

Median Absolute Deviation Reversion

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Robust Mean Reversion

TIMEFRAME

Intraday (M15–H1)

WEBSITE

www.algoBot.live

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Overview

Median Absolute Deviation Reversion is a robust-statistics mean-reversion Expert Advisor. Classic reversion systems such as Bollinger Bands or z-score bands center price on the arithmetic *mean* and scale by the *standard deviation*. Both estimators are fragile: a single violent spike drags the "fair value" toward itself and inflates the band, so the strategy either chases the spike or refuses to fade it.

This EA instead uses the two most outlier-resistant estimators in statistics. It takes the **median** of recent closes as the fair-value center, and the **Median Absolute Deviation (MAD)** as the dispersion scale. From these it forms a **robust z-score** that measures how stretched price is in units a lone spike cannot corrupt:

$$rz = (\text{close} - \text{median}) / (1.4826 \times \text{MAD})$$

The constant **1.4826** rescales MAD so that it matches the standard deviation (sigma) for normally-distributed data. When **|rz|** becomes large, price has been stretched far from its robust fair value, and the strategy fades that stretch back toward the median. To avoid the classic failure mode of reversion — fading a genuine trend — every entry is gated by a **flatness filter** and confirmed by a same-direction candle.

Why robust statistics? The median and MAD have a breakdown point of 50%, meaning up to half the sample can be corrupted by outliers before the estimate is ruined. The mean and standard deviation have a breakdown point of 0% — a single bad bar is enough to distort them. On spiky FX data, that difference is the whole edge.

How It Works

1. Robust center and scale

On each newly-closed bar the EA collects the last `Lookback` closing prices into a window. It computes:

- **Median** — the middle close of the sorted window, used as the robust fair-value center.
- **MAD** — the median of the absolute deviations `|close - median|`, used as the robust dispersion scale.
- **Robust scale** — `1.4826 × MAD`, a sigma-equivalent for Gaussian data. If this collapses to zero (a perfectly flat window), the bar is skipped.

The robust z-score `rz = (close - median) / robustScale` then quantifies how far the freshly-closed bar sits from fair value.

2. Flatness filter (range vs. trend)

Fading a trend is fatal for a reversion system, so the EA measures directional drift robustly. The lookback window is split into an older half and a newer half; the absolute difference between their two medians is normalised by the robust scale:

```
drift = |median(newer) - median(older)| / robustScale
```

If `drift > FlatnessMax`, the market is trending and no fade is taken. Only when drift is small — a genuine range — are entries considered.

3. Turn-confirmation candle

The EA requires the freshly-closed bar to point in the direction of the intended trade. This ensures it fades a stretch that is *starting to snap back*, not one still extending:

- **Long** requires a bullish closed bar (`close > open`).
- **Short** requires a bearish closed bar (`close < open`).

4. Entry logic

- **Long:** `rz ≤ -EntryZ` (stretched far below fair value), the range is flat, and the closed bar is bullish → **Buy** at Ask.

- **Short:** $rz \geq +EntryZ$ (stretched far above fair value), the range is flat, and the closed bar is bearish → **Sell** at Bid.

5. Stop loss and take profit

- **Stop loss:** placed $AtrStopMult \times ATR$ away from entry (below for longs, above for shorts), using an $AtrPeriod$ ATR measured on the just-closed bar.
- **Take profit:** set at the **median** itself — the robust fair value the trade is fading back toward. A safety guard flips TP to an ATR-based target if the median lies on the wrong side of entry.

6. Early exit on reversion

Open positions do not wait for the fixed TP. Once the robust z-score reverts through zero — meaning fair value has been reclaimed — the position is closed immediately:

- A **long** is closed as soon as $rz \geq 0$.
- A **short** is closed as soon as $rz \leq 0$.

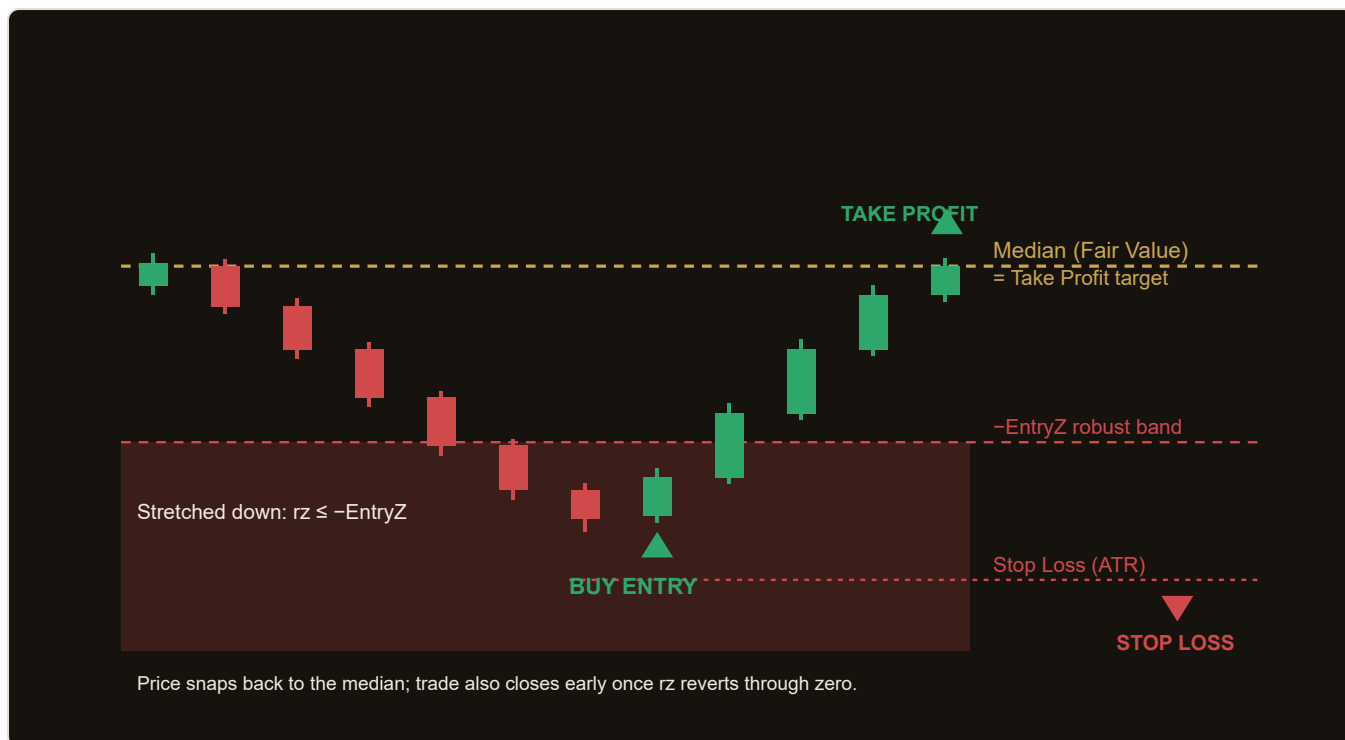
Only one position per magic number is ever open; the EA never stacks trades.

Worked example (long)

On a range-bound EURGBP chart, price sells off sharply and the freshly-closed bar prints $rz = -2.8$ (below the $EntryZ = 2.5$ threshold). The robust drift between the window halves is 0.4 (below $FlatnessMax = 1.0$), so the market is deemed flat. The closed bar is bullish, confirming the turn. The EA buys at Ask, sets the stop $1.8 \times ATR$ below entry, and targets the median. Price snaps back; when rz crosses above zero the trade is closed at fair value — often before the fixed TP is even reached.

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.

Parameters

Parameter	Default	Description
Lookback	40	Number of closes in the window used to compute the median and MAD. Range 16–120, step 4. Larger values give a smoother, slower-adapting fair value.
EntryZ	2.5	Robust z-score threshold for entry. A fade is only taken when <code> rz </code> reaches this level. Range 1.5–4.0, step 0.25. Higher values demand a more extreme stretch and trade less often.
FlatnessMax	1.0	Maximum allowed robust drift between the older and newer window halves. Above this the market is treated as trending and no trade is taken. Range 0.3–2.5, step 0.1.
AtrPeriod	14	ATR averaging period used to size the stop distance. Range 5–30, step 1.
AtrStopMult	1.8	Stop-loss distance as a multiple of ATR. Range 0.5–4.0, step 0.1. Larger values give more room but risk more per trade.
Lots	0.10	Fixed order volume in lots. Range 0.01–1.0, step 0.05.
Magic	7311	Magic number identifying this EA's positions so it manages only its own trades.

Recommended Settings

This is a range-fading system and performs best on instruments and timeframes that spend most of their time oscillating rather than trending.

- **Symbols:** range-prone FX crosses such as `EURGBP`, `EURCHF`, or other low-volatility pairs.
- **Timeframe:** intraday charts (M15–H1). The EA reads the chart's primary timeframe, so simply attach it to the timeframe you wish to trade.
- **Lookback / EntryZ:** the defaults (`40` / `2.5`) are a balanced starting point. Raise `EntryZ` toward `3.0+` for fewer, higher-conviction fades; lower it toward `2.0` for more frequent trades in calmer ranges.
- **FlatnessMax:** keep near `1.0`. Lower it to be stricter about only trading dead-flat ranges; raise it to allow fades during gently drifting conditions.

Tip: Always run a backtest and forward (demo) test on your specific broker's data before trading live. Robust reversion depends on the instrument actually mean-reverting; verify the pair ranges on your chosen timeframe rather than trending.

Avoid strongly trending markets. Even with the flatness filter, no reversion system is safe when a market breaks decisively out of its range. During trending regimes the EA should sit out; if you observe it repeatedly fading a persistent move, review the `FlatnessMax` and `EntryZ` settings or pause the EA.

How to Install on MetaTrader 5

- 1 Copy `MedianAbsoluteDeviationReversion.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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