

Turning Point Density Breakout

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Regime-Gated Breakout

TIMEFRAME

H1 (single timeframe)

WEBSITE

www.algobot.live

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Overview

Turning Point Density Breakout is a range-breakout Expert Advisor that only pulls the trigger when the market is in a clean, low-noise directional regime. Instead of trading every breakout, it first measures how "jittery" recent price action is using a classic nonparametric randomness statistic — the *turning-point density* of recent closes — and only participates when that density confirms a smooth, trending tape.

A *local turning point* is any interior close that is a peak (higher than both of its neighbours) or a trough (lower than both). For a pure random walk, the expected fraction of interior points that are turning points is $2/3$ (≈ 0.667) — the series is constantly reversing direction. When a market genuinely trends, consecutive closes push the same way and the turning-point density collapses **well below** 0.667. A choppy, ranging market sits at or above that baseline.

The EA translates a low density into a simple edge: a low-reversal tape is the environment where a fresh breakout is most likely to *run* rather than trap. It combines three conditions — a trending regime (low density), an unambiguous direction (net displacement across the window), and a confirmed price breakout of the recent high/low — and requires all three to agree before entering. Risk is managed with an ATR-based stop and a reward:risk take-profit; a confirmed opposite regime flattens the position rather than reversing into it.

Core intuition: a market that keeps reversing (density near or above 0.667) is noise — skip it. A market that has stopped reversing (density at or below `MaxDensity`) has committed to a direction. Trade the breakout only in that committed regime.

How It Works

On every completed bar (the EA acts once per new bar, never intrabar), the strategy rebuilds three measurements over a rolling window of completed closes and requires them to line up.

1. Turning-Point Density (the regime filter)

Over the last `Window` closes, the EA counts how many interior closes are peaks or troughs, then divides by the number of interior points (`Window - 2`):

```
density = turning_points / (Window - 2)
trending = density <= MaxDensity
```

- A **peak** is a close higher than both its neighbours; a **trough** is a close lower than both.
- `density ≈ 0.667` → random-walk / choppy behaviour → **no trade**.
- `density ≤ MaxDensity` (default 0.45) → a smooth, low-reversal directional regime → **trading is enabled**.

2. Regime Direction

Direction comes from the *net displacement* across the window — the newest close minus the oldest close:

```
net = close[newest] - close[oldest in window]
net > 0 → bullish regime
net < 0 → bearish regime
```

3. Fresh Breakout Trigger

Regime alone is not enough — the strategy waits for a genuine breakout on the just-completed bar. It scans the prior `BreakoutBars` bars (excluding the trigger bar itself) for the highest high and lowest low, then checks the close:

- **Long trigger:** the just-closed bar closes *above* the highest high of the prior `BreakoutBars`.
- **Short trigger:** the just-closed bar closes *below* the lowest low of the prior `BreakoutBars`.

Entry Logic

All three conditions must agree, giving distinct and symmetric long/short rules:

```
longSignal = trending AND net > 0 AND close > priorHigh
shortSignal = trending AND net < 0 AND close < priorLow
```

- **Buy** at the Ask when `longSignal` is true and no position is open.
- **Sell** at the Bid when `shortSignal` is true and no position is open.
- The EA **never stacks** same-direction entries — one position at a time.

Exit Logic & Position Management

- **Stop Loss / Take Profit:** every position is protected by an ATR-based stop and a reward:risk take-profit set at entry (see below).
- **Regime flip:** if a position is open and a confirmed *opposite* signal appears, the EA **closes** the current position and steps aside — it does not immediately reverse. A new entry can occur on a later bar once regime, direction, and breakout realign.

Risk Model — Stop & Target

Stop distance is a multiple of the Average True Range (ATR); the take-profit is a reward:risk multiple of that same distance:

```
risk = AtrStopMult × ATR(AtrPeriod)
```

```
Long:   SL = entry - risk      TP = entry + RewardRatio × risk
Short:  SL = entry + risk      TP = entry - RewardRatio × risk
```

Worked example (long)

Suppose ATR = 0.00120, `AtrStopMult` = 2.0, `RewardRatio` = 1.8, and the Ask at entry is 1.10000.

$\text{risk} = 2.0 \times 0.00120 = 0.00240$ (24 pips).

Stop Loss = $1.10000 - 0.00240 =$

1.09760

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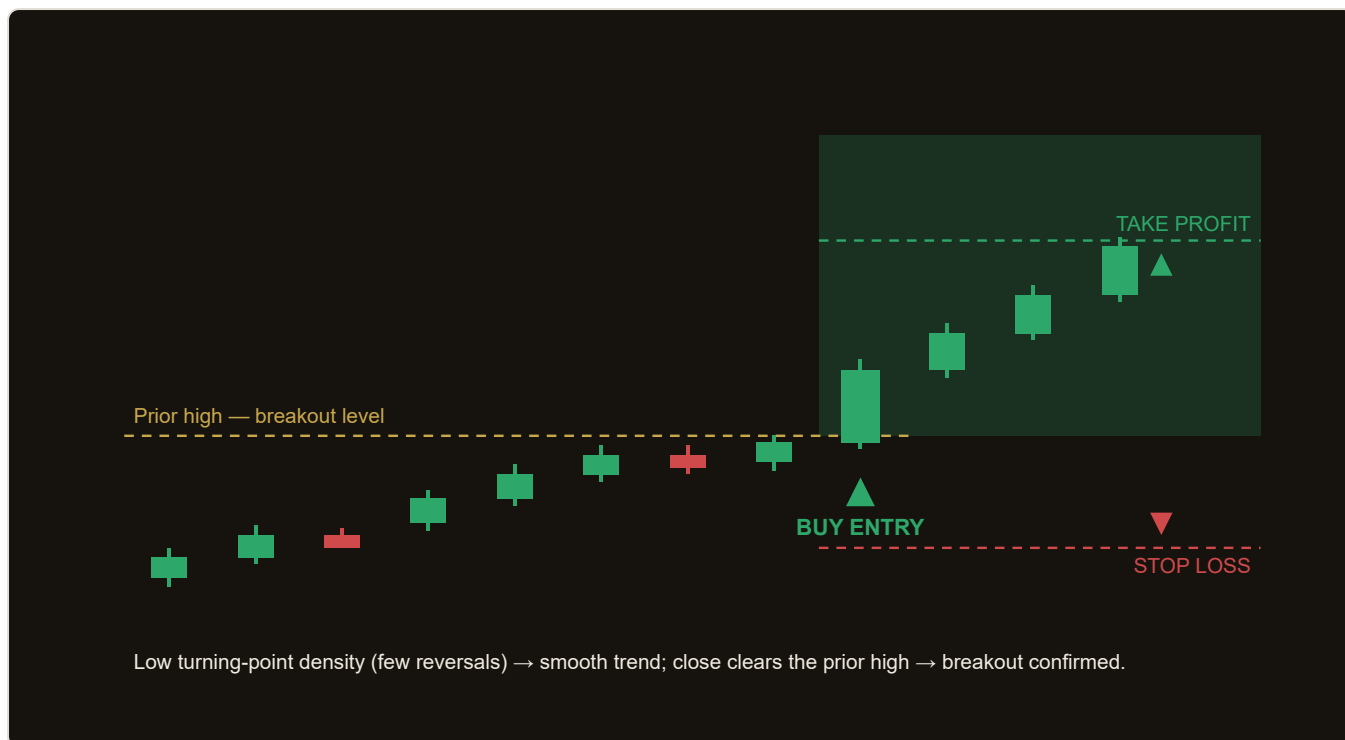
Take Profit = $1.10000 + 1.8 \times 0.00240 = 1.10000 + 0.00432 =$

1.10432

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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
Window	22	Number of completed closes over which the turning-point density is measured. Range 10–60, step 2. Larger = smoother, slower regime read.
MaxDensity	0.45	Trending regime when $\text{density} \leq \text{MaxDensity}$. Range 0.25–0.62, step 0.02. The random-walk baseline is ≈ 0.667 , so values below it demand a genuinely smooth (low-reversal) tape.
BreakoutBars	10	Breakout lookback: the number of prior bars whose highest high / lowest low the trigger bar must clear. Range 4–30, step 1.
AtrPeriod	14	ATR period used for stop sizing. Range 7–30, step 1.
AtrStopMult	2.0	Stop distance expressed as this many ATR. Range 1.0–4.0, step 0.5.
RewardRatio	1.8	Take-profit as a reward:risk multiple of the stop distance. Range 1.0–3.0, step 0.2.
Lots	0.10	Fixed order volume in lots. Range 0.01–1.0, step 0.05.
Magic	4412	Magic number identifying positions opened and managed by this EA on the chart symbol.

Recommended Settings

The defaults are a balanced starting point for liquid FX majors on an intraday timeframe. Treat every value as a starting hypothesis and confirm on your own broker feed with the Strategy Tester before going live.

- **Symbols:** liquid FX majors (e.g. EUR/USD, GBP/USD, USD/JPY) where clean directional runs occur and spreads are tight.
- **Timeframe:** H1 works well with the default `Window = 22`; the strategy runs on a single timeframe (the chart it is attached to).
- **Regime tightness:** lower `MaxDensity` (e.g. 0.35–0.40) trades less often but demands a smoother tape; raise it toward 0.55 for more, noisier signals.
- **Breakout sensitivity:** smaller `BreakoutBars` reacts faster (more, earlier signals); larger values require clearing a more significant swing.
- **Risk:** keep `Lots` aligned with your account size and risk tolerance. The default 0.10 lots is illustrative, not a recommendation.

Tuning tip: `Window` and `MaxDensity` work as a pair. A short window makes density noisier bar-to-bar, so pair a shorter `Window` with a slightly more permissive `MaxDensity`, and a longer `Window` with a tighter one.

Optimization caution: tightening `MaxDensity` and widening `BreakoutBars` can produce very few trades over a backtest window. A curve that looks clean on a handful of trades is not statistically meaningful — validate across multiple symbols and out-of-sample periods before trusting any parameter set.

How to Install on MetaTrader 5

- 1 Copy `TurningPointDensityBreakout.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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