PSEDYS | TECHNICAL REFERENCE MANUAL V3.0

MFI — Money Flow Index

Technical Reference Manual v1.0

PSEDYS | Complete Edition
RSI of Volume·TP · Money Flow · OB/OS · Divergences · MFI vs RSI vs OBV · MTF · Bot vs TradingView

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1. What is MFI? Concept and Origin

MFI (Money Flow Index) was created by **Gene Quong and Avrum Soudack** and is often described as the **RSI of volume** — instead of comparing Close gains/losses, it compares positive vs negative Money Flow (the value of transactions in a bullish vs bearish direction).

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Philosophy: A bar with a Typical Price higher than the previous bar and high volume = money "flowing into" the instrument (buying pressure). The sum of this money over N bars vs the sum of "outflowing" money = flow ratio.

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2. Calculation Formula — Complete

2.1 Typical Price

```
TP[i] = (High[i] + Low[i] + Close[i]) / 3
```

2.2 Raw Money Flow (RMF)

```
RMF[i] = TP[i] × Volume[i]
```

2.3 Positive/Negative Money Flow

```
If TP[i] > TP[i-1]: Positive_MF[i] = RMF[i], Negative_MF[i] = 0
If TP[i] < TP[i-1]: Positive_MF[i] = 0, Negative_MF[i] = RMF[i]
If TP[i] = TP[i-1]: Positive_MF[i] = 0, Negative_MF[i] = 0
```

2.4 Money Flow Ratio and MFI

```
Positive_MF_Sum[i] = Σ Positive_MF[j]  for j = i-period+1..i
Negative_MF_Sum[i] = Σ Negative_MF[j]  for j = i-period+1..i

MFR[i] = Positive_MF_Sum[i] / Negative_MF_Sum[i]
MFI[i] = 100 - 100 / (1 + MFR[i])
```

Special cases:
- Negative_MF_Sum = 0: MFI = 100 (all positive flow)
- Positive_MF_Sum = 0: MFI = 0 (all negative flow)

Standard period: 14

2.5 Complete Numerical Example — period=14

First MFI value: bar 15 (bars 2–15 for calculation, bar 1 has no previous TP)

Verification bar 15:

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```
Positive_MF_Sum[15] = 3,577,013.56  (sum of RMF on bullish TP bars from bars 2-15)
Negative_MF_Sum[15] = 873,876.14    (sum of RMF on bearish TP bars)

MFR = 3,577,013.56 / 873,876.14 = 4.0933

MFI = 100 - 100/(1+4.0933)
    = 100 - 100/5.0933
    = 100 - 19.63
    = 80.37  ✓  (Overbought — dataset in bullish trend)
```

MFI Table bars 15–24:

Bar	MFI	Zone
15	**80.37**	OB
16	80.59	OB
17	**85.06**	OB
18	84.39	OB
19	83.87	OB
20	83.74	OB
21	82.68	OB
22	83.25	OB
23	83.00	OB
24	**83.90**	OB

3. MFI Levels — Interpretation

MFI	Zone	Significance
> 80	**OB**	Extreme positive money flow — high buying pressure
60–80	Bullish	Bullish bias — more positive money flow
50	**Neutral**	Money flow equilibrium
20–40	Bearish	Bearish bias — more negative money flow
< 20	**OS**	Extreme negative money flow — selling pressure

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4. Lag and Warm-up

```
First MFI value: bar period+1 = bar 15 (for period=14)
Warm-up: period+1 bars (requires previous TP for bar 2)
Lag: rolling sum direct, no smoothing → lag ~N/2 bars
```

---

5. Trading Signals

5.1 Classic OB/OS

```
MFI > 80 (OB): excessive buying pressure → possible bearish reversal
  → In trend: riding with tight SL; do not Short directly
  → In range: Short when MFI falls below 80

MFI < 20 (OS): excessive selling pressure → possible bullish reversal
  → Long when MFI rises above 20 + EMA stack confirmation
```

5.2 Divergences

Bearish divergence:

```
Price Higher High + MFI Lower High
→ Money flow does not confirm the new high → fewer buyers at the same price
→ Strong bearish signal
```

Bullish divergence:

```
Price Lower Low + MFI Higher Low
→ Negative money flow is decreasing → sellers are weakening
→ Bullish signal
```

MFI divergences are considered **more reliable than RSI** because they include volume — an RSI divergence without MFI confirmation is less credible.

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5.3 Combined Filters

```
entry_long = (
    mfi < 25 and                # OS (extreme selling pressure)
    rsi < 35 and                # RSI confirmed OS
    ema_stack_bullish_4h and    # macro bullish trend
    adx > 18
)

# Bearish divergence detected
bearish_div = price_hh and mfi < mfi_prev_hh * 0.95  # MFI 5%+ lower
```

6. MFI vs RSI vs OBV — Comparison

Aspect	MFI	RSI	OBV
Basis	TP × Volume (money flow)	Close vs Previous Close	Directional volume
Normalization	0–100 (like RSI)	0–100	Cumulative (unbounded)
Volume included	Yes (direct in formula)	No	Yes
OB/OS	80/20	70/30	Not standard
Divergences	Yes (more reliable with vol)	Yes (standard)	Yes (cumulative)
Smoothing	None (rolling sum)	Wilder RMA	None
Warm-up	period+1 bars	period+1 bars	0 bars

MFI vs RSI: MFI = RSI with volume. A price increase with low volume contributes less to MFI than the same increase with high volume → more sensitive to market participation.

7. MFI in Various Regimes

Bullish trend: MFI maintains > 50, frequently > 60–70. High volume bullish bars dominate.

Sideways: MFI oscillates around 50. Spikes to OB/OS at range extremes.

Bearish trend: MFI maintains < 50, frequently < 30–40.

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8. MTF

Level	Timeframe	Long Condition
Macro	4H	MFI > 50 (positive macro money flow)
Meso	1H	MFI > 40 and rising
Entry	5M	MFI exit OS (< 20 → > 20) or MFI > 50

9. PSEDYS — MFI as Volume-Price Confirmation

```
# Volume-price momentum
vp_bullish = mfi > 60 and close > vwap
vp_bearish = mfi < 40 and close < vwap

# OS exit signal
mfi_exit_os = mfi_prev < 20 and mfi_curr > 20   # MFI returns from OS

entry_long = (
    mfi_exit_os and
    ema_stack_bullish and
    adx > 18
)
```

10. Bot vs TradingView Validation

```
□ TP = (H+L+C)/3
□ RMF = TP × Volume
□ Positive_MF: RMF if TP[i] > TP[i-1], otherwise 0
□ Negative_MF: RMF if TP[i] < TP[i-1], otherwise 0
□ MFI = 100 - 100/(1 + Pos_Sum/Neg_Sum)
□ Rolling window: [i-period+1:i+1] inclusive
□ Neg_Sum = 0: MFI = 100; Pos_Sum = 0: MFI = 0
□ Tolerance: < 0.1
```

Python Script:

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```
def mfi(highs, lows, closes, volumes, period=14):
    n = len(closes)
    tp = [(highs[i]+lows[i]+closes[i])/3 for i in range(n)]
    pos_mf = [0.0]*n; neg_mf = [0.0]*n
    for i in range(1, n):
        rmf = tp[i]*volumes[i]
        if tp[i] > tp[i-1]:   pos_mf[i] = rmf
        elif tp[i] < tp[i-1]: neg_mf[i] = rmf
    mfi_v = [None]*n
    for i in range(period, n):
        p = sum(pos_mf[i-period+1:i+1])
        ng = sum(neg_mf[i-period+1:i+1])
        if ng == 0:   mfi_v[i] = 100.0
        elif p == 0:  mfi_v[i] = 0.0
        else:         mfi_v[i] = 100 - 100/(1+p/ng)
    return mfi_v
```

---

11. Practical Exercises

Exercise 1: Confirmed Bearish MFI Divergence

Situation: BTC/USDT 4H. Price makes HH at 65000 (compared to previous 63500). MFI = 68 (compared to previous 79 at 63500). ADX = 31. Long position open.

Response: Tighten SL aggressively — valid bearish divergence. Lower MFI at the new high = buyers contributed less (with lower volume) to the new maximum. ADX = 31 = active trend but may be topping. Tighten trailing SL to 1×ATR below Close. Do not force exit now (active trend), but be prepared.

Exercise 2: MFI < 20 in 4H Bearish Trend

Situation: ETH/USDT 1H. 4H bearish trend (EMA stack bearish). MFI 1H = 16. ADX 1H = 22.

Response: Skip Long — OS in bearish trend. MFI < 20 = extreme selling pressure, but the macro context is bearish. OS in bearish trend = not a Long signal, but possible bearish continuation. Wait for either macro trend reversal (EMA 4H stack bullish) or confirmed OS exit on 4H (not 1H).

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12. Cheat Sheet — Quick Summary

Concept	Value / Formula
TP	`(H+L+C)/3`
RMF	`TP × Volume`
Positive MF	RMF if `TP[i] > TP[i-1]`
Negative MF	RMF if `TP[i] < TP[i-1]`
MFR	`Pos_Sum / Neg_Sum`
MFI	`100 - 100/(1+MFR)`
Standard period	14
OB	> 80
OS	< 20
Neutral	50
Warm-up	period+1 bars
Bearish Div.	Price HH + MFI LH
Bullish Div.	Price LL + MFI HL
vs RSI	MFI = RSI with volume (more reliable)
vs OBV	MFI: bounded 0–100; OBV: cumulative
Error Cause #1	Close instead of TP
Error Cause #2	Rolling sum vs Wilder smoothing

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