

MultiSymbol_LLM_EA.mq5 is a multifunctional trading Expert Advisor for MetaTrader 5 that uses the Large Language Model (LLM) via the Router AI API to generate trading signals on several currency pairs simultaneously.

The Expert Advisor analyzes market data (price, indicators, economic calendar) and sends them to LLM, getting a forecast of price movement (probability of growth or decline) with confidence. Based on this forecast and the set thresholds, a decision is made to open a position.

Key features:

- Multi-character trading (the list of characters is set by the user).
- Automatic LLM request when the bar closes (M15 by default) or when the price jumps sharply (spike filter).
- Money management: fixed lot or percentage of free margin, with drawdown protection.
- Real and virtual stop loss/take profit options.
- Trailing stop (with averaging over all positions or for each one separately).
- News filter: Block trading before / after important economic events.
- Built-in graphical dashboard for monitoring and manual control.
- Save the history of LLM forecasts for feedback and improve signal quality.

The Expert Advisor **does not work in the strategy Tester** (this restriction is included in the code) and requires an active Internet connection and a valid API key.

2. Key Features

- **Using LLM (Router AI):** API requests <https://routerai.ru> with the transmission of JSON containing the last 30 bars, indicator values, position information, an economic calendar, and a history of past forecasts. The model returns JSON with the fields prediction (0..1) and confidence (0..1).
- **Multi-character and multi-timeframe:** supports an arbitrary comma-separated list of characters and a selected timeframe (default is M15). The current chart symbol can be added automatically.
- **Triggers for accessing LLM:**
 - Closing of a new bar on the working timeframe (BAR_CLOSE).
 - Price spike: If the current price deviates from the opening price of the current bar by more than $\text{SpikeFactor} * \text{ATR}$, the request is triggered (but not more than once per SpikeCooldownSec).
- **News filter:** Check the economic calendar for symbol currencies; when an important event occurs (by importance and time before/after), trading is blocked, and the news context is sent to LLM to account for volatility.
- **Adaptive distance between orders:** you can set a fixed distance in points or a dynamic distance based on ATR ($\text{DynamicDistanceMultiplier} * \text{ATR}$).
- **Drawdown protection:** if the drawdown threshold (MaxDrawdownPercent) is exceeded, the lot size is automatically reduced proportionally.

- **Graphic dashboard:** created on the chart and shows for each symbol: signal (BUY/SELL/HOLD), LLM confidence, number of Buy / Sell positions, spread, floating profit, LLM status (OK, errors, blocks). There are also buttons for manually opening Buy / Sell and closing all positions on the symbol. You can drag and drop the dashboard.
- **Forecast history:** Each LLM forecast is saved to a binary file (MultiSymbol_LLM_History.bin) and sent back to LLM as feedback_history. After the specified number of bars (PredictionEvaluationBars), the forecast is evaluated as correct/incorrect based on the minimum price movement. This allows the model to account for its past mistakes.
- **Security:** lot verification and normalization, checking the level of broker's stop orders, limiting the maximum number of positions per symbol, and controlling the spread.

3. Assigning Expert Advisor Parameters

All parameters are grouped into logical blocks. Below is a detailed description of them.

Main Settings

Parameter	Description
The MagicNumber Description	parameter is a unique identifier of the Expert Advisor to distinguish its orders from others.
SessionStart	Start time of the trading session (UTC) – trading is allowed only in the specified range.
SessionEnd	Trading session end time (UTC).
UTCOffset	Server time offset from UTC in hours. Used for correct calculation of trading hours.
EnableDebugLogging	Enables detailed logging of all actions (requests, responses, errors).

Trading Symbols

Parameter	Description
InpSymbolList	A comma-separated list of characters (for example, "EURUSD, GBPUSD"). The Expert Advisor will trade all the specified symbols.
InpIncludeChartSymbol	If true, the symbol of the current chart is automatically added to the trading list (if it is not there).
InpTradeTF	Timeframe used for indicators, bars, and bar close detection.

Risk Management

Parameter	Description
LotCalculationMode	Lot calculation mode: LOT_MODE_FIXED – fixed lot; LOT_MODE_FREE_MARGIN – percentage of free margin.
FixedLotSize	Fixed lot size (used for LOT_MODE_FIXED).

Parameter	Description
RiskPercent	is the percentage of free margin that we risk in one trade (at LOT_MODE_FREE_MARGIN).
UseEquityProtection	Enables lot reduction in case of high account drawdown.
MaxDrawdownPercent	Drawdown threshold (in % of balance), after which the lot reduction begins.
MaxConcurrentTrades	is the maximum number of simultaneously opened positions per symbol.
MaxSpreadPoints	The maximum allowable spread (in points). If the amount is exceeded, no deals are opened.

Real SL / TP (Real Stop Loss and Take Profit)

Parameter Description

StopLoss Real stop loss in points (0 = disabled). It is set in the order when it is opened.

TakeProfit Real take profit in points (0 = disabled). It is set in the order when it is opened.

Important: If virtual SL/TP is enabled, real ones are ignored (see UseVirtualSL / UseVirtualTP).

Virtual SL / TP (Virtual Stop Loss and Take Profit)

Parameter	Description
The UseVirtualSL Description parameter	Includes a virtual stop loss (closing the position when the level is reached, without setting the real SL).
VirtualStopLoss	Level of the virtual SL in points (0 = not used).
UseVirtualTP	Enables virtual take profit.
VirtualTakeProfit	Virtual TP level in points (0 = not used).

Virtual stops are checked on each tick in CheckVirtualStops(). If the price has reached the level, the position is immediately closed.

Trailing Stop

Parameter	Description
The UseTrailing_Stop Description Parameter	Includes a trailing stop.
UseAveragePrice	If true, the trailing value uses the average entry price of all positions per symbol (buy or sell separately). If false, each position uses its own entry price.
TrailingStart	Profit in points (from the entry price), after which trailing is activated.
TrailingDistance	is the distance from the current price to the new SL in points.

Order Distance (Distance between orders)

Parameter	Description
FixedDistancePoints	Minimum distance in points between the new position and the existing one (unidirectional). Used if UseDynamicDistance = false.
UseDynamicDistance	If true, the distance is calculated as $ATR * DynamicDistanceMultiplier$.
DynamicDistanceAtrPeriod	The ATR period for calculating the dynamic distance.
DynamicDistanceMultiplier	The ATR multiplier.

AI Settings (Router AI)

Parameter	Description
RouterAIApiKey	API key for accessing Router AI. Required.
RouterAIModel	ID of the LLM model (for example, "google/gemini-3.5-flash-lite").
MinLLMConfidence	The minimum LLM confidence at which a signal is received.
LLM_PredictionHistory	The number of recent forecasts sent to LLM as feedback.
LLM_BuyThreshold	Forecast threshold for opening a Buy (if prediction $\geq$ LLM_BuyThreshold).
LLM_SellThreshold	Forecast threshold for opening a Sell (if prediction $\leq$ LLM_SellThreshold).

LLM Feedback

Parameter	Description
PredictionEvaluationBars	The number of bars (by working TF) after which the forecast is evaluated for correctness.
MinProfitForCorrectPoints	is the minimum price movement (in points) in the direction of the forecast to be considered correct.
MaxHistorySize	is the maximum number of entries in the forecast history (to prevent overflow).

Spike Filter

Parameter	Description
SpikeFactor	ATR multiplier for determining the spike: if the price deviation from the bar opening exceeds $SpikeFactor * ATR$, a trigger is triggered.
SpikeCooldownSec	is the minimum interval (in seconds) between requests caused by spikes, for one character.

Indicator Settings

Parameter	Description
RSIPeriod	Period RSI.

Parameter	Description
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ADXPeriod	Period ADX.
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CCIPeriod	Period CCI.
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WPRPeriod	Period Williams %R.
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MFIPeriod	Period MFI.
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BBPeriod	Period Bollinger Bands.
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BBDeviation	Deviation for Bollinger Bands.
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ATRPeriod	Period ATR (used for spike filter and dashboard).
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Economic Calendar (News Filter) – Фильтр News Filter

Parameter	Description
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The UseNewsFilter Description Parameter	Enables the news filter.
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MinNewsImportance	The minimum importance of an event to block (CALENDAR_IMPORTANCE_HIGH, etc.).
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NewsBlockBeforeMin	Block trading N minutes before the event.
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NewsBlockAfterMin	Block trading for N minutes after the event.
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NewsLookAheadHours	How many hours ahead to search for news to pass context to LLM.
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4. Work specifics

Initialization and launch

- During initialization (OnInit), it checks that the Expert Advisor is not running in the tester, whether the API key is present, and whether the thresholds are correct (BuyThreshold > SellThreshold).
- A list of symbols is created: from the InpSymbolList parameter (with checking the symbol availability) + optionally the symbol of the current chart.
- Indicator handles are created for each symbol: RSI, ADX, CCI, WPR, MFI, Bollinger Bands, ATR (main and distance). If no handles are created, the symbol is omitted.
- Loads the forecast history from a binary file.
- A dashboard is created and a timer starts with an interval of 250 ms.
- A test request is being made to the API (CheckAPIConnection) to check availability.

Main Loop (OnTimer)

Every 250 ms, ProcessSymbol is called for each initialized character:

1. **Virtual Stop check** – if enabled, all symbol positions are checked for reaching virtual SL/TP levels.
2. **Position management** – if trailing is enabled, stop losses are updated.
3. **Trigger Definition:**
 - If a new bar on the working TF is closed, the BAR_CLOSE trigger is triggered.
 - Otherwise, if the price deviated from the opening of the current bar by more than $\text{SpikeFactor} * \text{ATR}$ and enough time has passed since the last spike, the PRICE_SPIKE trigger is triggered.
4. **Evaluation of old forecasts** (EvaluatePredictions – - history records are checked for which the evaluation period has expired; the wasCorrect flag is set.
5. If there is a trigger, checks are performed:
 - The spread does not exceed MaxSpreadPoints.
 - The current time is located inside the trading session (including UTC offset).
 - If all checks are passed, SendLLMRequest is called.

Request to LLM

- SendLLMRequest first checks the number of open positions per symbol (MaxConcurrentTrades max).
- Calls BuildLLMUserJSON, which generates JSON with the following data:
 - trigger, symbol, account status, open positions by symbol.
 - economic calendar data (upcoming events). If an important event is detected within the blocking window, the isNewsBlocked = true flag is set and trading is blocked (the function returns control).
 - Indicator values: ATR, ADX, RSI, CCI, WPR, MFI, %B Bollinger bands, upper / lower bands, current price.
 - last 30 bars (OHLC).
 - latest LLM_PredictionHistory predictions for a given symbol (feedback).
- If isNewsBlocked == true, the status of the symbol on the dashboard is set to "News Block" and the request is not sent.
- CallLLM is called, which sends a POST request to the API with the system prompt (describing the strategy) and custom JSON.
- The response is parsed: JSON is extracted with the prediction and confidence fields. If parsing failed or values are out of range, an error is returned.
- If everything is successful, the forecast is saved to the history (AddPredictionToHistory), and then ProcessLLMDecision is called.

Making a trading decision

- If confidence < MinLLMConfidence, the signal is ignored.
- If prediction >= LLM_BuyThreshold, the distance to existing Buy positions is checked, real SL/TP is calculated (if enabled), and Buy is opened.

- Similarly, for Sell with a threshold of prediction $\leq$ LLM_SellThreshold.
- Otherwise, the position is not opened (neutral forecast).

Opening a position

- Before opening, we check the number of positions per symbol (MaxConcurrentTrades), spread, and stop order level (for real SL/TP).
- Lot is calculated (CalculateLot): fixed or percentage of free margin, taking into account drawdown protection and broker restrictions (min / max lot, step). If the margin is insufficient, the lot is reduced or the trade is canceled.
- For Buy/Sell, the current Ask/Bid is used.
- The order comment contains the signal type (LLM or MANUAL) and confidence.

Position Management

- **Virtual stops** are checked every tick: if the price has reached the virtual SL/TP, the position is closed.
- **Trailing:** Profit in points is calculated for all symbol positions (or averaged). If it exceeds TrailingStart, a new SL is set at the TrailingDistance distance from the current price in the direction of profit.

Dashboard

- It is created on a graph using graphical objects.
- Shows for each symbol: signal (from the last forecast in history), confidence, number of Buy / Sell positions, spread, profit, LLM status.
- The B, S, and C buttons allow you to manually open Buy, Sell, or close all positions on the symbol (while also checking distances and other conditions, as for automatic trades).
- You can drag and drop the dashboard and it scales to DPI.

Forecast history

- Each LLM forecast is added to the llmHistory array and saved to a file each time it is added.
- Correctness is evaluated in EvaluatePredictions: for each unevaluated forecast, if PredictionEvaluationBars bars have passed, the current price is compared with the price at the time of the forecast. If the movement in the direction of the forecast exceeded MinProfitForCorrectPoints, the forecast is considered correct (wasCorrect = true).
- The history size limit is MaxHistorySize; old records are deleted.

5. Recommendations for use

Customization

1. **Get the API key** from Router AI and enter it in the RouterAIApiKey parameter.
2. **Add the URL to the terminal's whitelist:** in MetaTrader 5, open *Tools* → *Settings* → *Expert Advisors* and in the "Allow WebRequest for the following URLs" section, add <https://routerai.ru>.

3. **Select the symbols** in the `InpSymbolList` or leave the current chart (if `InpIncludeChartSymbol=true`). Make sure that all symbols are available on your account and that the terminal can receive quotes for them.
4. **Set up the risk:** select the lot mode (`LotCalculationMode`), set `MaxConcurrentTrades`, `MaxSpreadPoints`, and stop losses.
5. **If necessary, activate the news filter:** `UseNewsFilter=true`, configure the importance and time windows.
6. **Run the Expert Advisor** on any chart (M15 is recommended, but not required – the chart is only needed for the dashboard and buttons). The Expert Advisor will trade all the specified symbols, regardless of which chart it is installed on.

Optimization and security

- Start with a demo account and small lots to evaluate the performance of LLM and the stability of the connection.
- Keep track of the Expert Advisor's log when `EnableDebugLogging` is enabled – This will help you identify API errors or problems with symbols.
- Check the dashboard periodically: the LLM status should be "OK" or "Idle". Errors (red) indicate connection problems or an invalid API key.
- Since the LLM model can produce unstable results, we recommend using conservative thresholds (`MinLLMConfidence`, `LLM_BuyThreshold`, `LLM_SellThreshold`) and not relying solely on it.
- Use the news filter to avoid trading during important events – this reduces the risk of sudden movements against the position.
- The forecast history will help the model adapt over time, but keep in mind that it is saved locally. If you change symbols or timeframes, you should clear your history (delete the `MultiSymbol_LLM_History.bin` file).

Limitations

- The Expert Advisor does not work in the strategy tester – only on a live or demo account.
- A stable Internet connection is required; if the connection fails, requests will fail and trading will be suspended.
- The frequency of requests to LLM is limited by triggers (bar close or spike) and API limits. Make sure that your Router AI data plan allows the required number of requests.

6. Important notes

- **Required condition:** URL `https://routerai.ru` it must be added to the allowed list in the MetaTrader settings, otherwise all requests will return an error.
- **The API key is stored in clear text** in the parameters of the Expert Advisor. Do not share the settings file (`.set`) with others.
- **It doesn't work in the strategy tester:** `OnInit()` explicitly checks `MQLInfoInteger(MQL_TESTER)` and returns `INIT_FAILED`.

- **Timeframe and symbols:** Indicators are calculated on the selected InpTradeTF. If you change the timeframe, the interpretation of bars and closes will also change. We recommend using M15 or higher to avoid overloading the API with requests.
- **Estimation of forecasts:** The PredictionEvaluationBars parameter works in the bars of the selected TF. For example, if PredictionEvaluationBars=3 and M15, the evaluation will occur 45 minutes after the forecast.
- **LLM Feedback:** The system prompt includes a history of past forecasts (with the was_correct flag). This can improve quality, but it can also lead to retraining for specific market conditions. Use MaxHistorySize for the constraint.
- **Virtual stops:** When using virtual SL/TP, no real stop orders are placed. This means that if the connection is broken or the terminal is disconnected, the positions will remain unprotected. We recommend using real stops for critical accounts.
- **Trailing:** If UseAveragePrice=true, trailing for all Buy (or Sell) positions uses the average price. This may cause the stop loss to be set higher/lower for individual positions than if an individual price was used. Make sure that this behavior is consistent with your strategy.
- **Dashboard:** Manual control buttons (B, S, C) perform the same checks as automatic signals, except for checking the spread and news? (Look at the code: OnClickBuy checks only the distance, then ComputeRealSLTP and ExecuteBuy. ExecuteBuy checks the spread, number of positions, and stop levels again, but **does not check** the news filter and trading hours. This means that manual trades can be opened even during the blocked period or outside the session. Keep this in mind when using buttons.)
- **Opening errors:** if there is not enough margin or the lot is too small, the trade is skipped with a message in the log. Check MaxConcurrentTrades and available margin.
- **Saving history:** The MultiSymbol_LLM_History file.bin is created in the MQL5/Files folder. If you transfer the Expert Advisor to another computer or account, you can delete the history – The Expert Advisor will start from scratch.
- **Logging:** When EnableDebugLogging is enabled, the log will contain a lot of information, including full JSON requests and LLM responses. This may slow down your work with frequent requests, but it is useful for debugging.
- **Compatibility:** The code uses the JASON.mqh library, which must be located in the MQL5/Include folder. Make sure that it is installed.