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Symbolic Entropy Regime Trend

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Regime-Filtered Trend	H1 (recommended)	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

Symbolic Entropy Regime Trend is an original, first-principles Expert Advisor that treats the traded instrument as a *stochastic source* which emits exactly one *symbol* per bar. Each symbol encodes both the sign and the magnitude of that bar's volatility-normalized log return. By measuring the informational structure of the recent stream of symbols, the EA decides whether the market is **ordered** (momentum persists) or **disordered** (moves are effectively random).

The core idea is drawn from information theory. When recent returns cluster into a few buckets and lean in one direction, the symbol stream carries **low entropy** — a coherent, one-sided rhythm the EA is willing to trade. When returns spread evenly across all buckets, the stream carries **high entropy** — noise — and the EA stands aside. A separate *drift* measure supplies direction, so the strategy only enters when the market is both ordered *and* moving, and it exits the moment that order dissolves.

The strategy is entirely self-contained: it uses **no chart indicators, no support/resistance levels, no chart patterns, and no published methodology** (it does not rely on SMC, ICT, Wyckoff, or similar frameworks). Volatility normalization and ATR-based sizing let the same logic adapt across instruments and market conditions without re-tuning.

> **In one sentence:** the EA quantifies how "random" recent price action is using Shannon entropy over a four-symbol alphabet, and trades with the prevailing drift only while that randomness is low.

How It Works

1. From prices to symbols

On each completed bar the EA computes a rolling window of **volatility-normalized log returns**:

```
r_i = ln( C_i / C_{i-1} )                 (log return of each bar)
σ   = std( r )  over the Window          (rolling volatility)
z_i = r_i / σ                             (self-scaling, unit-free return)
```

Each normalized return `z_i` is mapped to one of **four symbols** by its sign and magnitude, using `StrongMoveThreshold` (τ) as the boundary between mild and strong moves:

- **Symbol 3 — strong up:** `z ≥ +τ`
- **Symbol 2 — mild up:** `0 ≤ z < +τ`
- **Symbol 1 — mild down:** `-τ < z < 0`
- **Symbol 0 — strong down:** `z ≤ -τ`

2. Measuring order with entropy

The EA counts how often each symbol appears in the window, forms a probability `p_s` for each, and computes the **Shannon entropy** of the distribution:

```
H = - ∑ p_s · log2( p_s )          (bits, over the 4-symbol alphabet)
O = 1 - H / log2(4)  =  1 - H / 2      (Order index, in [0, 1])
```

An **Order index O near 1** means the symbols are concentrated in a few buckets — a low-entropy, structured regime. An **O near 0** means the symbols are spread evenly — maximum entropy, pure noise. The EA only considers trading when `O ≥ OrderThreshold`.

3. Measuring direction with drift

Because a distribution's entropy is *order-blind* (it cannot tell "up" from "down"), the EA adds a directional measure — the mean normalized return, or **drift**:

```
D = mean( z_i )                          (net direction of the window)
```

Drift rejects the "ordered-but-alternating" chop, which can show a high Order index yet a drift near zero. A trade only fires when `|D|` exceeds `DriftMin`, and its side follows the sign of `D`.

4. Entry logic

- **Long:** `O ≥ OrderThreshold` *and* `D > +DriftMin`
- **Short:** `O ≥ OrderThreshold` *and* `D < -DriftMin`

The EA evaluates once per completed bar and never stacks entries — at most one position is open per symbol and magic number at a time.

5. Exit logic & risk control

Every trade carries a hard **ATR-based stop and target**, computed from a manual mean-true-range so the strategy stays independent of platform indicator handles:

```
ATR      = mean true range over AtrPeriod bars
Stop     = StopAtrMult × ATR   (away from entry)
Target   = TpAtrMult   × ATR   (toward the trade)
```

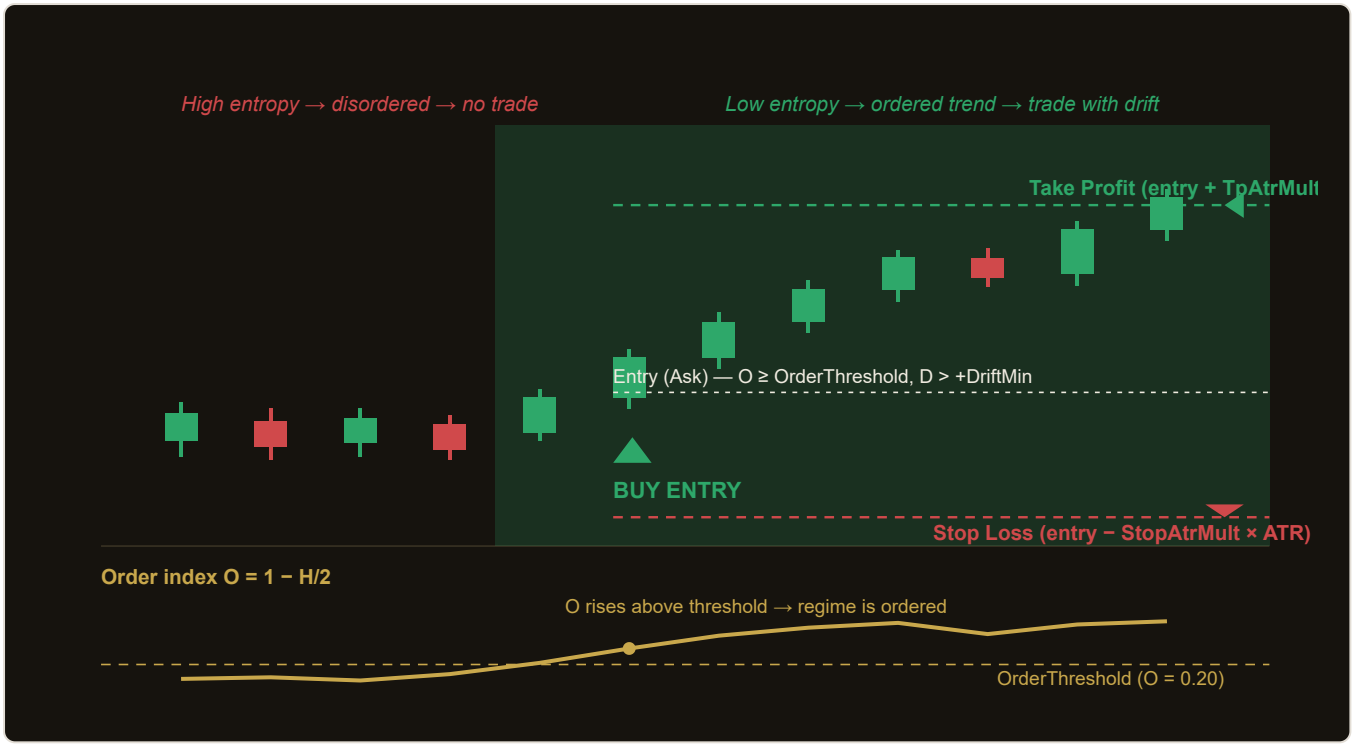
In addition to the fixed stop/target, the EA applies a **regime-dissolution exit**: if the Order index collapses below `ExitOrderThreshold` while a position is open, the trade is flattened immediately — the structure that justified the trade is gone, so the EA does not wait for the stop.

Worked example (long)

Over the last 40 bars, returns cluster tightly into the two "up" symbols. Entropy is low, so the Order index reads `O = 0.34` (above the 0.20 threshold), and drift is clearly positive at `D = +0.12` (above `DriftMin = 0.05`). The EA buys at the Ask, sets the stop 2×ATR below and the target 3×ATR above. If price reaches the target, the trade closes in profit; if the market turns choppy and `O` falls below 0.10 first, the regime-dissolution exit closes the position early.

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	`40`	Number of bars in the symbol-source window used to compute returns, entropy and drift. Range 20–120, step 5.
StrongMoveThreshold	`1.0`	The τ boundary (in normalized-return units) separating a “mild” move from a “strong” move when symbolizing each bar. Range 0.5–2.0, step 0.1.
OrderThreshold	`0.20`	Minimum Order index O required to open a trade. Higher values demand a more strongly ordered regime. Range 0.05–0.50, step 0.05.
DriftMin	`0.05`	Minimum absolute drift |D| required to enter, ensuring the ordered regime is also directional. Range 0.0–0.40, step 0.05.
ExitOrderThreshold	`0.10`	If the Order index falls below this while a position is open, the trade is flattened (regime-dissolution exit). Range 0.0–0.40, step 0.05.
AtrPeriod	`14`	Number of bars in the manual mean-true-range (ATR) used for stop and target distances. Range 5–40, step 1.
StopAtrMult	`2.0`	Stop-loss distance as a multiple of ATR. Range 0.5–5.0, step 0.5.
TpAtrMult	`3.0`	Take-profit distance as a multiple of ATR. Range 1.0–8.0, step 0.5.
Lots	`0.10`	Fixed trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	`20260710`	Magic number used to identify and manage this EA's positions independently of other trades.

> **Tuning tip:** `OrderThreshold` and `DriftMin` are the two dials that control trade frequency. Raising either makes the EA more selective (fewer, cleaner-looking regimes); lowering them takes more trades but admits more noise. Keep `ExitOrderThreshold` below `OrderThreshold` so the exit gate is looser than the entry gate.

Recommended Settings

The EA is deliberately self-scaling — volatility normalization and ATR sizing let the same defaults work across many instruments. As a starting point:

- **Timeframe:** H1 is a balanced default. Lower timeframes (M15–M30) increase trade frequency and noise; higher timeframes (H4) produce fewer, slower regimes.

- **Instruments:** liquid, trending-prone markets such as major FX pairs and index CFDs suit the drift-plus-order logic best. Very thin or heavily ranging instruments will spend most of their time above `ExitOrderThreshold` rarely.
- **Window:** keep near the default 40 on H1. Shorten it for faster regime detection on lower timeframes; lengthen it for smoother, slower signals.
- **Risk:** the default 2×ATR stop / 3×ATR target gives a 1.5:1 reward-to-risk on each closed trade. Adjust `Lots` so a single stop-out risks only a small, fixed fraction of account equity.

> **Always validate first.** Run the EA in the MT5 Strategy Tester and on a demo account across your chosen symbol and timeframe before considering any live use. Defaults are a starting point, not an optimized configuration.

How to Install on MetaTrader 5

1. Copy `SymbolicEntropyRegimeTrend.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 evaluates once per completed bar, so signals are confirmed on bar close rather than mid-bar. Leave the chart and terminal running for the EA to act on each new bar.

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.