

Directional Persistence Regime Switch

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Adaptive Regime Switch (Trend / Reversion)

TIMEFRAME

H1 (single timeframe)

WEBSITE

www.algotbot.live

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Overview

Directional Persistence Regime Switch is an original system built from first principles on the *sign process* of raw close-to-close returns — no classic indicator, chart pattern, or support/resistance level sits underneath it. Instead of asking "what is the price doing?", it asks a simpler question one bar at a time: "did the market push up, push down, or stand still?"

Reducing the tape to that stream of directional decisions exposes a subtle property of real markets: the **memory of direction is itself time-varying**. Sometimes a push tends to be followed by another push (trend persistence); at other times a push tends to be answered by a reversal (mean reversion). No fixed rule — always-trend or always-revert — survives both conditions. The edge here is to continuously **measure which memory is currently active** and let that measurement pick the trading mode.

The strategy condenses that measurement into a single scale-free number, the lag-1 sign autocorrelation ρ , and switches between a trend engine and a mean-reversion engine accordingly. Risk is fully volatility-adaptive: stops and targets are sized in ATR multiples, and the reward target changes with the regime — wider when riding persistence, tighter when fading a snapback.

How It Works

1. The sign process

Every closed bar is reduced to a single directional decision:

$$s_t = \text{sign}(\text{Close}_t - \text{Close}_{\{t-1\}}) \in \{ -1, 0, +1 \}$$

A rising close is **+1**, a falling close is **-1**, and an unchanged close is **0**. Flat bars (**0**) are skipped without breaking the chain of non-zero signs, so a single doji does not corrupt the memory estimate.

2. The regime coordinate ρ

Over a window of the last **Lookback** returns, the EA measures how often one sign is followed by the same sign — the lag-1 sign autocorrelation:

$$\rho = (1 / K) \cdot \sum s_i \cdot s_{\{i-1\}} \quad (K = \text{number of non-zero pairs})$$

Because each product $s_i \cdot s_{\{i-1\}}$ is exactly **+1** (continuation) or **-1** (reversal), this simplifies to a clean, unit-free coordinate bounded in **[-1, +1]**:

$$\rho = P(\text{continue}) - P(\text{reverse}) = 2 \cdot P(\text{continue}) - 1$$

Reading ρ . A value near **+1** means pushes almost always continue (strong trend memory). A value near **-1** means pushes are almost always reversed (strong mean-reversion memory). A value near **0** means the signs behave like independent coin flips — an efficient, memoryless tape with no exploitable structure.

3. The regime switch

The single threshold **RegimeThreshold** (θ) carves ρ into three states that select the mode:

Regime	Condition	Action
Persistence (trend)	$\rho \geq +\theta$	Trade with the latest bar — long if it closed up, short if it closed down. Target = RewardTrend × ATR.
Anti-persistence (reversion)	$\rho \leq -\theta$	Trade against the latest bar — long if it closed down, short if it closed up. Target = RewardReversion × ATR.
Memoryless	$ \rho < \theta$	No structure — stand aside , no trade.

Example — computing p

Suppose that over the last 40 returns the EA finds 33 non-zero consecutive pairs, and 26 of them continue in the same direction. Then $P(\text{continue}) = 26 / 33 \approx 0.79$, so $p = 2 \times 0.79 - 1 = +0.58$. With

$\text{RegimeThreshold} = 0.20$, that $+0.58 \geq +0.20$ places the market firmly in the *persistence* regime, and the EA prepares to trade with the direction of the most recent decisive bar.

4. The noise gate

A regime signal alone is not enough — the triggering bar must also be *decisive*. The just-closed bar's move must clear a fraction of current volatility:

$$|\text{Close}_t - \text{Close}_{\{t-1\}}| \geq \text{TriggerAtrFraction} \times \text{ATR}$$

This magnitude gate keeps the EA out of low-conviction chop: if the latest bar barely moved (or closed flat), the setup is discarded even when p is strong.

5. Entry, stop and adaptive target

When a regime is active, the trigger bar is decisive, and no position is already open for this magic, the EA places a single market order:

- **Direction** — dictated by the regime table above (ride the push in a trend; fade it in a reversion).
- **Stop loss** — always ATR-based: $\text{StopAtrMult} \times \text{ATR}$ away from entry, on the protective side.
- **Take profit** — regime-adaptive. Trend trades ride a wider $\text{RewardTrend} \times \text{ATR}$ because persistence extends; fade trades bank a tighter $\text{RewardReversion} \times \text{ATR}$ because snapbacks are fast.

Each order is tagged by regime and direction — `persist-long`, `persist-short`, `revert-long`, or `revert-short` — for clear trade-by-trade attribution in the journal.

6. Position management

The EA evaluates **once per newly-closed bar** (the forming bar is ignored; only completed bars feed the model). It holds **one position per magic number** at a time — a new signal is never taken while a trade is open — and operates on a **single timeframe**: every bar read uses the chart's own period.

Strategy in Action

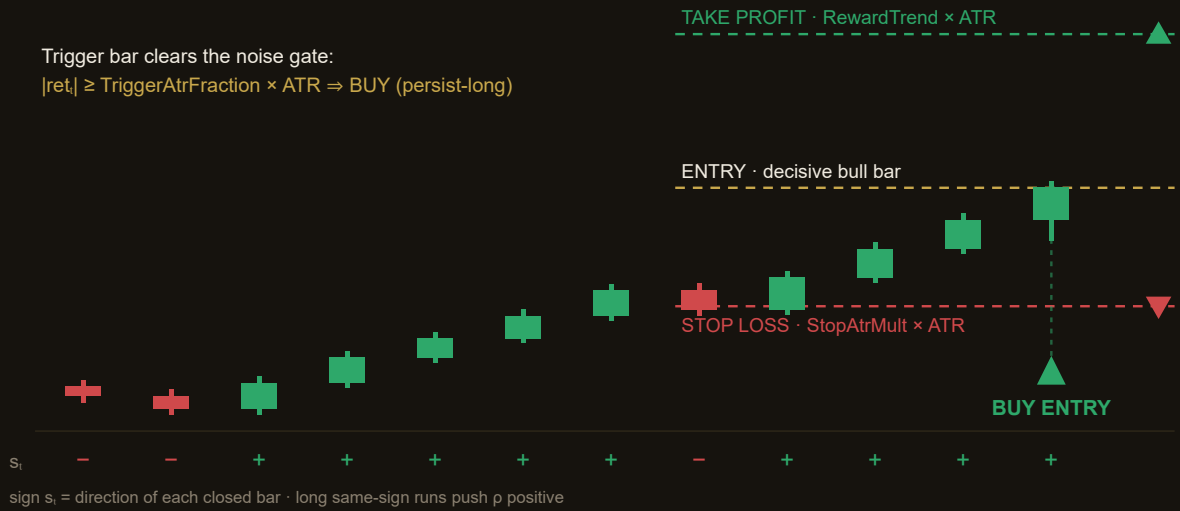
The illustration below shows an example of how the strategy identifies a setup and triggers its entry and exit. This is a simplified, illustrative example for educational purposes — not real market data.

Persistence regime · $\rho \approx +0.45 \geq \text{RegimeThreshold}$

Consecutive same-sign pushes \Rightarrow positive directional memory.
The market keeps trending, so the EA trades WITH the last bar.

Trigger bar clears the noise gate:

$|\text{ret}| \geq \text{TriggerAtrFraction} \times \text{ATR} \Rightarrow \text{BUY (persist-long)}$



Illustrative example only. Actual market behaviour varies.

Parameters

Parameter	Default	Description
Lookback	40	Window, in returns, used to estimate the sign-autocorrelation ρ . Larger values give a smoother, slower regime read. Range 15–120, step 5.
RegimeThreshold	0.20	The $ \rho $ gate — how decisive the directional memory must be before the EA acts. Below it the tape is treated as memoryless and no trade is taken. Range 0.05–0.60, step 0.05.
TriggerAtrFraction	0.50	The just-closed bar must move at least this fraction of ATR to count as a decisive trigger. Filters out low-conviction noise. Range 0.10–1.50, step 0.10.
AtrPeriod	14	Period of the ATR used for the noise gate, the stop, and target sizing. Range 7–40, step 1.
StopAtrMult	1.50	Stop-loss distance as a multiple of ATR. Range 0.50–4.00, step 0.25.
RewardTrend	3.00	Take-profit multiple (\times ATR) used in the persistence / trend regime — lets winners run. Range 1.00–6.00, step 0.50.
RewardReversion	1.50	Take-profit multiple (\times ATR) used in the anti-persistence / reversion regime — banks the quick snapback. Range 0.50–3.00, step 0.25.
Lots	0.10	Fixed order volume, in lots. Range 0.01–1.00, step 0.05.
Magic	7731	Unique order identifier. Enforces one open position per magic per symbol and isolates this EA's trades from others.

Recommended Settings

The strategy is scale-free and works on any single timeframe, but it is most robust on liquid instruments where the sign process is meaningful and ATR is stable. A practical starting point:

- **Symbol:** a major FX pair (e.g. EURUSD, GBPUSD) or a liquid index CFD.
- **Timeframe:** H1 — enough bars per day for the regime estimate to update, without over-trading intrabar noise.
- **Lookback:** 40 (default). Raise toward 60–80 for a slower, more stable regime read; lower toward 20–30 for faster adaptation.
- **RegimeThreshold:** 0.20 (default). Raise it to demand stronger memory and trade less often; lower it to act on weaker structure.

- **Risk multiples:** keep `StopAtrMult` ≈ 1.5 with `RewardTrend` ≈ 3.0 and `RewardReversion` ≈ 1.5 so each regime carries a payoff geometry that matches its behaviour.

Tuning tip. The two most impactful dials are `Lookback` and `RegimeThreshold` — together they set how quickly and how confidently the EA declares a regime. Change one at a time and always re-validate on out-of-sample data before committing capital. Keep `Lots` conservative until you have confirmed behaviour on a demo account.

How to Install on MetaTrader 5

- 1 Copy `DirectionalPersistenceRegimeSwitch.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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