

# Database



Ensign has been designed around a database for the following advantages:

1. With Tick and Minute databases there is a reduced need to refresh to have complete databases.
2. Capacity: Database can go back many months. Initial refresh from Barchart will be 8 months.
3. Speed: Building chart bars from the databases is considerably faster than extracting from a tick pool.
4. Consistency: All time frames build bars from the same database. Chart bars can be deleted and rebuilt.
5. Efficiency: A refresh updates the database. Do not need to refresh multiple time frames. The refresh benefits closed charts too, which is a huge benefit.
6. Preserve: Ability to lock individual days in the database so subsequent refresh does not overwrite data known to be good. This will be particularly useful in maintaining continuation files for futures.
7. Extent: Intra-day and tick charts can auto refresh upon opening, if a refresh is needed. Mode to auto refresh database on program run.
8. Playback uses the tick and minute database files. This is the actual tick history.
9. Time & Sales: Quickly jump to any date, any time of day, and view the time and sales ticks.

Click the Database button to display the Database Manager form. This form can also be displayed from a chart's pop-up menu. The advantage of using the chart's pop-up menu is the form will be opened with the correct directory folder selected for the chart.

Period	Open	High	Low	Close	Up Vol	Dn Vol	Ticks	Minutes
Evening	1.17104	1.17160	1.16652	1.16748	2,887	3,226	6,113	398
Day Session		1.17035	1.16684	1.16816	12,917	12,980	25,897	801
Daily	1.17104	1.17160	1.16652	1.16816	15,804	16,206	32,010	1199

**Legend** Each block represents a 30-minute period

- Refreshed Data
- Refreshed from eSignal
- Live Data Feed
- No Data in Refresh
- No Data Seen Yet
- Data Missing
- Period Not Locked

On the left side is a directory tool to navigate the Ensign10 folder to pick one of the Vendor folders, and either the Ticks\ folder or the Minutes\ folder. In each folder are sub-folders containing the database for each symbol that you follow. There is a tick database and a separate 1-minute database. Each day is a separate file providing the following advantages.

- If you need to replace or repair a day in the database, do so by working on that day's file.
- The whole database is never at risk of being corrupted or lost.

## Legend

When a date is selected, a row of boxes show that days' contents. There is a box for each half hour of the day and the colors indicate something about the content in that half hour. The 24 hour day will thus have 48 boxes, beginning with the evening session open and going through the day session close.

A box that is dark blue has data obtained by refreshing. A box that is green has data obtained from the live data feed, and a refresh of the same period will change green to blue. A box in the aqua color has no data, but that was the way it was in the refresh, so the omission is probably correct and doing another refresh is not going to add anything, because you already had a refresh covering that period. Most likely, the market is just idle or closed during that time period.

A box that is white indicates that no data has been seen (yet) in real-time or in a refresh, such as the remainder of the current day.

A red box, indicates that data is missing in the past, and may just needs to be refreshed. Boxes that have a center hole indicates those time periods have not been locked.

If the data is correct, and you do not want it to be changed, click the Lock File button and the boxes with holes become solid boxes. A refresh will make the box solid to begin with, meaning it is already as good as it can get and refreshing again will not benefit. The green box could be made locked by locking it, in which case the refresh will not replace it. To unlock a file that was locked, there is an Unlock File button, in which case a refresh could then replace the bars.

## Building Chart Bars

When a chart is opened, it will load the existing chart file which might go way back. Then the database files for ticks or minutes are used to bring the chart current. The database can have many months of files, and these do not self delete. Though a chart may not have been opened for 2 weeks, database files for these 2 weeks may exist so the chart can be updated. After extracting the bars from the database files, the updated chart file is saved so the extraction is not needed the next time the chart is opened.

The building of bars from the database is very fast. Any updating done to the database by either the live feed or the refresh benefits all charts that are closed. A single refresh that adds to the database provides content for any chart that uses the database. The same principles apply to the minute database.

All intra-day charts read from the same 1-min bar files to be brought current. A single refresh request for 1-min data benefits all these open charts and all close charts yet to be opened.

Tick, range, seconds, and volume charts all build from the tick database. This leads us to another great feature, and that is the program is smart about what needs to be refreshed.

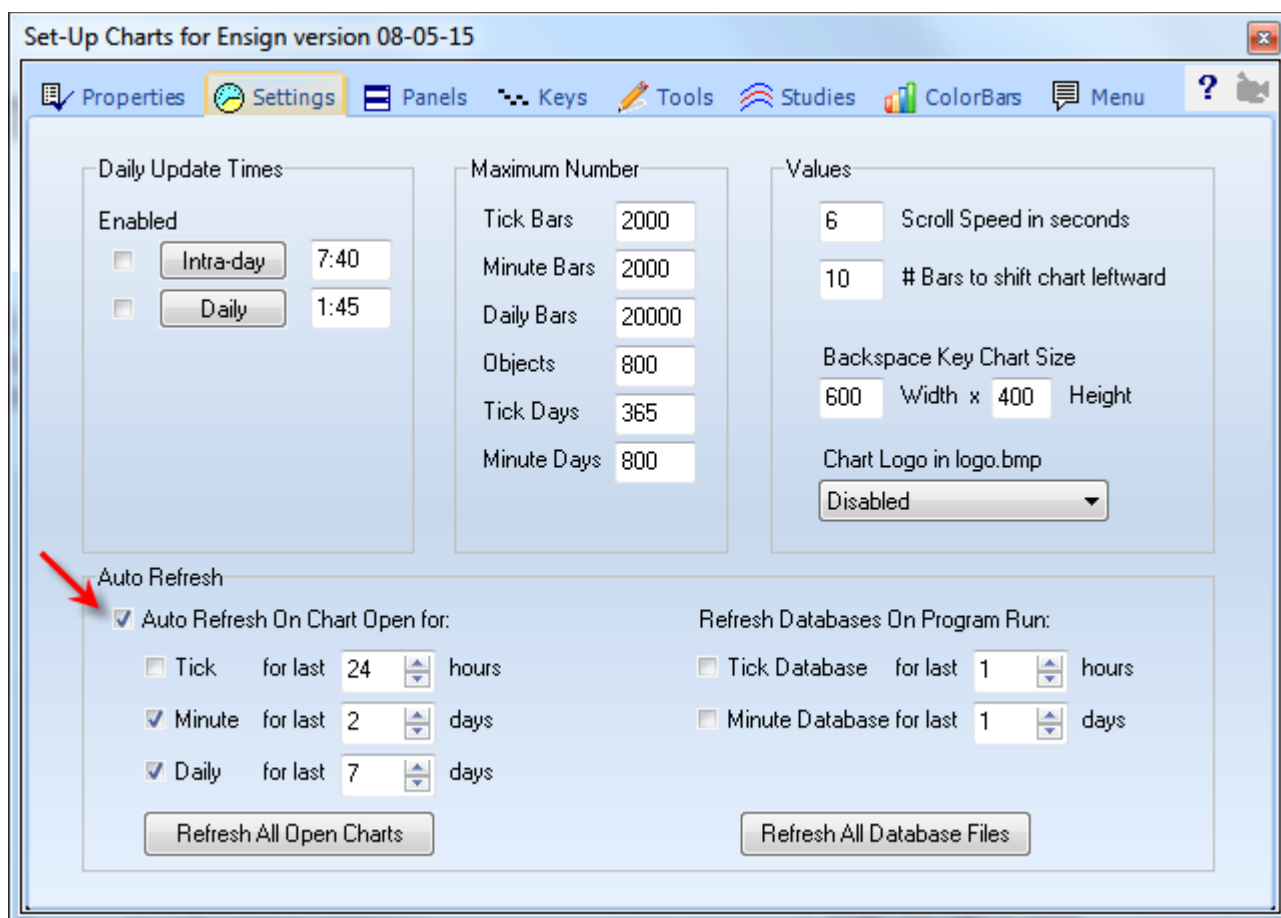
## Auto Refresh Options

Because Ensign can be configured to automatically refresh, you can give less thought to the chart content. One of the things implemented to that end was to have Ensign do refreshing before you need the chart. Ensign does it in advance in anticipation of your wanting it.

On the Setup | Charts property form are 2 check boxes to enable an automatic refresh feature that starts a couple minutes after the program runs. Ensign will go through the symbols on the Setup | Feeds symbol lists and determine how much data is needed to bring the databases current, and make refresh requests automatically.

Say a user with an eSignal connection is on-line until 9 pm at night, and then exits Ensign and turns it back on at 7 am the next day. Ensign's databases know they have data through 9 pm, so upon connecting if the auto refresh options are enabled, the program will start going through the symbol list for eSignal and request minute data from 9 pm through 7 am, and then when that process is finished, it will request tick data for the same time period.

The minute data base is refreshed first because that completes most quickly. You might start to open some charts, and they may or may not be refreshed, yet, but an unrefreshed chart is detected, and its refresh request is then moved to the top of the queue. Eventually all pending requests on the queue are serviced, and hopefully you never see a single refresh request the rest of the day because the databases are current already.



## Refresh on Chart Open

You may wish to have the auto refresh on program run turned off, and enable the options to refresh a chart when it is opened. Ensign can we see a database file might be missing data, and go do a refresh and show the data when it is received. Either auto refresh method works well.

## Interactive Brokers Refresh

Now the auto refresh is a good intention, but unfortunately it is tainted by which data vendor you use. And the taint is for the IB users, whose refresh from IB is plagued by 3 issues.

1. Any refresh request from IB is really slow to get a reply.
2. IB has a cap of 2000 records returned on any reply, so we have to break up a refresh for a given period into multiple requests. All that takes longer to get the total reply.
3. IB imposes a pacing restriction of 60- requests in a 10-min period. Since a period refresh might have been broken into multiple requests, the 60- limit gets used up pretty fast. Therefore, the auto refresh options for program run should be unchecked for IB users. Otherwise the refresh resource can be bottlenecked for a couple hours waiting for the 10 min limit period to expire.

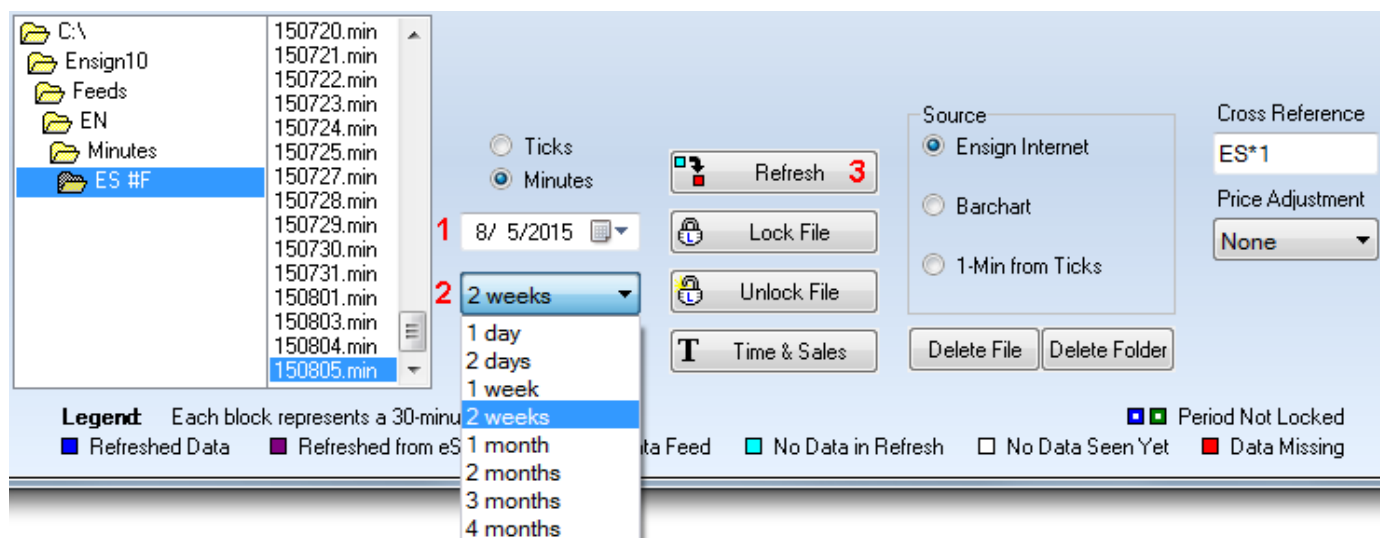
Barchart does not have any such limits. So if you can, IB users should do their refreshing from the Barchart source.

If the feature is enabled to Refresh on program run, you should have an updated database within a couple minutes of running Ensign and thus not see another refresh request all day long.

## Manual Refresh

If data is missing, a refresh can be manually requested, using 3 different methods.

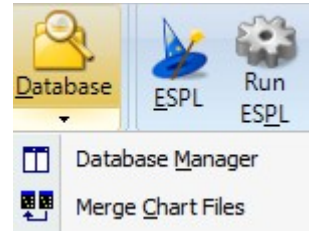
1. From a chart, use the Refresh pop-up menu and select a quantity in the side menu.
2. From the Setup | Charts form, enter the number of hours to refresh and click the Refresh All Database Files button. This will refresh all tick database files if the Refresh Tick Database on program run check box is checked. This will refresh all minute database files if the Refresh Minute Database on program run check box is checked. If both check boxes are unchecked, Ensign will assume both databases are to be refreshed. The refresh requests are queued, and you can see the refresh progress on the caption of the main Ribbon bar.
3. Use the Database Manager form. Select the date to refresh, the quantity, and click the Refresh button.



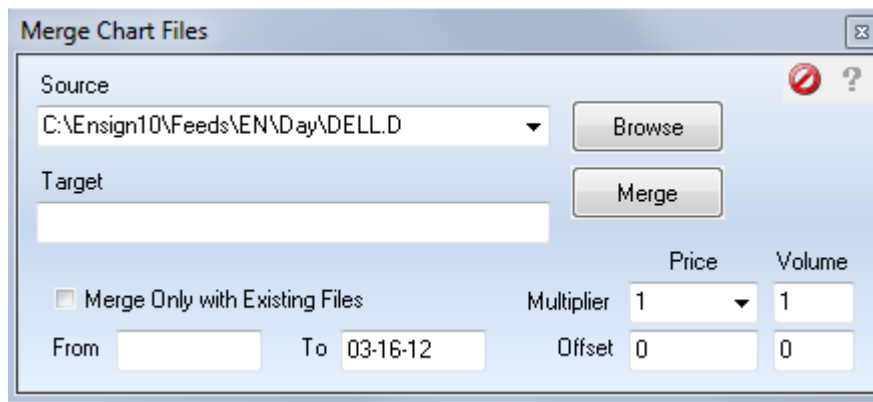
If you select Barchart as the source, you can refresh 3 years of 1-min files in a single request. The refresh of 12 months of 1-min files takes less than 2 minutes, and would only be needed to be done once for a symbol. This gives you lots of back data for all the intra-day charts, and from then on you are just keeping the database updated each day via the live feed or an occasional short term refresh.

## Merge Chart Files

Select **Merge Chart Files** to view the Merge Chart Files window. Merging chart files is used to correct bad data, add more data to an existing file, and to multiply or offset prices or volume. Merging can also be used to merge daily charts into a weekly or monthly chart. Weekly charts can be merged into a Monthly chart. Intra-day charts can be merged into other Intra-day charts. Merging chart data is often more preferable than copying chart files, because gaps are not introduced into the chart data.



The merge feature is used to merge a chart file into another chart file. Merging is used to create continuation charts from Futures data. Merging is used to create new chart files from existing chart files. New time frames can be created from lower time frames. For example, a 60-minute chart file can be created from a 5-minute chart file. Merging can also be used to adjust chart data for stock splits, or price adjustments. Price adjustments or splits are accomplished by multiplying, adding, or subtracting the chart data between a start and end date. If necessary, the Volume values for a chart can be multiplied separately.



**Source** - Specifies the location of the source data file to merge.

**Target** - Specifies the chart file that will receive the merge data from the source file. Enter the same symbol as the 'Source' file if adjusting prices for a stock split or price adjustment. The file will merge into itself while adjusting the price data.

**Browse Button** - Browses for the 'Source' file or files to merge.

**Merge Button** - Starts the merge process.

**Merge only with Existing Files** - Select this box to merge data into existing files only. Any files on a data disk that do not already exist on the computer will not be merged. This is used to update existing chart files and not install new chart files that are not being followed. Leave the box blank to merge all chart files from the 'Source'.

**From Date** - Optionally enter a starting date to specify the starting point for merging from the 'Source' file.

**To Date** - Optionally enter an ending date to specify the ending point for merging from the 'Source' file. The 'From' and 'To' entries are used to merge specific portions of the 'Source' file into the 'Target' file.

**Price Multiplier** - Specifies a value that will be multiplied to each data point during the merge process. This entry is normally used for stock splits. Entering a value of 10 will multiply all chart prices by 10.

**Price Offset** - Used to add or subtract a number to each bar price. Entering 200 would add 200 to all chart prices.

**Volume Multiplier** - Specifies a value that will be multiplied to each Volume value during the merge process.

**Volume Offset** - Used to add or subtract a number to each Volume value.

## Creating Weekly and Monthly Charts from Daily Charts

The merge file feature can be used to create a weekly chart or monthly chart from daily data. Enter a daily chart file name in the 'Source' box (example: IBM.D) , and the corresponding weekly chart name in the 'Target' box (example: IBM.W). The daily data will be merged into weekly bars. Enter IBM.M in the 'Target' box to create a monthly chart from the daily data.

## Delete 1 Date

Click the Main ribbon tab, then select Database | Delete 1 Date from the menu to delete a specific date from all daily chart files. Enter the date to delete in the displayed entry window and then click OK. This feature will delete the indicated date from daily charts only. Intra-day, weekly, and monthly charts will not be affected. This feature is most often used to delete a bar from all daily charts after accidentally running the daily update process on a Saturday, Sunday, or on a Holiday. The date specified will be deleted from all daily charts. If the specified date is found in the Holiday list, then dates will only be deleted from Holiday symbols.

## Import ASCII Data

Click the Main ribbon tab, then select Database | Import ASCII Data from the menu to view the Import ASCII Data screen. This screen is used to convert an ASCII data file to an Ensign chart file.

Symbol	Date	Time	Open	High	Low	Close	Volume	Tick
+ EUR/USD.T	20130401	0 0 0	1.278340	0	000738080	0		
+ EUR/USD.T	20130401	0 0 0	1.278330	0	000746657	0		
+ EUR/USD.T	20130401	0 0 0	1.278340	0	000747360	0		
+ EUR/USD.T	20130401	0 0 0	1.278350	0	000801797	0		
+ EUR/USD.T	20130401	0 0 0	1.278360	0	000803500	0		
+ EUR/USD.T	20130401	0 0 0	1.278350	0	000811750	0		
+ EUR/USD.T	20130401	0 0 0	1.278360	0	000817610	0		

Importing ASCII Data is a two step process, 1) Converting the data to a standard merge format, and 2) Merging the data into the Ensign Windows chart files. Several entry boxes are used to specify the source and target files, as well as other merge filters and formats. Daily chart data can be imported directly into weekly and monthly chart files if desired.

**Import control File** – This drop-down box can be used to populate the form with a saved set of parameters.

Select an entry from the drop-down list that best matches the ASCII data that you are going to import. Or type in the edit box a new name to be used to save this configuration under.

**Source** - Specifies the location of the source data file to merge. The source file must be an ASCII text file. The file can include chart data for a single symbol, or for multiple symbols. Enter the path and file name of the 'Source' file. After entering the file name in the 'Source' box, the file will be loaded and displayed in the import window. Click the **Browse** button to browse for the ASCII file on your hard disk.

**Target** - Specifies the Ensign Windows chart file that will receive the merge data from the 'Source' file. Leave the 'Target' box blank if merging an ASCII file that contains multiple symbols. The software will automatically determine the target location during the merge process. If the 'Target' box is blank, and the ASCII file does not contain the symbol, then the software will try to obtain a symbol from the Source file name. Intra-day files will import and save to the \ENSIGN10\MINUTE2 folder by default.

**Convert Button** - Converts the ASCII file data into a standardized format for merging. The standardized format is: Symbol, Date, Open, High, Low, Close, Volume, Open-interest (or Time). Clicking the **Convert** button will scan the ASCII file and validate all the ASCII lines in the file that can be merged. Validated lines will have a '+' plus sign added to the front of the line. Lines that will be skipped during the merge process will have a '-' minus sign added to the front of the line. After clicking the **Convert** button, the button will change to a **Merge** button. Click the **Merge** button to begin the merge process.

**Merge Button** - Starts the merge process. All ASCII lines that were validated during the convert process will be merged to the 'Target' chart file.

**Merge Only with Existing Files** - Select this box to merge data into existing files only. Any chart files that do not already exist will not be created and merged. This allows existing chart files to be updated by the merge data, and will not create new chart files for symbols that are not being followed. Uncheck the box to merge all chart files from the 'Source'.

**Voice** - When checked, a computerized voice will announce when the conversion is finished.

**Build Tick/Minute Database Files** - Check this box when tick or minute records are being imported to build database files. Uncheck the box to have the imported data build the Target chart file. The example shows data being imported to build tick database files for the EUR/USD symbol. The symbol is associated with a data vendor on the Setup | Feeds form. Thus, the program knows this import is to build files for the FXCM feed, and use the FXCM folders, by having 'EUR/USD' as a symbol on the watch list for the FXCM data feed.

Note: The following web site has tick data for Forex currency pairs for many years back. It is a great resource.

<http://www.histdata.com/download-free-forex-data/?/ascii/tick-data-quotes>

Download a zip file for a month and unzip the contents into the C:\Ensign10\Ascii folder. The Format characters are DTC V. There is a space character between the C and the V. The Date format is YMD as shown in the example.

**From Date** - Optionally enter a starting date to specify the starting point for merging from the 'Source' file. The date format should be mm-dd-yy.

**To Date** - Optionally enter an ending date to specify the ending point for merging from the 'Source' file. The 'From' and 'To' entries are used to merge specific date ranges of the 'Source' file into the 'Target' file. The date range is checked in the 'Merge' process, not in the 'Convert' process. The date format should be mm-dd-yy.

**Format** - The 'Format' combo box identifies the format of the ASCII data file. Alphabet letters are used to identify the data fields that are present in a line of data (ex. SDOHLCV). The following data fields are supported: S - Symbol, D - Date, T - Time, O - Open, H - High, L - Low, C - Close, V - Volume, I - Open-Interest. You can manually type in your own format if necessary. Place a ' - ' dash character in the format field if a particular import column should be ignored. Example: SD-OHLCV will ignore the 3rd column of ASCII data.

The following predefined 'Formats' are supported. Select these formats from the 'Import Control File' drop-down box when the ASCII data is copied and pasted from the following Internet web pages. The sites post daily

data for stocks or commodities after the markets close.

<http://biz.swcp.com/stocks> {SP500 stocks for 1 year}

<http://www.barchart.com/cme/cmedta.htm> {CME exchange for 18 months}

Some of the web sites require that a month, year and day be entered. If the ASCII data records are visible in your internet browser, then select Edit | Select All, then Edit | Copy from the browser menu to 'Copy' the ASCII data directly to the Windows clipboard. The clipboard data can then be pasted directly to the import window by clicking the Paste button.

**Symbol** - 'Default' is usually selected. Select 'CME/CBOT Data' to extract symbols correctly from data obtained from the CME web site. The 'Stocks' entry is used to substitute 'p' in place of the '\*' asterisk character found in some preferred stock symbols.

**Date** - Specify the order of the month, day, and year in the ASCII data (ex. MDY ).

**Price** - 'Default' is usually selected. Occasionally the ASCII prices need to be adjusted by multiplying or dividing by a constant. Use the drop down box to make a multiplier selection. For Futures ASCII data files that have mixed decimal formats, select 'Use Scale'. In this case, a scale factor will be determined for each Futures symbol. The 'x100 > 32nds' entry will import ASCII data that is already in 32nds but has a decimal in the price. It will multiply the data by 100 and then treat it as 32nds. Example: 101.16 becomes 10116.

**Volume** - 'Default' is usually selected. If the Volume and Open Interest values in the ASCII data contain commas, then select the 'Contain Commas' entry from the drop down list. If the Volume is provided in two adjacent fields such as 'Up Tick Volume' and 'Down Tick Volume', then select the 'Sum 2 Parts' entry from the drop down list. Occasionally the volumes need to be adjusted by multiplying or dividing by a constant. If necessary, select a multiplier from the drop down list.

The Volume and Open Interest from the 'CME/CBOT Data' is Total Volume and Total Open Interest, instead of individual contract volume and open interest. If the Volume and Open Interest from the 'CME/CBOT Data' set is desired, then select 'CME/CBOT Data' from the drop down list (otherwise it will be skipped).

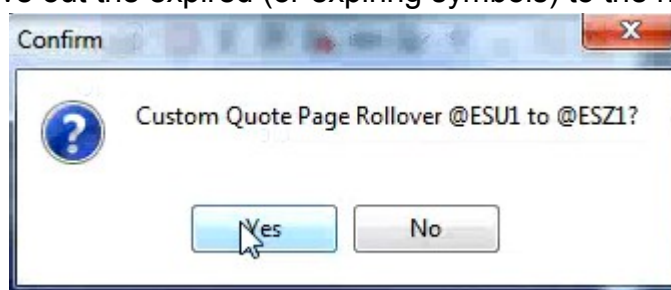
If the Open, High, or Low prices have a zero value, then they will be merged with the Close value. If the Volume and Open Interest values are zero, then the values will be retained for existing bars, or they will be zero. If the Symbol does not have a time extension (ex. IBM.D for daily ), then the merge will assume a Daily file merge. The Default Time Frame can be changed by making an entry in the 'Default Time Frame' box. Select the Time Zone that the import will post the time as in the imported data.

## Importing to Weekly and Monthly Charts

The import file feature can be used to create a weekly chart or monthly chart from daily data. Enter the daily chart import file name in the 'Source' box (example: IBM.TXT) , and the corresponding weekly chart name in the 'Target' box (example: IBM.W). The daily ASCII data will be merged into weekly bars. Enter IBM.M in the 'Target' box to create a monthly chart from the imported daily data. Weekly data can also be imported into a monthly chart.

## Rollover Symbols

Click the Main ribbon tab, then select Database | Rollover Symbols from the menu to run the rollover symbols feature. Futures markets expire on a regular basis. This feature is helpful in maintaining current symbols as the futures markets expire. When activated, this feature will scan through all of your symbol market lists and move out the expired (or expiring symbols) to the next contract month. You can



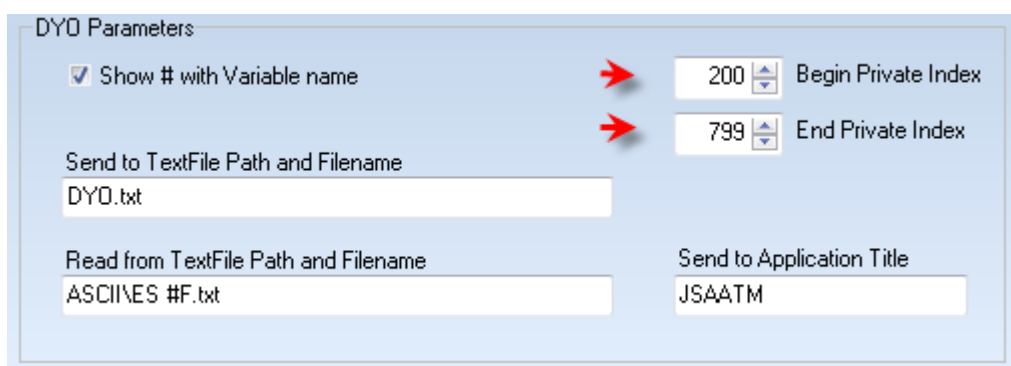


also run this feature while a custom quote page is open, and it will rollover any expiring symbols on the quote page. The software will prompt you to approve each rollover. You can also run this feature after displaying several charts (perhaps in a Layout), and it will rollover all the charts that have expiring symbols.

## Reset Variables

Click the Main ribbon tab, then select Database | Reset Variables from the menu to reset variables used by DYO and ESPL studies. This is a quick way to reset all 1,000 variables to a value of 99999999. In addition, an open chart that has focus will reset its private variables. This feature is useful for a developer of DYO and/or ESPL studies who wants to make sure that all the variables have been initialized and do not contain a prior value.

The boundaries for the private variables are set on the Setup | System | ESPL & DYO form.



The image shows a screenshot of a software interface titled "DYO Parameters". The interface is light blue and contains several input fields and checkboxes. At the top left, there is a checked checkbox labeled "Show # with Variable name". To its right are two red arrows pointing towards two spinners. The first spinner is set to "200" and is labeled "Begin Private Index". The second spinner is set to "799" and is labeled "End Private Index". Below these, there are two text input fields. The first is labeled "Send to TextFile Path and Filename" and contains the text "DYO.txt". The second is labeled "Read from TextFile Path and Filename" and contains the text "ASCII\ES #F.txt". To the right of these two fields is another text input field labeled "Send to Application Title" which contains the text "JSAATM".