

Control Chart Reversion

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Mean Reversion (SPC)

TIMEFRAME

M15 – H1 (Intraday)

WEBSITE

www.algobot.live

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Overview

Control Chart Reversion borrows a proven quality-control toolkit from the factory floor — the *Shewhart control chart* — and applies it directly to price. On a production line, engineers use control charts to separate a genuine change in a process from ordinary random noise. This Expert Advisor uses that same statistical framework to decide when a price excursion is a tradable anomaly versus the start of a real trend.

A rolling simple moving average acts as the **center line (CL)**. Around it, the EA draws **upper and lower control limits** at plus/minus `EntrySigma` population standard deviations. Two classic Statistical Process Control (SPC) signals then drive every decision:

- **Outlier (Shewhart Rule 1)** — a single closed bar punches *beyond* a control limit. In a well-behaved (ranging) market this is a statistical anomaly, not new information. Price is statistically expected to revert to the center line, so the EA prepares to fade the move.
- **Run rule (Nelson Rule 2)** — when `TrendRunLength` consecutive closes land on the *same side* of the center line, the process mean has genuinely shifted: a real trend is under way. When this fires, the EA **suppresses the counter-trend fade** on that side. This run rule is the primary drawdown control — it prevents the strategy from fighting a confirmed trend.

The EA is indicator-based, single-timeframe, with distinct long and short rules. All data is read from the primary chart timeframe, so it adapts to whatever timeframe you attach it to. It was designed with liquid FX

majors such as EUR/USD on intraday charts in mind.

Why control charts? A control chart formalises a simple intuition: in a stable process most observations cluster near the mean, and points far outside the "normal" band are rare and usually temporary. By quantifying "far" as a number of standard deviations, the EA turns a subjective "that looks overstretched" into an objective, reproducible trigger.

How It Works

1. Building the Control Chart

On each newly-closed bar the EA recomputes the chart over the last `Period` closes:

```
Center Line (CL) = SMA(Close, Period)
Std-Dev ( $\sigma$ )    = population standard deviation of the last Period closes
Upper Limit      = CL + EntrySigma  $\times$   $\sigma$ 
Lower Limit      = CL - EntrySigma  $\times$   $\sigma$ 
```

The center line is the "in-control" expectation of price; the control limits define the boundary beyond which a close is statistically unusual.

2. The Trend Filter (Nelson Rule 2)

Before considering any fade, the EA counts how many of the most recent consecutive closes sit on one side of the center line:

- If `bullRun  $\geq$  TrendRunLength` → a **confirmed up-trend** — short fades are suppressed.
- If `bearRun  $\geq$  TrendRunLength` → a **confirmed down-trend** — long fades are suppressed.

The logic is simple but powerful: an extended one-sided run means the mean has moved, so the market is no longer "in control" and reverting to the old center line would be fighting the tape.

3. The Reclaim Entry (avoiding the falling knife)

The EA never buys the outlier bar itself — catching a falling or rising knife is how mean-reversion systems get hurt. Instead it waits one bar for the excursion to **reclaim** back inside the control band, confirming that reversion has actually begun:

- **Long setup** — the prior bar closed *below* the lower limit, the current bar closed back *inside* it, and there is *no* confirmed down-trend → **BUY**.
- **Short setup** — the prior bar closed *above* the upper limit, the current bar closed back *inside* it, and there is *no* confirmed up-trend → **SELL**.

4. Stops, Targets and Position Management

Risk is defined structurally around the excursion extreme, buffered by ATR:

- **Long stop** = the lowest low of the excursion (prior and current bar) minus $\text{StopAtrMult} \times \text{ATR}$.
- **Short stop** = the highest high of the excursion plus $\text{StopAtrMult} \times \text{ATR}$.
- **Take profit** = the **center line (CL)** — a short-distance, high-probability objective, since price is statistically expected to revert to the mean.
- **Minimum target filter** — a trade is skipped unless the distance to the center line is at least $\text{MinTargetAtr} \times \text{ATR}$, avoiding low-reward setups when price is already close to the mean.

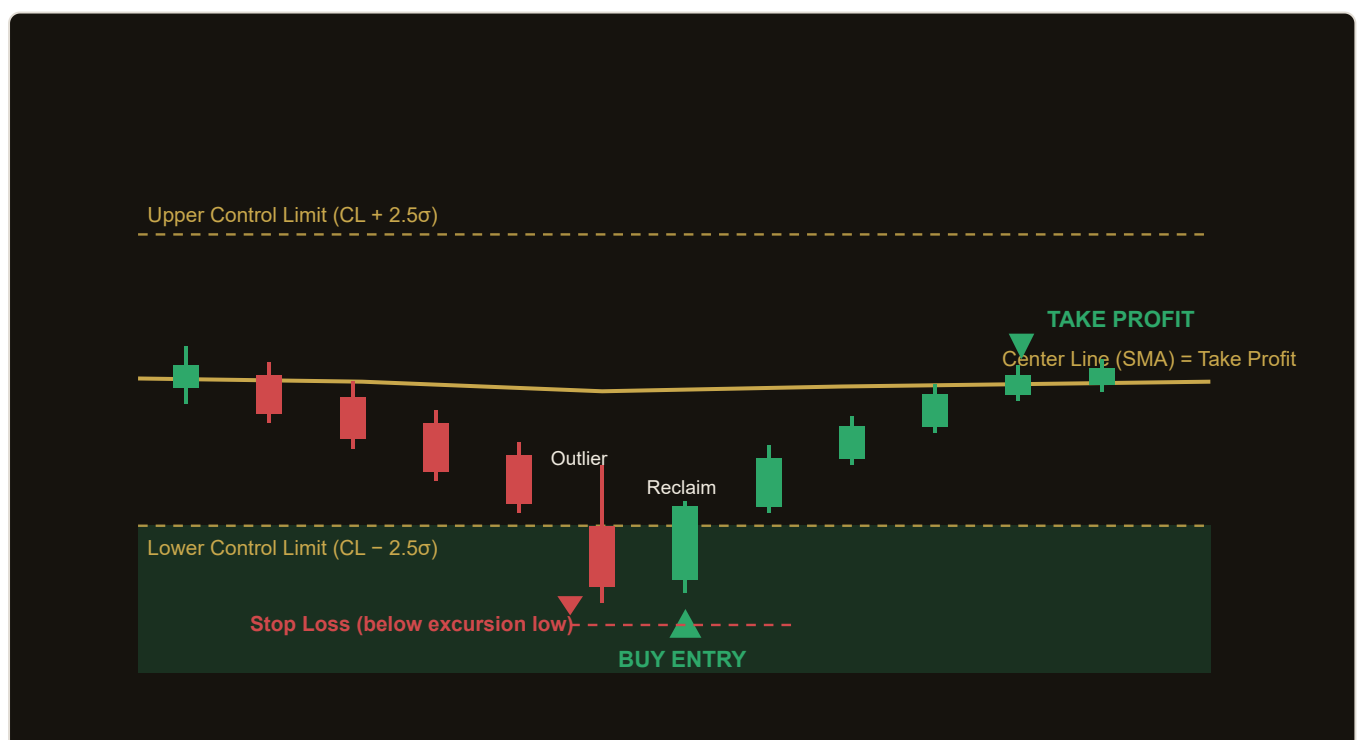
Only one position per magic number is held at a time; the fixed SL and TP manage the exit entirely — there is no re-entry or averaging.

Worked example — long fade

Suppose EUR/USD is ranging. The center line sits at 1.09500 with $\sigma = 0.00080$ and $\text{EntrySigma} = 2.5$, placing the lower limit at 1.09300. A spike bar closes at 1.09270 (beyond the limit — a Shewhart outlier). No 7-bar down-run is in force, so the trend filter stays quiet. On the next bar price closes back at 1.09340 (inside the band — the reclaim). The EA buys at the ask, sets the stop just below the excursion low (say 1.09250) minus an ATR buffer, and targets the center line at 1.09500.

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.



Parameters

Parameter	Default	Description
Period	20	Control window length — number of closes used for the center line (SMA) and standard deviation. Range 10–60, step 5.
EntrySigma	2.5	Distance of the upper/lower control limits from the center line, in population standard deviations. Higher = rarer, more extreme outliers. Range 1.5–3.5, step 0.25.
TrendRunLength	7	Nelson Rule 2 run length — number of consecutive same-side closes that confirm a trend and suppress the counter-trend fade. Range 5–12, step 1.
AtrPeriod	14	ATR period used as the structural stop buffer beyond the excursion extreme. Range 7–28, step 1.
StopAtrMult	1.2	Stop-loss distance beyond the excursion extreme, expressed in ATR multiples. Range 0.5–3.0, step 0.1.
MinTargetAtr	0.5	Minimum acceptable distance from entry to the center-line target, in ATR multiples. Trades below this are skipped. Range 0.1–3.0, step 0.1.
Lots	0.10	Fixed trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	4021	Magic number identifying this EA's positions, so it manages only its own trades.

Parameter note: In the MQL5 build the control-window input is named `ControlPeriod` (it is `Period` in the strategy definition). All other names match one-to-one.

Recommended Settings

Control Chart Reversion is a range/mean-reversion system, so it performs best on liquid instruments during balanced, non-trending conditions.

- **Symbols:** Liquid FX majors such as EUR/USD, USD/JPY, or GBP/USD, where mean-reversion behaviour is most reliable.
- **Timeframe:** Intraday charts (M15 to H1). The defaults were tuned with this range in mind.

- **EntrySigma:** Keep between 2.0 and 3.0. Lower values trade more often but catch shallower excursions; higher values wait for rarer, more extreme anomalies.
- **TrendRunLength:** Lower values (5–6) make the trend filter more aggressive at blocking fades — safer in trending markets. Higher values (9–12) allow more fades through.

Regime awareness: Mean-reversion strategies are exposed to strong, sustained trends. Although the Nelson run rule is built specifically to disarm the fade during confirmed trends, no filter is perfect. Always forward-test on a demo account and validate across multiple market conditions before considering live deployment.

How to Install on MetaTrader 5

- 1 Copy `ControlChartReversion.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

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