PSEDYS | TECHNICAL REFERENCE MANUAL V3.0

OBV — On-Balance Volume

Technical Reference Manual v1.0

PSEDYS | Complete Edition
Directional Cumulative Volume · Divergences · Trend Confirmation · OBV vs Price · MTF · Bot vs TradingView

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1. What is OBV? Concept and Origin

OBV (On-Balance Volume) was created by **Joseph Granville** and popularized in the book New Key to Stock Market Profits (1963). OBV adds the entire bar's volume if the price increased and subtracts the entire bar's volume if the price decreased, accumulating a cumulative total.

Granville's Philosophy: Volume precedes price. If OBV rises before the price increases, accumulation is occurring (smart money is buying). If OBV falls before the price decreases, distribution is occurring.

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2. Calculation Formula — Complete

2.1 Update Rule

```
OBV[0] = 0  (or any start value — DIRECTION matters, not the absolute value)

If Close[i] > Close[i-1]: OBV[i] = OBV[i-1] + Volume[i]   ← bullish bar = +vol
If Close[i] < Close[i-1]: OBV[i] = OBV[i-1] - Volume[i]   ← bearish bar = -vol
If Close[i] = Close[i-1]: OBV[i] = OBV[i-1]               ← neutral = unchanged
```

Note: The absolute OBV value is meaningless — what matters is the trend (rising or falling) and divergence from price.

2.2 Complete Numerical Example — 50 bars

Verify first 5 bars:

```
Bar 1: OBV = 0  (base)
Bar 2: Close[2]=99.27 > Close[1]=99.00 → OBV = 0 + 1456 = 1456  ✓
Bar 3: Close[3]=99.78 > Close[2]=99.27 → OBV = 1456 + 1102 = 2558
Bar 4: Close[4]=101.13 > Close[3]=99.78 → OBV = 2558 + 4037 = 6595
Bar 5: Close[5]=102.07 > Close[4]=101.13 → OBV = 6595 + 2126 = 8721
```

OBV bar selection table:

Bar	Close	Volume	OBV	Direction
1	99.00	3619	0	—
2	99.27	1456	1456	Bull
3	99.78	1102	2558	Bull
4	101.13	4037	6595	Bull
5	102.07	2126	8721	Bull
10	102.31	1419	8668	Bear (micro)
20	103.35	1383	18178	Bull
30	107.43	3872	32718	Strong Bull
40	106.92	4108	22690	Bear (correction)
50	111.83	4127	38032	Bull

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3. OBV Interpretation

```
Rising OBV + Rising Price: confirmed bullish trend (volume supports rise)
Rising OBV + Flat/Falling Price: ACCUMULATION → bullish divergence
Falling OBV + Falling Price: confirmed bearish trend
Falling OBV + Flat/Rising Price: DISTRIBUTION → bearish divergence
```

OBV as a "smart money tracker": Granville asserted that institutions buy/sell before the price moves visibly → OBV confirms or refutes the price movement.

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4. Lag and Warm-up

```
First OBV value: bar 1 (start at 0)
Warm-up: 0 bars (calculated from the first bar)
Lag: 0 structural (cumulative in real-time)
But: OBV divergences require a few bars to become visible
```

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5. Trading Signals

5.1 OBV Trend Confirmation

```
Valid bullish trend:
  Price makes HH + OBV makes HH (volume supports rise)
  → Long hold / add position

Suspect bullish trend:
  Price makes HH + OBV makes LH (volume does not confirm)
  → Tighten SL or reduce position
```

5.2 OBV vs Price Divergences

Bearish Divergence (distribution):

```
Price makes Higher High + OBV makes Lower High
→ Smart money distributes at high prices
→ Strong bearish signal (exit Long or enter Short)
```

Bullish Divergence (accumulation):

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```
Price makes Lower Low + OBV makes Higher Low
→ Smart money accumulates at low prices
→ Strong bullish signal (enter Long or exit Short)
```

5.3 OBV Breakout

```
OBV exceeds an OBV resistance level (previous high):
  → Confirms that the next price breakout is likely real

OBV below an OBV support level (previous low):
  → Likely price breakdown
```

5.4 Combined Filters

```
# OBV trend
obv_rising = obv > obv_prev_n  # OBV higher than N bars ago
obv_falling = obv < obv_prev_n

# Confirm entry
entry_long = (
    price_bullish_signal and
    obv_rising and              # volume supports
    ema_stack_bullish
)

# Divergence detection
bearish_div = (
    price_makes_hh and
    obv < obv_prev_hh          # OBV does not confirm new high
)
```

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6. OBV vs A/D Line vs CMF — Comparison

Aspect	OBV	A/D Line	CMF
Allocated Volume	Total (100% bull or 100% bear)	Proportional (Close relative to H/L)	Proportional × period
Sensitivity	High (all volume counts)	Moderate (weighted by Close position)	Moderate
Smoothing	None	None	SMA(period) implicit
Output Type	Cumulative (rise/fall)	Cumulative	Oscillator (−1 to +1)
Divergences	Excellent	Good	Moderate

7. OBV in Various Regimes

Active bullish trend: OBV rises consistently with price. Price pullbacks on low volume → OBV flattens but does not fall → healthy trend.

Sideways: OBV oscillates sideways. OBV spikes at resistance (distribution) or at support (accumulation).

Reversal: OBV diverges from price a few bars before reversal. The earliest available signal.

8. MTF

Level	Timeframe	OBV Usage
Macro	4H/1D	Major divergences on 4H → macro trend change
Meso	1H	Meso trend confirmation (rising OBV with price)
Entry	5M	No — OBV on 5M too noisy for entry

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9. PSEDYS — OBV as Trend Validator

```
# OBV slope
obv_slope_n = (obv[i] - obv[i-n]) / n   # n=10 bars

# OBV trend confirmation
obv_confirms_bull = obv_slope_n > 0 and price_trend == 'bull'
obv_diverges_bear = price_trend == 'bull' and obv_slope_n < 0  # bearish divergence

# Screener: symbols with OBV accumulation
bullish_accumulation = obv_slope_20 > 0 and price_below_resistance
```

---

10. Bot vs TradingView Validation

```
□ Close[i] > Close[i-1]: OBV += Volume[i]
□ Close[i] < Close[i-1]: OBV -= Volume[i]
□ Close[i] = Close[i-1]: OBV unchanged
□ Start value: 0 (or any constant — only direction matters)
□ Volume: same timeframe as candles
□ Tolerance: 0 (exact formula, no smoothing)
```

Python Script:

```
def obv(closes, volumes):
    n = len(closes)
    obv_v = [0] * n
    for i in range(1, n):
        if closes[i] > closes[i-1]:   obv_v[i] = obv_v[i-1] + volumes[i]
        elif closes[i] < closes[i-1]: obv_v[i] = obv_v[i-1] - volumes[i]
        else:                          obv_v[i] = obv_v[i-1]
    return obv_v
```

---

11. Practical Exercises

Exercise 1: Price at All-Time High, OBV below previous ATH

Situation: BTC/USDT 4H. Price exceeded ATH by 3%. OBV 8% below the maximum from the previous ATH period. ADX = 28.

Answer: Bearish OBV divergence — tighten SL, no addition. OBV below previous ATH at new high prices = likely institutional distribution. Tighten trailing SL to 1.5×ATR. Do not Short

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immediately (ADX=28 = active trend), but do not increase exposure. Exit if OBV falls below major support level or RSI divergence confirmed.

Exercise 2: Rising OBV in sideways

Situation: ETH/USDT 1H. Price sideways for 5 days (±0.5% range). OBV increased by 15% in the same period. ADX = 14.

Answer: Accumulation — prepare Long. Rising OBV with flat price = accumulation (smart money buying gradually without visibly moving the price). ADX = 14 = imminent breakout. Anticipated Long entry on the first bullish bar with RVOL > 1.5 or at breakout above the range. SL below the range Low.

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12. Cheat Sheet — Quick Summary

Concept	Value / Rule
Formula	`OBV += Vol (bull), OBV -= Vol (bear), unchanged (neutral)`
Start	0 (absolutely irrelevant, trend matters)
Warm-up	0 bars
Lag	0 structural
Rising OBV	Buying pressure or accumulation
Falling OBV	Selling pressure or distribution
Bearish Div.	Price HH + OBV LH → distribution
Bullish Div.	Price LL + OBV HL → accumulation
OBV breakout	OBV > previous OBV high → price confirmation
Accumulation	Rising OBV + flat price → Long preparation
Distribution	Falling OBV + flat price → Short preparation
vs A/D	OBV: all volume; A/D: proportional to Close relative to H/L
Usage	Divergences + trend confirmation + accumulation/distribution
Cause #1 error	Different volume source (spot vs futures)

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