

Teager Energy Momentum Burst

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Momentum Ignition (Trend-Following)

TIMEFRAME

M15 / H1

WEBSITE

www.algobot.live

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Overview

Teager Energy Momentum Burst is an original momentum-ignition system built on the *Teager-Kaiser Energy Operator (TKEO)* — a signal-processing tool that measures the *instantaneous energy* of an oscillation (roughly amplitude × frequency squared). Where a plain moving average or MACD reading tells you *where* momentum is, the Teager energy tells you *how hard it is firing right now*.

The strategy first detrends price into a zero-centred, MACD-style oscillator, then applies the discrete Teager operator to the last three oscillator samples. A clean directional thrust charges a large positive energy value; sideways chop collapses that energy toward zero. Because the operator is direction-agnostic (a hard down-move charges just as much energy as a hard up-move), direction is read separately from the sign of the oscillator, and every entry is gated so the burst is traded *with* the prevailing baseline drift rather than against it.

The energy is normalised by the square of the Average True Range (ATR²) so a single threshold behaves consistently across symbols and timeframes. The EA runs on whatever timeframe it is attached to — nothing is hardcoded — and a liquid FX major such as EURUSD on M15 or H1 is a natural home.

What makes it different: Most momentum systems fire on every bar a move persists. Teager Energy Momentum Burst fires only once, at *ignition* — the bar the normalised energy first crosses up through the threshold — so it enters at the start of a thrust rather than chasing a move that is already underway.

How It Works

1. The Detrended Oscillator

Two self-maintained exponential moving averages are kept incrementally (no series nesting) and subtracted to produce a zero-centred oscillator. A positive value means bullish drift (fast above slow); a negative value means bearish drift.

$$\text{osc} = \text{EMA}(\text{close}, \text{FastPeriod}) - \text{EMA}(\text{close}, \text{SlowPeriod})$$

2. Teager-Kaiser Energy

The discrete Teager-Kaiser operator is applied to the last three oscillator samples, centred on the previous one. For a clean directional thrust this is a large positive number; in chop it collapses toward zero.

$$\text{energy} = \text{osc}[t-1]^2 - \text{osc}[t-2] \times \text{osc}[t]$$

3. ATR Normalisation

The raw energy is divided by ATR^2 so the same `EnergyThreshold` works regardless of the instrument's price scale or volatility.

$$\text{eNorm} = \text{energy} / \text{ATR}^2$$

Entry Logic — a Fresh Burst

A trade is considered only on a **fresh burst**: the normalised energy must have been at or below the threshold on the prior bar and cross *up* through it on the current bar. This "crosses up" condition is what makes the EA fire once at ignition instead of on every bar of the move.

- **Long** — fresh burst, oscillator `> 0` and expanding (rising), and the slow baseline sloping **up**.
- **Short** — fresh burst, oscillator `< 0` and expanding down (falling), and the slow baseline sloping **down**.

The slow-baseline slope is the trend gate. The EA never takes an energy burst that fights the prevailing baseline drift — this is what keeps drawdown tight and separates a genuine ignition from a violent counter-trend spike.

Entry in plain terms

Price has been drifting sideways-to-up. The oscillator is already positive and rising, the slow baseline has just turned up, and this bar the Teager energy jumps from below the threshold to above it. That is the ignition — the EA opens a long at the ask with an ATR-based stop and target.

Exit Logic

Every position carries a hard ATR bracket set at entry, plus an adaptive early exit:

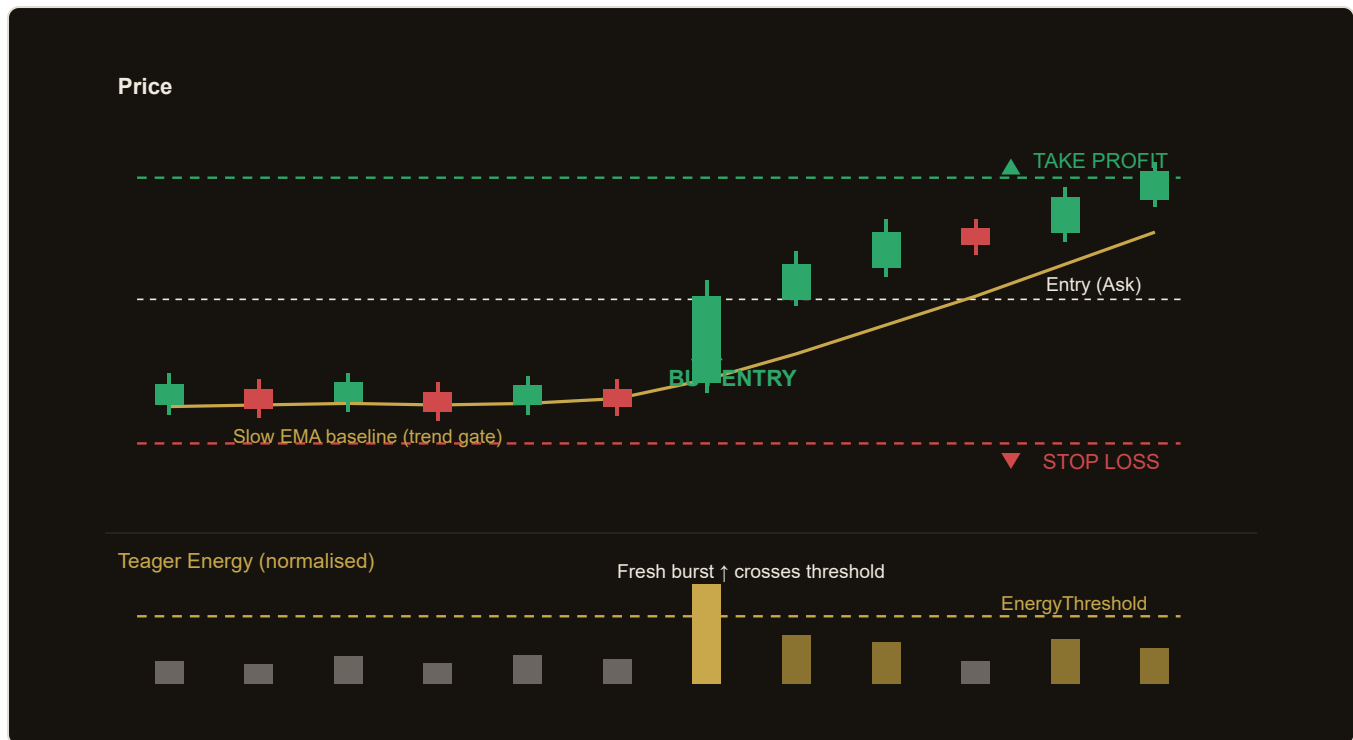
- **Stop loss** — $\text{StopMult} \times \text{ATR}$ away from entry.
- **Take profit** — $\text{StopMult} \times \text{RewardRatio} \times \text{ATR}$ away from entry.
- **Adaptive momentum-flip exit** — if the oscillator crosses back through zero *against* the open position, the trade is closed immediately, cutting losers and protecting winners before the hard stop is reached.

Only one position per magic number is held at a time; while a trade is open the EA manages only its exit and takes no new entries.

Risk framing: With the defaults ($\text{StopMult} = 1.5$, $\text{RewardRatio} = 2.0$) the take profit sits at $1.5 \times 2.0 = 3.0 \times \text{ATR}$ versus a $1.5 \times \text{ATR}$ stop — a 2:1 reward-to-risk target, before the momentum-flip exit is taken into account.

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
FastPeriod	5	Fast EMA length forming the detrended oscillator. Range 2–20, step 1.
SlowPeriod	34	Slow EMA length — the oscillator's other leg and the baseline trend gate. Range 10–100, step 2. Kept strictly longer than <code>FastPeriod</code> .
EnergyThreshold	0.10	Minimum normalised Teager energy (as a fraction of ATR^2) required to call a burst. Range 0.01–1.00, step 0.01.
AtrPeriod	14	ATR window used for energy normalisation and risk sizing. Range 5–40, step 1.
StopMult	1.5	Stop distance in ATR multiples (<code>StopMult × ATR</code>). Range 0.5–4.0, step 0.1.
RewardRatio	2.0	Target distance as <code>StopMult × RewardRatio × ATR</code> . Range 0.5–5.0, step 0.1.
Lots	0.10	Fixed lot size per trade. Range 0.01–1.00, step 0.05.
Magic	7726	Magic number identifying this EA's positions. Range 0–9,999,999, step 1.

Recommended Settings

The defaults are a balanced starting point for a liquid FX major on M15 or H1. Adjust in small increments and validate on your own history before any live use.

- **Symbol / timeframe:** A liquid FX major such as EURUSD on M15 or H1. The strategy is single-timeframe and adapts to whatever chart it runs on.
- **EnergyThreshold:** Raise it (e.g. 0.15–0.25) to demand more violent ignitions and trade less often; lower it (e.g. 0.05–0.08) for more frequent, weaker bursts.
- **FastPeriod / SlowPeriod:** Keep a clear separation (default 5 / 34). Widening the slow period smooths the baseline trend gate; narrowing the fast period makes the oscillator more reactive.
- **StopMult / RewardRatio:** Defaults give a 2:1 reward-to-risk bracket. Tighten `StopMult` for closer stops, or lift `RewardRatio` to let winners run further before the target.

Tip: Because the energy is ATR-normalised, the same `EnergyThreshold` transfers reasonably well between symbols and timeframes. Re-optimize the EMA lengths and stop multiples per instrument, but you can usually leave the threshold near its default when moving markets.

Optimisation caution: Fitting the parameters too tightly to one stretch of history is the fastest route to a curve-fit that fails live. Validate on out-of-sample data and across multiple market regimes before committing real capital.

How to Install on MetaTrader 5

- 1 Copy `TeagerEnergyMomentumBurst.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

Note: The EA acts once per newly-closed bar and needs a warm-up of roughly $\max(\text{SlowPeriod} \times 3, \text{AtrPeriod} + 2) + 3$ closed bars before it will trade, so the first signals appear only after enough history has loaded on the chart.

Risk Warning

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