

Vantage FlowPilot

Tutorial and settings reference for the automated footprint imbalance strategy for NinjaTrader 8

FlowPilot reads the footprint of the bar that is forming right now. When several price levels in a row show one-sided aggressive buying or selling (a stacked imbalance), it enters a market order with a fixed profit target and stop. A regime classifier decides whether to trade with the stack (Follow) or against it (Fade), and daily limits stop it for the session once the goal or the max loss is reached.

PLATFORM

NinjaTrader 8, any futures instrument (built and tuned on ES and NQ)

DATA NEEDED

Tick data with bid/ask. Turn on Tick Replay for backtests and history

BACKTESTING

Yes, in the Strategy Analyzer with Tick Replay

ENTRIES

Market orders with a tick-based profit target and stop

Part 1 · Tutorial

What FlowPilot does

Every trade printed on the exchange is classified as a buy (it hit the ask) or a sell (it hit the bid) and added to the footprint of the bar that is forming. At each price level the footprint then compares buying at that level with selling one level lower (a diagonal comparison). When one side is at least Imbalance Ratio times the other, and at least 10 contracts traded on the stronger side, that level is an imbalance.

Imbalances stacked on consecutive price levels show that one side pushed through several prices in a row. FlowPilot treats a stack of at least Stacked Requirement levels as its trigger. Buying imbalances make a bullish stack and selling imbalances make a bearish stack. If the bar has both kinds at the same time, FlowPilot does not trade.

How a trade is decided

1. A stack appears in the forming bar (checked on every trade, not only when the bar closes).
2. With Require Congruent Delta on, the bar's delta (buy volume minus sell volume) has to agree with the stack: positive for a bullish stack, negative for a bearish stack.
3. The Mode picks the direction. Follow trades with the stack: a bullish stack means buy. Fade trades against it: a bullish stack means sell. Auto uses Follow while the market is in a Trend regime and Fade while it is in a Regression regime.
4. The direction has to be armed (Arm Long, Arm Short or Arm Both) and allowed by the trend filters (Trend Long and Trend Short).
5. The daily gate has to be open: no daily goal or max-loss lock, and no cooldown running after a losing trade.
6. FlowPilot sends a market order with the profit target and stop attached. Then it disarms, so each arm gives one trade at most.

The Auto regime: Trend or Regression

At every bar close FlowPilot measures how closely price change follows delta over the last Correlation Window bars. A correlation at or above Trend Threshold means the market is in a Trend: aggressive buying moves price up, so following the stack makes sense. A correlation at or below Regression Threshold means the market is in Regression: aggression gets absorbed and price snaps back, so fading the stack makes sense. When the correlation is between the two thresholds, the previous regime stays in place.

There is also a range vote. If the session's high-low range over the last Range Bars bars is wider than Range To Bracket times your bracket (target ticks plus stop ticks), the regime is set to Trend. During the first Open Warm-up Bars of each session the regime is always Regression, because the opening rotation fades more often than it follows.

The Mode button on the panel shows the result, for example Mode: Auto (Trend) or Mode: Auto (Regression).

First run, step by step

1. Install the package with Install.ps1 -Clean and compile in NinjaTrader (New > NinjaScript Editor > F5). The INSTALL.txt file in the package has the details.
2. Open a chart of the instrument, for example ES or NQ. Data Series > Tick Replay must be ticked, or the history has no bid/ask detail.
3. Optional: load the Vantage Footprint chart template (right-click the chart > Templates > Load) so you can see the same imbalances the strategy trades.
4. Open the Chart Trader (right-click the chart > Chart Trader). FlowPilot adds its buttons below it.
5. Add the strategy: right-click the chart > Strategies > Vantage FlowPilot. Paste your licence key into License Key, choose the Sim101 account and enable the strategy.
6. Check the NinjaScript Output window for licensing messages. With Mode Auto, FlowPilot arms itself (Arm Both) at the next bar close.
7. Run it on Sim101 or in Market Replay for at least a few sessions before any funded or live account.

Daily routine

- Before the open: check Daily Profit Goal and Daily Max Loss against your account or prop firm rules, and check Quantity.
- Mode Auto re-arms Both at every bar close until the daily gate locks. Mode Follow and Mode Fade only trade after you press an Arm button, and they disarm after each entry.
- Use Trend Long or Trend Short to block one direction, for example on a strong trend day. Both are on by default, which allows both directions.
- Press Close to exit the open position at market. It does not disarm the strategy.
- When the goal or the max loss is reached, FlowPilot disarms and takes no new entries until the next session. The NinjaScript Output window says which one was reached.

Chart Trader panel

BUTTON	WHAT IT DOES
Arm Long / Arm Short	Allow the next entry in one direction only. Green while armed.
Arm Both	Allow the next entry in either direction. Mode Auto selects this by itself at each bar close.
Trend Long / Trend Short	Direction filters. Teal or maroon means allowed and grey means blocked. Clicking one switches it on or off.
Close	Exit the open position at market. Orange-red while a position is open.
Mode	Switch between Auto, Follow and Fade. In Auto the button shows the live regime: Trend (cyan) or Regression.

Part 2 · Settings reference sheet

Settings appear in the same groups and order as the NinjaTrader strategy dialog. **Allowed** is the range NinjaTrader accepts. **Suggested** is the range to start testing in on SIM or Market Replay. The last two columns say what happens when you raise the value (or switch it on) and when you lower it (or switch it off).

SETTING	WHAT IT DOES	INCREASE / ON	DECREASE / OFF
Vantage License Licensing only. These settings do not change how the strategy trades.			
License Key Default (empty) Allowed Your key Suggested Your key	The licence key from your purchase email. Without a valid key the strategy does not arm.	-	-
API URL Default https://license.vantedgealpha.com Allowed - Suggested Do not change	The licensing server. Only change it if support asks you to.	-	-
Vantage State The starting state of the Chart Trader panel. You normally change these with the panel buttons while the strategy runs.			
Armed Direction Default None Allowed None, Long, Short, Both Suggested None	Which direction is armed when the strategy starts. Mode Auto arms Both at the first bar close anyway.	-	-
Long Bias Default On Allowed On / Off Suggested On	The Trend Long filter. When it is off, no long entries are taken.	On: long trades allowed.	Off: long trades blocked.
Short Bias Default On Allowed On / Off Suggested On	The Trend Short filter. When it is off, no short entries are taken.	On: short trades allowed.	Off: short trades blocked.
Mode Default Auto Allowed Follow, Fade, Auto Suggested Auto	Follow trades with the stack and Fade trades against it. Auto picks Follow or Fade from the regime and re-arms at every bar close.	-	-
Analysis These settings decide what counts as a signal and which regime Auto uses.			
Imbalance Ratio Default 3.0 (300%) Allowed 1.0 - 10.0 Suggested 2.5 - 4.0	How many times bigger the aggressive side has to be than the opposite side, one level away diagonally, before a price level counts as an imbalance.	Fewer, stronger imbalances, so fewer trades. Stacks also complete later in the bar.	More levels qualify, including noise. Below about 2.0 most busy bars have stacks, and quality drops.
Stacked Requirement Default 3 Allowed 1 - 10 Suggested 2 - 4 on ES, 3 - 5 on NQ	How many imbalanced price levels in a row make a stack (the trigger).	Needs a longer push, so fewer and later entries with more conviction behind them.	More signals and earlier entries. 1 triggers on any single imbalance.

SETTING	WHAT IT DOES	INCREASE / ON	DECREASE / OFF
Allow Gap in Stacked Default On Allowed On / Off Suggested On	Lets one price level without an imbalance sit inside a stack without breaking it.	On: more stacks are found.	Off: stacks have to be perfectly consecutive, so there are fewer signals.
Correlation Window (Bars) Default 5 Allowed 2 - 200 Suggested 5 - 20	The number of closed bars used to correlate price change with delta for the Auto regime.	The regime is smoother and changes less often, but reacts later when the market changes character.	The regime reacts quickly but can switch back and forth on noise.
Trend Threshold Default 0.6 Allowed -1.0 - 1.0 Suggested 0.4 - 0.8	A correlation at or above this value switches Auto to Trend (Follow). Keep it above Regression Threshold.	Trend is harder to reach, so Auto fades more.	Trend is easier to reach, so Auto follows more.
Regression Threshold Default 0.0 Allowed -1.0 - 1.0 Suggested -0.2 - 0.3	A correlation at or below this value switches Auto to Regression (Fade). Between the two thresholds the regime does not change.	Regression is easier to reach. A narrower gap to Trend Threshold means more regime switches.	Regression is harder to reach. A wider gap means a more stable regime.
Range Bars Default 20 Allowed 1 - 500 Suggested 10 - 40	The number of bars in the session's range measurement for the Trend vote.	A longer lookback gives a wider range, so the vote picks Trend more often.	A shorter lookback gives a narrower range, so the vote picks Trend less often.
Range To Bracket Default 3.0 Allowed 0 - 100 Suggested 2.0 - 5.0	The range in ticks votes Trend when it is wider than this multiple of (Take Profit + Stop Loss). With the defaults that is $3 \times 32 = 96$ ticks.	The range vote fires less often. Auto relies more on the correlation.	Trend is picked more often. 0 makes Auto almost always Trend after the warm-up.
Open Warm-up Bars Default 3 Allowed 0 - 100 Suggested 2 - 10 (about the first 15 minutes)	Auto stays in Regression (Fade) for this many bars at the start of each session.	Fades the opening rotation for longer.	Auto can follow sooner after the open. 0 turns the warm-up off.
Require Congruent Delta Default On Allowed On / Off Suggested On	The forming bar's delta has to point the same way as the stack.	On: fewer trades, and stacks that are being absorbed are filtered out.	Off: more trades, including stacks the bar's delta disagrees with.
Execution Size and bracket. The tick values below are per contract: ES = \$12.50 per tick, NQ = \$5.00 per tick, MES = \$1.25 per tick, MNQ = \$0.50 per tick.			
Quantity Default 1 Allowed 1 and up Suggested Size so that one stop is no more than 1/3 of Daily Max Loss	The number of contracts per entry.	Profit and loss grow in step with size. The daily limits are in dollars, so they are reached after fewer trades.	Smaller swings. Use micros (MES or MNQ) for the smallest size.
Stop Loss (Ticks) Default 16 Allowed 1 - 1000 Suggested ES 8 - 16, NQ 16 - 40	The stop distance in ticks from the entry. It is also part of the bracket size used by Range To Bracket.	Fewer stop-outs from noise, but each loss is bigger. The range vote picks Trend less often.	Smaller losses, but more trades get stopped out before they work.

SETTING	WHAT IT DOES	INCREASE / ON	DECREASE / OFF
Take Profit (Ticks) Default 16 Allowed 1 - 1000 Suggested ES 8 - 16, NQ 16 - 40	The profit target distance in ticks from the entry.	Bigger winners, but a lower hit rate, and more trades come back to the stop or break-even.	A higher hit rate with smaller winners. Commission weighs more on each trade.
Trailing Stop Trigger (Ticks) Default 0 (off) Allowed 0 - 1000 Suggested 0, or between the break-even trigger and the target	Open profit in ticks before the trailing stop starts. It is checked once per bar, when a new bar starts.	The trail starts later, so a trade has more room before it is tightened.	The trail starts early and locks in profit sooner, but ends some trades early.
Trailing Stop (Ticks) Default 6 Allowed 1 - 1000 Suggested 4 - 12	The distance between price and the trailing stop once the trail is active. The stop only moves in your favour.	A looser trail gives the trade more room but gives back more open profit.	A tighter trail keeps more profit but stops out on small pullbacks.
Break-Even Trigger (Ticks) Default 11 Allowed 0 - 1000 (0 = off) Suggested 50 - 75% of Take Profit	Once the trade is this many ticks in profit, the stop moves to the entry price plus the offset. This happens once per position. It has to be lower than Take Profit to have any effect.	Protects later. Fewer trades are stopped at break-even, but more full losses come back.	Protects earlier. Fewer full losses, but more trades end at break-even before reaching the target.
Break-Even Offset (Ticks) Default 1 Allowed 0 - 100 Suggested 0 - 2	How many ticks beyond the entry the break-even stop is placed, on the profit side. Keep it smaller than the trigger.	The break-even stop locks in a little more, but price has to pull back less to hit it.	0 is a true break-even, so commission is not covered.
Daily Gates Hard limits on realised profit and loss per session, counted from real-time trades only. They are not applied in Strategy Analyzer backtests.			
Daily Profit Goal Default 2500 Allowed 0 - 1,000,000 (0 = off) Suggested 2 - 4 x Daily Max Loss	The realised profit, in account currency, at which FlowPilot stops for the rest of the session.	Keeps trading longer on good days, so more profit can also be given back.	Stops sooner on good days and keeps the day's gains.
Daily Max Loss Default 750 Allowed 0 - 1,000,000 (0 = off) Suggested Below your prop firm's daily loss limit, minus at least one full stop	The realised loss, in account currency, at which FlowPilot stops for the rest of the session. It counts closed trades, so the last trade can go past it by up to one stop.	More room on a bad day, with a bigger worst-case loss.	Stops sooner on a bad day. If it is set too tight, normal losing streaks end the day early.
Cooldown After Loss (ms) Default 20000 (20 s) Allowed 0 - 3,600,000 (0 = off) Suggested 10000 - 120000	After a losing trade, no new entries are taken for this long.	Less revenge-style re-entry into the same move, so fewer trades.	Re-enters quickly. Good in fast rotation, but losses can come in quick succession.

Starting profiles

Three starting profiles. Balanced uses the shipped defaults. Use them as a starting point for your own testing, not as a promise of results.

SETTING	CONSERVATIVE	BALANCED	ACTIVE
Imbalance Ratio	3.5	3.0	2.5

SETTING	CONSERVATIVE	BALANCED	ACTIVE
Stacked Requirement	4	3	2
Allow Gap in Stacked	Off	On	On
Require Congruent Delta	On	On	Off
Break-Even Trigger (Ticks)	8	11	12
Cooldown After Loss (ms)	60000	20000	10000
Quantity	1 (or micros)	1	Size to your Daily Max Loss

How to optimize

1. Change one group of settings at a time, starting with the signal: Imbalance Ratio and Stacked Requirement. Move on to the regime and then the bracket once the signal is settled.
2. Use the Strategy Analyzer with Tick Replay on, the same bar type and size as your live chart, and realistic commission and slippage.
3. Optimise over at least 2 - 3 months, then check the best settings on a later period they were not tuned on (walk-forward). Prefer a broad plateau of good results over a single peak.
4. Look at the number of trades, profit factor, max drawdown and average trade, not only net profit. A setting that only works with very few trades is usually overfitted.
5. The daily goal, max loss and cooldown are not applied in backtests. Before going live, confirm on Sim101 or in Market Replay that they behave as you expect.
6. Bar size matters. The footprint is built per bar, so larger bars collect more volume and produce more stacks per bar. Keep testing and live trading on the same bar type.

Built-in rules you cannot change

- Calculate is always On each tick. FlowPilot sets it itself, because the footprint needs every trade.
- An imbalance needs at least 10 contracts on its stronger side.
- One entry per arm, and no new entry while a position is open or an entry order is still working.
- A bar that has both a bullish and a bearish stack is skipped.

Troubleshooting

PROBLEM	FIX
No trades in the Strategy Analyzer	Turn on Tick Replay on the data series and use tick-based historical data. Without bid/ask detail the footprint stays empty.
No panel buttons on the chart	Open the Chart Trader (right-click the chart > Chart Trader), then disable and re-enable the strategy.
"MISSING LICENSE KEY" or "Cannot arm: Unlicensed"	Paste your key into License Key, check that you are online and read the NinjaScript Output window. Each key works on 2 devices.
Follow or Fade mode never trades	Only Auto re-arms by itself. In Follow or Fade, press Arm Long, Arm Short or Arm Both before each trade.
Trading stopped for the day	The daily goal or max loss was reached. It resets automatically at the next session.

Futures trading involves substantial risk of loss and is not suitable for every investor. The settings and ranges in this guide are starting points for your own testing, not a promise of results. Run every change on SIM or Market Replay before you use a funded or live account. Full risk disclaimer: <https://www.vantedgealpha.com/legal/risk-disclaimer>. Online version of this guide: <https://www.vantedgealpha.com/guides/vantedge-flowpilot>