



MotiveWave™
What's New in Version 6 Beta 2

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Table of Contents

1	Introduction	2
2	Elliott Wave Custom Ratios.....	3
2.1	Price Ratios	3
2.2	Time Ratios	4
3	DOM Enhancements	5
3.1	Market By Order	5
3.2	More Depth Levels	7
3.3	Position in Queue (Limit Orders).....	8
3.4	Bid/Ask Counts	9
3.5	Regular vs Extended Session for Volume Profile.....	9
4	Rithmic Enhancements	11
4.1	Native Order Types.....	11
4.2	@Bid/@Ask Values for Live Quotes	11
4.3	Latest Rithmic API.....	11
5	TPO Study.....	12
5.1	Split.....	12
5.2	Merge	13
5.3	Split ETH/RTH	14
5.4	Historical Bars vs Tick Data.....	15
6	Volume Imprint Study	16
6.1	Multiple Columns	16
6.2	Shading Levels	17
6.3	Profile	17
6.4	Totals	19
6.5	Delta Summary Profile.....	19
7	DOM History.....	21
8	Big Trades Study.....	22
9	OHLC Study.....	24
10	Volume Profile Study.....	26
11	Time and Sales Panel.....	29
12	Other Enhancements	30
12.1	Back Fill Settings	30
12.2	Intraday Bar Build Method	30
12.3	Price Scaling Ticks From Edge	31
13	SDK Enhancements	32
13.1	Market By Order	32
13.2	Historical Data.....	32

1 Introduction

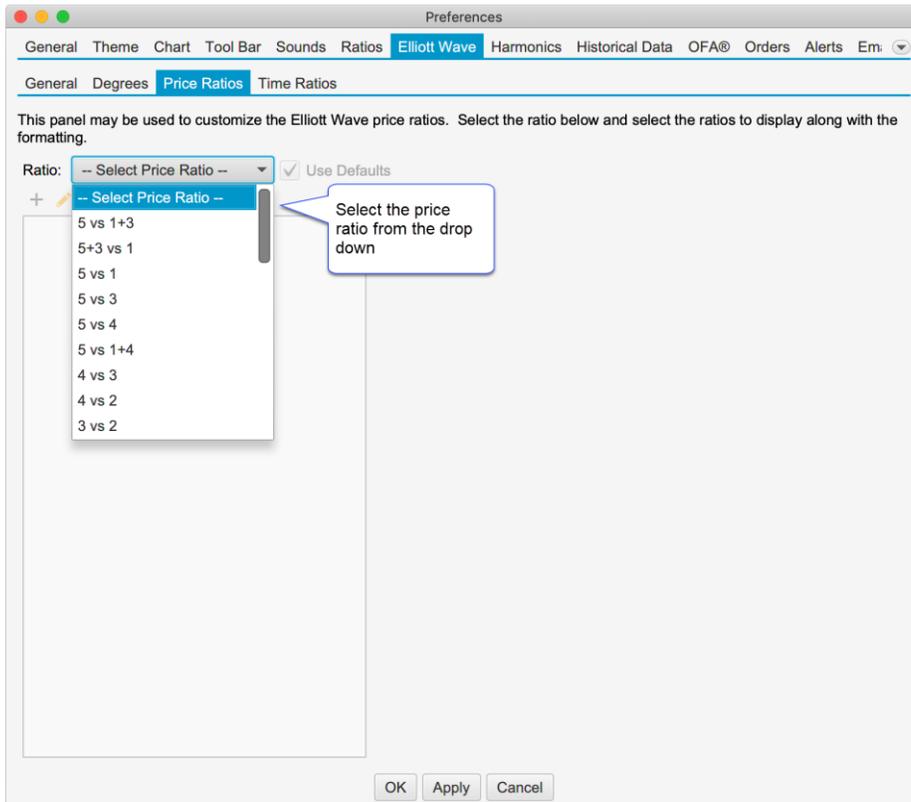
Welcome to MotiveWave™ version 6 Beta 2! We are excited to launch our second beta of version 6 to give you a preview of some of the features we are adding. **Note:** since this is a beta version there may be some issues with the new features. Please report any issues or enhancement suggestions to support@motivewave.com

2 Elliott Wave Custom Ratios

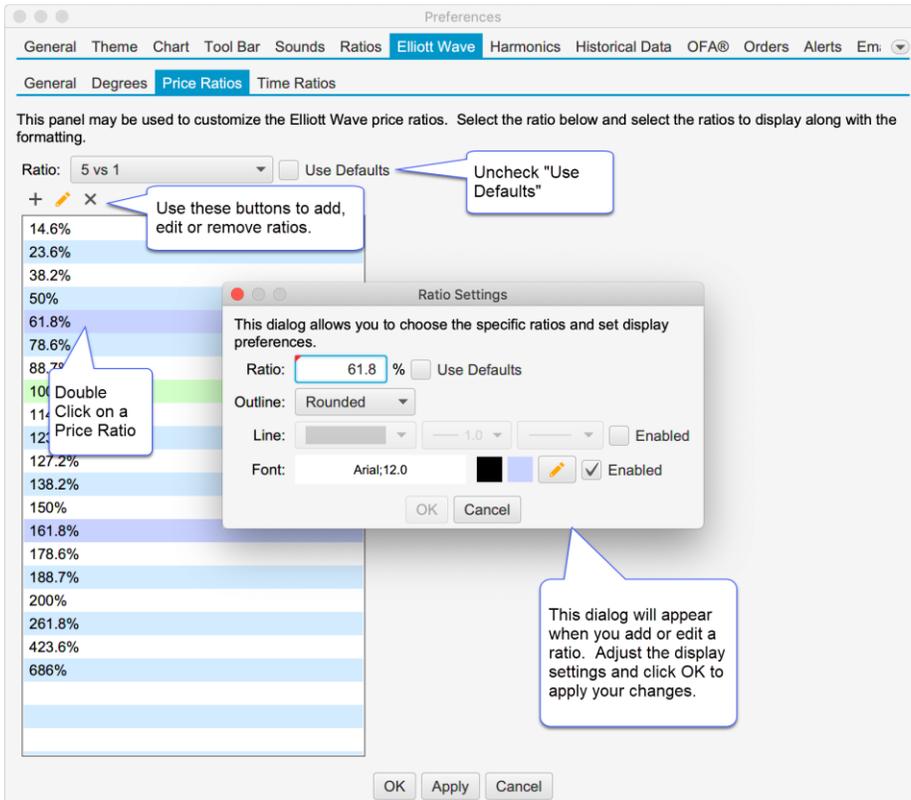
Price and time ratios for Elliott Waves may be customized from the Preferences Dialog (Configure -> Preferences from the Console menu bar, see Elliott Wave tab).

2.1 Price Ratios

Select the **Price Ratios** sub tab from the **Elliott Wave** tab in the Preferences Dialog. Choose a Wave Ratio by selecting it from the drop down.

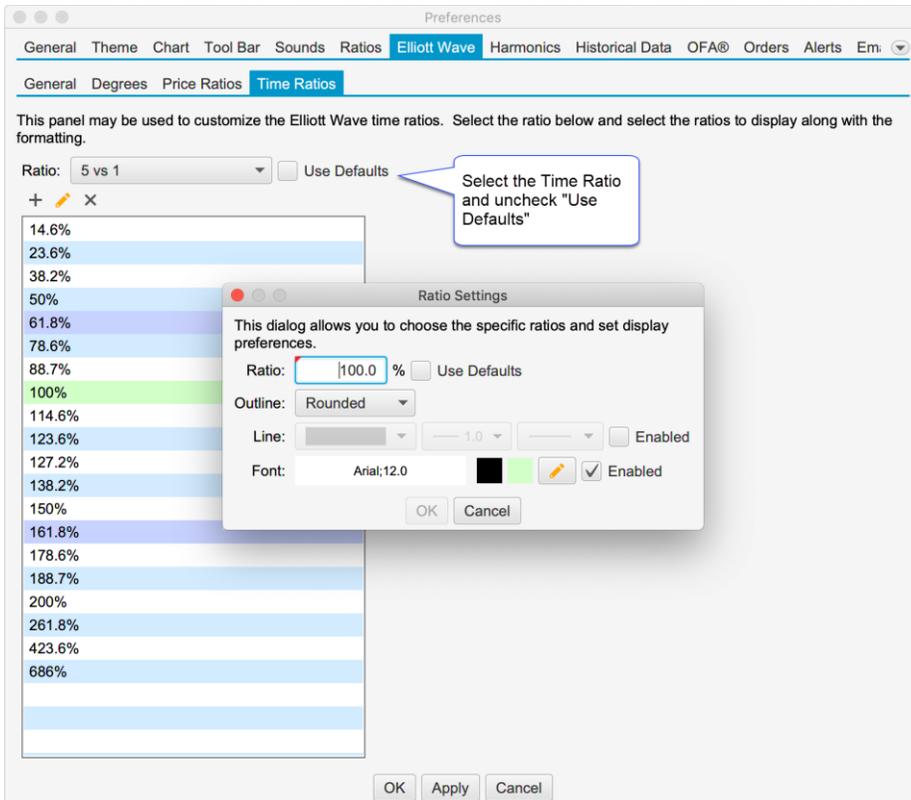


Once you have chosen a wave ratio, the existing settings will be populated in the list box. Uncheck the "Use Defaults" button to modify these ratios.



2.2 Time Ratios

Similar to the Price Ratios, the Time Ratios can be customized from the **Time Ratios** tab:



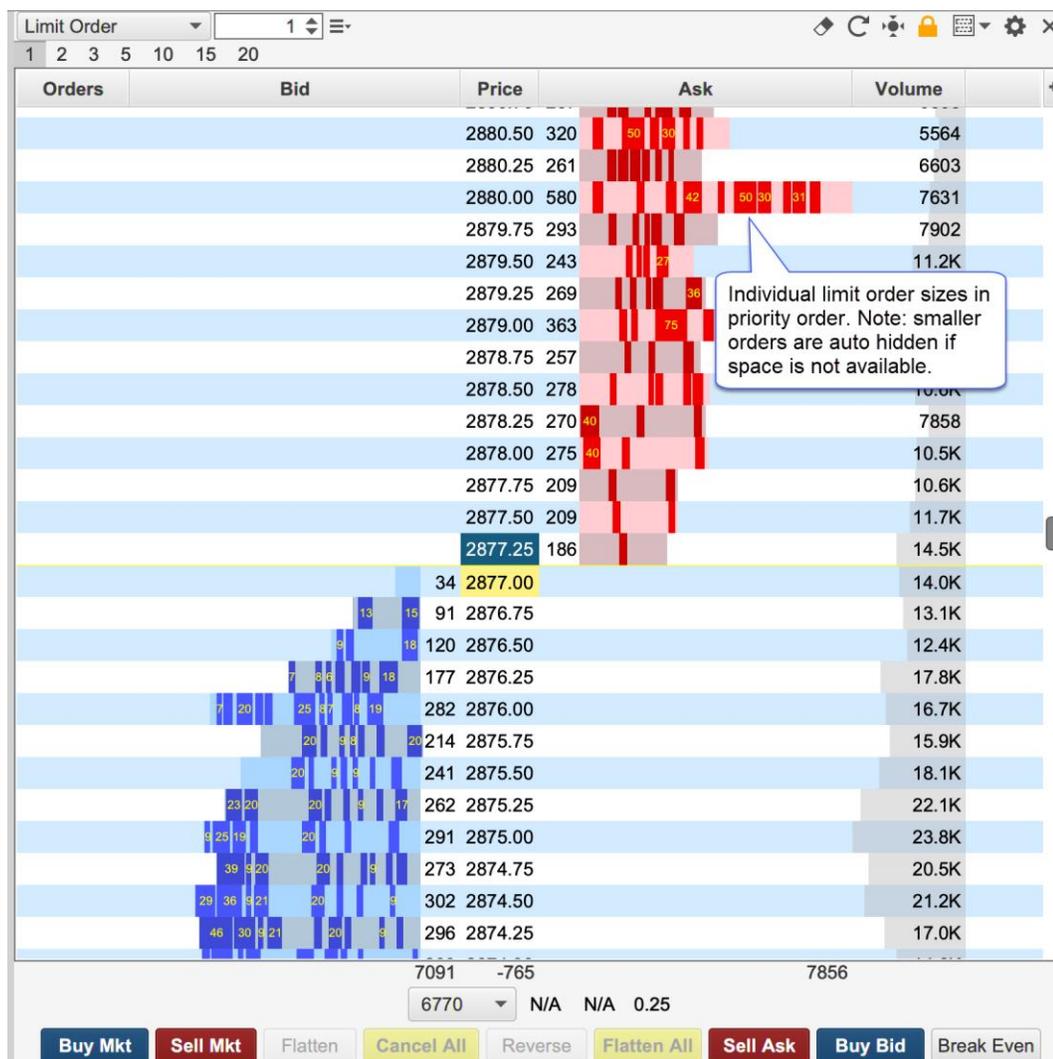
3 DOM Enhancements

Several new enhancements have been added to the Depth of Market (DOM) panel. Note: many of these features are currently exclusive to Rithmic accounts (due to lack of support in other APIs).

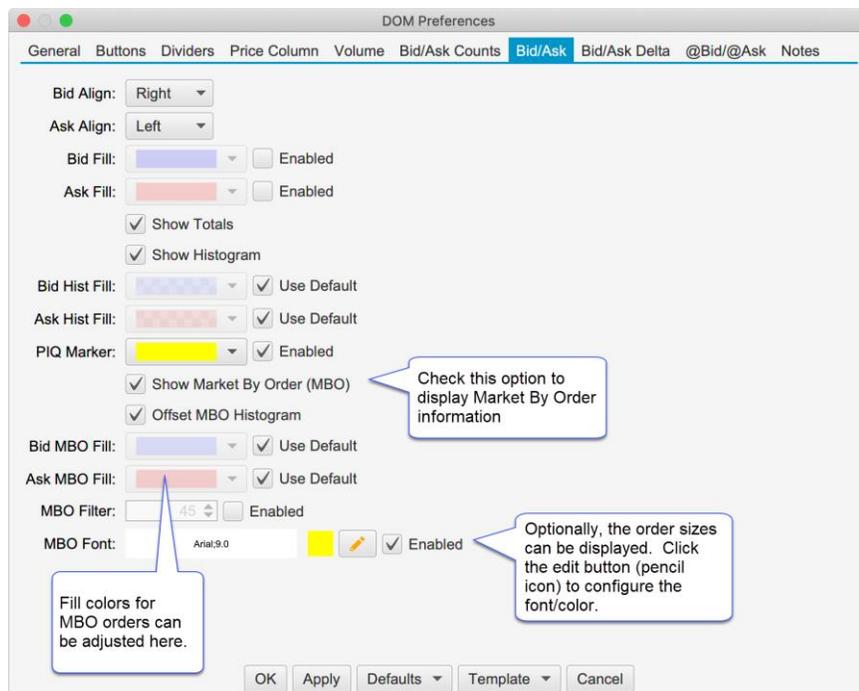
3.1 Market By Order

Market by Order displays individual order sizes in the Bid/Ask Columns (Rithmic Only). For more details on Market By Order, see: <https://www.cmegroup.com/education/market-by-order-mbo.html> Note: this information is also available in the SDK.

The screen shot below shows an example of the Market by Order feature on the S&P e-mini contract. Limit order sizes are displayed in priority order. Smaller order sizes are auto hidden for simplicity. If you would like to see more detail, increase the width of the Bid or Ask columns by clicking/dragging the edge of the column in the table header.



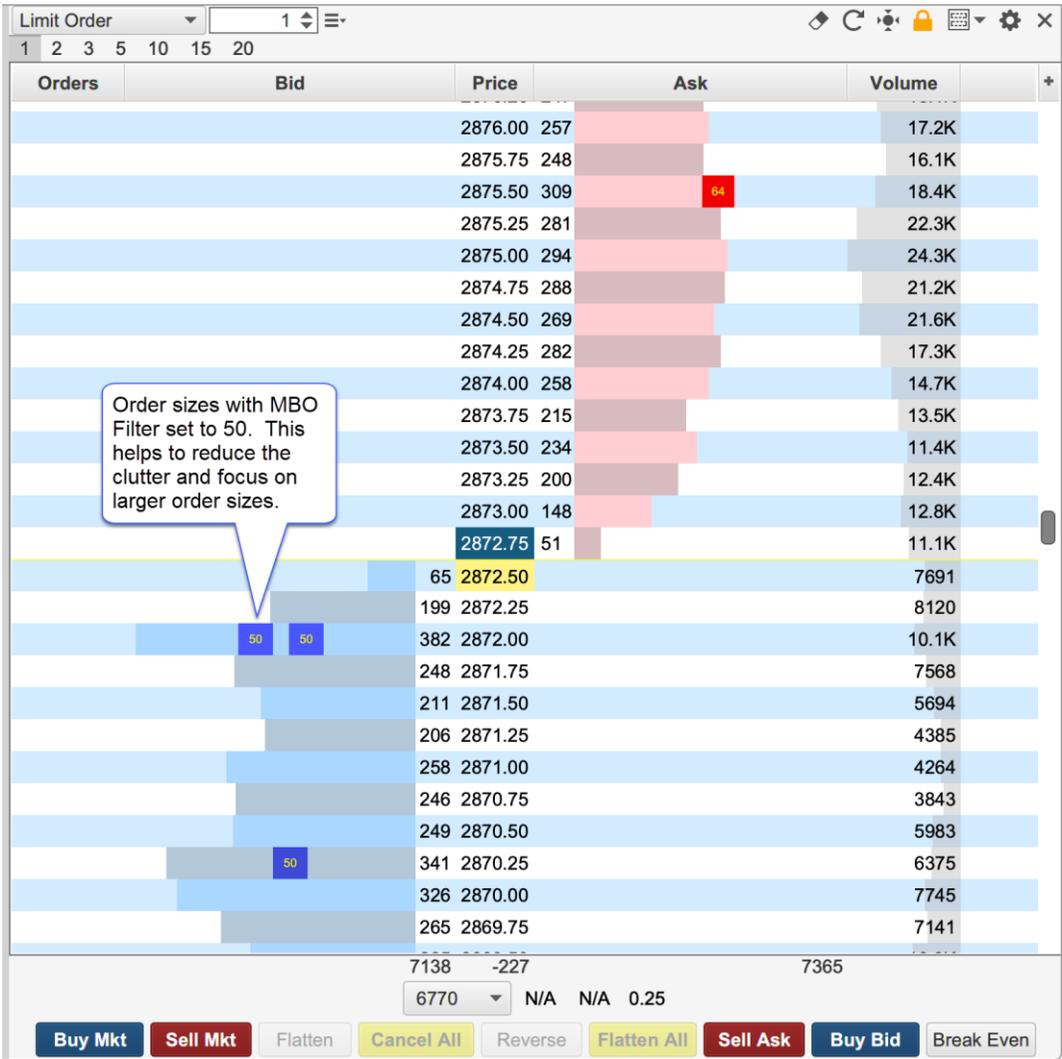
Configuration settings for this feature can be found in the Bid/Ask tab of the DOM Preferences Dialog (click on the Gear icon in the tool bar).



The following options are available for configuring Market by Order:

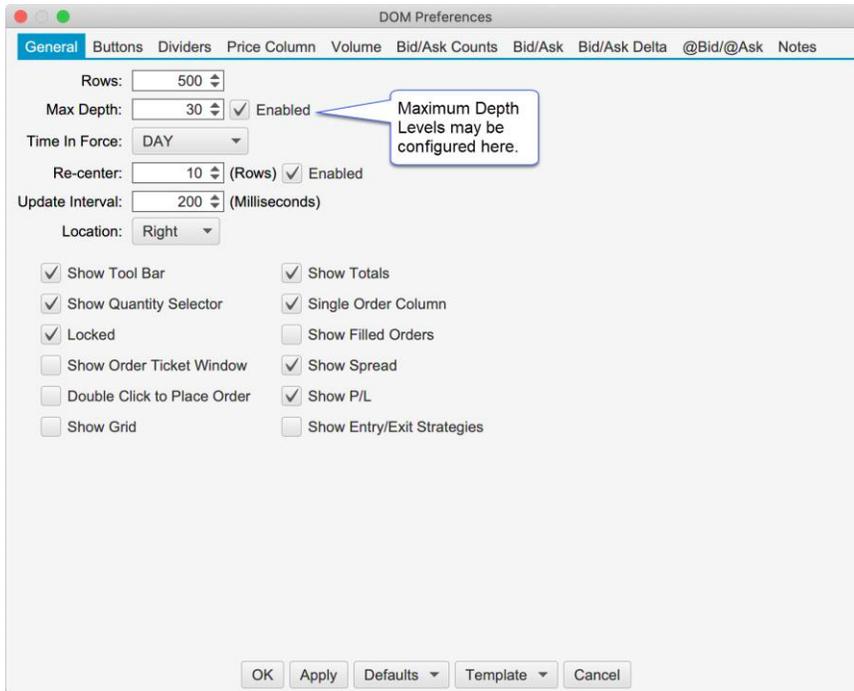
- **Show Market by Order (MBO)** – Toggles the display of the order sizes in the Bid and Ask columns
- **Offset MBO Histogram** – Offsets the histogram to the left/right of the Bid or ask size to avoid obscuring order sizes at the front of the priority queue.
- **Bid MBO Fill** – Fill color for visible order sizes in the Bid column
- **Ask MBO Fill** – Fill color for the visible order sizes in the Ask Column
- **MBO Filter** – Optionally, filters orders that are smaller than the given size
- **MBO Font** – Optionally display the order size (if space available). Click on the edit button to configure the font size/color.

The screen shot below shows the MBO filter option with the size set to 50:



3.2 More Depth Levels

Additional Bid/Ask levels (beyond the standard 10) may be displayed (Rithmic only). See DOM Preferences Dialog, General tab:



3.3 Position in Queue (Limit Orders)

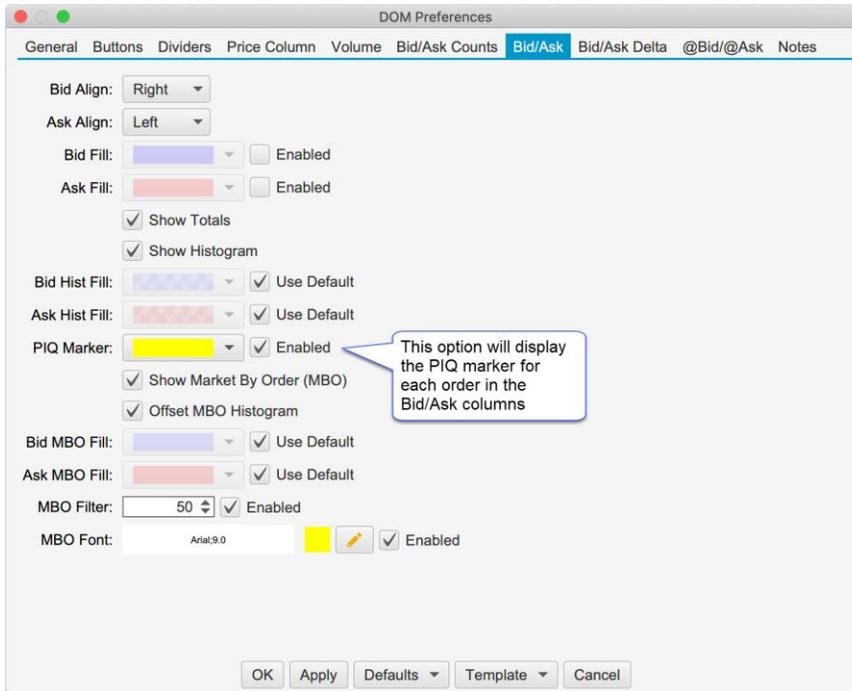
Actual position in queue is available for Live Rithmic accounts only. This makes use of the MBO feature to determine where the limit order is in the queue and calculates the number of contracts ahead of it by adding up the order sizes.

For all other accounts, the estimated position in queue (EPIQ) is displayed (prefixed by '~' in the DOM order column). EPIQ is calculated by monitoring the change in the bid/ask depth levels. When an order is first created it is assumed to be at the back of the queue (ie EPIQ = depth size). When the depth size gets smaller a percentage of that size is removed from the PIQ relative to its current position (i.e. $EPIQ = EPIQ - (EPIQ / \text{previous size}) * (\text{previous size} - \text{new size})$).

The following screen shot shows the position in queue in the **Order** column of the DOM:

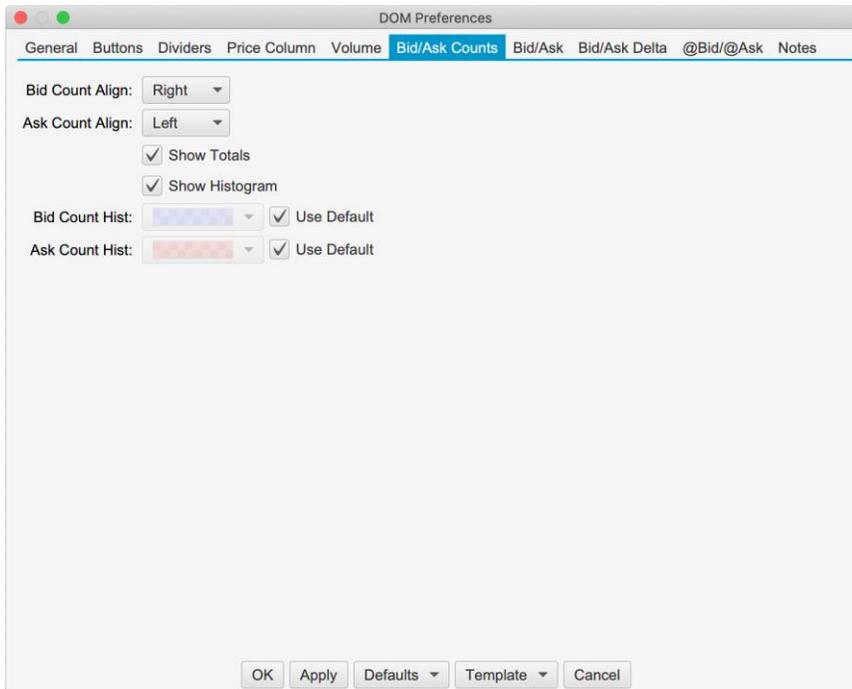
	214	2872.75		11.4K
	319	2872.50	50	7943
	232	2872.25		8148
	395	2872.00	50 50	10.1K
	269	2871.75		7568
	278	2871.50		5694
	271	2871.25		4385
	319	2871.00		4264
+LMT 1 (~291)			C	
	281	2870.75		3843
	273	2870.50		5983

The PIQ marker can be configured in the Bid/Ask tab of the DOM Preferences Dialog:



3.4 Bid/Ask Counts

The Bid/Ask Counts columns display the number of active orders at each price level (as opposed the depth quantity). **Note:** these columns are available on Rithmic accounts only.



3.5 Regular vs Extended Session for Volume Profile

Optionally the volume profile columns (Volume, Bid/Ask Volume, Delta) may be set to computed from the Regular or Extended trading session. The screen shot below shows where this setting can be found:

DOM Preferences

General Buttons Dividers Price Column **Volume** Bid/Ask Counts Bid/Ask Bid/Ask Delta @Bid/@Ask Notes

Display

Volume Align: Right
Bid Vol Align: Right
Ask Vol Align: Left
Delta Vol Align: Left

Bar Color: Use Default
Bid Color: Use Default
Ask Color: Use Default
POC Bar Color: Enabled

Show Volume Labels
 Show Bid/Ask Volume
 RTH Data Only

Value Area

Show Value Area
Range %: 70
Bar Color: Use Default
Range Fill: Enabled
Range Lines: 2.0 Enabled

OK Apply Defaults Template Cancel

The option toggles the display of Regular vs Extended Trading Hours for Volume based columns.

4 Rithmic Enhancements

Significant enhancements have been added to our Rithmic connector (some of which have been described in the DOM Enhancements section: MBO, Bid/Ask Counts, Depth Levels and Position in Queue).

4.1 *Native Order Types*

The following native implementations have been added for the following types of orders:

1. **OCO** – One Cancels Other
2. **Bracket (Attached) Orders** – Limit/Stop orders with attached profile/stop orders
3. **Trailing Stop** – Trailing stop orders
4. **LIT/MIT** – Limit if Touched/Market if Touched
5. **Iceberg** – Limit orders with the actual size hidden

4.2 *@Bid/@Ask Values for Live Quotes*

Live quotes use the “Aggressor Side” flag to determine a live quote was at the bid or ask price instead of relying on the Best Bid/Ask values (which are not guaranteed to be in sync). This will ensure that live quotes are correctly interpreted for Bid vs Ask volume and will match historical tick data.

4.3 *Latest Rithmic API*

We Beta2, we have upgraded to the latest Rithmic API (10.6.0.0).

5 TPO Study

5.1 Split

TPO Profile may be split from the context menu (right click on the TPO Profile Cell). The profile will be split at the cell where the context menu was opened.

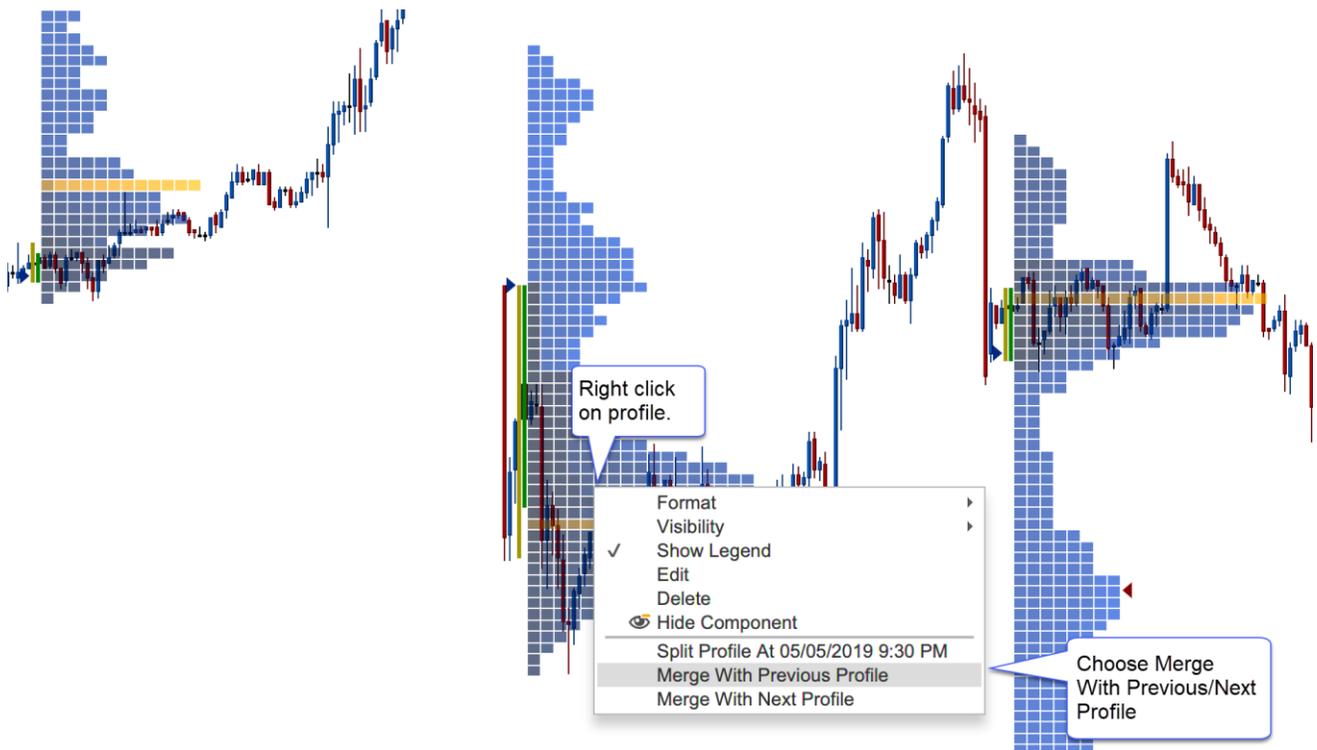


Split profiles have connector lines to indicate where the profiles were split. A TPO profile may be split multiple times. Splits may also be removed individually or all at once (Clear Splits option):



5.2 Merge

Merging profiles is similar to splitting profiles. Right click on a profile and choose **Merge With Previous Profile** or **Merge With Next Profile**:



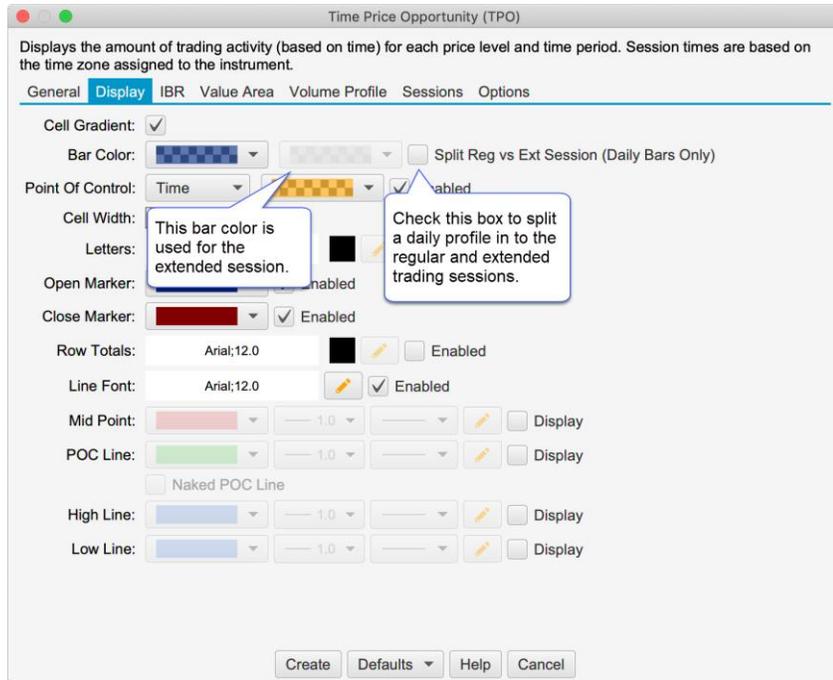
Profiles can be merged multiple times. You may also undo a merge (or all merges) from the context menu:



5.3 Split ETH/RTH

Daily TPOs can be split into two profiles where the first profile shows the regular trading session and the second shows the extended session. **Note:** this feature is only applicable to TPOs that have a 1-day timeframe.

This option can be found under the Display tab of the study dialog (double click on the study):

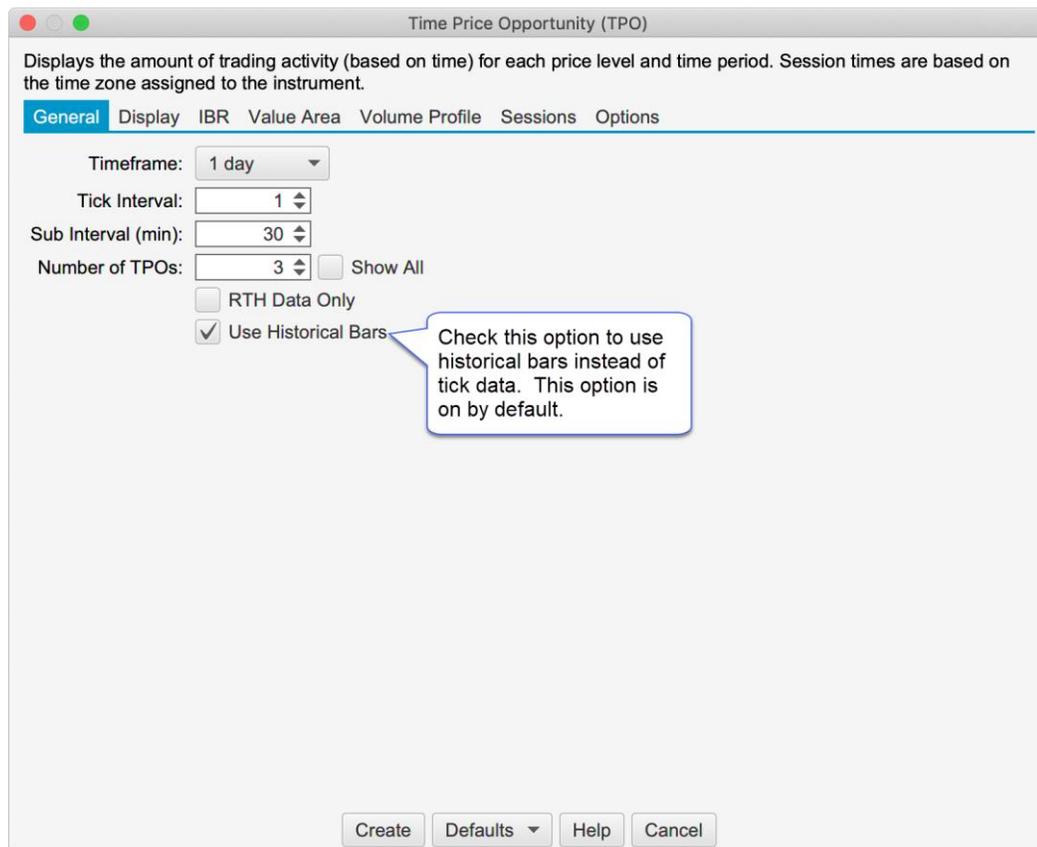


In the screen shot below, the regular trading session has the blue bars and the extended session has grey bars:



5.4 Historical Bars vs Tick Data

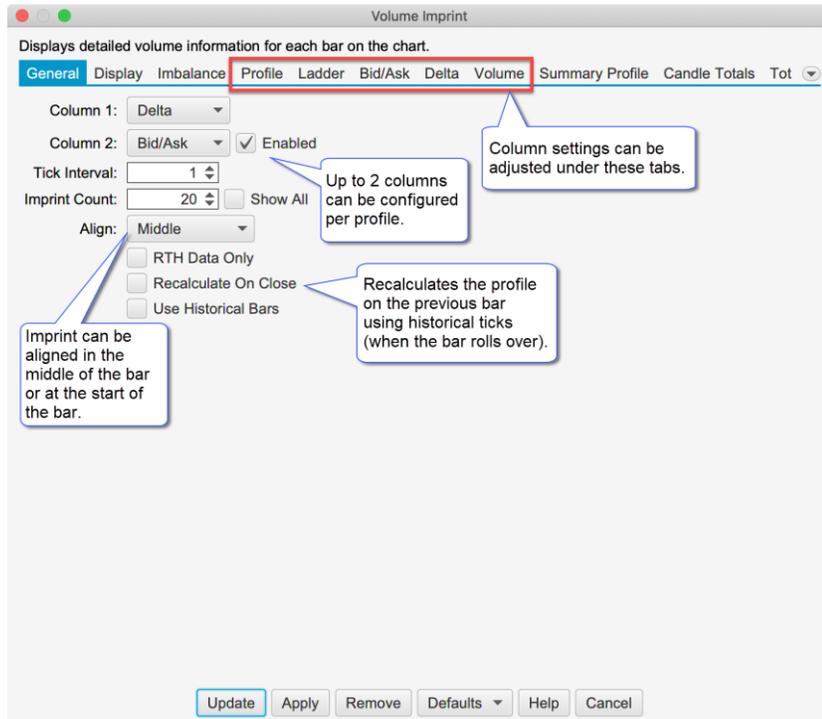
Optionally historical bars may be used instead of tick data (on by default). This significantly improves the loading time for the study and provides a greater range of data (at the expense of accuracy).



6 Volume Imprint Study

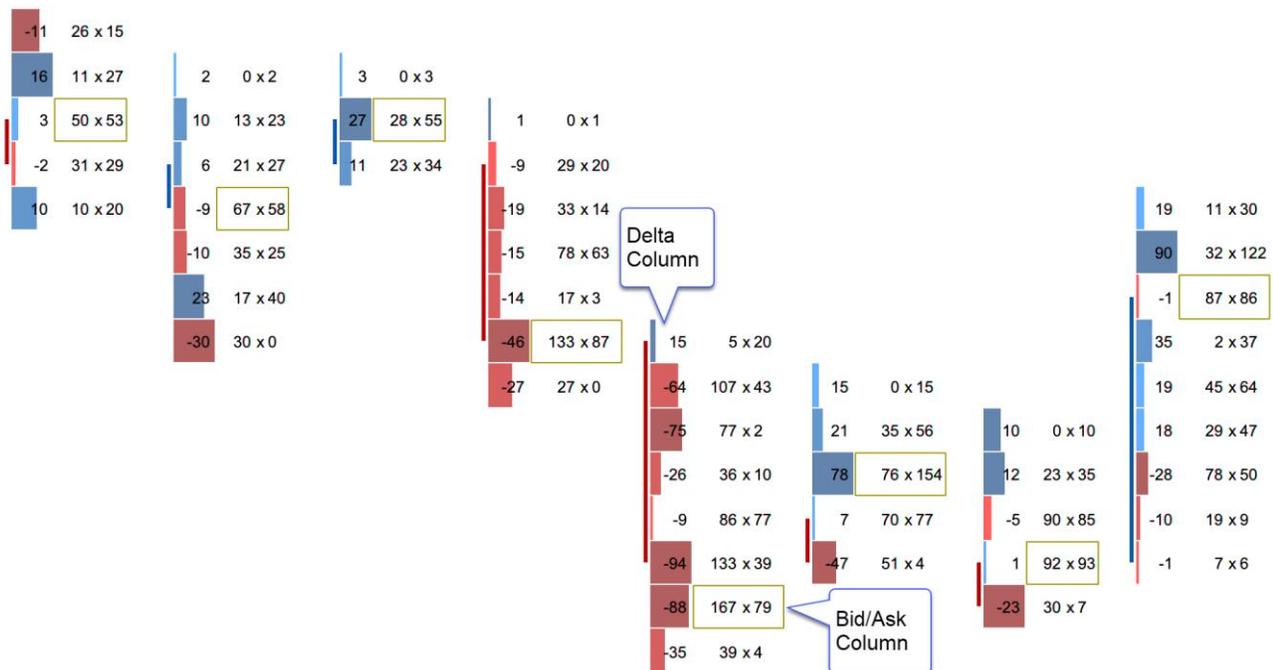
6.1 Multiple Columns

Two columns may be displayed for each Volume Imprint bar. This can be configured from the General tab of the study dialog:



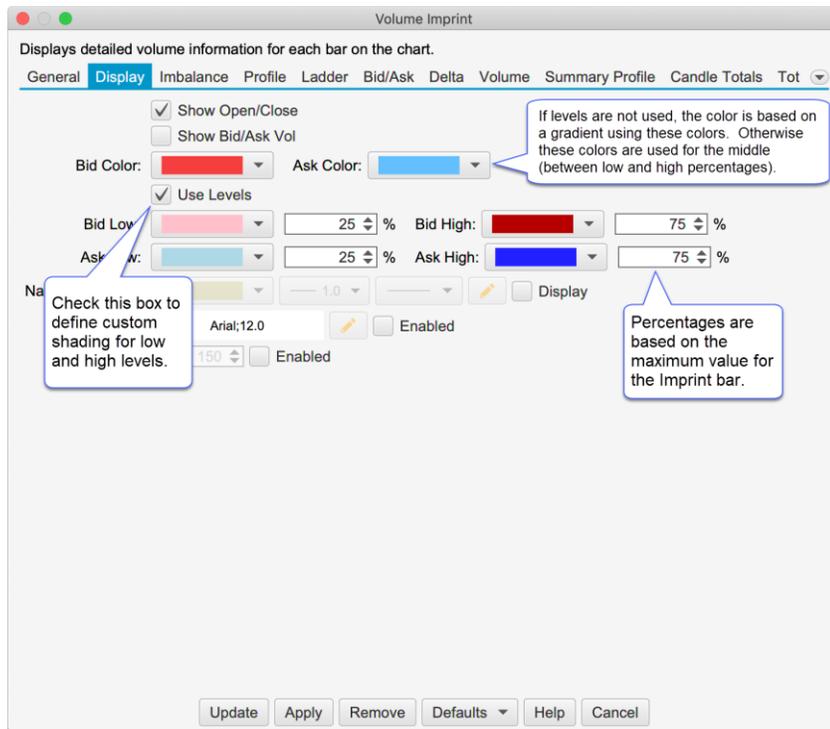
Settings can be tailored for each column under the Profile, Ladder, Bid/Ask, Delta and Volume tabs.

The following screen shot shows a Volume Imprint study with Delta and Bid/Ask columns:

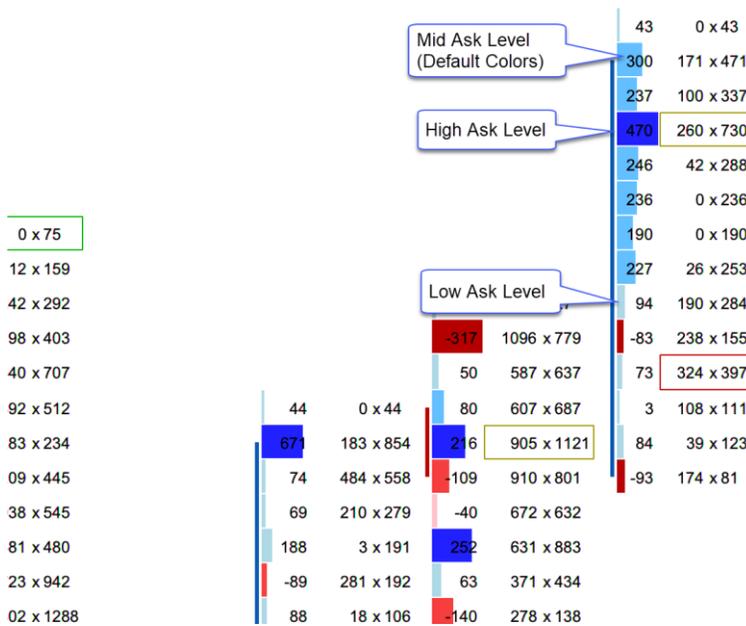


6.2 Shading Levels

Shading levels may be customized based on a percentage of the highest value. This can make it easier to spot high or low values. If levels are not used (uncheck Use Levels), then the shading uses a gradient based off the bid/ask colors (see below).



In the screen shot below, you can see the custom shading levels defined in the dialog box above.



6.3 Profile

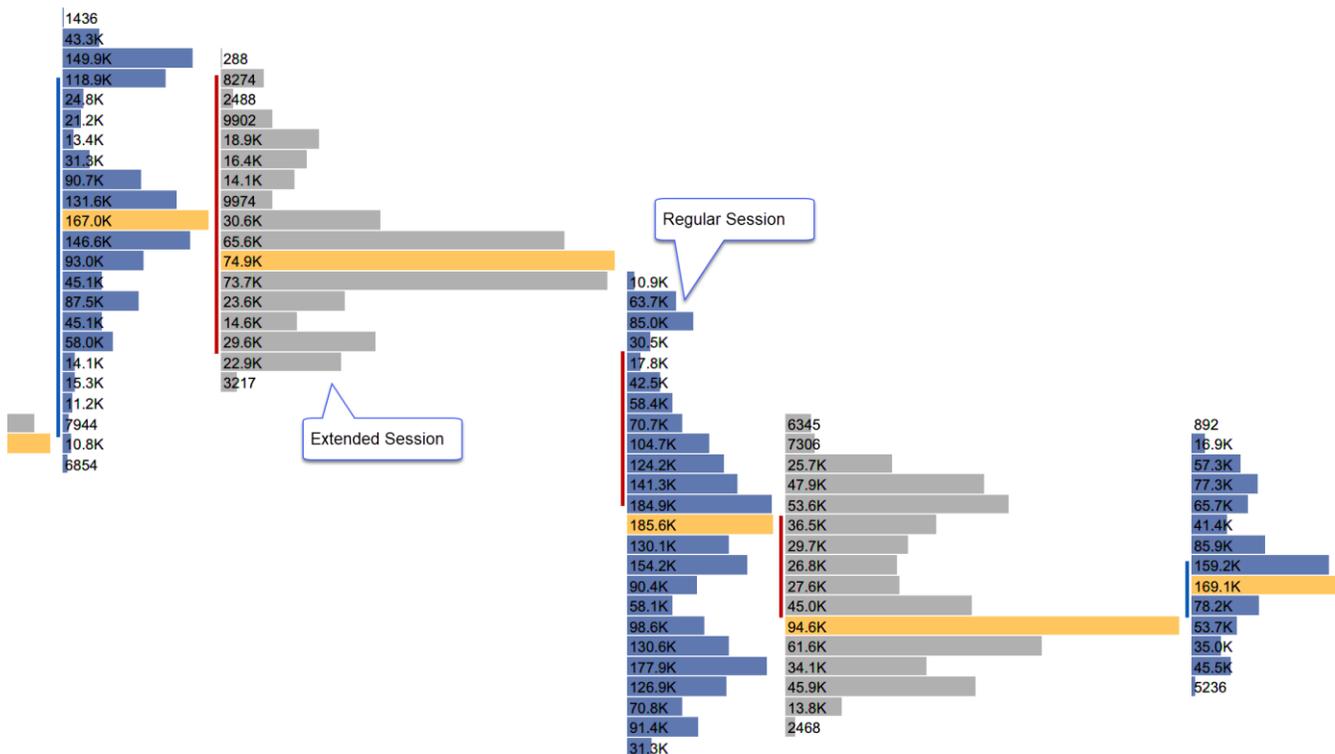
Several enhancements have been made to the profile column (see **Profile** tab in the Study Dialog):

1. **Split Reg vs Extended Session** – Splits the regular and extended trading session (daily bars only)
2. **Bar Color Scheme** – Optionally show Bid/Ask volume or Delta.

3. **Label Type** – This option will change the label displayed on each profile bar. Available options include (Note: this option is also available on Bid/Ask, Delta and Volume columns):
 - a. Profile – Displays the volume
 - b. Delta – Displays the delta value (Ask Volume – Bid Volume)
 - c. Bid/Ask – Displays the Bid and Ask volume (same as Bid/Ask type)
 - d. Volume – Displays volume (using imbalance coloring)



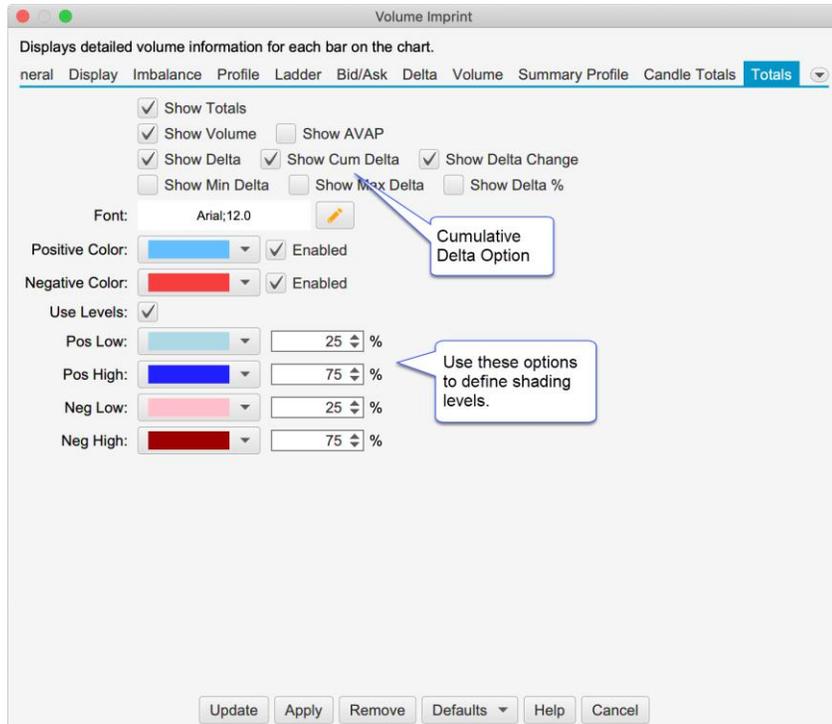
The screen shot below shows the profile split into Reg vs Extended session. Extended session bars are shown in grey:



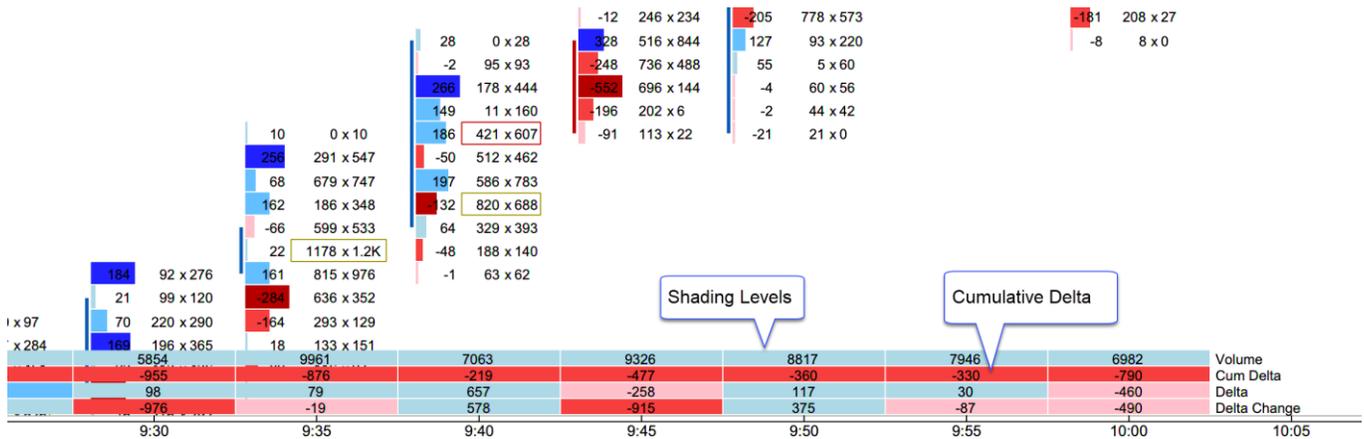
6.4 Totals

The following options have been added to the Totals tab of the study dialog:

1. **Show Cum Delta** – Displays daily cumulative delta
2. **Shading Levels** – Similar to the shading levels for the candle, this applies shading to the totals section at the bottom of the chart.

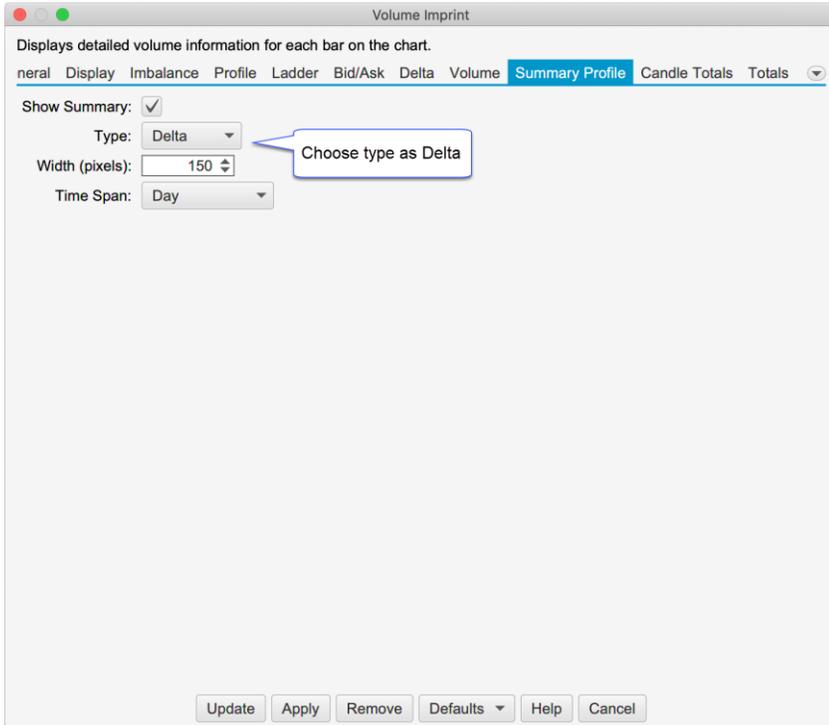


The screen shot below shows the totals at the bottom of the chart as configured in the dialog above:

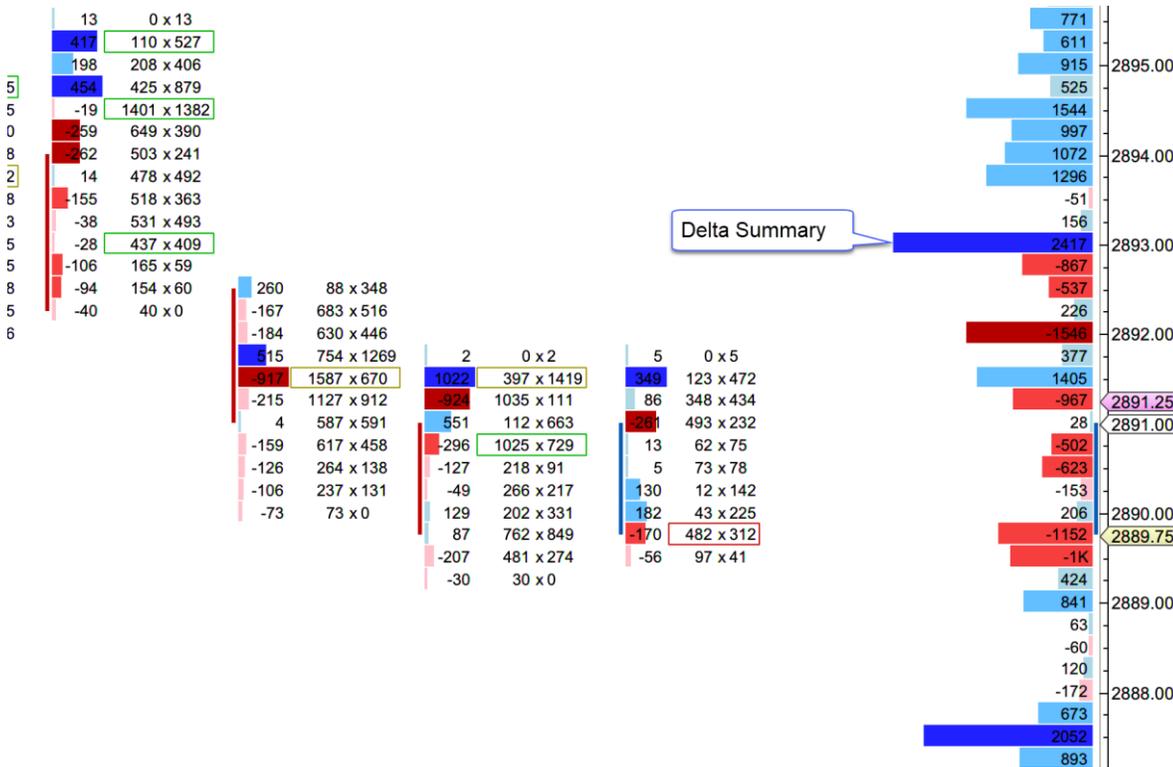


6.5 Delta Summary Profile

Delta has been added as an option for the summary profile:



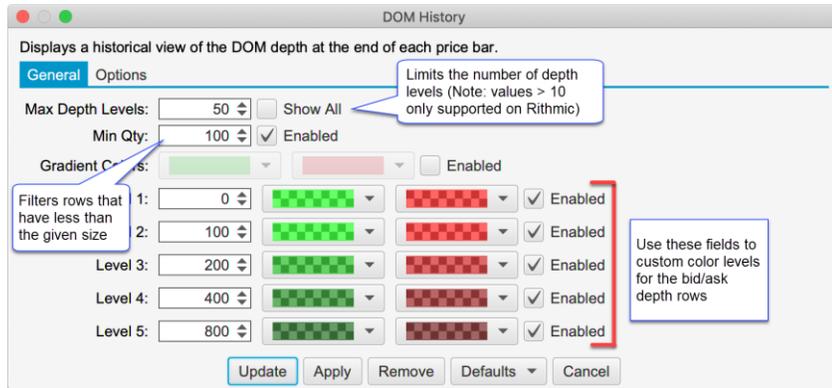
The screen shot below shows the Delta Summary profile on the right hand side of the chart:



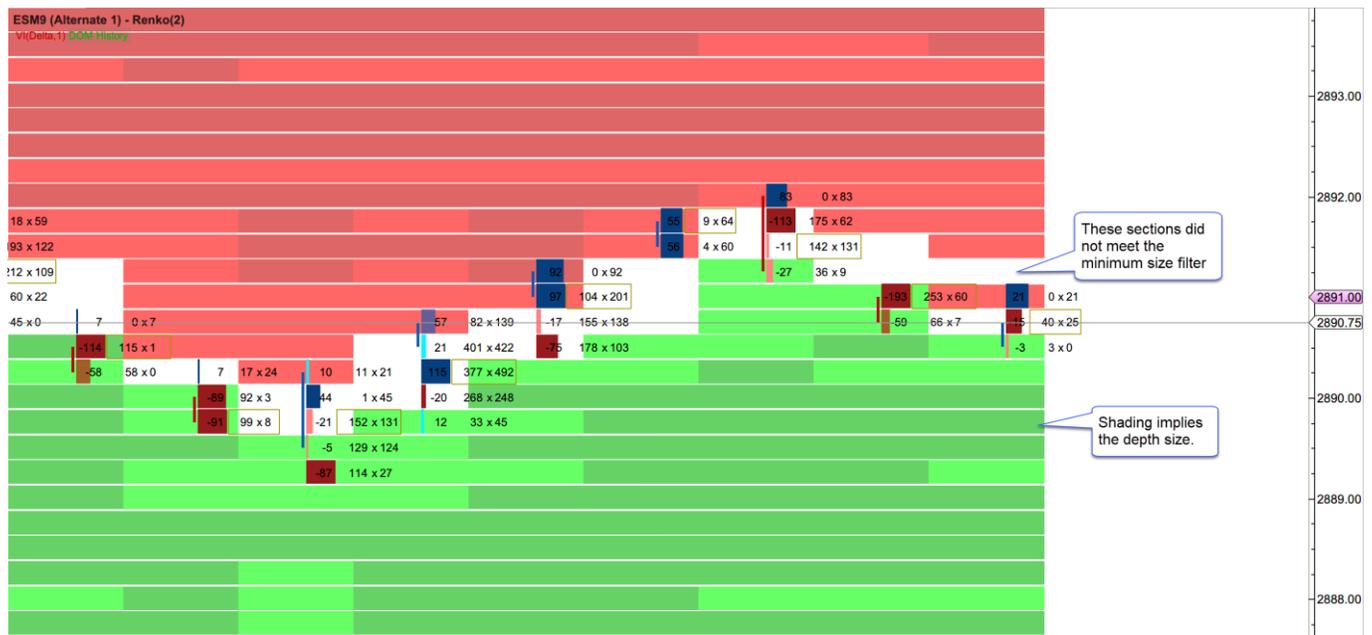
7 DOM History

The following enhancements have been added to the DOM History study (Study -> Volume Based -> DOM History from the top menu bar):

1. **Max Depth Levels** – This limits the number of depth levels displayed on the chart. Note: currently only Rithmic supports depth levels above 10.
2. **Min Qty** – Use this option to filter rows that are below the given depth size
3. **Levels 1-5** – Optionally set specific background colors for up to 5 depth levels. If this option is not chosen, a gradient is applied using the colors defined in the **Gradient Cells** section.



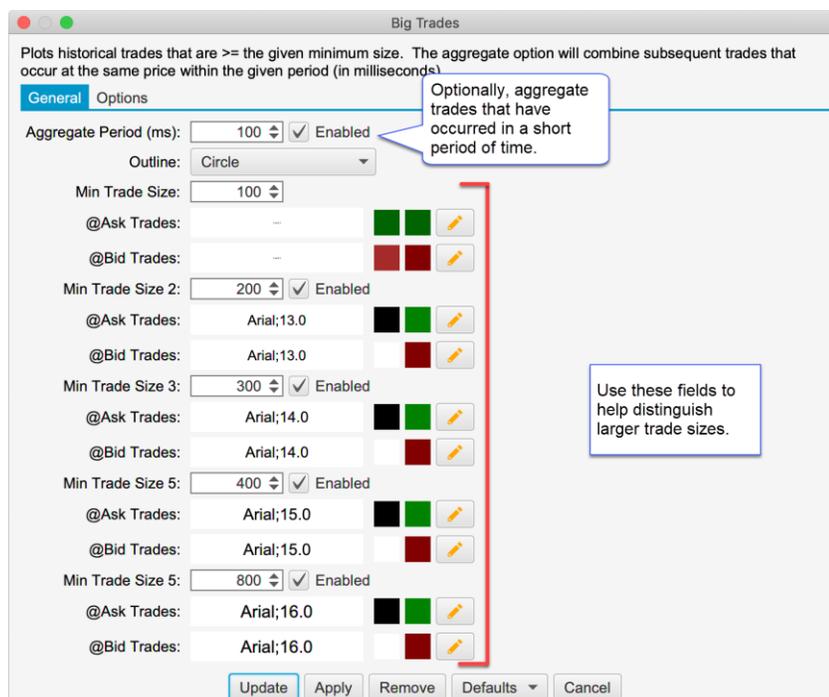
The screen shot below shows the DOM History study on a chart with the above settings:



8 Big Trades Study

This new study shows historical trades on the chart. These are computed using historical tick data. This study has the following options:

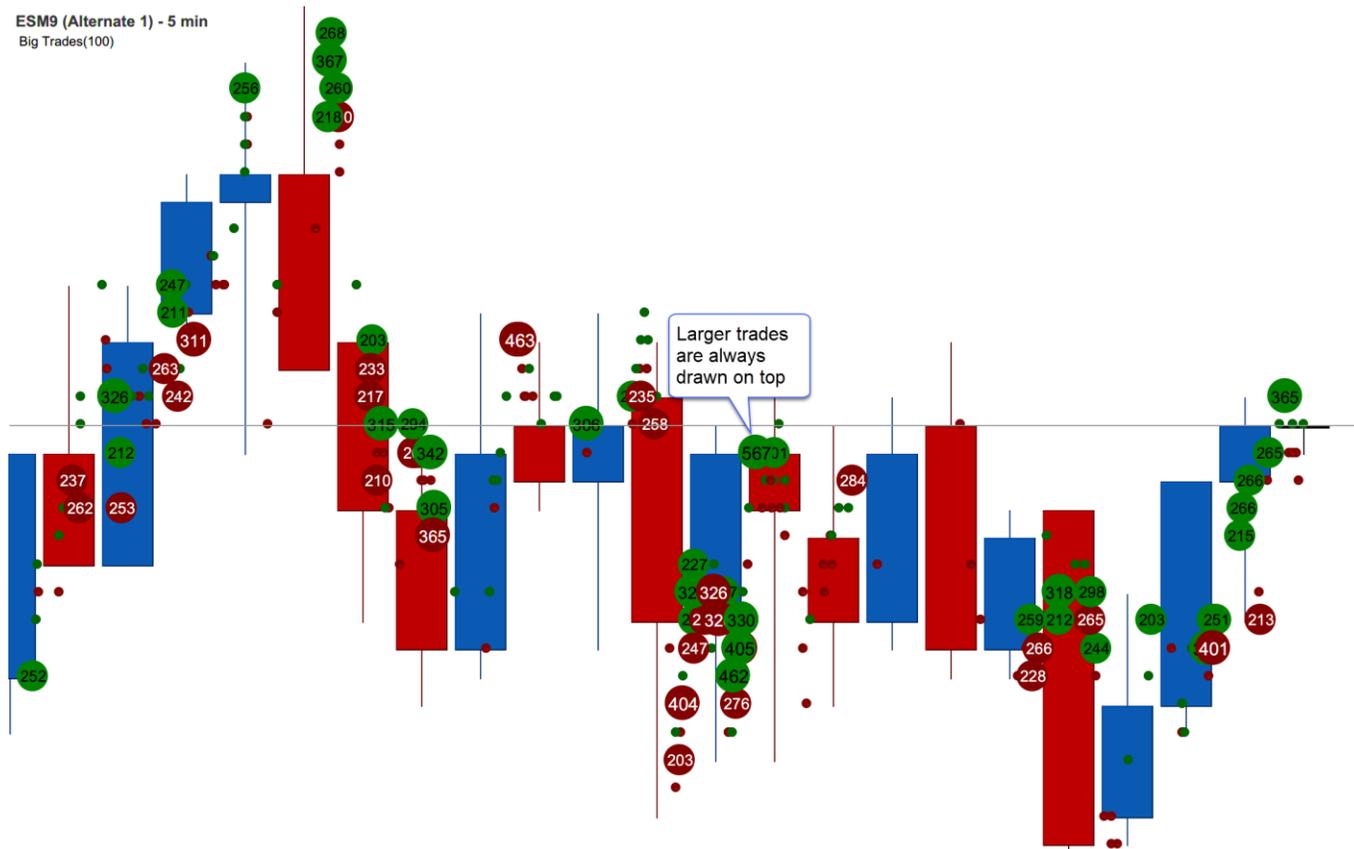
1. **Aggregate Period (ms)** – Optionally aggregates trades that have occurred within the aggregate period (milliseconds). These trades must occur at the same price and the @Ask flag must be the same.
2. **Outline** – Options include:
 - a. Circle (default)
 - b. Rectangle
 - c. Rounded Rectangle
 - d. None (text only)
3. **Min Trade Size** – Up to 5 trade sizes can be defined to distinguish between smaller and larger trades. Use the Min Trade Size for each level to define the tiers.
4. **@Ask Trades** – These fields define the font, font color and background color for trades that occurred at the ask price. The size of the trade can be modified by changing the size of the font. Text can be hidden by choosing the same font color as the background color.
5. **@Bid Trades** – Same as @Ask trades, but applies to trades that occurred at the bid price.



The screen shot below shows the Big Trades study with the settings from above. For convenience larger trades are drawn on top (potentially hiding smaller trades underneath). The following limitations are imposed to avoid performance issues with the study:

1. **Max 25000 Trades** – The study will only compute a maximum of 25000 trades that meet the given criteria
2. **Max 500 Visible** – A maximum of 500 trades will be drawn on the chart at one time.

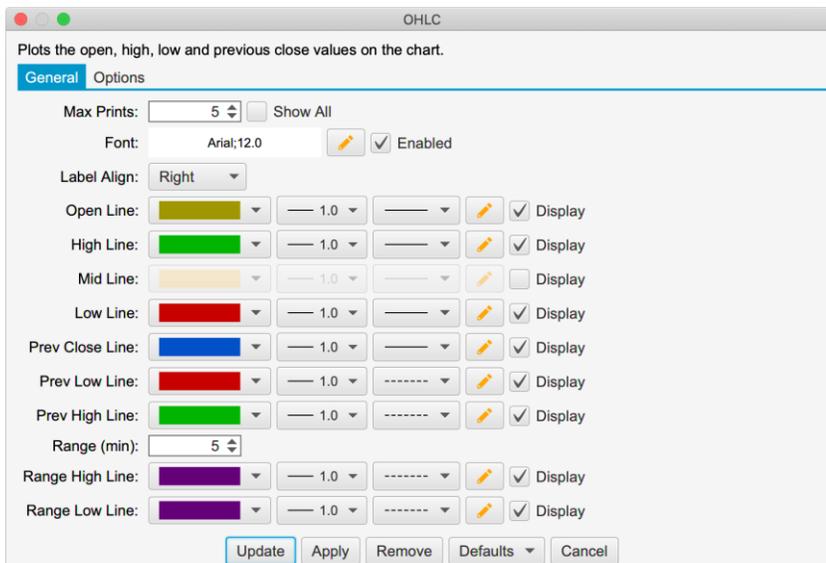
ESM9 (Alternate 1) - 5 min
Big Trades(100)



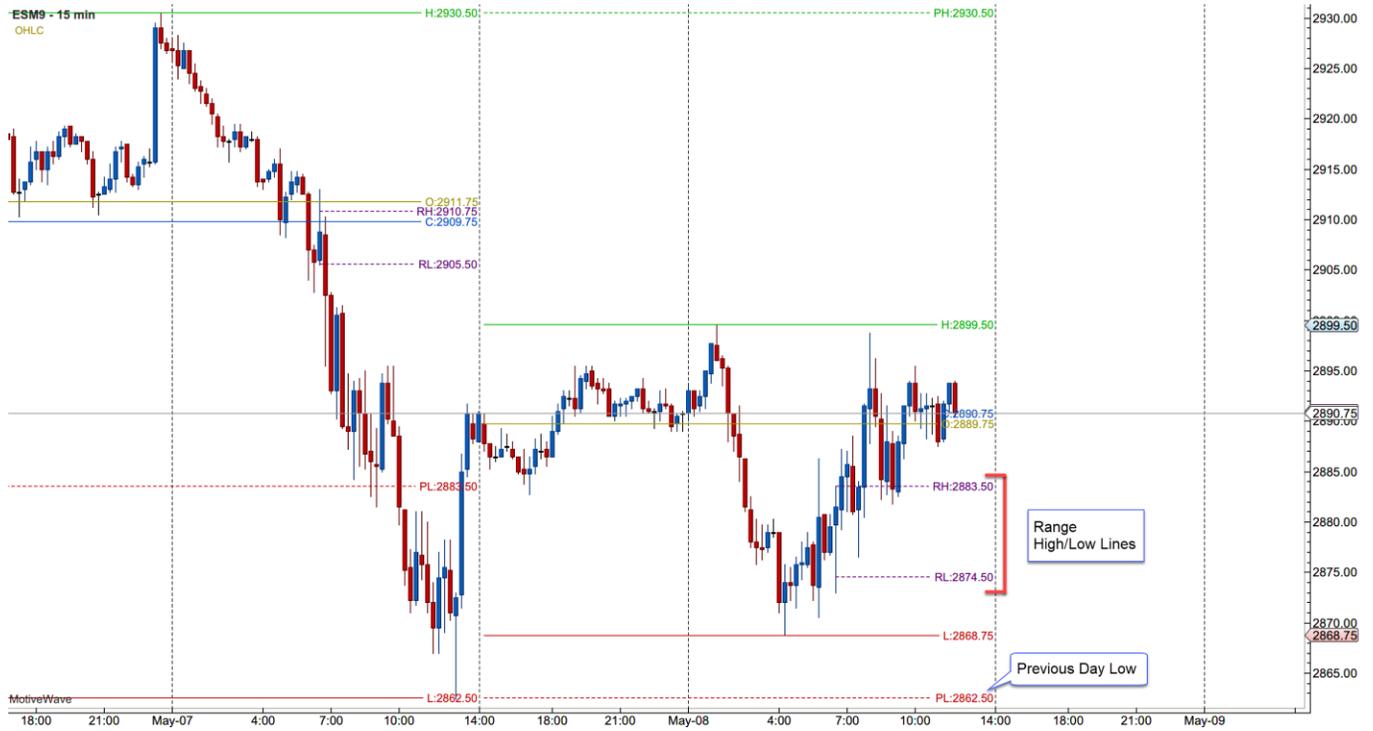
9 OHLC Study

This new study plots the daily information for the following: Note: this study only works on intraday bars.

1. Open – Opening price for the day
2. High – High price for the day
3. Low – Low price for the day
4. Prev Close – Close for the previous day
5. Mid – Midpoint between the high and low
6. Prev Low – Low price for the previous day
7. Prev High – High price for the previous day
8. Range (min) – Time range for computing the Range High/Low lines. The time starts at the opening time for the day (regular trading hours)
9. Range High – High value for the range defined above
10. Range Low – Low value for the range defined above



The screen shot below shows the study using the settings in the dialog above:



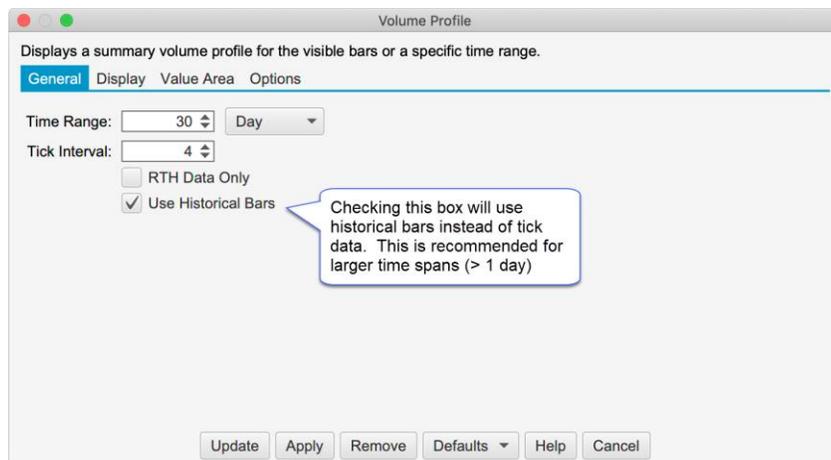
10 Volume Profile Study

The existing Volume Profile study has been rewritten in this update to use tick data and define a time range. The purpose of this study is to display a summary volume profile on the left or right side of the chart over an extended period of time.

General Tab

The following options are available on the **General** tab:

1. **Time Range** – Specified the time range for the volume profile. The range will “roll over” when it hits the end of the range. For example, if “Day” is chosen, the time range will shift when the start of the next day is reached. Available options include:
 - a. Day
 - b. 1 Min
 - c. 5 Min
 - d. 10 Min
 - e. 15 Min
 - f. 30 Min
 - g. 45 Min
 - h. 1 Hour
2. **Tick Interval** – number of ticks that make each bar in the profile
3. **RTH Data** – only uses regular trading hours data if checked
4. **Use Historical Bars** – Uses historical bars instead of tick data. This is recommended if the time range is larger (greater than 1 day) or tick data is limited from your broker/data service.

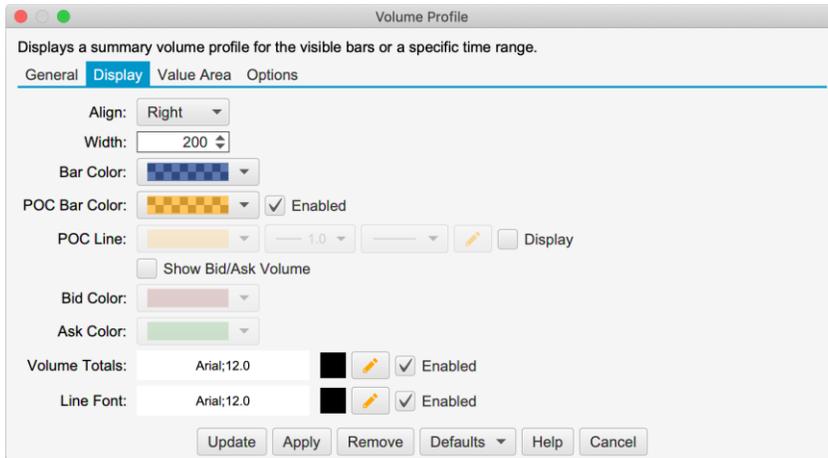


Display

The following options are available in the **Display** tab:

1. **Align** – Displays the profile on the left- or right-hand side of the price graph
2. **Width** – Maximum width for the profile bars.
3. **Bar Color** – Default color for the bars (not displayed if Show Bid/Ask Volume is checked)
4. **POC Bar Color** – Bar color for the bar that is the Point of Control (bar with the highest volume)
5. **POC Line** – Optionally displays a line across the chart from the middle of the POC bar
6. **Show Bid/Ask Volume** – Separates the Bid/Ask volume in each profile bar using the Bid/Ask colors below
7. **Bid Color** – Color for the bid volume in the profile bar

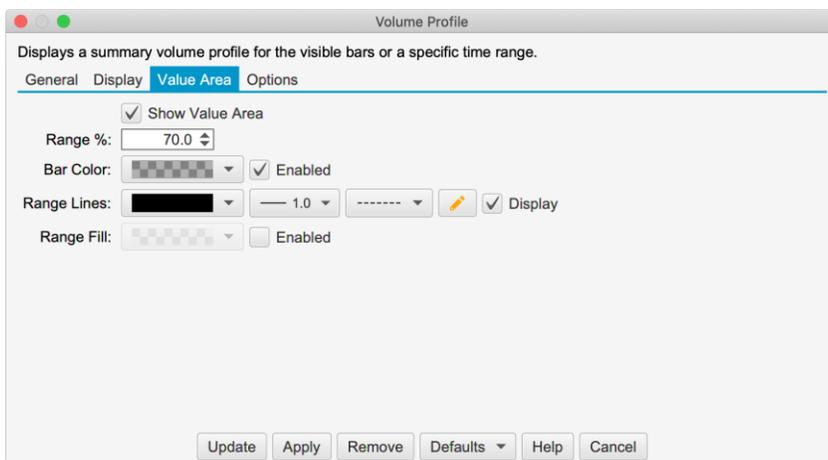
8. **Ask Color** – Color for the ask volume in the profile bar
9. **Volume Totals** – Toggles the display of the volume totals for each bar and defines the font/font color
10. **Line Font** – Toggles the display of the prices for the horizontal lines. This applies to the POC line as well as the Range Lines (see Value Area tab).



Value Area

Use this tab to display the value area for the profile. It has the following options:

1. **Show Value Area** – Toggles the display of the Value Area
2. **Range %** - Defines the percentage for calculating the value area. For example, 70% will select the range of bars that encompass 70% of the volume for the profile. This range must include the Point of Control and includes the minimum number of bars.
3. **Bar Color** – Bar color for the bars that are included in the value area
4. **Range Lines** – Optionally displays horizontal lines at the top and bottom of the value area
5. **Range Fill** – Optionally draws the given fill color for the value area.



The following screen shot shows a 30 day volume profile displayed on the right side of the price graph:

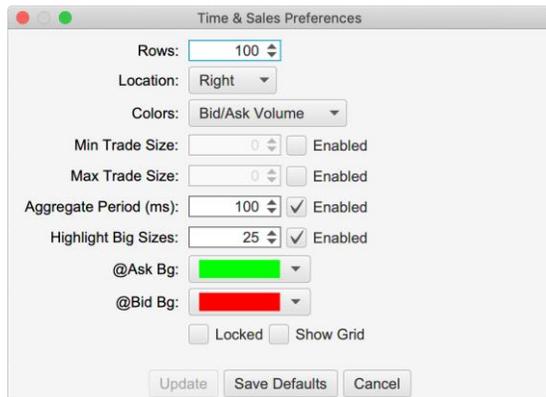


11 Time and Sales Panel

The following enhancements have been added to the Time and Sales panel:

1. **Millisecond Formatting** – The time stamp for the tick now shows the milliseconds (ie HH:MM:SS.MMM).
2. **Aggregate Period (ms)** – The period for aggregate can be customized (default 100 milliseconds). Trades are aggregated if they occur within the aggregation window, have the same price and them same Ask Tick value. These trades must occur in sequence (no non-matching trades between them).
3. **Highlight Big Sizes** – Background highlighting can be applied to larger trade sides.

The following screen shot shows the changes that have been made to Time & Sales Preferences dialog (click on the gear icon on the tool T&S toolbar).



In the screen shot below you can see the highlighting applied to rows that have sizes of 25 or higher.

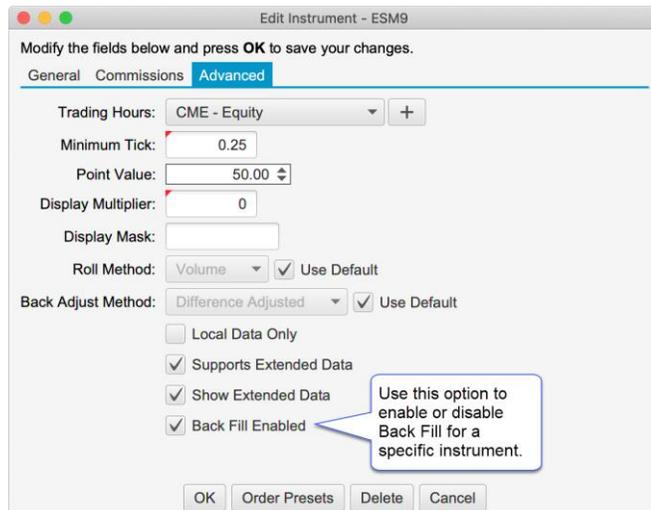
Time	Price	Volume	Ask Tick	
16:25:17.502	2885.00	2	N	
16:25:16.798	2885.00	1	N	Millisecond formatting
16:25:16.492	2885.00	17	N	
16:25:16.378	2885.25	1	N	
16:25:16.195	2885.25	12	Y	
16:25:15.817	2885.00	1	N	
16:25:14.694	2885.25	12	N	
16:25:14.056	2885.25	25	N	
16:25:13.810	2885.25	31	N	
16:25:13.611	2885.25	18	N	
16:25:13.609	2885.25	21	Y	
16:25:10.850	288	2	Y	
16:25:04.141	288	3	Y	Background coloring for larger trades
16:25:01.018	288	1	N	
16:25:00.181	2885.25	1	Y	
16:25:00.180	2885.50	2	Y	
16:25:00.180	2885.25	35	Y	
16:25:00.180	2885.00	3	Y	
16:24:45.170	2884.75	1	N	
16:24:44.303	2885.00	1	N	
16:24:44.301	2885.00	19	Y	

12 Other Enhancements

This section describes other minor enhancements that have been added in Beta 2.

12.1 Back Fill Settings

Back Fill may be enabled (or disabled) per instrument in addition to globally. This option can be found in the Instrument Dialog (right click on a chart and choose **Edit Instrument**, see **Advanced** tab):



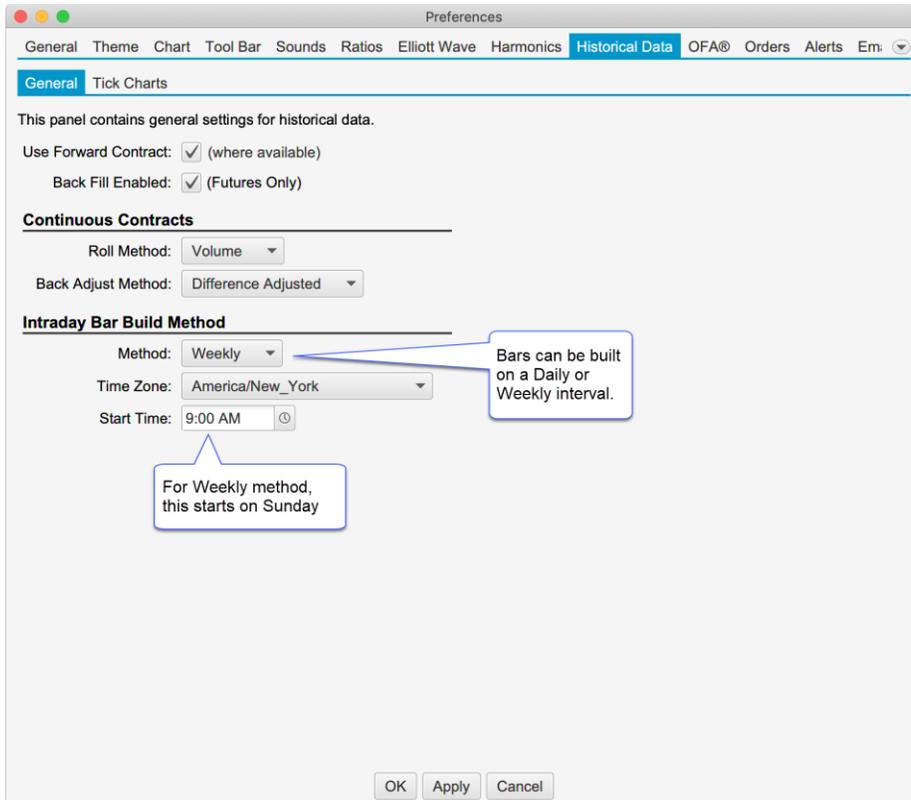
12.2 Intraday Bar Build Method

Depending on which broker/data service you are using, MotiveWave will receive and store historical bars in one or more of the following sizes (raw bar sizes): 1 min, 5 min, 30 min and 120 min.

All other bar sizes are built by combining data from the raw bars. By default, these bars are built on a weekly interval starting at 9:00 am on Sunday (EST).

This feature is now configurable in the Preferences Dialog (**Configure** -> **Preferences** from the Console menu bar, see **Historical Data** -> **General** tab). The following options are available:

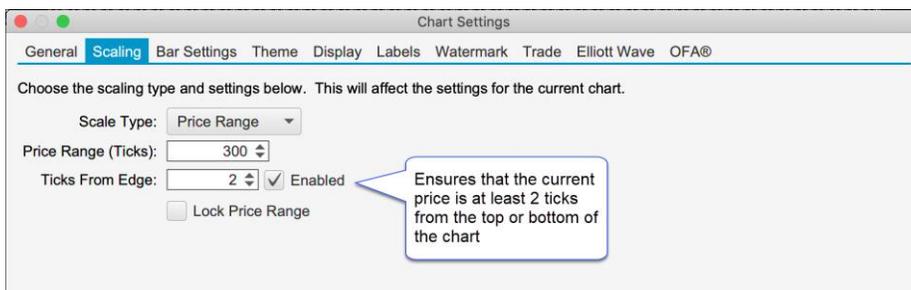
1. **Method** – Weekly or Daily. For weekly the bars will be built starting at the given time on Sunday
2. **Time Zone** – Relative timezone for the start time
3. **Start Time** – Time of day to start building the bars (using the time zone above).



12.3 Price Scaling Ticks From Edge

A new option has been added to the Price Range scaling option (see Chart Preferences Dialog **Scaling** tab, double click on the chart):

- **Ticks From Edge** – Keeps the current price at least X ticks away from the top or bottom of the chart. This setting only applies when the current price is shown on the chart.



13 SDK Enhancements

13.1 Market By Order

Market by Order information has been added to the Depth of Market (DOM) classes. For each DOMRow, a list of orders (DOMOrder) is available.

Figure 1 DOMRow Interface

```

package com.motivewave.platform.sdk.common;

import java.util.List;

/** Represents a row in the Depth of Market (DOM) with a price
    and aggregate size. */
public interface DOMRow
{
    /** Gets the price for this row.
        @return price for this row */
    float getPrice();
    /** Gets the size for this row. For some instruments (such as crypto
        currencies) this can contain floating point values.
        @return size for this row */
    float getSize();
    /** Gets the number of active limit orders at this price. Zero (0) will
        be returned if this feature is not supported by the broker.
        @return number of active orders at this price */
    int getOrderCount();
    /** Gets the list of active limit orders at this price (ordered by priority,
        first order is at the front of the queue). This is only available if
        your broker supports Market By Order.
        @return active limit orders (ordered by priority) for this price */
    List<DOMOrder> getOrders();
}

```

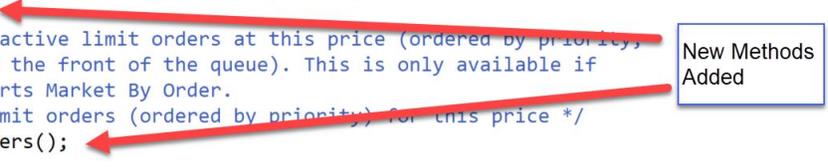


Figure 2 DOMOrder Interface

```

package com.motivewave.platform.sdk.common;

/** Represents an order in a Depth of Market Row (DOMRow).
    These orders are only available if your broker supports Market By Order. */
public interface DOMOrder
{
    /** Gets the id of the order at the exchange.
        @return exchange order id */
    String getExchangeOrderId();
    /** Gets the displayed quantity of this order.
        @return quantity of this order */
    float getQuantity();
}

```

13.2 Historical Data

Historical ticks and bars can be accessed directly from the Instrument interface (com.motivewave.platform.sdk.common.Instrument).

Tick Data: Use Historical Bars

For tick data, a new option has been added to the forEachTick method: useHistoricalBars. This option will generate ticks from historical bars (starting from 1 minute bars) instead of loading historical ticks. This option is useful if tick data is not available or you need to load a large amount of data (and accuracy is not as important).

Historical Bars

Historical bars can now be accessed directly (without the `DataSet` interface). This allows you to access bars without declaring them in the `SettingsDescriptor`. **Note:** only linear bars ≥ 1 min are currently supported.

```
import java.beans.PropertyChangeListener;

/** Represents an Instrument. */
public interface Instrument
{
    :
    :
    /** Performs the given operation on each tick that occurred between the given startTime and endTime.
     * If you need a large number of ticks (> 100K), this is preferred to the getTicks method since it
     * will be less memory intensive.
     * @param startTime start time (in milliseconds since 1970)
     * @param endTime end time (in milliseconds since 1970)
     * @param rth regular trading hours
     * @param useHistoricalBars if true, ticks are generated from historical OHLC bars
     * @param operation operation to perform on each tick */
    void forEachTick(long startTime, long endTime, boolean rth, boolean useHistoricalBars, TickOperation operation);
    :
    :
    /** Performs the given operation on each bar that occurred between the given startTime and endTime.
     * Note: only linear bars are currently supported (no second base bars either)
     * @param startTime start time (in milliseconds since 1970)
     * @param endTime end time (in milliseconds since 1970)
     * @param barSize size of the bars
     * @param rth regular trading hours
     * @param operation operation to perform on each bar */
    void forEachBar(long startTime, long endTime, BarSize barSize, boolean rth, BarOperation operation) throws MException;

    /** Gets the bars that occurred between the given startTime and endTime
     * @param startTime start time (in milliseconds since 1970)
     * @param endTime end time (in milliseconds since 1970)
     * @param rth regular trading hours
     * @return list of ticks that occurred in the given time */
    List<Bar> getBars(long startTime, long endTime, BarSize barSize, boolean rth) throws MException;

    /** Loads the given number of bars from the given end time.
     * @param endTime end time (in milliseconds since 1970)
     * @param count number of bars to load
     * @param rth regular trading hours
     * @return list of ticks that occurred in the given time */
    List<Bar> getBars(long endTime, int count, BarSize barSize, boolean rth) throws MException;
}
```

```
package com.motivewave.platform.sdk.common;

/** Represents a historical bar. */
public interface Bar
{
    /** Gets the bar size for the bar.
     * @return bar size for the bar. */
    BarSize getBarSize();

    /** Gets the start time for the bar (in milliseconds since 1970).
     * @return the start time of the bar (in milliseconds since 1970). */
    long getStartTime();
    /** Gets the end time for the bar (in milliseconds since 1970).
     * @return the end time of the bar (in milliseconds since 1970). */
    long getEndTime();

    /** Gets the open price for the bar
     * @return open price for the bar */
    float getOpen();
    /** Gets the high price for the bar.
     * @return high price for the bar. */
    float getHigh();
    /** Gets the low price for the bar.
     * @return low price for the bar. */
    float getLow();
    /** Gets the close price for the bar.
     * @return close price for the bar. */
    float getClose();
    /** Gets the volume for the bar (as a long value).
     * @return trade volume for the bar (as a long value) */
    long getVolume();
    /** Gets the volume for the bar as a floating point value
     * @return trade volume for the bar (as a floating point value) */
    float getVolumeAsFloat();
    /** Gets the open interest for the bar (daily bars only, if available)
     * @return open interest (daily bars only) */
    int getOpenInterest();
    /** Gets the number of trades for this bar (if available)
     * @return number of trades for this bar. */
    int getTrades();
    /** Gets the volume weighted average price for the bar (if available).
     * @return volume weighed average price (if available) */
    float getVWAP();
}
```