

FLXWave

Force Liquidity eXhaustion Wave

## 1. Objective Statement

FLXWave is a fully mechanical trading system designed to capture low-resistance continuation setups in

trending markets. It does this by identifying moments when short-term momentum diverges from-then

realigns with-underlying volume-driven efficiency. The system enters trades only when this alignment occurs

without disruption to cumulative efficiency. Trade exits are dynamically computed based on the magnitude of

past efficient moves, adapting to current market behavior for both profit targets and stop losses, while

rejecting trades where minimum stop conditions are not met.

## 2. Philosophical Overview

Markets tend to move most efficiently when opposition weakens. FLXWave quantifies this principle through

Cumulative Efficiency (CumEff) to measure directional ease normalized by volume, and a Smoothed Rate of

Change (SROC) to detect short-term momentum behavior. Temporary divergences are interpreted as internal

market testing. A decisive momentum recovery-without prior disruption to CumEff-is seen as a signal of

resumed conviction and trend continuation. The exit strategy reflects this philosophy by using a

percentile-based model of past efficient moves, ensuring that trades adapt to regime shifts without relying on

static assumptions.

### 3. Thesis Statement

FLXWave trades the resolution of internal market conflict. When momentum diverges without impairing

cumulative efficiency, and then recovers decisively, it implies continuation in the direction of least resistance.

Entry requires this specific sequence to occur with stable CumEff and a validated SROC trough and recovery.

Exit levels are not static but scaled dynamically based on historical distributions of efficient price travel,

ensuring the system adapts to current volatility conditions while enforcing minimum stop-loss thresholds to

preserve signal quality.

### 4. Entry Logic - Developer Algebra and Narrative

Define All Inputs:

- $n_{eff}$ : Lookback period for EMA of CumEff
- $n_{sroc}$ : Lookback period for smoothed Rate of Change (SROC)
- $N_E$ : Bars used to confirm CumEff trend
- $N_D$ : Bars used to measure SROC divergence and recovery
- $E_{min}$ : Minimum CumEff level to confirm trend
- $E_{stability\_ratio}$ : Minimum fraction of  $E_{min}$  CumEff must maintain during  $N_D$  (e.g., 0.75)
- $\Delta Drop$ : Minimum required drop in SROC before trough
- $\Delta Rise$ : Minimum required rise in SROC from trough to now
- $S_{min\_slope}$ : Minimum SROC slope for recovery
- $k$ : Lookback used to measure slope from trough to present

Formulas:

Where:

- C1 = most recent close price
- V1 = most recent closed VWAP value
- C2 = previous close price
- V2 = previous closed VWAP value
- Vol1 = volume of most recent close

$$\text{CumEff} = ((C1 - V1) - (C2 - V2)) / \text{Vol1}$$

$$2. \text{CumEff\_EMA}_t = \text{EMA}(\text{CumEff}, n_{\text{eff}})$$

$$3. \text{SROC}_t = 100 * (P_t - P_{\{t-n_{\text{sroc}}\}}) / P_{\{t-n_{\text{sroc}}\}}$$

(P = chosen price basis, such as Close or HLC3)

LONG ENTRY CONDITIONS:

1.  $\text{CumEff\_EMA} > E_{\text{min}}$  for all bars in  $[t - (N_D + N_E) + 1, t - N_D]$
2.  $\text{CumEff\_EMA} \geq (E_{\text{stability\_ratio}} * E_{\text{min}})$  for all bars in  $[t - N_D + 1, t]$
3. Identify  $\text{SROC}_{t-x}$  such that:
  - a)  $\text{SROC}_{t-x}$  is the minimum in a centered 3-bar window:  $\min(\text{SROC}_{\{t-x-1\}}, \text{SROC}_{\{t-x\}}, \text{SROC}_{\{t-x+1\}})$
  - b) SROC drops at least DeltaDrop before t-x

SHORT ENTRY CONDITIONS:

1.  $\text{CumEff\_EMA} < -E_{\text{min}}$  for all bars in  $[t - (N_D + N_E) + 1, t - N_D]$
  2.  $\text{CumEff\_EMA} \leq (E_{\text{stability\_ratio}} * -E_{\text{min}})$  for all bars in  $[t - N_D + 1, t]$
  3. Identify  $\text{SROC}_{t-x}$  such that:
    - a)  $\text{SROC}_{t-x}$  is the maximum in a centered 3-bar window:  $\max(\text{SROC}_{\{t-x-1\}}, \text{SROC}_{\{t-x\}}, \text{SROC}_{\{t-x+1\}})$
    - b) SROC rises at least DeltaDrop before t-x
    - c) SROC drops at least DeltaRise from t-x to t
    - d)  $(\text{SROC}_t - \text{SROC}_{t-x}) / (t - t_x) \leq -S_{\text{min\_slope}}$ 
      - For short entries, slope must be negative
  4. No open position
- c) SROC rises at least DeltaRise from t-x to t
- d)  $(\text{SROC}_t - \text{SROC}_{t-x}) / (t - t_x) \geq S_{\text{min\_slope}}$
- For long entries, slope must be positive
  - For short entries, slope must be negative
4. No open position

#### SHORT ENTRY CONDITIONS:

- Mirror logic with  $\text{CumEff\_EMA} < -E\_min$ ,  $E\_stability\_ratio * -E\_min$ , and SROC reflecting downward trend behavior

#### NOTES:

- CumEff is defined as  $((C1 - V1) - (C2 - V2)) / Vol1$ , where C = Close price, V = VWAP, and Vol = volume at the most recent close.
- All logic evaluates on closed bars only
- All thresholds must be user-adjustable and testable

### 5. Exit Logic - Efficiency-Aware Volatility Box

NOTE: If fewer than M valid trades exist, fallback to user-defined TP\_default and SL\_default values.

#### Define Inputs:

- M: Number of most recent completed FLXWave-valid trades
- TP\_mult: Take Profit multiplier (e.g., 1.0-1.5)
- SL\_mult: Stop Loss multiplier (e.g., 0.5-0.75)
- p: Percentile to evaluate historical efficient move distance (e.g., 75)
- Min\_SL: Minimum acceptable stop distance (in ticks or points)

#### Definitions:

- Entry\_i: Entry price of trade i, for i in [1, M]
- ExitEff\_i: Exit price where either CumEff slope or SROC slope reverses, whichever comes first
- Range\_i = |ExitEff\_i - Entry\_i|: Efficient move distance for trade i
- PercEffRange = Percentile(Range\_1...Range\_M, p)

#### Current Trade Execution (Entry\_0):

- Take Profit (TP) =  $\text{Entry}_0 + (\text{TP\_mult} \times \text{PercEffRange})$  (plus for long, minus for short)
- Stop Loss (SL) =  $\text{Entry}_0 - (\text{SL\_mult} \times \text{PercEffRange})$  (minus for long, plus for short)

Minimum SL Filter:

- If SL distance < Min\_SL, trade is disqualified (do not enter)

This logic ensures trades are only taken when prior signal behavior suggests sufficient room for profit and

loss control. All values are dynamically updated and printed to a status pane.

## **6. What Success Looks Like**

- Entries occur only after conviction reasserts itself
- No ambiguous or discretionary setups
- Visual signal pane shows trade readiness clearly
- Strategy operates cleanly on range charts
- Target behavior aligns with trend-following conviction

## **7. Integration Notes**

- Strategy logic is closed-bar only, suitable for NT8 Strategy Analyzer
- System will be triggered manually via signal light during testing
- Recommended chart type: 3-8 range bars
- Signal pane must show CumEff, SROC, and readiness state
- All thresholds must be user-adjustable and testable

# FLXWave User Guide

## 1. Setup and Configuration

### Chart Requirements

- Chart type: Range Bars (recommended 3–8 range)
- Instruments: Futures, stocks, or cryptocurrencies with sufficient volume
- Timeframe: Designed for intraday execution
- Bar closure: All logic evaluates on closed bars only

### Inputs to Configure

All input values should be user-adjustable and optimized per instrument:

n\_eff: Lookback for EMA of CumEff – 34

n\_sroc: Lookback for Smoothed Rate of Change (SROC) – 21

N\_E: Bars to confirm CumEff trend – 20

N\_D: Bars to monitor SROC divergence and recovery – 10

E\_min: Minimum CumEff value for trend confirmation – Empirically tuned

E\_stability\_ratio: Minimum fraction of E\_min CumEff must maintain during N\_D – 0.75

DeltaDrop: Minimum SROC drop before trough – 1.5

DeltaRise: Minimum SROC rise from trough – 1.0

S\_min\_slope: Minimum slope of SROC recovery – 0.2

TP\_mult: Take Profit multiplier – 1.25

SL\_mult: Stop Loss multiplier – 0.75

Min\_SL: Minimum acceptable stop distance (in ticks/points) – Contextual

## 2. Understanding the Status Panel

The FLXWave Status Panel provides real-time visual feedback on trade readiness. It is essential for users performing manual or semi-automated validation.

Signal Light – A round LED-style light showing system state:

- Red: No conditions met
- Orange: Some conditions met
- Green: All entry conditions met
- Flashing Red: Exit triggered by TP, SL, or slope reversal

CumEff Meter – Circular fill meter indicating how close CumEff is to threshold requirements

SROC Meter – Parallel meter showing health of SROC divergence and recovery

TP/SL Readout – Textual output displaying dynamic take profit and stop loss levels (e.g., TP: +12.5 | SL: -8.3)

### 3. How to Interpret Trade Readiness

A green signal light means all entry conditions are met, and a trade is valid.

Trade conditions:

- CumEff EMA has maintained above/below the E\_min threshold for N\_E bars
- It has remained stable above a defined ratio (E\_stability\_ratio) during the N\_D divergence window
- A valid SROC trough/peak has formed and resolved upward/downward with sufficient slope
- The system confirms that no trade is currently open

Red light = No conditions met

Orange light = Setup is forming but not yet valid

### 4. Executing and Managing Trades

#### Trade Entry

- Occurs on closed bars only
- Triggered when entry logic aligns (green light)

#### Trade Exit

- Uses a dynamic TP/SL box based on historical distributions of past efficient moves
- Trade is exited when:
  - TP or SL is hit
  - CumEff or SROC slope reverses direction
- If SL distance is less than Min\_SL, the trade is rejected

#### Exit Calculation Logic

Let M be the number of past valid trades.

Efficient Move Distance =  $|\text{ExitEff}_i - \text{Entry}_i|$

PercEffRange = Percentile of these distances (e.g., 75th percentile)

Take Profit (TP) =  $\text{Entry}_0 + \text{TP\_mult} \times \text{PercEffRange}$

Stop Loss (SL) =  $\text{Entry}_0 - \text{SL\_mult} \times \text{PercEffRange}$  (inverted for shorts)

If fewer than M valid trades exist, fallback to TP\_default and SL\_default.

## 5. Best Practices

- Use only in trending environments; avoid sideways markets
- Monitor SROC and CumEff meters to anticipate signal readiness
- One trade at a time—do not stack signals
- Validate logic visually before full automation
- Regularly backtest and tune thresholds per instrument

## Status Panel Design

The FLXWave Status Panel is a visual interface element designed to support live discretionary validation and clarity of signal states during manual or semi-automated execution. It provides real-time visual cues on trade readiness, entry logic alignment, and exit status.

- Key Components:
  - Signal Light – A single round LED-style light located on the far left of the panel. Its colors are:
    - - Red: No valid conditions met
    - - Orange: Partial conditions met
    - - Green: All entry conditions met, trade ready
    - - Flashing Red: Trade exited due to TP/SL or slope reversal (remains flashing for N bars)
  - CumEff Meter – A circular meter that fills from red through orange to green as CumEff approaches and meets threshold requirements.
  - SROC Meter – A parallel circular meter that reflects the momentum trough-recovery health using the same color logic as the CumEff Meter.
  - TP/SL Readout – A textual output on the right-hand side of the panel showing real-time take profit and stop loss values based on the dynamic volatility box logic:  
TP: +12.5 | SL: -8.3  
These values update with each new qualifying signal series.

All elements will be implemented using SharpDX rendering within NinjaTrader 8. Gradient fills, color transitions, and dot plots are achievable using custom geometry and brushes. The



signal light will latch on valid entry and remain active until an exit is triggered by the system. The meters are designed to provide a rapid visual reference for signal confidence without relying solely on numerical data.

An example design mockup is shown below:

