

Spread Exhaustion Reversion

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Mean Reversion (Microstructure)

TIMEFRAME

M5–M30

WEBSITE

www.algobot.live

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Overview

Spread Exhaustion Reversion is a mean-reversion Expert Advisor whose trigger comes from a piece of market microstructure that almost no chart strategy uses: the effective bid–ask spread *estimated* from the high–low ranges of two consecutive bars, via the **Corwin–Schultz (2012)** estimator. The insight behind that estimator is that a bar's high tends to be a buy and its low a sell, so the observed high–low range is inflated by the spread. Comparing single-bar ranges to the merged two-bar range lets the EA back out an implied spread using **only OHLC data** — no ticks and no volume required.

A sudden **spike** in the estimated spread means the two-bar range blew out relative to the individual bars — a signature of a thin-book stress event, a stop-run, or a liquidity vacuum. Such moves are typically transient: liquidity providers step back in and price is pulled back toward fair value. The EA treats an estimated-spread spike as a high-quality “this dislocation will revert” flag, then fades the move back toward an EMA baseline of fair value.

Because the estimator itself is spread-based rather than volume-based, it is robust on symbols with unreliable tick volume — unlike volume-based illiquidity measures such as Amihud or VPIN. Everything in the strategy self-scales: the spike test is a rolling z-score of the estimator, and the stretch gate and stops are all ATR-based. Its natural home is a liquid FX major or metal (EURUSD / XAUUSD) on M5–M30, but it runs on whatever timeframe is selected at backtest time.

Key idea: the estimator gives no direction — it only flags *when* liquidity has broken down. Direction is supplied separately by the EMA fair-value baseline. A trade fires only when an illiquidity spike coincides with price being stretched well away from that baseline.

How It Works

1. The Corwin–Schultz estimated spread

For two consecutive bars (the previous bar `t-1` and the current bar `t`), the EA computes the implied effective spread as follows:

```
beta  = ln(H_t / L_t)^2 + ln(H_{t-1} / L_{t-1})^2      (two single-bar ranges)
gamma = ln( max(H_t, H_{t-1}) / min(L_t, L_{t-1}) )^2  (the merged two-bar range)
k      = 3 - 2*sqrt(2)
alpha = (sqrt(2*beta) - sqrt(beta)) / k - sqrt(gamma / k)
S      = 2*(e^alpha - 1) / (1 + e^alpha)              (implied spread, floored at 0)
```

The estimate `S` is floored at zero — the model can produce a small noisy negative value, which is discarded as the standard convention. Degenerate OHLC (non-positive lows, or a high below its low) also returns zero.

2. Detecting a spike (rolling z-score)

Every time a new bar closes, the EA appends a fresh estimated-spread value to a rolling history. It then measures the current value against the mean and standard deviation of the **prior** window (length `SpreadLookback`). A spike is confirmed when:

```
S_current > mean(prior window) + SpreadSpikeMult * stdev(prior window)
```

This is a self-scaling test: a “spike” is defined relative to the symbol's own recent spread behaviour, so no fixed thresholds need tuning per instrument.

3. Direction from the fair-value baseline

Direction is decided by how far price has stretched from an `EmaPeriod` EMA of closing prices. The signed distance `stretch = close - EMA` is compared against a volatility gate `StretchMult × ATR`. On a freshly closed bar, three things must align:

- **LONG** — the estimated spread `S` spikes *and* price closed at least `StretchMult × ATR` **below** the EMA baseline (over-stretched down). The market has been shoved down into a liquidity vacuum; the EA buys the reversion.

- **SHORT** — S spikes *and* price closed at least $\text{StretchMult} \times \text{ATR}$ **above** the EMA baseline (over-stretched up). The EA sells the reversion.

4. Entry, stop and target

- **Long entry:** at the Ask. Stop-loss placed $\text{SLATRMult} \times \text{ATR}$ below the spike bar's low; take-profit $\text{TPATRMult} \times \text{ATR}$ above the entry.
- **Short entry:** at the Bid. Stop-loss placed $\text{SLATRMult} \times \text{ATR}$ above the spike bar's high; take-profit $\text{TPATRMult} \times \text{ATR}$ below the entry.
- Orders are validated before sending — the stop and target must sit on the correct side of entry, otherwise the signal is skipped.

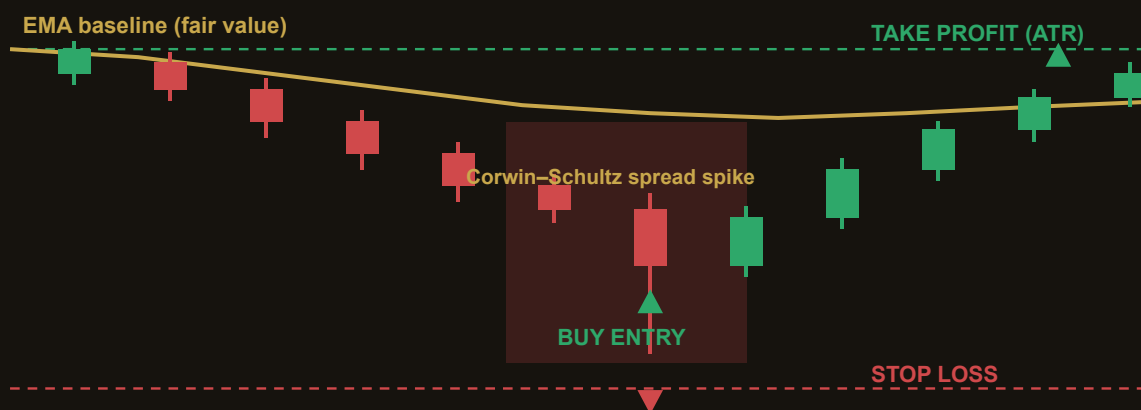
5. Exit logic

Beyond the fixed stop-loss and take-profit, an open trade is closed **early** the moment price reclaims the EMA baseline — for a long, when the close rises back to or above the EMA; for a short, when the close falls back to or below it. At that point the reversion thesis has played out and the position is banked.

Trade hygiene: the EA holds at most **one position per magic number**, acts only once per newly closed bar, and skips new entries whenever the live spread is wider than MaxSpreadPoints — avoiding entries during genuinely untradeable conditions.

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.



Price stretched below fair value → illiquidity spike → fade back to the EMA

Illustrative example only. Actual market behaviour varies.

Worked example (long)

Price has been pushed down five bars in a row, closing about 1.8 ATR below the 50-period EMA. The final down bar prints a violently wide two-bar range, and the Corwin-Schultz estimate spikes to 2.4 standard deviations above its 50-bar mean — a liquidity vacuum. The stretch gate (1.5 ATR) is satisfied, so the EA buys at the Ask, sets a stop 1.2 ATR below the spike bar's low, and a target 2.0 ATR above entry. Price snaps back; as soon as the close reclaims the EMA baseline, the position is closed early with a profit.

Parameters

Parameter	Default	Description
EmaPeriod	50	Period of the EMA fair-value baseline that price reverts toward. Range 20–200, step 10.
AtrPeriod	14	ATR lookback used for both the stretch gate and the protective stop. Range 5–40, step 1.
StretchMult	1.5	How far (in ATRs) price must have stretched from the EMA before a fade is allowed. Range 0.5–4.0, step 0.1.
SpreadLookback	50	Rolling window over which the estimated-spread spike (z-score) is measured. Range 20–200, step 5.
SpreadSpikeMult	1.5	Spike threshold: the estimated spread must exceed mean + this × stdev of its recent history. Range 0.5–4.0, step 0.1.
SIATRMult	1.2	Protective stop distance beyond the spike bar's extreme, in ATRs. Range 0.5–4.0, step 0.1.
TpATRMult	2.0	Take-profit distance from entry, in ATRs. Range 0.5–6.0, step 0.1.
MaxSpreadPoints	80	Skip new entries when the live broker spread (in points) is wider than this. Range 5–300, step 5.
Lots	0.10	Fixed trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	20732	Magic number identifying this EA's positions. Range 0–9,999,999, step 1.

Recommended Settings

The defaults are a balanced starting point for a liquid FX major or metal on an intraday timeframe. Consider the following when adapting them to your instrument and broker:

- **Symbol & timeframe:** EURUSD or XAUUSD on M5–M30. The estimator relies on clean OHLC, so favour liquid instruments with tight, stable spreads.
- **MaxSpreadPoints:** set this to reflect your broker's typical spread on the chosen symbol. Too low and the EA rarely trades; too high and it enters during genuinely untradeable conditions. Metals need a larger value than majors.
- **StretchMult / SpreadSpikeMult:** raising either makes entries rarer but higher-conviction. Lower them for more frequent, lower-quality signals during quiet regimes.

- **SlAtrMult / TpAtrMult:** the defaults give a roughly 1.2 : 2.0 risk-to-reward geometry. Widen the stop on noisier symbols so normal post-spike volatility does not stop you out prematurely.
- **SpreadLookback:** longer windows produce a steadier spike baseline; shorter windows adapt faster to changing volatility regimes.

Tip: because every threshold self-scales (z-score spike, ATR stretch and stops), the same defaults often transfer across timeframes better than a fixed-pip strategy would. Always run a backtest and forward-test on a demo account before trading live.

Optimisation caution: mean-reversion systems are especially prone to curve-fitting. Validate any tuned parameters on out-of-sample data and across multiple market regimes before committing real capital.

How to Install on MetaTrader 5

- 1 Copy `SpreadExhaustionReversion.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

Risk Warning

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