

Hjorth Mobility Trend Shift

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Trend Following · Regime-Gated	H1 / H4 (timeframe-adaptive)	www.algoBot.live

⚠ Important Disclaimer This document is for educational and informational purposes only. It does not constitute financial or investment advice. Trading forex, CFDs, and other leveraged instruments involves substantial risk of loss and is not suitable for all investors. Past backtest performance does not guarantee future results. Never trade with capital you cannot afford to lose.

Overview

Hjorth Mobility Trend Shift is a regime-gated trend-following Expert Advisor built on the **Hjorth descriptors** — a trio of signal-processing statistics (Activity, Mobility, Complexity) originally developed for EEG and time-series analysis. Rather than looking at price levels directly, the EA measures the *shape* of the price signal purely from the variance of the closes and their successive differences. Because those quantities are built from ratios of variances, they are completely **scale-invariant**: the same thresholds behave consistently across any symbol or timeframe.

Two of the three descriptors drive the logic:

- **Mobility** — $\sqrt{\text{var}(\text{dx}) / \text{var}(\text{x})}$, proportional to the signal's **dominant frequency**. *Low* Mobility means a slow, smoothly-evolving signal — a directional trend with few sign changes per bar. *High* Mobility means a fast-oscillating, choppy, mean-reverting market.
- **Complexity** — $\sqrt{\text{var}(\text{ddx}) / \text{var}(\text{dx})} / \text{Mobility}$, proportional to the signal's **bandwidth**. *Low* Complexity means the move is close to a single clean frequency — a tidy, high-conviction impulse leg rather than broadband noise.

A “**clean trend regime**” is defined as $\text{Mobility} \leq \text{MaxMobility}$ and $\text{Complexity} \leq \text{MaxComplexity}$. The EA does not chase established trends — it captures the **transition** into that regime: a fresh cross from noisy to

clean, taken in the direction of the prevailing drift measured by the slope of an EMA. That transition tends to mark the birth of a fresh directional leg emerging out of congestion.

Why this is different. Most trend filters react to price moves after they have already stretched. The Hjorth lens reacts to a change in the *character* of the signal — from broadband chop to a narrowband, low-frequency wave — which often precedes the visible expansion of a new leg.

How It Works

1. Building the Hjorth window

On each newly completed bar, the EA appends the just-closed bar's close to a rolling buffer. Once at least `Window + 1` closes are available, it computes the Hjorth descriptors over the newest `Window` closes:

```
dx  = first differences  of the closes
ddx = second differences of the closes

Mobility  = sqrt( var(dx) / var(x) )
Complexity = sqrt( var(ddx) / var(dx) ) / Mobility
```

All variances use the population form (divide by N). If any variance collapses to zero (a flat window), the bar is skipped.

2. The regime gate

The current bar is flagged **clean** when both bounds hold:

```
cleanNow = (Mobility ≤ MaxMobility) AND (Complexity ≤ MaxComplexity)
```

The EA remembers whether the *previous* completed bar was clean. A **fresh transition** occurs when the market was noisy last bar and turns clean this bar:

```
freshClean = cleanNow AND NOT prevClean
```

3. Direction from EMA drift

Direction is read from an exponential moving average of `EmaPeriod`. The EA compares the EMA now versus one bar ago (its slope) and the close's position relative to it:

- **Trend up** — close is above the EMA *and* the EMA is rising.
- **Trend down** — close is below the EMA *and* the EMA is falling.

4. Entry logic

The system is fully symmetric. On a fresh clean transition:

- **LONG** — regime just turned clean this bar and the close sits above a *rising* EMA.
- **SHORT** — regime just turned clean this bar and the close sits below a *falling* EMA.

If the regime turns clean but the EMA drift is flat or conflicting, no trade is taken. Only one position per Magic number is held at any time — the EA never stacks entries.

5. Exit logic & risk

Every trade is protected by an ATR-based bracket sized on the ATR at entry:

- **Stop loss** = entry $-/+$ $\text{AtrStopMult} \times \text{ATR}$
- **Take profit** = entry $+/-$ $\text{AtrTargetMult} \times \text{ATR}$

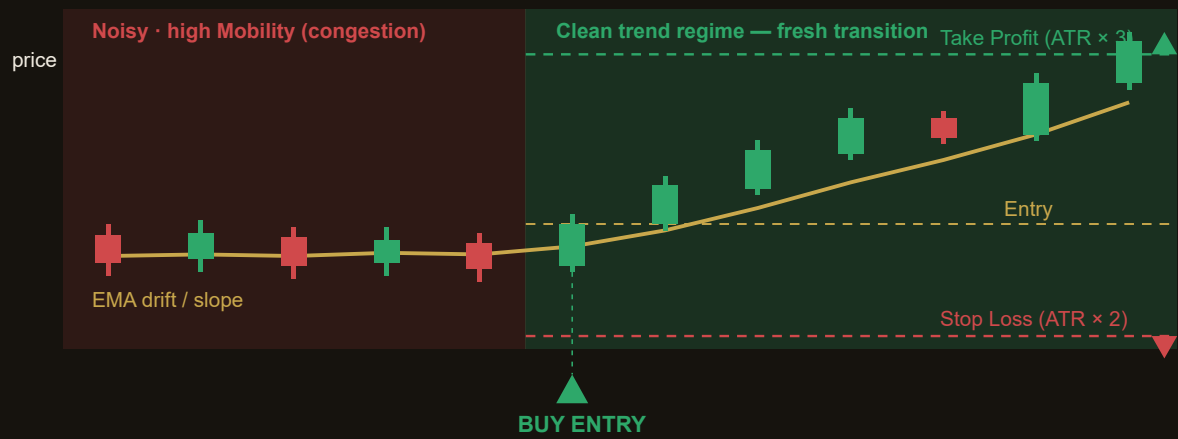
In addition to the passive stop/target, the EA applies an **early regime-failure exit**. While a position is open, if Mobility blows back out past $\text{MaxMobility} \times \text{ExitMobilityMult}$, the clean signal has degraded back into noise — the leg is judged over and the position is closed immediately, before the stop is reached.

Worked example (long)

On EUR/USD H1, several hours of overlapping candles keep Mobility around 0.80 (noisy). A fresh impulse compresses the oscillation: Mobility drops to 0.42 and Complexity to 1.25 — both under the 0.50 / 1.40 bounds, so the bar turns clean. The close is above a rising 21-EMA, so the EA buys. With ATR = 12 pips, the stop is placed 24 pips below entry ($2.0\times$) and the target 36 pips above ($3.0\times$). If Mobility later spikes back above 0.80 (0.50×1.60), the position is closed early rather than waiting for the stop.

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. Long setup: congestion (high Mobility) resolves into a fresh clean, low-frequency leg; the EA enters with the rising EMA and brackets the trade with ATR stop/target.

Parameters

Parameter	Default	Description
Window	40	Rolling window (bars) over which the Hjorth descriptors are computed. Range 20–90, step 5. Larger windows smooth the descriptors and slow the regime response.
EmaPeriod	21	EMA length used to read the drift direction and slope. Range 8–60, step 1.
MaxMobility	0.50	Upper Mobility bound. Below it the signal is slow enough to be a trend. Range 0.10–1.50, step 0.05. Lower = stricter (fewer, cleaner trends).
MaxComplexity	1.40	Upper Complexity bound. Below it the leg is a clean single-frequency move. Range 1.00–3.00, step 0.05.
ExitMobilityMult	1.60	Early-exit multiple. The position is closed when Mobility rises above <code>MaxMobility × this</code> (the regime broke back into noise). Range 1.10–3.00, step 0.10.
AtrPeriod	14	ATR period used to size the stop and target. Range 7–40, step 1.
AtrStopMult	2.0	ATR multiple for the stop-loss distance. Range 1.0–5.0, step 0.25.
AtrTargetMult	3.0	ATR multiple for the take-profit distance. Range 1.0–8.0, step 0.25.
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. One position per Magic is held at a time.

Recommended Settings

The Hjorth descriptors are scale-invariant, so the defaults are a sensible starting point on most symbols and timeframes. The EA reads its timeframe from the chart it is attached to — nothing is hardcoded.

- **Symbols:** Major FX pairs (EUR/USD, GBP/USD, USD/JPY) and liquid indices, where trend legs emerge cleanly out of congestion.
- **Timeframe:** H1 or H4 give a good balance between signal count and noise. Lower timeframes fire more often but include more false transitions.
- **Regime bounds:** Tighten `MaxMobility` toward 0.40 for fewer, higher-conviction entries; loosen toward 0.60–0.70 for more frequent trading.

- **Risk:** The default 2.0 / 3.0 ATR stop/target gives a 1.5R reward-to-risk profile. Keep `ExitMobilityMult` around 1.5–1.8 so genuine trends are given room while broken regimes are cut early.

Tip. Because the descriptors are dimensionless, the same `MaxMobility` / `MaxComplexity` thresholds transfer well when you switch symbols or timeframes — re-optimize the ATR multiples and EMA period rather than the regime bounds first.

How to Install on MetaTrader 5

- 1 Copy `HjorthMobilityTrendShift.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

Note. The EA acts once per completed bar. Allow it to run through at least `Window + 1` bars after attaching before it can produce its first signal, so that the Hjorth window and EMA-slope read are fully populated.

Risk Warning

Trading foreign exchange, CFDs, and other leveraged financial instruments involves substantial risk of loss and is not suitable for all investors. The strategies and tools described in this document are provided for **educational purposes only** and do not constitute financial advice, investment recommendations, or solicitation to trade. Always consult a qualified financial adviser before making trading decisions. Past backtest performance is not indicative of future results.