## Volatility Indicators

Volatility Indicators.

**classta.volatility.AverageTrueRange(high: pandas.core.series.Series, low: pandas.core.series.Series, close: pandas.core.series.Series, window: int = 14, fillna: bool = False)**

## Average True Range (ATR)

The indicator provide an indication of the degree of price volatility. Strong moves, in either direction, are often accompanied by large ranges, or large True Ranges.

<http://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:average_true_range_atr>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**average\_true\_range() → pandas.core.series.Series**

Average True Range (ATR)

**Returns**

New feature generated.

**Return type**

pandas.Series

**classta.volatility.BollingerBands(close: pandas.core.series.Series, window: int = 20, window\_dev: int = 2, fillna: bool = False)**

## Bollinger Bands

<https://school.stockcharts.com/doku.php?id=technical_indicators:bollinger_bands>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_dev** (int) – n factor standard deviation
* **fillna** (bool) – if True, fill nan values.

**bollinger\_hband() → pandas.core.series.Series**

### Bollinger Channel High Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**bollinger\_hband\_indicator() → pandas.core.series.Series**

### Bollinger Channel Indicator Crossing High Band (binary).

It returns 1, if close is higher than bollinger\_hband. Else, it returns 0.

**Returns**

New feature generated.

**Return type**

pandas.Series

**bollinger\_lband() → pandas.core.series.Series**

### Bollinger Channel Low Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**bollinger\_lband\_indicator() → pandas.core.series.Series**

### Bollinger Channel Indicator Crossing Low Band (binary).

It returns 1, if close is lower than bollinger\_lband. Else, it returns 0.

**Returns**

New feature generated.

**Return type**

pandas.Series

**bollinger\_mavg() → pandas.core.series.Series**

### Bollinger Channel Middle Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**bollinger\_pband() → pandas.core.series.Series**

### Bollinger Channel Percentage Band

From: <https://school.stockcharts.com/doku.php?id=technical_indicators:bollinger_band_perce>

**Returns**

New feature generated.

**Return type**

pandas.Series

**bollinger\_wband() → pandas.core.series.Series**

### Bollinger Channel Band Width

From: <https://school.stockcharts.com/doku.php?id=technical_indicators:bollinger_band_width>

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.bollinger\_hband(close, window=20, window\_dev=2, fillna=False)**

### Bollinger Upper Bands (BB)

Upper band at K times an N-period standard deviation above the moving average (MA + Kdeviation).

<https://en.wikipedia.org/wiki/Bollinger_Bands>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_dev** (int) – n factor standard deviation
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.bollinger\_hband\_indicator(close, window=20, window\_dev=2, fillna=False)**

### Bollinger High Band Indicator

Returns 1, if close is higher than bollinger high band. Else, return 0.

<https://en.wikipedia.org/wiki/Bollinger_Bands>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_dev** (int) – n factor standard deviation
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.bollinger\_lband(close, window=20, window\_dev=2, fillna=False)**

### Bollinger Lower Bands (BB)

Lower band at K times an N-period standard deviation below the moving average (MA − Kdeviation).

<https://en.wikipedia.org/wiki/Bollinger_Bands>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_dev** (int) – n factor standard deviation
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.bollinger\_lband\_indicator(close, window=20, window\_dev=2, fillna=False)**

### Bollinger Low Band Indicator

Returns 1, if close is lower than bollinger low band. Else, return 0.

<https://en.wikipedia.org/wiki/Bollinger_Bands>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_dev** (int) – n factor standard deviation
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.bollinger\_mavg(close, window=20, fillna=False)**

### Bollinger moving average Bands (BB)

N-period simple moving average (MA).

<https://en.wikipedia.org/wiki/Bollinger_Bands>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.bollinger\_pband(close, window=20, window\_dev=2, fillna=False)**

### Bollinger Channel Percentage Band

From: <https://school.stockcharts.com/doku.php?id=technical_indicators:bollinger_band_perce>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_dev** (int) – n factor standard deviation
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.bollinger\_wband(close, window=20, window\_dev=2, fillna=False)**

### Bollinger Channel Band Width

From: <https://school.stockcharts.com/doku.php?id=technical_indicators:bollinger_band_width>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_dev** (int) – n factor standard deviation
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**classta.volatility.DonchianChannel(high: pandas.core.series.Series, low: pandas.core.series.Series, close: pandas.core.series.Series, window: int = 20, offset: int = 0, fillna: bool = False)**

## Donchian Channel

<https://www.investopedia.com/terms/d/donchianchannels.asp>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**donchian\_channel\_hband() → pandas.core.series.Series**

### Donchian Channel High Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**donchian\_channel\_lband() → pandas.core.series.Series**

### Donchian Channel Low Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**donchian\_channel\_mband() → pandas.core.series.Series**

### Donchian Channel Middle Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**donchian\_channel\_pband() → pandas.core.series.Series**

### Donchian Channel Percentage Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**donchian\_channel\_wband() → pandas.core.series.Series**

### Donchian Channel Band Width

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.donchian\_channel\_hband(high, low, close, window=20, offset=0, fillna=False)**

### Donchian Channel High Band (DC)

The upper band marks the highest price of an issue for n periods.

<https://www.investopedia.com/terms/d/donchianchannels.asp>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.donchian\_channel\_lband(high, low, close, window=20, offset=0, fillna=False)**

### Donchian Channel Low Band (DC)

The lower band marks the lowest price for n periods.

<https://www.investopedia.com/terms/d/donchianchannels.asp>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.donchian\_channel\_mband(high, low, close, window=10, offset=0, fillna=False)**

### Donchian Channel Middle Band (DC)

<https://www.investopedia.com/terms/d/donchianchannels.asp>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type:**pandas.Series

**ta.volatility.donchian\_channel\_pband(high, low, close, window=10, offset=0, fillna=False)**

### Donchian Channel Percentage Band (DC)

<https://www.investopedia.com/terms/d/donchianchannels.asp>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.donchian\_channel\_wband(high, low, close, window=10, offset=0, fillna=False)**

### Donchian Channel Band Width (DC)

<https://www.investopedia.com/terms/d/donchianchannels.asp>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**Returns**

New feature generated.

**Return type**

pandas.Series

**classta.volatility.KeltnerChannel(high: pandas.core.series.Series, low: pandas.core.series.Series, close: pandas.core.series.Series, window: int = 20, window\_atr: int = 10, fillna: bool = False, original\_version: bool = True, multiplier: int = 2)**

## Keltner Channels

Keltner Channels are a trend following indicator used to identify reversals with channel breakouts and channel direction. Channels can also be used to identify overbought and oversold levels when the trend is flat.

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>
* **multiplier** (int) – The multiplier has the most effect on the channel width. default is 2

**keltner\_channel\_hband() → pandas.core.series.Series**

### Keltner Channel High Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**keltner\_channel\_hband\_indicator() → pandas.core.series.Series**

### Keltner Channel Indicator Crossing High Band (binary)

It returns 1, if close is higher than keltner\_channel\_hband. Else, it returns 0.

**Returns**

New feature generated.

**Return type**

pandas.Series

**keltner\_channel\_lband() → pandas.core.series.Series**

### Keltner Channel Low Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**keltner\_channel\_lband\_indicator() → pandas.core.series.Series**

### Keltner Channel Indicator Crossing Low Band (binary)

It returns 1, if close is lower than keltner\_channel\_lband. Else, it returns 0.

**Returns**

New feature generated.

**Return type**

pandas.Series

**keltner\_channel\_mband() → pandas.core.series.Series**

### Keltner Channel Middle Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**keltner\_channel\_pband() → pandas.core.series.Series**

### Keltner Channel Percentage Band

**Returns**

New feature generated.

**Return type**

pandas.Series

**keltner\_channel\_wband() → pandas.core.series.Series**

### Keltner Channel Band Width

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.keltner\_channel\_hband(high, low, close, window=20, window\_atr=10, fillna=False, original\_version=True)**

### Keltner high channel (KC)

Showing a simple moving average line (high) of typical price.

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.keltner\_channel\_hband\_indicator(high, low, close, window=20, window\_atr=10, fillna=False, original\_version=True)**

### Keltner Channel High Band Indicator (KC)

Returns 1, if close is higher than keltner high band channel. Else, return 0.

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.keltner\_channel\_lband(high, low, close, window=20, window\_atr=10, fillna=False, original\_version=True)**

### Keltner low channel (KC)

Showing a simple moving average line (low) of typical price.

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.keltner\_channel\_lband\_indicator(high, low, close, window=20, window\_atr=10, fillna=False, original\_version=True)**

### Keltner Channel Low Band Indicator (KC)

Returns 1, if close is lower than keltner low band channel. Else, return 0.

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.keltner\_channel\_mband(high, low, close, window=20, window\_atr=10, fillna=False, original\_version=True)**

### Keltner moving average channel (KC)

Showing a simple moving average line (central) of typical price.

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.keltner\_channel\_pband(high, low, close, window=20, window\_atr=10, fillna=False, original\_version=True)**

### Keltner Channel Percentage Band

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Returns**

New feature generated.

**Return type**

pandas.Series

**ta.volatility.keltner\_channel\_wband(high, low, close, window=20, window\_atr=10, fillna=False, original\_version=True)**

### Keltner Channel Band Width

<https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Parameters**

* **high** (pandas.Series) – dataset ‘High’ column.
* **low** (pandas.Series) – dataset ‘Low’ column.
* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **window\_atr** (int) – n atr period. Only valid if original\_version param is False.
* **fillna** (bool) – if True, fill nan values.
* **original\_version** (bool) – if True, use original version as the centerline (SMA of typical price) if False, use EMA of close as the centerline. More info: <https://school.stockcharts.com/doku.php?id=technical_indicators:keltner_channels>

**Returns**

New feature generated.

**Return type**

pandas.Series

**classta.volatility.UlcerIndex(close: pandas.core.series.Series, window: int = 14, fillna: bool = False)**

## Ulcer Index

<https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:ulcer_index>

**Parameters**

* **close** (pandas.Series) – dataset ‘Close’ column.
* **window** (int) – n period.
* **fillna** (bool) – if True, fill nan values.

**ulcer\_index() → pandas.core.series.Series**

Ulcer Index (UI)

**Returns**

New feature generated.

**Return type**

pandas.Series