MotiveWave™

Volume and Order Flow Analysis

Version: 1.4

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1 Introduction

Welcome to the MotiveWave™ Volume and Order Flow Analysis Guide! If you are reading this document then you have already installed MotiveWave™ on your computer and you are ready to start using the application.

If you have not yet installed MotiveWave™ or registered for a trial on our website, please read the [Installation Guide](#) before continuing on with this document.

The purpose of this document is to highlight and explain some of the recent features added to MotiveWave™ for analyzing volume and order flow.

1.1 Terms and Definitions

The following are common terms and their definitions that explain some of the concepts in Volume and Order Flow analysis:

Absorption

Absorption occurs when a buying/selling trend is "absorbed" by a large order (or large number of orders) and the trend reverses. Absorption is defined by a Bid or Ask Imbalance that is followed by a reversal in price of X ticks.

Ask Volume

Ask Volume is the volume that occurred (traded) at the ask price. This volume typically represents buying activity and is sometimes known as Buy Volume or Up Volume.

Bid Volume

Bid Volume is the volume that occurred (traded) at the bid price. This volume typically represents selling activity and is sometimes known as Sell Volume or Down Volume.

Delta DOM

Delta DOM is the difference between the sum of bid sizes and the sum of the ask sizes that are in the DOM ladder. Positive values indicate support and negative values indicate resistance.

Delta Spread

Delta Spread is the difference between the best bid size and the best ask size. This is similar to the Delta DOM but only considers the best bid/ask.

Delta Volume

Delta volume is the difference between the Ask Volume and the Bid Volume (ie Delta Vol = Ask Vol – Bid Vol). Positive delta values indicate buying pressure and negative delta values indicate selling pressure.

Extended Trading Hours (ETH)

Defines the time of the day outside of the regular trading session where after hours trading occurs. Volume is typically lower during these hours.

Imbalance (diagonal)

A buy imbalance occurs when ask volume at a given price is higher (by a given percentage) than the bid volume at one price level below (sometimes known as diagonal imbalance). Sell imbalance occurs when the bid volume is higher by a given percentage than the ask volume at one price level higher.

Initial Balance Range (IBR)

Conventionally, this is the range (high/low prices) that the instrument reached during the first hour (60 minutes) of trading.

Instrument

An instrument is the security that is being traded. All instruments trade on an exchange and are uniquely identified by a symbol/exchange. There are several types of instruments (such as stocks, futures contracts, contract for difference (CFD) or FOREX).

Naked POC (NPOC)

This is a Point of Control (POC) that does not overlap (touch) in future sessions (sometimes referred to as Virgin POC).

Open Range

Open range is similar to Initial Balance Range but with a shorter period. Typically this is the range (high/low) that occurred during the first 5-30 minutes of the regular trading day, but will vary depending on the market.

Point of Control (POC)

Represents the price (or price range) where the highest amount of trading activity occurred. This may be based on volume (for a Volume Profile) or time (for a TPO chart).

Price Range/Interval

Volume/Market (TPO) profiles can optionally be depicted using price ranges instead of individual prices. This is typically useful for highly volatile instruments (large price ranges) or instruments with very small tick sizes (such as FOREX).

Regular Trading Hours (RTH)

Defines the time of day where regular trading occurs for an instrument.

Resistance Line

This line visually indicates where a possible over supply of ask volume may exist to provide price resistance to keep the market below the line.

Support Line

This line visually indicates where a possible over supply of bid volume may exist to provide price support to keep the market above the line.

Tick Size (Min Tick)

The Tick Size represents the smallest movement in price for an instrument. For stocks this is typically one cent (0.01). Values for other instrument types (such as Futures Contracts or FOREX) vary widely. These values are typically set correctly in MotiveWave™ but you may need to adjust manually depending on the broker or data service that you are using.

TPO (Market Profile)

TPO stands for "Time and Price Opportunity" (sometimes referred to as Market Profile). Similar to a Volume Profile, it graphically illustrates the amount of time spent at each price (or price range) over a given period of time (typically daily, in 30-minute sub intervals).

Trade Volume

Trade volume represents the number of trades that occurred over a given period of time. This is similar to volume, but only considers each trade and not the number of units that were exchanged. Trade volume will always be less than or equal to (<=) volume.

Trading Hours

Trading hours define the times of the day when an instrument is available for trading. Some instruments (such as Stocks or Futures) have regular trading sessions and extended (after hours) trading sessions.

Value Area

The Value Area is the price range (centered around the Point of Control) that encompasses X% of the trading activity (typically 70%). The value area may be computed using volume or time.

Volume

Volume represents the number of units (stocks, contracts etc) that were traded (exchanged hands) over a given period of time.

Volume Profile

A volume profile graphically depicts the volume traded at each price (or price range) for a given period of time. This identifies how trading activity is distributed by volume (exchanged units).

1.2 Tick Data

The Volume and Order Flow analysis tools described in this document rely on tick data to present accurate results.

Tick data is a record of the trades that occurred for an instrument. Tick data is not available from all Brokers and Data Services and in some cases only partial information is available. It is very important to understand these limitations as they will affect the accuracy of the information that is presented from the Volume/Order Flow Analysis tools.

There are two types of tick data:

1. **Live Ticks** – These ticks are generated from a Level 1 feed (live price updates) and are stored in memory. By default, MotiveWave™ will keep up to the latest 2000 ticks, but this is configurable in the Preferences Dialog (*Configure -> Preferences* from the Console menu bar, see "General" tab). These live ticks are merged with the historical ticks where appropriate.

2. **Historical Ticks** – These are ticks that have occurred in the past and are downloaded from the Broker/Data Service or from the MotiveWave™ back fill server. The amount of data available will depend on instrument and the source.

Each tick may contain the following information:

1. **Trade Time** – this is the time at which a trade occurred (in millisecond precision).
2. **Price** – This is the price that the trade occurred at.
3. **Volume** – Number of units that traded hands in this trade
4. **Ask Price** – The best ask price at the time of the trade (used to determine Ask Volume)
5. **Ask Size** – number of units available at the best ask price at the time of the trade
6. **Bid Price** – The best bid price at the time of the trade (used to determine Bid Volume)
7. **Bid Size** – number of units available at the best bid price at the time of the trade

Bid/Ask sizes are not currently used by the volume analysis tools in MotiveWave™ but are available in the Time/Sales panel and the Java SDK (see Tick interface).

The following table explains tick data availability. Brokers/Data services not listed (and that don't connect via a gateway such as CQG, Rithmic or GAIN Futures) do not provide historical tick data.

Broker/Data Service	Time/Price/Vol	Bid/Ask Price	Bid/Ask Size	Historical Limit	Back Fill
CQG[1]	Y	Y	Y	10 Days	Y[3]
GAIN Futures[1]	Y	Y	N	?	Y[3]
Rithmic[1]	Y	Y	Y	?	Y[3]
IQFeed	Y	Y	Y	8 Days (60 Days After Hours)	N
eSignal	Y	Y	N	?	N
BarChart				?	N
TradeKing	Y	N	N	?	Y[3]
FXCM[2]	Time/Price Only	N	N	?	Y[3]

[1] CQG/Rithmic/GAIN Futures are gateways to many different brokers. Check your broker connection to see if they connect through one of these gateways.

[2] FXCM Tick Data does not include volume information and can be extremely slow to load.

[3] Loaded from MotiveWave™ Back Fill server. Back Fill may not be available for all symbols.

1.2.1 Historical Bid/Ask Prices

Historical bid/ask prices are used to determine if the trade occurred at the "Bid Price" or the "Ask Price". This is used to separate Bid Volume from Ask volume.

As illustrated in the table from the previous section, historical bid/ask prices are not available from some brokers/data services. In cases where this information is not available, the price from the previous tick will be used to determine if the trade should be used to tally Bid/Ask volume. When the price increases, it is considered an "Ask Tick" and when it decreases it is considered a "Bid Tick". If the price remains the same, the Bid/Ask Tick is inherited from the previous tick.

1.2.2 Generated Ticks

For many of our supported Brokers and Data Services historical tick data is not available. In these cases MotiveWave™ will generate ticks using minute bars (and in some cases second based bars). Each bar will generate 4 ticks, each with one quarter of the bar's reported volume:

1. **Open** – Open price of the bar with ¼ of the bar's volume
2. **High/Low** – If the close is greater than the open the high is used first, then the low otherwise low then high. Each of these ticks has ¼ of the bar's volume
3. **Close** – Closing price of the bar with the remaining volume in the bar

Bid/Ask volume is determined using the rules from the previous section where bid/ask prices are not available (ie: previous price determines bid/ask volume).

1.3 Depth of Market (DOM) Data

Depth of Market (DOM) data shows the cumulative sizes (at each price step) of active limit orders that exist above and below the current price. The number of available rows above and below the current price depend on the exchange and the source of the data. For most futures (especially from the CME), this is limited to 10 rows above and below.

All depth of market data is live data only (no historical values are available from the exchange). MotiveWave™ will accumulate historical Depth of Market data at 1 second intervals in memory the first time a DOM panel (or study that uses DOM data). This historical record of DOM data can be useful to see where the hidden market demand exists and help to predict the short-term movement of the market.

1.4 Summary of Volume Studies/Tools

MotiveWave™ has many different volume-based studies and two components. The complete list of these studies can be found under the *Study -> Volume Based* sub menu (see top menu bar). In this document we will be focusing on the following studies/components:
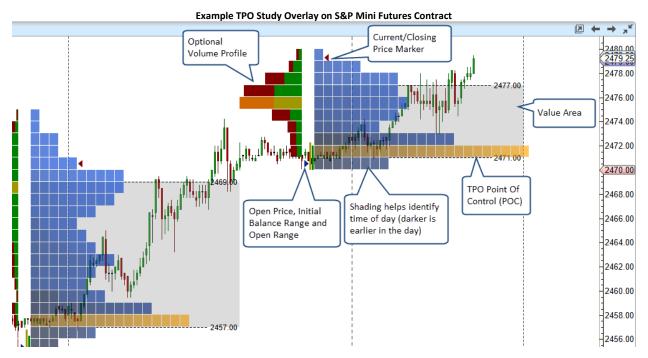
1. **Time Price Opportunity (TPO)** – Provides a graphical illustration of how much time is spent at each price.
2. **Volume Imprint** – Provides several different views of how the trading activity of a price bar (candle) breaks down with Bid/Ask volume.
3. **Delta Volume** – Plots the difference between the Bid/Ask volume
4. **Cumulative Delta** – Plots the difference between the Bid/Ask volume as it accumulates through the trading day.
5. **Bid/Ask Volume** – Plots the Bid Volume and the Ask volume together so that you can identify changes from buying pressure to selling pressure.
6. **Speed of Tape** – Displays the current and historical speed pace of the market for a given statistic.
7. **DOM Power** – Displays current/historical order demand at the bid and ask.
8. **DOM History** – Historical display of cumulative limit order sizes above and below the market price.
9. **Speed Gauges** – Displays active statistical values graphically on the price graph.
10. **Volume Profile Component** – Allows you to dynamically draw a Volume Profile by dragging the component from the "General" panel (or using the Mouse Tool). The range for the volume profile may be adjusted using the resize points).
11. **TPO Component** – Component version of the TPO study. The component allows you to dynamically select the time frame for the TPO/Volume Profile by using the resize points. This component is available in the "General" panel or as a mouse tool.

2 Time Price Opportunity (TPO) Study

The Time Price Opportunity (TPO) study displays market activity using time and price (sometimes known as Market Profile). This study can be found under the *Study -> Volume Based* menu (see top menu bar).

The following screen shot of the S&P mini futures contract illustrates some of the features of the TPO study. This is a daily TPO with a 30-minute time interval on a 15-minute price chart. The price interval is set to 4 ticks.

Example TPO Study Overlay on S&P Mini Futures Contract

Each cell in the above chart represents a 30 minute time interval in the trading day.   The beginning and end of this range is set using the trading hours that are defined for instrument. In the above example we are using extended data and the trading day starts at 6:00 pm EST on the previous day and ends at 5:00 pm. For convenience the cells are shaded darker near the beginning of the trading day and lighter near the end of the day (optional).

Configuration settings for the study can be found in the Study Dialog (double click on the study or right click and choose "Edit")
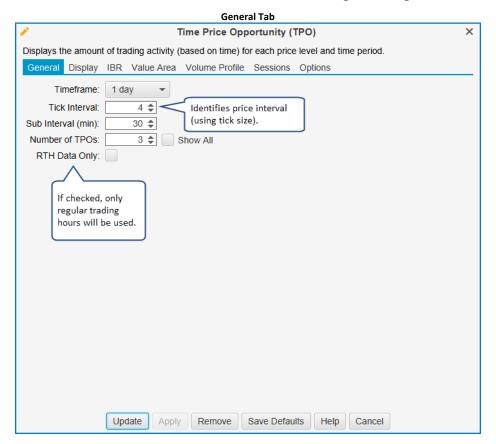
2.1 General Settings

Basic configuration settings can be found under the "General" tab.

1. **Timeframe** – the typical timeframe for a TPO study is 1 day, but there are several options available including intra-day values and weekly/monthly bar sizes. The time frame defines the range of tick data (start/end times) used for each TPO graph. For example, a 1 day time frame would start at the beginning of the trading day and finish at the end of the trading day (defined in the trading hours).

2. **Tick Interval** – this defines the price range that applies to each row in the TPO graph. A tick interval of 1 will plot a row for every price. In the case of the S&P mini futures contract, a tick interval of 4 will display a row for every point of price movement since the minimum tick is one quarter point (ie: 0.25). The tick interval can be very useful when trading an instrument that has

a wide range of movement (highly volatile) or has a very small minimum tick value relative to its typical range (such as FOREX or high value stocks).

3. **Sub Interval** – This determines the length (in time) of each cell that makes up the TPO chart. On a daily chart this is typically set to 30 minutes. In this case each cell covers 30 minutes of trading activity at the given price interval. A cell is drawn at a price interval if 1 or more trades occurred for that price interval in that slice of time.

4. **Number of TPOs** – This may be used to limit the number of TPOs that are drawn on the chart. Loading historical tick data can be expensive in terms of computer resources and network activity. Check the "Show All" box to show all TPOs in the time range of the chart.

5. **RTH Data Only** – If checked, this will only load tick data that occurred during the regular trading session for the instrument. For details see the trading hours for the instrument. If no regular trading session is defined for the instrument, this this setting will be ignored.
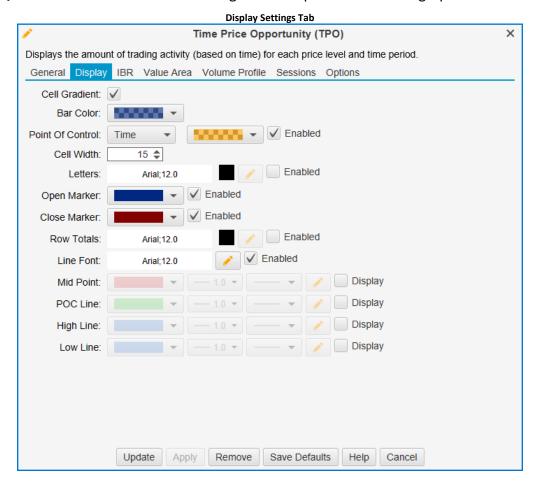
General Tab

2.2 Display Settings

General display settings for the TPO graph can be found under the "Display" tab:

1. **Cell Gradient** – This option will shade the cells that are at the beginning of the time frame darker and the cells near the end of the time frame lighter. This helps to provide a visual indicator of how the time is distributed in the TPO graph.

2. **Bar Color** – This is the default color assigned to each cell/bar

3. **Point Of Control** – This identifies the row in the TPO graph where the price spent the most time. In the case where there is more than one row that meets this criteria, the one with the highest amount of volume is chosen. Optionally, **Volume** can be used as the criteria for the Point Of Control (see Time drop down below). In this case the row with the highest amount of volume

will be highlighted using the selected color. This feature can be disabled by unchecking the Enabled box on the right hand side.

4. **Cell Width** – this is the width (in pixels) for each cell that is drawn in the TPO graph.
5. **Letters** – If this option is enabled letters will be drawn that identify the sequence of the cells. For example all cells that occurred during the first sub interval will be assigned the letter A (B for the second, C for the third etc).
6. **Open/Close Markers** – displays where the open price and closing price of the timeframe occurred. In the case of the latest TPO it will display the latest price for the Close Marker.
7. **Row Totals** – Displays the number of cells in each row on the left hand side of the TPO graph.
8. **Line Font** – If this option is enabled, the price level of each line that is drawn will be shown at the right hand side.
9. **Mid Point** – draws a line for the mid point between the high and low price of the TPO graph.
10. **POC Line** – draws a line from the end of the Point Of Control row to the end of the time frame.
11. **High/Low Line** – draws a line for the high and low prices of the TPO graph.

Display Settings Tab

The following diagram illustrates the TPO graph with some of the options above enabled.
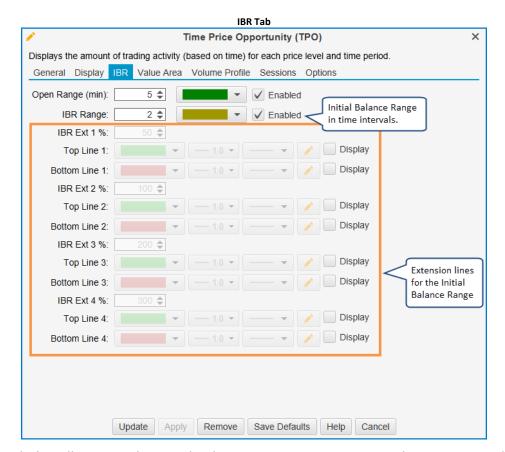
2.3 Initial Balance Range (IBR) Settings

The IBR tab contains settings for Open Range and Initial Balance Range.

1. **Open Range (min)** – This is the time period and color for the open range marker displayed to the left of the TPO graph. The open range is the high/low price range the market traded within during the first X mins (default 5). If the Enabled box is unchecked, this will not be displayed.
2. **IBR Range** – This defines the time period (in sub intervals) and fill color for the Initial Balance Range high/low. This is displayed to the left of the TPO graph. If the Enabled box is unchecked, this will not be displayed.
3. **IBR Ext X %** - This is the percent of the IBR that is projected above and below the IBR Range marker. This field is only enabled if either the Top Line or Bottom Line fields are displayed.
4. **Top Line X** – Allows you to configure the line settings for the top IBR extension. Uncheck the Display box to hide.
5. **Bottom Line X** - Allows you to configure the line settings for the bottom IBR extension. Uncheck the Display box to hide.

IBR Tab

The screen shot below illustrates the Initial Balance Range, Open Range and IBR extension lines.
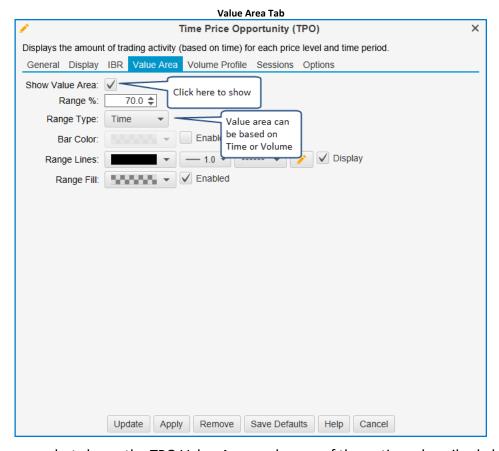

2.4 TPO Value Area Settings

The value area identifies the rows surrounding the Point of Control (POC) that encompass X % (typically 70%) of the trading time or volume. Settings for the value area can be found under the Value Area tab:
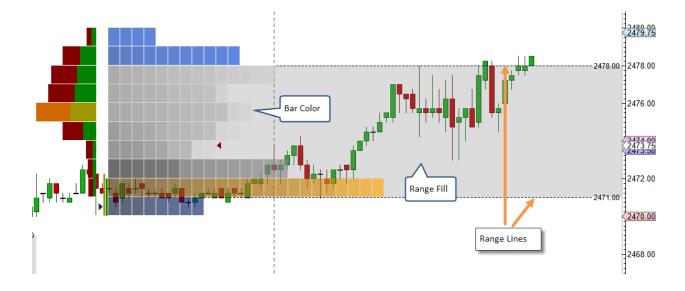
1. **Show Value Area** – Check this box to show the value area for the TPO graph

2. **Range %** - percentage of the trading time/volume to include in the value area
3. **Range Type** – choose either Time or Volume for calculating the Value Area
4. **Bar Color** – Shade color for the bars that are part of the value area. A semi-transparent color can be used to blend with the existing bar colors.
5. **Range Lines** – settings for the lines that identify the top and bottom of the Value Area
6. **Range Fill** – fills the white space within the value area with a specified color.

Value Area Tab

The following screen shot shows the TPO Value Area and some of the options described above:

2.5 Volume Profile

Optionally, a Volume Profile graph can be displayed with the TPO graph. This makes it easy to compare price/time with price/volume. Click on the Volume Profile tab (see below):
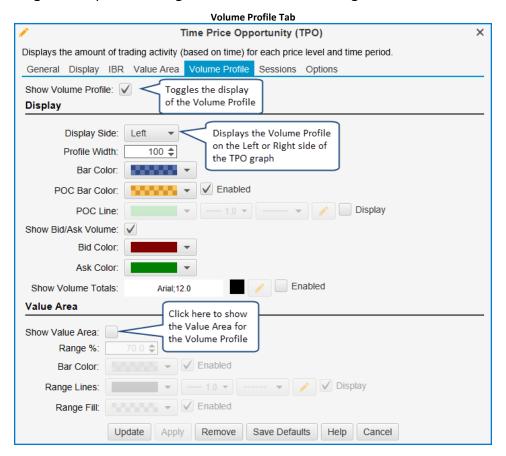
1. **Show Volume Profile** – Check this box to display the Volume Profile graph
2. **Display Section**
   a. **Display Side** – The volume profile can be displayed on the left-hand side of the TPO graph or on the right-hand side (right justified).
   b. **Profile Width** – width of the volume profile graph (in pixels).
   c. **Bar Color** – default color for the volume profile rows
   d. **POC Bar Color** – color for the Point of Control row
   e. **POC Line** – optionally display a horizontal line from the Point of Control row.
   f. **Show Bid/Ask Volume** – if this is enabled the bid vs ask volume will be displayed in the profile rows.
   g. **Show Volume Totals** – displays the total volume for each row in the profile
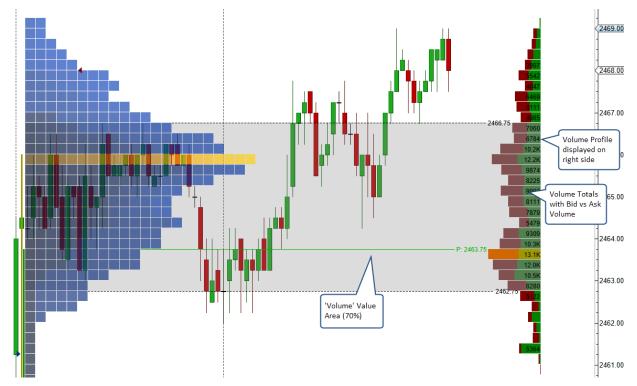3. **Value Area Section**
   a. **Show Value Area** – optionally displays the value area for the volume profile
   b. **Range %** - This is the percentage of the volume activity that is included in the value area (default 70%). This area will be centered around the POC row.
   c. **Bar Color** – color for the bars that are part of the value area. A transparent color may be useful to make sure the POC and other information is not hidden.
   d. **Range Lines** – settings for the top/bottom of the range.
   e. **Range Fill** – optional background fill color for the range area.

Volume Profile Tab

The following screen shot shows the Volume Profile displayed on the right hand side of the TPO graph.
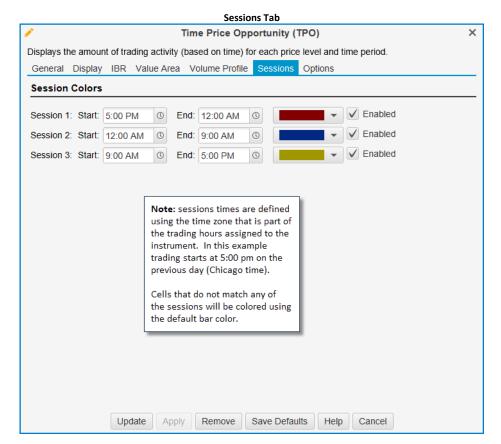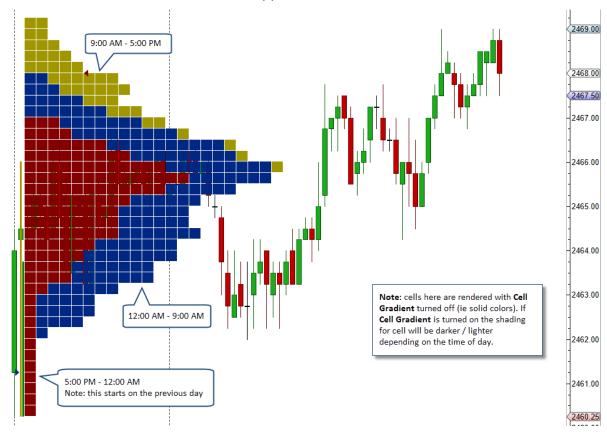

2.6 Session Colors

Colors can be assigned to user defined sessions for a trading day. The Sessions tab allows you to enable up to 3 different session colors. Any cells that do not fit within these sessions will be colored using the default bar color. The time zone used for these session times is inherited from the trading hours that are assigned to the instrument. For example, the S&P mini futures contract will use the time zone "America/Chicago".

In the example below, the first session starts at 5:00 pm on the previous day and ends at 12:00 am (midnight). The second session goes from 12:00 am (midnight) until 9:00 am and the final session is from 9:00 am until 5:00 pm (on the current day). All these times are in "Chicago" time.

Sessions Tab

The following screen shot shows an example of session colors using the settings from the dialog above. Cell Gradient has been disabled so all cells appear in their solid color.
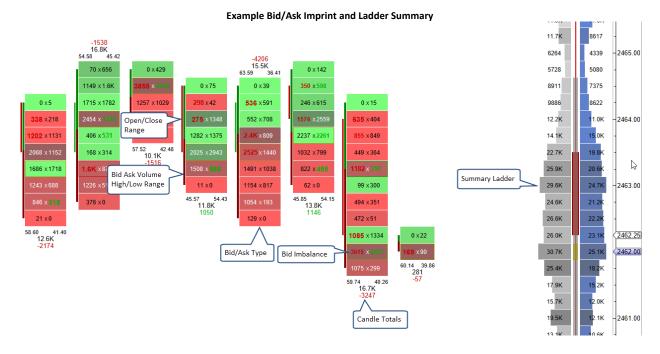
3 Volume Imprint

The volume imprint study provides several ways to look at volume and how it relates to price (see *Study -> Volume Based* from the top menu bar). This study uses historical tick data to segment volume into price intervals. Each price interval divides the volume into bid volume and ask volume. There are currently 5 different types of display candles:

1. **Profile** – displays a histogram of the volume that occurred at each price interval. The volume can be color coded to show bid/ask volume.
2. **Bid/Ask** – numerically displays the bid and ask volume at each price interval.
3. **Ladder** – displays separate histograms for bid and ask volume on opposite sides of a price bar.
4. **Delta** – numerically displays the difference between the ask volume and bid volume (delta) at each price interval
5. **Volume** – numerically displays the volume for each price level.

Optionally, a summary profile can be displayed that summarizes the volume that occurred over the given time span (visible bars, day, week or month). This summary can be displayed as a volume profile or ladder.

The example below displays the volume imprint with the type as "Bid/Ask" and a ladder summary on the right-hand side.

Example Bid/Ask Imprint and Ladder Summary

Example Delta Imprint

Delta Imprint. Each number is the difference between the Ask Volume and Bid Volume

Volume Imprint Example

Volume Imprint. Each number is the volume that traded at the given price level.

Configuration settings for the study can be found in the Study Dialog (double click on the study or right click and choose "Edit")

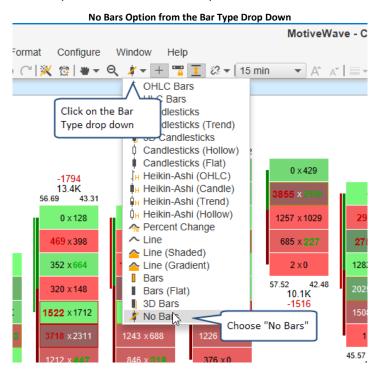## Background Shading

If you look at the examples above you will notice that the shading for the background and the summary ladder histogram is different for each cell. The intensity of the shading is determined by the absolute delta value. If this value is higher the shading is darker. This feature makes it easier to identify rows where there is a greater difference between the bid/ask volume.

'No Bars' Bar Type

Since this study displays a profile for each bar, it is recommended that the "No Bars" bar type is used in order to reduce the excess clutter on the screen. The "No Bars" bar type can be found under the Bar Type drop down on the tool bar (see screen shot below):
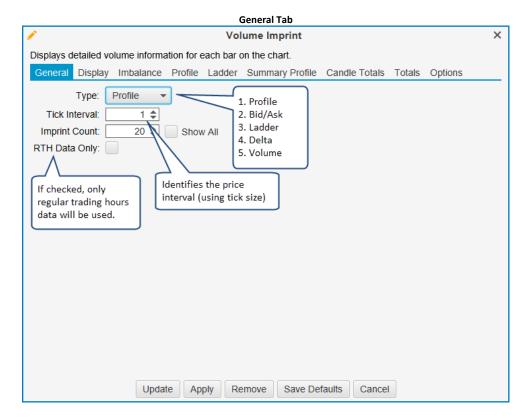

3.1 General Settings

The first tab in the study dialog defines general settings for the study. The type drop down offers 5 different imprint types

1. **Type** – 5 imprint types allow you to visualize the volume distribution within the candle:
    a. **Profile** – displays a volume histogram
    b. **Bid/Ask** – numerically displays the bid volume vs the ask volume
    c. **Ladder** – displays bid and ask volume on opposite sides of a price bar.
    d. **Delta** – displays the difference between the ask and bid volume at each price level
    e. **Volume** – displays the total volume for each price level
2. **Tick Interval** – this defines the price range that applies to each row in the price bar. A tick interval of 1 will plot a row for every price. In the case of the S&P mini futures contract, a tick interval of 4 will display a row for every point of price movement since the minimum tick is one quarter point (ie: 0.25). The tick interval can be very useful when trading an instrument that has a wide range of movement (highly volatile) or has a very small minimum tick value relative to its typical range (such as FOREX or high value stocks).
3. **Imprint Count** – This may be used to limit the number of imprints that are drawn on the chart. Loading historical tick data can be expensive in terms of computer resources and network activity. Check the "Show All" box to show all imprints in the time range of the chart.
4. **RTH Data Only** – If checked, this will only load tick data that occurred during the regular trading session for the instrument. For details see the trading hours for the instrument. If no regular trading session is defined for the instrument, this this setting will be ignored.
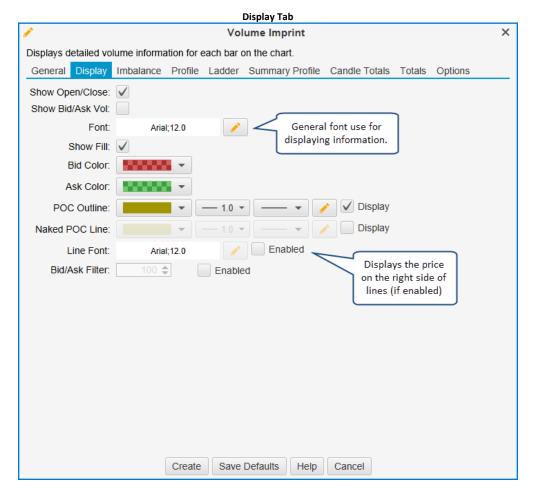
General Tab
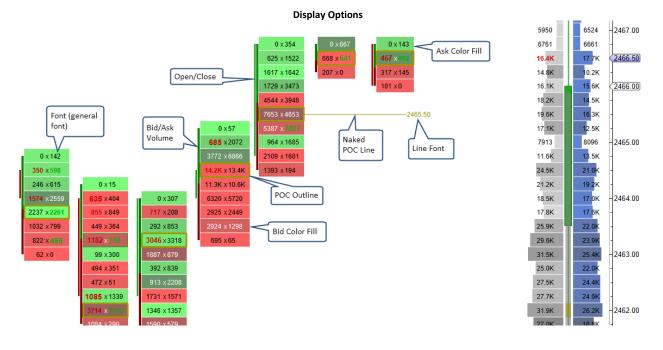

3.2 Display Settings

The Display tab in the study dialog contains general display settings:

1. **Show Open/Close** – displays a bar that shows the range between the open and close prices for the bar. The price bar colors are used to shade the bar depending on whether the close is higher/lower than the open.
2. **Show Bid/Ask Vol** – displays a bar that outlines the high/low price for the bar and the distribution of bid/ask volume.
3. **Font** – general font for displaying volume information in the bars.
4. **Show Fill** – if enabled, this will paint the background color for Bid/Ask, Volume and Delta bar using the bid/ask colors below.
5. **Bid Color** – this color is used when the price interval is dominated by bid volume. The cell will be shaded darker/lighter based on the bid/ask volume ratio (darker for higher bid volume)
6. **Ask Color** - this color is used when the price interval is dominated by ask volume. The cell will be shaded darker/lighter based on the bid/ask volume ratio (darker for higher ask volume)
7. **POC Outline** – Draws an outline around the cell if it is the Point of Control (Bid/Ask, Volume and Delta bars only)
8. **Naked POC Line** – Draws a line from the POC to the next bar whose range covers that POC price.
9. **Line Font** – this font is used to draw the price on the right-hand side of horizontal lines.
10. **Bid/Ask Filter** – This option may be used to reduce the number of bid/ask prints when viewing a Bid/Ask bar. If this option is enabled bid and ask numbers that are below the filter value will print a dash (-) instead of the bid/ask number.

Display Tab

The following example illustrates the display options described above.
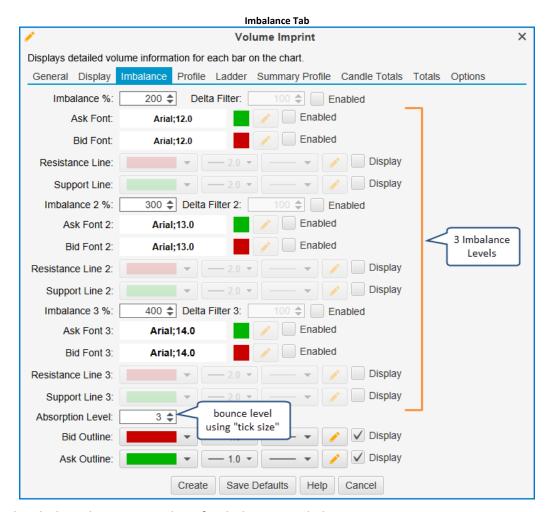
Display Options

3.3 Imbalance Settings

The *Imbalance* tab (see below) contains settings for displaying Buy/Sell imbalances and absorption. Currently up to 3 levels of imbalances are supported. Imbalances are visualized on the chart by using a different font and color. Optionally, support and resistance lines may be extended where the imbalances occur.

1. **Imbalance %** - percentage for the first level imbalance.
2. **Delta Filter** – this option may be used to filter out absorptions where the difference between the bid and ask imbalance values are below the given filter value. These are cases where the volume levels are lower and may not be considered relevant.
3. **Ask/Bid Font** – Bid and Ask font/color for the first level imbalance
4. **Support/Resistance Line** – Optionally draws support and resistance lines for the first imbalance level.
5. **Imbalance 2 %** - percentage for the second level imbalance.
6. **Ask/Bid Font 2** – Bid and Ask font/color for the second level imbalance
7. **Support/Resistance Line 2** – Optionally draws support and resistance lines for the second imbalance level.
8. **Imbalance 3 %** - percentage for the third level imbalance.
9. **Ask/Bid Font 3** – Bid and Ask font/color for the third level imbalance
10. **Support/Resistance Line 3** – Optionally draws support and resistance lines for the third imbalance level.
11. **Absorption Level** – Number of ticks for the price to reverse (closing price) from an imbalance point.
12. **Bid Outline** – Outline (box) to draw around the cell where the sell (bid) absorption occurred.
13. **Ask Outline** - Outline (box) to draw around the cell where the buy (ask) absorption occurred.

Imbalance Tab

The screenshot below shows examples of imbalances and absorptions.

Imbalances and Absorptions

3.4 Profile Settings

Display options for the Profile imprint type can be found under the *Profile* tab. The type of imprint is chosen from the General tab (see General Settings section). The *profile* imprint type displays a volume histogram for each bar on the chart. Each row in the histogram shows the volume that occurred at the given price interval (with optional coloring for the bid/ask volume).

The settings in this tab also apply to the summary profile if the summary profile type is 'profile'.

3.4.1 Display Section

The Display section contains general display settings for the profile.

1. **Display Side** – alignment for the histogram bars. Available options: Left and Right
2. **Bar Color** – Color for the volume bars. Note: this is not used if the Bid/Ask volume is enabled.
3. **POC Bar Color** – Color for the Point of Control (POC) bar. Tip: use a semi-transparent color so you can still see the bid/ask volume for the bar.
4. **Show Bid/Ask Volume** – option for showing the bid/ask volume in each bar.
5. **Bid Color** – Color for the Bid volume (ie sell volume)
6. **Ask Color** – Color for the Ask volume (ie: buy volume)
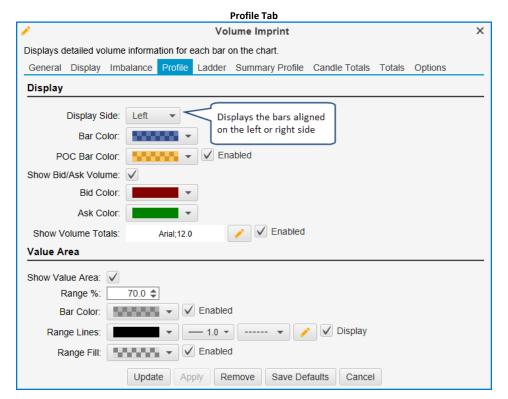7. **Show Volume Totals** – If enabled, this will display the volume totals in each bar using the specified font.

3.4.2 Value Area Section

The value area can optionally be displayed for each profile. The value area represents where X % (default 70%) of the volume occurred in the bar (centered around the POC).
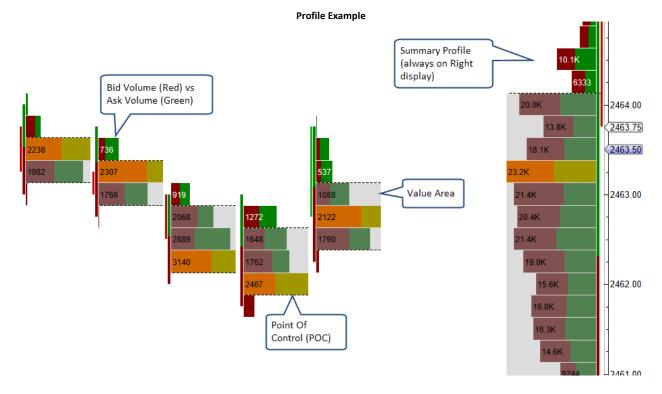
1. **Show Value Area** – Check this option to show the value area for each profile

2. **Range %** - Percentage of volume to include in the range
3. **Bar Color** – color to paint the bars that are in the value area
4. **Range Lines** – draws lines on the top and bottom of the value area
5. **Range Fill** – background fill for the value area range.

Profile Tab

The following example shows a profile imprint where the display side is on the left. The value area has been enabled with the summary profile.
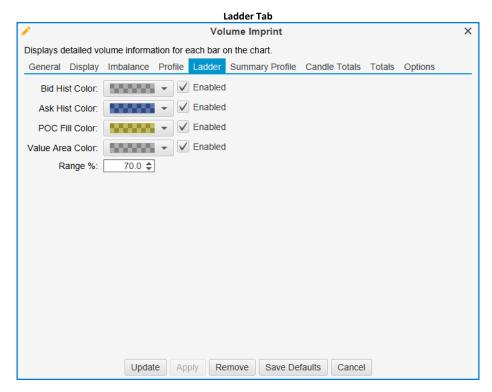
Profile Example
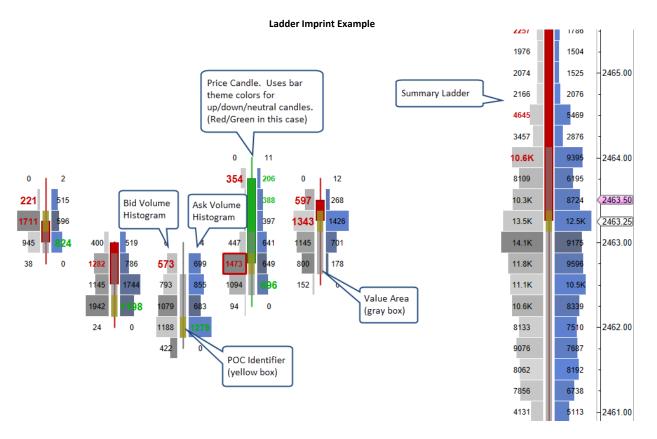
3.5 Ladder Settings

The *Ladder* tab contains settings that apply to the imprint type of 'Ladder' (see General Settings). The ladder view displays bid and ask volume (using a histogram) on opposite sides of a price bar. Note: The Open/Close and Bid/Ask Volume ranges do not apply to this imprint type (see Display Settings).

1. **Bid Hist Color** – color to use the bid volume histogram
2. **Ask Hist Color** – color to use for the ask volume histogram
3. **POC Fill Color** – highlight to identify the POC row in the histogram
4. **Value Area Color** – highlight to identify the value area
5. **Range %** - percentage of volume to include in the value area.

Ladder Tab

🖉	**Volume Imprint** ✕

Displays detailed volume information for each bar on the chart.

General Display Imbalance Profile **Ladder** Summary Profile Candle Totals Totals Options

Bid Hist Color: [▼] ✔ Enabled
Ask Hist Color: [▼] ✔ Enabled
POC Fill Color: [▼] ✔ Enabled
Value Area Color: [▼] ✔ Enabled
Range %: 70.0 ⬍

Update   Apply   Remove   Save Defaults   Cancel

The following example shows the ladder imprints and a summary ladder (on the right hand side).

Ladder Imprint Example

3.6 Summary Profile Settings

An optional summary profile can be displayed on the right-hand side of the chart. This summary tallies the bid/ask volume for the given time span and updates in real time. Two types of summary imprints are supported: Profile and Ladder.

1. **Show Summary** – Check this box to show the summary on the right-hand side of the chart.
2. **Type** – Profile or Ladder. The configuration settings for these are found under the Profile and Ladder tabs.
3. **Width** – Width of the summary (in pixels).
4. **Time Span**:
    a. **Visible Bars** – Includes the bars that are currently visible on the chart.
    b. **Day** – Summary for the current trading day.
    c. **Week** – Summary for the current trading week.
    d. **Month** – Summary for the current trading month.

Summary Profile Tab

3.7 Candle Totals Settings
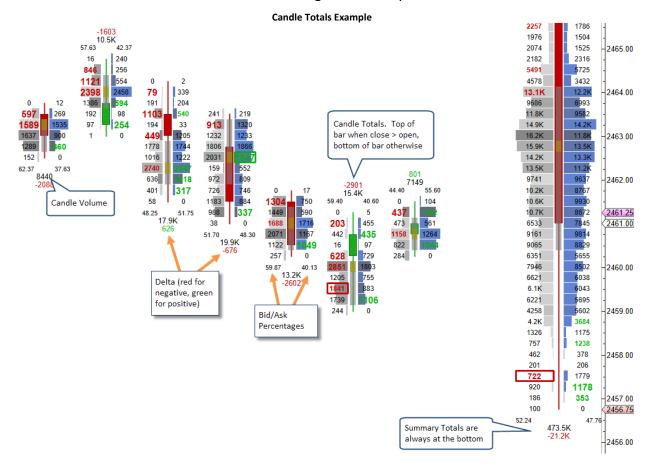
Candle totals can be displayed above/below each candle (price bar). The Candle Totals tab contains settings that you can adjust:

1. **Positive Delta** – this option is used when the Ask Volume – Bid Volume is greater than 0.
2. **Negative Delta** – this option is used when the Ask Volume – Bid Volume is less than 0.
3. **Volume Total** – total volume for the candle
4. **Bid/Ask Percentage** – displays the percentage of the total volume for the Bid and Ask volume sides.

Candle Totals Tab

The screen shot below shows the candle totals using a ladder imprint.

Candle Totals Example

3.8 Totals Settings

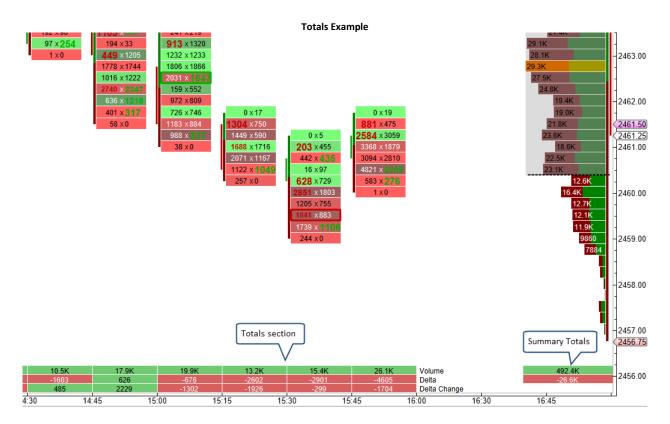Totals for volume, delta and delta change can be displayed at the bottom of the price graph from the settings in the Totals tab.

1. **Show Totals** – Check this box to show totals at the bottom of the price graph
2. **Show Volume** – shows a row that has the total volume for each candle
3. **Show Delta** – shows a row that has the difference between the ask volume and the bid volume
4. **Show Delta Change** – shows a row that has the difference between the delta of the current candle and the previous candle
5. **Font** – Font to use for the totals
6. **Positive Color** – background color for positive numbers
7. **Negative Color** – background color for negative numbers

Totals Tab

In the example below, the totals are displayed using the settings above.
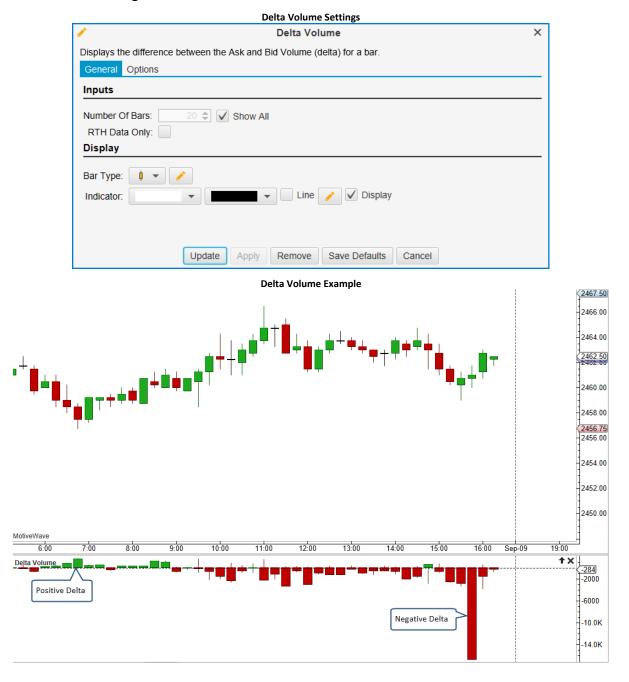
Totals Example

Totals section

Summary Totals

4 Delta Volume

Delta volume (*Study -> Volume Based -> Delta Volume* from the top menu bar) displays the difference between the Ask and Bid Volume as a candle chart in a separate graph. Positive values indicate buying pressure and negative values indicate selling pressure. The following screen shot shows the available settings for this study:

1. **Number of Bars** – optionally limits the number of bars that are displayed. This is useful if you want to avoid loading a large amount of historical tick data. Check "Show All" to show a delta bar for every loaded candle.
2. **RTH Data only** – Check this box to only show bars that occurred during regular trading hours.
3. **Bar Type** – Type of bar to display (ie OHLC, Candle, Line, Bar etc)
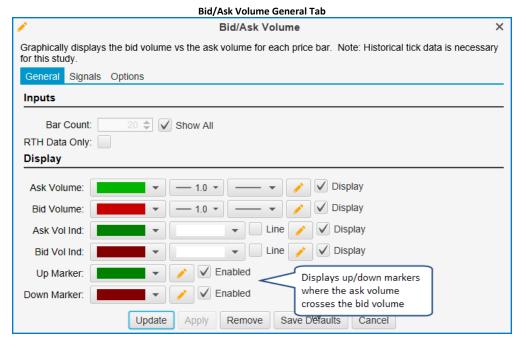4. **Indicator** – Settings for the latest value indicator in the vertical axis.

Delta Volume Settings
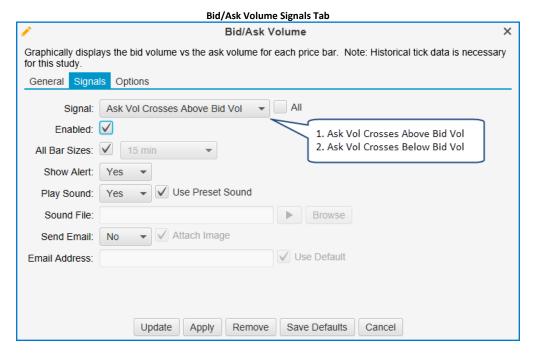

Delta Volume Example

5 Cumulative Delta

Plots the accumulation of the delta (difference between ask and bid volume). The delta total is reset at the beginning of each day (using regular trading hours). These values are display as price bars (candles) in a separate plot.

1. **Bar Type** – Type of bar to display (ie OHLC, Candle, Line, Bar etc)
2. **Indicator** – Settings for the latest value indicator in the vertical axis.

Cumulative Delta Settings

Cumulative Delta Example

6 Bid/Ask Volume

Plots the bid volume and ask volume as separate paths and optionally shows where these paths cross (generating signals). This study can be accessed from the top menu bar: *Study -> Volume Based -> Bid/Ask Volume*. The following screen shot shows the general settings for this study:

1. **Bar Count** - optionally limits the number of bars that are displayed. This is useful if you want to avoid loading a large amount of historical tick data. Check "Show All" to show for all bars.
2. **RTH Data only** – Check this box to only show data that occurred during regular trading hours.
3. **Ask Volume** – Settings for the ask volume path.
4. **Bid Volume** – Settings for the bid volume path.
5. **Ask Vol Ind -** Settings for the latest ask volume indicator in the vertical axis.
6. **Bid Vol Ind -** Settings for the latest bid volume indicator in the vertical axis.
7. **Up Marker** – Displays an up marker where the ask volume crosses above the bid volume.
8. **Down Marker** - Displays a down marker where the ask volume crosses below the bid volume.
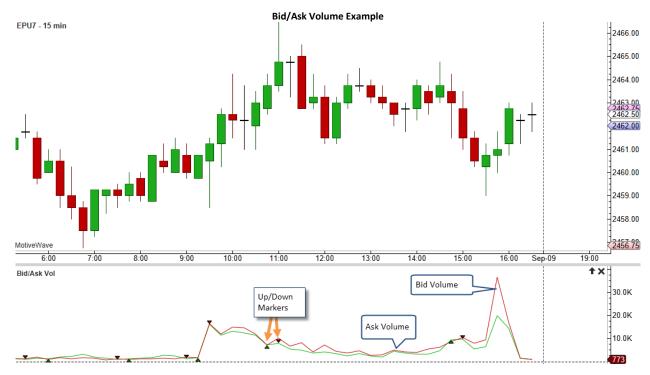
Bid/Ask Volume General Tab

This study generates signals when the ask volume crosses above or below the bid volume. These signals can be configured to generate alerts:

Bid/Ask Volume Signals Tab

The following screen shot shows an example of the Bid/Ask Volume study. Markers are enabled to indicate where the ask volume path crosses the bid volume path.
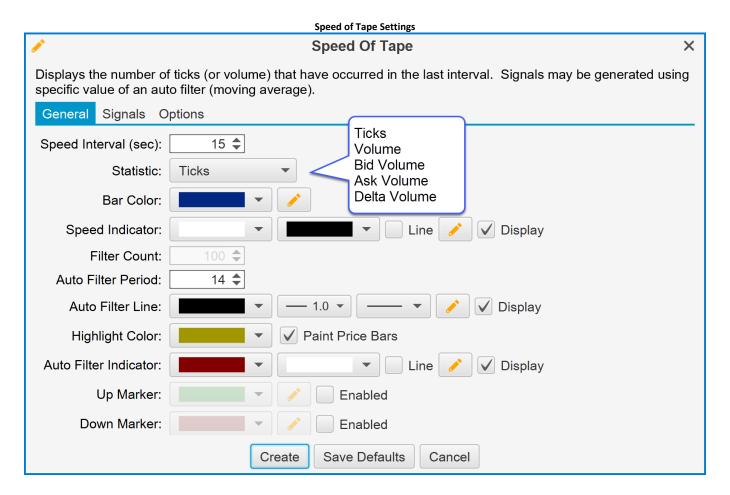
7   Speed Of Tape

The Speed of Tape study measures the speed of a given statistic
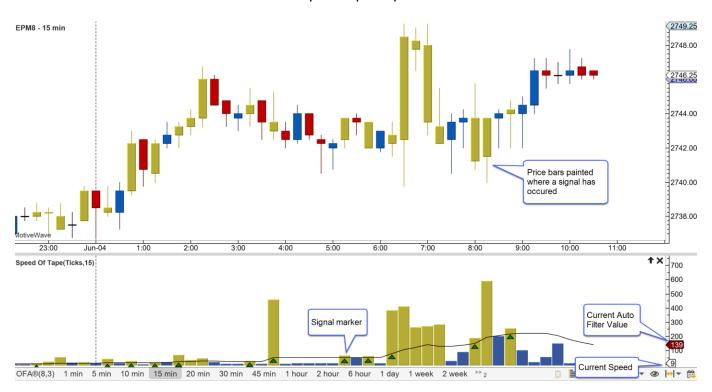
 over an interval (in seconds).

This study uses tick data to compute the statistics and display historical values. The following screen shot displays the available configuration options:

1. **Speed Interval (sec) -** The interval in seconds for computing the statistic. For example, number of ticks that occurred in the last 15 seconds. For historical values this will be the computed from the end time of the price bar.
2. **Statistic** – Defines what you want to measure. This has the following values:
    a. **Ticks** – Number of ticks that occurred
    b. **Volume** – Total volume that occurred during the interval
    c. **Ask Volume** – Volume that occurred at the ask price
    d. **Bid Volume** – Volume that occurred at the bid price
    e. **Delta Volume** – Difference between the ask volume and the bid volume for the given interval.
3. **Bar Color** – Color of the bars. Press the edit button for more configuration options
4. **Speed Indicator** – Configuration settings for the latest speed value (displayed on the vertical axis)
5. **Filter Count** – used to filter generate signals. This is disabled if the auto filter option is used.
6. **Auto Filter Period** – Used to generate signals when the closing value for the bar crosses above the SMA of the given period.
7. **Auto Filter Line** – Configuration for the auto filter line
8. **Highlight color** – highlights bar where the closing value is above the filter value. Optionally the price bars can be painted this color as well.
9. **Auto Filter Indicator** – Display configuration for the current auto filter value in the vertical axis.
10. **Up Marker** – Displays a marker where the latest value has crossed above the filter
11. **Down Marker** – Displays a marker where the latest value has crossed below the filter.
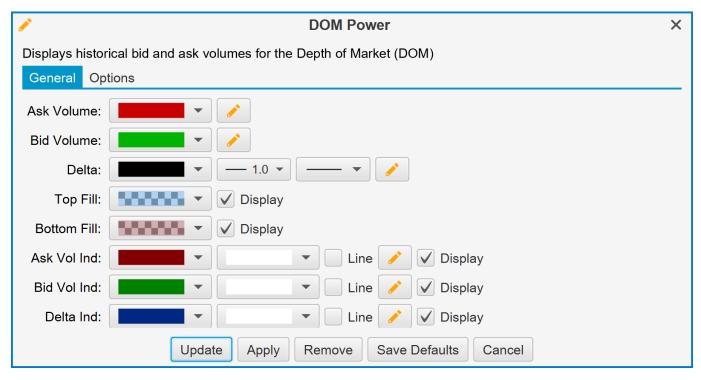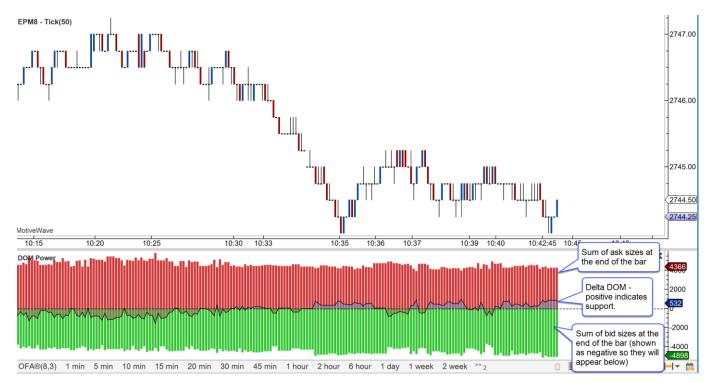
Speed of Tape Settings

Speed of Tape Example

8 DOM Power

Displays historical bid/ask sizes for the Depth of Market (DOM). Note: Historical DOM values are built in memory. Recording begins when the study is opened or a DOM panel is opened. The delta is displayed to show where support and resistance exists. The delta is the difference between the total bid size and the total ask size. For convenience, the bid sizes are shown as negative values so they will appear below the ask bars.
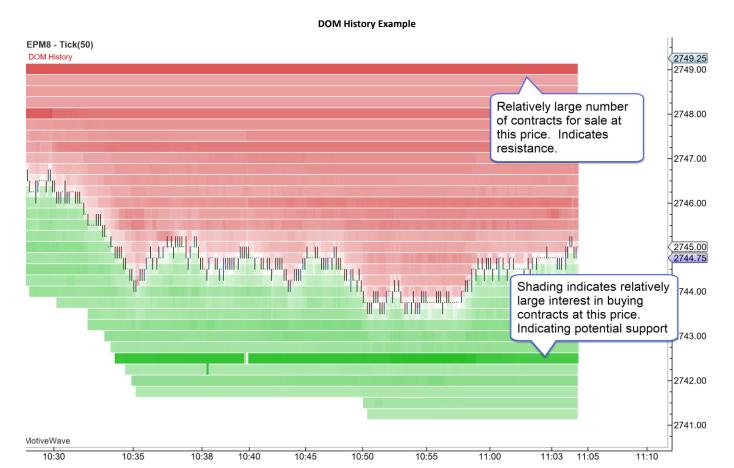
8.1 DOM History

Graphically displays historical Depth of Market sizes captured at the end of the bar (since version 5.4). Blocks are shaded according to their relative size. Darker shading indicates higher sizes (lighter shading on dark chart themes). Blocks where no depth currently exists are extended forward to show where orders may still exist (most depth of market feeds are limited to 10 bid/ask depth).

This study can be very useful to discover where potential support and resistance levels exist based on the cumulative size of the orders to buy or sell at the given price.

Configuration options for this study are simple. Just choose the base color for the ask and bid sizes. The shading is computed by changing the opacity of the color relative to the maximum size present in the DOM history.
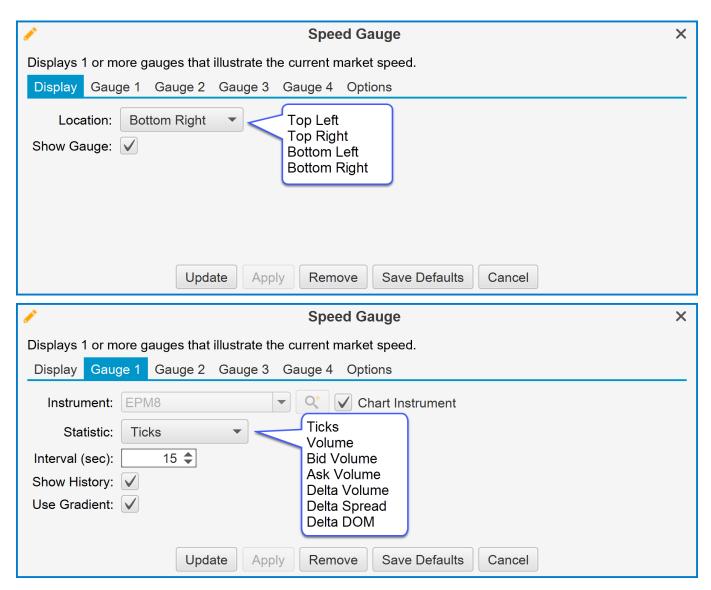
DOM History Example

8.2 Speed Gauges

Speed gauges are useful for displaying live statistics on the price graph (since version 5.4). Up to 16 gauges can be displayed on a single price graph for multiple instruments (4 per study). Optionally, a historical graph shows values over the past minute.

Each study can display up to 4 gauges. The following summaries the configuration options for this study:

1. **Location** – Specifies where on the price graph to display the gauges.
2. **Show Gauge** – Toggles the display of the graphical gauge that shows the range of values
3. **Gauge Tabs** – Each tab allows for the configuration of up to 4 gauges.
4. **Instrument** – Instrument used for the statistic. Check "Chart Instrument" to use the same instrument as the active chart.
5. **Statistic** – The following statistics are supported:
    a. Ticks – Number of ticks for the given interval (in seconds)
    b. Volume – Total volume that occurred in the current interval
    c. Bid Volume – Total volume that occurred at the bid price
    d. Ask Volume – Total volume that occurred at the ask price
    e. Delta Volume – Difference between the ask volume and bid volume
    f. Delta Spread – Difference between the current best bid size and the best ask size
    g. Delta DOM – Difference between the total bid size and the total ask size in the DOM (Depth of Market).
6. **Interval (sec)** – Interval in seconds over which to compute the statistic. Note: this is only used for some of the statistics.
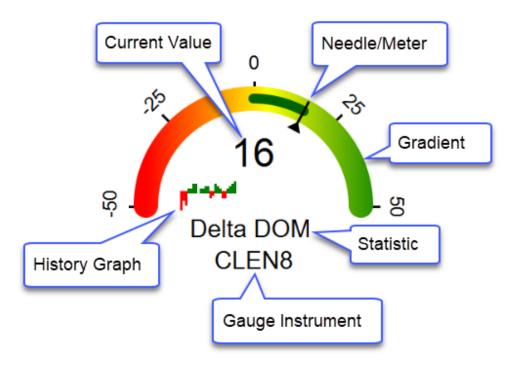
7. **Show History** – If checked this will show a historical graph (for the past minute) below the current value.
8. **Use Gradient** – Shows a gradient (green – yellow – red) as the background on the gauge

The following diagram names some of the elements of the speed gauge:

The example below shows speed gauges in the top right and bottom right corners of the price graph.
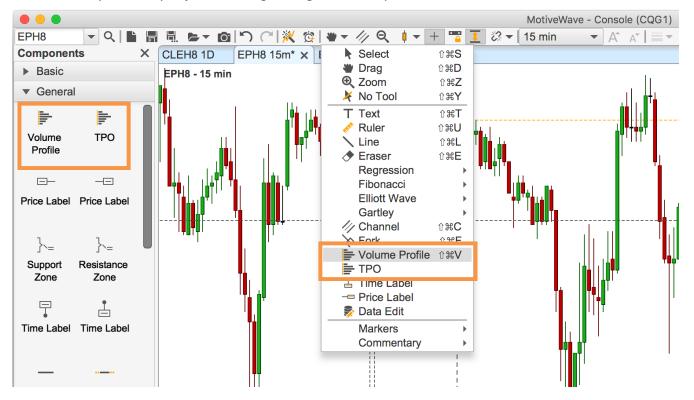
9   Components

Starting with version 5.3 of MotiveWave™, two components have been added to the General tab of the Components panel. These components offer a convenient way to drag/drop a TPO or Volume Profile on a chart and dynamically adjust the range using the resize points.

9.1 Volume Profile Component

The Volume Profile component uses tick data to display a histogram of volume at each price level for the given range of price bars. The volume profile will optionally compute common information such as:

1. Value Area
2. Point of Control
3. Bid vs Ask Volume and Deltas
4. Midpoint, High/Low values

The screen shot below shows an example of a live volume profile (updates in real time) that is aligned to the right. A profile can be made "live" by dragging the right resize point to the latest price bar.
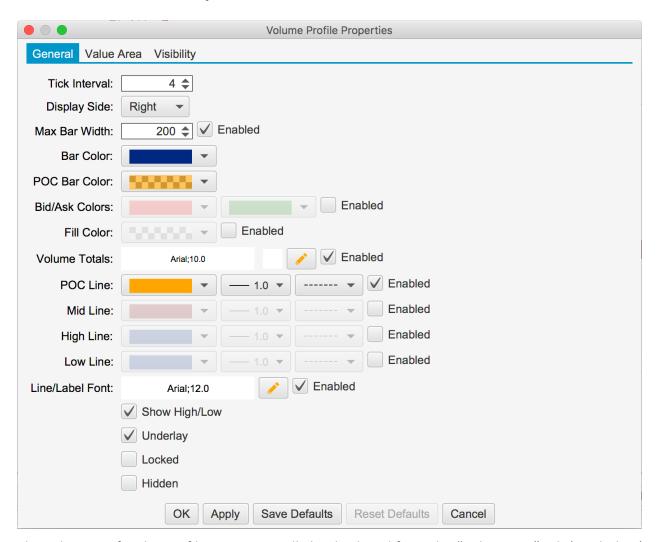
The screen shots below show the configuration options available from the properties dialog (double click on the volume profile object to display). Some of the notable options include:

1. **Tick Interval** – Use this option to specify the number of ticks that make up each volume bar. In the example below 4 ticks are used (for the S&P mini futures contract this represents a single point (min tick is 0.25)).
2. **Display Side** – Options include Left and Right. If displaying a "Live" profile the "Right" option will right justify the profile next to the price axis.
3. **POC Bar Color** – Use this to highlight the "point of control" volume bar.
4. **Bid/Ask Colors** – Enable this option to display the bid vs ask volume in the volume bars. (Note: this will override the bar color option).
5. **Fill Color** – This will display a background fill color for the entire range of the volume profile component.
6. **Volume Totals** – Displays the total volume for each bar using the given font. The label will not be displayed if there is not enough room.
7. **POC/Mid/High/Low Lines** – Optionally draws lines for these values.
8. **Line/Label Font** – Font for price values on the lines above. If not enabled, the price labels will not be displayed.
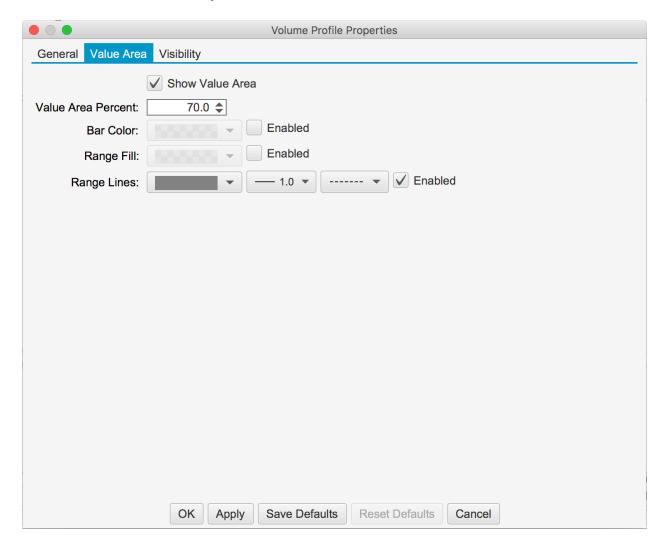
The value area for the profile may optionally be displayed from the "Value Area" tab (see below):

1. **Value Area Percent** – Percentage of volume to be included in the value area. The value area will always include the point of control (POC).
2. **Bar Color** – Optionally change the bar color for bars included in the value area.
3. **Range Fill** – Fill color to use as a background color for the value area.
4. **Range Lines** – Displays horizontal lines at the top and bottom of the value area. Price labels are controlled using the "Line/Label Font" option in the "General" tab.

9.2 TPO Component

The Time Price Opportunity (TPO) component displays a histogram that represents the amount of time spent at each price range.

The component is effectively the same as the TPO Study (see section above for details) except that only one TPO is displayed and you can configure the data range by moving the resize points (see graph below).