

Rainbow Oscillator Trend Shift

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Trend Following

TIMEFRAME

H1 (any, not hardcoded)

WEBSITE

www.algobot.live

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Overview

Rainbow Oscillator Trend Shift is a trend-following Expert Advisor built on Mel Widner's classic "Rainbow" construction (*Stocks & Commodities*, 1997). Rather than tracking a single moving average, it builds a **ladder of recursively-smoothed averages**: the first is a simple moving average of price, the second is a moving average of the first, the third a moving average of the second, and so on. Each rung lags a little more than the one below it, so the family fans out like a rainbow. Their mean forms a very stable, noise-resistant centre of gravity for price.

The **Rainbow Oscillator** measures how far the current close sits above or below that rainbow centre, expressed as a percentage of the recent high-low range:

$$\text{osc} = 100 \times (\text{Close} - \text{mean}(\text{MA1}..\text{MA}_n)) / (\text{HighestHigh}_N - \text{LowestLow}_N)$$

Dividing by the range makes the reading **scale-free**, so the same numeric thresholds behave consistently across FX majors, metals, and indices, and across quiet versus volatile regimes. A positive oscillator means price is riding above the smoothed rainbow (a bullish pull); a negative reading means price is below it (a bearish pull). The EA opens a position only when price thrusts decisively clear of the whole rainbow *and* the rainbow itself has begun to tilt in that direction — the "trend shift" the strategy is named for.

Why it can work. The recursively-smoothed rainbow is a far cleaner trend proxy than a single moving average — each extra smoothing pass strips more high-frequency noise. The range-normalised oscillator turns "how far has price broken free of that trend cloud" into a single stationary number. Requiring both a threshold thrust *and* an agreeing rainbow tilt filters much of the chop that whipsaws ordinary MA-crossover systems.

How It Works

The Rainbow Ladder

On every freshly-closed bar the EA rebuilds the rainbow from the close series. Starting with the raw closes, it applies a simple moving average of length `SmoothPeriod` to produce the first rung, then applies the same average again to produce the second rung, and repeats until `RainbowLevels` rungs exist. The newest value of each rung is collected, and the **rainbow mean** is the average of those newest values. The EA computes this mean twice — for the current bar and for the previous bar — so it can tell whether the rainbow is **rising** or **falling**.

The Oscillator

The oscillator is the distance from the latest close to the rainbow mean, scaled by the recent high-low range over `NormPeriod` bars and multiplied by 100. Values are effectively a percentage: a reading of +15 means the close is 15% of the recent range above the rainbow centre.

Entry Logic

All decisions use only **closed bars** — the strategy is non-repainting. The forming bar is used solely to detect when a new bar has opened. An entry requires three conditions to align:

- **Long:** the oscillator crosses *up* through `+Threshold`, the rainbow mean is rising, and the close is above the rainbow centre.
- **Short:** the oscillator crosses *down* through `-Threshold`, the rainbow mean is falling, and the close is below the rainbow centre.

A crossing (not merely being beyond the threshold) is required, so the signal fires on the bar the thrust actually breaks free of the cloud. A `CooldownBars` gate enforces a minimum number of bars between entries to curb churn, and only one position is held at a time.

Exit Logic

The EA leaves on the opposite side of the rainbow. A long is closed when the oscillator falls back through **zero** — price has re-entered the rainbow cloud — and a short is closed when the oscillator rises back through zero. Exit management always takes priority: on any bar where a position is closed on a zero-cross, the EA does not open a new trade (it never flips on a management bar).

Protective Stop, Target & Trailing

Every position is protected by an ATR-based stop and target measured at entry:

- **Stop loss** = entry $\mp$ $\text{ATR} \times \text{SLatrMult}$
- **Take profit** = entry $\pm$ $\text{ATR} \times \text{TpAtrMult}$

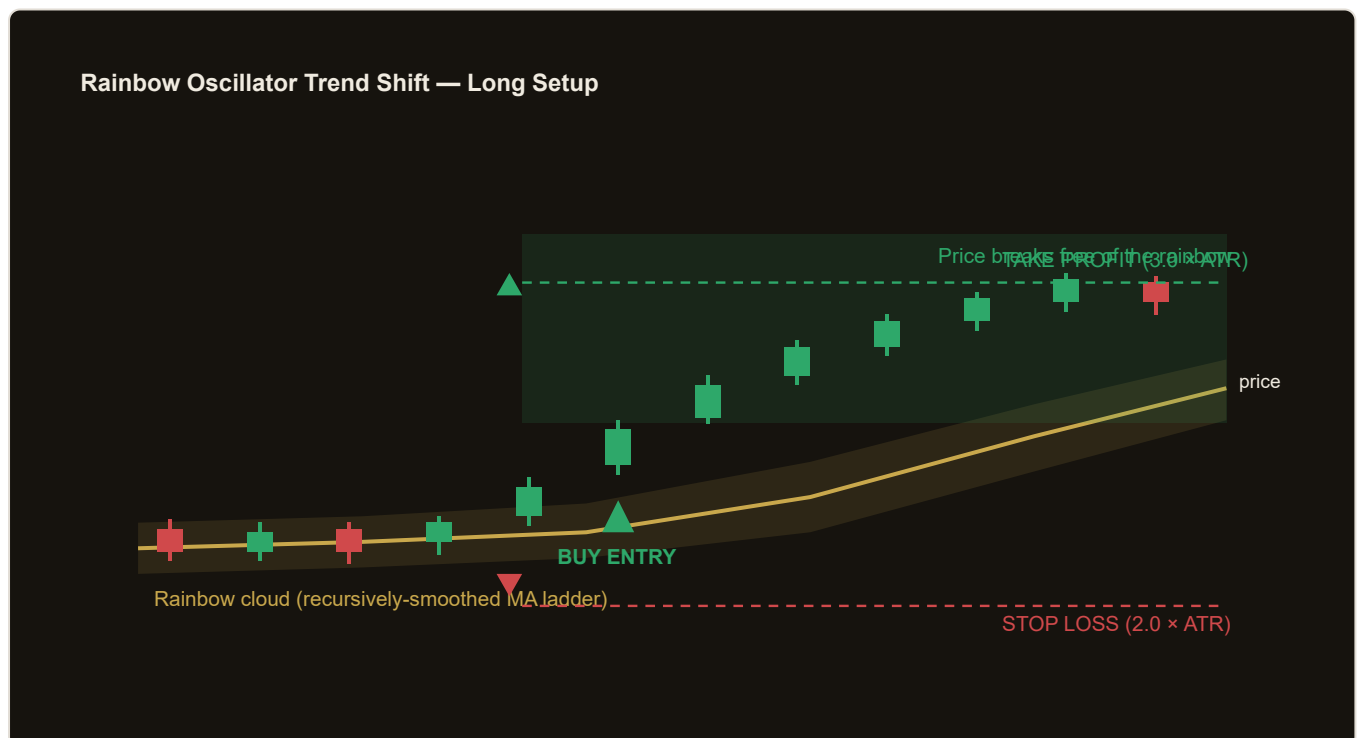
An optional **ATR trailing stop** runs on every tick for responsiveness. When TrailAtrMult is greater than zero, the stop ratchets only in the favourable direction, held $\text{ATR} \times \text{TrailAtrMult}$ away from current price and never loosened. Setting TrailAtrMult to 0 disables the trail and leaves the fixed stop/target in place.

Worked example (long)

After a quiet range, the oscillator lifts from +10 to +19, crossing above the default +15 threshold. The rainbow mean has just turned upward and the close is above the rainbow centre — all three long conditions align, so the EA buys at the ask. With ATR at 0.0020, the stop sits $2.0 \times \text{ATR}$ (40 pips) below and the target $3.0 \times \text{ATR}$ (60 pips) above. As price advances, the trailing stop follows $1.5 \times \text{ATR}$ behind. The trade is closed either at target, at the trail, or when the oscillator later falls back through zero and price re-enters the rainbow.

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.

Parameters

Parameter	Default	Description
SmoothPeriod	2	Smoothing period used at every rung of the rainbow ladder. Range 2–6, step 1.
RainbowLevels	10	Number of recursively-smoothed averages that make up the rainbow. Range 4–16, step 1.
NormPeriod	20	Lookback (bars) for the high-low range that normalises the oscillator. Range 10–60, step 5.
Threshold	15.0	Oscillator band (in %) the thrust must clear to arm a trade. Range 0.0–50.0, step 2.5.
AtrPeriod	14	ATR period for the protective stop, target, and trail. Range 7–30, step 1.
SLAtrMult	2.0	Stop-loss distance as a multiple of ATR. Range 0.8–5.0, step 0.1.
TpAtrMult	3.0	Take-profit distance as a multiple of ATR. Range 1.0–8.0, step 0.1.
TrailAtrMult	1.5	ATR trailing-stop distance (0 disables the trail). Range 0.0–5.0, step 0.1.
CooldownBars	1	Minimum bars between entries to curb churn. Range 0–20, step 1.
Lots	0.10	Fixed trade volume in lots. Range 0.01–2.0, step 0.01.
Magic	20260719	Magic number identifying this EA's positions.

Recommended Settings

The EA is designed to run on whatever timeframe you select — nothing is hardcoded — and the range-normalised oscillator keeps its thresholds meaningful across instruments. As a sensible starting point:

- **Timeframe:** H1 is a balanced default; the strategy also works on M30–H4. Lower timeframes generate more (and noisier) signals.
- **Symbols:** liquid FX majors (EUR/USD, GBP/USD, USD/JPY), major metals, and index CFDs.
- **Threshold:** the default 15.0 filters mild wiggles. Raise it (e.g. 20–25) for fewer, stronger-thrust entries; lower it for more frequent, earlier entries.
- **Rainbow depth:** more `RainbowLevels` (12–16) yields a smoother, slower cloud; fewer (4–8) reacts faster but tracks noise more closely.
- **Risk:** keep `SLAtrMult` and `TpAtrMult` in a roughly 1:1.5 ratio (defaults 2.0 / 3.0). Set `TrailAtrMult` to 0 to rely purely on the fixed target and the oscillator zero-cross exit.

Tip. Always backtest and optimise on your own broker's data before going live. Because every parameter has explicit Min/Max/Step bounds (shown in the Parameters table), the ranges make convenient starting points for the MT5 Strategy Tester's optimisation grid.

How to Install on MetaTrader 5

- 1 Copy `RainbowOscillatorTrendShift.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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