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Variance Asymmetry Momentum

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Momentum (Directional Variance Asymmetry)	Intraday (M15–H1)	www.algobot.live

> ⚠ **Important Disclaimer** This document is for educational and informational purposes only. It does not constitute financial or investment advice. Trading forex, CFDs, and other leveraged instruments involves substantial risk of loss and is not suitable for all investors. Past backtest performance does not guarantee future results. Never trade with capital you cannot afford to lose.

Overview

Variance Asymmetry Momentum is an original, first-principles momentum system. Rather than counting up bars against down bars, it measures the *energy imbalance* hidden in recent price returns. The core idea: in a genuine trend, the with-trend impulses arrive as a few large moves while the against-trend corrections stay small and noisy. Because energy scales with the *square* of displacement, squaring each return amplifies the impulse side and mutes the jitter side, exposing a directional bias that a simple net-drift measure blurs together with chop.

The strategy is built entirely from its own self-computed calculations — it uses no published indicator, no price-action pattern, and no SMC/ICT/Wyckoff or support/resistance concept. It also **self-adapts**: instead of comparing the imbalance to a fixed threshold, it standardises the imbalance against that market's own recent behaviour, so the effective trigger level adjusts automatically as a symbol's character drifts — no manual re-tuning per symbol or timeframe.

It operates on a single timeframe (the chart it is attached to), trades one position at a time, and manages risk with a self-computed Average True Range (ATR): a fixed protective stop, a reward-ratio target, breakeven protection at +1 ATR of profit, and an ATR-based trailing stop thereafter.

> **Best suited for:** a liquid FX major (for example EUR/USD) or a major index on an intraday timeframe. Because the trigger standardises against each market's own distribution, the logic self-adapts to whatever symbol and timeframe you attach it to.

How It Works

1. The directional variance asymmetry index (A)

Over the last `Lookback` closed bars, the EA takes one-step returns $r_i = Close_i - Close_{i-1}$ and splits their energy by sign — a directional semivariance, left un-normalised:

$$E_{up} = \sum \max(r_i, 0)^2 \quad \text{(upside energy)}$$
$$E_{dn} = \sum \max(-r_i, 0)^2 \quad \text{(downside energy)}$$
$$A = (E_{up} - E_{dn}) / (E_{up} + E_{dn} + \varepsilon) \rightarrow \text{bounded in } [-1, +1]$$

An `A` near **+1** means almost all return energy is on the upside (bullish pressure); near **−1** is bearish; near **0** is balanced. Squaring the returns is what makes this a second-moment measure rather than a net-drift (first-moment) one.

2. Self-adapting standardisation (z)

A raw threshold on `A` cannot fit every symbol and timeframe, so `A` is standardised against its *own* recent distribution over a window of `AdaptWindow` past values:

$$z = (A - \text{mean}_W(A)) / \text{std}_W(A)$$

The trade gate is $|z| \geq ZEntry$ — the current energy imbalance must be statistically *extreme relative to how imbalanced this market usually is*. As the symbol's character changes, the mean and standard deviation of `A` drift and the effective trigger level adapts automatically.

3. Entry logic

Trades are taken only on a **fresh crossing** of the band (the previous `z` was inside the band and the new `z` is outside), so each impulse is acted on exactly once. A confirming candle on the just-closed bar is also required:

- **Long:** `z` crosses up through `+ZEntry` *and* the trigger bar closed higher than it opened (bullish candle).
- **Short:** the exact mirror — `z` crosses down through `-ZEntry` *and* the trigger bar closed lower than it opened (bearish candle).

The EA acts once per *closed* bar (the forming bar is ignored until it closes), and only when no position is already open.

4. Exit, stops and trade management

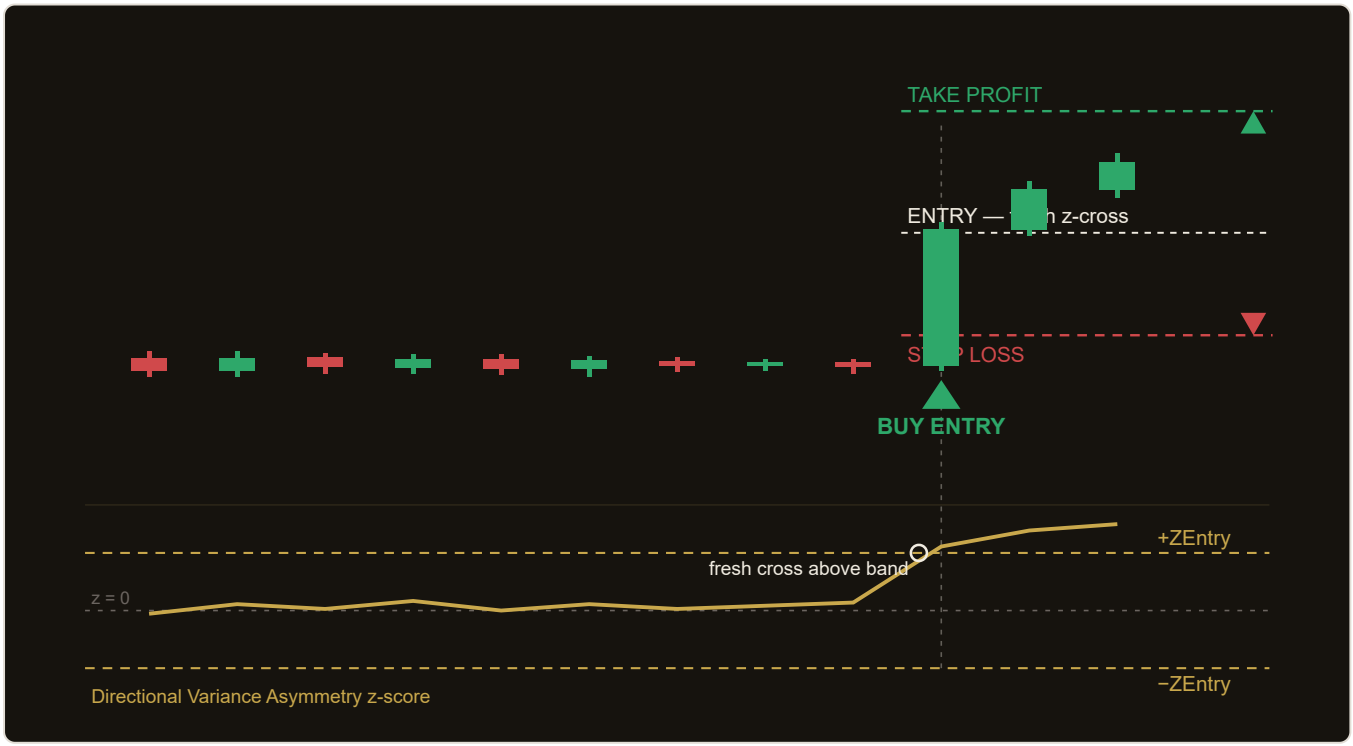
Risk is sized from a self-computed ATR — the simple average of the last `AtrPeriod` true ranges (deliberately *not* Wilder-smoothed, so the C# and MQL5 builds match exactly).

- **Initial stop:** placed `StopMult × ATR` away from entry.
- **Take profit:** placed at `StopMult × ATR × RewardRatio` — i.e. the reward is a multiple of the risked stop distance.
- **Breakeven ratchet:** once price moves +1 ATR in profit, the stop is advanced so it never sits below (long) or above (short) the entry price.
- **Trailing stop:** beyond breakeven, the stop trails the market by `TrailMult × ATR`, only ever tightening, locking in gains as the impulse extends.

> **Note:** while a position is open, the `z` value is intentionally frozen and only trade management runs. The EA holds a maximum of one position at a time; the stop, target and trail handle the rest.

Strategy in Action

The illustration below shows an example of how the strategy identifies a setup and triggers its entry and exit. This is a simplified, illustrative example for educational purposes — not real market data.



Illustrative example only. Actual market behaviour varies.

Reading the illustration

During the consolidation, up and down energy stay balanced, so the asymmetry z-score hovers around zero. A cluster of large bullish returns then floods the upside energy term, the z-score spikes and crosses *up* through `+ZEntry` on a bullish close — a fresh cross. The EA buys, sets a stop `StopMult × ATR` below entry and a target `RewardRatio` times that distance above, then ratchets to breakeven and trails as the move extends toward take profit.

Parameters

Parameter	Default	Description
Lookback	`20`	Number of closed-bar returns used to measure the directional variance asymmetry index A. Range 5–60, step 1.
AdaptWindow	`50`	Window of past A values used to standardise the index into a z-score. Larger = slower, more stable adaptation. Range 10–200, step 5.
ZEntry	`1.2`	The |z| band that gates entries. Higher values demand a more statistically extreme imbalance, so trades are fewer but more selective. Range 0.3–3.0, step 0.1.
AtrPeriod	`14`	Period of the self-computed simple-average ATR used to size stops, targets and the trail. Range 5–50, step 1.
StopMult	`1.6`	Protective stop distance in ATRs. Range 0.5–4.0, step 0.1.
RewardRatio	`1.8`	Take-profit distance as a multiple of the stop distance (risk:reward). Range 0.5–5.0, step 0.1.
TrailMult	`1.5`	Trailing-stop distance in ATRs applied after breakeven is reached. Range 0.5–4.0, step 0.1.
Lots	`0.10`	Fixed trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	`5271`	Unique identifier tagging this EA's orders so it manages only its own positions.

Recommended Settings

The defaults are a balanced starting point and, thanks to the self-adapting trigger, transfer reasonably across markets. Use the guidance below as a tuning framework rather than a fixed prescription, and always validate on your own broker's data with the Strategy Tester before any live use.

SUGGESTED STARTING POINT

- **Symbol:** a liquid FX major (e.g. EUR/USD) or a major index.
- **Timeframe:** intraday, typically M15 to H1.
- **Lookback / AdaptWindow:** keep the defaults (20 / 50) initially; these define how much history feeds the imbalance and its standardisation.
- **ZEntry:** 1.2 for a moderate cadence. Raise it (e.g. 1.5–2.0) if you want fewer, higher-conviction signals.
- **Risk (StopMult / RewardRatio / TrailMult):** defaults 1.6 / 1.8 / 1.5 give a positive reward-to-risk profile with an active trail.

> **Tuning tip:** because the entry gate standardises against each market's own distribution, `ZEntry` is your primary dial for trade frequency — it behaves consistently across symbols. Adjust it first, and change `Lookback` / `AdaptWindow` only when you want to alter how responsive the imbalance measure itself is.

> **Position sizing:** the `Lots` value is fixed and does not scale to account size. Set it in line with your account balance and risk tolerance, and confirm the resulting per-trade risk in the Strategy Tester before trading live.

How to Install on MetaTrader 5

1. Copy `VarianceAsymmetryMomentum.ex5` to your MT5 `MQL5\Experts\` folder
2. Restart MetaTrader 5 and refresh the Navigator panel
3. Drag the EA onto a chart matching the recommended symbol and timeframe
4. Configure the input parameters and click **OK**
5. Enable **Algo Trading** in the MT5 toolbar

> **Before going live:** run the EA in the MT5 Strategy Tester across a representative date range for your chosen symbol and timeframe, then forward-test on a demo account. The strategy needs enough history to fill both the return window and the adaptation window before it can produce its first signal.

Risk Warning

Trading foreign exchange, CFDs, and other leveraged financial instruments involves substantial risk of loss and is not suitable for all investors. The strategies and tools described in this document are provided for **educational purposes only** and do not constitute financial advice, investment recommendations, or solicitation to trade. Always consult a qualified financial adviser before making trading decisions. Past backtest performance is not indicative of future results.