

Regression Slope Momentum

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Trend Momentum	H1 (H1–H4)	www.algotbot.live

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Overview

Regression Slope Momentum is a trend-momentum Expert Advisor. Its core signal is the *slope* of a least-squares linear regression line fitted to the most recent `RegPeriod` closes. That slope — the average price change per bar — is then divided by the current ATR, converting it into a volatility-adjusted momentum reading expressed in **“ATR per bar”**.

Because the reading is measured in ATR units, a single fixed threshold behaves consistently across quiet and volatile regimes: it automatically tightens as volatility expands and loosens as it contracts. The EA acts only when this normalized slope **freshly crosses** the threshold in either direction, which turns a continuous indicator into discrete, deliberate entries.

- **Regime filter:** low-slope chop is gated out, producing fewer but cleaner trades.
- **Volatility adaptive:** normalizing by ATR keeps the trigger meaningful as market conditions change.
- **Discrete entries:** a fresh cross fires once, rather than re-triggering on every tick.
- **Volatility-targeted sizing:** position size shrinks when volatility rises and compounds with account equity.

How It Works

The Momentum Signal

On each newly completed bar the EA fits a least-squares regression line to the last `RegPeriod` closes. The line's slope measures how much price moves per bar. To make it comparable across regimes, the slope is normalized by ATR:

```
slope      = least-squares slope of last RegPeriod closes
slopeNorm  = slope / ATR(AttrPeriod)    // "ATR per bar"
```

A positive `slopeNorm` indicates an up-trend; a negative value indicates a down-trend. The magnitude tells you how strong that trend is *relative to current volatility*.

Entry Logic — Fresh Threshold Cross

The EA compares the current normalized slope against the previous bar's reading and looks for a **fresh cross** of `SlopeThreshold`:

- **Long signal:** the previous `slopeNorm` was below `+SlopeThreshold` and the current one is at or above it.
- **Short signal:** the previous `slopeNorm` was above `-SlopeThreshold` and the current one is at or below it.

Requiring the value to have been on the other side one bar earlier is what makes the entry *discrete*: the EA fires once at the moment momentum ignites, not repeatedly while the trend persists. A first reading is always skipped because a previous value is needed to detect a cross.

Note — Signals are evaluated only on **completed bars**. Intraday ticks are ignored, so the slope is computed on settled prices and entries do not repaint.

Exit Logic — Exit & Reverse

The strategy holds at most one position per symbol. While a position is open it is normally managed by its stop-loss and take-profit. However, if the **opposite** signal appears — a short cross while long, or a long cross while short — the EA closes the current position immediately. If a fresh entry signal is present on that same bar, a new position can be opened in the new direction on the next evaluation, giving the strategy an exit-and-reverse character.

Stop-Loss & Take-Profit

Protective levels are placed at ATR multiples of the entry price, so they breathe with volatility:

```
Long:   SL = entry - SlAtrMult × ATR      TP = entry + TpAtrMult × ATR
Short:  SL = entry + SlAtrMult × ATR      TP = entry - TpAtrMult × ATR
```

With the defaults (`SlAtrMult = 2.0` , `TpAtrMult = 3.0`) each trade targets roughly a **1.5 : 1** reward-to-risk ratio in ATR terms.

Position Sizing

Volume is volatility-targeted and equity-scaled. A volatility baseline (`refAtr`) and a balance baseline (`initBalance`) are locked once, on the first qualifying bar:

```
volScale    = refAtr / ATR                // < 1 when volatility is elevated
equityScale  = balance / initBalance       // grows as the account compounds
volume       = BaseLots × volScale × equityScale
volume       = clamp(volume, 0.01, max(BaseLots × 3, 0.01)) // rounded to 0.01 lots
```

Size therefore **shrinks** when ATR climbs above its baseline (keeping per-trade risk steadier and dampening drawdown in fast markets) and **grows** as equity compounds. The result is clamped to a band between `0.01` lots and three times the base size. The MQL5 build additionally snaps the result to the broker's volume step and min/max limits.

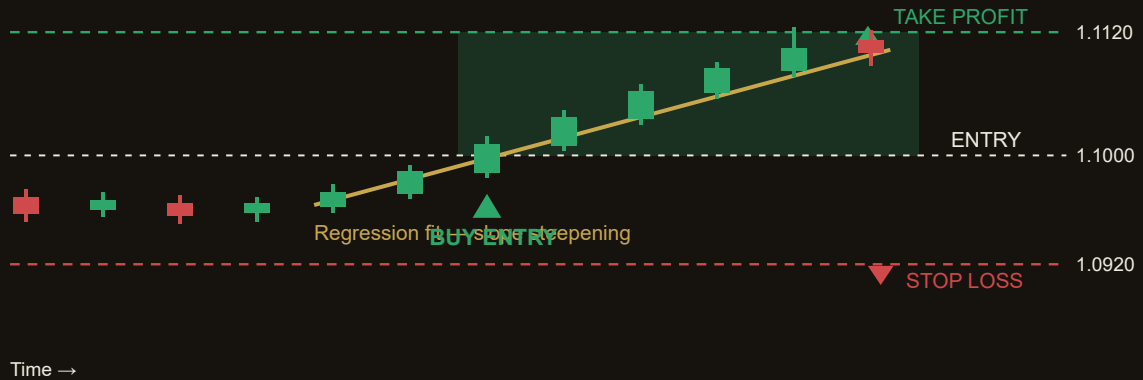
Worked example (long)

Suppose `slopeNorm` rises from `0.03` to `0.07` with `SlopeThreshold = 0.05` — a fresh upward cross, so a long is triggered. If `ATR = 0.0040` and the entry (Ask) is `1.10000`, then `SL = 1.10000 - 2.0 × 0.0040 = 1.09200` and `TP = 1.10000 + 3.0 × 0.0040 = 1.11200` .

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.

Normalized slope crosses +threshold → discrete long entry



Illustrative example only. Actual market behaviour varies.

Parameters

Parameter	Default	Description
RegPeriod	20	Least-squares regression window in bars. Integer, range 8–60 (step 2). Longer windows smooth the slope and react more slowly; shorter windows are more responsive but noisier.
SlopeThreshold	0.05	Normalized-slope trigger in “ATR per bar”. Numeric, range 0.01–0.30 (step 0.01). Higher values demand stronger momentum before entering, cutting trade frequency.
AtrPeriod	14	ATR period used to normalize the slope and to size the stop, target, and volume. Integer, range 7–30 (step 1).
SIatrMult	2.0	Stop-loss distance as a multiple of ATR ($SL = SIatrMult \times ATR$). Numeric, range 1.0–4.0 (step 0.5).
TpAtrMult	3.0	Take-profit distance as a multiple of ATR ($TP = TpAtrMult \times ATR$). Numeric, range 1.0–6.0 (step 0.5).
BaseLots	0.10	Base position size before volatility and equity scaling. Numeric, range 0.01–1.0 (step 0.01). Final volume is clamped between 0.01 and $3 \times$ this value.
Magic	4021	Magic number identifying this EA's orders, so it manages only its own positions.

Recommended Settings

The regression window and ATR periods are tuned for intraday swing timeframes. As a starting point:

- **Symbol:** liquid, trend-friendly FX majors (e.g. EUR/USD, GBP/USD) or index CFDs.
- **Timeframe:** `H1` as the primary; `H4` for slower, higher-conviction signals.
- **RegPeriod / AtrPeriod:** keep the defaults (20 / 14) until you have backtested alternatives.
- **SlopeThreshold:** raise toward 0.08–0.12 for fewer, stronger-momentum entries; lower toward 0.02–0.04 for more frequent signals.
- **Risk multiples:** the default 2.0 / 3.0 SL/TP gives roughly 1.5 : 1 reward-to-risk — adjust to your risk tolerance.

Tip — Because the threshold is expressed in ATR units, the same `SlopeThreshold` tends to transfer reasonably well across symbols and timeframes. Still, always re-validate on the specific instrument and timeframe you intend to trade before going live.

Optimization caution With six tunable inputs it is easy to over-fit a backtest. Prefer walk-forward or out-of-sample testing, and favour parameter regions that stay robust rather than a single peak value.

How to Install on MetaTrader 5

- 1 Copy `RegressionSlopeMomentum.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 — Run the EA on a demo account and in the Strategy Tester across several market regimes first. Confirm that spreads, commissions, and the broker's minimum volume step are acceptable for your intended position sizes.

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.