Testing Visualization: Trade History

1. Motivation

Starting from build 196, MetaTrader 4 Client Terminal offers testing visualization function. It allows controlling the Expert Advisors' testing on a brand new level. Now, the trading programmer can watch every action of his or her Expert Advisor checking its operation on history!

You can read about how to use the visualizer in Testing of Expert Advisors in the MetaTrader 4 Client Terminal: An Outward Glance. In my previous article named Testing Visualization: Functionality Enhancement, it was described how to realize the "Trade" tab for testing. We will add the "Account History" tab to it here.
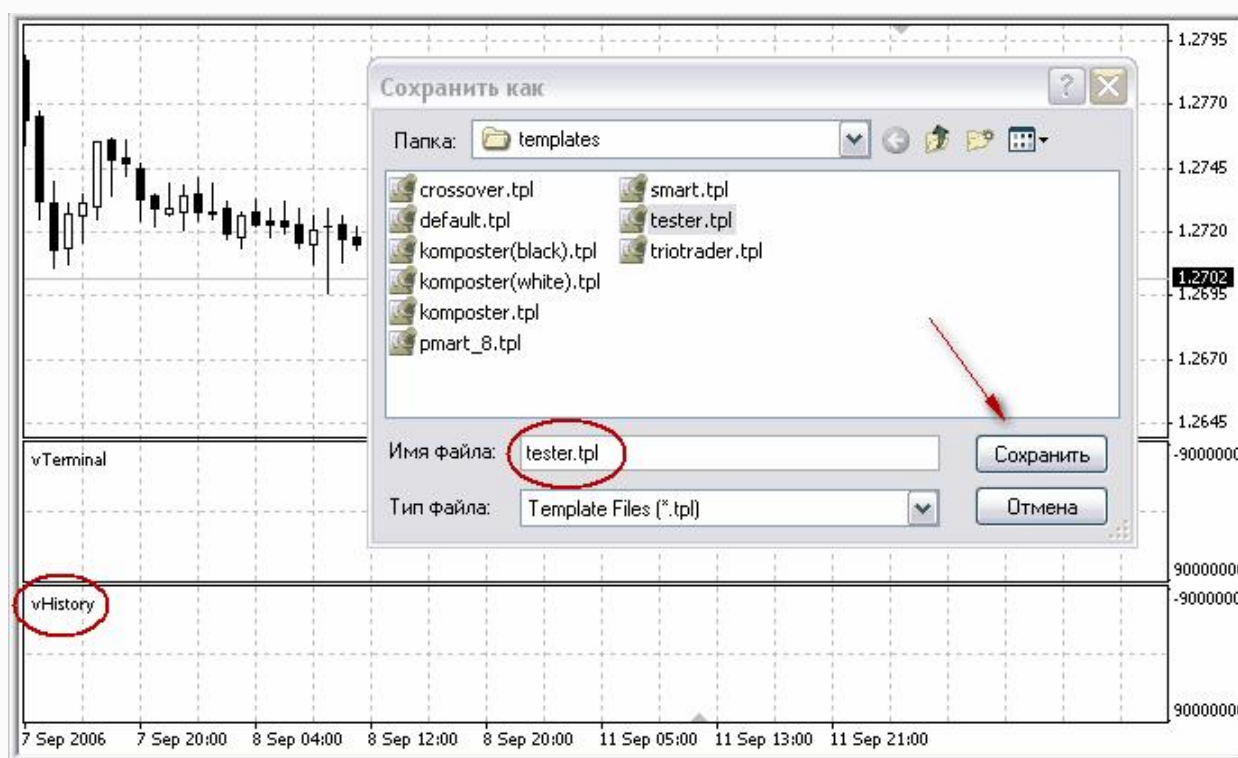
2. The Task and How to Realize It

First of all, we will have to reconcile ourselves to that we cannot create a shadow copy of the "Account History". To create it, we would have to write a complicate program using dlls. But we do not need this at all since the "Test Results" tab of the Tester contains almost the full information about operations made.

Our task is to display actual information. This can be very convenient when analyzing the Expert Advisor's work. There will be no need to switch between tabs all the time.

Since there is not very much space in the display and realization of scrolling is not a very simple task, we will only display the most recent events.

What is left, is to remind that, to create a subwindow where the history will be displayed, it is necessary to create an indicator and, having attached it to the chart, create the template named tester.tpl or in the template <expert_name>.tpl (you can download the indicator directly from this article).

Saving a Template for Testing

Now we can start to prepare the Expert Advisor.

This is not very difficult either:
- save the VisualTestingTools.mq4 file in the directory named ...\MetaTrader 4\experts\include\;
- add the #include <VisualTestingTools.mq4> line to the Expert - now the file content is included into the Expert's code; and
- insert in the Expert's init() and start() functions the calls for functions responsible for trade history updating .

```
...
double _Commission = 0.0; string _Comment = ""; datetime _Expiration = -1;

#include <VisualTestingTools.mq4>
```

```
    int init()
      {
        if(FastEMAPeriod >= SlowEMAPeriod)
            return(-1);
        vTerminalInit();
        vHistoryInit();
        return(0);
      }

    int start()
      {
        if(FastEMAPeriod >= SlowEMAPeriod)
            return(-1);
        vTerminalRefresh();
        vHistoryRefresh();

        int _GetLastError = 0;
    ...
```
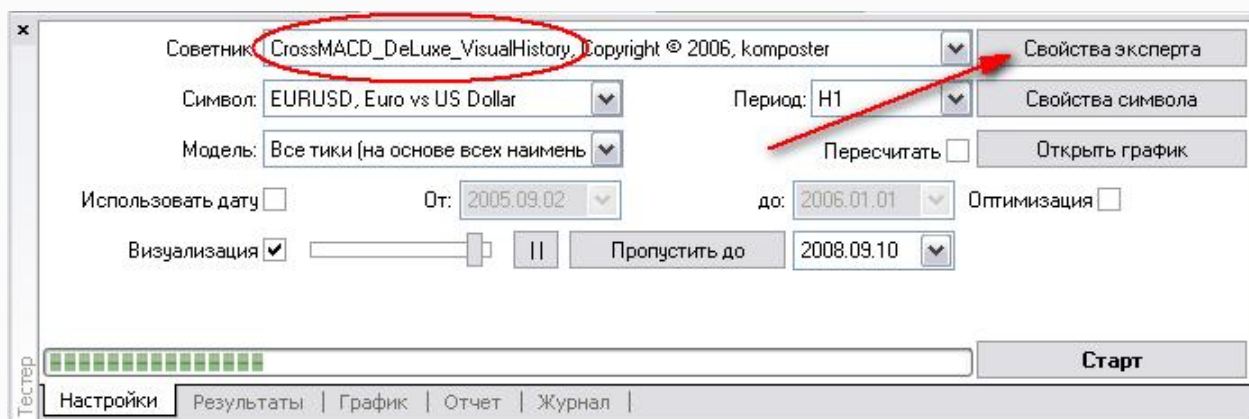
You can download the ready Expert Advisor here.

3. Testing

Now, let us try to test the new Expert. For this, open the Strategy Tester window, select the
CrossMACD_DeLuxe_VisualHistory in the Expert's menu and press its properties button.

Strategy Tester Window

The Expert has got some new external variables - they are declared in an included file named VisualTestingTools.mq4.
Some of them are intended for controlling the "Terminal" tab, the other ones - for the "Account History" tab, but most of
them are common:
- TerminalRows - the maximum amount of the "Terminal" tab lines to be displayed. If you make TerminalRows = 0, the
terminal will not be updated;
- HistoryRows - the maximum amount of the "Account History" lines to be displayed. If you make HistoryRows = 0, the
account history will not be updated;
- BigText - set true if you want to make the fonts larger;
- SignalPoints - the distance, in points, starting from which the Stop Loss, Stop Profit and Open Price fields of pending
orders will be highlighted. For example, if SignalPoints = 10, the Stop Loss field will change its color when the price is at a
10-point distance from the Stop Loss of the position;
- ShowCancelled - set true if you want to see the cancelled orders in your trade history;
- ShowExpired - set true if you want to see expired pending orders in your trade history;
- MainColor - color of headlines of the Terminal and Account History, as well as the Terminal's trade account information
bar (Balance, Equity, ...).
- BuyColor - color of information about Buy positions;
- BuyOPColor - color of the Open Price field of the Terminal tab; this color will replace the main color when the current
price approaches to the open level of orders Buy Stop and Buy Limit;
- BuySLColor - for the Terminal tab: color, which will replace the main color when the price approaches the Stop Loss
levels of Buy positions; for the Account History tab: color, which will replace the main color if the Buy position has been
closed by StopLoss;
- BuyTPColor - the same as BuySLColor applied to the Take Profit of positions;

- SellOPColor, SellSLColor and SellTPColor - the same for Sell positions.

Set the desired values of variables and press OK. Check whether Visualization is enabled and start testing:

Testing Visualization: 'Terminal' and 'Account History' windows have been loaded

The EA has opened a position, and this is visualized in the 'Terminal' window

http://articles.mql4.com/303   11/5/2007

vTerminal Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CurPrice	Swap	Profit	Comment
2	2003.04.02 09:47	Sell	0.1	1.0865	1.0896	1.0765	1.0860	0.00	5.00	CrossMA0
Balance: 10000.00 Equity: 10005.00				Margin: 108.59 FreeMargin: 9896.41 MarginLevel: 9213.56%					5.00	

vHistory Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CloseTime	ClosePrice	Swap
1	2003.04.02 09:00	Sell	0.1	1.0861	1.0861	1.0761	2003.04.02 09:47	1.0861	0.00

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As soon as the position has been closed, it moved to the 'Account History' and was replaced with another one.
Note that the StopLoss field is highlighted in red - the position was closed by Stop Loss.

vTerminal Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CurPrice	Swap	Profit	Comment
Balance: 10100.00 Equity: 10100.00				Margin: 0.00 FreeMargin: 10100.00					0.00	

vHistory Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CloseTime	ClosePrice	Swap
2	2003.04.02 09:47	Sell	0.1	1.0865	1.0817	1.0765	2003.04.02 17:51	1.0765	0.00
1	2003.04.02 09:00	Sell	0.1	1.0861	1.0861	1.0761	2003.04.02 09:47	1.0861	0.00

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the second position has been closed by Take Profit.
Note that the latest positions are shown on top in the Account History.
Thus, we will always see the most recent events.

vHistory Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CloseTime	ClosePrice	Swap
20	2003.05.08 14:32	Buy	0.1	1.1441	1.1440	1.1541	2003.05.08 16:02	1.1440	0.00
19	2003.05.08 14:00	Buy	0.1	1.1443	1.1439	1.1543	2003.05.08 14:32	1.1439	0.00
18	2003.05.07 20:00	Sell	0.1	1.1366	1.1360	1.1266	2003.05.08 10:12	1.1360	2.16
17	2003.05.05 15:00	Buy	0.1	1.1236	1.1237	1.1336	2003.05.05 16:28	1.1237	0.00
16	2003.05.05 06:00	Sell	0.1	1.1216	1.1256	1.1116	2003.05.05 15:00	1.1236	0.00

This is how our virtual Terminal looks after several minutes.

4. Possible Problems

The problem described in my article Testing Visualization: Functionality Enhancement applies to the vHistory indicator, as well: If the indicator is not in the second subwindow in the template used by the Tester, the proper operation of functions responsible for Account History updating should be provided by the explicitly specified subwindow number:

```
vHistory_win = WindowFind( "vHistory" );
if ( IsTesting() ) { vHistory_win = 2; }
```

5. Conclusion

Screenshots that illustrate how the Account History tab looks in various situations are given below.

vTerminal Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CurPrice	Swap	Profit	Comment
28	2003.05.29 18:00	Buy	0.1	1.1838	1.1857	1.1938	1.1885	-0.96	47.00	CrossMAC
Balance: 10219.56 Equity: 10265.60				Margin: 118.87 FreeMargin: 10146.73 MarginLevel: 8635.99%					47.00	

vHistory Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CloseTime	ClosePrice	Swap
27	2003.05.27 23:00	Sell	0.1	1.1814	1.1785	1.1714	2003.05.28 14:00	1.1714	0.72
26	2003.05.23 09:00	Buy	0.1	1.1691	1.1667	1.1791	2003.05.23 11:00	1.1791	0.00
25	2003.05.23 08:00	Sell	0.1	1.1677	1.1727	1.1577	2003.05.23 09:00	1.1691	0.00
24	2003.05.22 14:00	Buy	0.1	1.1722	1.1672	1.1822	2003.05.22 17:00	1.1672	0.00
23	2003.05.21 22:00	Sell	0.1	1.1681	1.1686	1.1581	2003.05.22 11:00	1.1686	2.16
22	2003.05.20 16:00	Buy	0.1	1.1669	1.1686	1.1769	2003.05.21 14:00	1.1686	-0.96
21	2003.05.20 11:00	Sell	0.1	1.1607	1.1657	1.1507	2003.05.20 13:00	1.1657	0.00

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26 May 2003   27 May 07:00   27 May 15:00   27 May 23:00   28 May 07:00   28 May 15:00   28 May 23:00   29 May 07:00   29 May 15:00   29 May 23:00

vTerminal Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CurPrice	Swap
18	2003.05.08 14:00	Buy	0.1	1.1443	1.1393	1.1543	1.1475	0.00
Balance: 10038.56 Equity: 10070.56				Margin: 114.77 FreeMargin: 9955.79 MarginLevel: 8774.56%				

vHistory Ticket	OpenTime	Type	Lots	OpenPrice	StopLoss	TakeProfit	CloseTime	Clo
17	2003.05.07 20:00	Sell	0.1	1.1366	1.1366	1.1266	2003.05.08 12:00	1.11
16	2003.05.05 15:00	Buy	0.1	1.1236	1.1249	1.1336	2003.05.06 10:00	1.11
15	2003.05.05 06:00	Sell	0.1	1.1216	1.1265	1.1116	2003.05.05 15:00	1.12
14	2003.04.29 20:00	Buy	0.1	1.1062	1.1086	1.1162	2003.04.30 17:00	1.1
13	2003.04.28 17:00	Sell	0.1	1.0998	1.1012	1.0898	2003.04.29 17:00	1.10
12	2003.04.25 19:00	Buy	0.1	1.1042	1.1015	1.1142	2003.04.28 11:00	1.10

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5 May 2003   5 May 20:00   6 May 04:00   6 May 12:00   6 May 20:00   7 May 04:00   7 May 12:00   7 May 20:00   8 May 04:00   8 May 12:00