

## 1 Introduction

Welcome to the HullBuster family of trading products! This document is a user manual for the Range V5 script which runs on the Tradingview cloud platform. HullBuster Range is written in the Pine Language Version 4 . The product consists of two scripts:

1. Pine strategy used to conduct backtesting so as to configure the product.
2. Pine study used to generate alerts sent to the screen, email or cell phone.

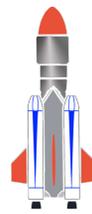
Each of the two scripts expose an identical set of inputs which alter the behavior of the scripts. In the backtest module the inputs are used to experiment with different values. Once you are satisfied with the results the backtest inputs can be applied to the study whereby alerts can be configured. The Tradingview platform does not allow alerts from within the strategy logic hence the need for two different sets of code.

The majority of this document is dedicated to the configuration of the Range V5 input dialog box and the steps needed to produce a viable backtest result. As such most of the instructions this guide has to offer are centered around the strategy pine script.

## 2 TradingView Account

TradingView is a cloud based charting platform. Therefore, no download is required to use this system. Since HullBuster runs on Tradingview a login account is needed to access the Range V5 scripts. TradingView offers four tiers of service. The basic account is free and requires only an email address. The following steps are required to get HullBuster Range V5 up and running on TradingView:

1. Go to [www.tradingview.com](http://www.tradingview.com) and sign up for an account. Its free for a basic account.
2. Once you have a TradingView login name you will need to provide us with that name so that we may grant your account access to the scripts. While logged in to TradingView visit the scripts page for the account [tradingtudi](https://tradingtudi) or type URL: [www.tradingview.com/u/tradingtudi/#published-scripts](http://www.tradingview.com/u/tradingtudi/#published-scripts). Click on the image for HullBuster Range and request access in the comments section at the bottom of the page.
3. Return to the TradingView main page and enter the trading symbol of your choice in the Ticker edit control at the top of the page. On the subsequent screen click on the web button named "Full-featured chart" (it's on the right side of the page).
4. The TradingView Chart menu is contained within the black strip beneath the URL bar of the browser. Click on the "Indicators" menu item. The resulting dialog box features a vertical menu and is titled "Indicators & Strategies". Click on the menu item named "Invite-Only Scripts". Find HullBuster Range-V5. This is the backtest module for which is the focus of this document.



## 3 Overview

HullBuster Range V5 is designed to detect short term trading patterns using cone based measurements. The success of a trading system built upon this product is largely determined by correctly recognizing the base and vertex of market price patterns. The vertex being the point in which the price turns around and starts going the other way. Ideally, a correctly configured system which is trading long will buy at the base and sell at the vertex. Correspondingly, a sell short will enter a trade at the vertex and exit at the base.

As the name implies and as one would expect HullBuster Range performs best in sideways markets. It performs poorly in prolonged trending markets. TradingView limits the amount of code that a strategy may employ in effort to minimize the strain on their cloud servers. This being the case, HullBuster Range is optimized to excel at short term swing trading. However, Range V5 contains numerous features which enable it to detect trading opportunities in all market conditions. A well configured Range V5 can be made part of an automated trading system that is intended to operate continuously.

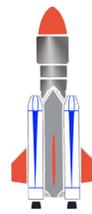
HullBuster Range can be placed into one of three different modes:

1. Long - buys valleys and sells at peaks (market order entry and exit)
2. Short - sells short at peaks and buy covers at valleys (market order entry and exit)
3. Ping Pong - buys valleys and sells short at peaks (position reversals)

HullBuster Range is designed to accommodate any liquid market symbol and on any chart interval between one day and five minutes. In order to achieve this capability Range V5 exposes over 50 inputs. While many fields contain adequate default values a large degree of finesse is required to produce the most profitable configuration.

One notable feature of Range V5 is DCA. Upon activation the system can be made to increase the order size in response to losses or winning streaks. This empowers the user to experiment with recovery techniques while in the backtest. The results of which may then be applied to the study or the actual order execution platform. Other significant features include:

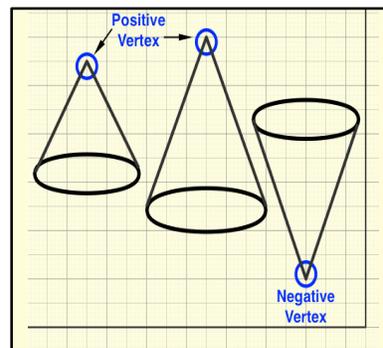
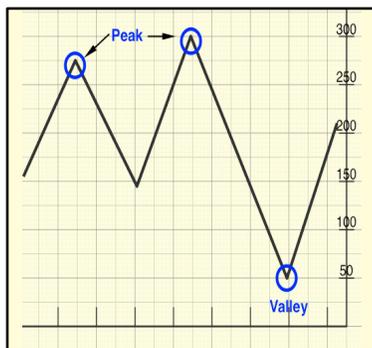
1. Calculation presets for Stocks, Forex and Cryptocurrency
2. Configurable profit target amount (basis point value)
3. Configurable stop loss target amount (basis point value)
4. Reentry safeguard which prevents initiating a position immediately after hitting the stop
5. Adjustable trading bandwidth gives the user much flexibility in determining the number of trades to generate per trading session. Trade once a week or multiple times per day.
6. Counter trend safeguards attempt to avoid entering trades against the prevailing price action at the expense of less total trades.
7. Consecutive loss counter visually reports when sustained losses exceed a user specified threshold.
8. Indicator repainting is an industry wide problem which occurs when mixing backtest data with real time trades. Much effort has been expended to reduce the difference between the backtest and study. As a result both scripts produce nearly identical chart plots.



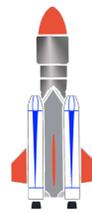
A key difference between the TradingView strategy and study is that the strategy comes equipped with a broker simulator which accepts simulated trades triggered from within the Pine script logic. As such the broker simulator opens and closes positions and calculates profit and loss. The overall result of a backtest can be seen in the performance report. Various metrics are captured in the report including win percent, profit factor, draw down, net profit etc. The report also shows you a visual representation of the profit or loss accumulated over time. In the process of configuring your Range V5 trading system much time will be spent entering values into the input dialog and observing the resulting change in the performance report.

By contrast, the TradingView study has a much more narrow purpose though equally important. The Pine strategy designer duplicates the entry and exit conditions and issues alerts to the TradingView operating system. The user “tells” TradingView how they wish to receive notification through the alert setup window available on every chart. Simply, click on the alert icon and you are presented with the TradingView Alerts dialog box for the indicators attached to the current chart. Select the HullBuster Range V5 designated alerts from the drop down list. Choose to be notified by popup with sound, by email or SMS to your phone.

As mentioned earlier, HullBuster Range uses cone centric calculations to measure price peaks and valleys. These measurements are reflected in the strategy input dialog box whereby the user can establish the width of the trading band. Generally speaking, the absolute magnitude of the market symbol’s price as measured from negative vertex to positive vertex determines how many trades the system will produce.



A tighter band will produce more trades than a wider band. This is especially true when Ping Pong mode is selected. Range V5 uses five different algorithms to detect peaks and valleys. The user must select one or more of these calculations from the strategy input dialog box. The differing aspect of each algorithm is the recognition element used.



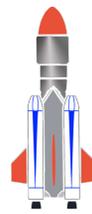
Each algorithm is depicted as an indicator and is named after the pattern it tries to detect as follows:

1. **Volume Indicator** - to be effective TradingView must receive transaction volume in the symbol's tick data. This is true for most symbols but may not be available from some cryptocurrency exchanges.
2. **Histogram Indicator** - a histogram is used to establish support and resistance levels which represent valleys and peaks respectively. This indicator can be made to detect very small ranges and thus will produce the most trades.
3. **Fractal Indicator** - a trend-line pattern which typically manifests itself prior to reversals. Since its a composite pattern it doesn't always show up and so it won't produce as many trades as other options.
4. **Candle Indicator** - chart candles are measured as a sequence. A doji marks the end of the sequence. This indicator is compatible with most of the others so can be combined to produce more trades.
5. **Macro Indicator** - measures the duration of continuous price pressure. When the duration exceeds a relative threshold a reversal is expected. This indicators produces the widest band and therefore, the fewest trades.

The diversity of the strategy input parameters minimizes the likelihood of other traders using this same program to exhibit an identical trading pattern. Trader A won't know trader B's signals just because they are both using HullBuster Range V5.

It's important to realize that the end result of a trading system developed with HullBuster on TradingView is a signal. Be it on screen, email or text message. The system merely gives you the heads up that its time to trade. The actual trade itself must then be made using your real broker's user interface on your desktop, iPad or cell phone. There exists no mechanism from TradingView to execute a buy order from a buy signal. However, there does exist third party software that can be used to send orders to specific brokers. Using such services can enable Range V5 to be integrated into a fully automated system.

A word about TradingView tick data. TradingView offers various levels of paid subscription with increased capability on each more expensive successive level. Their Basic level is free and comes with free chart data. Free accounts are limited to 10,000 bars per chart and real-time time ticks are not part of this package. Also market symbols from registered exchanges like NYSE and NASDAQ come from data servers which produce approximate price streams. Meaning that a backtest developed on these symbols will most certainly behave differently with actual exchange data say from your broker. Paid subscriptions, of course, do not suffer these limitations. As far as we are aware, Forex and Cryptocurrency prices are genuine.



## 4 Inputs

On the TradingView platform, strategy and study scripts receive configuration settings through an input dialog box. There are no other initialization files or API access available to the user or the script developer. This means that all configuration settings, from seldom used to most important, must be made available on the input dialog window. Unfortunately, this makes for a cluttered and overly complex user interface. While we, here at HullBuster, have tried hard to internalize as many settings as possible, the ability to work on any symbol at any interval necessitates many adjustments.

HullBuster Range V5 currently exposes over 50 input parameters. The number of inputs that need to be configured depends entirely on the trading mode selected. A strictly long or short trading system is a lot easier to setup and consumes less inputs than a bidirectional one. Of course, a single sided system doesn't have the same earning potential as a two way trader but the user may not be trading with a margin account. Stocks and cryptocurrency are good examples. In this case, configuring the inputs for long only trading is relatively simple.

### 4.1 Instrument Type

Select the best fit category of the instrument you are backtesting. There are currently four choices:

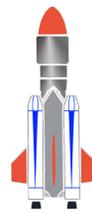
1. Crypto - cryptocurrency. Intended for symbols quoted against Bitcoin (BTC).
2. Forex - sovereign currency trading on the inter-bank spot market.
3. FX-Milli - apply this type to a Forex currency that is quoted with five digit precision. Intended primarily for USD/MXN, USD/ZAR and USD/SEK.
4. Stock - exchange traded equity or CFD listing.

### 4.2 Trading Mode

Select the trading direction and behavioral model of the backtest system. There are currently four choices:

1. Long - generates only buy trades. Conditional close at minimum profit.
2. Short - generates only sell trades. Conditional close at minimum profit.
3. PingPong - bidirectional trading enabled. Reverses position if the opposite trading condition is detected. Otherwise, conditional close at minimum profit.





### 4.3 Minimum Profit

This edit field accepts a floating point number which represents the smallest amount which will permit a close order. The value entered here is expressed as the base currency of the symbol. It is the result of subtracting two chart prices. In PingPong Mode a reversal can occur without achieving the minimum profit.



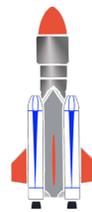
### 4.4 Stop Offset

This edit field accepts a floating point number which represents the maximum amount a trade can lose before terminating a position. This is a protective measure which prevents your account capital from being wiped out during runaway market conditions. The broker simulator will closeout any position with losses exceeding this amount during the backtest. The value entered here is expressed as the base currency of the symbol. It is the result of subtracting two chart prices.



### 4.5 Reentry Minimum Span

The “Reentry Minimum Span” and the “Reentry Bar Window” are both part of a single feature. Together, these two fields are designed to prevent entering a trade immediately after hitting the stop. The “Reentry Minimum Span” establishes a threshold value that must be exceeded before a new trade can be initiated. The value for this field is specified as a chart price result similar to the “Minimum Profit” and “Stop Offset” fields. Setting this field will likely cause the backtest to generate less profit but this is because the backtest process is inherently prone to exhibit a data-mining bias. In forward testing this feature is more likely to save you money thereby increasing your profit.



## 4.6 Reentry Bar Window

The “Reentry Bar Window” and the “Reentry Minimum Span” are both part of a single feature. Together, these two fields are designed to prevent entering a trade immediately after hitting the stop. “Reentry Bar Window” designates a time frame for which to apply the “Reentry Minimum Span”. An easy way to look at this is that minimum span is the distance from the last stopped out trade and the reentry window is the amount of time to keep looking at that stopped trade. The “Reentry Bar Window” is specified as number of bars in the current chart interval.

## 4.7 Enable DCA

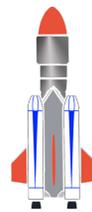
In general, dollar cost averaging involves significant risk to your account capital. It involves increasing the order size on subsequent trades in response to losses or winning streaks. With the rise of cryptocurrency this feature has found its way into several popular trading applications. No doubt, it is a powerful feature that when properly employed can produce tremendous gains. It can also wipe out your account if the market turns against you and stays that way for a prolonged period.

The “Enable DCA “ checkbox combined with a value entered into the “Maximum DCA Increments” edit field activate dollar cost averaging for losing trades. The “Win Streak Accumulation” checkbox activates dollar cost averaging for winning trades. The “Maximum DCA Increments” field establishes a limit which prevents increasing the order size beyond the specified number of attempts.

The way this feature works in Hullbuster Range V5 is a little different than some of the popular crypto trading applications. Namely, we don’t add to a losing trade. All trades have to close either by hitting the stop or by reversal. The outcome of the previous trade determines whether DCA will be applied to the next upcoming trade. If the previous trade was a loser and “Enable DCA” is checked and the backtest has not exceeded the “Maximum DCA Increments” limit then the next trade size is increased. The amount of the increase is the result of the following formula:

1. Order Size x (increment sequence number + 1)
2. Where the order size is the value entered into the properties tab of the TradingView input dialog box. This field is supplied by TradingView and is not part of the HullBuster Inputs.

Each time the backtest closes a losing trade the amount of the loss, in chart points, is summed into the debt register. Each winning trade reduces the debt by the commensurate chart point gain. When the entire debt has been recovered the trade size returns to the base order size specified in the properties dialog box. The Range V5 report system displays a magenta colored label above the bar where the debt has been fully recovered. To see this label be sure to enable “Report Debt Recovery” in section 5 of the input dialog box.



## 4.8 Win Streak Accumulation

This is a DCA related feature. Please read the “Enable DCA” section of this user manual for an overview of the HullBuster DCA system. When enabled this feature increases the order size in response to winning trades. The order size is increase by the amount described in section 4.7 of this document. The order size keeps increasing until the “Maximum DCA Increments” limit is reached or the winning streak ends. As mentioned in section 4.7 this is a high risk feature but can produce handsome returns when employed carefully and against an adequately funded account. For a heart pounding experience, “Win Streak Accumulation” can be combined with “Enable DCA” which together have the potential for spectacular returns. Be sure to set a maximum DCA limit well above your capital maximum acceptable loss.

## 4.9 Volume Indicator

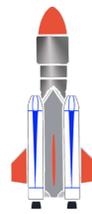
The vertex of this calculation includes the trading volume and price pressure. Transaction volume must be included in the data feed to TradingView for this indicator to be effective. For this reason it’s best suited to instruments trading on centralized exchanges like the NYSE or high liquidity currency pairs such as the EUR/USD. Cryptocurrency exchanges report their own trading volume which can be spotty to say the least.

## 4.10 Histogram Indicator

The trading band for this indicator is inherently narrow thus will produce the most frequent trades. This indicator will perform best in range bound markets where the peak to peak distance is well accounted for in the vertex adjustment section of the input dialog. Trending markets, where the price moves in one direction for a prolonged period will experience generally poor trading results in Ping Pong mode. For instance, in a bull market lasting several days Ping Pong mode will continue selling tops potentially resulting in multiple consecutive losses. If DCA is enabled the order size may quickly reach the maximum increments limit. To compensate for this behavior increase the base to vertex net change making conditions for short entry more difficult. Alternatively, lower the minimum profit so as to exit the short position before the stop can be hit. Markets with lengthy wide swings are best served with a wider indicator such as the fractal or macro.

## 4.11 Candle Indicator

The candle indicator observes candle shapes and measure magnitude. In addition to the standard vertex adjustments, this indicator uses the “Snap Candle” value in section 2 of the input dialog box. A larger snap candle value produces fewer trades by making the entry condition more difficult. This indicator can be made to generate frequent trades second only to the histogram indicator. Although, unlike the histogram, the diverse range of inputs enable the candle to be combined with other indicator types. Thereby, increasing the total number of trades during the backtest period. Like the histogram the candle indicator is susceptible to poor counter trend performance



## 4.12 Fractal Indicator

The Fractal indicator uses standardized trend line shapes to determine peak recognition (tops and bottoms). Because the expected shapes have to form over time, this indicator will not always result in a pattern hit. Some instruments generate recognizable patterns more reliably than others. Usually, the more liquid the instrument the more abundant the fractals. Forex, for example is a good market for this type indicator and especially the major currency pairs. Stocks have relatively short trading hours so fractal formation is spotty thereby resulting in fewer trades. This indicator will generally operate best in wider ranges compared to the histogram or candle. With careful vertex settings combined with wide long and short entry parameters, the Fractal indicators can be the basis of a well performing all weather trading system. If your intent is to build a system that will produce signals to an automated trading robot much consideration should be applied to the likelihood of the broker settling the trades that appear on the backtest. Many of the trades that are reported profitable on the backtest will not actually have equivalent gain in live trading. A backtest built on gains of just a few percentage points per trade will certainly not translate with the same degree of profit factor from signal to broker. If a trading robot is the order entry method of the HullBuster Range V5 signal it's best to configure your system to produce wider entry to exit signals.

## 4.13 Macro Indicator

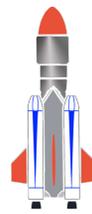
The macro indicator is the widest range recognition algorithm in the Range V5 indicator set. As such, it will produce the fewest trades but will suffer the least in prolonged counter trending markets. The Macro indicator keys off of long duration trend line patterns combined with short term fractals. On some symbols the macro and histogram make a complimentary trading combination. Don't be afraid to experiment with different chart intervals if you are trying to create a high win percentage trading system.

## 4.14 Widen Indicator Span

Enable this feature when the "Base to Vertex" and "Vertex To Base" settings are insufficient to capture the mean trading band. The "Widen Indicator Span" applies a different algorithm to minimum base to base measurement. When enabled, this feature, may increase the precision of your backtest but will do so at the expense of total trades. This feature is intended for use with the histogram and candle indicators.

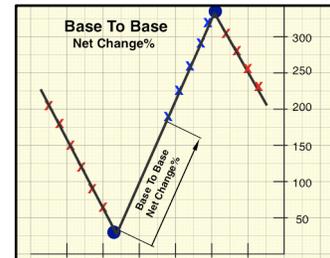
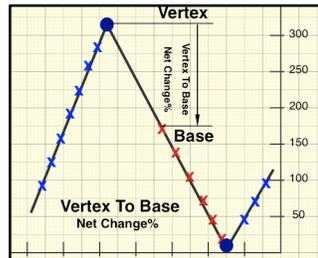
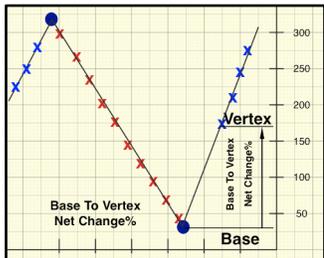
## 4.15 Show Markers

To see the base to vertex thresholds on the chart click "Show Markers" in section 2 of the input dialog. Blue text represents the result of the base to vertex measurement. Red text represents the result of the vertex to base measurement. It's easier to say blue points up from rising price pressure and red points down from falling price pressure. Since Range V5 is a swing trading system short positions are entered on blue markers and long positions on red markers. Each indicator employs a different vertex calculation algorithm which can readily be seen with "Show Markers" enabled.



Every indicator has a set of built in adjustments which are exposed on the input dialog:

1. Base To Vertex Net Change.
2. Base To Vertex ROC.
3. Vertex To Base Net Change.
4. Vertex To Base ROC.
5. Minimum Base To Base Blue.
6. Minimum Base To Base Red.



The importance of these six adjustments cannot be overstated. Each indicator is configured in its entirety by these six values. Since the vertex calculations are different, the same values produce a different result in each indicator. This fact makes combining indicators difficult so the simplest systems will be built on a single indicator. With "Show Markers" enabled you can see the results of any adjustments applied to these six inputs directly on the chart.

## 4.16 Base to Vertex Net Change and ROC

This is a floating point number which is combined with the similarly named ROC input. Together these values alter the location of the blue markers.

## 4.17 Vertex to Base Net Change and ROC

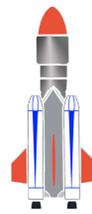
This is a floating point number which is combined with the similarly named ROC input. Together these values alter the location of the red markers.

## 4.18 Minimum Base To Base Delta

This is a floating point number which is used to increase the distance between the base of the blue vertex and the base of the red vertex.

## 4.19 Snap Candle Delta

The snap candle is used by the candle indicator and also the mandatory snap long and short inputs. This feature uses a standard deviation calculation to pinpoint outlier candle formations. The value entered here establishes a threshold that is used to measure candle bodies. When a chart candle exceeds the threshold value it is included in the vertex calculation.



## 4.20 Rise Event Net Change and ROC

The rise event calculation uses rising price pressure over time in an attempt to identify changes in market sentiment. Generally speaking, when a rise event is detected and short caution mode is enabled Range V5 tries to avoid entering short positions against the trend. On the other hand, a long position may use the rise event to exit at a profit. When enabled there are various components of Range V5 which make use of the rise event defined by the values entered in these two inputs.

The “Rise Event Net Change” and “Rise Event ROC” are both floating point numbers which together establish a detection threshold. If a zero value is entered in either field the rise event algorithm is disabled. The system performance does not necessarily degrade with a zeroed out rise event. As with all of the inputs, the fields you select and what values they contain depend entirely on trading system you envision. Typical values for the net change are 1 or greater and 1 or less for the ROC.

## 4.20 Fall Event Net Change and ROC

The fall event calculation uses falling price pressure over time in an attempt to identify changes in market sentiment. Generally speaking, when a fall event is detected and long caution mode is enabled Range V5 tries to avoid entering long positions against the trend. On the other hand, a short position may use the fall event to exit at a profit. When enabled there are various components of Range V5 which make use of the fall event defined by the values entered in these two inputs.

The “Fall Event Net Change” and “Fall Event ROC” are both floating point numbers which together establish a detection threshold. If a zero value is entered in either field the fall event algorithm is disabled. The system performance does not necessarily degrade with a zeroed out fall event. As with all of the inputs, the fields you select and what values they contain depend entirely on trading system you envision. Typical values for the net change are 1 or greater and 1 or less for the ROC.