PSEDYS | TECHNICAL REFERENCE MANUAL V3.0

MOM — Momentum Indicator

Technical Reference Manual v1.0

PSEDYS | Complete Edition
Absolute Difference · Zero Cross · MOM vs ROC · Signal Line · Absolute Price Bias · MTF · Bot vs TradingView

CONTENTS

1. What is MOM? Concept and Origin
2. Calculation Formula — Complete
   - 2.1 Standard Formula (absolute difference)
   - 2.2 MOM vs ROC — mathematical relationship
   - 2.3 Signal Line (SMA on MOM)
   - 2.4 Complete Numerical Example — 50 bars
   - 2.5 Alternative Parameters
3. MOM Range — Absolute Unlimited
4. Lag and Warm-up
5. MOM Levels — Interpretation
6. Trading Signals
   - 6.1 Zero-line Cross
   - 6.2 Signal Line Crossover
   - 6.3 Divergences
   - 6.4 Combined Filters
7. MOM vs ROC vs TRIX vs RSI — Comparison
8. MOM in Sideways and Trend Markets
9. Multi-Timeframe Analysis (MTF)
10. PSEDYS — MOM as Acceleration Detector
11. Bot vs TradingView Validation
12. Practical Exercises
13. Cheat Sheet — Quick Summary

1. What is MOM? Concept and Origin

The Momentum Indicator (MOM) is **the simplest momentum indicator** in technical analysis — it compares the current price with the price from N bars ago through **absolute difference**.

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

The concept of momentum originates from physics: an object with high speed has greater momentum.

Philosophy: If the current Close is higher than the Close from 14 bars ago, the market has positive (bullish) momentum. The amplitude of the difference indicates the **intensity** of the movement.

Relationship with ROC: MOM is the **unnormalized (absolute)** version of ROC. ROC = MOM / Close[i−N] × 100. The critical difference: MOM depends on the absolute price level (BTC vs altcoins), ROC is percentage normalized and comparable between instruments.

---

2. Calculation Formula — Complete

2.1 Standard Formula (Absolute Difference)

```
MOM[i] = Close[i] − Close[i − period]
```

Standard period: 14 (or 10, 12)

2.2 MOM vs ROC — Mathematical Relationship

```
MOM[i] = Close[i] − Close[i−N]                          (absolute)
ROC[i] = (Close[i] / Close[i−N] − 1) × 100               (percentage)

Relationship:
  ROC = MOM / Close[i−N] × 100
  MOM = ROC × Close[i−N] / 100
```

When they coincide numerically:
- If Close[i−N] = 100: MOM = ROC numerically (e.g., MOM = −3.65, ROC = −3.65%)
- If Close[i−N] ≠ 100: they differ

MOM bias to absolute price:

```
BTC: Close[i]=50000, Close[i-14]=47000 → MOM = +3000
ETH: Close[i]=2000,  Close[i-14]=1880  → MOM = +120

ROC BTC: +6.38%
ROC ETH: +6.38%  ← identical percentage, comparable

MOM BTC: +3000   ← incomparable with ETH
MOM ETH: +120
```

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

Conclusion: MOM is useful on a single consistent instrument. ROC is preferable for cross-instrument comparisons (screener).

2.3 Signal Line (SMA on MOM)

```
Signal[i] = SMA(MOM, signal_period)[i]    (standard signal_period=9)
```

Crossover MOM vs Signal = analogous to MACD Line vs Signal Line:
- MOM > Signal: accelerating bullish momentum
- MOM < Signal: decelerating momentum

2.4 Complete Numerical Example — period=14, 50 bars

Verification bar 15 (first MOM value):

```
Close[15] = 96.35
Close[1]  = 100.00

MOM[15] = 96.35 − 100.00 = −3.6500  ✓  (bearish, price dropped 3.65 units)
ROC[15] = (96.35/100.00 − 1) × 100 = −3.65%  (coincides numerically — base = 100)
```

MOM table bars 15–50 (selection):

Bar	Close	Close[i−14]	MOM	ROC%	Zone
15	96.35	100.00	**−3.65**	−3.65%	BEAR
19	97.36	98.07	−0.71	−0.72%	BEAR
26	100.05	98.29	**+1.76**	+1.79%	BULL
35	104.13	97.21	+6.92	+7.12%	BULL
41	108.48	99.73	**+8.75**	+8.77%	BULL
43	108.11	97.39	+10.72	+11.01%	BULL
49	103.33	104.13	**−0.80**	−0.77%	BEAR
50	104.05	103.95	+0.10	+0.10%	BULL

Zero-line crosses on dataset:
- **Bar 26:** MOM bullish cross zero (−0.82 → +1.76)
- **Bar 49:** MOM bearish cross zero (+1.64 → −0.80)
- **Bar 50:** MOM bullish cross zero (−0.80 → +0.10)

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

2.5 Alternative Parameters

Variant	Period	Warm-up	Characteristic
Fast	10	10	Ultra reactive, noisy
Standard	**14**	**14**	**PSEDYS default**
Medium	20	20	Balanced
Slow	25	25	Macro filter

---

3. MOM Range — Absolute Unlimited

MOM has no limits — the scale directly depends on the instrument's price level:

```
MOM BTC(14) typical: ±500 to ±5000 USD
MOM ETH(14) typical: ±50 to ±500 USD
MOM altcoin sub-$1: ±0.01 to ±0.1
```

Zero-line = equilibrium. MOM > 0 = price higher than N bars ago. MOM < 0 = price lower.

---

4. Lag and Warm-up

```
First MOM value: bar period + 1 = bar 15 (for period=14)
Warm-up: period bars
Semantic lag: N/2 bars (center of comparative interval)

MOM(14): lag ~7 bars
```

MOM has no smoothing → **the fastest and noisiest** momentum indicator. Frequent whipsaws on short timeframes.

Lag comparison:

```
MOM(14):   ~7 bars lag  ← fastest
ROC(14):   ~7 bars lag  (identical to MOM semantically)
RSI(14):   ~14+ bars lag (Wilder smoothing)
TRIX(14):  ~20 bars lag (triple EMA)
MACD:      ~14 bars lag
```

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

5. MOM Levels — Interpretation

MOM	Interpretation
> 0	Bullish — price higher than N bars ago
= 0	Neutral — price equal to N bars ago
< 0	Bearish — price lower than N bars ago
Positive and rising	Bullish momentum with acceleration
Positive and falling	Bullish momentum with deceleration
Negative and rising	Bearish momentum recovering
Negative and falling	Bearish momentum deepening

OB/OS: no absolute standard — calibrate on the instrument's history or use ROC (normalized) for comparisons.

---

6. Trading Signals

6.1 Zero-line Cross

```
MOM cross zero bullish (from negative to positive):
  Current Close > Close[i−N] → momentum turns positive
  → Long Signal (confirmation)

MOM cross zero bearish (from positive to negative):
  Current Close < Close[i−N] → momentum turns negative
  → Short Signal (confirmation)
```

Semantically identical to ROC cross zero. Signal **filtered with ADX and EMA stack** to reduce false signals.

6.2 Signal Line Crossover

```
MOM > Signal (bullish crossover):
  Momentum accelerating compared to its average → earlier Long signal

MOM < Signal (bearish crossover):
  Momentum decelerating → earlier Short signal
```

Signal crossover is more sensitive than zero-cross — signals before MOM reverses sign.

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

6.3 Divergences

```
Bearish divergence: Price HH + MOM LH
  → Price makes a new high but the difference from N bars ago is smaller
  → Momentum weakening at new highs

Bullish divergence: Price LL + MOM HL
  → Price bottom is lower, but MOM less negative
  → Bears exhausted
```

MOM divergences are semantically identical to ROC divergences.

6.4 Combined Filters

```
entry_long = (
    ema_stack_bullish and     # direction
    adx > 20 and              # strength
    mom > 0 and               # positive momentum
    mom > mom_signal          # accelerating momentum
)

# Acceleration detection
momentum_accelerating = mom > mom_prev and mom > 0
```

7. MOM vs ROC vs TRIX vs RSI — Comparison

Aspect	MOM	ROC	TRIX	RSI
Formula	`C[i]−C[i-N]`	`(C/C[N]-1)×100`	ROC on EMA³	Avg Gain/Avg Loss
Normalization	No (absolute)	Yes (%)	Yes (%)	Yes (0-100)
Smoothing	None	None	Triple EMA	Wilder RMA
Lag	~N/2 bars	~N/2 bars	~3×N/2 bars	N+ bars
Filtering	Minimal	Minimal	Maximum	Medium
Cross-instrument	No (absolute price bias)	Yes	Yes	Yes
Divergences	Yes (frequent, partially false)	Yes	Yes (rare, reliable)	Yes (standard)
Warm-up	N bars	N bars	3N-1 bars	N bars

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

When to choose MOM vs ROC:
- MOM: analysis on a single instrument, simpler to implement
- ROC: cross-instrument comparisons, screener, normalization needed
- TRIX: maximum filtering, medium-long term trend
- RSI: bounded 0-100, standard divergences, smoothed

---

8. MOM in Sideways and Trend Markets

Sideways: MOM frequently oscillates through zero with small amplitude. Frequent false signals. ADX < 20 filter mandatory.

Bullish trend: MOM remains positive with spikes on impulses. MOM falling towards zero = normal pullback. MOM below zero = possible trend end.

Bearish trend: MOM remains negative. MOM rising towards zero = technical bounce. Bullish zero cross = possible reversal.

Ghost effect: If a bar with a large move exits the N-bar window, MOM jumps sharply (up or down) without actual current price movement — identical to ROC.

---

9. MTF

Level	Timeframe	Long Condition
Macro	4H	MOM > 0 (positive momentum on 14 bars 4H)
Meso	1H	MOM > 0 or MOM > Signal (acceleration)
Entry	5M	MOM cross zero bullish or MOM > Signal

Combined MTF:

```
4H: MOM(14) > 0                → active macro bullish trend
1H: MOM(14) > 0, rising        → positive meso momentum
5M: MOM(14) cross zero bullish  → timing entry
→ Triple confirmed Long
```

---

10. PSEDYS — MOM as Acceleration Detector

MOM in PSEDYS complements the EMA stack with momentum acceleration detection:

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

```
# Acceleration/deceleration detection
mom_accelerating = mom > 0 and mom > mom_prev       # bullish + acceleration
mom_decelerating = mom > 0 and mom < mom_prev       # bullish but weakening
mom_recovering   = mom < 0 and mom > mom_prev       # bearish but recovering
mom_deepening    = mom < 0 and mom < mom_prev       # bearish and deepening

# PSEDYS screening filter
bullish_momentum = mom > 0 and mom_accelerating
```

Advantage vs ROC: On a single constantly monitored instrument, MOM provides raw absolute values without normalization — simpler and direct. ROC is necessary for a screener with multiple symbols.

Indicator manual: MOM — Momentum Indicator Part 2 of 2.

11. Bot vs TradingView Validation

Sources of Divergence:

```
□ TradingView Formula: MOM = Close[i] - Close[i - period]
  Some platforms use: MOM = Close[i] / Close[i - period] × 100
  (= ROC factor, not absolute difference!) → completely different scale

□ Period off-by-one: Close[i-period] vs Close[i-period+1]
  → 1 bar difference = systematic error

□ Signal line: some implementations use EMA(9) on MOM, not SMA(9)
  → Signal values differ slightly
```

Checklist:

```
□ MOM = Close[i] - Close[i - period]  (absolute difference, not ratio!)
□ Close[i - period] = bar EXACT period bars ago
□ First value: bar period + 1 (index period, 0-indexed)
□ Tolerance: < 0.0001 (formula without cumulative smoothing)
```

Python Script:

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

```
def mom(closes, period=14):
    n = len(closes)
    mom_v = [None] * n
    for i in range(period, n):
        mom_v[i] = closes[i] - closes[i - period]
    return mom_v

def mom_signal(mom_values, signal_period=9):
    n = len(mom_values)
    signal = [None] * n
    valid = [(i, v) for i, v in enumerate(mom_values) if v is not None]
    for j in range(signal_period - 1, len(valid)):
        idx = valid[j][0]
        signal[idx] = sum(valid[k][1] for k in range(j - signal_period + 1, j + 1)) / signal_peri
    return signal
```

---

12. Practical Exercises

Exercise 1: MOM positive but decreasing for 8 consecutive bars — exit Long?

Situation: On 1H, MOM = +1.2 (from peak +8.7 at 8 bars ago). EMA stack bullish. ADX = 26.

Answer: No forced exit, but tighten trailing SL. MOM > 0 = bullish momentum still present. Decreasing MOM = deceleration (retracement or consolidation in trend). With ADX = 26 and EMA stack bullish, the trend is active. Tighten trailing SL to −1.5× ATR. Exit at: MOM < 0 (momentum reverses) or ADX < 20 (trend weakening).

Exercise 2: MOM cross zero bullish on 5M — direct entry?

Situation: On 5M, MOM(14) crosses from −0.5 to +0.3. EMA 200 4H above price (bearish macro). ADX 4H = 28.

Answer: Skip Long. MOM bullish cross on 5M = micro momentum signal. Macro context bearish (EMA 200 4H above price + ADX 4H = 28 = active bearish trend). Long against macro trend based on MOM 5M signal = high risk. Wait for either macro bias to reverse or use the signal as entry for Short at bounce (MOM 5M turns negative again in 4H bearish trend).

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

13. Cheat Sheet — Quick Summary

Concept	Value / Rule
Formula	`Close[i] − Close[i − period]`
Standard Period	14
Range	Unlimited (absolute, depends on instrument price)
Zero-line	0 — price equal to N bars back
> 0	Bullish — price increased compared to N bars back
< 0	Bearish — price decreased compared to N bars back
Zero cross bull	MOM from negative to positive → momentum turns positive
Zero cross bear	MOM from positive to negative → momentum turns negative
Signal Line	`SMA(MOM, 9)` (standard) or `EMA(MOM, 9)`
Signal crossover bull	MOM > Signal → bullish acceleration
Warm-up	period bars
Lag	N/2 bars semantic
Smoothing	None (raw) — the noisiest momentum indicator
MOM vs ROC	MOM = absolute (price bias); ROC = percentage (cross-instrument)
Ghost effect	Large expiring bar from window → sudden MOM jump
Bearish divergence	Price HH + MOM LH
Bullish divergence	Price LL + MOM HL
Usage	Basic indicator, often replaced by ROC (normalized)
Cause #1 divergence	Ratio vs difference formula (MOM ≠ MOM/Close×100)
Cause #2 divergence	Off-by-one at index Close[i-period]
Cross-instrument	Not recommended — use ROC for screener

PSEDYS MOM Technical Manual v1.0 — May 2026

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS

Downloaded from PSEDYS Ecosystem | t.me/PSEDYS