

Biweight Band Reversion

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Robust Mean Reversion

TIMEFRAME

M5 – H1

WEBSITE

www.algobot.live

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Overview

Biweight Band Reversion is a robust-statistics mean-reversion Expert Advisor. Its central idea is a better "fair value" line. Instead of a moving average, median, VWAP or trimmed mean — all common, and all easily distorted by a handful of spike bars — it computes the **Tukey biweight (bisquare) M-estimator of location**: an iteratively re-weighted centre in which every bar's influence decays with its distance from the centre and drops to *exactly zero* once it passes a MAD-scaled cut-off.

In plain terms, the estimator throws the spike/outlier bars completely out of the calculation, so the centre it reports is the level the "normal" bars agree on — precisely the value an over-stretched price tends to be pulled back toward. Around that spike-immune centre the EA builds a fade band and an outer guard fence, then fades price only inside a calm, flat, ranging regime. That regime filter, together with an ATR stop, a minimum reward-to-risk gate and a breakeven lock, is designed to keep drawdown small.

Core intuition. A simple average moves toward a spike; the biweight centre ignores it. When price stretches well past the band but has *not* broken clean out of the range, the robust centre acts like a magnet — and that centre is exactly where the trade takes profit.

How It Works

1. The robust fair-value centre

Over the last `Window` closed bars the EA takes each bar's typical price $tp = (High + Low + Close) / 3$ and computes:

```
med  = median(tp)
MAD  = median(|tp - med|)      (robust dispersion)
sigma = 1.4826 × MAD          (MAD → sigma-equivalent)
s    = TuneC × sigma          (biweight cut-off distance)

iterate T (start T = med):
    u_i = (tp_i - T) / s
    w_i = (1 - u_i2)2 for |u_i| < 1, else 0
    T   = Σ(w_i · tp_i) / Σ(w_i)    (re-weighted centre)
```

The weight function $(1 - u^2)^2$ is the bisquare kernel: bars near the centre carry near-full weight, bars far away are down-weighted smoothly, and any bar beyond `TuneC × sigma` gets a weight of **exactly zero** — it is completely rejected. The centre `T` is refined over up to 10 iterations until it stops moving. $\sigma = 1.4826 \times MAD$ is a robust standard-deviation equivalent that self-scales every band and gate below.

2. Bands and the outer guard fence

The fade band and the runaway/breakout guard are placed symmetrically around the centre in sigma units:

```
Lower = T - BandMult × sigma      Upper = T + BandMult × sigma
LowerGuard = T - GuardMult × sigma UpperGuard = T + GuardMult × sigma
```

The band marks a meaningful stretch worth fading. The guard is a fence: a move beyond it is treated as a *real breakout*, not a reversion opportunity, and is left alone.

3. Flat-regime gate

The EA only fades in calm, ranging conditions. It measures the centre's slope over `SlopeLookback` bars, normalised into sigma units:

```
slopeNorm = |center - center[SlopeLookback ago]| / sigma
flatRegime = slopeNorm ≤ MaxSlope
```

If the centre is trending (slope above `MaxSlope`), no fade is taken. This keeps the strategy out of established trends where reversion setups fail most often.

4. Entry logic

With one position per magic maximum, a flat regime confirmed, and the current spread within `MaxSpreadPoints`, the just-closed signal bar must show the first snap-back:

- **Long** — the closed bar closes *below* the Lower band but still *above* the lower Guard, the regime is flat, and the bar is bullish (close > open). Buy at Ask.
- **Short** — mirror image: the closed bar closes *above* the Upper band but still *below* the upper Guard, the regime is flat, and the bar is bearish (close < open). Sell at Bid.

5. Exit logic, stop and target

- **Take profit** — the robust centre `T` itself. Price is expected to be pulled back to fair value, so the centre is the structural magnet target.
- **Stop loss** — $\text{AtrStopMult} \times \text{ATR}$ beyond the entry (below for longs, above for shorts), using an `AtrPeriod` ATR.
- **Minimum reward:risk** — a setup is rejected if the target is closer than $\text{MinRewardRisk} \times$ the ATR stop distance, i.e. price already sits too near `T`.
- **Breakeven lock** — once price travels $\text{BreakevenAtr} \times \text{ATR}$ in favour, the stop is moved to the entry price, so a trade that half-works then reverses costs nothing.

Everything self-scales. Bands and the slope gate scale via `sigma` (robust dispersion); the stop and breakeven scale via `ATR`; the target is structural (the centre). There are no hard-coded pip distances, so the EA adapts across symbols and volatility regimes.

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.

Upper Guard ($T + \text{GuardMult} \cdot \sigma$) — no fade beyond

Upper Band ($T + \text{BandMult} \cdot \sigma$)

Biweight Centre T — robust fair value
TAKE PROFIT
(centre T)

Lower Band ($T - \text{BandMult} \cdot \sigma$)

Lower Guard ($T - \text{GuardMult} \cdot \sigma$) — no fade beyond

BUY ENTRY — bullish snap-back below band
STOP LOSS
($\text{AtrStopMult} \cdot \text{ATR}$)

Illustrative example only. Actual market behaviour varies.

Parameters

Parameter	Default	Description
Window	40	Rolling window (bars) for the biweight centre and its dispersion. Range 15–150, step 5.
TuneC	6.0	Biweight tuning constant; the cut-off distance is $\text{TuneC} \times \text{sigma}$. Lower rejects outliers harder. Range 3.0–12.0, step 0.5.
BandMult	2.2	Fade-band width as a multiple of robust sigma ($1.4826 \times \text{MAD}$). Range 1.0–4.0, step 0.1.
GuardMult	4.0	Outer runaway/breakout guard in sigma; a stretch beyond this is not faded. Range 2.5–8.0, step 0.5.
SlopeLookback	5	Bars over which the centre's slope is measured for the flat-regime gate. Range 2–25, step 1.
MaxSlope	0.15	Max centre slope in sigma units to count the regime as flat/ranging. Range 0.02–0.60, step 0.01.
AtrPeriod	14	ATR lookback used for the stop, breakeven and reward:risk. Range 5–30, step 1.
AtrStopMult	1.4	Stop distance as a multiple of ATR beyond the entry. Range 0.5–4.0, step 0.1.
BreakevenAtr	0.8	Move the stop to breakeven once price travels this $\times$ ATR in favour. Range 0.2–3.0, step 0.1.
MinRewardRisk	0.8	Reject setups whose target (T) is closer than this $\times$ the ATR stop distance. Range 0.3–3.0, step 0.1.
MaxSpreadPoints	80	Skip new entries when the current spread (points) is wider than this. Range 5–300, step 5.
Lots	0.10	Trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	4517	Magic number identifying this EA's positions. Range 0–9,999,999, step 1.

Recommended Settings

The strategy's natural home is a liquid FX major or metal on **M5 to H1**, where robust reversion to a spike-immune fair value is well behaved. It runs on whatever timeframe the chart is set to (it uses only the primary timeframe).

SUGGESTED STARTING POINT

- **Symbol:** a liquid FX major (e.g. EURUSD, GBPUSD) or a metal (e.g. XAUUSD).
- **Timeframe:** M15 or M30 as a balanced default within the M5–H1 band.
- **Window / TuneC / BandMult / GuardMult:** the defaults (40 / 6.0 / 2.2 / 4.0) give a well-behaved centre, a meaningful fade band and a sensible breakout fence.
- **MaxSpreadPoints:** tighten this for low-spread majors and widen it for metals; it directly blocks entries during costly conditions.

Tuning the robustness

Lower **TuneC** makes the centre reject outliers more aggressively (a more "stubborn" fair value). Raising **BandMult** demands a larger stretch before a fade is considered — fewer but higher-conviction setups. Lowering **MaxSlope** restricts trading to flatter, calmer ranges, which typically reduces trade count and drawdown.

Low-drawdown design. Only one position per magic is open at a time; the minimum reward:risk filter discards setups where price already sits near fair value; and the breakeven lock removes risk from trades that move in favour before stalling. Always validate any settings on the MT5 Strategy Tester with your broker's spreads before live use.

How to Install on MetaTrader 5

- 1 Copy **BiweightBandReversion.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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