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# Settlement Barycenter Drift

Expert Advisor Documentation

| PLATFORM | TYPE | TIMEFRAME | WEBSITE |
|---|---|---|---|
| MetaTrader 5 (MT5) | Adaptive Momentum | Any (chart TF) · H1 suggested | 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

**Settlement Barycenter Drift** is an original, first-principles Expert Advisor derived entirely from raw OHLC geometry. It uses no classical indicator, no chart pattern, no support/resistance, and no published methodology. Instead it is built from a single hypothesis: *every finished bar is the record of an auction, and the bar's own shape encodes who won it.*

The EA measures two dimensionless, volatility-invariant facts about each completed candle, then averages them into a per-bar *conviction* score. That conviction is accumulated through a leaky memory integrator to produce the **settlement barycenter drift** — a running centre of directional control. Because the raw drift is regime-dependent, the system standardises it into a rolling *z-score*, so a trade is triggered only when control becomes statistically extreme *for this market right now*, not merely non-zero.

The result is a self-adapting momentum model: in calm regimes a small drift qualifies as significant, while in violent regimes it demands more. Positions are protected with ATR-based stops and targets, and are also exited natively the moment control changes hands.

> **In one sentence:** the EA reads how each candle was "driven and held", integrates that conviction over time, and goes long or short only when the accumulated control becomes an unusually extreme reading relative to the market's own recent behaviour.

## How It Works

### 1. Per-bar conviction from pure geometry

For each just-completed bar, with range `R = High − Low`, the EA computes two range-normalised quantities, each bounded in `[−1, +1]`:

- **Traverse (δ)** — `δ = (Close − Open) / R`. The signed fraction of the range that net flow carried price from open to close. This is *effort that produced result*.
- **Settlement (β)** — `β = (2·Close − High − Low) / R`. Where price finally came to rest inside the range. `+1` = closed at the high (buyers held the top), `−1` = closed at the low.

Neither alone is trustworthy: a bar can traverse up yet settle weak (a rejected push), or settle high yet barely traverse (indecision). Genuine conviction requires **both** — price was driven *and* held — so the two are averaged:

```
kappa (κ) = 0.5·δ + 0.5·β        // per-bar conviction, in [-1, +1]
```

A degenerate/flat bar ( `R ≤ 0` ) carries no directional information, so its conviction is set to zero.

### 2. The leaky drift integrator

Conviction has inertia — whoever controlled the close tends to control the next few opens — so the EA integrates κ with memory using an exponential leaky accumulator (built from scratch, not an EMA of price):

```
D_t = lambda·D_{t-1} + (1 - lambda)·kappa_t
lambda = P / (P + 1)        // P = DriftMemory
```

`D_t` is the **settlement barycenter drift**: the running centre of directional control. A larger `DriftMemory (P)` means longer memory, smoother and slower drift.

### 3. Self-adapting standardisation

The raw magnitude of `D_t` depends on the regime, so the drift is standardised against its own recent distribution over the last `N` bars ( `StandardizeWindow` ):

```
z_t = (D_t - mean_N(D)) / stdev_N(D)
```

In calm regimes the standard deviation shrinks, so smaller absolute drifts qualify; in violent regimes it grows and demands more. The logic tunes itself to current conditions.

### 4. Entry rules (symmetric long / short)

The EA is cross-triggered — it enters on the *transition* past the threshold, not on every extended bar:

- **LONG** — the z-score crosses *up* through `+θ` (`TriggerZ`) while `D_t > 0`. Buyers' control has become dominant beyond normal variation.
- **SHORT** — the z-score crosses *down* through `−θ` while `D_t < 0`.

Only **one position per magic number** is allowed — the EA never stacks trades. Sizing is fixed-lot.

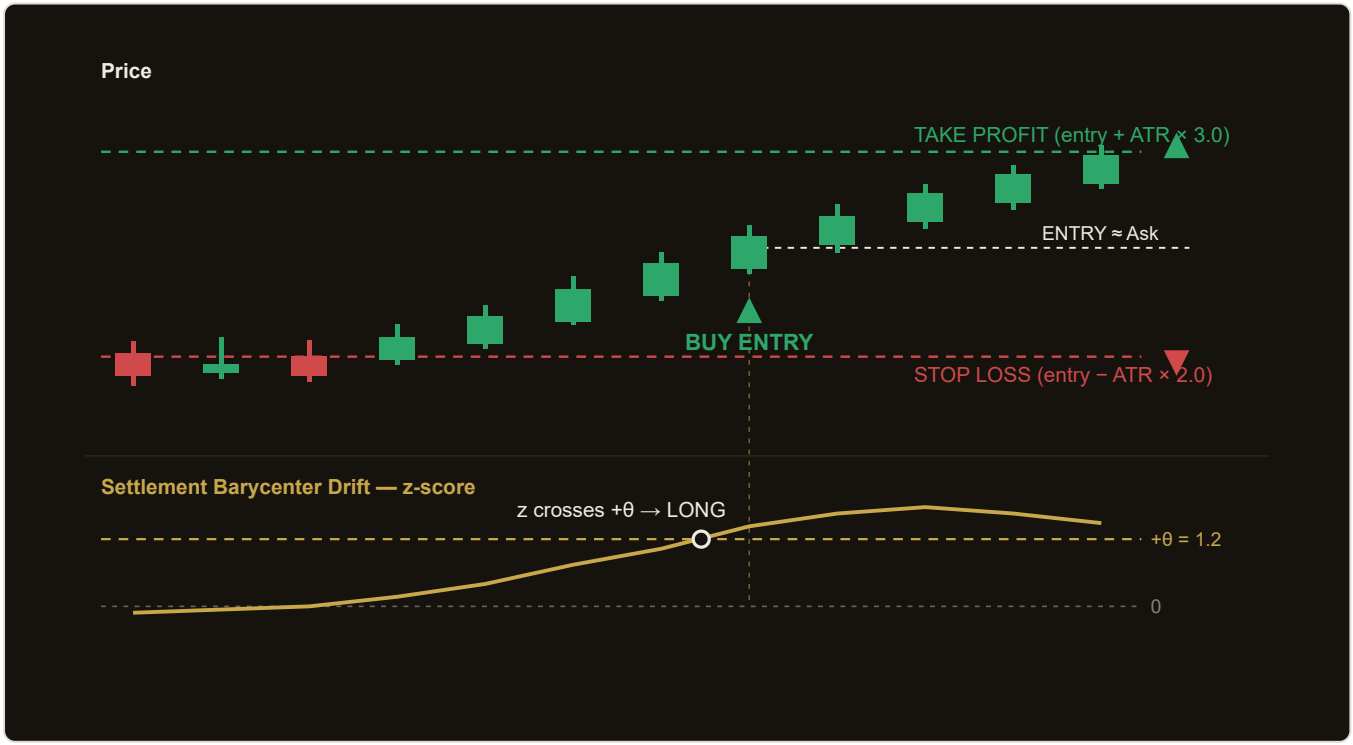
### 5. Exit rules & dynamic risk

- **ATR stop-loss** — placed at `entry ∓ AtrSlMult · ATR`.
- **ATR take-profit** — placed at `entry ± AtrTpMult · ATR`.
- **Control-flip exit** — a model-native exit: the moment `D_t` crosses back through zero *against* the open position, the barycenter of control has changed hands, the thesis is void, and the trade is closed immediately regardless of price. This adapts to structure rather than a fixed level.

> **Single-timeframe design:** every bar reference uses the primary/chart timeframe, so the strategy runs on whatever timeframe you attach it to at test or trade time.

## 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.*

In the illustration, choppy early bars keep the drift z-score near zero. As successive candles are both *driven up and held near their highs*, per-bar conviction stays positive and the leaky integrator accumulates control. The z-score rises and finally **crosses up through the +θ threshold** while the drift is positive — triggering a long entry. A stop-loss is set at `ATR × 2.0` below entry and a take-profit at `ATR × 3.0` above; the rally continues and the target is reached.

## Parameters

| Parameter | Default | Description |
|---|---|---|
| **DriftMemory** | `10` | Memory `P` of the leaky conviction integrator ( `λ = P/(P+1)` ). Larger values mean longer memory — smoother, slower drift. Range 3–40, step 1. |
| **StandardizeWindow** | `60` | Rolling window `N` of drift values used to compute the z-score mean and standard deviation. Range 20–200, step 10. |
| **TriggerZ** | `1.2` | The z-score threshold `θ` — how statistically extreme control must be before a trade is taken. Higher = more selective. Range 0.5–3.0, step 0.1. |
| **AtrPeriod** | `14` | ATR length used to size the stop-loss and take-profit distances. Range 7–30, step 1. |
| **AtrSlMult** | `2.0` | Stop-loss distance multiplier: `SL = entry ∓ AtrSlMult · ATR` . Range 0.5–5.0, step 0.25. |
| **AtrTpMult** | `3.0` | Take-profit distance multiplier: `TP = entry ± AtrTpMult · ATR` . Range 0.5–8.0, step 0.25. |
| **Lots** | `0.10` | Fixed lot size per trade. Range 0.01–1.0, step 0.05. |
| **Magic** | `5137` | Magic number identifying this EA's positions. Used to enforce one position per magic and to isolate the EA from other trades. |

## Recommended Settings

The strategy is intentionally self-adapting, so the defaults are a sound starting point across many symbols and timeframes. Because it standardises the drift against the market's own recent behaviour, it does not require heavy re-tuning when switching instruments.

### TIMEFRAME & SYMBOL

- **Timeframe:** works on any chart timeframe; **H1** is a balanced starting point. Lower timeframes react faster but are noisier; higher timeframes are smoother but signal less often.
- **Symbol:** best suited to instruments with clean, continuous auctions and reasonable trending behaviour (major FX pairs, indices). Always confirm on your broker's data via the Strategy Tester first.

### TUNING NOTES

- **DriftMemory:** raise it for smoother, slower signals in noisy markets; lower it for quicker response in cleaner trends.
- **StandardizeWindow:** a longer window makes the z-score reflect a broader regime and produces fewer, more considered signals.
- **TriggerZ:** the primary selectivity dial. Raise it to demand more extreme conviction (fewer, higher-quality entries); lower it to trade more often.
- **AtrSlMult / AtrTpMult:** the defaults give a 1 : 1.5 risk-to-reward. Keep `AtrTpMult > AtrSlMult` to preserve a favourable payoff profile, and note that the control-flip exit may close trades before either level is touched.

> **Tip:** optimise `TriggerZ` and `DriftMemory` together first — they jointly control how often and how confidently the EA acts. Only then fine-tune the ATR multipliers to fit the instrument's volatility.

**Example — conservative H1 configuration**

`DriftMemory = 14`, `StandardizeWindow = 80`, `TriggerZ = 1.6`, `AtrPeriod = 14`, `AtrSlMult = 2.0`, `AtrTpMult = 3.5`, `Lots = 0.10`. Longer memory and a higher trigger reduce trade frequency and favour only strongly-confirmed directional control.

## How to Install on MetaTrader 5

1. Copy `SettlementBarycenterDrift.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

**Before going live:** always run `SettlementBarycenterDrift.ex5` in the MT5 Strategy Tester on your broker's historical data, then forward-test on a demo account. Verify that spread, commission, and swap on your account are accounted for in your expectations.

## Risk Warning

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