

Calm Range Spike Reversion

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Mean Reversion (Spike Fade)

TIMEFRAME

M15 – H1

WEBSITE

www.algobot.live

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Overview

Calm Range Spike Reversion is a regime-gated, single-bar spike-fade mean reversion Expert Advisor. Its central premise is that in a *calm* market — one with a flat trend and contracting volatility — a lone bar that stabs through a volatility band and then snaps back inside on the *same* bar is almost always a liquidity flush rather than the beginning of a new trend. Those flushes revert to fair value with a high hit-rate.

What makes this system conservative is not a clever exit — it is a strict refusal to act. The strategy trades *only* the calm regime and stays flat whenever the market is trending or expanding, which are precisely the two conditions that punish mean-reversion systems most heavily. By staying out of those environments, it keeps drawdown small and only engages the setup where fading a spike has a genuine statistical edge.

Fair value is defined by an exponential moving average (the *anchor*). A volatility band is drawn a configurable number of short-window ATRs above and below that anchor. When a single bar pierces a band, rejects with a wick, and closes back inside — while the bar before it was still fully inside — the EA fades the spike back toward the mean.

How It Works

On every new bar the EA appends the bar that just closed and rebuilds all of its measurements purely from finished bars — nothing is computed from the still-forming candle. It then evaluates a two-stage regime gate followed by a spike-and-snap-back trigger.

The Regime Gate (both conditions must hold)

No trade is even considered unless the market is genuinely calm. Both filters must pass:

- **1. Low volatility (contraction):** the short-window ATR must sit below a fraction of the long-window ATR — $\text{ATR_short} < \text{ContractFactor} \times \text{ATR_long}$. This confirms volatility is compressing rather than expanding.
- **2. Flat trend:** the EMA must have barely moved over the lookback window, measured in ATR units — $|\text{EMA}(\text{now}) - \text{EMA}(\text{SlopeLookback ago})| < \text{FlatFactor} \times \text{ATR_short}$. This confirms there is no meaningful directional drift to fight.

Why the gate matters. Mean reversion is destroyed by trends and volatility expansion. By requiring a flat EMA and a contracting ATR before any signal is read, the EA simply declines to trade in the environments where fading price is most dangerous. This selectivity is the core risk control — not the stop-loss.

Entry Logic

Once the regime gate passes, the anchor and bands are computed:

```
anchor = EMA(TrendPeriod)
upper  = anchor + BandMultiplier × ATR_short
lower  = anchor - BandMultiplier × ATR_short
```

The EA then inspects the last two closed bars — the *signal* bar (shift 1) and the bar before it (*prev*, shift 2).

LONG SETUP — A DOWNWARD SPIKE THAT FLUSHES AND SNAPS BACK UP

- **Pierce & snap-back:** the signal bar's low drops below the lower band, but its close finishes back inside the band ($\text{Low} < \text{lower}$ and $\text{Close} > \text{lower}$).
- **Wick rejection:** the lower tail is meaningful — $(\text{Close} - \text{Low}) \geq \text{WickFraction} \times \text{range}$, i.e. the close sits in the upper portion of the bar's range.
- **Freshness:** the prior bar was still inside the band ($\text{prevLow} \geq \text{lower}$), confirming this is a single-bar spike, not the continuation of a move already underway.

Entry is at market (Ask). The stop-loss is placed below the spike low, and the take-profit is the anchor (mean).

SHORT SETUP — THE EXACT MIRROR

- The signal bar's high pushes above the upper band but closes back inside ($\text{High} > \text{upper}$ and $\text{Close} < \text{upper}$).
- An upper-wick rejection is present: $(\text{High} - \text{Close}) \geq \text{WickFraction} \times \text{range}$.
- The prior bar was still inside the band ($\text{prevHigh} \leq \text{upper}$) — a fresh, single-bar spike.

Entry is at market (Bid), stop-loss above the spike high, take-profit at the anchor.

Stop-Loss, Take-Profit & the Reward Filter

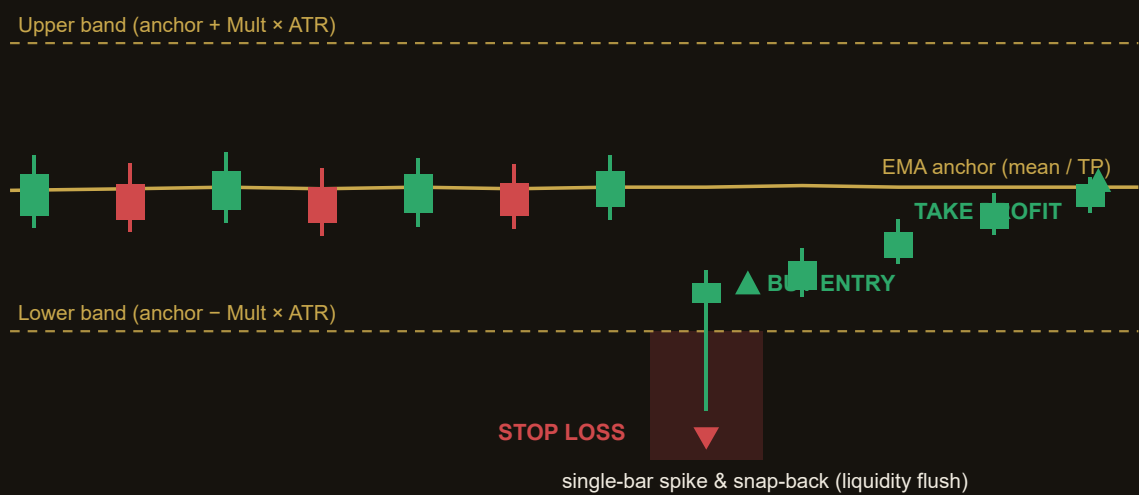
- **Stop-loss (long):** $\text{SL} = \text{spikeLow} - \text{StopBufferAtr} \times \text{ATR_short}$ — just beyond the flush extreme.
- **Take-profit:** $\text{TP} = \text{anchor}$ — the EMA fair value the price is expected to revert to.
- **Minimum reward filter:** the trade is only sent if the distance to target clears a floor — $\text{TP} - \text{entry} \geq \text{MinRewardAtr} \times \text{ATR_short}$ (and the mirror for shorts). If the snap-back has already carried price too close to the mean, the setup is skipped.

Trade Management

- **One position at a time:** the EA holds a single open position per symbol for its magic number and will not stack entries.
- **New-bar execution:** signals are evaluated only when a new bar opens, so entries are stable and never repaint within a bar.
- **Fixed brackets:** each trade carries a hard SL and a TP at the mean; there is no trailing logic — the position resolves at one of the two levels.

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.



Regime: flat EMA + contracting ATR → fade the spike back to fair value

Illustrative example only. Actual market behaviour varies.

Parameters

Parameter	Default	Description
TrendPeriod	50	EMA period defining the trend anchor / mean-reversion target. Range 20–150, step 5.
ShortAtrPeriod	14	Short-window ATR used for the band width and the regime tests. Range 5–30, step 1.
LongAtrPeriod	50	Long-window ATR used as the volatility-contraction baseline. Range 30–120, step 5.
SlopeLookback	20	Number of bars back used to measure the EMA's flatness (drift). Range 5–60, step 5.
BandMultiplier	2.0	Band width in short-ATR units above and below the anchor. Range 1.0–4.0, step 0.1.
FlatFactor	1.0	Maximum permitted EMA drift (in ATR units) for the trend to count as flat. Range 0.3–3.0, step 0.1.
ContractFactor	0.90	Volatility gate: short ATR must be below this fraction of the long ATR. Range 0.5–1.2, step 0.05.
WickFraction	0.50	Minimum rejection-wick fraction of the signal bar's range. Range 0.3–0.8, step 0.05.
StopBufferAtr	0.30	Stop-loss buffer beyond the spike extreme, in short-ATR units. Range 0.0–1.5, step 0.1.
MinRewardAtr	0.60	Minimum take-profit distance required to accept the trade, in short-ATR units. Range 0.1–2.0, step 0.1.
Lots	0.10	Fixed trade volume in lots. Range 0.01–1.0, step 0.01.
Magic	7731	Magic number identifying this EA's positions for the one-position-at-a-time rule.

Recommended Settings

The defaults are tuned to be broadly usable on liquid FX majors. Because this is a selective, calm-regime system, it naturally trades infrequently — that is by design, not a fault.

- **Symbols:** liquid FX majors with tight spreads (e.g. EUR/USD, USD/JPY, GBP/USD). Reversion to the mean depends on low transaction cost, so spread matters.

- **Timeframe:** M15 to H1. Lower timeframes generate more spikes but noisier fills; higher timeframes give cleaner flushes but fewer signals.
- **Band width:** a wider `BandMultiplier` (2.5–3.0) fades only more extreme spikes and improves per-trade quality at the cost of frequency.
- **Regime strictness:** lowering `ContractFactor` and `FlatFactor` tightens the calm requirement — fewer but higher-conviction setups.

Tip. Because the take-profit is fixed at the EMA anchor, the reward available on any given signal shrinks as price snaps closer to the mean. If you find too many valid spikes are being skipped, check `MinRewardAtr` — it is the filter deciding whether the remaining distance to the mean is worth trading.

Example — a long trade

The regime gate confirms a flat EMA and contracting ATR. On the signal bar, price stabs below the lower band, prints a long lower wick, and closes back inside — while the previous bar was fully inside the band. The EA buys at the Ask, sets the stop just below the spike low (`StopBufferAtr × ATR` beyond it), and targets the EMA anchor. Provided the distance to the anchor clears `MinRewardAtr × ATR`, the order is sent; otherwise the setup is skipped.

How to Install on MetaTrader 5

- 1 Copy `CalmRangeSpikeReversion.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

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