


# Formula Editor Overview

Trade-Ideas offers a number of standard formulas. These can be used in a number of places, including filtering a list of stocks, sorting a list of stocks, or displaying data about a stock. These are typically represented by icons, such as  for the stock's price.

The formula editor allows you to create and modify your own formulas. These are specific to your account, although you can share your formulas with other users. These formulas will each have their own icons, and can be used just like the built in formulas. The formula editor offers some data which is not available as predefined formula. However, the real power of the formula editor is that it allows you to mix and match the various data items in an almost unlimited number of ways.

The formula editor is more advanced than our basic product. This document is aimed at a user who is already familiar with computer programming. This is not a tutorial.

## [Formula Editor Overview](#)

### [Editor Settings](#)

#### [Icon](#)

#### [Description and Units](#)

#### [Source](#)

#### [Top List](#)

#### [Format](#)

#### [Graphics](#)

### [Formula Components](#)

#### [Preexisting Formulas](#)

#### [Numbers](#)

#### [null](#)

#### [Operators](#)

##### [Standard Operators](#)

##### [null Coalescing Operator](#)

##### [Reserved](#)

#### [Other Data](#)

#### [Functions](#)

##### [min\(a, b \[, ...\]\)](#)

##### [max\(a, b \[, ...\]\)](#)

##### [if\(predicate, true\\_value \[, false\\_value\]\)](#)

##### [abs\(x\)](#)

##### [ceil\(x\)](#)

##### [floor\(x\)](#)

##### [exp\(x\)](#)

##### [ln\(x\)](#)

[log\(base, x\)](#)

[sqrt\(x\)](#)

[sin\(x\), cos\(x\), tan\(x\)](#)

[asin\(x\), acos\(x\), atan\(x\)](#)

[Examples](#)

[Volatility](#)

[Dollars vs. Percent](#)



[Extremes](#)

[Volume](#)

[Boolean Expressions](#)

# Editor Settings

## Icon

Choose an icon between  and  to represent your formula. “U” is for “user.” This will be displayed in the various GUIs in the Trade-Ideas product.

This selection must be unique. If you create two formulas with the same icon, the second one will overwrite the first one.

Your strategies will reference this icon. If you change the formula associated with the icon, that change will automatically be applied to all strategies which use that icon.

## Description and Units

These are text descriptions of the formula. These will also be displayed in various GUIs. These can be anything you want and have no additional meaning.

## Source

This is the source code for your formula. See the Formula Components section, below, for details about this field.

## Top List

Some formulas are not available from the top lists, only in an alert window. The software automatically makes this determination for you, and shows this to you on the master list of all of your formulas.

For example alerts have a “quality” field. Top lists do not. If your formula references the quality field, it will not be available in a top list.

## Format

This says how to display the formula as a number.

“1.00” means to show 2 digits after the decimal. “1.000” means to display 3 digits after the decimal. “1” means to round to the nearest integer. Etc.

“Price” tells the software to automatically pick an appropriate format based on the stock’s price.

## Graphics

This says how to display the formula. Currently there are three choices.

None	No graphics
Cone	Good for positive numbers. 0 is all the way to the left. 100 is all the way to the right. You can still read numbers over 100.  Note: The terminology is out of date. Newer versions of the software use 3 overlapping triangles of different colors.
Position in Range	0 is all the way to the left. 100 is all the way to the right. Other values are in between. You can tell if something is less than 0 or greater than 100, but you can’t see the exact value.

Note that you can use the formula editor to scale a value to match the graphics. For example  $([DRSI]-20)/0.6$  will scale the daily RSI so 20 and 80 will be the extremes. This will make it easy to find stocks which are overbought or oversold.

Note that you can typically see the numerical value of the formula as a tool tip, even when displaying the value graphically.

## Formula Components -- What can I use?

Formulas are all written as mathematical expressions. The basic style of this language is based on the C programming language.

## Pre-existing Formulas

You can reference a preexisting formula by putting its internal code in square brackets. For example [Price] is the stock's price. [Vol5] is the stock's volume over the last 5 minutes, expressed as a percentage of normal for a 5 minute period.

The easiest way to get a formula's internal code is from <http://www.trade-ideas.com/FormulaEditor/FilterCodes.html>.

You can also see these codes in our help. Click on an icon in the top of <http://www.trade-ideas.com/Help.html> and look at the resulting hyperlink. For example, clicking on the price icon gives you [http://www.trade-ideas.com/Help.html#WSF\\_MinPrice](http://www.trade-ideas.com/Help.html#WSF_MinPrice). That ends in "Price" so you can use "[Price]" in a formula.

## Numbers

You can use standard decimal numbers in a formula. Never add a comma. Use a period for the decimal place, per the standard US English conventions.

Examples:

5  
5.00  
-0.2

## null

null represents any number of errors. This includes 0/0, not enough data, and a lot more. Most pre-existing formulas can be null sometimes. If you use null in a formula, typically the result will be null. For example, 5+null is null.

You can insert "null" directly in your formulas if you wish to report an error. See the ?? operator, below, for the opposite effect. That allows you to add a value to a formula which otherwise would have been null.

Most comparisons involving a null will fail. For example, if a stock's current price is \$10, but the stock has been trading for less than 50 days, the stock's 50 day moving average will be null. So if you ask how far this stock is above it's moving average (50 - null) you will get null. If you ask for all stocks which are above their moving average in one window, and all stocks below their moving average in other window, you will not see this stock in either window. That is to say "null < 0", "null > 0" and "null = 0" all return false.

null will typically be displayed on the screen as a blank cell.

# Operators

## Standard Operators

These operators all have their standard meanings from the C programming language.

! < > + - \* / != <= >= || && ==

(null || true) returns true. (null && false) returns false. Any other operator will return null if one or both of its arguments is null.

## null Coalescing Operator

x??y will return x if x is not null. Otherwise it will return y.

## Reserved

->

## Other Data

These items can be used just like a number or a preexisting filter.

price, last	price is the exact price of the most recent print. This is the price that set off the alert. last only updates with "official" prints. For example, it does not count pre and post market trades. [Price] and other predefined formulas automatically choose between these.
most_recent_close	Yesterday's close or today's close.
expected_open	Today's open, or the most recent print if the stock has not opened yet.
seconds_after_open	The time of day, in seconds. This will be negative in the premarket. This only looks at the clock. It does not know about half days, holidays, or special instruments which do not trade on the normal schedule.
day_of_week	1 = Monday, 2 = Tuesday, ..., 5 = Friday.
t_high, t_low	Today's high and low.
high_pre, low_pre	Today's premarket high and premarket low

v_up_1, v_up_5, v_up_10, v_up_15, v_up_30	The volume for the last 1, 5, 10, 15 or 30 minutes. This is expressed in shares. The predefined filters show the same data in percent.
sma_2_5, sma_5_5, sma_15_5, sma_2_8, sma_2_20, sma_2_200, sma_5_8, sma_5_20, sma_5_200, sma_15_8, sma_15_20, sma_15_200, sma_60_8, sma_60_20, sma_60_200	The 5, 8, 20, or 200 period SMA for 2, 5, 15, and 60 minute periods. The first number is the number of minutes per candle. The second number is the number of candles.
std_5_20, std_15_20, std_60_20	The 20 period standard deviation for 5, 15 and 60 minute periods.
vwap	The VWAP for the day.
sma_200, sma_50, sma_20	The SMA for the last 200, 50, or 20 days.
high_p, low_p, open_p, volume_p	The previous day's high, low, open, and volume.
close_p	The close from the day before yesterday. What we called "previous close" yesterday.
high_52w, low_52w	The 52 week high and low.
std_20	The 20 day standard deviation.
standard_deviation	Yearly (weighted) standard deviation.
consolidation_high, consolidation_low	The highest value and the lowest value in the recent daily consolidation pattern.
last_price	The official closing price for the previous day.
high_life, low_life	Lifetime highs and lows.
high_5d, low_5d, high_10d, low_10d, high_20d, low_20d	The high and low for the last 5, 10, and 20 days.
close_5d, close_10d, close_20d	The closing price 5, 10, and 20 days ago.
adx_14d, pdi_14d, mdi_14d	The ADX, DI+, and DI- measured over the last 14 days.
short_interest	Short interest, in shares. The preexisting formula Days to Cover is similar, but that's a %.
p_up_1	The price change for the last minute. The current price - the price one minute ago, in

	dollars.
bid, ask	The bid and ask price of the stock, in \$.

## Functions

### **min(a, b [, ...])**

This returns the smallest of 2 or more values.

### **max(a, b [, ...])**

This returns the largest of 2 or more values.

### **if(predicate, true\_value [, false\_value])**

If the first value is true, this returns the second value. Otherwise it returns the third value.

This function will treat null as false. This and ?? are the two ways to get rid of a null.

The third parameter is optional. It defaults to null.

### **abs(x)**

Absolute value of x.

### **ceil(x)**

Ceiling of x.

$\lceil x \rceil$

### **floor(x)**

Floor of x.

$\lfloor x \rfloor$

### **exp(x)**

$e^x$

### **ln(x)**

Natural log of x.

$\log_e(x)$

## **log(base, x)**

Log of the given base of x.

## **sqrt(x)**

The square root of x.

$\sqrt{x}$

## **sin(x), cos(x), tan(x)**

The standard sine, cosine, and tangent functions. x is measured in radians.

## **asin(x), acos(x), atan(x)**

The inverse of the sine, cosine, and tangent functions. The result is in radians.

# **Examples**

## **Volatility**

This will compare today's range to the size of the Bollinger band.

$[TRangeD]/std\_20/4$

There are a lot of ways to measure the recent price movement (range for the day, up from the close, up from the open, up in the last 5 minutes, etc.) and there are a lot of ways to estimate the volatility (ATR, %, etc.). We couldn't possibly list every possible combination as a predefined formula. A common use of the formulas is to compare the size of a recent move to the size of past moves.

## **Dollars vs. Percent**

This gives you the spread as a percent of the current price.

$[Spread]/[Price]*100$

Some people disagree with our choice of \$ or % for a particular filter.

If you are looking at the block trade alerts, this will let you filter based on the size of the trade as *a percent of the average daily volume*.

$quality/[Vol]*100$

## **Extremes**

If you sort by this, the most extreme stocks will all be at the top, regardless of the stock's direction.

$abs([FCP])$

A stock which is up 5% from the close and a stock which is down 5% from the close will both return 5.



## Volume

This will compare a stock's volume in the last minute to the same stock's volume in the previous 4 minutes.

$$v\_up\_1/(v\_up\_5-v\_up\_1)/5$$

Similar to price movements, you can compare recent volume numbers to historical baselines.

There are many different options here. You could look at different time frames. This compares the last 5 minutes to the previous 10 minutes.

$$v\_up\_5/(v\_up\_15-v\_up\_5)/2$$

You could change the scaling. The previous examples used 1.0 to mean normal. The following makes 100.0 normal, which might work better with the graphical indicators.

$$v\_up\_5/(v\_up\_15-v\_up\_5)/2*100$$

The previous examples compare two time frames which do not overlap. It might be simpler to ask for the last minute compared to the last 5 minutes.

$$v\_up\_1/v\_up\_5$$

This is simpler, but it can't show anything above 100%

This formula is similar to the first one, but it will give you a very large value if the stock didn't trade anything for the previous 4 minutes but is trading now.

$$v\_up\_1/(v\_up\_5-v\_up\_1+0.000001)/5$$

This is not as precise, and it's a little more complicated, but there's a good chance this is what you want. This way you'll see when a stock is trading more than normal, even if normal is 0.

Clearly this list could keep going. There are far too many combinations of the data than we could put in our standard list of filters. That is the power of the formula editor.

## Boolean Expressions

The following is a Boolean expression. It will return 0 for false, or 1 for true.

$$([PV] > 500) || ([RV] > 5)$$

Setting the min value for this filter to 0.5 will only show you stocks where the expression is true.

Setting the max value to 0.5 will only show you stocks where the expression is false.

Several people have asked for more complicated ways to mix and match the filters. In this example we look for stocks where one volume filter is greater than 500% **or** a different volume filter is greater than 5. Without the formula editor, different conditions are typically combined with an **and**, not an **or**.