clock is based on local time.

If Demo Account

Executes other connected blocks below if EA runs on a demo account.

If Gap

IfGap uses Order Id to identify open position and checks if current price moved away from it number of pips. If current price moved set number of pips from original position, other attached blocks get executed. This block can be used to trade up, trade down or any other scenarios when you need to take action once price moves in certain direction preset number of pips. Gap parameter might need to be negative in cases when you wait for price drop gap.

If Live Account

Executes other connected blocks below if EA runs on live account.

If Order Does Not Exist

Checks if order with specific Order Id and order type is open. Use this block to check for pending orders and attach below other blocks to work with those orders. Example: using this block you can limit number of same orders open at the same time, check if there is already one SELL_STOP order, if it does not exist, open SELL_STOP order by attaching order opening block below this one.

If Order Exists

Checks if order with specific Order Id and order type is open. Use this block to check for pending orders and attach below other blocks to work with those orders.

If Position Does Not Exist

Checks if position with specific Order Id and order type is open. Use this block to check for positions and attach below other blocks to work with those orders. Example: using this block you can limit number of same orders open at the same time, check if there is already one SELL position, if it does not exist, open SELL order by attaching order opening block below this one.

If Position Exists

Checks if position with specific Order Id and order type is open. This is opposite of block called "If Position Does Not Exists".

Limit Open Orders

Limits number of pending orders you can have open at one time to the fixed maximum number. Use Order Id parameter to only limit specific orders. Use this block just before blocks where you open new orders.

MessageBox

Produces pop up window on the terminal and waits for user input. Mostly used in semi-automated trading scenario when EA and trader work together. IMPORTANT: function does not work in Strategy Tester.

Modify Position

Modify position stoploss and takeprofit. Prints message in the log if fails. It will use Bid or Ask to set new stoploss and takeprofit from depending if it is POSITION_TYPE_BUY or POSITION_TYPE_SELL type of position.

Modify Position Flex

Modify position stoploss and takeprofit. Prints message in the log if fails. Stoploss and Takeprofit are indicator or bar values.

Once a Day

Executes connected blocks once a day. Good for trading on larger timeframes.

Once an Hour

Executes connected blocks once an hour at certain minute (from 0 to 59). Clock is based on local time.

Once Per Bar

Executes connected blocks when new bar starts.

Once Per Minutes

Executes connected blocks only after number of minutes have passed. But does not execute connected blocks if more than set minutes have passed. So it waits for exact number of minutes passed and runs connected blocks. If because of other blocks used before this one, more time passes than number of minutes set, Once Per Minutes block will not execute connected blocks. In most cases it is a bad idea to use Once Per Minutes block. Order execution should be market driven and not time (pause) driven. This block works best with "On Every Tick" rounded block. If you use "On Every New Bar" it may not work because new bars may appear less frequent than set pause.

On Every Tick

Executes connected blocks on every tick. Detects digits used by broker. Use "Clear All Objects" to clear the chart after Expert Advisor has been removed from the chart.

Print Functions to Chart

Prints information on the screen of the chart. Useful for diagnostic purpose to see if technical analysis functions produce desired numeric results.

Print Functions to File

Writes information to the file. Useful for diagnostic purpose to see if technical analysis functions produce desired numeric results. Also useful if you just want to export some information into the file. File is created in terminal_directory\experts\files folder. If file exists new output will be appended.

Print Info to Chart

Prints some basic account information and number of block executions on the screen of the chart. Useful for information purpose.

Print to Log

Produces record in the "Experts" tab on the terminal. Useful to debug and see how EA setup works. Mostly used in semi-automated trading or in development scenarios when EA and trader work together.

Sell Order

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks.

Sell Order Flex

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks.

Sell Order Lots

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup initial lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots.

Sell Pending Order

Opens pending short position (sell limit or sell stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Pending Order Flex

Variation of pending order where Stoploss and Takeprofit are not fixed values. Flexible SL and TP set via indicator or function. Opens pending short position (sell limit or sell stop) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Price Offset is the number of pips off the function set via Price parameter. Price can be moving average, High, Low, or other price based function. Expiration is the number of minutes until pending order expires or it is filled and becomes market order. IMPORTANT: Price Offset might need to be negative value depending on pending order type.

Sell Pending Order Lots

Opens short position (sell) based on parameters set via properties sheet. Prints error in the log if fails. Use Order Id property to identify each open order and manage them via management blocks. Use Initial Lots parameter to setup initial lot size. Martingale management allows you to double down on loss or profit. Use fractions if you want to reduce Lots. Semi-Martingale management increases or reduces Lots depending on last order result. If last order was (non-)profitable you can change Lots for new order. If you want to reduce Lots use negative values in Lots Change parameters. Use positive values to increase Lots.

Send Email

Sends a message to the e-mail set in the terminal Tools->Options->EMail tab.

Sleep

Suspends execution of the current expert for the specified interval. Should be used for short intervals only. If you need to wait for minutes for some blocks to run use "Once Per Minutes" block instead. "Once Per Minutes" block does not suspend the EA.

Spread Filter

Checks current spread for current currency pair. Executes attached blocks if spread is less than maximum set spread. Use this block just before blocks where you open new orders.

Technical Analysis

Allows you to compare two technical indicators or constant values. If result is TRUE other blocks connected to this block are executed. If you need to compare few sets of indicators simply chain one Technical Analysis block after the other. Example: you need to make sure fast moving average is above slow moving average and momentum indicator is above 50. Setup one Technical Analysis block to compare moving averages and join it to second Technical Analysis block where you compare momentum indicator with value 50.

Technical Analysis 2

Allows you to compare 2 groups of technical indicators or constant values. If result of first group AND result of second group is TRUE other blocks connected to this block are executed. This block is similar to two blocks of simple Technical Analysis chained together. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Technical Analysis 3

Allows you to compare 3 groups of technical indicators or constant values. If result of first group AND result of second group AND result of third group is TRUE other blocks connected to this block are executed. This block is similar to three blocks of simple Technical Analysis chained together. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Technical Analysis 2 Or

Allows you to compare 2 groups of technical indicators or constant values. If result of first group OR result of second group is TRUE other blocks connected to this block are executed. This block is similar to two blocks of simple Technical Analysis connected to the same resulting block together. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Technical Analysis 3 Or
Allows you to compare 3 groups of technical indicators or constant values. If result of first group OR result of second group OR result of third group is TRUE other blocks connected to this block are executed. This block is similar to three blocks of simple Technical Analysis connected to the same resulting block. But if you need to compare even more sets of indicators simply chain other Technical Analysis blocks below this one.

Terminate
Terminates (stops) execution of EA for future ticks until terminal is restarted in order for EA to run again. Useful if you want to stop any execution of EA under special circumstances.

Trade Up
Single Trade up. Trade Up uses Order Id to identify open position and adds to the position if current price moved away from original order number of pips set in TradeUpPoint. Lots parameter is new order volume to open once Trade Up Point is reached. Trade Up Point might be reached only one time as price moves in right direction and number of pips get collected. If New TakeProfit is set to zero then original order takeprofit is used. If New StopLoss is set to zero then original order stoploss is used.

Trailing Stop
Trailing stop uses Order Id to identify open order and trail it based on trailing parameters set here. It starts trailing once price moves distance TrailingStop+TrailingGap. Then it moves trailing stop based on TrailingStop but leaves TrailingGap. Using those two parameters you can change trailing behaviour significantly. Set NewTakeProfit to zero if you want to keep original takeprofit value. Trailing works best if order stoploss is less than TrailingStop+TrailingGap. If Trail Once is set to true, then trailing will be performed no more than once per position.

Utility Code
Allows you to enter your own custom MQL source code into final generated Expert Advisor or Script. Your code will be placed in the generated source file as is. Enter all variables via Variables property. Variables will appear next to other global variables in the output source code.

Vertical Line
Draws vertical line on the chart at the time of execution. Use "Clear All Objects" to remove all lines from the chart.

Weekday Filter
Allows trades only on certain days. Connect other blocks to this block if you want them to be executed only on specific days of the week.

Appendix C. List of Blocks for Custom Indicator Generator – MT4

This list includes blocks specific to Custom Indicator Mode only. Blocks that are common for "Custom Indicator Generator Mode - MT4" and "EA and Script Generator Mode - MT4" listed in Appendix A.

Calculation
Indicator calculation. Used to save calculation result in the indicator buffer so it could be used in EA or script.

Chart Line
Indicator chart line.

Chart Line 2
Indicator chart line with two overlap colors. It compares First Function and Second Function. If result of compare is True then Formula 1 is used to calculate final indicator output but if result is False then Formula 2 is used to calculate indicator output.

Chart Text
Chart text used to display result of calculation on the chart screen.

Dotted Line
Indicator chart line made of single color dots. It compares First Function and Second Function. If result of compare is True then Formula 1 is used to calculate final indicator output but if result is False then Formula 2 is used to calculate indicator output.

Dotted Line 2

Indicator chart line made of two color dots. It compares First Function and Second Function. If result of compare is True then Formula 1 is used to calculate final indicator output but if result is False then Formula 2 is used to calculate indicator output.

Histogram

Indicator histogram. Used mostly on separate chart window.

Histogram 2

Indicator histogram with two colors. Used mostly on separate chart window. It compares First Function and Second Function. If result of compare is True then Formula 1 is used to calculate final indicator output but if result is False then Formula 2 is used to calculate indicator output.