PSEDYS | TECHNICAL REFERENCE MANUAL V3.0

StochRSI — Stochastic RSI Technical Reference Manual v1.0

PSEDYS | Complete Edition

RSI → StochRSI → %K → %D · Double Oscillator · Range 0–1 · OB/OS · Sensitivity · StochRSI vs RSI vs Stoch · MTF · Bot vs TradingView

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1. What is StochRSI? Concept and Innovation

StochRSI was created by Tushar Chande and Stanley Kroll and published in 1994. It is an **oscillator of an oscillator** — applying the Stochastic formula to RSI values (not prices):

```
StochRSI = Stochastic(RSI)    ← not Stochastic(Price)
```

Why StochRSI exists:
- Standard RSI can remain in non-extreme zones (40–60) for long periods → rare signals
- Stochastic on price is too sensitive to absolute High/Low → false signals
- StochRSI captures RSI extremes, not price extremes → more sensitive than RSI, more robust than Stochastic on price

StochRSI vs others:

Indicator	Applied on	Sensitivity	False signals
RSI	Close (changes)	Medium	Few
Stochastic	High/Low/Close	High	Many
StochRSI	**RSI values**	**Very high**	**Many in sideways**

2. Calculation Formula — Complete

2.1 Step 1 — RSI (base)

```
RSI = rsi(Close, rsi_period=14)    ← standard Wilder formula (K=1/N)
```

Identical to standard RSI — Wilder RMA, K=1/14.

2.2 Step 2 — StochRSI Raw

```
StochRSI[i] = (RSI[i] − Lowest(RSI, stoch_period)) /
              (Highest(RSI, stoch_period) − Lowest(RSI, stoch_period))

RSI window: last stoch_period RSI values (not prices!)
```

Range: 0–1 (not 0–100 like RSI or Stochastic):

```
StochRSI = 0:    Current RSI = lowest RSI in last N bars (RSI at minimum)
StochRSI = 1:    Current RSI = highest RSI in last N bars (RSI at maximum)
StochRSI = 0.5:  RSI at the midpoint of its recent range
```

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Special case: if HH(RSI) = LL(RSI) (stagnant RSI), StochRSI = 0.5.

2.3 Step 3 — %K

```
%K[i] = SMA(StochRSI, K_smooth=3)
```

Light smoothing to reduce raw noise of StochRSI.

2.4 Step 4 — %D

```
%D[i] = SMA(%K, D_smooth=3)    ← signal line
```

2.5 Complete Numeric Example — 80 bars

Parameters: RSI=14, Stoch=14, K=3, D=3. Warm-up = 31 bars.

Manual check bar 28 (first StochRSI value):

```
RSI window [bars 15..28] (14 RSI values):
  Min RSI = 98.19, Max RSI = 100.00
  RSI[28] = 98.24

StochRSI = (98.24 − 98.19) / (100.00 − 98.19) = 0.05 / 1.81 = 0.0249  ✓
```

Key bars table (31–80):

Bar	Close	RSI	StochRSI	%K	%D	Zone
30	111.74	81.96	0.0000	0.008	N/A	OS
36	109.83	61.08	0.0417	0.019	0.008	OS
42	107.51	40.60	0.0000	0.000	0.005	OS
45	105.92	31.61	0.0000	0.000	0.000	OS
48	106.40	37.81	0.2311	0.143	0.070	BEARISH
51	108.16	53.35	0.7441	0.619	0.458	BULLISH
54	109.82	64.29	**1.0000**	0.996	0.897	**OB**
57	111.89	73.67	1.0000	**1.000**	**1.000**	**OB extreme**
80	121.52	93.49	1.0000	1.000	1.000	OB extreme

Key observations:
- Bars 30–45: StochRSI ≈ 0 — RSI at its minimum → strong OS signal (RSI at its lowest level in

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the last 14 bars)
- Bar 48–51: StochRSI rises quickly from 0 to 0.74 → recovery momentum
- Bars 54+: StochRSI = 1.0 constant → RSI at its maximum → extreme bullish trend

StochRSI = 1 for 30+ consecutive bars (bars 54–80) — in a strong bullish trend, RSI remains at the maximum of the 14-bar window → StochRSI locked at 1.

2.6 Alternative Parameters

Variant	RSI	Stoch	K	D	Warm-up	Characteristic
Standard	**14**	**14**	**3**	**3**	**31**	**PSEDYS default**
Fast	8	8	3	3	19	Scalp small TF
Slow	21	14	3	3	38	Macro filter
No smooth	14	14	1	1	29	Raw StochRSI

3. Combined Logic — RSI + Stochastic

StochRSI answers two questions simultaneously:

```
RSI (question 1): are average gains greater than average losses?
Stochastic on RSI (question 2): is the current RSI at extremes compared to its recent past?

Combined:
StochRSI ≈ 1 + RSI > 70: RSI at recent maximum and absolutely bullish → extreme bullish momentum
StochRSI ≈ 0 + RSI < 30: RSI at recent minimum and absolutely bearish → extreme bearish momentum
StochRSI ≈ 1 + RSI = 55: RSI at recent maximum BUT in neutral zone → modest recovery, not strong
```

4. Range 0–1 vs 0–100

StochRSI raw is in the range **0–1**. TradingView displays values multiplied by 100 (0–100) for visual consistency with classic Stochastic.

```
StochRSI raw:  0–1
TradingView:   0–100 (= StochRSI × 100)

Standard OB:   StochRSI > 0.80 (raw) = 80 (TV)
Standard OS:   StochRSI < 0.20 (raw) = 20 (TV)
```

Bot implementation: Check if values are in 0–1 or 0–100 — if in 0–1, OB/OS thresholds are 0.8 and 0.2.

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5. Lag and Warm-up

```
Total warm-up = rsi_period + stoch_period + K_smooth + D_smooth − 3
              = 14 + 14 + 3 + 3 − 3 = 31 bars

Breakdown:
  Bars 1..14:   RSI seed (SMA of first 14 changes)
  Bar 15:       First RSI value
  Bars 15..28:  14 RSI values for StochRSI seed
  Bar 28:       First StochRSI value
  Bars 28..30:  3 StochRSI values for %K seed
  Bar 30:       First %K value
  Bars 30..32:  3 %K values for %D seed
  Bar 32:       First complete %D value
```

Effective lag: StochRSI is the fastest oscillator — reacts to RSI changes almost instantly, without additional Wilder smoothing.

6. StochRSI Levels

Level (×100)	Zone	Meaning
> 80	**Overbought**	RSI at recent maximum → extreme bullish momentum
50–80	Bullish	RSI in the upper half of its range
50	**Neutral**	RSI at the midpoint of its recent range
20–50	Bearish	RSI in the lower half
< 20	**Oversold**	RSI at recent minimum → extreme bearish momentum
= 100 (=1)	Extreme OB	RSI at absolute maximum in window
= 0	Extreme OS	RSI at absolute minimum in window

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7. Trading Signals

7.1 OB/OS and Cross Centerline (0.5 / 50)

```
StochRSI exit OS (0→>0.20):   bearish momentum ends → possible Long
StochRSI exit OB (1→<0.80):   bullish momentum ends → possible Short
StochRSI cross 0.50 bullish:   move into bullish zone
StochRSI cross 0.50 bearish:   move into bearish zone
```

7.2 %K/%D Crossover

```
%K cross above %D in OS zone (<0.20): Long signal
%K cross below %D in OB zone (>0.80): Short signal
```

Filters: Closed candle + ADX > 15 + EMA direction confirmation.

7.3 Divergences

Identical to RSI/Stochastic — captures loss of momentum:

```
Price HH + StochRSI LH → bearish divergence
Price LL + StochRSI HL → bullish divergence
```

7.4 StochRSI = 1 or = 0 Extended

When %K = 1.0 or 0.0 for multiple consecutive bars:

```
%K = 1.0 persistent: RSI remains at window maximum → extreme bullish trend
  → Not a Short signal! It is a confirmation of a strong trend
  → Exit from 1.0 (%K drops below 0.80) = first warning signal

%K = 0.0 persistent: RSI remains at window minimum → extreme bearish trend
  → Exit from 0.0 (%K rises above 0.20) = first recovery signal
```

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8. StochRSI vs RSI vs Stochastic — Comparison Triangle

Aspect	StochRSI	RSI	Stochastic
Sensitivity	Very high	Medium	High
OB/OS levels	0.80/0.20	70/30	80/20
False signals	Many	Few	Many
Time in OB/OS	Short (fast)	Medium	Medium
Warm-up	31 bars	15 bars	16 bars
Trend filter	Weak	Good (RSI 50)	Medium
Divergences	Good	Excellent	Good
Ideal TF	5M–15M	15M–1H	Any
Ideal context	Ultra-fast timing	Trend filter, divergences	Range timing

General rule:
- RSI for macro trend filter (RSI 50 as bias)
- StochRSI for ultra-fast entry timing in confirmed trend
- Stochastic for range trading (OB/OS at range extremes)

---

9. StochRSI in Trending Markets

StochRSI is **more useful in trend** than classic RSI for entry timing:

```
Active bull trend (EMA stack + ADX > 20):
  StochRSI retraces to < 0.20 (OS) → buy the dip
  This happens more frequently than RSI < 30 in the same context
  → More entry opportunities in trend

Active bear trend:
  StochRSI rises to > 0.80 (OB) → sell the rally
```

Limitation in extreme trend: Persistent StochRSI = 1.0 (as in numeric example, bars 54–80) → no differentiated signals offered.

Indicator manual: StochRSI — Stochastic RSI Technical Reference Manual v1.0 Part 2 of 2.

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10. Multi-Timeframe Analysis (MTF)

Level	Timeframe	Usage
Macro	4H	RSI 4H > 50 (not StochRSI)
Meso	1H	StochRSI > 0.50 and rising
Micro	15M	StochRSI exit OS + %K cross %D
Entry	5M	%K cross %D in OS zone (<0.20)

Complete Long Setup:

```
RSI 4H > 50 + EMA stack bullish + ADX > 18 + StochRSI 5M exit OS
= Quality Long Entry
```

11. PSEDYS — StochRSI as Ultra-Fast Timing Filter

StochRSI on 5M is the fastest momentum indicator in the series — ideal for timing entry on signals generated by EMA + ADX + MACD:

```
entry_long = (
    ema_stack_bullish and        # direction
    adx > 18 and                 # strength
    rsi_4h > 50 and              # macro RSI
    stochrsi_k < 0.20 and        # local oversold
    stochrsi_k > stochrsi_d      # momentum returning
)
```

12. Bot vs TradingView Validation

Main Sources of Divergence:

Source	Impact
RSI calculated with standard K vs Wilder	Major
StochRSI range 0–1 vs 0–100	Major (incorrect thresholds)
Stoch window on RSI: inclusive vs exclusive	Moderate
HH=LL RSI: 0.5 vs 0 or 1	Minor

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Checklist:

```
□ Internal RSI: K = 1/N (Wilder), NOT 2/(N+1)
□ StochRSI raw: range 0–1
□ OB/OS thresholds: 0.8 / 0.2 (raw) or 80/20 (if ×100)
□ %K = SMA(StochRSI, 3), %D = SMA(%K, 3)
□ Stoch window: rsi[i-period+1:i+1] → period elements
□ Tolerance: < 0.01 (raw) or < 1 point (TV scale)
```

Python Script:

```
def stochrsi(closes, rsi_period=14, stoch_period=14, k_smooth=3, d_smooth=3):
    rsi_v = rsi(closes, rsi_period)  # Wilder RSI
    n = len(closes)
    srsi = [None] * n
    for i in range(rsi_period + stoch_period - 1, n):
        window = [rsi_v[j] for j in range(i-stoch_period+1, i+1)
                  if rsi_v[j] is not None]
        if len(window) == stoch_period:
            hh = max(window); ll = min(window)
            srsi[i] = (rsi_v[i] - ll) / (hh - ll) if hh != ll else 0.5
    k = smooth_sma(srsi, k_smooth)
    d = smooth_sma(k, d_smooth)
    return srsi, k, d
```

---

13. Practical Exercises with Complete Answers

Exercise 1: Persistent StochRSI = 1 — Short Signal?

Situation: BTC on 15M. StochRSI %K = 1.0 for 12 bars. RSI 15M = 78. EMA stack bullish. ADX = 35.

Answer: NO Short. Persistent %K = 1.0 = RSI at its window maximum = extreme bullish trend. Stay Long, tighten trailing SL. The warning signal comes when %K drops below 0.80.

Exercise 2: StochRSI exit OS in a bullish context

Situation: On 5M, StochRSI %K rises from 0.08 to 0.24 (exit OS). %K > %D. EMA 200 4H < price. RSI 4H = 62. ADX = 22.

Answer: Valid Long Entry. Exit OS + %K > %D = momentum returning. RSI 4H > 50 + EMA 200 bullish = macro context OK. ADX 22 > 18 = strength. Enter with SL below the last Low. TP1 at StochRSI = 0.80.

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Exercise 3: StochRSI vs RSI — which is more useful on 5M?

Situation: On 5M, RSI = 54 (neutral, no signal). StochRSI %K = 0.15 (OS) and rising.

Answer: StochRSI on 5M. RSI at 54 gives no clear signal. But RSI has decreased from its maximum over the last 14 bars (current RSI = recent minimum) → StochRSI captures this pullback. On small TFs, StochRSI provides more frequent and actionable algotrading signals.

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14. Cheat Sheet — Quick Summary

Concept	Value / Rule
Formula	`(RSI − LL_RSI) / (HH_RSI − LL_RSI)`
%K	`SMA(StochRSI, 3)`
%D	`SMA(%K, 3)`
Raw Range	0–1 (TradingView: ×100 = 0–100)
Standard Parameters	RSI=14, Stoch=14, K=3, D=3
Warm-up	31 bars (14+14+3+3−3)
OB	> 0.80 (or 80 TV)
OS	< 0.20 (or 20 TV)
%K = 1.0 persistent	Extreme bullish trend — no Short
%K = 0.0 persistent	Extreme bearish trend — no Long
Exit OS signal	%K rises above 0.20 → Long timing
Exit OB signal	%K drops below 0.80 → Short timing
%K cross %D in OS	Strong Long signal
%K cross %D in OB	Strong Short signal
RSI seed	Wilder K=1/N (not standard EMA)
StochRSI vs RSI	StochRSI faster; RSI more reliable
Ideal for	Ultra-fast entry timing in trend
Cause #1 divergence	RSI calculated with standard K, not Wilder
Cause #2 divergence	Thresholds 0.8/0.2 vs 80/20 (scale 0–1 vs 0–100)

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