Charting Platform Indicators

Reference Guide

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Technical analysis focuses on market action — specifically, volume and price. Technical analysis is only one approach to analyzing stocks. When considering which stocks to buy or sell, you should use the approach that you're most comfortable with. As with all your investments, you must make your own determination as to whether an investment in any particular security or securities is right for you based on your investment objectives, risk tolerance, and financial situation. Past performance is no guarantee of future results.

Any screenshots, charts, or company trading symbols mentioned are provided for illustrative purposes only and should not be considered an offer to sell, a solicitation of an offer to buy, or a recommendation for the security.

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Indictors Reference Guide

The following document outlines the technical analysis theory for some of the more popular built-in indicators.

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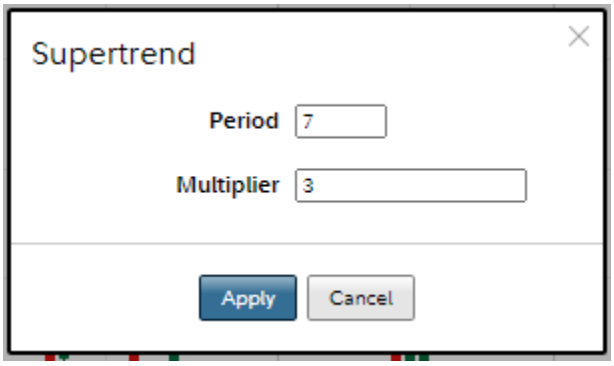
Supertrend

Indicator Type

Trend following indicator

Formula



The upper band is the average price plus the volatility-based multiplier (usually average true range (ATR)). The lower band is the average price minus the volatility-based multiplier. Only one band is drawn for any period and it switches when price crosses it similar to the parabolic stop-and-reverse. Similar to any trailing stop, the upper band can never move higher once established and the lower band can never move lower once established. Each is continued at the same price level as the previous period. Arrows are drawn pointing to the close of the bar when direction changes.

Math

Supertrend Upper = ((high + low / 2) + Multiplier * ATR …Only if price < upper Lower = ((high + low / 2) – Multiplier * ATR …Only if price > lower

ATR (Average True Range) TR (True Range) is defined as the greatest of the following:

- Current high minus the current low
- Current high minus the previous close (absolute value)
- Current low minus the previous close (absolute value) ATR = simple moving average of TR

Donchian Channel

Indicator Type

Trend following indicator

Formula

The channel is formed by taking the highest high and the lowest low of the prior n periods. The median line is the average of the upper and lower band for each period and not a moving average of price.

Math

1. Directional Movement (DM) is defined as the largest part of the current period's price range that lies outside the previous period's price range.

- PDM = current high minus the previous high (called plus DM)
- MDM = current low minus the previous low (called minus DM)
- If PDM > MDM then MDM is set to zero
- If MDM > PDM then PDM is set to zero
- If current range lies within or is equal to the previous range then set both PDM and MDM to zero

2. Calculate the value of the Plus and Minus Directional Indicators:

$$PDI(n) = \frac{PDM(n) * 100}{ATR(n)}$$

$$MDI(n) = \frac{MDM(n) * 100}{ATR(n)}$$

Where:
n = Number of periods
ATR = Average True Range

3. Calculate the absolute value of the Directional Movement Index (DMI):

$$DMI = \frac{(PDI - MDI)}{(PDI + MDI)}$$

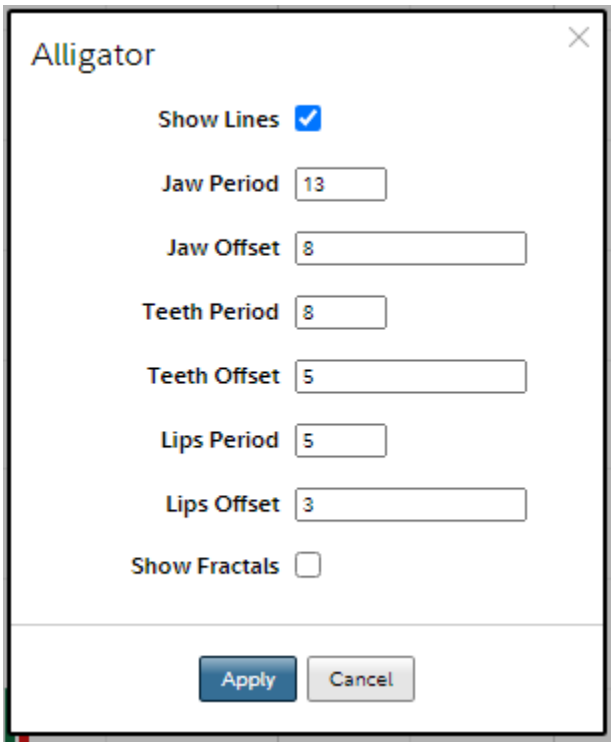
4. Calculate the Average Directional Movement (DMIA a.k.a. ADX):
DMIA(n) = Simple Moving Average of DMI

Alligator and Gator Oscillator

Indicator Type

Trend following indicator

Formula



The indicator uses three smoothed moving averages, each one offset forward (into the future).

Math

Calculate three moving averages and offsets them into the future.

- The Jaw line is a 13-period Smoothed Moving Average (SMMA), moved into the future by 8 bars;
- The Teeth line is an 8-period Smoothed Moving Average (SMMA), moved by 5 bars into the future;
- The Lips line is a 5-period Smoothed Moving Average, moved by 3 bars into the future.

Smoothed Moving Average – Same calculation as an exponential moving average except the smoothing constant is different.

$$\frac{P + wP1 + w^2P2 + \ldots + w^{(n-1)}P(n-1)}{1 + w + w^2 + \ldots + w^{(n-1)}}$$

Exponential smoothing constant: 2/(n+1)

Wilder smoothing constant: 1/n

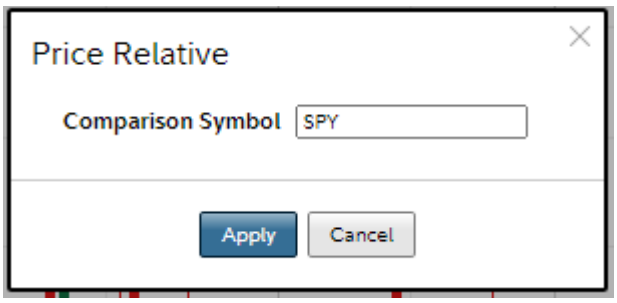
Therefore, the Wilder average reacts slower than an exponential average. Also, the Wilder average can be converted into an exponential average with the formula 2n-1. For example, a 26-day Wilder average will draw the exact same plot as a 51-day exponential average.

Price Relative (Relative Strength)

Indicator Type

Relative performance Indicator

Formula



A simple ratio of A / B. Select the item to be used as “B.”

Math

A simple ratio of the first item to the second: A / B

Chaikin Money Flow

Indicator Type

Buying/Selling Pressure Gauge

Formula

Similar to on-balance or cumulative volume, CMF uses price times volume. However, there are two main differences. Whereas on-balance volume calculates each period's value and plots the running total, CMF acts more like a moving window. It sums up price times volume for a user defined span of periods and then calculates a fresh value for the next period. The second difference is that instead of close price, CMF calculates the percentage of where the close price falls within that period's range. Called a "multiplier" instead of simply price, it ranges from -1 for a close at the low to +1 for a close at the high.

Math

Find the Money Flow Multiplier:

$$\frac{(\text{Close} - \text{Low}) - (\text{High} - \text{Close})}{(\text{High} - \text{Low})}$$

Calculate Money Flow Volume:

$$(\text{Money Flow Multiplier}) \times \text{Volume}$$

Calculate the CMF:

$$\frac{(\text{N-Period Sum of Money Flow Volume})}{(\text{N-Period Sum of Volume})}$$

Keltner Channel

Indicator Type

Moving average envelope

Formula

The upper and lower lines form an envelope drawn a number of Average True Ranges (ATRs) above and below a moving average.

Math

Center Line: 20-day exponential moving average
Upper Channel Line: 20-day EMA + (2 x ATR (10-period))
Lower Channel Line: 20-day EMA – (2 x ATR (10-period))

Awesome Oscillator

Indicator Type

Momentum Oscillator

Formula

The difference between two simple moving averages using the median price instead of the close price. The result does not have high or low limits.

Math

Fast Period: Simple Moving Average (Highest Price + Lowest Price)/2
Slow Period: Simple Moving Average (Highest Price + Lowest Price)/2

Aroon and Aroon Oscillator

Indicator Type

Trend Finder

Formula

The Aroon indicators are shown in percentage terms and fluctuate between 0 and 100. Aroon Up is based on recent highs and Aroon Down is based on recent lows. The Aroon Oscillator is simply a plot of Aroon Up minus Aroon Down.

Math

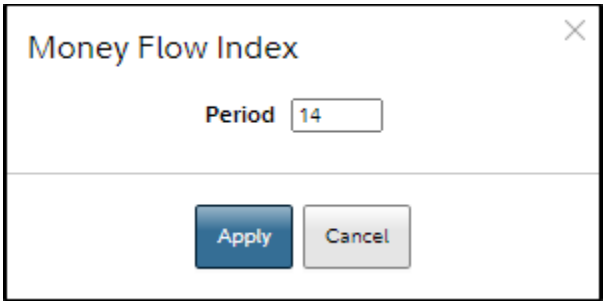
Aroon Up: 100 x (n- Days Since n-day High)/n
Aroon Down: 100 x (n – Days Since n-day Low)/n
Aroon Oscillator: Aroon Up – Aroon Down

Money Flow Index

Indicator Type

Momentum Oscillator

Formula



The formula is essentially a volume-weighted relative strength index (RSI). However, instead of using simple close prices, MFI uses the typical price multiplied by volume. The result is then used in the RSI calculation as a ratio of average volume weighted size of the up-closes over the past “n” periods and compared to the average volume weighted size of the down-closes. The result is indexed between 0 and 100.

Math

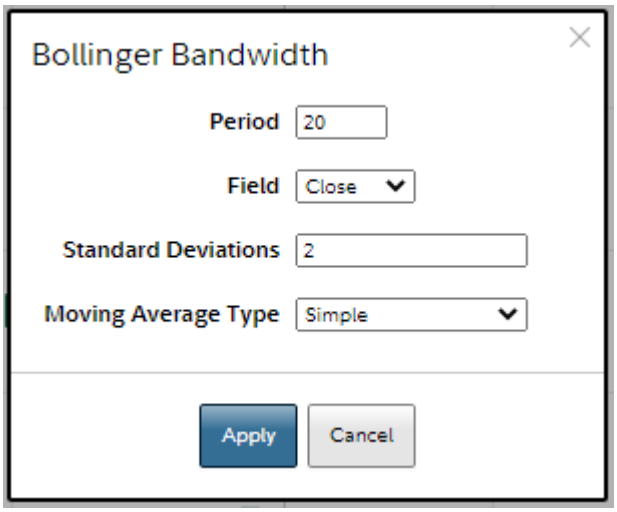
Calculate Money Flow = Typical Price x Volume
Typical Price = (High + Low + Close)/3
Find positive money flow = sum of the volume weighted “up” typical price changes for the past n-periods
Find negative money flow = sum of the volume weighted “down” typical price changes for the past n-periods
Calculate Money Flow ratio = (n-period positive Money Flow)/ (n-period negative Money Flow)
Calculate Money Flow Index = 100 – 100/ (1 + Money Flow Ratio)

Bollinger Bandwidth

Indicator Type

Volatility Oscillator

Formula



Bollinger Bands form an envelope drawn a number of standard deviations above and below a moving average. Bandwidth measures the percentage difference between the upper and lower bands and therefore the volatility level.

Math

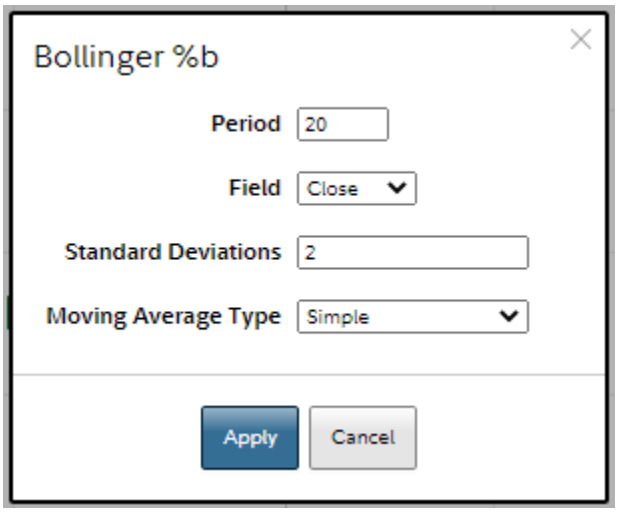
Bandwidth = (Upper Band – Lower Band) / Central Moving Average * 100

Bollinger %B

Indicator Type

Momentum Oscillator

Formula



Bollinger Bands form an envelope drawn a number of standard deviations above and below a moving average. %B is simply a percentage measure of a security's location between the bands. %B can be lower than 0 or higher than 100 if price moves outside the bands.

Math

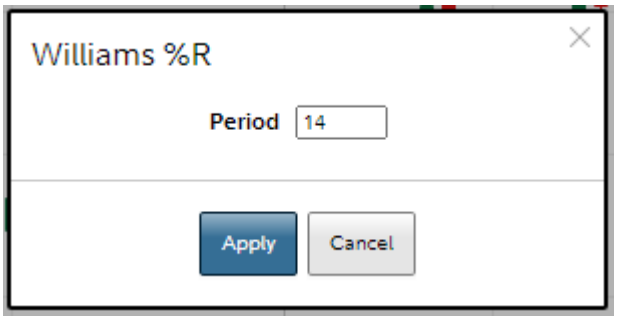
%B = (Price – Lower Band) / (Upper Band – Lower Band)

Williams %R

Indicator Type

Momentum oscillator

Formula



The calculation tells us where price is in its recent range.

Math

Calculates where price is within a recent range.

- Fast calculation (%K) uses raw value with a simple moving average
- Slow (smoothed) version (%D) uses the simple average with another simple average of the first

%R = (Highest High – Current) / (Highest High – Lowest Low)
The result is multiplied by -100 and is plotted on a scale of -100 to zero
Lowest Low = lowest low for the past N-periods including current
Highest High = highest high for the past N-periods including current

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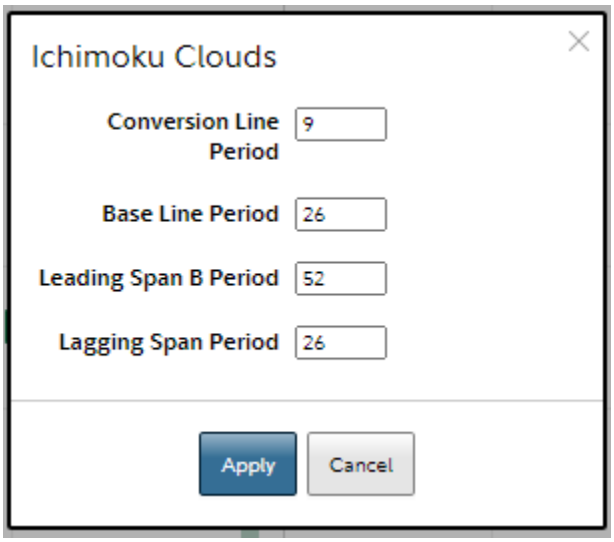
Ichimoku Cloud (intro)

Indicator Type

Trend finder

Formula



There are five components:

- Tenkan Sen (Conversion Line) – Calculated as the sum of the highest high over the past nine periods and the lowest low divided by two
- The Kijun Sen (Base Line) – Calculated as the sum of the highest high over the past 22 periods and the lowest low divided by two.

- Senkou Span A (leading) – The sum of the Tenkan Sen and the Kijun Sen divided by two. The calculation is then plotted 26 time periods ahead of the current price action.
- Senkou Span B (leading) – The sum of the highest high and the lowest low over the past 52 periods divided by two. It is also plotted 26 periods ahead.
- Chikou (lagging)) – The same and Senkou Span B leading but plotted 26 periods in the past.

Math

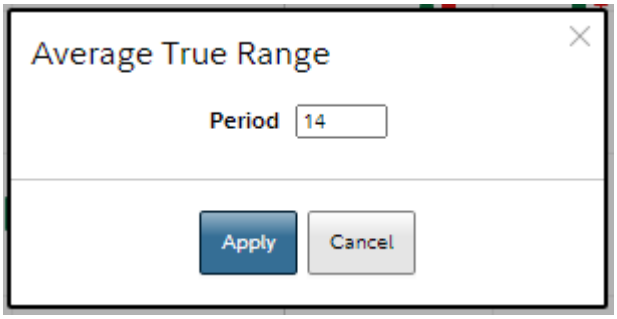
coming soon!

Average True Range (ATR) Trailing Stop

Indicator Type

Trade trigger

Formula



Calculate the Average True Range and then multiply by the multiplier. For an up trend, subtract from previous close. For a down trend, add to previous close.

Math

TR=True Range = defined as the greatest of the following:

- Current high minus the current low
- Current high minus the previous close (absolute value)
- Current low minus the previous close (absolute value)

ATR = simple moving average of TR
ATR Trailing Stop in a rising trend is highest price over the user-defined span minus (multiplier * ATR). If prices continue to rise, the stop will continue to rise. However, if prices

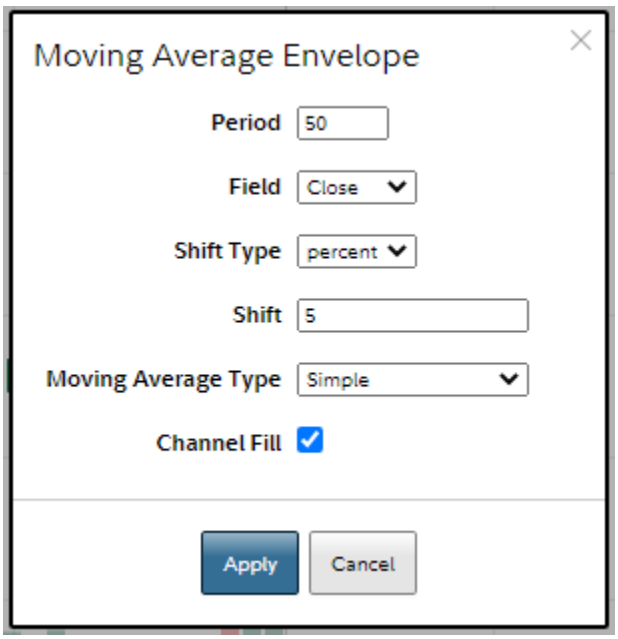
flatten out or pull back the stop will be flat. Only when price dips below the flat stop line will it flip to the inverse with the stop above prices.

Moving Average Envelope

Indicator Type

Trend follower

Formula



Lines are drawn a percentage or number of points above and below a moving average.

Math

Envelopes start with any moving average type (see Moving Averages for formulas) and then creates an offset x% above or below the average or an offset Y points above or below the average.

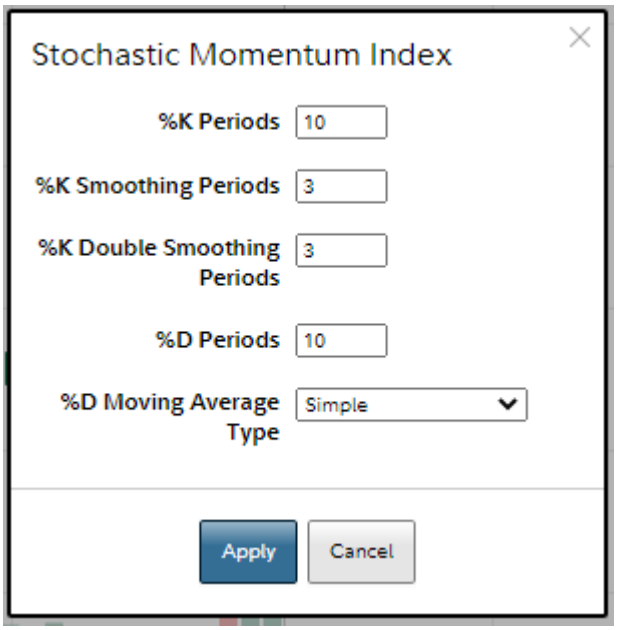
For percentage envelopes:
Upper band = moving average + x%(moving average)
Lower band = moving average – x%(moving average)
Upper band = moving average + constant
Lower band = moving average – constant

Stochastic Momentum (SMI)

Indicator Type

Momentum oscillator

Formula



The calculation tells us where price with regard the median of its recent range and runs a smoothing average through the result. Most traders smooth the smoothed line again to create a slower version of the indicator.

Math

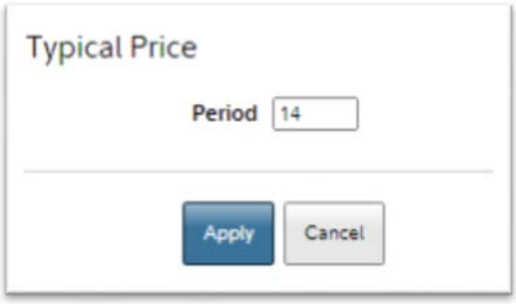
coming soon!

Typical Price

Indicator Type

Price indicator

Formula



The formula is a simple average of the period's open, high and low. ChartIQ allows you to calculate a moving average based on the typical price over a user defined span. It works the same way as a simple average of the other data points (open, high, low or close) works.

Math

Typical Price = (high + low + close) / 3
The moving average is calculated as a simple moving average Mov Avg =

$$\frac{P + P1 + \ldots + P(n-1)}{n}$$

Volume Profile

Indicator Type

Activity indicator

Formula

Volume data is reported as is.

Math

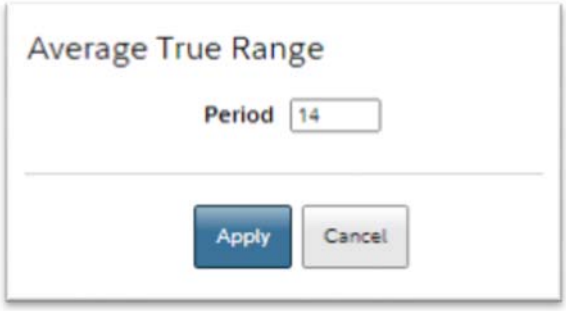
None

Average True Range (ATR)

Indicator Type

Volatility measure

Formula



The True Range is the largest of (high – previous close), (previous close – low) or (high – low).

Math

TR=True Range = defined as the greatest of the following:

- Current high minus the current low
- Current high minus the previous close (absolute value)
- Current low minus the previous close (absolute value)

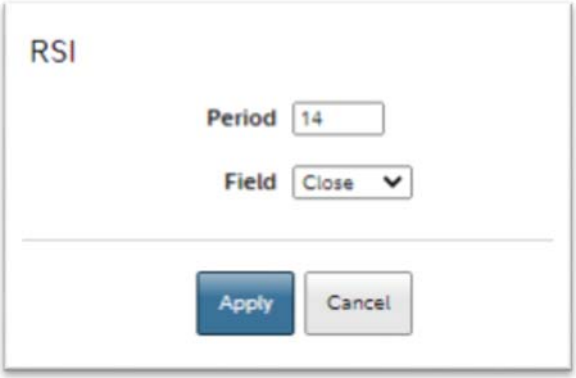
ATR = simple moving average of TR

RSI

Indicator Type

Momentum oscillator

Formula



The RSI looks at a ratio of average size of the up-closes over the past “n” periods and compares to the average size of the down-closes. The result is indexed between 0 and 100. RSI values are smoothed exponentially using the same “n” period parameter.

Math

RSI = 100 – 100/(1 + RS)
RS =

$$\frac{\text{Average of the up closes over n-periods}}{\text{Average of the down closes over n-periods}}$$

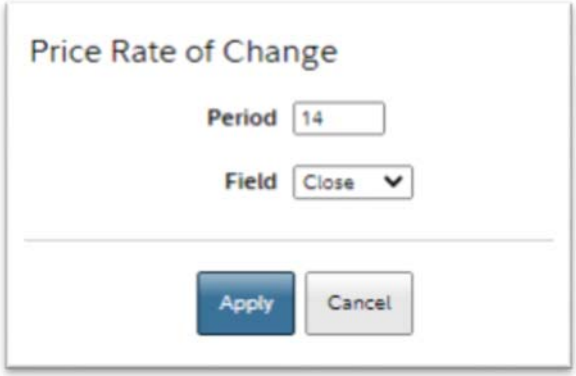
The average of the “up closes” refers to the total changes higher over the past “n” periods (not the last “n” up-periods) divided by “n.” The average of “down closes” refers to the total changes lower over the same span. RSI values are smoothed in an exponential manner after the initial calculation whereby the averages of up closes and down closes are each divided by n-1 and the new period’s up or down close is added. The result is then divided by n. As follows: Average up close = (previous average up close x (n-1) + current up close). Average down close = (previous average down close x (n-1) + current down close).

Price Rate of Change

Indicator Type

Momentum indicator

Formula



((Current Price – Price n-periods ago) / Price n-periods ago) * 100

Math

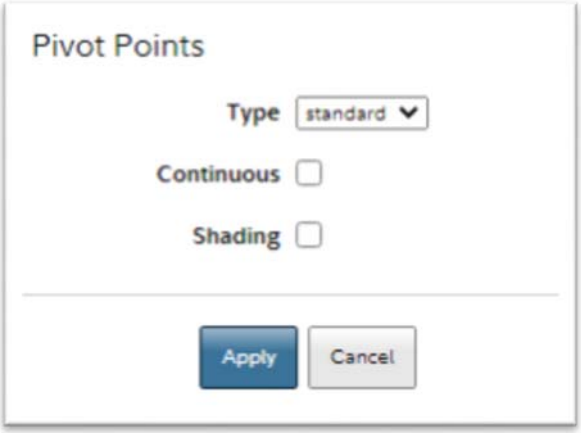
$$ROC = \frac{\text{Current Price} - \text{Price (n-periods ago)} * 100}{\text{Price n-periods ago}} - 1$$

Pivot Points

Indicator Type

Support/Resistance

Formula



The pivot point and its support and resistance pairs are defined as follows:

- Pivot point (P) = (H + L + C) / 3
- Third resistance level (R3) = P + 2*(H – L)
- Second resistance level (R2) = P + (H – L)
- First resistance level (R1) = (2 * P) – L
- First support level (S1) = (2 * P) – H
- Second support level (S2) = P – (H – L)
- Third support level (S3) = P – 2*(H-L)

where H, L, C are the previous period's high, low and close

Math

Plots 7 horizontal lines for each period, one for Pivot line, 3 for Support, and 3 for Resistance Period is determined as follows:

- Intraday chart from 1 minute up to but not including 30 minutes – Period=daily
- Intraday chart from 30 minutes upwards – Period=weekly
- Daily charts – Period=monthly
- Weekly and Monthly charts – Period=yearly

Daily periods begin at midnight ET for equities, 5PM for forex, 6PM for metals

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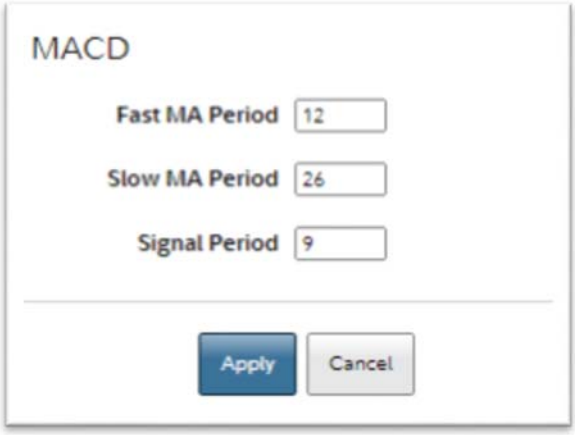
MACD

Indicator Type

Momentum oscillator

Formula



The Moving Average Convergence-Divergence (MACD) indicator makes use of three moving averages, usually of the exponential variety. Two are averages of price and the third is an average of the difference of the other two. The MACD line is generated from the first two averages, subtracting the longer from the shorter. The Signal Line is simply a moving average of the MACD line.

Math

MACD line – short moving average minus short moving average Signal line – a moving average of the MACD line Histogram – same as MACD line but in a different visual format Averages are usually based on the close and are exponentially smoothed.

Cumulative (On-Balance) Volume

Indicator Type

Volume study

Formula

Cumulative total of daily volume on up days minus daily volume on down days. Each day's volume may also be weighted by the price change for that day so that volume on days with large price moves is counted more heavily.

Math

A running total of volume on up-periods minus volume on down periods. Periods with no change have no effect.

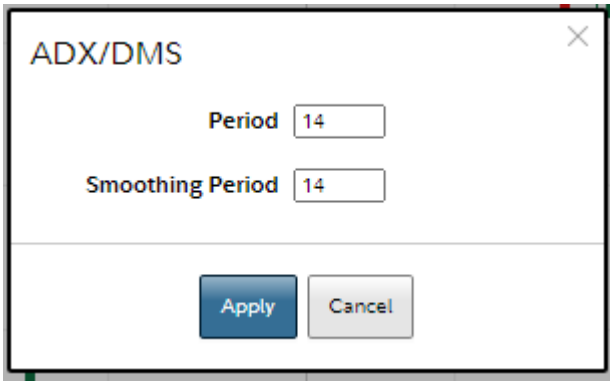
∑ volume * (direction of price change) Value will change depending on span chosen but plot will look the same.

ADX/DMS

Indicator Type

Trend finder

Formula



Directional Movement (DM) is defined as the largest part of the current period's price range that lies outside the previous period's price range. Each period will either be positive (larger range above previous range), negative (larger range below previous range) or zero if moves above and below the previous period's range are the same or price stay within the previous day's range. The value of the Plus Directional Indicator (+DI) is the DM, if above the previous range) divided by the average true range. The value of the Minus Directional Indicator (-DI) is the DM (if below the previous range) divided by the average true range. Each period with have only one result, either plus, minus or zero. Calculate the Average Directional Index by taking a simple moving average of the past +DI and -DI values. IIChart defaults to 14 periods.

Math

1. Directional Movement (DM) is defined as the largest part of the current period's price range that lies outside the previous period's price range.
    - PDM = current high minus the previous high (called plus DM)

- MDM = current low minus the previous low (called minus DM)
- If PDM > MDM then MDM is set to zero
- If MDM > PDM then PDM is set to zero
- If current range lies within or is equal to the previous range then set both PDM and MDM to zero

2. Calculate the value of the Plus and Minus Directional Indicators:

$$PDI(n) = \frac{PDM(n) * 100}{ATR(n)}$$

$$MDI(n) = \frac{MDM(n) * 100}{ATR(n)}$$

Where: n = Number of periods ATR = Average True Range

3. Calculate the absolute value of the Directional Movement Index (DMI):

$$DMI = \frac{(PDI – MDI)}{(PDI + MDI)}$$

4. Calculate the Average Directional Movement (DMIA a.k.a. ADX):

DMIA(n) = Simple Moving Average of DMI

Volume

Indicator Type

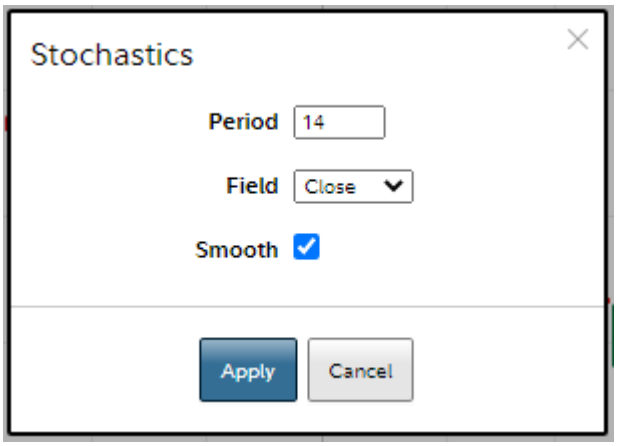
Activity indicator

Stochastics

Indicator Type

Momentum oscillator

Formula



The calculation (fast) tells us where price is in its recent range. It is then smoothed with a 3-period moving average (slow) leaving both lines on the chart. Most traders smooth the smoothed line again to create a slower version of the indicators.

Math

Calculates where price is within a recent range.

- Fast calculation (%K) uses raw value with a simple moving average
- Slow (smoothed) version (%D) uses the simple average with another simple average of the first

Fast %K = (Current Price – Lowest Low) / (Highest High – Lowest Low)
Fast %D = 3-period simple moving average of Fast %K
Slow %K = Fast %D
Slow %D = 3-period simple moving average of Slow %K
Lowest Low = lowest low for the past N-periods including current
Highest High = highest high for the past N-periods including current

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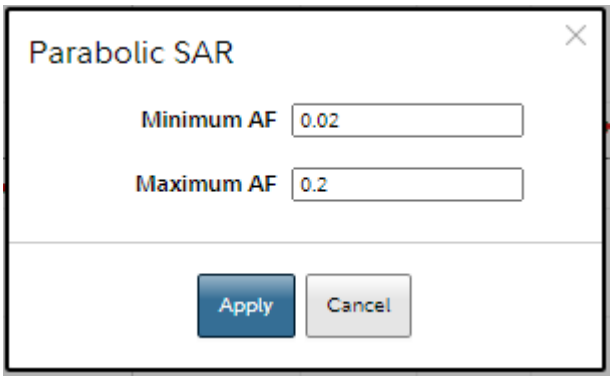
Parabolic SAR

Indicator Type

Trend following system

Formula



The initial SAR (stop and reverse point) is set at the end of the previous trend. For new rising trend, to calculate the next SAR, the acceleration factor is multiplied by the difference between the current high for the new trend and the prior period's SAR. This is then added to the prior period's SAR.

Math

The initial SAR (stop and reverse point) is set at the extreme price of the previous trend. After the initial SAR is set, the next interval's SAR is adjusted in the direction of the trend by the distance between the high for the new trend and the previous SAR then multiplied by an acceleration factor. The acceleration factor typically starts at .02 and increases by .02 to a typical maximum of .20 each period the market makes a new high/low for the move. For a rising trend:

- Previous SAR: The SAR value for the previous period.
- Extreme Point (EP): The highest high of the current uptrend.
- Acceleration Factor (AF): Starting at .02

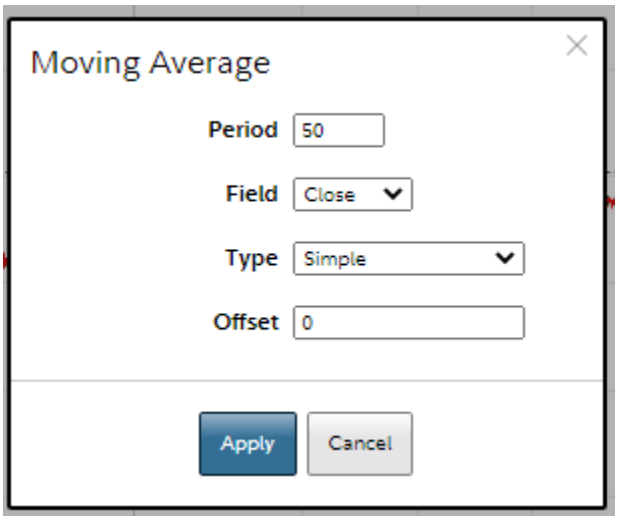
Current SAR = Previous SAR + Previous AF(Previous EP – Previous SAR)
When price moves through the SAR point, the entire calculation starts over but the extreme point becomes the lowest low of the new trend and the AF becomes a negative number.
Current SAR = Previous SAR – Previous AF(Previous EP – Previous SAR)

Moving Average

Indicator Type

Trend follower

Formula



Moving averages can be calculated from open, high, low, close or some combination of these data. Simple averages are means of the data. Other averages assign higher significance to recent data than to older data. Technician allows you to calculate the average based on open, high, low, close or adjusted close data. You also have a choice of several average types as follows.

- **Simple:** mean (average) of the data.
- **Exponential:** newer data are weighted more heavily geometrically.
- **Time Series:** Calculates a linear regression trendline using the “least squares fit” method.
- **Triangular:** Weighted average where the middle data are given the most weight, decreasing linearly to the end points.
- **Variable:** An exponential moving average with a volatility index factored into the smoothing formula. The Variable Moving average uses the Chande Momentum Oscillator as the volatility index.
- **VIDYA:** An exponential moving average with a volatility index factored into the smoothing formula. The VIDYA moving average uses the Standard Deviation as the volatility index. (Volatility Index DYnamic Average)
- **Weighted:** newer data are weighted more heavily arithmetically.
- **Welles Wilder:** The standard exponential moving average formula converts the time period to a fraction using the formula EMA% = 2/(n + 1) where n is the number of days. For example, the EMA% for 14 days is 2/(14 days +1) = 13.3%. Wilder, however, uses an EMA% of 1/14 (1/n) which equals 7.1%. This equates to a 27-day exponential moving average using the standard formula.

Math

<u>Moving Averages</u>

Simple =

$$\frac{P + P1 + \ldots + P(n-1)}{n}$$

Weighted =

$$\frac{n*P + (n-1)*P1 + (n-2)*P2 + \ldots + P(n-1)}{1 + 2 + 3 + \ldots + n}$$

Exponential =

$$\frac{P + aP1 + a^2P2 + \ldots + a^{(n-1)}\,P(n-1)}{1 + a + a^2 + \ldots + a^{(n-1)}}$$

Welles Wilder =

$$\frac{P + wP1 + w^2P2 + \ldots + w^{(n-1)}\,P(n-1)}{1 + w + w^2 + \ldots + w^{(n-1)}}$$

Variable =

$$\frac{P + (a*b)P1 + (a*b)^2P2 + \ldots + (a*b)^{(n-1)}\,P(n-1)}{1 + (a*b) + (a*b)^2 + \ldots + (a*b)^{(n-1)}}$$

Vidya =

$$\frac{P + (a*bv)P1 + (a*bv)^2P2 + \ldots + (a*bv)^{(n-1)}\,P(n-1)}{1 + (a*bv) + (a*bv)^2 + \ldots + (a*bv)^{(n-1)}}$$

Triangular = Same as weighted average except the middle data gets the highest weight and the ends get arithmetically lower weights

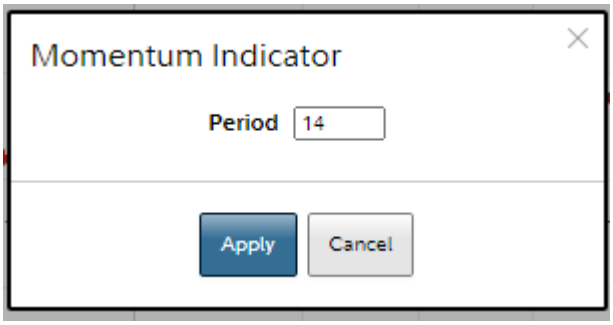
Where:
P = current price
P1 = price 1 period ago
P2 = price 2 periods ago
a = smoothing constant 2/(n+1)
w = smoothing constant 1/n
v = a * b and is variable
b = absolute value (F(P)/100)
F = Chande Momentum Oscillator (CMO) with Period 9
n = user-defined number of periods for the average

Momentum

Indicator Type

Momentum indicator

Formula



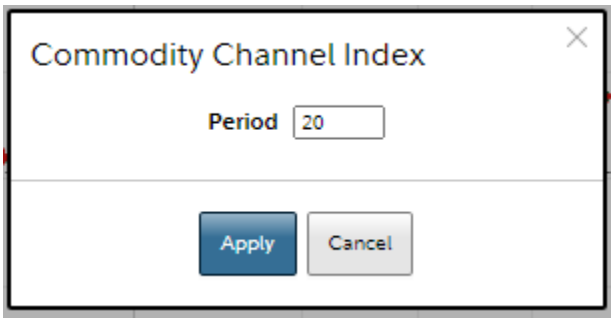
Current Price – Price n-periods ago

Commodity Channel Index (CCI)

Indicator Type

Momentum indicator

Formula



The CCI starts with the average of the high, low and close for the period and subtracts the "n" period moving average. The goal is to measure the current price level relative to an average price level over a given period of time, normalized for the average price over time.

Math

CCI =

$$\frac{\text{Typical Price (TP)} - \text{(n-period simple moving average of TP)}}{(0.015 * \text{Mean Deviation})}$$

Typical Price =

$$(\text{high} + \text{low} + \text{close}) / 3$$

Mean Deviation =

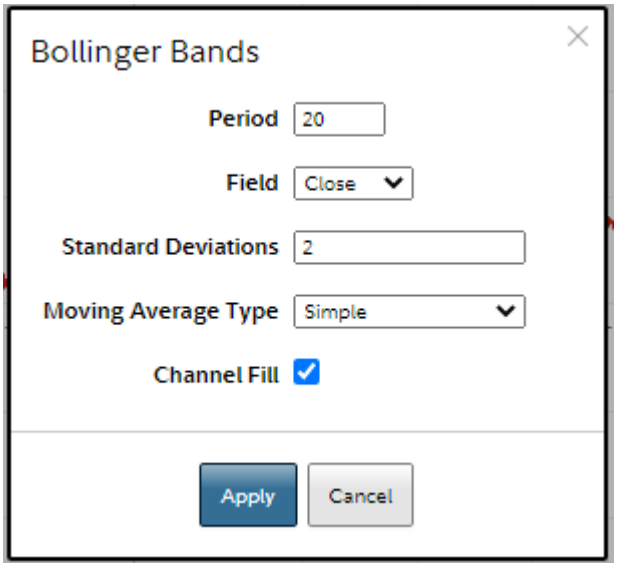
$$\frac{\sum \text{(absolute value of difference of TP and its N-pd simple moving average)}}{N}$$

Bollinger Bands®

Indicator Type

Moving average envelope

Formula



The bands form an envelope drawn a number of standard deviations above and below a moving average.

Math

An envelope based with width determined by standard deviations above and below a moving average.

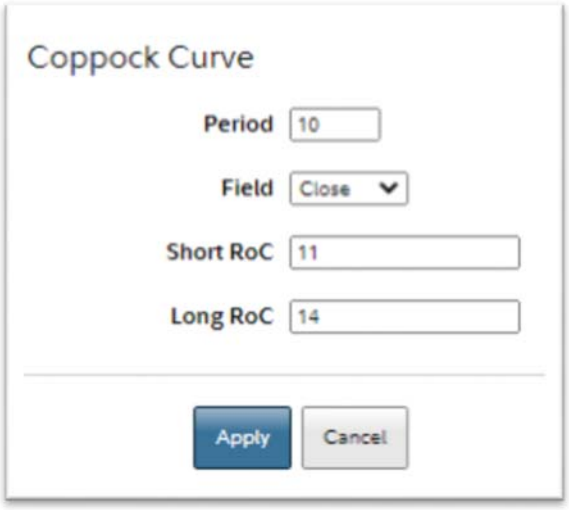
- Middle Band = N-period moving average
- Upper Band = N-period moving average + (N-period standard deviation of price x multiple)
- Lower Band = N-period moving average – (N-period standard deviation of price x multiple) Multiple = user defined number of deviations above and below middle band (typically 2.0) N-period = typically 20 Standard Deviation =
    - Calculate the average (mean) price for N periods
    - Subtract each price over N periods from the average price over N periods
    - Square each difference.
    - Sum these squares
    - Divide this sum by N
    - Standard deviation = the square root of that number.

Coppock Curve

Indicator Type

Momentum indicator

Formula



The Coppock Curve is calculated by first determining the sum of the rates of change of a long and a short period. Then, a Weighted Moving Average of this sum is taken over another period. This average is the result for the indicator.

The defaults for the periods are 11 for the Short period, 14 for the Long period, and 10 for the WMA period. The rate of change is usually calculated on the Close.

Math

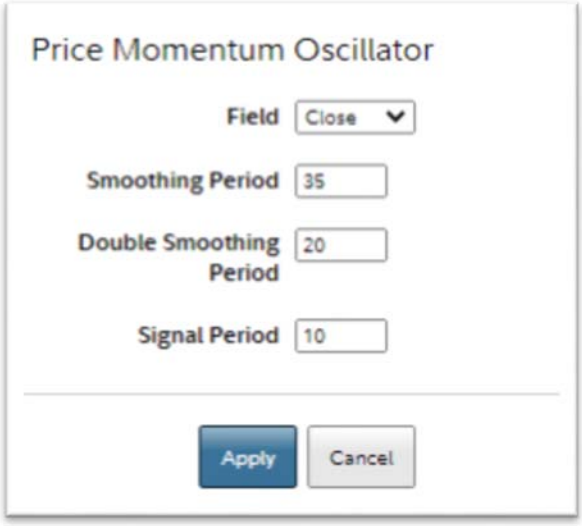
- SP=Short Period, LP=Long Period, N=WMA Period, X=data field
- sumi=100 * (Xi / Xi-SP + Xi / Xi-LP - 2)
- Coppocki: WMA(i,sum,N)

Price Momentum Oscillator

Indicator Type

Momentum indicator

Formula



The Price Momentum Oscillator is a twice smoothed rate of change of the price from the previous price. The smoothing is an EMA with a period one less than specified. There is also a signal which is an EMA of the oscillator result.

The defaults for the periods are 35 for the first smoothing, 20 for the second smoothing, and 10 for the signal period. The rate of change is usually calculated on the Close.

Math

- SM=smoothing period, DSM=double smoothing period, SG=signal period, X=data field
- ai=1000* (Xi / Xi-1 - 1)
- smi=EMA(i, a, SM - 1)
- PMOi=EMA(i, sm, DSM - 1)
- Signali=EMA(i, PMO, SG)

Elder Impulse System

Indicator Type

Trend-momentum crossover indicator

Formula

The Elder Impulse System combines an exponential moving average with the moving average convergence/divergence (MACD) to produce bullish and bearish signals on the chart. The result is a colored bar chart where the colors represent bullish, bearish or neutral signals.

The EMA had a period of 13, computed on the Close. The MACD has a fast period of 12, a slow period of 26, and a signal period of 9.

Math

- MAi = EMA(i, Close, 13)
- MACD1 i= EMA(i, Close, 12)
- MACD2i = EMA(i, Close, 26)
- MACDi = MACD1-MACD2
- MACDSigi = EMA(i, MACD, 9)

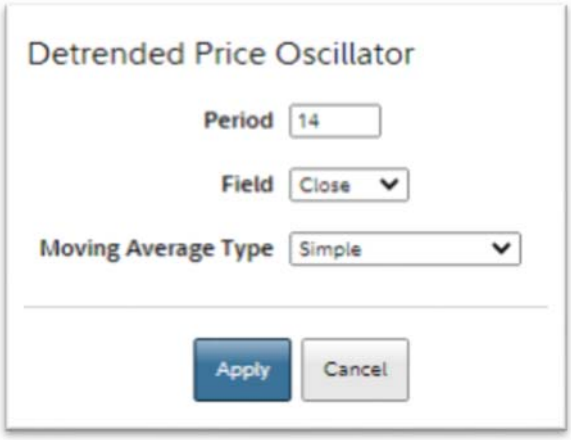
If MAi>MAi-1 and MACDi-MACDSigi>MACDi-1-MACDSigi-1 then bar i is bullish
If Mai<MAi-1 and MACDi-MACDSigi<MACDi-1-MACDSigi-1 then bar i is bearish
If neither of the above, bar i is neutral

Detrended Price Oscillator

Indicator Type

Price cycle

Formula



The Detrended Price Oscillator seeks to remove trend information from the dagta. It does this by taking a moving average and shifting it to the left. It then subtracts the average from the time period from the Close of that time period to arrive at the result.

The resulting DPO plot will emphasize the movement of the security above and below the moving average while filtering out the general trends.

Note that as the moving average is shifted to the left, the DPO will not compute to the present bar.

The Moving Average type defaults to Simple, and the moving average period defaults to 14, computed on the Close.

Math

In this section, xMA denotes any moving average chosen by the user. N is the period, and X is the data field.

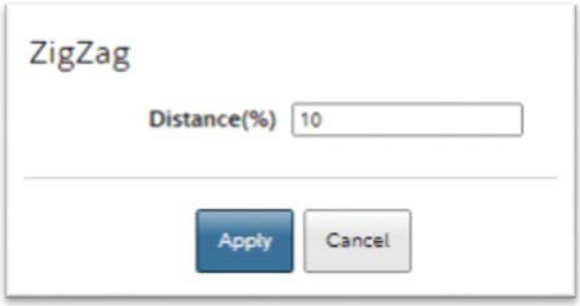
- MAi = xMA(i, X, N)
- MAShiftedi = MA(i+int(N/2+1)) *where "int" is the whole number portion of the formula within the parentheses. For example, int(16.5)=16.*
- DPOi = Xi - MAShiftedi

Zig Zag

Indicator Type

Trend finder/ Elliot Wave finder

Formula



The ZigZag is used to identify trends in the price movement. It filters out noisy fluctuations in price while identifying larger trends.

Lines are drawn on a diagonal, up then down, when price movement exceeds a distance threshold percentage (default is 10). A lowest low point is recorded once a high price is reached which is the distance threshold percentage greater than that low, after which lowest low is sought once more. A highest high point is recorded once a low price is reached which is D less than that high, after which highest high is sought once more.

For OHLC data, the high and low values of the bar are considered. For line and mountain charts, only the close is considered.

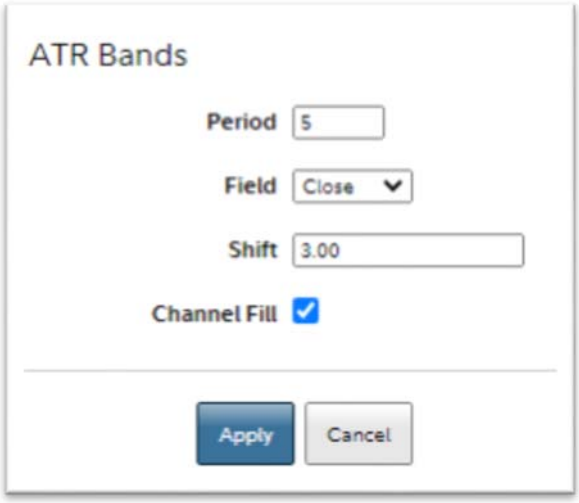
The final leg of the ZigZag is a proposed line between the last extreme value encountered and the present price.

ATR Bands

Indicator Type

Moving Average Envelope

Formula



The Average True Range, or ATR, is a measure of the volatility of a security. ATR Bands creates an envelope around the data field being measured (usually the close) sby drawing a plot above and below the data offset vertically by a percentage of the ATR, forming a channel. When the data breaks out of the channel, it can be interpreted as a signal.

By default, the ATR Bands will use an ATR with period of 5, and a 3% shift, to compute the bands. The Close field is usually used as the median band.

Math

Where M is the ATR period

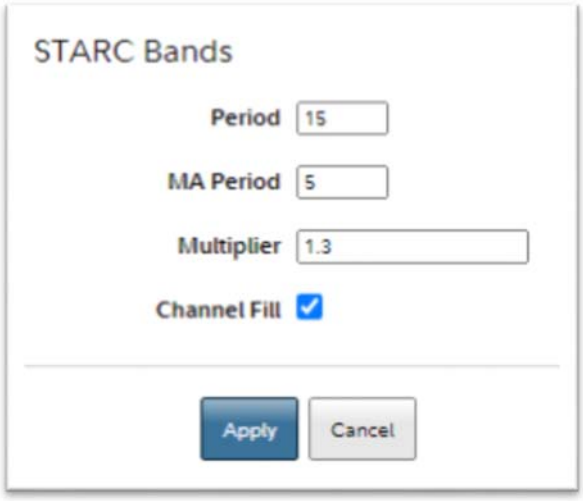
- Median Bandi = Xi *(usually X is the Close)*
- Top bandi = Median Bandi + %Shift * ATR(M)i
- Bottom Bandi= Median Bandi - %Shift * ATR(M)i

STARC Bands

Indicator Type

Moving Average Envelope

Formula



STARC Bands are a special type of ATR Bands. Instead of basing the envelope as a percentage shift off a data field such as the close, it is based instead on the simple moving average of the Close.

By default, the ATR Bands will use an ATR with period of 15, and a 1.3% shift, to compute the bands. The moving average has a period of 5.

Math

Where M is the ATR period, N is the SMA period.

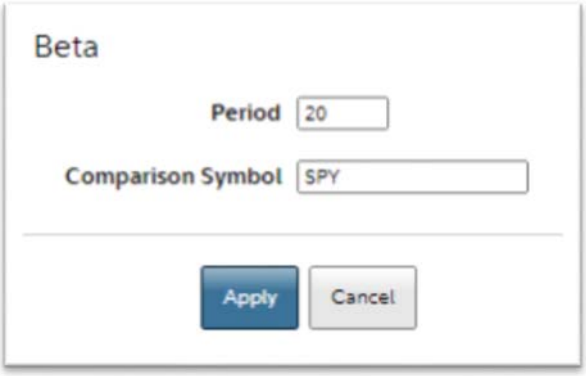
- Median Bandi = SMA(i, Close, N)
- Top bandi = Median Bandi + %Shift * ATR(M)i
- Bottom Bandi= Median Bandi - %Shift * ATR(M)i

Beta

Indicator Type

Relative volatility measure

Formula



The Beta calculation is a statiscical formula which measures volatility of one security tvs a benchmark security, usually the S&P 500 Index.

Math

Where X is the Close of the measured security, Y is the Close of the benchmark security, and N is the period.

- XChgi = Xi – Xi-1
- YChgi = Yi – Yi-1
- XMAi = SMA(i, XChg, N)
- YMAi = SMA(i, YChg, N)
- COVARi = (XChgi-XMAi) * (YChgi-YMAi)
- VARi = (XChgi-XMAi)2
- Betai = SMA(i, COVAR, N) / SMA(i, VAR, N)

Technical analysis focuses on market action — specifically, volume and price. Technical analysis is only one approach to analyzing stocks. When considering which stocks to buy or sell, you should use the approach that you're most comfortable with. As with all your investments, you must make your own determination as to whether an investment in any particular security or securities is right for you based on your investment objectives, risk tolerance, and financial situation. Past performance is no guarantee of future results.

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