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Maximize Your Profits

Adaptive Serial Correlation Switch

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Adaptive Regime (Trend / Mean-Reversion)	Any (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

The **Adaptive Serial Correlation Switch** is a purely statistical Expert Advisor. It uses *no* indicators in the conventional sense, no price-action patterns, no Smart-Money / ICT concepts, no Wyckoff, and no support/resistance. Instead it treats the stream of bar-to-bar returns as a raw stochastic process and asks a single question on every closed bar:

"Is the market currently persistent (trending) or anti-persistent (mean-reverting)?"

The answer comes from the **lag-1 autocorrelation** of the most recent log returns — a scale-invariant number, called `rho` (ρ), bounded between −1 and +1. Its **sign** tells the EA which regime the market is in right now, and therefore whether to trade *with* the latest impulse or *against* it. Because ρ is re-measured every bar, the same logic trades trend-following in one regime and mean-reversion in another — the strategy self-adapts to the measured serial dependence rather than assuming a fixed directional edge.

Risk is handled with an ATR-based stop-loss and a **conviction-scaled** take-profit whose ATR multiple grows with the strength of the measured regime. If the live regime later flips to argue the opposite way while a trade is open, the position is closed immediately. The EA runs on a single primary timeframe and is suited to liquid FX pairs, metals, and crypto.

> **The core idea in one line:** measure whether recent moves tend to continue or reverse, then take the side the statistics favour — riding the impulse when the market is persistent, fading it when the market is mean-reverting.

How It Works

1. Measuring the regime — lag-1 autocorrelation (ρ)

Let the last `CorrWindow` (N) log returns be `r[t] = ln(C[t] / C[t-1])`, with mean `mu`. The Pearson lag-1 autocorrelation coefficient is:

```
rho = sum( (r[t]-mu) * (r[t-1]-mu) )  /  sum( (r[t]-mu)^2 )
```

This value is bounded in `[-1, +1]` and invariant to price scale, so it behaves the same whether the instrument trades at 1.10 or 40,000. Its sign classifies the local micro-regime against a dead-zone threshold `theta` (θ = `RegimeThreshold`):

- **ρ > +θ → PERSISTENT:** a move tends to be followed by a same-signed move. The edge is to go **with** the recent impulse (trend).
- **ρ < −θ → ANTI-PERSISTENT:** a move tends to reverse. The edge is to go **against** the recent impulse (mean reversion).
- **|ρ| ≤ θ → NOISE:** no reliable serial dependence. The EA stands aside.

2. Confirming a real move — the ATR impulse gate

The "recent impulse" is the price change over the last `ImpulseSpan` (k) bars: `Close[1] − Close[1+k]`, measured in raw price units so it is directly comparable to ATR. To count as a genuine signal rather than microstructure noise, its absolute size must clear a volatility-adaptive gate:

```
|recentMove|  >=  ImpulseAtrFrac * ATR
```

Only when a fresh, ATR-sized impulse exists does the EA consider taking a trade. The *sign* of that impulse defines the reference direction.

3. Deciding the trade direction

Combining regime and impulse gives the desired position:

- **Persistent regime + fresh impulse** → trade in the **same** direction as the impulse (ride it).
- **Anti-persistent regime + fresh impulse** → trade in the **opposite** direction to the impulse (fade it).
- Otherwise → no new trade.

4. Entry, stop-loss and conviction-scaled take-profit

When a trade is opened, orders are placed at market (Ask for longs, Bid for shorts) with:

- **Stop-loss:** `AtrSlMult × ATR` away from entry (below for longs, above for shorts).
- **Take-profit:** conviction-scaled. The base multiple `AtrTpMult` is amplified by the strength of the regime:

```
conv    = min(1.0, |rho|)
tpMult  = AtrTpMult * (1.0 + conv)
TP      = entry ± tpMult * ATR
```

The stronger the measured serial dependence, the larger the target — higher-confidence regimes aim for proportionally larger moves, while weak regimes take more modest profits.

5. Adaptive regime-flip exit

While a position is open, the EA keeps re-measuring ρ every bar. If a fresh impulse now implies a *desired* direction opposite to the position currently held, the trade is closed immediately — the market's serial dependence has flipped and the original thesis no longer holds. If no such conflict exists, the stop-loss and take-profit are left to work.

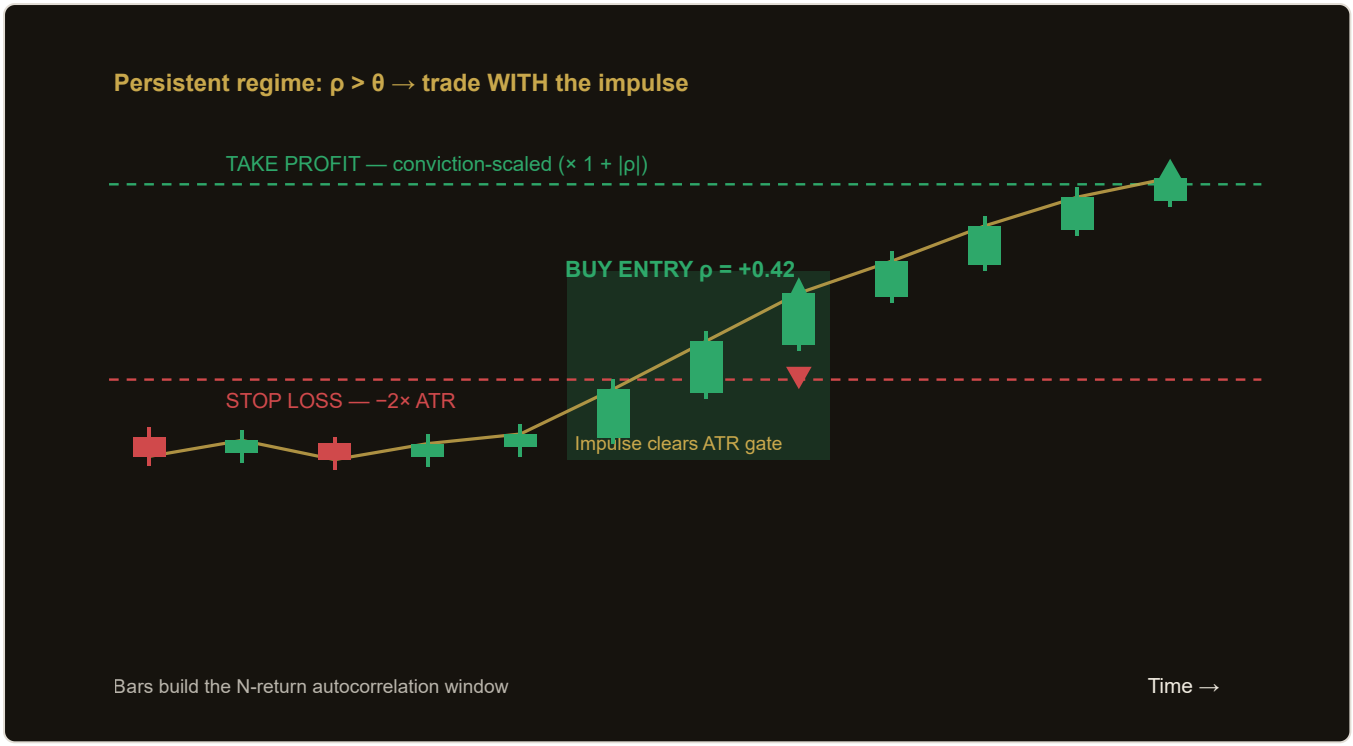
> **One position at a time.** The EA manages a single position per symbol (identified by its Magic number). It will not stack or hedge — a new entry is only considered when flat, and an open trade is either left to its SL/TP or closed on a regime flip.

Execution cadence

All logic runs **once per newly-closed bar**. The EA waits until enough history exists to fill the return window, the impulse span, and the ATR period before it evaluates any signals, so early bars after attaching are used only to build the sample.

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. It depicts a **persistent** regime (ρ > θ): after an ATR-sized bullish impulse, the EA trades *with* the move and rides it to a conviction-scaled target.



Illustrative example only. Actual market behaviour varies.

Reading the illustration

After a period of noise, three strong same-signed bars form an ATR-sized bullish impulse. The lag-1 autocorrelation reads `ρ = +0.42` — comfortably above the threshold θ — so the regime is *persistent*. The EA trades **with** the impulse (BUY), places the stop 2× ATR below entry, and sets a take-profit stretched by the strong conviction (`tpMult = AtrTpMult × 1.42`). Price continues in the trend and reaches the target. Had ρ instead read below −θ, the same impulse would have produced a *SELL* (fade) trade.

Parameters

Parameter	Default	Description
CorrWindow	`30`	Number of log returns (N) in the autocorrelation window. Range 10–100, step 5. Larger = smoother, slower-adapting regime reads.
ImpulseSpan	`3`	Bars (k) spanned by the "recent impulse" measurement `Close[1] − Close[1+k]`. Range 1–10, step 1.
RegimeThreshold	`0.15`	Dead-zone θ. |ρ| must exceed this to declare a persistent or anti-persistent regime; otherwise the EA stands aside. Range 0.0–0.6, step 0.05.
ImpulseAtrFrac	`0.25`	The impulse must exceed this fraction of ATR to be a valid signal (noise filter). Range 0.0–1.5, step 0.05.
AtrPeriod	`14`	ATR averaging period used for the stop, target, and impulse gate. Range 7–40, step 1.
AtrSlMult	`2.0`	ATR multiple for the stop-loss distance. Range 0.8–5.0, step 0.1.
AtrTpMult	`3.0`	Base ATR multiple for the take-profit, before conviction scaling by (1 + |ρ|). Range 1.0–6.0, step 0.5.
Lots	`0.10`	Fixed trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	`7391`	Magic number identifying this EA's positions, so it manages only its own trades.

> **Tip — tuning the responsiveness.** A smaller `CorrWindow` and lower `RegimeThreshold` make the EA switch regimes more readily (more trades, more noise). A larger window with a higher threshold trades less often but only on clearer serial dependence. Adjust `ImpulseAtrFrac` to control how large a move must be before it is treated as a signal.

Recommended Settings

The EA is timeframe-agnostic and can be optimised on whatever timeframe you attach it to. As a sensible starting point:

- **Instruments:** liquid FX majors, metals (e.g. XAUUSD), or major crypto pairs where returns are clean and spreads are tight.
- **Timeframe:** H1 is a balanced default — enough bars to estimate ρ meaningfully while still producing regular signals. Lower timeframes react faster but are noisier; higher timeframes are steadier but trade

less.

- **Defaults:** `CorrWindow 30`, `ImpulseSpan 3`, `RegimeThreshold 0.15`, `ImpulseAtrFrac 0.25`, `AtrPeriod 14`, `AtrSlMult 2.0`, `AtrTpMult 3.0`.
- **Position size:** keep `Lots` conservative relative to account equity; the fixed-lot model does no equity-based scaling.

> **Always validate first.** Backtest across several instruments and market conditions, then run on a demo account before committing real capital. Because the strategy adapts its own behaviour to measured statistics, its edge depends heavily on the data it is applied to — confirm the regime signal is meaningful on your chosen market and timeframe.

How to Install on MetaTrader 5

1. Copy `AdaptiveSerialCorrelationSwitch.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

> 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.