

Mean Distance Trend Expansion

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Trend-Momentum Breakout

TIMEFRAME

H1 (primary chart)

WEBSITE

www.algobot.live

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Overview

Mean Distance Trend Expansion is a trend-momentum breakout Expert Advisor. Instead of asking *how far price has moved in raw price terms*, it asks a sharper question: *how far has price stretched from its own baseline, measured in units of that market's own volatility?* A move only counts as a genuine breakout when price has travelled a meaningful number of "average candles" away from fair value — and when the baseline itself is drifting in the same direction.

The heart of the EA is a range-normalized displacement oscillator, in the spirit of Mark Johnson's *Pretty Good Oscillator*. It divides the classic distance of price from its moving-average baseline by the exponentially-smoothed true range of the market. The result is scale-invariant across symbols and volatility regimes, and — importantly — it is **not** a z-score: a market can sit a long way from its mean in price yet only a modest distance once its own volatility is accounted for. Only that genuine, volatility-adjusted stretch is treated as a breakout.

The system is fully symmetric and reverses on the opposite signal. It acts once per freshly closed bar, sizes risk from ATR, and applies a spread filter so that fills stay realistic. Everything runs on the primary chart timeframe only.

How It Works

The Displacement Oscillator

On every closed bar the EA computes a single reading — the displacement — that expresses how far the latest close sits from its moving-average baseline, normalized by the market's smoothed true range:

$$\text{Displacement} = (\text{Close} - \text{SMA}(\text{Close}, \text{MeanPeriod})) / \text{EMA}(\text{TrueRange}, \text{MeanPeriod})$$

- The **numerator** is the familiar distance of price above or below its baseline (a simple moving average of the close over `MeanPeriod` bars).
- The **denominator** is the exponentially-smoothed true range over the same period. True range captures gaps and full high-low travel, so the oscillator effectively answers: *"how many average candles' worth of range has price travelled away from fair value?"*

Normalizing by true range rather than by the standard deviation of closes is what makes the reading comparable across symbols and market conditions, and distinct from a conventional standard-score. A displacement of `+3.0` means price is roughly three average true-ranges above its own mean.

Why true range, not standard deviation? A standard-deviation z-score measures how unusual a move is relative to the recent *spread of closes*. True-range normalization measures how far price has travelled relative to how far it *typically travels per candle*. The latter is a cleaner definition of momentum stretch and behaves consistently whether a symbol is quiet or wild.

Entry Logic — A Fresh Band Crossing

A breakout is registered only on the **first bar** that pushes the displacement through a band, so the EA ignites once rather than chasing an already-extended run. It compares the displacement on the current closed bar with its value on the prior bar:

- **Up-side thrust** — displacement crosses *up* through `+BreakoutBand` (previous $\leq$ band, current $>$ band).
- **Down-side thrust** — displacement crosses *down* through `-BreakoutBand` (previous $\geq$ -band, current $<$ -band).

The Trend Filter

A single, genuinely additive filter keeps the EA on the right side of the drift: the moving-average baseline itself must be sloping **with** the trade.

- A long is allowed only when the SMA is **rising** (`smaNow > smaPrev`).
- A short is allowed only when the SMA is **falling** (`smaNow < smaPrev`).

This rejects the countertrend volatility spikes — a sharp stretch above a still-falling mean — that make naive "distance from mean" systems bleed. A breakout is taken only when a fresh band crossing *and* the correct mean slope coincide:

```
bull = bullCross && meanUp;    // fresh +band cross with a rising mean → BUY
bear = bearCross && meanDown;  // fresh -band cross with a falling mean → SELL
```

Order Handling & Reversal

The strategy holds at most one position per direction for its magic number and reverses on the opposite signal:

- On a **bull** signal, any open short is closed first; if no long is open and the spread is acceptable, a new long is sent.
- On a **bear** signal, any open long is closed first; if no short is open and the spread is acceptable, a new short is sent.

Risk — Stop Loss & Take Profit

Protective levels are anchored to the Average True Range (period `AtrPeriod`) at entry, so they breathe with current volatility:

- **Long:** Stop Loss = entry - `SLAtrMult` × ATR, Take Profit = entry + `TpAtrMult` × ATR.
- **Short:** Stop Loss = entry + `SLAtrMult` × ATR, Take Profit = entry - `TpAtrMult` × ATR.

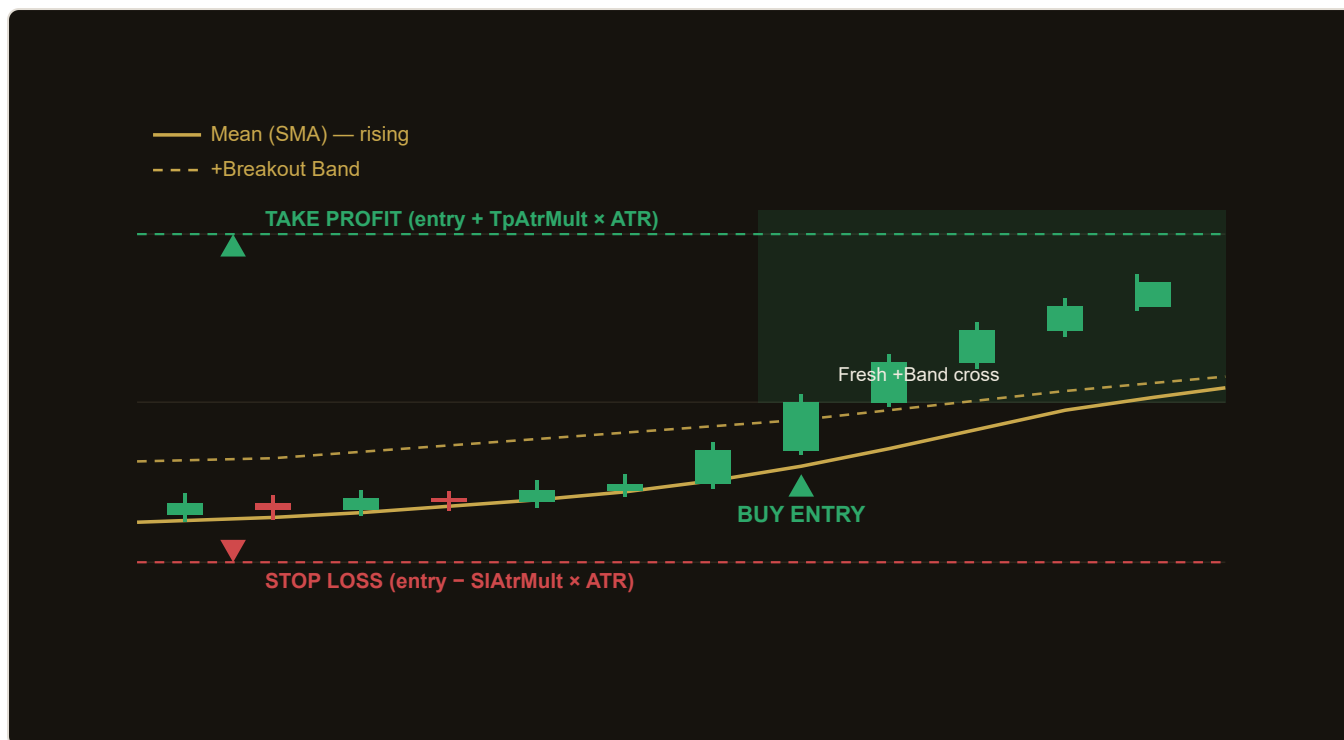
With the defaults (`SLAtrMult = 2.0` , `TpAtrMult = 3.0`) each trade targets a reward-to-risk ratio of roughly 1.5 : 1.

Execution Discipline

- **Once per closed bar** — signals are evaluated only when a new bar forms; the still-forming bar (shift 0) is never traded, so there is no intrabar repainting.
- **Spread filter** — trades are suppressed when the current spread exceeds `MaxSpreadPoints` (set to 0 to disable the check).
- **Primary timeframe only** — no multi-timeframe lookups; the EA reads the chart it is attached to.

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
MeanPeriod	34	Lookback for both the SMA baseline and the smoothed true range in the displacement oscillator (range 10–100, step 2). Larger values give a slower, smoother mean and demand a more sustained stretch.
BreakoutBand	3.0	Volatility band the displacement must cross to fire, expressed in true-ranges from the mean (range 1.0–6.0, step 0.25). Higher values demand a larger stretch, giving fewer but more decisive signals.
AtrPeriod	14	Averaging period of the ATR used to size the stop loss and take profit (range 7–40, step 1).
SIATRmult	2.0	Stop-loss distance as a multiple of ATR at entry (range 0.5–5.0, step 0.1).
TpATRmult	3.0	Take-profit distance as a multiple of ATR at entry (range 0.5–8.0, step 0.1).
MaxSpreadPoints	30	Maximum allowed spread, in points, for a new entry. Set to 0 to disable the spread check (range 0–200, step 5).
Lots	0.10	Fixed trade volume in lots (range 0.01–1.0, step 0.05).
Magic	5271	Magic number identifying this EA's positions, so it manages only its own trades on the symbol.

Recommended Settings

The defaults are a balanced starting point for major FX pairs on the **H1** timeframe. Because the oscillator is normalized by each market's own true range, the same settings transfer reasonably across symbols — but always validate on your broker's data and spread before going live.

BALANCED (DEFAULT)

- **MeanPeriod** 34, **BreakoutBand** 3.0 — a moderate, well-formed stretch is required.
- **SlAtrMult** 2.0, **TpAtrMult** 3.0 — approximately a 1.5 : 1 reward-to-risk profile.

MORE SELECTIVE (FEWER, STRONGER SIGNALS)

- Raise **BreakoutBand** toward 4.0–5.0 and lengthen **MeanPeriod** to 40–60. Fewer trades fire, but each demands a larger volatility-adjusted stretch.

MORE ACTIVE (MORE SIGNALS)

- Lower **BreakoutBand** toward 2.0–2.5 and shorten **MeanPeriod** to 20–26. Expect more entries and more noise; keep the spread filter tight.

Tip: The rising/falling-mean trend filter is deliberately strict — it will veto a fresh band crossing whenever the baseline slope disagrees with the trade. If the EA seems to skip breakouts you expected, it is usually because the mean had not yet turned in that direction.

Worked example — long entry

On EUR/USD H1 the close pushes the displacement from **+2.7** on the previous bar to **+3.4** on the just-closed bar, crossing up through **+BreakoutBand = 3.0** for the first time. The SMA has ticked higher (rising mean), so the filter agrees. With ATR = 0.0011 and entry (Ask) at 1.09250, the EA buys 0.10 lots with Stop Loss at 1.09030 (entry – 2.0 × ATR) and Take Profit at 1.09580 (entry + 3.0 × ATR).

Volatility & overtrading: Breakout systems can cluster losses during choppy, range-bound conditions where price repeatedly nudges the band without a sustained trend. The mean-slope filter reduces this, but does not eliminate it. Backtest across varied regimes and size positions conservatively.

How to Install on MetaTrader 5

1 Copy `MeanDistanceTrendExpansion.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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