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Linear Regression Channel Reversion

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Mean Reversion	M15 – H1	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

Linear Regression Channel Reversion is a statistically-grounded mean-reversion Expert Advisor built on a least-squares linear regression channel. Over the last *N* closed bars the EA fits the best-fit straight line to price using ordinary least squares (OLS). That line represents the market's short-term "fair value" trajectory, and the standard deviation of price about the line defines a channel that expands and contracts with volatility.

Price spends most of its time inside such a channel and is statistically pulled back toward the line. However, a naked band touch can simply keep going, so the strategy does **not** fade the stretch itself. Instead it waits for a **reclaim**: the prior bar closed *outside* a band and the just-closed bar has stepped back *inside* it. That one-bar confirmation is the first objective sign that the deviation is being rejected, which sharply cuts false signals versus buying or selling the raw extreme.

Everything in the system self-scales: the channel width adapts to volatility through the residual standard deviation (σ), the protective stop adapts through ATR, and the take-profit is a genuine structural magnet — the regression line itself.

How It Works

The Regression Channel

On each newly-closed bar the EA recomputes a closed-form ordinary least-squares fit over the last `RegPeriod` closed bars. With `x = 0 … N−1` (oldest to newest):

```
fit    y = a + b·x            (b = slope, a = intercept)
line   = a + b·(N−1)          (regression value at the newest closed bar)
σ      = sqrt( Σ (yᵢ − (a + b·xᵢ))² / N )   (residual std deviation)
Upper  = line + DevMult·σ
Lower  = line − DevMult·σ
```

The `line` is the mean the strategy trades back toward; `Upper` and `Lower` are the channel edges whose half-width is `DevMult` standard deviations.

Entry Logic — The Reclaim

- **Long setup:** the previous bar closed *below* the Lower band, the just-closed bar closed *back above* the Lower band (and is still below the line, leaving room to revert up), and the channel is not steeply falling. The EA buys at the Ask.
- **Short setup:** the previous bar closed *above* the Upper band, the just-closed bar closed *back below* the Upper band (and is still above the line), and the channel is not steeply rising. The EA sells at the Bid.

The Slope Filter

A runaway trend produces a channel that just marches in one direction and never reverts. To avoid fading such moves, the EA measures the total drift across the window, `|b·(N−1)|`, in units of σ. Longs are blocked when the channel is falling faster than `SlopeTol·σ`, and shorts are blocked when it is rising faster than `SlopeTol·σ`. The result is that the EA only fades deviations inside a reasonably balanced, gently-sloped channel.

Exit Logic — Stop & Target

- **Take-profit:** the regression `line` itself — the structural mean the deviation is expected to snap back to.
- **Stop-loss:** `AtrStopMult × ATR` beyond the entry (below entry for longs, above entry for shorts), so the protective distance scales with current volatility.

Trade Filters

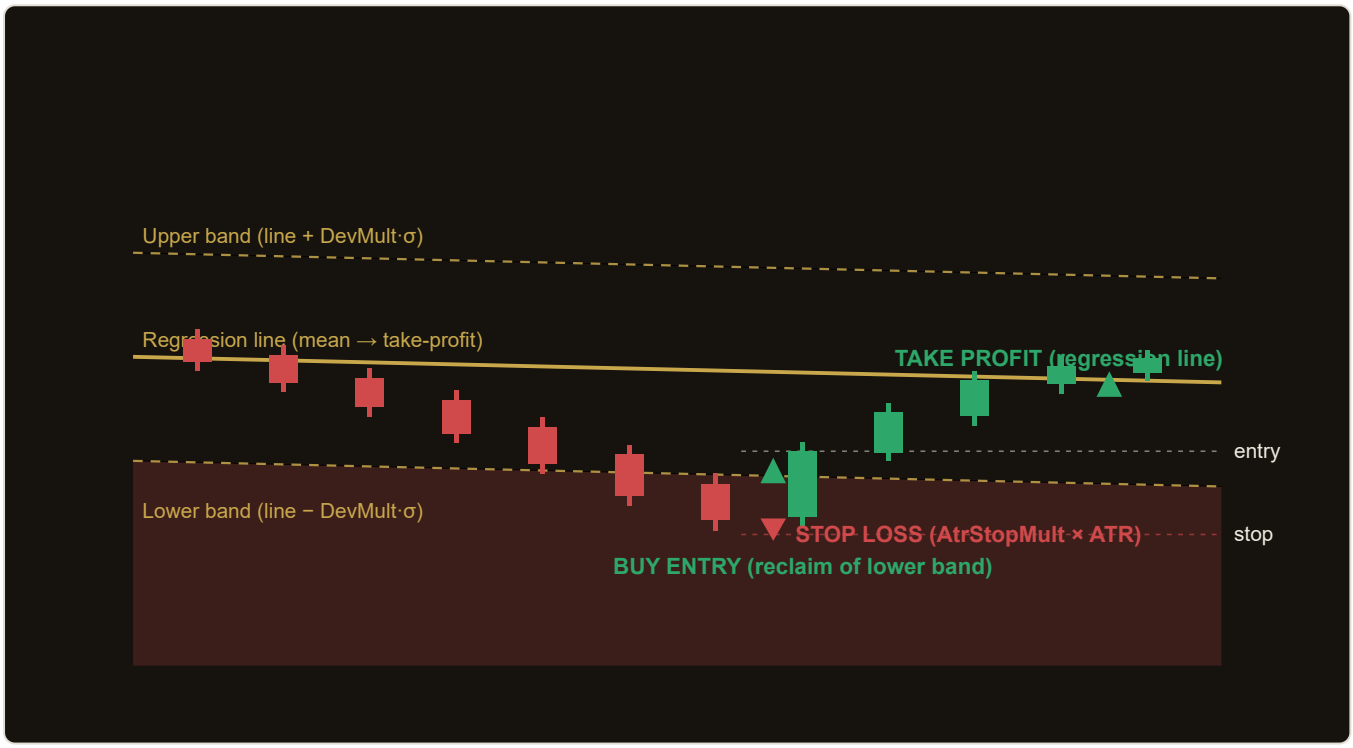
- **Minimum reward:risk:** a setup is rejected when the line target is closer to entry than `MinRewardRisk ×` the ATR stop distance — this discards deviations already too small to justify the risk.
- **Spread guard:** new entries are skipped when the current spread (in points) exceeds `MaxSpreadPoints`.

- **One position per magic:** only a single position per magic number is held at a time; the ATR stop and line target manage every exit.

> **Note:** The EA acts strictly once per newly-closed bar. All calculations use closed bars only (the forming bar is ignored), so signals are evaluated on confirmed data rather than on an in-progress candle.

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.

Walk-through of the long shown above

Price drifts below the Lower band and one bar closes clearly outside it (the deviation). The next bar — a strong green candle — closes back *inside* the channel while remaining below the regression line: the reclaim is confirmed and, with the channel not steeply falling, the EA buys. The take-profit sits at the regression line (the mean), and the stop is placed `AtrStopMult × ATR` below entry. Because the line target is farther than `MinRewardRisk` × the stop, the setup passes the reward:risk filter and the order is sent.

Parameters

Parameter	Default	Description
RegPeriod	`60`	Lookback (bars) for the least-squares regression fit and its σ channel. Range 20–200, step 5.
DevMult	`2.0`	Channel half-width as a multiple of the residual standard deviation. Range 1.0–4.0, step 0.1.
SlopeTol	`1.5`	Maximum channel drift (`|slope·(N−1)|` , in σ units) that still allows a fade. Range 0.0–5.0, step 0.1.
AtrPeriod	`14`	ATR lookback used to size the protective stop. Range 5–30, step 1.
AtrStopMult	`1.5`	Protective stop distance (× ATR) placed beyond the entry. Range 0.5–4.0, step 0.1.
MinRewardRisk	`0.8`	Reject setups whose line target is closer than this × the ATR stop distance. Range 0.3–3.0, step 0.1.
MaxSpreadPoints	`80`	Skip new entries when the current spread (points) is wider than this. Range 5–300, step 5.
Lots	`0.10`	Trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	`5142`	Magic number identifying this EA's positions. Range 0–9,999,999, step 1.

Recommended Settings

The strategy is designed for markets where regression-channel reversion is well behaved: a liquid FX major such as **EURUSD** or **GBPUSD**, or a metal such as **XAUUSD**, on the **M15–H1** timeframes. The EA runs on whatever timeframe the chart is set to at attach/backtest time.

Suggested Starting Points

Setting	Value	Rationale
Symbol	`EURUSD / GBPUSD / XAUUSD`	Liquid, well-behaved reversion; tight spreads.
Timeframe	`M15 – H1`	Balances signal frequency with channel stability.
RegPeriod	`60`	Enough bars for a stable fit without over-smoothing.
DevMult	`2.0`	Standard 2σ band; widen for fewer, deeper setups.
SlopeTol	`1.5`	Filters out steep, one-directional channels.
AtrStopMult	`1.5`	Volatility-scaled stop with sensible breathing room.

Tuning tip: On faster timeframes or noisier symbols, raise `DevMult` so only more meaningful deviations qualify, and lower `SlopeTol` to be stricter about how flat the channel must be before a fade is allowed. Always confirm settings on out-of-sample data before going live.

Spread & costs matter. As a mean-reversion system targeting a structural level, edges can be modest per trade. Keep `MaxSpreadPoints` realistic for your broker and account for commission — excessive spread can erode the reward:risk the strategy relies on.

How to Install on MetaTrader 5

1. Copy `LinearRegressionChannelReversion.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.