

NC ATR Renko Bars

User Manual · Version 1.0

Renko bricks whose size follows the market: the brick size comes from the Average True Range of a timeframe you choose. Two versions are included: one draws classic even bricks, the other uses only real prices.

Brick size from the ATR

ATR of the timeframe you choose, times a multiplier.
Bricks grow when the market gets busier and shrink when it calms down.

Live building bar

The bar in progress moves with every trade, as on NinjaTrader's own Renko.

Two versions

NC ATR Renko: classic even bricks. NC ATR Renko-P: every open, high, low and close is a real trade.

Same ATR as NinjaTrader

The timeframe bars and the ATR are built the same way as NinjaTrader's minute bars and ATR indicator.

CONTENTS

- | | |
|---------------------------------------|-------------------------------|
| 1. Installing | 6. Worked example |
| 2. Adding the bars to a chart | 7. Which one to use |
| 3. How the brick size is worked out | 8. Choosing the settings |
| 4. NC ATR Renko: how a brick is built | 9. Strategies and NinjaScript |
| 5. NC ATR Renko-P: how a bar is built | 10. Good to know |

01 Installing

- 1 If the older **ATR Renko** and **ATR Renko-P** bars are installed, remove them first. In the NinjaScript Editor, open the **BarsTypes** folder, right-click **ATRRenko** and **ATRRenkoPrecise** and remove them. The NC versions use the same bars type ids (56 and 58), so the old and new files can't be installed together.
- 2 In the Control Center, choose **Tools** → **Import** → **NinjaScript Add-On...** and select the NC ATR Renko Bars zip file.
- 3 NinjaTrader compiles the import. **NC ATR Renko V1.0** and **NC ATR Renko-P V1.0** now appear in the **Type** list of every Data Series window.

In this manual, the pieces of **NC ATR Renko** are called **bricks** and the pieces of **NC ATR Renko-P** are called **bars**, so it is always clear which version is meant.

02 Adding the bars to a chart

- 1 Open a new chart (**New** → **Chart**), or right-click an existing chart and choose **Data Series...** (Ctrl+F).
- 2 Select the instrument, then under **Type** choose **NC ATR Renko V1.0** or **NC ATR Renko-P V1.0**.
- 3 Set **ATR Period**, **ATR Timeframe (min)** and **Multiplier**.
- 4 Set **Days to load** (default 30). Load enough days for the warm-up plus the days you want to see (section 8).

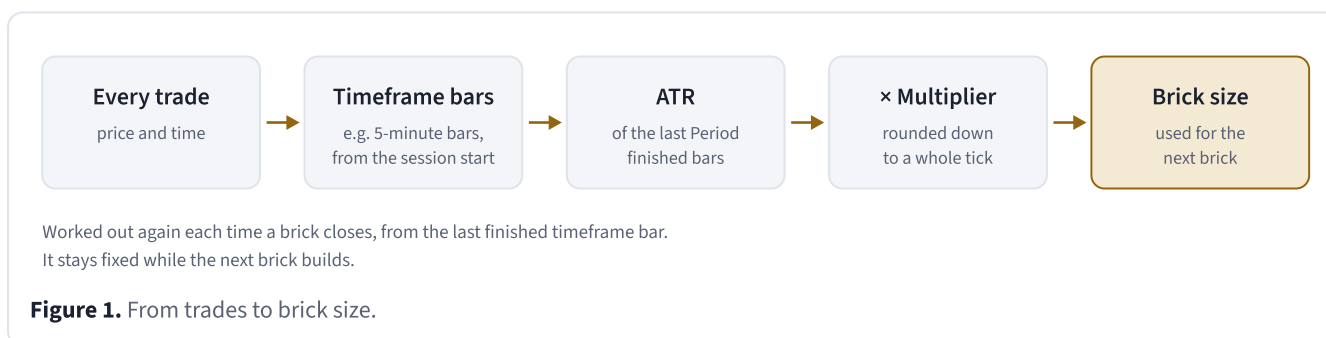
5 Click **OK**. The chart label shows the settings, for example `NC ATR Renko(60) 5min x1`.

Setting	Default	What it does
ATR Period	60	How many finished timeframe bars the ATR averages.
ATR Timeframe (min)	5	Length in minutes of the time bars the ATR is measured on. Any whole number of minutes: 1, 5, 15, 60, 240...
Multiplier	1	Brick size = ATR × Multiplier. Whole numbers only: 2 doubles the brick size.
Days to load	30	Days of tick data the bars are built from. The first part is used for the warm-up.
Break at EOD	—	Not used. Bricks run across sessions.
Chart style	Your choice	Candlestick is recommended. It shows the wicks of Renko-P bars and of the building bar.

Values below 1 are treated as 1.

03 How the brick size is worked out

Both versions work out the brick size the same way. It comes from the Average True Range (ATR), measured on regular time bars that the bars type builds itself from the same trades. You don't need a second chart or an indicator for this.



The timeframe bars

- Every trade goes into a time bar that is **ATR Timeframe** minutes long.
- The bars are counted from the session start of the data series' **Trading hours** template, the same way NinjaTrader builds its own minute bars. The last bar of a session ends at the session close, and a new session starts a new bar. For example, 60-minute bars on US stocks run 9:30–10:30, 10:30–11:30, and so on.
- Only finished bars count. The bar that is still running never changes the brick size.

The ATR

- The true range of a bar is the largest of: high – low, high – previous close, and previous close – low. It includes gaps from the previous bar.
- $ATR = (\text{previous ATR} \times (\text{Period} - 1) + \text{true range}) \div \text{Period}$. This is the same formula as NinjaTrader's ATR indicator, so with the same trading hours, ATR(60) on a 5-minute chart shows the value the bars type uses.

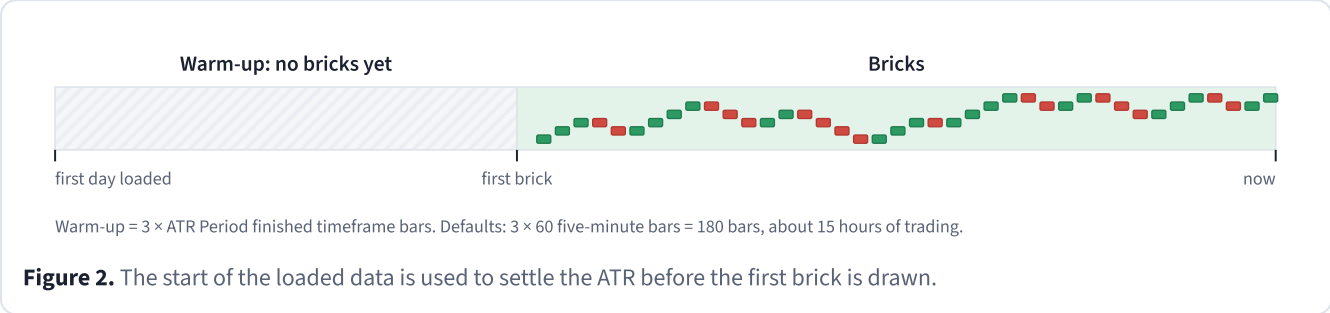
From ATR to brick size

- Brick size = ATR × Multiplier, rounded **down** to a whole tick. The smallest possible size is 1 tick × Multiplier.

- The size is worked out each time a brick closes, from the last finished timeframe bar, and stays fixed while the next brick builds. Bricks can differ in size from one to the next, but a brick never changes size while it is building.

Example. On ES (tick size 0.25) the ATR is 3.37 points. With Multiplier 1 the brick size is 3.25 points (13 ticks). With Multiplier 2 it is 6.74, rounded down to 6.50 points.

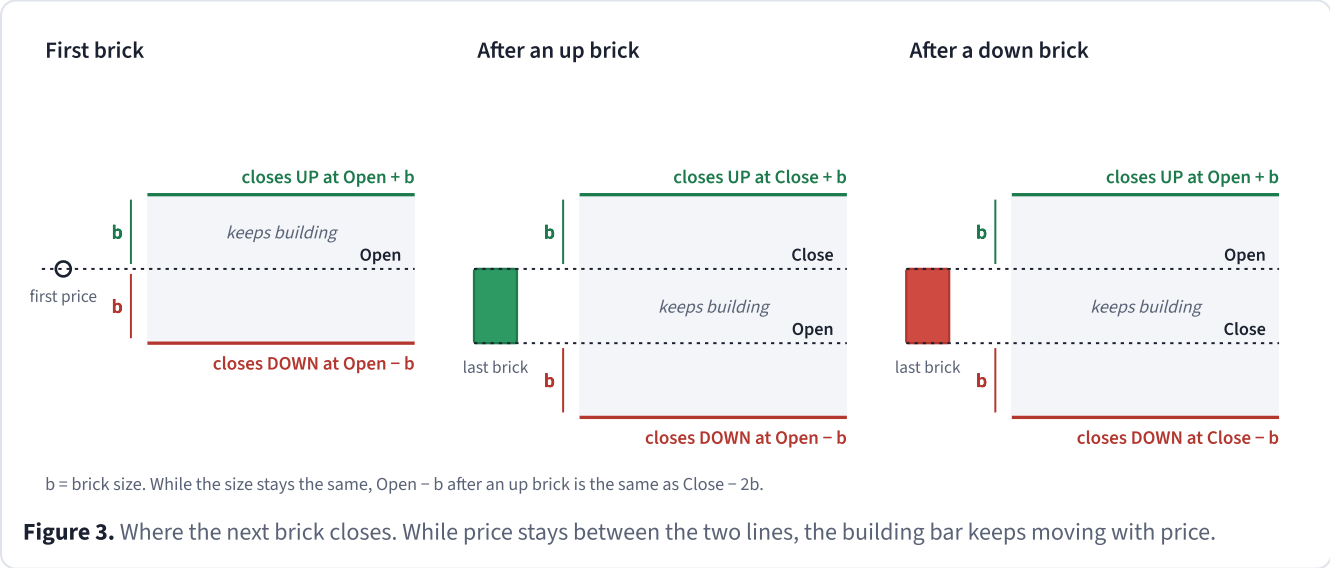
Warm-up



No bricks appear until $3 \times \text{ATR Period}$ timeframe bars have finished, so the ATR has settled before the first brick. Section 8 shows how many days that takes. When a chart loads a number of bars instead of days, the bars types automatically look back far enough to cover the warm-up.

04 NC ATR Renko: how a brick is built

NC ATR Renko draws classic Renko bricks. Every finished brick is exactly one brick size tall and starts where the previous brick ended. It works like NinjaTrader's built-in Renko, except that the brick size follows the ATR.

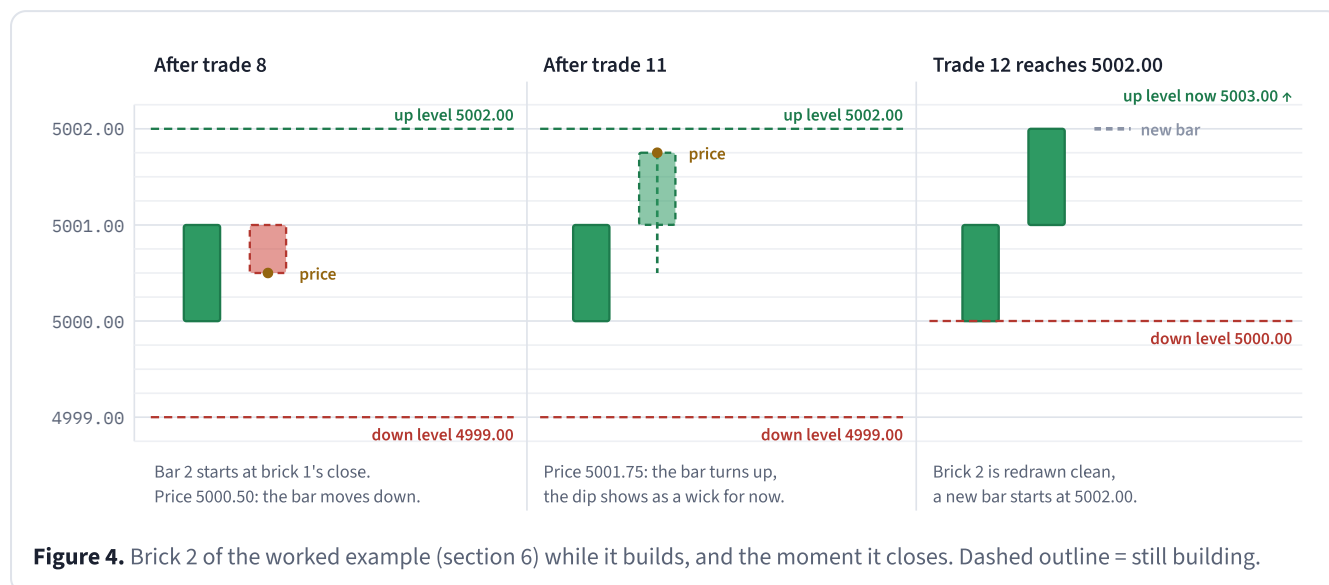


Situation	Brick closes up at	Brick closes down at
First brick on the chart	its open + b	its open - b
Last brick closed up	last close + b	last open - b (a turn)
Last brick closed down	last open + b (a turn)	last close - b

b is the brick size worked out when the last brick closed. A turn starts at the previous brick's open, so price has to move about two bricks against the trend before the bricks change direction.

The building bar

The bar in progress moves with every trade. It starts at the last brick's close, and its close, high and low follow price, so a pullback shows as a wick. When price reaches a level, the bar is redrawn as a clean brick: open and close on the levels, no wick. The trade that reached the level starts the next building bar.



What each value of a finished brick is

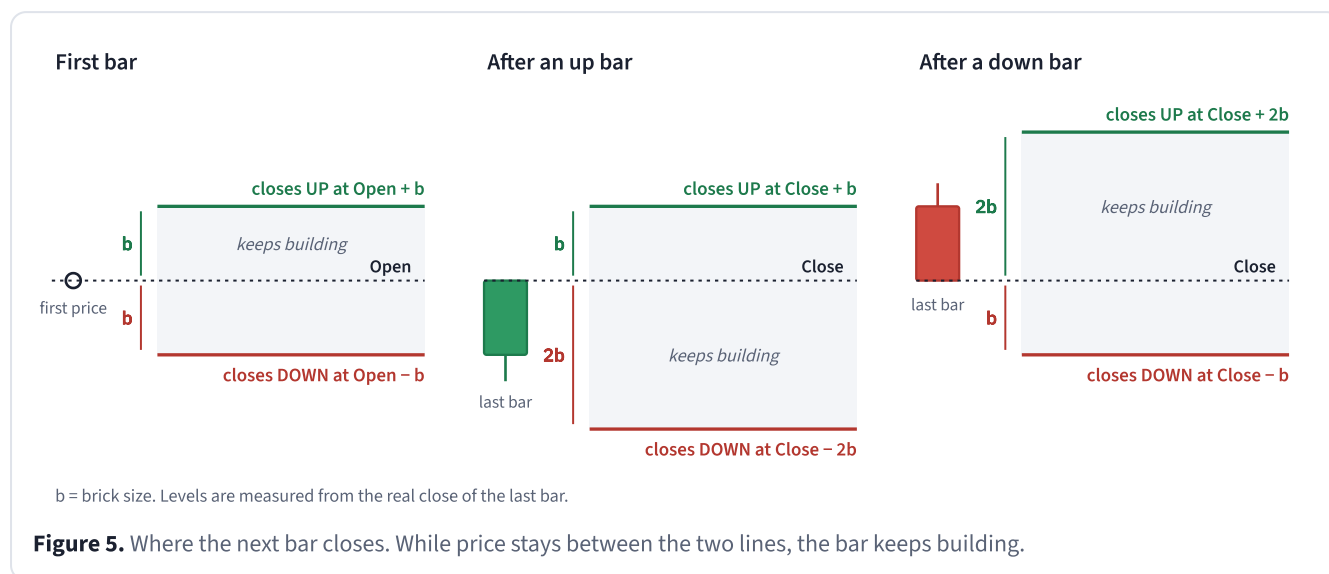
Open	The previous brick's close. After a turn, the previous brick's open.
High / Low	The top and bottom of the brick. Wicks are removed when the brick finishes.
Close	The level that was reached.
Volume	All trades from the one that started the building bar up to the last trade before the level was reached. The trade that reached the level counts in the next bar, because its price can be beyond the brick's close.
Time	The time of the last trade before the level was reached.

Price jumps

When one trade jumps past several levels, NC ATR Renko adds the missing bricks so the bricks stay unbroken. These filler bricks have no trades and 0 volume. The next building bar starts at the last brick's close and holds the trade that jumped.

05 NC ATR Renko-P: how a bar is built

NC ATR Renko-P (P for precise) uses only real prices: every open, high, low and close is a price that traded. The levels are measured from the real close of the last bar.



Situation	Bar closes up at	Bar closes down at
First bar on the chart	its open + b	its open - b
Last bar closed up	last close + b	last close - $2b$ (a turn)
Last bar closed down	last close + $2b$ (a turn)	last close - b

What each value of a bar is

Open	The close of the previous bar, a real trade.
High / Low	The highest and lowest trades in the bar: real wicks.
Close	The trade that reached the level. If price jumped past the level, the bar closes at that real price, not at the level.
Volume	Every trade in the bar, including the one that closed it. The next bar starts at the same price, with no volume until its first trade.
Time	The time of the trade that closed it. For the bar still building, the time of its latest trade.

Three things follow from this:

- **Bars aren't all the same height.** A bar in the trend direction is about one brick size tall. A turn is about two, because it starts at the previous close. A price jump makes a taller bar.
- **There are no filler bars.** Every finished bar contains real trades.
- **A finished bar never changes.** The bar in progress moves with every trade and stays exactly as it is when it closes.

06 Worked example

An ES-type instrument with a tick size of 0.25. To keep the picture readable, assume $\text{ATR} \times \text{Multiplier}$ works out to 1.00 point (4 ticks) and doesn't change during these 30 trades. Each trade is 1 contract.

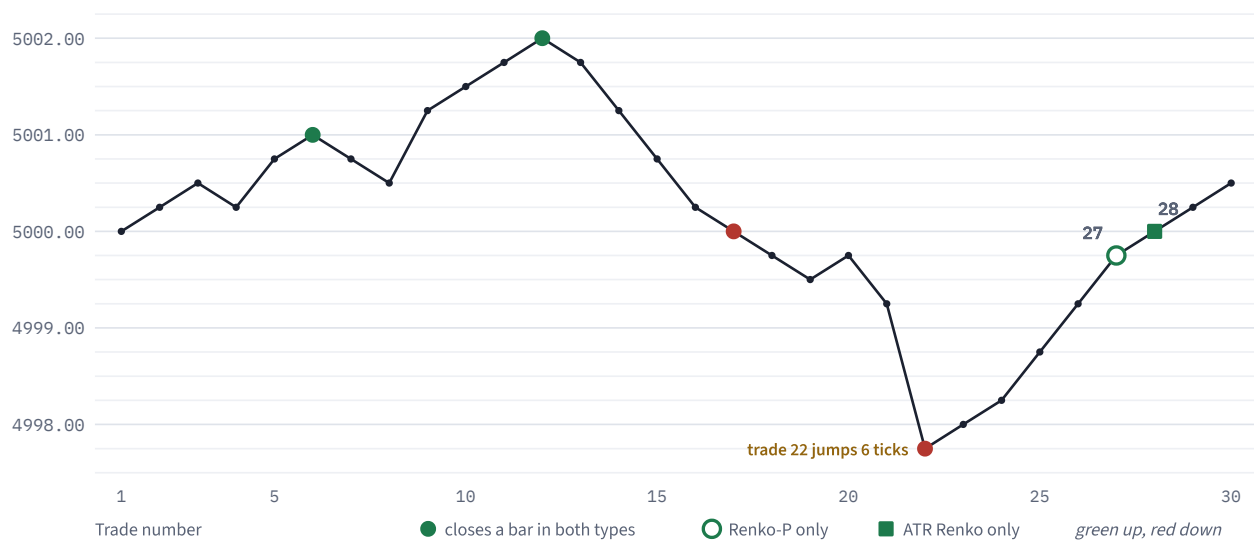


Figure 6. The 30 trades. Large markers are the trades that close a brick or bar.

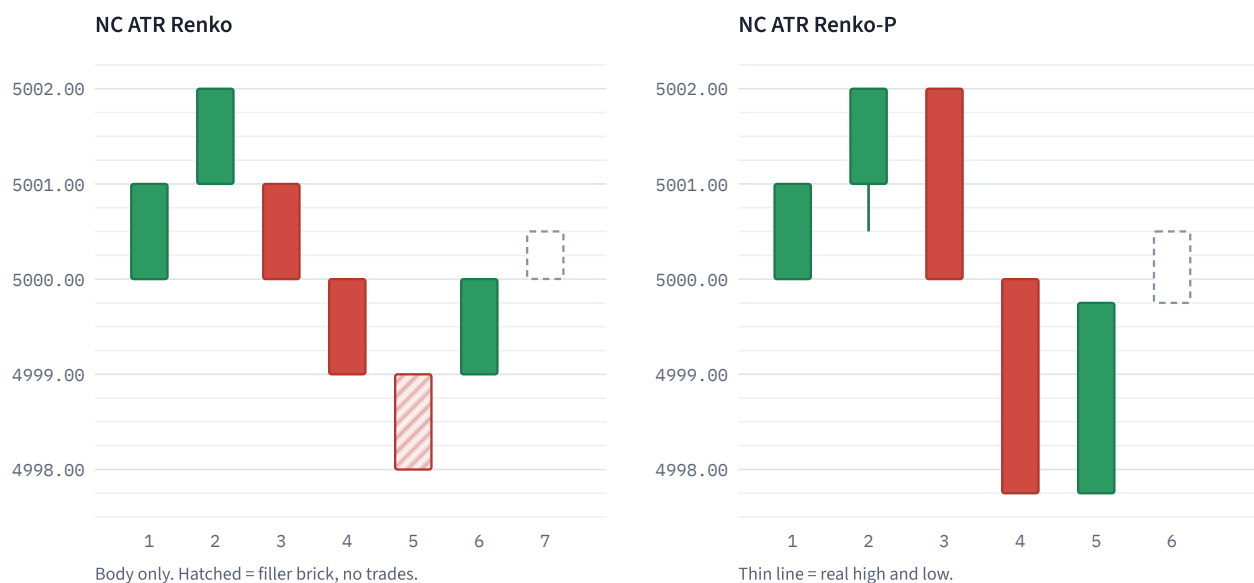


Figure 7. The same trades built by both versions. Dashed outline = still building.

NC ATR Renko

#	Trades	Open	High	Low	Close	Closed	Vol	Why it closed
1	1–5	5000.00	5001.00	5000.00	5001.00	Up	5	First brick: trade 6 reached open + 1.00
2	6–11	5001.00	5002.00	5001.00	5002.00	Up	6	Trade 12 reached close + 1.00. The dip to 5000.50 is not kept
3	12–16	5001.00	5001.00	5000.00	5000.00	Down	5	Trade 17 reached brick 2's open – 1.00 (a turn). Opens at brick 2's open
4	17–21	5000.00	5000.00	4999.00	4999.00	Down	5	Trade 22 jumped to 4997.75, past two levels
5	—	4999.00	4999.00	4998.00	4998.00	Down	0	Filler brick for that jump: no trades
6	22–27	4999.00	5000.00	4999.00	5000.00	Up	6	Trade 28 reached brick 5's open + 1.00 (a turn)
7	28–30	5000.00	5000.50	5000.00	5000.50	—	3	Still building

NC ATR Renko-P

#	Trades	Open	High	Low	Close	Closed	Vol	Why it closed
1	1–6	5000.00	5001.00	5000.00	5001.00	Up	6	First bar: trade 6 reached open + 1.00
2	7–12	5001.00	5002.00	5000.50	5002.00	Up	6	Trade 12 reached close + 1.00. The real dip to 5000.50 stays as a wick
3	13–17	5002.00	5002.00	5000.00	5000.00	Down	5	Trade 17 reached close – 2.00 (a turn): two bricks tall
4	18–22	5000.00	5000.00	4997.75	4997.75	Down	5	Trade 22 jumped past close – 1.00: one bar, closes at the real 4997.75
5	23–27	4997.75	4999.75	4997.75	4999.75	Up	5	Trade 27 reached close + 2.00 (a turn)
6	28–30	4999.75	5000.50	4999.75	5000.50	—	3	Still building

What to notice

- **The turn at trade 17.** NC ATR Renko's brick 3 is one brick tall and opens at brick 2's open, 5001.00. Renko-P's bar 3 starts at the real close 5002.00 and is two bricks tall.
- **The jump at trade 22.** NC ATR Renko draws brick 4 and adds brick 5 as a filler with no trades. Renko-P makes one bar that closes at the real 4997.75.
- **After the jump the two versions measure from different prices.** Renko-P turns up at trade 27 (4999.75, two bricks above its real close). NC ATR Renko needs brick 5's open + 1.00, so it turns at trade 28 (5000.00).
- **The dip at trades 7–8.** Renko-P keeps it as the wick of bar 2. NC ATR Renko shows it while brick 2 builds, then removes it when the brick finishes.
- **Volume adds up to 30 in both.** In NC ATR Renko the trade that reaches a level counts in the next bar. In Renko-P it counts in the bar it closes.

07 Which one to use

	NC ATR Renko	NC ATR Renko-P
Looks	Even bricks, like NinjaTrader Renko	Bars of different heights, with wicks
Open	A level: the previous brick's close, or its open after a turn	A real trade: the previous bar's close
High / Low	The brick's top and bottom; wicks removed when it finishes	The real highest and lowest trades
Close	The level that was reached	The real trade that reached the level
Turn	Starts at the previous brick's open, one brick tall	Starts at the previous close, two bricks tall
Price jumps	Filler bricks with 0 volume	One taller bar
Building bar	Moves with price, then is redrawn as a clean brick	Moves with price and stays as it is
Best for	Reading the chart and spotting trends	Strategies, backtests, and indicators that use the open, high, low and close

Why it matters for strategies

A strategy reads each bar's open, high, low and close. On NC ATR Renko the open and close are levels, and after a price jump whole bricks are filler. A backtest can then fill orders at prices that never traded at that moment, which makes results look better than they would be live. On NC ATR Renko-P every value is a real trade, so fills, stops and targets are based on prices that actually traded.

Rule of thumb. Use NC ATR Renko-P for anything automated or backtested. Use NC ATR Renko when you want the clean, even look of classic Renko on your chart.

08 Choosing the settings

- **ATR Timeframe** sets the scale. One brick is about the typical range of one bar on that timeframe, times the Multiplier. A longer timeframe gives bigger bricks, fewer bricks and less noise.
- **ATR Period** sets how quickly the brick size reacts. A long period gives a steady size that changes slowly. A short period follows changes in volatility faster.
- **Multiplier** scales the brick size in whole steps: 2 doubles it, 3 triples it.

Tip. To see the brick size in points before you build the chart, open a regular chart of the same instrument on the ATR Timeframe and add NinjaTrader's ATR indicator with the same period. The brick size is that value × Multiplier, rounded down to a tick.

How many days to load

The warm-up needs $3 \times \text{ATR Period}$ finished timeframe bars before the first brick appears. Load at least these trading days, plus the days of bricks you want to see:

ATR Period	ATR Timeframe	Warm-up bars	Full futures session (23 h, e.g. ES)	Regular hours only (6.5 h, e.g. US stocks)
14	5 min	42	1 day	1 day
60	5 min (default)	180	1 day	3 days
20	15 min	60	1 day	3 days
14	60 min	42	2 days	6 days
60	60 min	180	8 days	26 days
14	240 min	42	7 days	21 days

The bars are built from tick data, so more days take longer to load. On higher timeframes it is often better to lower the ATR Period than to load many weeks of ticks.

09 Strategies and NinjaScript

Strategy Analyzer and Market Replay

In the Data Series section, choose **NC ATR Renko-P V1.0** (or NC ATR Renko) as the Type and enter the settings as on a chart. Historical tick data must be available for the whole test. The warm-up also applies here: the first part of the test period has no bars yet, so start the test early enough to cover it.

Calculate setting

With **On bar close**, a strategy sees each brick or bar once it has finished, and finished ones never change. With **On each tick** or **On price change**, the bar still building keeps changing. On NC ATR Renko it is also redrawn as a clean brick at the moment it closes, so its open, high and low can change on that last update.

Using the bars in your own code

Bars type	Id	Settings
NC ATR Renko	56	Value = ATR Period, Value2 = ATR Timeframe in minutes,
NC ATR Renko-P	58	BaseBarsPeriodValue = Multiplier

To add them as an extra series in a strategy or indicator, call this in `State.Configure` :

```
AddDataSeries(new BarsPeriod
{
    BarsPeriodType = (BarsPeriodType)58,
    Value = 60,
    Value2 = 5,
    BaseBarsPeriodValue = 1
});
```

To check that the primary series uses NC ATR Renko-P:

```
var isAtrRenkoP = Bars.BarsPeriod.BarsPeriodType == (BarsPeriodType)58;
```

10 Good to know

The chart is empty

Either the loaded days don't cover the warm-up yet (section 8), or your data connection doesn't provide historical tick data for those days. Without tick history, only live trades build bricks, and the first brick appears once the warm-up has passed in real time.

The bricks are not all the same size

This is by design. The size follows the ATR and is worked out again each time a brick closes. On Renko-P, turns are two bricks tall and price jumps make taller bars (section 5).

The building bar jumps when an NC ATR Renko brick closes

When price reaches a level, the bar is redrawn as a clean brick and its wick disappears. NinjaTrader's own Renko does the same.

The brick size doesn't change for a while after a reload

If NinjaTrader continues a chart from bricks it built earlier, the ATR history isn't available any more. The bars then keep the last brick size until enough new data has arrived to warm the ATR up again.

The ATR doesn't quite match my ATR indicator

Use the same timeframe, period and trading hours template on both. Right after the start of the loaded data the two can differ slightly, because each one starts from its own first bar. With plenty of history they match.

Historical futures prices look shifted

With the merge policy **Merge back adjusted**, NinjaTrader shifts the prices of older contracts by the rollover difference, so past bricks show prices that never traded. To see prices as they traded, choose **Merge non back adjusted** or **Do not merge** under **Tools → Options → Market data**.

Changing a setting reloads the chart

Changing ATR Period, ATR Timeframe or Multiplier rebuilds all bricks from tick data, including the warm-up.

The import shows errors, or two versions appear

The older ATR Renko files are probably still installed. Remove them as described in section 1, then import again. Always import both NC ATR Renko Bars together from the same zip.