

WAVEWIN FILE MANAGER & ANALYSIS

REFERENCE GUIDE

SOFTSTUF INC.

SOFTSTUF, INC.

SOFTWARE STRUCTURE FOR UNLIMITED FUNCTIONALITY

P.O. Box 40245

PHILADELPHIA, PA 19106-0245

1-800-818-3463 · 215-922-6880

www.softstuf.com

www.wavewin.net

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Preface

This document lists all the fields and features available in the Wavewin software. The fields and features are listed in alphabetical order.

This document is intended for use by individuals working in protection, engineering, and system operations.

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C H A P T E R 1


Fields & Features

This chapter describes all of the fields and features available in the software. They are listed alphabetically for your convenience.

ACTIVE TOPIC - HELP

Location: All child windows

Description: Display the active window's Help file.

Activation: *Direct:* F1
Menu: Alt-(H) Help, (T) Active Topic...
Ribbon, Button Bar: 

ADJUST FILES DATE & TIME


Location: Analysis

Description: The Adjust Files Time allows for adjusting the date and time of the open file. To open the Adjust File Time dialog select the Adjust Files Time option under the Data tab. You can specify to add or subtract a given date and/or time increment from the files current date and time. Enter the desired time increment for the year, month, day, hour, minutes, seconds and milliseconds. If there is no adjustment needed on a specific field enter 0.

Activation: *Menu:* Alt-(D) Data, (J) Adjust Files Time...



Ribbon, Data Tab: 

Comments: To always have the file's date/time automatically adjusted when that specific driver is used to open a file check the Adjust Open Time check box. To show the file's original date and time click on the Restore Original button  Original under the Data tab.

See Also: [D&T](#)
[Start Date Field](#)
[Start Time Field](#)

ALIGN CHANNEL DATA

Location: Analysis

Description: The Align Channel Data option allows for aligning the channel data using the Thiran 3rd Order All-Pass Fractional filter. To open the Align Channel Data dialog select the Align option under the Channel tab. Enter the phase shift for each analog channel. If the filter does not apply to a specific analog channel, enter 0 or leave the field blank. Click the Run Thiran Filter to apply the filter.

Activation: *Menu:* Alt-(C) Channels, (T) Align Channel Data...

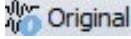
Ribbon, Channel Tab: 

Fields:

| | |
|----------------------|---|
| <i>Phase Shift:</i> | The phase shift angle for each analog channel. |
| <i>A0:</i> | The Thiran A0 coefficient for each analog channel. |
| <i>A1:</i> | The Thiran A1 coefficient for each analog channel. |
| <i>A2:</i> | The Thiran A2 coefficient for each analog channel. |
| <i>A3:</i> | The Thiran A3 coefficient for each analog channel. |
| <i>Always Apply:</i> | Always apply the filter when opening files for the active driver. |
| <i>Coefficients:</i> | Calculate coefficients at run or use the entered coefficients. |

Options:

| | |
|--------------------------------|--|
| <i>Calculate Coefficients:</i> | Calculate the Thiran coefficients for each analog channel. |
| <i>Run Thiran Filter:</i> | Run the Thiran filter. |
| <i>Esc/Cancel:</i> | Exit the dialog without executing the command. |

Comments: To always have the filter automatically applied when that specific driver is used to open a file check the Always Apply check box. To show the file's original values click on the Restore Original option under the Data tab .

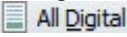
See Also: [Software Analog Channels](#)

ALL DIGITAL CHANNELS

Location: Analysis

Description: View all the digital channels in the file.

Activation:

| | |
|------------------------------|---|
| <i>Direct:</i> | F9 |
| <i>Menu:</i> | Alt-(V) View, (D) All Digital Channels |
| <i>Ribbon, Waveform Tab:</i> |  |

Comments: When a waveform file is displayed only the triggered digital channels are displayed. The All-Digital Channels option toggles between showing all the digital channels and showing just the triggered channels. When the button is highlighted, all digital channels are displayed, and when it is not highlighted just the triggered digital channels are displayed.

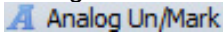
See Also: [Show All Digital Channels](#)
[Show Channel Information](#)
[Sort Digital Channels](#)

ANALOG MARK/UNMARK ALL

Location: Analysis

Description: Mark all analog channels if there are no analog channels marked otherwise unmark all the marked channels.

Activation:

| | |
|----------------------------------|---|
| <i>Menu:</i> | Alt-(C) Channels, (N) Analog Mark/Unmark All |
| <i>Ribbon Menu, Channel Tab:</i> |  |

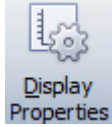
Comments: The channel's ID and titles are displayed in light red when marked. Press F8 to mark or unmark all the analog and digital channels.

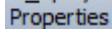
ANALOG TABLE FONT SIZE

Location: File Manager

Description: Change the size of the font for the text displayed in the Analog Table.

Activation: *Menu:* Alt-(O) Options, (D) Display Dialog...



Ribbon, Options Tab:  , Data Plotting Tab

Fields: *Analog Table Font Size:* Change the size of the font in the Analysis Window's analog table.



Comments: Select the size of the font from the fields drop down list. The options are 8, 9, 10, 11, 12, 14 and 16.

See Also: [Analog Table View](#)

ANALOG TABLE VIEW

Location: Analysis

Description: Displays the channel titles, scale, units, and associated data values.

Comments: Use the  button or the shift-right/left arrow keys to scroll the columns in the table. This button is located to the right of the analog table headers. To show / hide the Analog table click on the Analog Table option under the Waveform tab,  [Analog Table](#).

See Also: [Show Hide Channels](#)
[Data Bar](#)
[Reference Bar](#)
[Combined View](#)

APPEND CSV FILES

Location: File Manager

Description: Combine a number of CSV files of the same type (must have the same number of columns) into one file. Mark the files first using the spacebar or mouse then select the Append CSV files... menu option.

Activation: *Menu:* Alt-(O) Options, (R) Reports, (A) Append CSV Files...

Fields: *File Path:* Select or enter the path for the appended file.
File Name: Enter the filename for the appended file.
No Open (Save Only): Save the appended file only, do not open.
Open in a Table: After appending the files open the final file in a table.

Comments: The files must be of the same type (same number of columns). The final file can be displayed in the data plotting window. Double click on the file to view in the data plotting window. If it cannot be plotted, then it will be displayed in Excel.

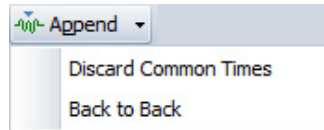
See Also: [Append Waveform Files](#)
[Append Open Files](#)

APPEND OPEN FILES

Location: Analysis

Description: Combine a number of open files of the same type (the analog/digital channel titles must match) in time. All of the currently open waveform files will be appended into a new analysis window.

Activation: *Menu:* Alt-(F) Files, (F) Append Open Files, (D) Discarding Common times
Menu: Alt-(F) Files, (F) Append Open Files, (B) Back-to-Back



Ribbon, Waveform Tab:

Comments: The files must be of the same type (the analog/digital channel titles must match). The results in the new analysis window can be saved in a Comtrade file for archiving. If the files have matching times, then select the Discard Common Times option otherwise select the Back-to-Back option.

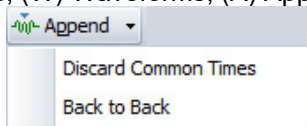
See Also: [Append Waveform Files](#)

APPEND WAVEFORM FILES

Location: File Manager

Description: Combine a number of waveform files of the same type (the analog/digital channel titles must match) in time into a new analysis window.

Activation: *Menu:* Alt-(O) Options, (W) Waveforms, (A) Append, (D) Discarding Common Times
Menu: Alt-(O) Options, (W) Waveforms, (A) Append, (B) Back-to-Back



Ribbon, Options Tab:

Comments: The files must be of the same type (the analog/digital channel titles must match). The results in the data analysis window can be saved in a Comtrade file for archiving. If the files have matching times, then select the Discard Common Times option otherwise select the Back-to-Back option. To append file in the file manager first mark the files. To mark files, use the spacebar or mouse. Marked files are displayed in red.

See Also: [Append Open Files](#)

ASCENDING SORT

Location: All Tables

Description: Sort the columns in ascending order with respect to the selected sort field.

Activation: *Menu:* Alt-(S) Sort, (A) Ascending
Ribbon, Click on the Header of each column.


Comments: To sort the columns, press the column header button. The header button toggles between ascending and descending order.

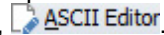
See Also: [Descending Sort](#)
[Set Sort Field](#)

ASCII DRIVER

Location: File Manager

Description: Display the file at the cursor position in the ASCII text editor.

Activation: *Menu:* Alt-(D) Drivers, (A) ASCII...
Ribbon, Drivers Tab: 

Comments: When using the ASCII Driver to open a file, that files Driver will be changed to the ASCII driver under the Driver column in the table. You will lose the current driver associated with the file. To keep the current driver for the selected file, use the ASCII editor under the Options Tab, .

See Also: [ASCII Editor](#)

ASCII EDITOR

Location: File Manager

Description: Edit the ASCII file at the cursor position.

Activation: *Direct:* F2
Menu: Alt-(O), Options, (A) ASCII Display...

Ribbon, Options Tab: 

Comments: The file contents are displayed in text editor. Use the up arrow, down arrow, left arrow, right arrow, page up, page down, home, end, Ctrl-home and Ctrl-end keys or the scroll bar to navigate through the data and the ribbon options to cut, copy, or paste text. A maximum of ten ASCII Editors may be opened simultaneously.

See Also: [ASCII Driver](#)

AS STATUS FIELD

Location: Analysis (Status Bar)

Description: Displays the current state of the Auto Scale mode (ON, OFF, ++ or Units).

Comments: To toggle through the Auto Scaling options (ON, OFF, ++ or Units), press F6 or select the Auto Scale option from the Options tab. When auto scale is set to ON, the channel data is scaled to the maximum value allocated for display from the zero-reference line. When auto scaling is set to the ++ state the signals are plotted using the maximum space allocated for

display, ignoring the zero-reference line. The highest value is plotted at the maximum position and the smallest value is plotted at the lowest position. This feature shows the full profile of frequency, Vdc and load channels. In OFF mode all channels are scaled according to maximum and minimum values in all of the analog channels. In Units mode all channels are scaled according to the maximum and minimum values for each group of channels with the same units.

See Also: [Auto Scaling](#)
[Increase Amplitude](#)
[Decrease Amplitude](#)
[Trace Scale Multiplier](#)

ASSOCIATING FILE TYPES

Location: File Manager (**Full Version & Universal Viewer**)

Description: The File Manager automatically associates file types according to the file naming structure. The associated driver is displayed in the driver column. When the <enter> key is pressed, or the default mouse button is double clicked the software inspects the filename at the cursor and executes the associated driver.

File Types:

| | |
|--|---|
| <i>Directories:</i> | Directories are tagged according to the parameters read from the file allocation table. . |
| <i>Applications:</i> | Files with the extension “.BAT”, “.COM”, or “.EXE” are tagged as application files.. |
| <i>Hathaway DFR I,II, IIB, & 2000:</i> | Files that match the Hathaway Base32 file naming scheme or are long files with the DFR extension are tagged as DFR I,II, IIB, & 2000 files. . |
| <i>Hathaway Replay Plus:</i> | Files with the “.DAT” extension with no “.CFG” associated with it are tagged as Hathaway Replay Plus Files. |
| <i>EMAX Faxtrax II / Director:</i> | Filenames with the extensions “.RCD”, “.RCL”, “.RCU”, and there is a corresponding “.CTL” file, are tagged as Faxtrax II / Director files. The Emax Faxtrax II / Director (12-bit/16bit) format is supported. |
| <i>Emax Long Term:</i> | Files with the “.DAT” extension with an associated “.SET” file are tagged as Emax Long Term Files. |
| <i>Mehta Transcan:</i> | Files that have an extension starting with “X” and a corresponding “.SCF” file exists are tagged as Mehta Transcan files. |
| <i>Rochester TR16**:</i> | Files that have the same name and an extension with a number and there is a corresponding .PRE file in the same directory are tagged as Rochester files. |
| <i>ERLPhase Tesla:</i> | Files with the extension “.TLR” are tagged as ERLPhase Tesla files. |
| <i>ERLPhase Relay Files:</i> | Files with the “.BPR, .TPR, .LPR, FPR” extensions are tagged as ERLPhase Relay Files. |
| <i>Comtrade – Multiple Files:</i> | Files with the extension “.DAT” that have a corresponding “.CFG” file are tagged as COMTRADE files. |
| <i>Comtrade – Single File:</i> | Files with the extension “.CFF” are tagged as COMTRADE files. |
| <i>SEL:</i> | Files with the extensions “.SEL”, “.CEV” or “.EVE” are tagged as SEL files.. |

| | |
|---|--|
| <i>SEL LDP:</i> | Files with the extension “.BSV” are marked as SEL Load Profile Data files.. |
| <i>DLP:</i> | Files with the extension “.OSC” are tagged as DLP relays. GE DLP1 and DLP3 formats are supported. |
| <i>REL300/301/302:</i> | Files with the extension “.REL” are tagged as ABB-MDAR files. |
| <i>TPU/DPU/GPU:</i> | Files with the extension “.CAP” are tagged as ABB-TPU/DPU/GPU files. |
| <i>ABB Load Profile:</i> | Files with the “.DLA” extension are tagged as ABB Load Profile-Wye files. |
| <i>GE SR Relay Files:</i> | Files with the “.CSV” extension are tagged as GE SR Relay Files. |
| <i>SDC Log File:</i> | Files with the “.CSV” extension are tagged as SDC Log Files. |
| <i>TIS File:</i> | Files with the “.TIS” extension are tagged as TIS (Trip Information System) Files. |
| <i>Ametek Files:</i> | Files with the “.AMT” extension are tagged as Ametek TR-100+, DL-8000, TR-2000 & P&QR128 Files. |
| <i>S&C IntelliRupter fault interrupter:</i> | Files with the extension “.WFC” are tagged as S&C IntelliRupter fault interrupter Waveform Files. |
| <i>Nicolet Power Pro WFT:</i> | Files with the extension “.WFT” are tagged as Nicolet Power Pro WFT Files. |
| <i>Nicolet PNRF:</i> | Files with the extension “.PNRF” are tagged as Nicolet PNRF Files. |
| <i>S&C PXI:</i> | Files with the extension “.TSV” are tagged as S&C PXI Waveform Files. |
| <i>S&C Extended Waveform:</i> | Files with the extension “.EWC” are tagged as S&C IntelliRupter fault interrupter Extended Waveform Files. |
| <i>S&C Meter:</i> | Files with the extension “.PRO” are tagged as S&C IntelliRupter fault interrupter Meter Files. |
| <i>Audio Wave:</i> | Files with the extension “.WAV” are tagged as Microsoft’s Wave Files. |
| <i>Application Files:</i> | Word Documents (“.Doc” & “.RTF”), Excel Documents (“.XL”, “.XLS”, “.XLT”, “.XLM”, “.XLA”, “.XLC” & “.XLW”), Web pages (“.HTM”, “.HTML”, “.MSPX” & “.ASP”), Access Files (“.MDB” & “.ADP”), Power Point Presentation files (“.PPT” & “.PPS”), Image files (“.GIF”, “.TIF”, “.JPG”, “.JPE”, “.BMP”, “.PSD” & “.PDD”), Zip files (“.ZIP”), and PDF files (“.PDF”) are automatically associated with their source application. |
| <i>ASCII:</i> | All other files are tagged as ASCII files. |

Comments: To change the driver type, place the cursor on the filename and select the driver from the Drivers tab. Once a driver is assigned the file contents appear in the corresponding display window. If the driver encounters an error while reading a file an Invalid Driver Message is displayed indicating the line number in which the error was encountered. Use the ASCII or Hexadecimal editors to locate and correct the error. The ASCII and hexadecimal editors display the cursor’s line and character number in the lower left corner of the window.

See Also: [Auto Detect](#)

ATFILE

Location: File Manager (Status Field)**Description:** Displays the row number of the selected file in the table.**See Also:** [TotFiles](#)
[TotMarks](#)**AUDIO WAVE DRIVER**

Location: File Manager**Description:** Changes the driver at the cursor position to the Window's Audio Wave driver (*.WAV) and plots the input channels.**Activation:** *Menu:* Alt-(D) Drivers, (W) Audio Wave File...
Ribbon, Driver Tab: **Audio****Comments:** All files that have a ".WAV" extension are tagged as Microsoft Audio Wave files.**AUTO CONVERT TO COMTRADE**

Location: File Manager**Description:** The auto convert to Comtrade dialog is used for defining the properties to automatically convert specific file types to the IEEE C37.111 Comtrade 1991, 1999 and 2103 format. The type of format to save is available in the Save As Type drop-down list. Auto Convert to Comtrade monitors the entered Source Path for the defined file extensions. When a file is detected, it first saves the converted Comtrade file to the defined Destination Path then archives the source file to the defined Archive Path. There is an Advanced button to define specific features for the Source path, Destination path and Archive path.**Activation:** *Menu:* Alt-(O) Options, (U) Auto Convert to Comtrade...*Ribbon, Options Tab:*

| | |
|----------------|---|
| Fields: | <i>Source Path:</i> The path to monitor for the specified file types. <i>Destination Path:</i> The path where the converted Comtrade files are saved. <i>Archive Path:</i> The path where the original files are archived. <i>File Extensions:</i> The file extensions to monitor and convert. <i>Scan Period:</i> The number of minutes the auto convert will run. <i>Save As Type:</i> A drop-down list with the available Comtrade types. <i>Save SEL Settings:</i> Check the box to save the SEL settings to the .HDR file. <i>Minimum # of Cycles:</i> The minimum number of cycles required before saving. <i>Millisecond Difference:</i> The maximum number of milliseconds between samples. |
|----------------|---|

| | |
|-----------------|---|
| Options: | <i>Start Convert:</i> Start the conversion process. <i>Advanced:</i> Display the Advanced setting dialog. <i>Automatically Start:</i> Automatically start the Convert to Comtrade when Wavewin is ran. <i>Close:</i> Close the dialog. |
|-----------------|---|

Comments: To open the Auto Convert to Comtrade dialog select the Auto Convert option under the Options tab in the File Manager. Enter the source path, destination path, archive path, file extensions and the scan period in minutes. Auto convert to Comtrade monitors the Source path for the defined file extensions every scan period.

To start the process, click on the Start Convert button. Once the conversion starts the button caption will change to End Convert. To end the conversion process, click on the End Convert button. If a file already exists in the destination path, then the file is overwritten. The status of each scan is displayed in the Status section of the dialog.

To have the auto convert to Comtrade process started when Wavewin is ran check the Automatically Start Convert to Comtrade at Run Time check box. The conversion process is performed in the background, so the dialog is not required to be open for the process to execute. To check the status of the conversion, open the dialog. The Next Scan In field reports how many minutes before the next scan is started.

The Advanced button displays the Auto Convert to Comtrade advanced settings:

- Source Path: Include Sub-Folders: When scanning files to convert to Comtrade include all paths under the Source path.
- Destination Path: Automatically Rename to the IEEE Long File Naming Format: After Converting the files to Comtrade rename the Comtrade files in the destination path to the IEEE long file naming format.
- Archive Path: Rename all Archive Files using the IEEE Long File Naming Format: After Archiving the original files rename them to the IEEE long file naming format.
- Archive Path: Append all like files in The Archive Path to a single file per year: When the auto convert to Comtrade is between scans append all files that have the same year, station and device name to one file per year. After each append delete the original appended files.

See Also: [Save as Comtrade](#)

AUTO PLAY WAVEFORM

Location: Analysis

Description: Play the waveform as an oscilloscope.

Activation: *Menu:* Alt-(D) Data, Play Waveform/Pause Waveform, Increase/Decrease Speed

Ribbon, Data Tab: 

Comments: The Play Waveform will auto play the displayed analog and digital channels, phasors and any other dialogs open such as the harmonic window, Sequence Components window and the Power Harmonic Calculator. The analog and digital channels will move to the left keeping the data cursor fixed at one cycle from the beginning of the display. In the Ribbon system the button to the left of the auto play button is used to slow the speed of the waveform movement and to the right is a button to increase the speed of the waveform. In the Menu System use the menu items increase/decrease to control the speed of the waveforms.

The Auto Play Waveform does extensive drawing to the screen. To minimize flicker and slow drawing select a maximum of 7 channels and expand the time scale to see a smooth transition when the analog channels are played. The drawing is done in the background. This allows for marking, deleting, expanding, contrasting, scaling channels and more while the Waveform is being played.

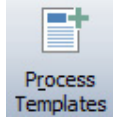
AUTO PROCESS TEMPLATES

Location: Analysis (**Full Version & Universal Viewer**)

Description: The Auto Process Templates dialog allows for automatically extracting key information out of waveform files located in the active file manager path and saving the extracted information to a comma separated ASCII file with a .DIG extension. The DIG file can then be imported into a database.

The template files contain script commands that will perform calculations on the voltage and current channels. For the calculations to work properly the analog channels must be in the right position. For this, line groups are created. The line groups ensure that the voltage channels (VA, VB, VC) are the first 3 channels displayed and the next 4 are the current channels (IA, IB, IC, IN). Line groups work for DFR and Relay files and are associated with Comtrade files. For more information on the line groups refer to the Auto Process Templates in the File Manager & Analysis Quick Start.

Activation: *Menu:* Alt-(O) Options, (P) Auto Process Templates



Ribbon, Options Tab:

Fields:

- Template 1:* The path and filename of the first template to process.
- Template 2:* The path and filename of the second template to process.
- Template 3:* The path and filename of the third template to process.
- Template 4:* The path and filename of the fourth template to process.
- Template 5:* The path and filename of the fifth template to process.
- Report Path:* The path where the final report is saved.
- Process Files:* The type of files to process. When a file is processed the system will add WWD to the end of the file to indicate the file has been processed. Select process New Files or All Files.
- Process only the marked File in the Active Path:* Process only the marked file in the file manager's active path.
- Include All Sub-Folders:* Process all files included in the sub-folders under the file manager's active path.

Options:

- Run:* Start the processing of the defined templates.
- Cancel:* Exit the dialog without executing the command.

Comments: Once the line groups are defined then template files can be built to extract key information from the files.

Available Template Commands:

Window Commands

| | |
|--------------|---|
| <Station> | Write the full Station name. |
| <Station:12> | Write the first 12 characters of the Station name. |
| <Device> | Write the full Device name. |
| <Device:6> | Write the first 6 characters of the Device name. |
| <Date:F> | Write the Date at the data bar in the following format mm/dd/yyyy. |
| <Time:F> | Write the Time at the data bar in the following format hh:mm:ss.zzzzzz. |
| <Date:U> | Write the Date at the data bar in the following format yyyyymmdd. |
| <Time:U> | Write the Time at the data bar in the following format hhmmsszzz. |
| <Cycles> | Write the number of Cycles between the data bar and the reference bar. |
| <DeltaX> | Write the time difference between the data bar and the reference bar. |

| | |
|--------------|--|
| <Line> | Write the active Line name. |
| <Data> | Write if the data being processed is BAD or GOOD. This is determined by the size of the binary file compared with the calculated size using the total samples * scan size. |
| <Remote> | Write the Remote Feeder Name as defined in the Line Group, REMOTENAME=. |
| <RDME> | Write the Remote Station Name as defined in the Line Group, REMOTEDME=. |
| <RDEV> | Write the Remote Device Name as defined in the Line Group, REMOTEDEVICE=. |
| <PHSROT> | Write the Phase Rotation as defined in the Line Group, PHASEROTATION=. |
| <SFreq> | Write the sampling frequency at the data bar or reference bar. |
| <LFreq> | Write the line frequency. |
| <LL> | Write the Line Length. |
| <Z1M> | Write the Z1 Magnitude. |
| <Z1P> | Write the Z1 Angle. |
| <Z0M> | Write the Z0 Magnitude. |
| <Z0P> | Write the Z0 Angle. |
| <Filename> | Write the Filename displayed in the data plotting window. |
| <Triggers> | Write the number of triggers for the script commands. |
| <Cktnum> | Write the Circuit Name as defined in the Line Group as CKTNUM=. |
| <Tobus> | Write the To Bus Name as defined in the Line Group as TOBUS=. |
| <Frombus> | Write the From Bus Name as defined in the Line Group as FROMBUS=. |
| <ReportFile> | Write the name of the generated PDF report file. If there was no report file generated it writes NONE. |

Analog Commands

| | |
|---------|--|
| <> | Write the analog data at the data bar, |
| [] | Write the analog data at the reference bar, |
| Number | Write the visible analog column data at the data bar separated by commas for specified Channel number. |
| ^Number | Write all the visible analog column data separated by commas for the Channel in number position. |
| :A | Write the average value for the whole channel. |
| :C | Write the RMS value for the last cycles in the file. |
| :R | Write the RMS value. |
| :T | Write the Channel Title. |
| :U | Write the Channel Unit. |
| :P | Write the Phase value. |
| :I | Write the Instantaneous value. |
| :F | Write the DFT magnitude for the specified Harmonic. For example, ^6:F0 writes the DFT Magnitude of the DC Offset for channel 6 and ^6:F2 writes the DFT Magnitude of the 2 nd Harmonic for channel 6. |
| :D | Write the Duration of the Fault. |
| :H | Write the value DC Offset divided by the fundamental. Indicates a pegged channel. |
| :X | Write the CT ratio. |
| :Y | Write the PT ratio. |
| :Z | Write the frequency. |
| :W | Write the megawatts. |
| :V | Write the megavars. |
| :% | Write the Percentage of Nominal from the Prefault bar to the Fault bar. |

| | |
|--------------------------------------|---|
| :%v | Measures voltage sag immunity. |
| :+ | Write the channels maximum value. |
| :- | Write the channels minimum value. |
| :Number | Specifies the width of the analog data values. Will only be applied if the defined width is greater than the length of the data values. Spaces are padded to the beginning of the written values. This is used to right justify values. |
| :S | The skew of the 3 analog channels using the angles. The S command is used with 3 analog channels <1,2,3:S>. This command adds the 3 angles at the cursor. One of the channels must be marked as a reference channel. |
| :B | The Unbalanced Value for 3 Channels. The B command is used with 3 analog channels <1,2,3:B>. This command finds the highest and lowest DFT magnitude of the 3 channels. The result is the highest – lowest. |
| :N | The Negative Sequence for 3 Channels. The N command is used with 3 analog channels <^1,^2,^3:N>. This command computes the negative sequence for the 3 current or voltage channels in position 1, 2 and 3 on the screen. The magnitude for the negative sequence result is displayed. |
| :Q | The Positive Sequence for 3 Channels. The Q command is used with 3 analog channels <^1,^2,^3:Q>. This command computes the positive sequence for the 3 current or voltage channels in position 1, 2 and 3 on the screen. The magnitude for the positive sequence result is displayed. |
| :M | The M command is used for an entire channel. It calculates the maximum value of the channel minus the minimum value of the channel divided by 2 ((max-min)/2), <^1:M>. Since the command is not sample based both types of brackets can be used (<>, []). |
| :SG100 :BL50 :NG5000 :ML700 | The letter G or L followed by a number after the :S, :B, :M or :N defines a trigger. The letter G stands for greater than and L is less than. If the result is true than Alarm is displayed else Normal is displayed. |

Example Analog Commands

| | |
|-----------------|--|
| <1> | Write the visible analog column data at the date bar separated by commas for Channel 1. |
| <^1> | Write the visible analog column data separated by commas for the Channel in position 1. |
| <1:R> | Write the RMS value at the data bar for Channel 1. |
| <2:T> | Write the Channel Title for Channel 2. |
| <^3:U> | Write the Channel Unit for the Channel in position 3. |
| <4:P> | Write the Phase value for channel 4. |
| <^5:I> | Write the Instantaneous value for the Channel in position 5. |
| <6:F5> | Write the DFT magnitude of the 5 th Harmonic for Channel 6. |
| [^1] | Write the visible analog column data at the reference bar separated by commas for Channel 1. |
| <^1:MG1000> | Write Alarm if the ((max-min) / 2) is greater than 1000 else it writes Normal. |
| <^1,^2,^3:S> | Write the sum of the angles at the data bar. One of the 3 channels must be marked as a reference channel. |
| [^1,^2,^3:B] | Write the difference between the highest and lowest DFT magnitude at the reference bar. |
| <^1,^2,^3:N> | Write the magnitude of the negative sequence at the data bar for the channels in position 1, 2 and 3. |
| <^1,^2,^3:NG50> | Write Alarm if the magnitude of the negative sequence is greater than 50 or it write Normal if the magnitude of the negative sequence is less than or equal to 50 for the channels in position 1, 2 and 3 at the data bar. |

Digital Commands

| | |
|------|--|
| B1:T | Write the Breaker 1 Digital Channel Trigger Information as defined in the Line Group as Breaker1=. The output text is the Digital Channel Title/Start Second:Milliseconds/Duration. If the Digital Channel started in Alarm state, then NA is defined as the start date. If the Digital Channel started in Alarm state or ended in Alarm state, then NA is written for the Duration. |
| B2:T | Write the Breaker 2 Digital Channel Trigger Information as defined in the Line Group as Breaker2=. The output text is the Digital Channel Title/Start Second:Milliseconds/Duration. If the Digital Channel started in Alarm state, then NA is defined as the start date. If the Digital Channel started in Alarm state or ended in Alarm state, then NA is written for the Duration. |
| E1:T | Write the Event 1 Digital Channel Trigger Information as defined in the Line Group as Event1=. The output text is the Digital Channel Title/Start Second:Milliseconds/Duration. If the Digital Channel started in Alarm state, then NA is defined as the start date. If the Digital Channel started in Alarm state or ended in Alarm state, then NA is written for the Duration. |
| B1:S | Write A (Alarm) or N (No Alarm) indicating if the Breaker 1 Trigger status in the File. |
| E3:D | Write the Event 3 Start Time |
| B1:E | Write the total number of times the digital channel toggled. |

When a caret ^ is specified before the channel number it indicates the channel position in the display.

The < > characters save the analog data at the data bar and the [] characters saves the analog data at the reference bar. To open the Auto Process Template dialog, select the Process Templates icon under the Options tab.

The dialog allows for 5 templates to be processed at one time. Enter or select the template files in the template fields. Enter or select the report path where the report files are saved. Select the type of files to process. The All-Files option will process all the files in the active path and the included sub folders if the option is specified. After a file is processed a WWD is added to the last field in the long filename. This tags the file as processed. To only process new files, select the New Files option.

If files are marked in the active path the Process Only Marked Files check box will be enabled. Click this option to process only the marked files. To include all the sub folders under the active path, click the Include Sub Folder check box.

To start the process, click the Run button. When the Run button is activated the fields in the dialog will be saved and the dialog will be closed. Each specified file will be opened in the analysis window, the Mark and Save window will be opened and each line group will be selected in the file. The template fields will be processed for each line group and saved to the appropriate report file. The report files are saved to the specified report path and each report file will have the same name as the template file with a .DIG extension.

To view the report files, navigate to the report path and double click on the .DIG files. The report will be displayed in a table. To plot the file with the specified line group, double click on the desired row.

Restrictions: The processed files must be a supported oscillography file.

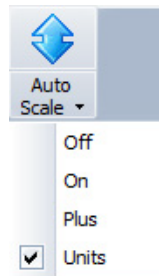
See Also: [Associating File Types](#)
[IEEE Long File Naming Format](#)
[Save As Comtrade](#)

AUTO SCALING

Location: Analysis

Description: Changes the state of amplitude auto scaling to On, Off, ++ or Units for all the visible analog channels.

Activation: *Direct:* F6 
Menu: Alt-(D) Data, (A) Auto Scale, (F) Off, (O) On, (P) Plus and (U) Units



Ribbon, Data Tab:

Comments: The AS field displayed in the status bar indicates the auto scale's current mode, ON, OFF, ++ or Units. When auto scale is set to ON, the channel data is scaled to the maximum value allocated for display from the zero-reference line. When auto scale is set to ++ mode the signals are plotted using the maximum and minimum values allocated for display, ignoring the zero-reference line. The highest value is plotted at the maximum position and the smallest value is plotted at the lowest position. This feature shows the full profile of frequency, Vdc and load channels. In OFF mode scale all channels according to maximum and minimum values in all of the analog channels. In Units mode all channels are scaled according to the maximum and minimum values for each group of channels with the same units.

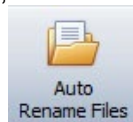
See Also: [Increase Amplitude](#)
[Decrease Amplitude](#)
[AS Status Field](#)
[Trace Scale Multiplier](#)

AUTO RENAME FILES

Location: File Manager

Description: The auto rename files feature will automatically rename waveform/load files to the IEEE ComNames format. This feature monitors a folder for waveform/load files with user defined extensions. When a file is detected in the source path or in its included sub-folders it will first move the original file to the Archive path then read the file's configuration information and rename the file to the destination path. To activate this feature, select the Auto Rename Files option under the Options menu/tab. A dialog will be displayed. Enter the Source Path, click the Include Sub Folders check box if needed. Enter the Destination and Archive Paths. Enter all file extensions (*.DAT,*.CEV,*.CFF) and the scan period.


Activation: *Menu:* Alt-(O) Options, Auto Rename Files...



Ribbon, Options Tab:

- Fields:**
- Source Path:* The path to monitor for the specified file types.
 - Include Sub Folders:* Include all sub folders under the source path.
 - Destination Path:* The path where the renamed files are saved.
 - Archive Path:* The path where the original files are archived.
 - File Extensions:* The file extensions to monitor and rename.
 - Scan Period:* The number of minutes the auto rename waits to run.
- Options:**
- Start Rename:* Start the rename process.
 - Auto Start Rename Run Time:* Automatically start the rename files when Wavewin is ran.
 - Close:* Close the dialog and save the fields.
 - Cancel:* Close the dialog without saving the fields.
- Comments:** To open the Auto Rename dialog select the Auto Rename option under the Options tab in the File Manager. To start the rename process, click on the Start Rename button. Once the conversion starts the button caption will change to End Rename. To end the rename process, click on the End Rename button. The status of each scan is displayed in the Status section of the dialog.
- To have the auto rename process start when Wavewin is ran check the Automatically Start Auto Rename at Run Time check box. The rename process is performed in the background, so the dialog is not required to be open for the process to execute. To check the status of the rename process open the dialog. The Next Scan In field reports how many minutes before the next scan is started.
- See Also:** [ComName\(s\) Rename](#)
[ComName Properties](#)
[IEEE Long File Naming Format](#)

AUTO SET DATA BAR

- Location:** Analysis
- Description:** Defines where the data bar is positioned when the file is first opened. The data bar is the solid black line. If the auto set data bar is turned on the data bar is positioned 2 cycles from the trigger position. If it is off the data bar is positioned one cycle from the first sample.
- Activation:** *Menu:* Alt-(V) View, (U) Auto Set Data Bar
Ribbon, Waveform Tab:  Set Data Bar
- Comments:** The auto set data bar is an on/off feature. The ribbon option is highlighted when on and the data bar is positioned 2 cycles from the trigger position. When off, the ribbon option is not highlighted, and the data bar is positioned one cycle from the first sample.
- See Also:** [Data Bar](#)

CALCULATED TRIGGER POSITION

- Location:** Analysis
- Description:** Display the systems calculated trigger bar and the calculated trigger position for each analog channel.
- Activation:** *Menu:* Alt-(F) File, (T) Window Properties, Display Settings Tab



Ribbon, Waveform Tab: **Properties**

Comments: The system calculates the fault inception when reading the samples values from the file. The fault inception is determined by the values entered into the Duration calculations inside the File Manager's Display dialog under the data plotting tab.

To show the systems calculated fault inception bar and each channels fault inception position, open the Properties dialog inside the data plotting window. Click on the Display Settings tab and select Yes for the Show Calculated Trigger Bar field and select Yes for the Chan Fault field. The calculated Fault Bar is position at the first channels calculated trigger. The calculated trigger bar is a purple dotted line with a fuschia triangle at the bottom of the bar. Each channels calculated poistion is depicted with a red dot.


See Also: [Data Bar](#)

CALIBRATION REPORT

Location: File Manager

Description: Generate a calibration report for all marked waveform files.

Activation: *Menu:* Alt-(O) Options, (R) Reports, (C) Calibration...

Ribbon, Options Tab:  **Calibrate**

Comments: The Calibration report list the Maximum and Minimum analog summary information for the marked files.

For this feature to work properly reports should be generated on non-fault data. The DVREPORT.DTB file, saved in the installed directory contains the last generated report. To archive the contents of this file, use the Save As option to save the file under a new name.

See Also: [Waveform Summary](#)

CHANGE ANALOG COLORS

Location: Analysis

Description: Change the analog channel colors.

Activation: *Popup Menu:* Opposite Click on the Channel ID number





Comments: To change the color of an analog channel opposite click on the channel ID number and select the color listed in the popup menu or select the More Colors option to select a color from the palette.

See Also: [Clear Analog Colors](#)
[Window Properties](#)

CHANGE DRIVE/DIRECTORY

Location: File Manager

Description: Change the file table's active path.

Activation: *Direct:* F7, ChDir button , Back button , Up button , Right Click, Folder Tree
Menu: Alt-(F) Files, (H) Change Drive/Directory...
Ribbon, Files Tab:  Change


Comments: There are a number of ways to change the file table's active path. Use the folder tree to navigate the connected drives. To enter a folder, use the Change Drive/Directory dialog located in the Files tab. To select from a list of the last 12 active folders click the opposite mouse button in the file table. To navigate back through the last 12 active folders, use the Back button. To change to the previous folder, use the Up button. An error message is displayed if the destination path is not found.

See Also: [Create Directory/Folder](#)
[Delete Files](#)
[Folder Tree](#)

CHANGE FREQUENCY

Location: Analysis

Description: Change the current sampling frequency of the active file.

Activation: *Menu:* Alt-(D) Data, (F) Change Sampling Frequency...
Ribbon, Data Tab:  Sampling

Fields:

| | |
|--|---|
| <i>Current Sampling Frequency:</i> | The current sampling frequency. |
| <i>Enter the New Sampling Frequency:</i> | The new sampling frequency. |
| <i>Open Frequency:</i> | Sets the driver to open with the new frequency. |

Options:

| | |
|--------------------|---|
| <i>Enter/Ok:</i> | Exit the dialog and change the frequency. |
| <i>Esc/Cancel:</i> | Exits the dialog without executing the command. |

Comments: The Open Frequency field will set the current display driver to always convert the files to the new frequency before displaying.

See Also: [Restore Original](#)

CHANGE QUERY OPERATORS

Location: Query Fields

Description: Change the operator for the active query field.

Activation: *Direct:* F9
Menu: Alt-(Q) Query, (O) Change Operator

Ribbon, Query Tab: 

Comments: To change the operator, press F9 or click the mouse button on the operator symbol. The F9 key is activated when the editor is visible in the query field. Use the tab key to navigate from the table to the query fields.

See Also: [Equal To \(=\)](#)
[Greater Than \(>\)](#)
[Less Than \(<\)](#)

CHANNEL BACKGROUND COLOR

Location: Analysis

Description: Change the background colors for the analysis window. The background colors fields are listed in the Window Properties dialog under the Colors tab.

Activation: *Menu:* Alt-(F) Files, (T) Window Properties..., Color's Tab




Ribbon, Waveform Tab:  Properties

See Also: [Window Properties](#)


CHANNEL INFORMATION (OPEN/CLOSE)

Location: Analysis

Description: Show or hide the channel information table displayed to the right of the analog and digital traces.

Activation: *Direct:* Analog table close button , Mouse Position the mouse over the table separators and drag left or right to close or open

Menu: Alt-(V) View, (C) Channel Information

Ribbon, Waveform Tab:  Analog Table

Comments: The channel information frame can be resized by selecting the vertical separator bars and dragging them to the right or left. The cursor changes to the vertical resize cursor when the mouse is positioned over the separator bars.

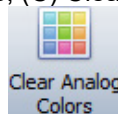
See Also: [Analog Table View](#)
[Combined View](#)
[Window Properties](#)

CLEAR ANALOG COLORS

Location: Analysis

Description: Set the analog channel colors to the default color, black.

Activation: *Menu:* Alt-(C) Channels, (C) Clear Analog Colors



Ribbon, Channels Tab:  Clear Analog Colors

Comments: To change the color of an analog channel opposite click on the channel ID number.

See Also: [Change Analog Channel Colors](#)
[Window Properties](#)

CLEAR MARKS

Location: Analysis

Description: Clear all the Marked Scans in the active window.

Activation: *Menu:* Alt-(A) Values, (C) Clear Marked Scans

Ribbon, Channels Tab:  Clear Marks

Comments: Marked scans have a red upside-down T above each marked scan. Scans are marked either in the Mark and Save dialog or by clicking on the Mark Scan option under the Waveform tab. Each marked scan can have a comment associated with the scan. When the cursor is placed over the scan the comment is displayed in a hint window. To add a comment to a scan, use the Edit Marks option under Waveform tab.

See Also: [Edit Marks](#)
[Mark & Save](#)
[Mark Scan](#)
[Next Marked Scan](#)

CLEAR QUERY AREA

Location: Query Fields

Description: Set all the query fields to blanks and default the query operators to equal (=).

Activation: *Direct:* F8
Menu: Alt-(Q) Query, (C) Clear Query Area

Ribbon, Files Tab:  Clear Query

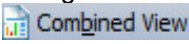
Comments: The F8 function key only works when the query editor is visible. Use the tab key to navigate from the table to the query fields. To navigate between the query fields, use the Ctrl-left/right arrow keys or the mouse.

See Also: [Equal To \(=\)](#)
[Greater Than \(>\)](#)
[Less Than \(<\)](#)
[Query All Rows](#)
[Query Marked Rows](#)
[Query Unmarked Rows](#)

COMBINED VIEW

Location: Analysis

Description: Display all the selected information contained in the analog table in a condensed form.

Activation: *Direct:* F4
Menu: Alt-(V) View, (A) Analog Combined View
Ribbon, Waveform Tab:  Combined View

Comments: Use the F4 key to toggle between the tabular view and the combination view. The combination view is only available if there is enough space between the analog channels to display three lines of text. To change the position of the data values, select the Window Properties option under the Files tab, then click on the Analog Combination tab.

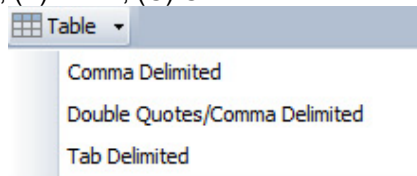
See Also: [Analog Table View](#)
[Show Channel Information](#)
[Windows Properties](#)

COMMA DELIMITED TABLE DRIVER

Location: File Manager

Description: Display the selected comma delimited file in a table format. Comma delimited files have textual fields separated by commas, such as 0001,7834,872.

Activation: *Menu:* Alt-(D) Drivers, (T) Table, (C) Comma Delimited



Ribbon, Drivers Tab:

Comments: The data in the file is presented in tabular form. When the file is opened the rows are displayed exactly as they are in the file. To sort the columns, use the column header buttons.

See Also: [Double Quotes/Comma Delimited Table Driver](#)
[Tab Delimited Table Driver](#)

COMMAND LINE PARAMETERS

Location: System

Description: Command line parameters are supported in the Wavewin software. The listed command line parameters are specific for the file manager and data plotting window.

Activation: *Wavewin.exe [passed parameters]*

Parameters:

| | |
|---------------------------|--|
| <i>Path and Filename:</i> | Path and file name surrounded by “ ”. |
| <i>/Print:</i> | Used with the path and file name. It prints the specified file. |
| <i>/Comtrade:</i> | Used with the path and file name. It converts the specified file to the IEEE Comtrade format. |
| <i>/Batch:</i> | The “/Batch” command line parameter is used along with a path and batch filename command line. It automatically opens the defined batch file and executes each command line parameter defined in the file. |

| | |
|----------------|--|
| <i>/Merge:</i> | The “/Merge” command line parameter is used along with a path and filename command line. It will merge the file with all files that have a /merge command line parameter associated with them. The /merge command line parameter is defined in a Merged File.lst ASCII file. The Merged File.lst is passed to Wavewin through the command line parameters. |
| <i>/X:</i> | The “/X” command line parameter tells where to display Wavewin’s left corner when executed. |
| <i>/Y:</i> | The “/Y” command line parameter tells where to display Wavewin’s upper corner when executed. |
| <i>/W:</i> | The “/W” command line parameter tells the width of the Wavewin application when executed. |
| <i>/H:</i> | The “/H” command line parameter tells the height of the Wavewin application when executed. |
| <i>/Exit:</i> | The “/Exit” command line will automatically exit Wavewin after all other command line parameters are fully complete. |

Comments: Refer to the File Manager Quick Start for more information and examples on each passed parameter.

COMNAME PROPERTIES

Location: File Manager

Description: Setup the fields not available in the supported waveform files for the IEEE long file naming format.

Activation: *Menu:* Alt-(F) Files, (O) ComNames Properties...
Ribbon, Files Tab:  ComNames Prop

Fields:

| | |
|----------------------|---|
| <i>Company Name:</i> | Enter the Company name that will be used in the long naming format. |
| <i>Time Code:</i> | Enter the time code for the device files to rename. |
| <i>User Field 1:</i> | Enter the 1 st User Field. |
| <i>User Field 2:</i> | Enter the 2 nd User Field. |

Options: *Enter/Ok:* Exit the dialog and save the entered data.
Esc/Cancel: Exit the dialog without saving.

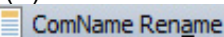
Comments: These fields are used for all the files renamed to the IEEE long file naming format. Update this dialog for files with different time codes.

See Also: [ComName\(s\) Rename](#)
[IEEE Long File Naming Format](#)

COMNAME(S) RENAME

Location: File Manager

Description: Rename all the marked time sequenced data files to the IEEE long file naming format.

Activation: *Menu:* Alt-(F) Files, (A) ComNames Rename
Ribbon, Files Tab:  ComName Rename

Comments: A message box will be prompted before renaming the file to ensure the execution of the rename feature. This feature will permanently rename the files. It is advisable to back up the files before renaming. Some proprietary applications may not be able to read the files once they are renamed.

See Also: [ComName Properties](#)
[IEEE Long File Naming Format](#)

COMPANY COLUMN

Location: File Manager

Description: Displays the company name included in the long file name format. The sixth field in the file name defines the company field for the IEEE long file-naming format.


See Also: [IEEE Long File Naming Format](#)

COMPLEX CALCULATOR

Location: File manager and Analysis

Description: The complex calculator is used to perform complex mathematical operations. Operations can be performed in Polar or Rectangular form.

Activation: *Menu:* File Manager: Alt-(O) Options, (O) Complex Calculator
Menu: Analysis: Alt-(D) Data, (X) Complex Calculator

Ribbon, Files Tab: File Manager:  Complex
Ribbon, Data Tab: Analysis:

Fields: *Magnitude:* Magnitude Value.
Angle: Angle Value.
Memory I: Saved magnitude or real value [1..4].
Memory II: Saved angle or imaginary value [1..4].
Type: The type of values stored in the memory location, Polar or Rectangular.


Options: *Recall:* Recall the selected memory location to the calculate fields.
Clear All: Clear all fields.
Close: Close the dialog.

Comments: The calculator operates as an HP calculator. After each entry click the Enter button to record the values in the Accumulator.

COMPRESS COMTRADE FILES

Location: File Manager

Description: Convert all the marked COMTRADE ASCII files to COMTRADE Binary files.

Activation: *Menu:* Alt-(O) Options, (C) Compress Comtrade Files
Ribbon, Options Tab:  Compress

Comments: This feature compresses the COMTRADE ASCII files to the Binary format to save disk space.

See Also: [Save As Comtrade](#)

COMTRADE DRIVER

Location: File Manager

Description: Change the driver at the cursor position to the COMTRADE driver and plot the input channels.

Activation: *Menu:* Alt-(D) Drivers, (O) Comtrade



Ribbon, Drivers Tab:  Comtrade


Comments: All files that have a .CFF (2013) .DAT or .D## extension, and a corresponding .CFG file exists for the .DAT files are tagged as COMTRADE files. If the selected file does not have a corresponding .CFG file and is not a .CFF file an error message is generated. Both the COMTRADE ASCII and Binary formats are supported for the 1991, 1999 and 2013 IEEE C37.111 Comtrade formats.


See Also: [Associating File Types](#)
[Save As Comtrade](#)
[Windows Properties](#)

CONDENSE TIME

Location: Analysis

Description: Condense the time scale for all visible channels.

Activation: *Direct:* Ctrl-Page Down or the Condense menu button 
Menu: Alt-(D) Data, (C) Condense Time




Ribbon, Data Tab:  Condense



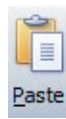
See Also: [Expand Time](#)

COPY/CUT/PASTE FILES

Location: File Manager

Description: Copy or Cut the marked files to the clipboard. Navigate to the destination folder and Paste the files.

Activation: *Direct:* Ctrl-X (Cut)  Cut , Ctrl-C (Copy)  Copy , Ctrl-V (Paste)  Paste
Menu: Alt-(E) Edit, (T) Cut, Alt-(E) Edit, (C) Copy, Alt-(E) Edit, (P) Paste

Ribbon, Edit Tab:  Cut,  Copy,  Paste



Comments: Marked files are displayed in red. The TotMarks and MrkSize fields displayed in the status bar are updated accordingly. To copy/cut/paste files use the Edit options in the Files tab or right click in the file table and select the desired popup menu option.

See Also: [Copy File](#)
[Move Files](#)
[Mark/Unmark File](#)

COPY FILES

Location: File Manager

Description: Copy the marked files to the specified destination path. For a new path click the New Folder button. The system prompts prior to creating the directory.

Activation: *Direct:* F8 or the Copy menu button 
Menu: Alt-(F) Files, (C) Copy To...
Ribbon, Files Tab: 

Fields: *Folder Tree:* Navigate and select the destination folder.

Options: *New Folder:* Create a new folder under the selected path.
Enter/Ok: Copy the marked files to the destination path.
Esc/Cancel: Exit the dialog without executing the command.



Comments: Marked files are displayed in red. The TotMarks and MrkSize fields displayed in the status bar are updated accordingly. Files that were unsuccessfully copied are marked and grouped at the top of the table.

See Also: [Move Files](#)
[Mark/Unmark File](#)
[Drag Drop Files](#)

COPY TEXT

Location: ASCII Editor

Description: Copy the blocked text to the clipboard.

Activation: *Direct:* Ctrl-C, Ctrl-Ins, Right Click - Copy menu button 
Menu: Alt-(E) Edit, (C) Copy
Ribbon, File Tab: 

Comments: To block text, use the mouse or the shift key and the up arrow, down arrow, page up and page down keys or drag the mouse.

See Also: [Cut Text](#)
[Paste Text](#)

CREATE DIRECTORY/FOLDER

Location: File Manager

Description: Create a new directory/folder.

Activation: *Direct:* Right Click on the folder in the Tree, select the New Folder menu option.
Menu: Alt-(F) Files, (E) Create Directory



Ribbon, Files Tab:

Fields: *Edit Box:* Enter the new directory/folder name.

Options: *Enter/Ok:* Rename the new directory/folder.

Comments: To delete the new folder right click on the folder in the tree and select the Delete menu option.

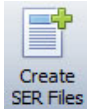
See Also: [Change Drive/Directory Folder Tree](#)
[Rename File/Directory](#)

CREATE SER FILES

Location: File Manager

Description: The Create SER Files feature monitors a folder for waveform files with user defined extensions. When a file is detected, it will read the file and create a comma delimited SER file from the digital channel activity. The SER file will have the same name as the original waveform file with a .SER extension.

Activation: *Menu:* Alt-(O) Options, Create SER Files...



Ribbon, Options Tab:

Fields: *Source Path:* The path to monitor for the specified file types.
Include Sub Folders: Include all sub folders under the source path.
File Extensions: The file extensions to monitor and rename.
Scan Period: The number of minutes the auto rename waits to run.
Create Combined SER: Create a Combined SER Files with all Files Digital Activity.
Combined Path: Enter the path where the combined file is saved.
Combined Filename: Enter the filename for the combined SER file.

Options: *Start Create:* Start the Create SER files process.
Auto Start Create: Automatically start the Create SER files when Wavewin is ran.
Close: Close the dialog and save the fields.
Cancel: Close the dialog without saving the fields.

Comments: To activate this feature, select the Create SER Files option under the Options menu/tab. A dialog will be displayed. Enter the Source Path, click the Include Sub Folders check box if needed, enter the file extensions (*.DAT,*.CEV,*.CFF) and the scan period. If this feature needs to start when Wavewin runs, click the Automatically Start Create SER Files at Run Time checkbox. The bottom section of the dialog gives a status update on the activity of the

process. It displays the last scan time; the original and SER filename being processed and when the next scan will start in minutes. To start the process, click the Start Create button.

To create an SER file with all the digital activity from all processed Waveform files click on the Create a Combined SER File check box. Select or enter the path of the Combined file and enter its filename. This allows for adding the SER information into a database from one single file.



To have the auto create SER Files process start when Wavewin is ran, check the Automatically Start Create SER Files at Run Time check box. The Create SER Files process is performed in the background, so the dialog is not required to be open for the process to execute. To check the status of the create SER Files process open the dialog. The Next Scan In field reports how many minutes before the next scan is started.

See Also: [Sequence of Events List](#)

CUT TEXT

Location: ASCII Editor

Description: Copy the blocked text to the Windows clipboard then delete the blocked text.

Activation: *Direct:* Ctrl-X, Shift-Del - Cut menu button 
Menu: Alt-(E) Edit, (T) Cut
Ribbon, File Tab:  Cut

Comments: Use the mouse or the shift key and the up arrow, down arrow, page up and page down keys to block text.

See Also: [Copy Text](#)
[Paste Text](#)

CYCLE HOP

Location: Analysis

Description: Move the data bar (vertical black solid line) one cycle forward or backward in time for the first displayed channel or the first marked channel.

Activation: *Direct:* Shift-Ctrl-Left arrow and Shift-Ctrl-Right arrow

Comments: Use the shift+ctrl left/right keys to move one cycle in time for the first displayed channel or the first marked channel. The number of cycles from the data bar to the reference bar is displayed in the Delta X status bar.

See Also: [Data Bar](#)
[Peak Hop](#)
[Reference Bar](#)

D&T

Location: Analysis (Status Field)

Description: Displays the data and time of the sample at the data bar.

See Also: [Delta X Field](#)

DATA BAR

Location: Analysis

Description: Displays the channel's instantaneous sample value. The data bar is the solid black line that runs vertically across the analog and digital channels.


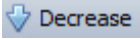
Comments: The data bar is used to view channel information (such as analog sample values, RMS values, digital information, data and time...). The information is displayed in the analog channel table and in the status bar. The Ctrl-Left/Right keys move the data bar peak to peak, and the Shift-Ctrl-Left/Right keys moves the data bar one cycle in time. When a file is first opened the data bar is positioned one cycle from the first sample. To have the data bar positioned 2 cycles from the fault position click on the Set Data Bar option under the Waveform tab. The Set Data Bar option is highlighted when active.

See Also: [Auto Set Data Bar](#)
[Cycle Hop](#)
[Fault Bar](#)
[Fault Bar](#)
[Peak Hop](#)
[Reference bar](#)
[RMS bar](#)

DECREASE AMPLITUDE

Location: Analysis

Description: Decrease the amplitude of all the analog channels, or just the marked analog channels.

Activation: *Direct:* Ctrl-Down Arrow or the AmpDn menu button 
Menu: Alt-(D) Data, (D) Decrease Amplitude
Ribbon, Data Tab: 

Comments: When the channels' amplitude is decreased the Scale column in the analog table is updated with the new scale. The Trace Scale Multiplier field inside the properties dialog determines the amount the signal is increased or decreased. To change the Trace Scale Multiplier field, select the Window Properties option under the Waveform tab then select the Display Settings tab.

See Also: [Increase Amplitude](#)
[Trace Scale Multiplier](#)

DELETE FILES

Location: File Manager

Description: Remove all the marked files and directories from the active directory.

Activation: *Direct:* Delete
Menu: Alt-(F) Files, (D) Delete

Ribbon, Files Tab:  Delete Popup Menu:  Delete


Comments: Marked files and directories are displayed in red. The TotMarks and MrkSize fields displayed in the status bar are updated accordingly. Files and directories that were unsuccessfully deleted are marked and grouped at the top of the table.

See Also: [Mark/Unmark File](#)

DELETE TEXT

Location: ASCII Editor

Description: Delete the blocked text.

Activation: *Direct:* Del
Menu: Alt-(E) Edit, (D) Delete
 Ribbon, File Tab: 

Comments: Use the mouse or the shift keys and the up arrow, down arrow, page up and page down keys to block text.

See Also: [Cut Text](#)

DELTA X

Location: Analysis (Status Field)

Description: Displays the time in microseconds, milliseconds, or seconds between the RMS bar and the data bar. The number of cycles is also displayed if the samples in the file are microseconds or milliseconds apart.

See Also: [D&T Field](#)
[Data Bar](#)
[RMS bar](#)

DELTA Y

Location: Analysis (Status Field)

Description: Displays the difference between the data horizontal bar and the reference horizontal bar.

Comments: To activate the horizontal data bars, select the  Horz Bars option under the Waveform tab.

See Also: [Delta X](#)

DESCENDING SORT

Location: All Tables

Description: Sort the columns in descending order with respect to the selected sort field.

Activation: *Direct:* Click on Column Header

Menu: Alt-(S) Sort, (D) Descending Sort

Comments: The sort field is displayed in the status bar at the bottom of the window. To sort the table columns directly press the column header button. The header buttons toggle between ascending and descending order.

See Also: [Ascending Sort](#)

DEVICE COLUMN

Location: File Manager

Description: Displays the device name associated with the long file name. The fifth field in the file name defines the device field for the IEEE long file-naming format. It represents the name or code of the device that originated the file.

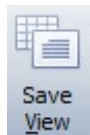
See Also: [IEEE Long File Naming Format](#)

DIGITAL GROUPS

Location: Analysis

Description: Add Digital Groups to a View.

Activation: *Menu:* Alt-(V) View, (S) Save View...



Ribbon, Waveform Tab:

Fields:

| | |
|----------------------------|--|
| <i>Digital Channels:</i> | Select the digital channels to save as a digital group. |
| <i>Digital Group Name:</i> | Enter the digital group name to be listed in the drop-down menu off the Analysis main toolbar. |

Options:

| | |
|-------------------|--|
| <i>New Group:</i> | Click the new group button after selecting the digital channels for the group. |
| <i>Save:</i> | Save the new group to the view. |

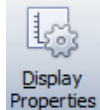
Comments: To create a digital group, use the Mouse to select the digital channels in the Digital Channel's list box. Next, click on the New Group button. Once the New Group button is clicked the Digital Group section will be enabled and the Digital Group Name field will have the focus. Type in the name of the new group and hit enter or click the Save button. The table below the Digital Group Name field will be populated with the name of the digital groups in the first column and the number of channels in that group in the second column.

In the Data Plotting window select the View that was saved with the Digital Groups. A new drop down button is added to the Data Plotting main toolbar. The new drop down lists all the Digital Groups in the View. To display a digital group select the group from the drop down menu. By default Wavewin only displays the triggered digital channels for each group. To view all the digital channels in the group click on the All Digital ribbon item in the Waveform tab.

See Also: [Save User Views](#)

DIGITAL MARK/UNMARK ALL

Location: Analysis**Description:** Mark all digital channels. If there are no digital channels marked, then unmark all the marked digital channels.**Activation:** *Direct:* F8*Menu:* Alt-(C) Channel, (I) Digital Mark/UnMark All*Ribbon, Channels Tab:* **Comments:** The channels ID and titles are displayed in red when marked. Press F8 to mark or unmark all the analog and digital channels.**See Also:** [Analog Mark/Unmark All](#)**DISPLAY DIALOG**

Location: All Tables**Description:** Reposition the columns in the table.**Activation:** *Menu:* Alt-(O) Options, (I) Display...*Ribbon, Options Tab:*

Fields:

File Column List: A list of all the columns in the table. Use the Move Up and Move Down Buttons to rearrange the columns. Use the checked boxes to show/hide the analog columns.

Table Font Size: A list of the font sizes for the table. Select the Font size from the drop-down list.

File Marking: A list of the 2 types of marking for files in the file manager.

Default Path: The path the file manager is opened with when first displayed.

Open View: Open the first view in the line group file when opening a new analysis window. This will only work if a line group is associated with the file.

Analog Table Font Size: Select the desired font from the drop-down list.

Digital Toggled Channels: Only display the toggled digital channels when opening files.

Open Files w/Primary Values If the files values are in secondary quantities and the ratio values are defined in the file then convert the secondary quantities to primary values.

Batch Files: When processing batch template files process all the files or just the new files. Processed files have a WWD added to the end of the file name.

Versioning: If a file has a line group create a version of the line group with the same name as the file's name with a .LGP extension.

Duration Calculation: There are two calculations used when determining the fault duration and sag duration of a channel. This section allows for modifying these calculations. When a file is open an RMS value is calculated at each sample using a running

Append ComName Files: RMS equation. After the first full cycle the duration equations are run on each sample using the RMS values. Append all like ComNames files within the selected time frame.

Help Files: Select to display the help files in PDF format or ASCII text.

Options:

- Move Up:* File Columns Tab. Move the highlighted column up one position.
- Move Down:* File Columns Tab. Move the highlighted column down one position.
- Reset:* File Columns Tab. Default the order of the columns to how they were when the software was first installed.
- Short Cuts:* Displays the Short Cuts keys dialog.
- OK:* Change the order of the columns and redraw the device table and save all modified settings.
- Cancel:* Exit the dialog without saving the settings.

Comments: To resize the table columns, place the mouse over the column separator and drag the mouse to the left or the right or double click on the column separator to expand to the maximum area for that column.

See Also: [Resize Columns](#)

DISTURBANCE REPORT

Location: File Manager

Description: Create a disturbance report from the fault files located in the specified directories.

Activation: *Menu:* Alt-(O) Options, (R) Reports, (D) Disturbance Report...

Ribbon, Options Tab:  Disturbance

Fields:

- Destination File:* The folder and filename where the report is saved.
- Source Folder(s):* The source folder(s) where the event files are located.
- Filter: Faulted Phases:* Enter the valid faulted phases (separated by commas).
- Filter: Fault Location:* Enter the maximum % of the line length to detect.
- Filter: Voltage Class:* Enter the voltage kv value that is above the phase to ground level.
- Filter: Fault Current:* Enter the minimum magnitude value.
- Filter: System Frequency:* Enter the deviation from the line frequency to detect.

Options:

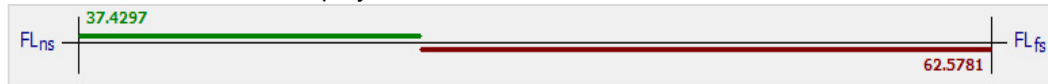
- Process:* Process the report and display the results.
- Save Script:* Save the entered values to the Disturbance.ini script file.
- Edit Script:* Edit the Disturbance.ini script file.
- Show Help:* Show the help file below the buttons.
- Close:* Close the disturbance dialog without saving.

Comments: The result disturbance report is saved to the defined destination file and displayed in a comma delimited table. The table allows for sorting, querying, deleting of rows and saving.

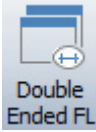
DOUBLE ENDED FAULT LOCATION

Location: Analysis


Description: Display the double ended fault location dialog. The double ended fault location dialog calculates the percent of line from the near end to the far end. A graphical display of the near end and far end is displayed above the Line Data box.



Activation: *Menu:* Alt-(D) Data, (U) Fault Calculators, (D) Double Ended...



Ribbon, Data Tab:

- Fields:**
- Z2:** Magnitude and angle of Z2.
-  Change the Z2 fields from secondary values to primary values or from primary to secondary.
- LL:** Length of the line and the units for the line length (% , Miles, Km).
- Neg Seq:** Select the type of double ended calculation to use (Negative, Positive or Zero Sequence).
- Pos Seq:** Select the type of double ended calculation to use (Negative, Positive or Zero Sequence).
- Zero Seq:** Select the type of double ended calculation to use (Negative, Positive or Zero Sequence).
- nsAng:** Display the angle for the near side DE calculation.
- fsAng:** Display the angle for the far side DE calculation.
- Z2VF:** Voltage Fault Resistance magnitude and angle.
- Z2IF:** Current Fault Resistance magnitude and angle.
- Z2RF:** Residual Fault Resistance magnitude and angle.
- Chan:** Select the channel numbers for VA, VB, VC, IA, IB and IC.
- VA:** Magnitude and Angle of Channel VA from the Near and Far End.
- VB:** Magnitude and Angle of Channel VB from the Near and Far End.
- VC:** Magnitude and Angle of Channel VC from the Near and Far End.
- IA:** Magnitude and Angle of Channel IA from the Near and Far End.
- IB:** Magnitude and Angle of Channel IB from the Near and Far End.
- IC:** Magnitude and Angle of Channel IC from the Near and Far End.
- V0:** Zero Sequence Voltage Magnitude and Angle.
- V1:** Positive Sequence Voltage Magnitude and Angle.
- V2:** Negative Sequence Voltage Magnitude and Angle.
- I0:** Zero Sequence Current Magnitude and Angle.
- I1:** Positive Sequence Current Magnitude and Angle.
- I2:** Negative Sequence Current Magnitude and Angle.
- Values:** Select the type of values for the calculation.
- Angle Rotation:** Increment the voltage and current angles for the near and far end.
- Vectors:** Select the vectors to display.
- Options:**
- Refresh:** Refresh VA, VB, VC, IA, IB and IC from the date bar locations.
- Calculate:** Calculate the fault location % of line.
- Plot:** Plot the double ended fault location in the data plotting window.
- Report** Display a textual report of the double ended fault location.
- Close:** Close the dialog.
- Show Details:** Open the dialog to show the sequence components.
- Composite** Doubles the Z2 magnitude and line length.



Displays the near end and far end line impedance value in an information window. If the magnitude and angles are different between the near end and far end then a red explanation, **!**, will be displayed next to the button.



Turns auto scale on or off for displayed vectors.



Increase the displayed vectors.



Decrease the displayed vectors.

Rotate: Increment the voltage and current angles for the near and far end.

Comments: The double ended calculator requires two open fault records (near and far end). The near end is the top left window displayed. To reorganize the windows, use the Tile buttons.

The channels in each record must be organized as follows: The first 3 visible channels are the Voltage channels, VA, VB and VC. The next 3 visible channels are the Current channels, IA, IB and IC. To reposition the analog channels first mark the channels then use the plus key to move the channels up one position and the minus key to move the channels down one position or drag them to the desired location. To change the order of the channels in the dialog, click on the Show Details button then select the channel numbers from the Chan drop down list.

The values populated in the dialog are read at the data bar positions from both open records. The double ended dialog is a stay on top window. This allows for repositioning the data bars without closing the dialog. To refresh the Voltage and Current values in the dialog use the Refresh button.

To plot the fault location in the data plotting window as a new channel, click on the drop-down arrow in the plot button. The two options available are plot the fault location between bars or plot the fault location for the entire record. The default option of the plot button is plot between bars. Between bars plots the fault location between the data bar and the reference bar.

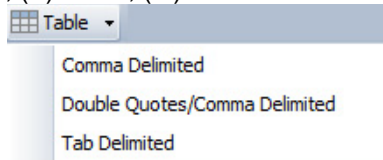
See Also: [Single Ended Fault Location](#)

DOUBLE QUOTES/COMMA DELIMITED TABLE DRIVER

Location: File Manager

Description: Display the double quote delimited file in a table format. Double quote-delimited files have textual fields separated by double quotes and commas, such as "CHANNEL", "DATE", "TIME".

Activation: *Menu:* Alt-(D) Drivers, (T) Table, (Q) Double Quotes/Comma Delimited



Ribbon, Drivers Tab:

Comments: The data in the file is presented in tabular form. The rows are first displayed exactly as they are in the file. To sort the columns, use the column header buttons.

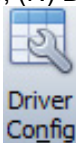
See Also: [Comma Delimited Table Driver](#)
[Tab Delimited Table Driver](#)


DRAG DROP CHANNELS

Location: Analysis**Description:** Drag marked analog channels to a specific location.**Activation:** *Direct:* Mark and Drag**Comments:** To drag analog channels first mark the channels. Channels can be marked using the mouse or the space bar. Drag the channels to the desired location.**See Also:** [Shift Marks Up](#)
[Shift Marks Down](#)
[Reorder Channels](#)**DRAG DROP FILES**

Location: File Manager**Description:** Drag marked files to a folder in the folder tree. All dragged files are moved to the final location.**Activation:** *Direct:* Mark and Drag**Comments:** To drag files first mark the files in the file Manager. Files can be marked using the mouse or the space bar. Drag the files to the desired folder in the folder tree. All files will be moved to the destination folder.**See Also:** [Copy Files](#)
[Move Files](#)**DRIVER COLUMN**

Location: File Manager**Description:** Displays the driver associated with the file. The driver column indicates what driver is used to open the file.**See Also:** [Associating File Types](#)**DRIVER CONFIGURATION DIALOG**

Location: File Manager**Description:** Display the driver configuration dialog. The driver configuration dialog allows for setting certain features pertaining to a specific driver.**Activation:** *Menu:* Alt-(O) Options, (N) Driver Configuration*Ribbon, Options Tab:***Fields:** *Drivers List:* A list of the supported drivers in the system.

- Driver's Data Type:** Options (Peak, RMS Calibrated or Log File). Select the type of data that is contained in the files for the selected device.
- Driver's Header Directory:** If the device requires support files to display the data then the support files can be placed in a centralized directory so they do not have to be in the directories where the data files are located. Enter the directory or use the browse button  to browse for an existing directory. This field is for devices that maintain separate files for the Analog & Digital information.
- Change Sampling Frequency:** This field is used to automatically change the sampling frequency when a file is displayed for the selected driver. For example, if the files have 4 samples per cycle and it is preferred to view the files with 40 samples per cycles enter 2400. To maintain the original frequency, leave this field blank or set it to 0.00.
- Change Line Frequency:** If the line frequency is not defined in a specific driver's files, then the line frequency can be defined in this dialog. The entered line frequency will be used when displaying files for the selected driver. To maintain the original line frequency, leave this field blank or enter 0.00.
- Options:** *Ok:* Save the changes made and close the dialog.
Cancel: Ignore any changes made and close the dialog.


Comments: The ERLPhase devices have different properties. ERLPhase files are displayed as Comtrade files using the ERLPhase conversion DLL.

See Also: [Associating File Types](#)

DRIVER DATA TYPE

Location: Analysis

Description: Set the active display driver's data type, RMS or PEAK.

Activation: *Direct:* Window Properties menu button 
Menu: Alt-(F) File, (T) Window Properties, Driver Data Type Tab



Ribbon, Waveform Tab: [Properties](#), Driver Data Type Tab

Comments: The data stored in the displayed file can be peak values or RMS values. The default setting for all drivers is peak values. If the display device saves the sample values as RMS calibrated, then select the RMS Type from the drop-down list. If the data values are RMS and the data type is not set to RMS type, then the analog column data will be displayed incorrectly. To always have the files displayed as RMS values when the files are opened then open the Driver Configuration dialog in the File Manager and set that drivers data type field to RMS Calibrated. The Driver Configuration dialog is located in the File Manager's Options tab.

See Also: [Data Bar](#)

DUPLICATE CYCLES

Location: Analysis

Description: Duplicate the cycle between the Data bar and the RMS bar.

Activation: *Menu:* Alt-(D) Data, (L) Duplicate Cycles...

Ribbon, Data Tab:  Duplicate

Fields: # Cycles: Enter the number of times to duplicate the highlighted cycle(s).

Options: *Enter/Ok:* Duplicate the highlighted cycle(s).
Esc/Cancel: Exit the dialog without executing the command.

Comments: This feature is useful for creating test set files or for creating files to play back into simulation or modeling applications.

See Also: [Truncate Cycles](#)

EDIT DAU-DEF

Location: File Manager

Description: Display the DAU-DEF editor for Hathaway DAU-DEF files. The DAU-DEF editor allows for changing certain fields defined in the DAU-DEF records. A Window's file selection dialog is first displayed to select the DAU-DEF file to edit. Navigate to the desired directory and double click on the DAU-DEF file to edit.

Activation: *Menu:* Alt-(O) Options, (E) Edit DAU-DEF File...

Ribbon, Options Tab:  Edit DAU-DEF

Fields:

| | |
|---------------------------|---|
| <i>DAU-DEF Records:</i> | A list of all the DAU-DEF records defined in the selected file. |
| <i>DAU-ID:</i> | The DAU ID associated with the selected record. |
| <i>DAU-DEF Index:</i> | The DAU-DEF index number. |
| <i>Station Name:</i> | The station name for the selected DAU-DEF record. |
| <i>Telephone Number:</i> | The phone number to get access to the device. |
| <i>Analog Channels:</i> | A list of all the analog channels defined for the selected record. |
| <i>Analog Name:</i> | Edit the analog name for the selected analog channel. |
| <i>Analog Full Scale:</i> | Edit the analog full-scale value for the selected analog channel. |
| <i>Analog Prefix:</i> | Edit the analog prefix for the selected analog channel. |
| <i>Analog Unit:</i> | Edit the analog unit for the selected analog channel. |
| <i>Event Channels:</i> | A list of all the event channels defined for the selected record. |
| <i>Event #:</i> | Edit the event's number for the selected event channel. |
| <i>Event Name:</i> | Edit the event name for the selected event channel. |
| <i>Event NoNc:</i> | Edit the event's normally open normally close value for the selected event channel. |
| <i>Sensor Channels:</i> | A list of all the sensors channels defined for the selected record. |
| <i>Sensor #:</i> | Edit the sensor number for the selected sensor channel. |
| <i>Sensor Name:</i> | Edit the sensor name for the selected sensor channel. |
| <i>Sensor NoNc:</i> | Edit the sensor's normally open normally close value for the selected sensor channel. |

Options: *Save:* Save the selected DAU-DEF record.
Ok: Save all changes made and close the dialog.
Cancel: Ignore any changes made and close the dialog.

Default Sensor #8: Checking this option will always default Sensor channel #8's NoNc value to be 1.

Comments: When this feature is activated the Window's file selection dialog is displayed, navigate to the desired directory and double click on the DAU-DEF file to edit.

EDIT MARKS

Location: Analysis

Description: Associate a comment with each marked scan in the active window.

Activation: *Menu:* Alt-(A) Values, (E) Edit Marked Scans

Ribbon, Channels Tab: 

Comments: The Edit Marked Scans dialog lists all the marked scans in a table. The first column lists the sample number where the scan is marked. The second column lists the date and time of the scan. And the third column lists the comment associated with the scan. To add a comment double click in the comment section for the scan. Marked scans have a red upside-down T above each marked scan. Scans are marked either in the Mark and Save dialog or by clicking on the Mark Scan option under the Waveform tab. When the cursor is placed over the scan the comment is displayed in a hint window.

See Also: [Clear Marks](#)
[Mark & Save](#)
[Mark Scan](#)
[Next Marked Scan](#)


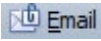
EMAIL FILES

Location: File Manager and Analysis

Description: Email a group of files or a single file using the users default email application. All support files needed to display the selected files will be automatically attached. Support files include Comtrade configuration (*.CFG), header (*.HDR) & information (*.INF) files, DFR's analog and digital information files such as: Hathaway DAU files, Rochester preamble and header files, Faxtrax/Director CTL files, Transcan SCF and TCF files.


Activation: *Menu:* File Manager: Alt-(F) Files, (L) Email Marked Files – Analysis: Alt-(F) File, (E) Email



Ribbon: File Manager: Files Tab , Analysis: Waveform Tab 


Fields:

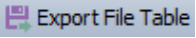
| | |
|--------------------|--|
| <i>To:</i> | Recipient of the email, initially empty. |
| <i>From:</i> | Sender, automatically defaulted. |
| <i>Subject:</i> | Empty. |
| <i>Attachment:</i> | All selected files and their support files automatically attached. |

Comments: Files can be emailed either in the file table or in the analysis window. To email a set of files, mark the desired files in the file table and select the Email option under the Files tab or right click on the file table and select the Email  Email option from the pop-up menu. To email a file from the analysis window select the Email option under the Waveform tab. All support files needed to display the file(s) are automatically attached.

EQUAL TO (=)

Location: Query Fields**Description:** Search the active table for records that match the entered criteria.**Comments:** To change the query operator, press F9 or click on the operator symbol.**See Also:** [Greater Than \(>\)](#)
[Less Than \(<\)](#)**EXPAND TIME**

Location: Analysis**Description:** Expand the time scale of all visible analog channels.**Activation:** *Direct:* Ctrl-Page Up or the Expand menu button 
Menu: Alt-(D) Data, (E) Expand Time*Ribbon, Data Tab:* **See Also:** [Condense Time](#)**EXPORT FILE TABLE**

Location: File Manager**Description:** Export the File Table to a comma delimited CSV file.**Activation:** *Menu:* Alt-(F) Files, Export File Table*Ribbon, Files Tab:* **Fields:**
Path: Select or enter the path for the comma delimited CSV file.
Filename: Enter the name for the exported file.
All Files Select All Files to export all the files in the active path.
Marked Files Select Marked Files to export only the marked files in the active path.**Options:** *Enter/Ok:* Export the specified files to the entered comma delimited files.
Esc/Cancel: Exit the dialog without executing the command.**Comments:** This feature is useful for analyzing the contents of the file manager in an excel spreadsheet.**F-TYPE COLUMN**

Location: File Manager**Description:** Displays the file type. The “/dr” indicates that the file is a sub-directory. The DAU ID number is displayed for DFR I, II, IIB and 2000 files and the extension of the file is displayed for all other files.**Comments:** If the active directory is a sub-directory, then the first 2 rows of the table are reserved for the “.” and “..” navigation shortcuts. The “.” is a shortcut to the root directory and the “..” is a shortcut to the previous directory.

See Also: [Associating File Types](#)
[Change Drive/Directory](#)

FAULT BAR

Location: Analysis

Description: The Fault bar is the red dotted line that runs vertically across the analog and digital channels.

Comments: The fault bar is fixed and positioned at the fault time defined in the file. The fault bar can be shown or hidden by selecting Yes or No for the Show Vertical Fault Bar field in the properties dialog under the Display Settings tab.

See Also: [Data bar](#)
[RMS Bar](#)
[Reference Bar](#)

FAULT DATE COLUMN

Location: File Manager


Description: Displays the fault date of the oscillography files. This column is left blank if the file is not a valid oscillography file or the fault date and time is not available in the file name.

See Also: [Fault Time Column](#)
[IEEE Long File Naming Format](#)

FAULT REFERENCE TIME BAR

Location: Analysis

Description: Displays the time difference from the fault time defined in the displayed file. The units are displayed in the Delta X status field.

Comments: The fault reference time bar is displayed between the analog channels and the digital channels. To show or hide the fault reference time bar open the Window Properties  dialog under the Waveform tab. Click the Display Settings tab and toggle the Show Reference Time Bar field.

See Also: [Fault Bar](#)

FAULT TIME COLUMN

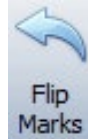
Location: File Manager


Description: Displays the fault time of the oscillography files. This column is left blank if the file is not a valid oscillography file or the fault date and time is not available in the file name.

See Also: [Fault Date Column](#)
[IEEE Long File Naming Format](#)

FILE NAME COLUMN

Location: File Manager**Description:** Displays the name of the files/directories in the active directory.**Comments:** If the active directory is a sub-directory, then the first 2 rows of the table are reserved for the “.” and “..” navigation shortcuts. The “.” is a shortcut to the root directory and the “..” is a shortcut to the previous directory.**See Also:** [F-Type Column](#)**FLIP MARKS**

Location: All Tables**Description:** Mark all the unmarked rows and unmark all the marked rows.**Activation:** *Menu:* Alt-(M) Mark, (F) Flip Marks*Ribbon, Files Tab:***Comments:** Marked records are displayed in red. The TotMarks field displayed in the status bar is updated accordingly.**See Also:** [Unmark Marked Row](#)
[Mark/Unmark Row](#)**FOLDER TREE**

Location: File Manager**Description:** Displays all connected drives and folders in a tree structure.**Activation:** *Menu:* Alt-(F) Files, (T) Show/Hide Folder Tree*Ribbon, Files Tab:*  **Folders** – Toggle Show/Hide Tree**Comments:** To show/hide the folder tree select the Folder option under the Files tab. Folders can be renamed by left mouse clicking on the folder name until the editor is displayed. Also, folders that reside on the computer can be sent to the recycle bin by selecting the Delete option under the folder tree's right click pop-up menu. If the folders reside on external drives, then the folders are permanently deleted.**See Also:** [Change Drive/Directory](#)**FREE**

Location: File Manager (Status Field)**Description:** Displays the amount of free hard disk space on the active drive, displayed in Kbytes.

See Also: [Size](#)
[MrkSize](#)

FREQUENCY CALCULATOR

Location: Analysis

Description: The frequency calculator is used to measure the frequency between the reference bar and the data bar. The calculator is displayed in the upper right corner of the data plotting window.

Activation: *Menu:* Alt-(D) Data, (Q) Frequency Calculator...

Ribbon, Data Tab:  **Frequency**

Fields:

| | |
|-------------------|---|
| <i>Cycles:</i> | Enter the number of cycles between the data bar and the reference bar. |
| <i>Delta X:</i> | Delta X is automatically populated from the Delta X status bar field in the data plotting window. |
| <i>Frequency:</i> | Displays the frequency calculated between the reference bar and data bar. |

Options:

| | |
|-------------------------|--------------------------|
| <i>Enter/Calculate:</i> | Calculate the Frequency. |
| <i>Esc/Close:</i> | Close the dialog. |

Comments: The frequency dialog is a stay on top dialog allowing for the data bar to be moved in the data window while the dialog is open. When using the cursor keys to move the data bar make sure the data window is the active window. The Delta X values will be automatically updated when the data bar is moved in the data plotting window. Enter the number of cycles between the reference bar and data bar then click the Calculate button to show the frequency value. The number of cycles is displayed in the status bar in the Delta X section.

See Also: [Software Analog Channels](#)

Fs

Location: Analysis (Status Field)

Description: Displays the sampling frequency of the sample at the data bar.

See Also: [Data Bar](#)

FST

Location: Waveform Summary (Events/Sensors Activity Summary)

Description: Displays the status of the first digital samples in the file. Fst is the first column in the Events/Sensors Activity Summary. A=Alarm, N=Normal.

Comments: This data is also displayed in the second column of the digital information table view.

See Also: [Waveform Summary](#)

FST-CHANGE

Location: Waveform Summary (Events/Sensors Activity Summary)

Description: Displays the date and time the channel first changed state. Fst-Change is the third column in the Events/Sensors Activity Summary.

Comments: This data is also displayed in the fourth column of the digital information table view.

See Also: [Waveform Summary](#)

GREATER THAN (>)

Location: Query Fields

Description: Search the active table for records that match the entered criteria.

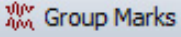
Comments: To change the query operator, press F9 or click the mouse button on the operator symbol.

See Also: [Change Query Operator](#)
[Equal To \(=\)](#)
[Less Than \(<\)](#)

GROUP MARKED ANALOG CHANNELS

Location: Analysis

Description: Group all the marked analog channels and move them to the top of the display area.

Activation: *Menu:* Alt-(C) Channels, (G) Group Marked Analog Channels
Ribbon, Channels Tab: 

See Also: [Mark/Unmark Channels](#)

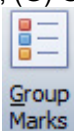
GROUP MARKED ROWS

Location: All Tables

Description: Group all the marked rows and move them to the top of the table.

Activation: *Menu:* Alt-(M) Mark, (G) Group Marks

Ribbon, Files Tab:



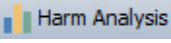
See Also: [Unmarked Marked Rows](#)
[Mark/Unmark Row](#)

HARMONICS ANALYSIS REPORT

Location: Analysis

Description: The harmonic analysis report runs the harmonic calculation on each channel from harmonics 0 (dc-offset) to the maximum harmonic (samples per cycle/2).

Activation: *Menu:* Alt-(D) Data, (H) Harmonic Analysis Report...

Ribbon, Data Tab: 

Fields: *Report Harmonics Above:* Report all Harmonics above a specified % above the fundamental.

Ignore DFT Currents Below: Ignore current values below the enter value.

Ignore DFT Voltages Below: Ignore voltage values below the enter value.

Options: *Enter/Run Report:* Exit the dialog and run the harmonics report.
Esc/Cancel: Exit the dialog without executing the command.

Comments: The final report is an ASCII text file. The top section lists the summary information for the file. The analysis report is in a table format and lists the following columns:

- Harmonic number,
- Date and Time the harmonic was first detected,
- Sample number the harmonic first detected,
- Magnitude at the Sample number (DFTPeak),
- Fundamental,
- Percentage of the fundamental,
- Duration how long the harmonics was detected.

See Also: [Harmonics Table](#)

HARMONICS TABLE


Location: Analysis

Description: View the harmonics table.

Activation: *Direct:* F11, Opposite click on phasor diagram or information header
Menu: Alt-(V) View, (T) Harmonics Table



Ribbon, Waveform Tab: 

Comments: The harmonics table displays the number of harmonics according to the file's sampling frequency with a maximum of 512 harmonics supported. The table displays one channel at a time. It will display the first marked analog channel, or if no channels are marked then the first visible channel. The harmonic calculation runs from the RMS bar to the data bar. The display values include DFT Peak, DFT RMS, DFT Angles, % of fundamental and % of TrueRMS. When the data bar is moved in the data plotting window the harmonics values will be automatically updated. To view the harmonics in a histogram, click on the harmonics toggle  button located next to the channel name.

See Also: [Harmonics Analysis Report](#)
[Harmonics Vectors](#)
[Histogram](#)

HARMONIC VECTORS

Location: Analysis

Description: View the harmonics vectors in the phasor diagram.

Activation: *Menu:* Alt-(V) View, (H) Vector Harmonics

Ribbon, Waveform Tab:  Vector Harm

Comments: The harmonics of the first marked analog channel, or if no channels are marked then the first visible analog channel, is displayed in a vector format in the phasor diagram. The harmonic calculation is performed on one cycle of data. It starts at the RMS bar and goes forward one cycle. To hide/show the harmonic vectors toggle the Vector Harm option under the Waveform tab from ON=highlighted to OFF=not highlighted.

See Also: [Harmonics Analysis Report](#)
[Harmonics Table](#)
[Histogram](#)


HELP

Location: All Child Windows.

Description: Displays the help file for the active child window.

Activation: *Direct:* F1

Menu: Alt-(H) Help, (T) Active Topic...

System Tool bar: 

Comments: The help file is a PDF document with search capabilities.

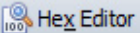
HEXADECIMAL EDITOR

Location: File Manager

Description: Edit the file at the cursor position in a binary editor.

Activation: *Direct:* F3

Menu: Alt-(O) Options, (X) Hexadecimal Display...

Ribbon, Files Tab:  Hex Editor

Comments: The file contents are displayed in a Hex editor. Use the up arrow, down arrow, page up, page down, Ctrl-home and Ctrl-end keys to navigate through the file's data or use the scroll bar. When a hex value is overwritten the ASCII equivalent is displayed in the window to the right of the editor. A maximum of 10 editor windows can be simultaneously opened. The F4 and F3 function keys allow for searching ASCII data or Hex values. To search for hex values, insert the “#” character before the hex value in the Find Text field.

See Also: [ASCII Editor](#)
[Hexadecimal Driver](#)

HEXADECIMAL DRIVER

Location: File Manager

Description: Change the driver at the cursor position to the Hexadecimal driver and display the file in binary format.

Activation: *Menu:* Alt-(D) Drivers, (D) Hexadecimal...

Ribbon Drivers Tab:  Hex

See Also: [Hexadecimal Editor](#)
[ASCII Driver](#)

HIDE MARK(S)

Location: Analysis

Description: Hide all the marked analog channels and re-space the unmarked channels.

Activation: *Direct:* Delete

Menu: Alt-(C) Channels, (H) Hide Mark(s)

Ribbon, Channels Tab:  Hide Mark(s)

Comments: To mark/unmark an analog channel, click the channel ID number or the channel table data or use the spacebar. Press Esc key to restore the hidden channels or click on the Restore Mark(s) option under the Channels tab.

See Also: [View Mark\(s\)](#)
[Show All Hidden](#)
[Restore Mark\(s\)](#)


HISTOGRAM

Location: Analysis


Description: View the harmonics histogram.


Activation: *Direct:* F11, Opposite click on phasor diagram or information header

Menu: Alt-(V) View, (T) Harmonics Table

Ribbon, Waveform Tab:  Harmonics

Comments: The histogram displays the number of harmonics according to the file's sampling frequency with a maximum of 512 harmonics supported. The histogram displays one channel at a time. It will display the first marked analog channel, or if no channels are marked then the first visible channel. The harmonic calculation starts at the RMS bar and runs to the data bar. The display values can be DFT Peak, DFT RMS, DFT Angles, % of fundamental and % of TrueRMS. The default view is % of fundamental. To change the data displayed click on

the drop-down menu button  and select from the list. When the data bar is moved in the data plotting window the harmonics values will be automatically updated. To view the

harmonics in a table, click on the harmonics toggle  button located next to the channel name.

See Also: [Harmonics Analysis Report](#)
[Harmonics Table](#)
[Harmonics Vectors](#)

HORIZONTAL BARS

Location: Analysis

Description: Displays a solid black horizontal line that follows the data bar and displays a dotted blue horizontal line that follows the reference bar.

Activation: *Menu:* Alt-(V) View, (B) Horizontal Bars

Ribbon, Waveform Tab: 

Comments: The bars will be positioned at the first marked analog channel (displayed in red). If no channels are marked, then they are positioned at the first displayed channel. The Delta Y field in the status bar shows the difference between the two bars. The black line follows the data bar, and the blue bar follows the reference bar.

See Also: [RMS bar](#)
[Data Bar](#)
[Reference Bar](#)

IEEE LONG FILE NAMING FORMAT

Location: IEEE Long File Name



Description: The File Manager supports the IEEE long file naming format. The IEEE long file naming format is a PSRC format used to name time sequenced data files. The file table columns are used to display the contents of the long file name. The file name contains the six required fields stored in a comma-delimited fashion. The remaining fields are optional. The file table lists four optional columns at the end of the table to support user defined fields. The ComNames properties dialog allows for user input for the first two optional fields.

Fields:

| | |
|--------------------|--|
| <i>Date:</i> | The Date field defines the start date of the file. The date fields are defined as the first two characters are the year, the next two are the month and the last two are the day. (required) |
| <i>Time:</i> | The time field defines the start time of the file. The Time fields are defined as the first two characters are the hour, the next two are the minutes, the next two are the seconds and the last two or three are the milliseconds. (required) |
| <i>Tcode:</i> | The TCode field is the time offset from GMT time. If the start time is expressed in UT, this field is coded 0z, Note: GMT is the international abbreviation Greenwich Mean Time. (required) . |
| <i>Substation:</i> | The substation name or code where the originating device is located. (required) |
| <i>Device:</i> | The device name or code that generated the file. (required) |
| <i>Company:</i> | The company of the specified substation. (required) |

See Also: [ComName\(s\) Properties](#)
[ComName Rename](#)

INCREASE AMPLITUDE

Location: Analysis**Description:** Increase the amplitude of all the analog channels, or just the marked analog channels.**Activation:** *Direct:* Ctrl-Up arrow or the AmpUp menu button *Menu:* Alt-(D) Data, (I) Increase Amplitude*Ribbon, Data Tab:*  Increase**Comments:** When the channels' amplitude is increased the Scale column in the analog table is updated with the new scale. The Trace Scale Multiplier field inside the properties dialog determines the amount the signal is increased or decreased. To change the Trace Scale Multiplier field, select the Properties option under the Waveform tab then select the Display Settings tab.**See Also:** [Decrease Amplitude](#)**INSTPEAK COLUMN**

Location: Analysis (Analog Table)**Description:** The highest absolute value of all of the samples between the two zero reference crossings surrounding the data bar (black solid line).**Comments:** The value is displayed as Peak type. If the data type for the loaded driver is set to RMS type, then the value is multiplied by the square root of 2.**See Also:** [InstVal Column](#)
[RMS Column](#)**INSTVAL COLUMN**

Location: Analysis (Analog Table)**Description:** Displays the instantaneous sample value at the data bar.**Comments:** This value is multiplied by the square root of 2 if the driver's data type is set to RMS type.**See Also:** [InstPeak Column](#)
[Data Bar](#)**INVERT MARKED ANALOG CHANNELS**

Location: Analysis**Description:** Invert All the Marked Analog Channels.**Activation:** Opposite click on analog information table.**Comments:** To activate, first mark the desired analog channels using the spacebar or mouse. Next, right click on the analog channel table and select the Invert Marked Channels menu option. If there are no analog channels marked then this option will be disabled.

All of the marked channels scale factor will be multiplied by -1. To restore the original, mark the channels again and select the popup menu option Invert again.

See Also: [Software Analog Channels](#)

LESS THAN (<)

Location: Query Fields

Description: Search the active table for rows that are less than the entered criteria.

Comments: To change the operator, press F9 or click the mouse button on the operator symbol.

See Also: [Equal To \(=\)](#)
[Greater Than \(>\)](#)

LST

Location: Waveform Summary (Events/Sensors Activity Summary)

Description: Displays the status of the last digital samples in the file. Lst is the second column in the Events/Sensors Activity Summary. A=Alarm, N=Normal.

Comments: This data is also displayed in the third column of the digital information table view.

See Also: [Waveform Summary](#)

LST-CHANGE

Location: Waveform Summary (Events/Sensors Activity Summary)

Description: Displays the date and time the digital channel last changed state. Lst-Change is the fourth column in the Events/Sensors Activity Summary.

Comments: This data is also displayed in the fifth column of the digital information table view.

See Also: [Waveform Summary](#)

MARK & SAVE

Location: Analysis

Description: The Mark and Save window saves selected analog data to a user defined ASCII file using the selected template file. To open the Mark and Save window select the Mark Save option under the Waveform tab. The window is divided into two sections. The top section displays the contents of the selected template file in a notepad editor and contains a drop-down list to select the template file. The list is initially populated with all the files that have a *.FMT extension that are located in the Wavewin directory. A browse button is available to add template files to the list that are located in other directories. The bottom section displays the contents of the values file in a notepad editor and the location and name of the file.

Activation: *Menu:* Alt-(A) Values, (W) Mark & Save Window



Ribbon, Waveform Tab:

- Fields:**
- Template File:* The template path and filename.
 - Use Default:* Use default will save all the analog table columns as they are displayed.
 - Template Contents:* List all the commands in the template file.
 - Values Files:* The values file path and filename.
 - Values Contents:* Displays the contents of the values file.

- Options:**
- Mark:* Save the values at the data bar to the values file.
 - Clear:* Clear the values note pad data.
 - Save:* Save the template file and the values file.
 - Help:* Display the help window for the mark and save dialog.
 - Close:* Close the mark and save dialog.

Comments: The Apply Unit Prefix will multiply all analog values by 1000 if the values are in kilo. The truncate Values will save only integer values.

The Use Default checkbox will write the visible analog columns to the Values notepad with a header for each column.

Window Commands

- <Station> Writes the full Station name.
- <Station:12> Writes the first 12 characters of the Station name.
- <Device> Writes the full Device name.
- <Device:6> Writes the first 6 characters of the Device name.
- <Date:F> Writes the Date at the data bar in the following format mm/dd/yyyy.
- <Time:F> Writes the Time at the data bar in the following format hh:mm:ss.zzzzzz.
- <Date:U> Writes the Date at the data bar in the following format yyyyymmdd.
- <Time:U> Writes the Time at the data bar in the following format hhmmsszzz.
- <Cycles> Writes the number of Cycles between the data bar and the reference bar.
- <DeltaX> Writes the time difference between the data bar and the reference bar.
- <Line> Writes the active Line name.

Analog Commands

- <> Write the analog data at the data bar,
- [] Write the analog data at the reference bar,
- Number Writes the visible analog column data at the date bar separated by commas for specified Channel number.
- ^Number Writes the visible analog column data separated by commas for the Channel in position 1.
- :R Writes the RMS value.
- :T Writes the Channel Title.
- :U Writes the Channel Unit.
- :P Writes the Phase value.
- :I Writes the Instantaneous value.
- :F Writes the DFT magnitude for the specified Harmonic. For example, ^6:F0 writes the DFT Magnitude of the DC Offset for channel 6 and ^6:F2 writes the DFT Magnitude of the 2nd Harmonic for channel 6.


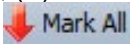
| | |
|---------|---|
| :D | Writes the Duration of the Fault. |
| :% | Write the Percentage of Nominal from the Prefault bar to the Fault bar. |
| %v | Writes the <i>measured voltage sag</i> immunity. |
| :Number | Specifies the width of the analog data values. Will only be applied if the defined width is greater than the length of the data values. Spaces are padded to the beginning of the written values. This is used to right justify values. |
| :S | The skew of the 3 analog channels using the angles. The S command is used with 3 analog channels <1,2,3:S>. This command adds the 3 angles at the cursor. One of the channels must be marked as a reference channel. |
| :B | The Unbalanced Value for 3 Channels. The B command is used with 3 analog channels <1,2,3:B>. This command finds the highest and lowest DFT magnitude of the 3 channels. The result is the highest – lowest. |
| :N | The Negative Sequence for 3 Channels. The N command is used with 3 analog channels <^1,^2,^3:N>. This command computes the negative sequence for the 3 current or voltage channels in position 1, 2 and 3 on the screen. The magnitude for the negative sequence result is displayed. |
| :M | The M command is used for an entire channel. It calculates the maximum value of the channel minus the minimum value of the channel divided by 2 ((max-min)/2), <^1:M>. Since the command is not sample based both types of brackets can be used (<>,[]). |
| :SG100 | The letter G or L followed by a number after the :S, :B, :M or :N defines a trigger. The letter G stands for greater than and L is less than. If the result is true than Alarm is displayed else Normal is displayed. |
| :BL50 | |
| :NG5000 | |
| :ML700 | |

See Also: [Edit Marks](#)
[Clear Marks](#)
[Mark Scan](#)
[Next Marked Scan](#)

MARK ALL ROWS

Location: All Tables

Description: Mark all the rows in the table.

Activation: *Direct:* Mark menu button (if no files are marked). 
Menu: Alt-(M) Mark, (A) Mark All
Ribbon, Files Tab: 

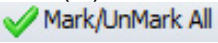
Comments: Marked rows are displayed in red. The TotMarks field displayed in the status bar is updated accordingly. The Mark menu button toggles between marking and unmarking all rows in the table. To mark rows, use the mouse, shift mouse, Ctrl mouse or the spacebar.

See Also: [Unmarked Marked Rows](#)
[Flip Marks](#)
[Group Marked Rows](#)

MARK/UNMARK ALL CHANNELS

Location: Analysis

Description: If channels are marked then unmark all analog & digital channels otherwise mark all the channels.

Activation: *Direct:* F8
Menu: Alt-(C) Channels, (M) Mark/UnMark All
Ribbon, Files Tab: 

Comments: When an analog channel is marked the ID, title, Scale, and units are displayed in red. When a digital channel is marked the ID, and titles are displayed in red. To mark or unmark a channel click the channel's corresponding ID number or title or use the space bar.

See Also: [Analog Mark/Unmark All](#)
[Digital Mark/Unmark All](#)

MARK/UNMARK ROW

Location: All Tables

Description: Toggle the row at the cursor position between the marked and unmarked state.

Activation: *Direct:* Spacebar, Ctrl-Left Mouse Click
Menu: Alt-(M) Mark, (M) Un/Mark
Ribbon, Files Tab: 

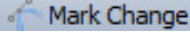
Comments: Marked rows are displayed in red. The TotMarks field displayed in the status bar is updated accordingly. The Un/Mark option toggles the active row in the table between the marked and unmarked state. To mark rows, use the mouse, shift mouse, Ctrl mouse or the spacebar.

See Also: [Unmarked Marked Rows](#)
[Flip Marks](#)
[Group Marked Rows](#)

MARK CHANGE IN SIGN

Location: Analysis

Description: Mark all positions in the analog channels where the waveform changed in sign.

Activation: *Menu:* Alt-(A) Values, (H) Mark Change in Sign Values
Ribbon, Waveform Tab: 

Comments: A small gray triangle marks the change in sign position. The Mark Change option is an On/Off feature. When the option is highlighted, the feature is ON, and when not highlighted it is OFF.

See Also: [Mark Raw Values](#)
[Mark Peak Values](#)

MARK PEAK VALUES

Location: Analysis

Description: Mark all positive and negative peaks on the analog channels.

Activation: *Menu:* Alt-(A) Values, (H) Mark Peak Values

Ribbon, Waveform Tab:  Mark Peaks

Comments: A small gray square marks the positive and negative peaks. The Mark Peak Values option is an On/Off feature. When the option is highlighted, the feature is ON, and when not highlighted it is OFF.

See Also: [Mark Change in Sign](#)
[Mark Raw Values](#)

MARK RAW VALUES

Location: Analysis

Description: Mark all the raw samples read from the active waveform file.

Activation: *Menu:* Alt-(A) Values, (M) Mark Raw Values

Ribbon, Waveform Tab:  Mark Raw

Comments: A small hollow blue circle is placed at the raw samples read from the file. The Mark Raw Values option is an On/Off feature. When the option is highlighted, the feature is ON, and when not highlighted it is OFF.

See Also: [Mark Change in Sign](#)
[Mark Peak Values](#)

MARK SCAN

Location: Analysis

Description: Mark a scan in the active window.

Activation: *Direct:* Ctrl-S

Menu: Alt-(A) Values, (S) Mark Scan



Ribbon, Channels Tab:

Comments: Use the Mark Scan option to mark a scan in the active window. Marked scans have a red upside-down T above each marked scan. Scans are marked either in the Mark and Save dialog or by clicking on the Mark Scan option under the Waveform tab. When the cursor is placed over the scan the comment is displayed in a hint window.

See Also: [Clear Marks](#)
[Edit Marks](#)
[Mark & Save](#)
[Next Marked Scan](#)

MAXPEAK COLUMN

Location: Analysis (Analog Table)

Description: Displays the maximum peak value of the channel.

Comments: If the active driver's data type is set to RMS calibrated then the files MaxPeak value is multiplied by Root 2.

See Also: [MinPeak Column](#)

MAXVAL COLUMN

Location: Analysis (Analog Table)

Description: Displays the maximum value of the channel.

Comments: This column is displayed if the active driver's data type is set to Non-Sinusoidal-Log Files.

See Also: [MinVal Column](#)

MAXWIN COLUMN

Location: Analysis (Analog Table)

Description: Displays the absolute maximum value between the RMS bar (black dotted line) and the data bar (black solid line).


Comments: This column is displayed if the active driver's data type is set to Non-Sinusoidal-Log Files.

See Also: [Data Bar](#)
[RMS Bar](#)

MEDIUM DISPLAY

Location: Analysis

Description: Displays the analog channel using the maximum pixels allowed with no zero-reference point. The medium display is activated through the Auto Scale feature.

Activation: *Direct:* F6, - Auto Scale button 
Menu: Alt-(D) Data, (A) Auto Scale, (P) Plus

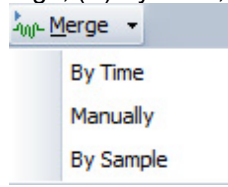


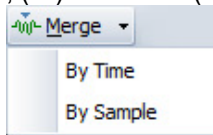
Ribbon, Data Tab:

Comments: The Auto Scale toggles between (Off, On, ++ and Units). Plus (++) plots the signal using the number of maximum pixels allowed for the channel. The highest value is plotted at the maximum position allowed and the smallest value is plotted at the lowest position allowed. This feature was added to clearly show the profile of frequency, Vdc and load data channels.

See Also: [AS Status Field](#)

[Auto Scaling](#)**MERGE OPEN FILES**

Location: Analysis**Description:** Merge the visible or marked channels from all the open analysis windows into a new data window. There are three Merge options available. Merge files By Time will merge only the common times in the open files. Merge files Manually will merge the data according to the positions of the data bars in each open window. Merge files By Sample will merge the files by lining up the samples in each open window.**Activation:** *Menu:* Alt-(F) File, (G) Merge, (B) By Time, (M) Manually, (S) By Sample*Ribbon, Waveform Tab:***Comments:** To distinguish between the merged channels the station name is placed before each merged channel. To deactivate this feature, open the Window Properties dialog, select the Append/Merge tab and click the Merge Files option. If the files have different sampling frequencies a dialog will be displayed to select the frequency for the new window.**See Also:** [Change Frequency](#)
[Merge Waveform Files](#)**MERGE WAVEFORM FILES**

Location: File Manager**Description:** Merge all the channels from the marked waveform files into an analysis window. There are two Merge options available. Merge files By Time will merge only the common times in the open files. Merge files By Sample will merge the files by lining up the samples in each marked file.**Activation:** *Menu:* Alt-(O) Options, (W) Waveform(s), (M) Merge, (B) By Time, (S) By Sample*Ribbon, Options Tab:***Comments:** To distinguish between the merged channels, the station name is placed before each channel merged. To deactivate this feature, open the analysis Window Properties dialog in the data plotting window, select the Append/Merge tab and click the Merge Files option. If the files have different sampling frequencies a dialog will be displayed to select the frequency for the new window.**See Also:** [Merge Open Files](#)**MINPEAK COLUMN**

Location: Analysis (Analog Table)

Description: MinPeak is the column that displays the minimum peak value of the channel.

Comments: If the active driver's data type is set to RMS calibrated then the files minpeak value is multiplied by Root 2.

See Also: [MaxPeak Column](#)

MINVAL COLUMN

Location: Analysis (Analog Table)

Description: Displays the minimum value of the channel.

Comments: This column is displayed if the active driver's data type is set to Non-Sinusoidal-Log Files.

See Also: [MaxVal Column](#)

MOVE ANALOG CHANNELS

Location: Analysis

Description: Move the marked analog channels.

Activation: *Direct:* + key: Move the marked analog channels up one channel.
 - key: Move the marked analog channels down one channel.
 Drag and Drop, Mark the Channels then Drag the channels to a specific location.
Menu: Alt-(C) Channels, (U) Shift Marks Up
 Alt-(C) Channels, (W) Shift Marks Down

Ribbon, Channels Tab: Shift Channels Up 

Ribbon, Channels Tab: Shift Channels Down 

Comments: Individual channels can be marked or unmarked by clicking the channels corresponding display ID number or the channel table data, or by pressing the spacebar. Marked channels are displayed in red. To restore the channels back to their original position, select the Reorder Channels option under the Channels tab.

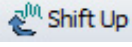
See Also: [Drag Drop Channels](#)
[Shift Marks Up](#)
[Shift Marks Down](#)
[Reorder Channels](#)

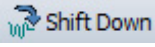
MOVE DIGITAL CHANNELS

Location: Analysis

Description: Move the marked digital channels.

Activation: *Direct:* + key: Move the marked digital channels up one channel.
 - key: Move the marked digital channels down one channel.
Menu: Alt-(C) Channels, (U) Shift Marks Up
 Alt-(C) Channels, (W) Shift Marks Down

Ribbon, Channels Tab: Shift Channels Up 

Ribbon, Channels Tab: Shift Channels Down 



Comments: Individual digital channels can be marked or unmarked by clicking the channels corresponding display ID number or channel table data, or by pressing the spacebar. Marked channels are displayed in red. Use the + and – keys to rearrange the marked digital channels. To toggle between the analog channels and the digital channels use the tab key.

See Also: [Shift Marks Up](#)
[Shift Marks Down](#)

MOVE FILES

Location: File Manager

Description: Copy the marked files to the specified destination path then delete the files from the source directory. If a file is not copied successfully, it is marked and grouped at the top of the active directory. To create a new destination directory, click on the New Folder button.

Activation: *Direct:* F9, - Move menu button 
Menu: Alt-(F) Files, (M) Move To...
Ribbon, Files Tab: 

Fields: *Folder Tree:* Navigate and select the destination folder.

Options: *New Folder:* Create a new folder under the selected path.
Enter/Ok: Move the marked files to the destination path.
Esc/Cancel: Exit the dialog without executing the command.

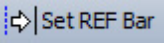
Comments: Marked files are displayed in red. The TotMarks and MrkSize fields displayed in the status bar are updated accordingly.

See Also: [Copy Files](#)
[Mark/Unmark File](#)

MOVE REFERENCE BAR TO DATA BAR

Location: Analysis

Description: Move the Reference bar (blue dotted line) to the sample at the Data bar position (black solid line).

Activation: *Direct:* Ctrl-A
Menu: Alt-(V) View, (M) Move Reference Bar to Data Bar
Ribbon, Waveform Tab: 

Comments: The Delta time field (Delta X) in the status bar at the bottom of the screen displays the time difference between the reference bar and the data bar. If the time difference between the samples is in milliseconds or microseconds, then the number of cycles between the two bars is also displayed.

See Also: [Data Bar](#)

[Delta X](#)
[Reference Bar](#)

MOVE RMS BAR TO REFERENCE BAR

Location: Analysis

Description: Move the RMS bar (black dotted line) to the sample at the Reference bar position (blue dotted line).

Activation: *Direct:* Ctrl-Z
Menu: Alt-(V) View, (R) Move RMS Bar to Reference Bar

Ribbon, Waveform Tab:  Set RMS Bar

Comments: The RMS and Data bars define the RMS sliding window.

See Also: [Data Bar](#)
[Reference Bar](#)
[RMS Bar](#)

MRKSIZE

Location: File Manager (Status Field)

Description: Displays the size (in Kbytes) of all marked files.


See Also: [Size](#)
[Free](#)

NEW FILE

Location: ASCII Editor

Description: Open a new empty ASCII edit window with the title defaulted too Untitled.

Activation: *Menu:* Alt-(F) File, (N) New...

Ribbon, File Tab:  New

See Also: [Open File](#)

NEXT MARKED SCAN

Location: Analysis

Description: Move to the next marked scan in the active window.

Activation: *Direct:* Ctrl-X
Menu: Alt-(A) Values, (N) Next Marked Scan

Ribbon, Channels Tab:  Next Marked

Comments: Use the Next Marked Scan option to navigate between each marked scan in the active window. Marked scans have a red upside-down T above each marked scan. Scans are marked either in the Mark and Save dialog or by clicking on the Mark Scan option under the Waveform tab. Each marked scan can have a comment associated with it. To add a comment to each scan, use the Edit Marks option under the Waveform tab. When the cursor is placed over the scan the comment is displayed in a hint window.

See Also: [Edit Marks](#)
[Clear Marks](#)
[Mark & Save](#)
[Mark Scan](#)

ONEBIT

Location: Waveform Summary

Description: Displays the analog channel's full-scale value divided by the channel's resolution.

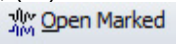
Comments: The OneBit value is the channel's full-scale value.

See Also: [Waveform Summary](#)

OPEN ALL MARKED WAVEFORM FILES

Location: File Manager

Description: Open all the marked waveform files in the file table and minimize the file table.

Activation: *Menu:* Alt-(O) Options, (W) Waveform File(s), (F) Open All Marked Files
Ribbon, Options Tab: 

Comments: All the marked waveform files are opened, tiled and the file table is minimized. A maximum of 10 data windows can be open at one time.


See Also: [Open Waveform File](#)
[Associating File Types](#)

OPEN CFG FILE

Location: Analysis

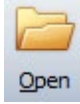
Description: Open the Comtrade files CFG file. The CFG file will be displayed in a new ASCII edit window.

Activation: *Menu:* Alt-(F) File, Open CFG File

Ribbon, File Tab: 

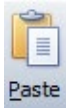
Comments: This will allow for viewing or editing the contents of the channel configurations.

OPEN FILE

Location: ASCII Editor**Description:** Open an existing file. The selected file will be displayed in a new ASCII edit window.**Activation:** *Menu:* Alt-(F) File, (O) Open...*Ribbon, File Tab:***Comments:** The Window's Open File dialog is displayed. Click on the file then click the Open button.**See Also:** [New File](#)**OPEN WAVEFORM FILE**

Location: Analysis**Description:** Open a waveform file. The selected file will be displayed in a new analysis window.**Activation:** *Menu:* Alt-(F) File, (O) Open...*Ribbon, Waveform Tab:* **Open** ▾**Comments:** To open a previously opened file, click on the drop-down list and select the file. To open a new file, click on the button. The Window's Open File dialog is displayed. Navigate to the file, click on the file then click the Open button.**See Also:** [Reopen Waveform File](#)**OPTIONAL COLUMNS**

Location: File Manager**Description:** The IEEE long file naming format allows for user defined fields appended at the end of the filename. The file table reserves 4 columns for the first 4 user defined fields. The columns are named Optional-1 to Optional-4.**See Also:** [IEEE Long File Naming Format](#)**PASTE TEXT**

Location: ASCII Editor**Description:** Paste the contents of the clipboard into the document at the cursor position. Existing blocked text is overwritten with the contents of the clipboard.**Activation:** *Direct:* Ctrl-V, Shift-Ins - Paste menu button
Menu: Alt-(E) Edit, (P) Paste*Ribbon, File Tab:*

Comments: Use the shift keys and the up, down, page up and page down keys to block file text.

See Also: [Copy Text](#)
[Cut Text](#)

PATH/FILENAME (NO EXT.)

Location: Save as COMTRADE Dialog (ASCII/Binary)

Description: Displays the destination path and filename of the new COMTRADE file.

Comments: The oscillography file at the cursor position is saved in COMTRADE format to the specified filename. When specifying a filename exclude the extension, the “.CFF” or “.CFG” and “.DAT” files are automatically assigned. If a path is not specified, then the files are saved to the active directory. Select the Comtrade format from the Save As Type drop-down list.

Restrictions: The filename cannot contain an extension.

See Also: [Save As Comtrade](#)

PEAK HOP

Location: Analysis

Description: Move the data bar (vertical black solid line) to the next or previous peak for the first channel or the first marked channel.

Activation: *Direct:* Ctrl-Left arrow and Ctrl-Right arrow

Comments: Use the ctrl left/right keys to move the data bar to the next or previous peak for the first displayed channel or the first marked channel. The number of cycles from the data bar to the reference bar is displayed in the Delta X status bar.

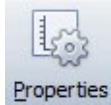
See Also: [Cycle Hop](#)
[Data Bar](#)
[Delta X](#)
[Reference Bar](#)

PHASOR/CIRCULAR CHART SCALE MULTIPLIER (ASM)

Location: Analysis (Window Properties Dialog)

Description: Used as a multiplier to increase/decrease the length of a vector in the phasor diagram or to increase/decrease the circular chart data.

Activation: *Menu:* Alt-(F) File, (T) Window Properties..., Display Settings Tab



Ribbon, Waveform Tab: **Properties**, Display Settings Tab

Range: Greater Than 1.00

Default: 1.75

Comments: When a channel's amplitude is increased, the phasor/circular chart scale value is multiplied with the scale multiplier value, and when the channel's amplitude is decreased the phasor/circular chart scale value is divided by the scale multiplier value .

See Also: [Window Properties](#)

PLAY CHANNELS AUDIO

Location: Analysis

Description: Plays the audio of the first marked analog channel. If no channels are marked, then it plays the audio of the first displayed channel.

Activation: *Menu:* Alt-(D) Data, (P) Play Channels Audio


Ribbon, Channels Tab:  Play Audio

Fields:

| | |
|------------------------|---|
| <i>Analog Channel:</i> | Title of the active analog channel. |
| <i>Save Audio:</i> | Save the analog channel data to the windows “.WAV” format. |
| <i>Audio Filename:</i> | The path and name of the saved “.WAV” file. |
| <i>Folder Button:</i> | A list of folders. Select the desired drive/folder and enter the file name. |

Options:

| | |
|----------------|---|
| <i>Play:</i> | Play the active analog channels data. |
| <i>Volume:</i> | Decrease/Increase the volume of the output. |

Comments: Marked channels are displayed in red. The Active Channel section displays the active analog channel in the analysis window. The Audio Controls section allows for playing the active analog channel's data through the computers speakers and for increasing/decreasing the volume of the output. The Save “.WAV” File section allows for saving the analog channel data in the Window's “.WAV” format. Click the folder button  to select a destination Folder and enter a new “.WAV” file or select an existing “.WAV” file. The selected file path and name will be updated in the Audio Filename field.


See Also: [Analog Mark/Unmark All](#)

PRIMARY VALUES

Location: Analysis (Analog Table)

Description: The values displayed in the analog table are either in primary or secondary quantities. If the file defines the type of values saved, then the type is displayed in the window header. Also, if the CT and PT ratios are defined in the configuration file then the values can be changed from primary to secondary and vice versa. To change the values, open the properties dialog and click on the Driver Data Type tab, select the Primary or Secondary radio button to switch between values.

Activation: *Direct:* Window Properties Menu button  Driver Data Type Tab
Menu: Alt-(F) File, (T) Window Properties..., Driver Data Type Tab

Ribbon, Waveform Tab:  Properties, Driver Data Type Tab

Comments: The CT and PT ratio values can also be changed using the Edit Ratio Values button located in the Driver Data Type tab.

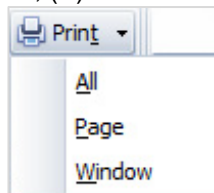
See Also: [Ratio Values](#)
[Secondary Values](#)

PRINT ALL DATA

Location: Analysis

Description: Print all the data for the visible analog and digital channels.

Activation: *Menu:* Alt-(F) File, (P) Print, (A) All



Ribbon, Waveform Tab:

Comments: The printed pages include the page number and the date/time of the first sample on the page. The channel information is printed at the end of the data. Use the print page option to print only the contents of the data window.

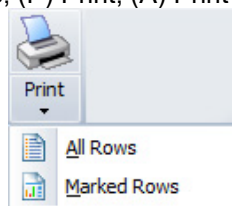
See Also: [Printer Setup](#)

PRINT ALL ROWS

Location: All Tables

Description: Print all the rows in active table.

Activation: *Menu:* Alt-(F) Files, (P) Print, (A) Print All Rows



Ribbon, Files Tab:

Comments: Use the Print Marked option to print only the marked files.

See Also: [Printer Setup](#)

PRINTER SETUP

Location: All child windows.

Description: Change the printer type and set up the current printer.

Activation: *Menu:* Alt-(F) File, (S) Printer Setup

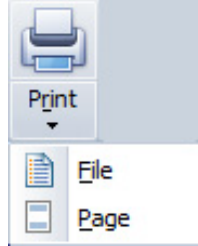
Ribbon, Files Tab:  Setup
 Ribbon Waveform Tab:

PRINT FILE

Location: ASCII/Binary Editors

Description: Print all pages in the open file.

Activation: *Menu:* Alt-(F) File, (P) Print, (F) File



Ribbon, File Tab:

Comments: The printer must be registered in the system's WIN.INI file. In the ASCII/Binary editors, use the Print/ Page option to print the current page.

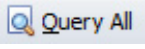
See Also: [Printer Setup](#)

QUERY ALL ROWS

Location: Query Fields

Description: Compare the entered criteria to all the rows in the active table.

Activation: *Direct:* F6, <enter>
Menu: Alt-(Q) Query, (A) All Files

Ribbon, Files Tab:  Query All

Comments: All the rows in the active table are compared to the entered query criteria. A marked row that does not meet the query requirements is unmarked. The rows that meet the query requirements are marked and grouped at the top of the table. Marked rows are displayed in red.

The Enter key searches all the records in the table.

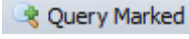
See Also: [Query Marked Rows](#)
[Query Unmarked Rows](#)
[Clear Query Criteria](#)

QUERY MARKED ROWS

Location: Query Fields

Description: Compare the entered criteria to the marked rows in the active table.

Activation: *Direct:* F5
Menu: Alt-(Q) Query, (M) Marked Files

Ribbon, Files Tab: 

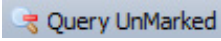
Comments: The marked rows that meet the query requirements are marked and grouped at the top of the table. All other marked rows are unmarked. Marked rows are displayed in red.

See Also: [Query Unmarked Rows](#)
[Query All Rows](#)

QUERY UNMARKED ROWS

Location: Query Fields

Description: Compare the entered criteria to the unmarked rows in the active table.

Activation: *Direct:* F7
Menu: Alt-(Q) Query, (U) UnMarked Files
Ribbon, Files Tab: 

Comments: The unmarked rows that meet the query requirements are marked and grouped below the previous marked rows. Marked rows are displayed in red.


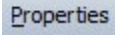
See Also: [Query Marked Rows](#)
[Query All Rows](#)

RATIO VALUES

Location: Analysis

Description: Edit the CT and PT ratio values.

Activation: *Direct:* Windows Properties menu button , Data Type Tab, Edit Ratio Values Button
Menu: Alt-(F) File, (T) Window Properties..., Driver Data Type Tab, Edit Ratio Values


Ribbon, Waveform Tab: , Driver Data Type Tab, Edit Ratio Values Button

Fields: *Channel:* Channel Number and Title.
Primary: Channel's primary value.
Secondary: Channel's secondary value.

Options: *Enter/OK:* Save and close the dialog.
Esc/Cancel: Exit the dialog without saving.

Comments: The values are listed in a table format for each analog channel. The modified ratio values are not saved to the original file. To save the edited ratio values use the Save As option under the Waveform Tab.


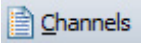
See Also: [Primary Values](#)
[Secondary Values](#)

RECORDED CHANNELS

Location: Analysis

Description: Display the following information for the active oscillography file:

| | | |
|-----------|------------------------|-----------------------|
| Channel # | Analog Channel Titles | Full Scale Values |
| SAC # | SAC Titles | Full Scale Values |
| Channel # | Digital Channel Titles | Original State Values |
| SDC # | SDC Titles | Original State Values |

Activation: *Direct:* F2 - Channel menu button 
Menu: Alt-(F) Files, (R) Recorded Channels...
Ribbon, Waveform Tab: 

Comments: Triggered digital channel titles are displayed in red. All valid and invalid channels are displayed.

REFERENCE BAR

Location: Analysis

Description: The reference bar is displayed as a blue dotted line. The reference bar is defaulted to the second cycle in the file.

Comments: To move the reference bar to the position of the data bar use the Move Reference Bar to Data Bar option under the Waveform tab or press Ctrl-A. Click the opposite mouse button to move the reference bar to any position in the trace area. The status field Delta X in the status bar at the bottom of the screen shows the time difference (in milliseconds or seconds) between the reference bar and the data bar. It also shows how many cycles are between the two bars.

The default position of the reference bar is two cycles from the first sample.

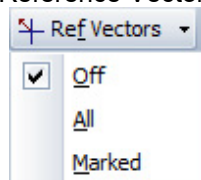
See Also: [Data Bar](#)
[Delta X](#)
[Fault Bar](#)
[RefVal](#)

REFERENCE VECTOR

Location: Analysis

Description: Display a vector for the reference bar in the phasor window. The reference bar is the blue dotted line.

Activation: *Menu:* Alt-(V) View, (F) Reference Vectors (Off, All & Marked)



Ribbon, Waveform Tab:

Comments: The reference bar is positioned at the second cycle in the file. To move the reference bar right click in the trace window. The vector at the reference bar is displayed for all the channels or just the marked channels.




The reference vector is used to measure phase shifts. The reference vector drop-down list options are off, all or marked channels.

See Also: [Reference Bar](#)
[RefVal Column](#)

REFRESH

Location: File Manager

Description: Update the contents of the folder tree and the active directory from the operating system's allocation table.

Activation: *Direct:* F12, Refresh button , Opposite click in the Folder Tree and select  Refresh
Menu: Alt-(F) Files, (F) Refresh Directory
Ribbon, Files Tab:  Refresh

See Also: [Folder Tree](#)

REFVAL COLUMN

Location: Analysis (Analog Table)

Description: Displays the sample value at the Reference bar (blue dotted line).



Comments: If the active driver's data type is set to RMS type, the sample value at the reference bar position is multiplied by the square root of 2.

See Also: [Reference Bar](#)
[Reference Vector](#)

RENAME FILE/DIRECTORY

Location: File Manager

Description: Rename the file or directory at the cursor position.

Activation: *Direct:* Opposite click in the Folder Tree and select  Rename
Menu: Alt-(F) Files, (N) Rename File/Directory...
Ribbon, Files Tab:  Rename


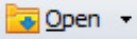
Fields: *From:* The current name of the file.
To: The new name of the file.

Options: *Enter/Ok:* Change the name.
Esc/Cancel: Exit the dialog without executing the command.

REOPEN A WAVEFORM FILE

Location: Analysis

Description: Reopen a file that was previously viewed.

Activation: Menu *Button Bar*: Open File drop down menu button 
Ribbon, Waveform Tab:  Open ▾

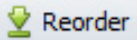
Comments: A list of the last 14 open files is displayed in a drop-down menu. Click on the file to reopen. To open a new file, click on the button to display the Window's Open File dialog.

See Also: [Open Waveform File](#)

REORDER CHANNELS

Location: Analysis

Description: Reorder all the analog channels to their original position when the file was first opened.

Activation: *Menu*: Alt-(C) Channels, (O) Reorder Channels
Ribbon, Channels Tab:  Reorder

Comments: After moving channels or after selecting views the channels can be positioned back to their original position by selecting this option.

See Also: [Shift Marks Up](#)
[Shift Marks Down](#)
[Drag Drop Channels](#)

RESIZE COLUMNS

Location: All Tables

Description: Resize the columns in the table.

Activation: *Direct*: Mouse Drag

Comments: To resize the table columns, place the mouse over the column separator and drag to the right or the left. The cursor changes to the vertical resize cursor when the mouse is positioned over the column separator. Double click the mouse over the separators to make the column size the maximum area to display all the text in the column.

See Also: [Display Dialog](#)

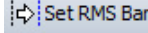
RESIZE SLIDING WINDOW

Location: Analysis

Description: Resize the RMS sliding window.

Activation: *Menu*: Alt-(V) View, (W) Set Sliding Window Size...

Ribbon, Waveform Tab: 

Comments: To automatically resize the RMS sliding window click on the Sliding Win drop list and select a size from the list or click on Sliding Win button to display the resize sliding window dialog. To manually resize the RMS sliding window click the right mouse button to set the reference position. Then click the  option. The RMS bar is moved to the reference position. The Delta time (Delta X) field displayed in the status bar at the bottom of the screen shows the time difference (in milliseconds or seconds) and the number of cycles between the reference and data bars. Use the left, right, ctrl+left, and ctrl+right keys or the horizontal scroll bar to move the sliding window.

See Also: [Data Bar](#)
[Move RMS bar to Reference Bar](#)
[Reference Bar](#)
[RMS Bar](#)

RESTORE MARK(S)

Location: Analysis

Description: Restore all the hidden analog channels. The delete key removes the marked analog channels and the insert key restores the channels.

Activation: *Direct:* Insert
Menu: Alt-(C) Channels, (R) Restore Mark(s)

Ribbon, Channels Tab: 

Comments: To hide channels first mark the channels then press the delete key. Marked channels are displayed in red. To mark channels, click on the channel ID number or title or use the spacebar.

See Also: [Hide Mark\(s\)](#)
[Show All Hidden](#)
[View Mark\(s\)](#)

RESTORE ORIGINAL

Location: Analysis

Description: Restore the displayed file to the original samples stored in the file. This feature will undo all changes made using the change frequency, duplicate cycles and truncate cycles features.

Activation: *Menu:* Alt-(D) Data, (R) Restore Original Data

Ribbon, Data Tab: 

Comments: If the Open Frequency option is checked in the Change Frequency dialog the Restore Original is not available.

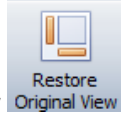
See Also: [Duplicate Cycles](#)
[Truncate Cycles](#)
[Change Frequency](#)

RESTORE ORIGINAL VIEW

Location: Analysis

Description: Restore the analog channels, digital channels, phasors, and the analog table back to the original view when the file was first opened.

Activation: *Menu:* Alt-(V) View, (O) Restore Original View



Ribbon, Waveform Tab:

Comments: To restore the original view, select the Restore Original View menu option under the View menu in the Menu system or click the Restore Original View icon in the View section under the Waveform tab in the Ribbon System.

See Also: [Hide Mark\(s\)](#)
[Show All Hidden](#)
[View Mark\(s\)](#)

RMS COLUMN

Location: Analysis (Analog Table)

Description: Displays the RMS value for all samples positioned between the RMS bar (black dotted line) and the data bar (black solid line). If the data is RMS type, each sample value is multiplied by the square root of 2 before it is squared.

See Also: [Data Bar](#)
[RMS Bar](#)

RMS BAR

Location: Analysis

Description: The RMS bar is the black dotted line that runs vertically across the analog and digital channels. The RMS bar and data bar define the RMS sliding window.


Comments: When the analysis window is initially opened the sliding window is defaulted to one cycle. The sliding window is used to calculate the RMS value for all samples positioned between the data bar and the RMS bar. This value is displayed in the Analog View.

To resize the sliding window, click the right mouse button to set the reference bar position and the left mouse button to set the data bar position then select the Set RMS Bar option under the Waveform tab. The button will move the RMS bar to the reference bar.

See Also: [Data Bar](#)
[Fault Bar](#)
[RMS Column](#)

ROSE PLOTS

Location: Analysis

Description: The Rose plots feature plots the waveform signal using the circular charts. To plot a rose chart, first mark the channels to plot then hit enter to isolate the channels. Next, click on the C button above the phasor diagram. The rose charts display a small circle the same color as the signal color if the value is a negative value. To return to the phasor display click on the  button above the rose chart.

Activation: *Menu & Ribbon:*



See Also: [Three-D Plots](#)

SAMPLE BASED DISPLAY

Location: Analysis

Description: The sample base display plots the channel data with 1 pixel distance between each displayed sample. Sample based displays are useful for showing changes in the sampling frequency.

Comments: To change the trace display settings, open the Properties dialog under the Waveform tab. Click the Display Settings tab and change the Trace Display Type field to time based or sample based.

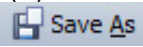
See Also: [Time Based Display](#)

SAVE AS

Location: ASCII/Binary Editor

Description: Save the opened file to a new name.

Activation: *Menu:* Alt-(F) File, (A) Save As...

Ribbon, File Tab: 

See Also: [Save As Text](#)

SAVE AS

Location: File Manager and Analysis

Description: Save the waveform file(s) or the displayed analog/digital channels to the COMTRADE ASCII or Binary format or the RMS Values, Instantaneous Values and Vector Values.

Activation: **File Manager – Menu:** Alt-(F) Files, Save As
Analysis – Menu: Alt-(F) File, Save As



File Manager: *Ribbon, Files Tab:*

Analysis: *Ribbon, Waveform Tab:*

Fields: *Path:* The destination path.

Filename: The filename with no extension.
Use the ComNames Naming Convention: Check this box to have the file automatically named using the IEEE long file naming format.
Save As Type: Select the File format from the drop-down list.
Save SEL Settings: Save the SEL setting to the .HDR file.
Files: When using the Save As dialog from the file manager the Files section is displayed. Select the files to Save, Selected File, All Files or Marked files.

Options: *Enter/Ok:* Read the file contents and save it in selected format.
Esc/Cancel: Exit the dialog without executing the command.

Comments: Do not enter a filename extension. For COMTRADE Files (.CFG) and data (.DAT) or the single file (.CFF) files are automatically assigned. For the RMS Values, Instantaneous Values and Vector Values format the .CSV extension is assigned. If a path is not defined, the files are saved in the active directory.

There are three Comtrade versions supported: the older 1991 format and the 1999 format and the new 2013 format. The Comtrade format is selected from the Save As Type drop down list.

If the sample values in the selected file are RMS calibrated and the outcome Comtrade file must have instantaneous values, then set the Comtrade Settings fields to automatically convert the RMS data to instantaneous values. To set the Comtrade Settings fields open the Properties dialog in the analysis window. Select the Comtrade tab then select “Yes” for the Convert RMS Calibrated Data to Peak Data field.

The four Save as CSV options are:

- Save As CSV - RMS Values: Save the RMS Values.
- Save As CSV - Instantaneous Values: Save the Instantaneous Values.
- Save As CSV - Vector Values (Mag & Ang): Save the DFT Magnitude and Angle.
- Save As CSV - Vector Values (RMS & Ang): Save the RMS Value and Angle.

The file format is saved as a comma delimited ASCII file and the .CSV extension is automatically assigned. The first line in the file defines the header information.

All files saved using the Save as CSV formats are tagged as SDC files and are plotted using the SDC driver.

To automatically save the files using the IEEE long file naming convention check the Use the ComNames Naming Convention to Name the Comtrade File(s) field in the Save As Dialog and leave the File Name field empty. The selected channels are converted to the selected format and are named using the IEEE long file naming format.

Restrictions: The selected file must be a supported oscillography file.

See Also: [Comtrade Driver](#)
[IEEE Log File Naming Format](#)

SAVE AS TEXT

Location: Binary Editor

Description: Save the binary values in the hex editor to an ASCII text file.

Activation: *Menu:* Alt-(F) File, (T) Save As Text...



Ribbon, File Tab:

See Also: [Save As](#)

SAVE DATE COLUMN

Location: File Manager

Description: Displays the date the file was last saved on disk.

Comments: Click the table's Save Date header to sort the files in ascending or descending order with respect to the Save Date. The Save Time column is also sorted with respect to the save date.

See Also: [Fault Date Column](#)
[Fault Time Column](#)
[Save Time Column](#)

SAVE TIME COLUMN

Location: File Manager

Description: Displays the time the file was last saved on disk.

Comments: Click the table's Save Time header to sort the files in ascending or descending order with respect to the Save Time.

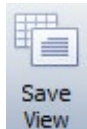
See Also: [Fault Date Column](#)
[Fault Time Column](#)
[Save Date Column](#)

SAVE USER VIEWS

Location: Analysis

Description: Save the displayed view information in an ASCII text file.

Activation: *Menu:* Alt-(V) View, (S) Save View...



Ribbon, Waveform Tab:

Fields:
View File Path: Destination path for the file.
View Name: The name of the view. A file extension is not needed. The “.VIW” extension is automatically assigned.

Options: *Enter/Ok:* Save the view.
Esc/Cancel: Exit the dialog without executing the command.

Comments: The following information is saved:

- Displayed analog channels,
- Analog channel order,
- Superimposed channels,
- Analog channel colors,
- Digital channels displayed,
- Digital channel order,
- Sampling frequency,
- Time scale,
- Sliding window size (RMS bar to Data bar),
- Phasor window size,
- Table window size,
- Red fault bar,
- Auto scale and
- Phasor or circular chart displayed

See Also: [Select User Views](#)
[Select Line Views](#)

SEARCH FILE CONTENTS

Location: File Manager

Description: The Search File Contents dialog allows for searching ASCII files for key words and displaying the results in a table format. To open the dialog, select the Search option under the Files tab.

This dialog allows for selecting the Start Date, End Date, Search Path, the file extensions to search, the key strings to search for and the path where the results will be saved.

Activation: *Menu:* Alt-(F) Files, (E) Search File Contents

Ribbon, Files Tab:  Search

Fields:

| | |
|-----------------------------|--|
| <i>Start Date:</i> | The start date for the search. |
| <i>End Date:</i> | The end date for the search. The search engine will search a file if it's saved date is between the start date and end date. |
| <i>Search Path:</i> | The search path to search the files. |
| <i>Include Sub-Folders:</i> | Include all sub-folders under the search path. |
| <i>Extensions:</i> | List the file extensions to search separated by commas: *.DTB,*.SEL,*.TXT. |
| <i>Search Strings:</i> | The strings to search for in the files separated by commas: password,fault,target. |
| <i>Report Path:</i> | The path to save the search report results too. |

Options:

| | |
|----------------------|---|
| <i>Save:</i> | The entered search fields can be saved to an ASCII text file. |
| <i>Save As:</i> | Save the entered search fields to a new path/filename. |
| <i>Open:</i> | Open an existing search file. |
| <i>Close:</i> | Close the dialog without executing the search. |
| <i>Search:</i> | Start the search. |
| <i>View Results:</i> | View the search results in a table format. |

Comments: The dialog also allows for saving the search fields to an ASCII txt file and for opening existing search files. Use the Save, Save As and Open buttons to save the active search to the active file listed in the status field, save the search fields under a new file name or for opening an existing search file.

To start the search, click the Search button. If results are found then the results are saved to a CSV file with the following file name: yymmdd,hhmmss,Search Results.CSV.

The Search Results window section displays the search path, each file being searched, and the number of search items found.

To view the search results, click the View Results button. A table is displayed with the following columns:

- Occurrence: The occurrence number in the listed filename.
- File Date: The save date of the file.
- File Time: The save time for the file.
- Search String: The search string found.
- Line Number: The line number where the search string was found in the file.
- Line Text: The text of the line number.
- Filename: The path and filename where the search string exists.

To view the file and line number of the search results double click on the table row of the desired search item. The file will be displayed in an ASCII editor at the specified line number.

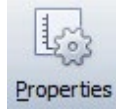
See Also: [Digital Groups](#)

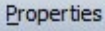
SECONDARY VALUES

Location: Analysis (Analog Table)

Description: The values displayed in the analog table are either in primary or secondary quantities. If the file defines the type of values saved, then the type is displayed in the window header. Also, if the CT and PT ratios are defined in the configuration file then the values can be changed from primary to secondary and vice versa. To change the values, open the properties dialog and click on the Driver Data Type tab, select the Primary or Secondary radio button to switch between values.

Activation: *Direct:* Window Properties Menu button  Driver Data Type Tab
Menu: Alt-(F) File, (T) Window Properties..., Driver Data Type Tab



Ribbon, Waveform Tab: , Driver Data Type Tab

Comments: The CT and PT ratio values can also be changed using the Edit Ratio Values button located in the Driver Data Type tab. The changed ratio values are not saved to the file. To save the changed ratio values select the Save As option in the Waveform tab.

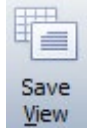
See Also: [Primary Values](#)
[Ratio Values](#)

SEL VIEWS

Location: Analysis

Description: Create SEL Views and have them automatically applied when an SEL file is opened.

Activation: *Menu:* Alt-(V) View, (S) Save View...



Ribbon, Channel Tab:

Comments: SEL Views allows for saving a view for each type of SEL Relay. The view can also be automatically applied when the SEL files are opened. To create the SEL views first select the SEL file in the File Manager, open a summary of the file by selecting Summaries under the Options Tab/Menu. The Device Type listed under the File Information section shows the name of the SEL view file. Next, open an SEL file, setup the view then save the view using the Device Type name listed in the summary display.


For more information refer to the File Manager and Analysis Quick Start.

See Also: [Save User Views](#)
[Select User Views](#)

SELECT LINES/VIEWS


Location: Analysis

Description: Select a specific line or view for display.

Activation: *Direct:* Line/View drop down menu button 
Menu: Alt-(V) File, (V) Select Views...



Ribbon, Channel Tab:

Comments: The DFR Transcan, Faxtrax USI and APP records have predefined views encoded into their format. To select the predefined views, click on the Show All/ Select View drop down menu button or select the Select Views option under the Channels tab. A list of the available lines/graphs will be displayed. To view all the analog channels in the file, press the <esc> key, the <backspace>, or click the Show All  button.

See Also: [Save User Views](#)
[Select User Views](#)

SELECT USER VIEWS

Location: Analysis

Description: Select a view file from the list of files located in the displayed view path.

Activation: *Menu:* Alt-(V) View, (V) Select Views..

Ribbon, Waveform Tab: 

Fields: *View Files:* A list of all the view files in the displayed view path.
Analog Channels: All analog channel information is defined in the view file.
Digital Channels: All digital channel information is defined in the view file.

Options: *Enter/Ok:* Select the highlighted view.
Esc/Cancel: Exit the dialog without executing the command.

Comments: The following information is read from the selected view file and applied to the displayed file:

- Displayed analog channels,
- Analog channel order,
- Superimposed channels,
- Analog channel colors,
- Digital channels displayed,
- Digital channel order,
- Sampling frequency,
- Time scale,
- Sliding window size (RMS bar to Data bar),
- Phasor window size,
- Table window size,
- Red fault bar,
- Auto scale and
- Phasor or circular chart displayed

If the analog channel and digital channel names defined in the view file are not in the displayed file, then an error message is displayed.

A number of manufactures save the lines contained in a DFR record in the header format of the file. These predefined lines/views are listed in the top section of the view drop down menu.

See Also: [Save User Views](#)
[Select Lines/Views](#)

SEMI F47-0706 VOLATGE SAG CHART

Location: Analysis

Description: The SEMI F47-0706 Voltage Sag display shows the sag immunity chart. The chart depicts the required voltage sag ride-through capability curve. The unaffected region is the green area, and the miss operation region is the red area.

Activation: *Menu:* Alt-(C) SEMI F47 Voltage Sag Chart



Ribbon, Channel Tab:

Comments: To view the chart, click on the SEMI F47 option from the Channels menu/tab. If no channels are marked, then the first 3 voltage channels are automatically selected.

To the right of the chart is the sag percentage which is calculated for each voltage channel using the following equation: $(\text{Nominal RMS} * 100) / (\text{Lowest Sag RMS})$. Each displayed percentage is followed by the channel number, the duration in milliseconds and cycles.

The trigger value for the duration calculation is set in the System Settings dialog. The default setting is 15% of nominal.

The F47 plot will adjust according to the amount of time in the file.

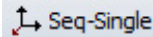
See Also: [Display Dialog](#)
[Three-D Plots](#)

SEQUENCE COMPONENTS CALCULATOR

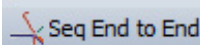
Location: Analysis

Description: The sequence components calculator calculates the zero, positive and negative sequence components for the data values at the data bar for the active window (single) or for two open windows (end to end).

Activation: *Menu:* Alt-(D) Data, (N) Sequence Calculator, (S) Single End...
Menu: Alt-(D) Data, (N) Sequence Calculator, (E) End to End...



Ribbon, Data Tab:



Fields:

| | |
|-----|--|
| VA: | Magnitude and Angle of Channel VA. |
| VB: | Magnitude and Angle of Channel VB. |
| VC: | Magnitude and Angle of Channel VC. |
| IA: | Magnitude and Angle of Channel IA. |
| IB: | Magnitude and Angle of Channel IB. |
| IC: | Magnitude and Angle of Channel IC. |
| V0: | Zero Sequence Voltage Magnitude and Angle. |
| V1: | Positive Sequence Voltage Magnitude and Angle. |
| V2: | Negative Sequence Voltage Magnitude and Angle. |
| I0: | Zero Sequence Current Magnitude and Angle. |
| I1: | Positive Sequence Current Magnitude and Angle. |
| I2: | Negative Sequence Current Magnitude and Angle. |

Angle Rotation: Increment the voltage and current angles.

Options:

| | |
|-----------------|--|
| <i>Refresh:</i> | Refresh VA, VB, VC, IA, IB and IC from the date bar locations. |
| <i>Close:</i> | Close the dialog. |
| <i>Rotate:</i> | Increment the voltage and current angles. |
| <i>Vectors:</i> | Select the vectors to display. |



Turns auto scale on or off for displayed vectors.



Increase the displayed vectors.



Decrease the displayed vectors.

Comments: The channels in the active records must be organized as follows: The first 3 visible channels are the voltage channels, VA, VB and VC. The next 3 visible channels are the current channels, IA, IB and IC. To reposition the analog channels first mark the channels then drag them to the proper location or use the plus key to move the channels up one position and the minus key to move the channels down one position. If the channels are not organized as

suggested, then the channel numbers can be changed directly in the dialog using the Channel drop down list to the left of the channel titles.

The values populated in the dialog are read at the data bar positions in the open records. The sequence calculator dialog is a stay on top window. This allows for repositioning the data bars without closing the dialog. The values are automatically populated in the dialog when the data bar is moved. To refresh the voltage and current values in the dialog use the Refresh button.

To increment the voltage and current angles enter an increment value in the Angle Rotation field and click on the Rotate button.

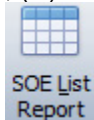
See Also: [Double Ended Fault Location](#)

SEQUENCE OF EVENTS LIST

Location: File Manager

Description: View a detailed list of all the sequence of events contained in the marked files in a table format. Mark all the desired files then press F11 or select the SOE List Report option under the Options tab. A table will be displayed listing all the events triggered in the selected files.

Activation: *Direct:* F11
Menu: Alt-(O) Options, (R) Reports, (S) SOE List...



Ribbon, Options Tab:

Fields:

| | |
|-----------------------|---|
| <i>Substation:</i> | The substation where the device is installed. |
| <i>Device:</i> | The device the channel came from. |
| <i>State:</i> | The state of the channel at that time (A=Abnormal, N=Normal). |
| <i>Trigger Date:</i> | The trigger date. |
| <i>Trigger Time:</i> | The trigger time. |
| <i>Channel:</i> | The channel number of the event in the file. |
| <i>Channel Title:</i> | The title of the channel. |
| <i>File:</i> | The file containing the event/sensor channel. |

Comments: The table is sorted according to the date and time. The Query section at the bottom of the table allows for searching events from specific substations, devices, channels and more. Use the header buttons to sort the columns. To view the file containing the specific events in the data plotting window press enter or double click on the event.

See Also: [Sequence of Events Summary](#)

SEQUENCE OF EVENTS SUMMARY

Location: File Manager

Description: View a summary of the sequence of events contained in the marked files in a table format. Mark all the desired files then select the SOE Summary option under the Options tab. A table will be displayed listing a summary of the events triggered in the selected files.

Activation: *Menu:* Alt-(O) Options, (R) Reports, (O) SOE Summary...



Ribbon, Options Tab:

| | | |
|----------------|---------------------------|---|
| Fields: | <i>Substation:</i> | The substation that triggered the event/sensor |
| | <i>Device:</i> | The device the channel originated from. |
| | <i>Fst-State:</i> | The state the channel started at, A=alarm and N=normal. |
| | <i>Lst-State:</i> | The state the channel ended at, A=alarm and N=normal. |
| | <i>First Change Date</i> | The date the channel first changed state. |
| | <i>First Change Time:</i> | The time the channel first changed state. |
| | <i>Last Change Date</i> | The date the channel last changed state. |
| | <i>Last Change Time:</i> | The time the channel last changed state. |
| | <i>Changes:</i> | The number of times the channel changed state. |
| | <i>Chan#:</i> | The channel number in the file. |
| | <i>Channel Title:</i> | The title of the channel. |
| | <i>File:</i> | The file containing the event/sensor channel. |

Comments: The table is sorted according to the first change date and time. The Query section at the bottom of the table allows for searching events from specific substations, devices, channels and more... To view the file containing the specific events in the data plotting window press enter or double click on the event.

See Also: [Sequence of Events List](#)

SET OPENING FREQUENCY

Location: Analysis

Description: Set a driver to always open a file using the defined sampling frequency. This feature is available in the Change Sampling Frequency dialog.

Activation: *Menu:* Alt-(D) Data, (F) Change Sampling Frequency...

Ribbon, Data Tab:  Sampling

Fields: *Open Frequency:* Always open the driver's file using the entered frequency.

Options: *Enter/Ok:* Exit the dialog, then save and execute the entered information.

Esc/Cancel: Exit the dialog without saving the information.

Comments: Setting the Always Open field will open all files associated with the active driver using the entered frequency. This feature is useful for files with low sampling frequency.

See Also: [Change Frequency](#)

SET SLIDING WINDOW

Location: Analysis

Description: Set the size of the window between the data bar and the RMS bar. The Sliding Win option has a drop-down list to select the size. Use the drop-down list or click directly on the button to display the sliding window dialog.

Activation: *Menu:* Alt-(V) View, (W) Set Sliding Window Size

Ribbon, Waveform Tab: 

- Fields:** # Cycles: Enter the number of cycles or days or hours to display between the data bar and the RMS bar. For log files the days or hours is displayed in the dialog and for waveform files cycles is displayed.
- Options:** *OK:* Save and set the number of cycles and close the dialog.
Cancel: Exit the dialog without saving.
- Comments:** The RMS column in the analog table is calculated from the data bar to the RMS bar. If there is a large number of samples per cycle, then it may slow down the system when calculating the RMS values.
- See Also:** [Data Bar](#)
[RMS Bar](#)

SHIFT MARKS DOWN

Location: Analysis

Description: Shift all the marked analog and digital channels down one position.

Activation: *Direct:* "-" key
Menu: Alt-(C) Channels, (W) Shift Marks Down

Ribbon, Channels Tab: 

Comments: Individual channels can be marked or unmarked by clicking on the channels corresponding display ID number or channel information or by pressing the spacebar. Marked channels are displayed in red. To restore the channels back to their original position, select the Reorder option under the Channels tab. All marked analog and digital channels are moved down one position.

See Also: [Drag Drop Channels](#)
[Reorder Channels](#)
[Shift Marks Up](#)

SHIFT MARKS UP

Location: Analysis

Description: Shift all the marked analog and digital channels up one position.

Activation: *Direct:* "+" key
Menu: Alt-(C) Channels, (U) Shift Marks Up

Ribbon, Channels Tab: 

Comments: Individual channels can be marked or unmarked by clicking on the channels corresponding display ID number or channel information or by pressing the spacebar. Marked channels are displayed in red. To restore the channels back to their original position, select the Reorder option under the Channels tab. All marked analog and digital channels are moved up one position.

See Also: [Drag Drop Channels](#)

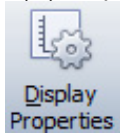
[Reorder Channels](#)
[Shift Marks Down](#)

SHORTCUTS DIALOG

Location: File Manager

Description: Define a number of shortcuts that will be displayed off the tool menu bar in a drop-down menu button.

Activation: *Menu:* Alt-(O) Options, (D) Display..., ShortCuts button



Ribbon, Options Tab: **Display Properties**, Short Cuts button

Fields: *File Table Tab:* A list of a number of file manager options.
Data Plotting Tab: A list of a number of data plotting options.

Options: *Move:* Move the highlighted menu items to the User ShortCuts list.
Delete: Delete the highlighted shortcut.
Move Up: Move the highlighted shortcut up by one item.
Move Down: Move the highlighted shortcut down by one item.
OK: Save the shortcuts and display the new shortcuts in the drop-down menus.
Cancel: Exit the dialog without saving the shortcuts.

Comments: A drop-down menu button is added to the toolbar with the shortcuts listed in the drop-down menu. Clicking on the button will activate the first short cut in the drop-down list.


See Also: [Display Dialog](#)

SHOW/HIDE CHANNEL TITLES

Location: File Manager

Description: The Show/Hide Channel Titles dialog allows for hiding invalid channel titles, removing titles from the invalid title list and adding new titles to the invalid channel list. All analog and digital channels that contain the characters in the list in the beginning of the title are automatically hidden.

Activation: *Menu:* Alt-(O) Options, (T) Show/Hide Channel Titles...

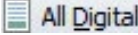
Ribbon, Options Tab:  Show/Hide Titles


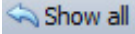
Fields: *Title List Box:* Lists all invalid channel titles.
Add Title: Add a new title to the list.
Remove Title: Remove a title from the list.

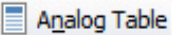
Options: *Enter/Ok:* Exit the dialog and save the changes.
Esc/Cancel: Exit the dialog without saving the changes.

Comments: To show a title, uncheck the checkbox next to the title. To add new titles to hide type the characters in the edit box and click the Add button. To remove an item from the list, click on the item then click the Remove button.

SHOW ALL DIGITAL CHANNELS

Location: Analysis**Description:** Show all digital channels or just the triggered digital channels. This option toggles between the two views.**Activation:** *Direct:* F9
Menu: Alt-(V) View, (D) All Digital Channels
Ribbon, Waveform Tab: **Comments:** Placing the mouse on the horizontal separator bar and dragging it up or down can resize the digital channel display area. The cursor changes to the horizontal resize cursor when the mouse is positioned over the bar.**See Also:** [All Digital Channels](#)**SHOW ALL HIDDEN**

Location: Analysis**Description:** Show all hidden analog and digital channels.**Activation:** *Direct:* ViewAll menu button , the <esc> key or the <backspace> key
Menu: Alt-(C) Channels, (S) Show All Hidden
Ribbon, Channels Tab: **See Also:** [View Mark\(s\)](#)
[Hide Mark\(s\)](#)
[Restore Mark\(s\)](#)**SHOW CHANNEL INFORMATION**

Location: Analysis**Description:** Show or hide the channel information window. This option toggles between the two views.**Activation:** *Menu:* Alt-(V) View, (C) Channel Information
Ribbon, Waveform Tab: **Comments:** The channel information window can be resized by placing the mouse on the vertical separator bar and dragging it to the right or the left. The cursor changes to the vertical resize cursor when the mouse is positioned over the bar.**See Also:** [Show Phasor/Circular Chart Information](#)**SHOW PHASOR/CIRCULAR CHART INFORMATION**

Location: Analysis**Description:** Show or hide the phasor/circular chart information window. This option toggles between showing and hiding the phasor/circular chart window.

Activation: *Menu:* Alt-(V) View, (P) Phasor/Circular Chart Window

Ribbon, Waveform Tab: 

Comments: The phasor/circular chart window can be resized by placing the mouse on the vertical separator bar and dragging it to the right or the left. The cursor changes to the vertical resize cursor when the mouse is positioned over the bar.

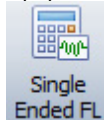
See Also: [Show Channel Information](#)

SINGLE ENDED FAULT LOCATION – RADIAL LINE

Location: Analysis

Description: Display the single ended fault location calculator dialog. The single ended fault location calculator calculates a single ended Fault Location. The single ended calculator has four types of calculators: Radial Line Method, Reactance Method, Multi-Phase and Three Phase. This section describes the Radial Line Method.

Activation: *Menu:* Alt-(D) Data, (U) Fault Calculators, (S) Single Ended... Radial Line Method Tab



Ribbon, Data Tab:

Fields:

| | |
|---------------------|---------------------------------|
| <i>V Channel #:</i> | Faulted Voltage channel number. |
| <i>I Channel #:</i> | Faulted Current channel number. |
| <i>Z1:</i> | Magnitude and Angle Z1. |
| <i>Z0:</i> | Magnitude and Angle Z0. |

Options:

| | |
|-------------------|---|
| <i>Refresh:</i> | Refresh V and I values from the date bar location and calculate the FL. |
| <i>Calculate:</i> | Calculate the fault location. |
| <i>Plot:</i> | Plot the fault location between bars or for the entire record. |
| <i>Report</i> | Display an ASCII report of the calculated radial line fault location. |
| <i>Close:</i> | Close the dialog. |

Comments: To calculate the radial line method click on the Radial Line Method tab. Select the faulted voltage channel from the V Channel Number drop down list and select the faulted current channel from the I Channel Number drop down list. Next, enter the Z1 and Z0 magnitude and angle. If the Z1 and Z0 values are stored in the opened file, then these fields will be automatically populated. To have the current and voltage channels automatically populated when the dialog is displayed mark the channels first in the analysis window.

The single ended calculator is a stay on top window which allows for changing the position of the data bar while the dialog is open. Use the cursor keys or mouse to move the data bar.

The magnitude and angle for V_f and I_f are read from the data bar position in the selected open window. To change the position of the data bar, click on the desired location in the analysis window or use the left and right arrow keys. The values in the single ended fault location dialog are updated automatically. To calculate the fault location, click on the Calculate button.

To plot the fault location in the data plotting window as a new channel, click on the drop-down arrow in the plot button. The two options are plot the fault location between bars or plot the fault location for the entire record. The default option of the plot button is plot

between bars. Between bars plots the fault location between the data bar and the reference bar.

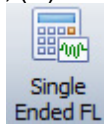
See Also: [Double Ended Fault Location](#)

SINGLE ENDED FAULT LOCATION – REACTANCE

Location: Analysis

Description: Display the single ended fault location calculator dialog. The single ended fault location calculator calculates a single ended Fault Location. The single ended calculator has four types of calculators: Radial Line Method, Reactance Method, Multi-Phase and Three Phase. This section describes the Reactance Method.

Activation: *Menu:* Alt-(D) Data, (U) Fault Calculators, (S) Single Ended... Reactance Method Tab



Ribbon, Data Tab:

Fields:

- V Channel #:* Faulted Voltage channel number.
- I Channel #:* Faulted Current channel number.
- N Channel #:* Faulted Neutral channel number.
- Z1:* Magnitude and Angle Z1.
- Z0:* Magnitude and Angle Z0.

Options:

- Refresh:* Refresh V, I and N values from the date bar location and calculate the FL.
- Calculate:* Calculate the fault location.
- Plot:* Plot the fault location between bars or for the entire record.
- Report:* Display an ASCII report of the calculated Reactance fault location.
- Close:* Close the dialog.

Comments: To calculate the radial line method click on the Reactance Method tab. Select the Voltage faulted channel from the V Channel Number drop down list, select the faulted current channel from the I Channel Number drop down list and select the neutral channel from the N Channel Number drop down list. Next, enter the Z1 and Z0 magnitude and angle. If the Z1 and Z0 values are stored in the opened file header then these fields will be automatically populated. To have the current and voltage channels automatically populated when the dialog is displayed mark the channels first in the analysis window.

The single ended calculator is a stay on top window which allows for changing the position of the data bar while the dialog is open. Use the cursor keys or mouse to move the data bar.

The magnitude and angle for V_f , I_f and I_N are read from the data bar position in the selected open window. To change the position of the data bar, click on the desired location in the analysis window or use the left and right arrow keys. The values in the single ended fault location dialog are updated automatically. To calculate the fault location, click on the Calculate button.

To plot the fault location in the data plotting window as a new channel, click on the drop-down arrow in the plot button. The two options are plot the fault location between bars or plot the fault location for the entire record. The default option of the plot button is plot between bars. Between bars plots the fault location between the data bar and the reference bar.

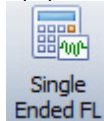
See Also: [Double Ended Fault Location](#)

SINGLE ENDED FAULT LOCATION – MULTI-PHASE

Location: Analysis

Description: Display the single ended fault location calculator dialog. The single ended fault location calculator calculates a single ended Fault Location. The single ended calculator has four types of calculators: Radial Line Method, Reactance Method, Multi-Phase and Three Phase. This section describes the Multi-Phase Method.

Activation: *Menu:* Alt-(D) Data, (U) Fault Calculators, (S) Single Ended... Multi-Phase Tab



Ribbon, Data Tab:

Fields:

- Vf1 Channel #:* First faulted Voltage channel number.
- Vf2 Channel #:* Second faulted Voltage channel number.
- If1 Channel #:* First Faulted Current channel number.
- If2 Channel #:* Second Faulted Current channel number.
- Z1:* Magnitude and Angle Z1.
- Z0:* Magnitude and Angle Z0.

Options:

- Refresh:* Refresh the two voltage and two current values from the date bar location.
- Calculate:* Calculate the fault location.
- Plot:* Plot the fault location between bars or for the entire record.
- Report* Display an ASCII report of the calculated multi-phase fault location.
- Close:* Close the dialog.

Comments: To calculate the Multi-Phase method click on the Multi-Phase tab. Select the two faulted voltage channel from the Vf1 and Vf2 Channel Number drop down lists then select the IF1 and IF2 Channel Drop down lists. Next, enter the Z1 and Z0 magnitude and angle. If the Z1 and Z0 values are stored in the opened file, then these fields will be automatically populated. To have the current and voltage channels lists automatically populated when the dialog is displayed mark the channels first in the analysis window.

The single ended calculator is a stay on top window which allows for changing the position of the data bar while the dialog is open. Use the cursor keys or mouse to move the data bar.

The magnitude and angle for Vf1, Vf2, If1 and IF2 are read from the data bar position in the selected open window. To change the position of the data bar, click on the desired location in the analysis window or use the left and right arrow keys. The values in the single ended fault location dialog are updated automatically. To calculate the fault location, click on the Calculate button.

To plot the fault location in the data plotting window as a new channel, click on the drop-down arrow in the plot button. The two options are plot the fault location between bars or plot the fault location for the entire record. The default option of the plot button is plot between bars. Between bars plots the fault location between the data bar and the reference bar.

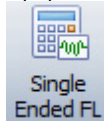
See Also: [Double Ended Fault Location](#)

SINGLE ENDED FAULT LOCATION – THREE PHASE

Location: Analysis

Description: Display the single ended fault location calculator dialog. The single ended fault location calculator calculates a single ended Fault Location. The single ended calculator has four types of calculators: Radial Line Method, Reactance Method, Multi-Phase and Three Phase. This section describes the Three Phase Method.

Activation: *Menu:* Alt-(D) Data, (U) Fault Calculators, (S) Single Ended... Three Phase Tab



Ribbon, Data Tab:

Fields:

- VA Channel #:* Faulted VA channel number.
- VB Channel #:* Faulted VB channel number.
- VC Channel #:* Faulted VC channel number.
- IA Channel #:* Faulted IA channel number.
- IB Channel #:* Faulted IB channel number.
- IC Channel #:* Faulted IC channel number.
- Z1:* Magnitude and Angle Z1.
- Z0:* Magnitude and Angle Z0.

Options:

- Refresh:* Refresh VA, VB, VC, IA, IB and IC from the data bar locations.
- Calculate:* Calculate the fault location.
- Plot:* Plot the fault location between bars or for the entire record.
- Report* Display an ASCII report of the calculated three-phase fault location.
- Close:* Close the dialog.

Comments: To calculate the multi-phase method click on the Multi-Phase tab. Select the three faulted voltage channels from the VA, VB and VC Channel Number drop down lists and select the three faulted current channels from the IA, IB and IC Channel Number drop down lists. Next, enter the Z1 and Z0 magnitude and angle. If the Z1 and Z0 values are stored in the opened file, then these fields will be automatically populated. To have the voltage and current channels automatically populated when the dialog is displayed move the VA, VB and VC channels to the first three display positions in the window followed by IA, IB and IC channels.

The single ended calculator is a stay on top window which allows for changing the position of the data bar while the dialog is open. Use the cursor keys or the mouse to move the data bar.

The magnitude and angle for VA, VB, VC, IA, IB and IC are read from the data bar position in the selected open window. To change the position of the data bar, click on the desired location in the analysis window or use the left and right arrow keys. The values in the single ended fault location dialog are updated automatically. To calculate the fault location, click on the Calculate button.

To plot the fault location in the data plotting window as a new channel, click on the drop-down arrow in the plot button. The two options are plot the fault location between bars or plot the fault location for the entire record. The default option of the plot button is plot between bars. Between bars plots the fault location between the data bar and the reference bar.

See Also: [Double Ended Fault Location](#)

SIZE

Location: File Manager (Status Field)**Description:** Displays the total size (in Kbytes) of all files in the active directory.**See Also:** [Free](#)
[MrkSize](#)**SIZE COLUMN**

Location: File Manager**Description:** Displays the size (in bytes) of the file.**SOFTWARE ANALOG CHANNELS**

Location: Analysis**Description:** Display the software analog channel dialog for creating virtual analog channels.**Activation:** *Direct:* F5
Menu: Alt-(C) Channels, (A) Software Analog Channels...*Ribbon, Channel Tab:***Fields:**
Titles: The titles for the software analog channels.
Operators: Each analog operation followed by an operator terminator “/”.
Fast SACs: A list of predefined SAC titles and operators.**Options:**
Enter/Ok: Exit the dialog then save and execute the operators.
Esc/Cancel: Exit the dialog without saving or executing the operators.
Apply: Execute the SAC Channels without closing the dialog.
Open: Open a *.SAC file.
New: Create a new *.SAC file.
Save: Save the active SAC file.
Save As: Save the active SAC file under a new name.
Clear All: Clear all the SAC titles and Operators.
Show Help: Show or hide the help window.**Comments:** Software analog channels (SAC's) are extra channels provided by the system. These channels can be used to calculate a missing phase, create +, - and 0 sequence channels, create an envelope of a selected trace, or define an under/over-trigger values to monitor a given channel. The SAC window is split into two sections: the titles and the operators. To navigate between fields, use the tab, up arrow and down arrow keys.

Operators are formatted as a stacked set of instructions. To select from the predefined fast SACs, click on the drop-down list then double click on the desired SAC. The name of the SAC is in the first column and the operator is in the second column. To have the SAC name automatically copied to the SAC title click on the Set SAC Titles using Fast SAC headers check box. The position of the channel in the operators is marked by a Pound Sign #. If there are any marked channels in the data plotting window, then the fast SAC will be populated with the marked channel numbers. For example, if channels 4, 5 and 6 are marked and the Calculate Neutral fast SAC is selected then the Operator will be displayed

as: +4/+5/+6/u=A/. If there are no channels marked the operator will be +#/+#/#/u=. The user will have to replace the # with the desired channels numbers and complete the unit.

The SAC instructions are composed of an operator and an operand. An operand can be a channel defined by the channel number or a constant. Constant values must have a “^” operator before each value to distinguish between channel numbers and constant values. To phase shift analog channels, use the “@” sign before each angle defined. All angles must be defined in degrees. Following is a list of all the software operators that are available:

- “+” - Add (Analog),
- “-” - Subtract (Analog),
- “*” - Multiply (Analog),
- “/” - Divide (Analog),
- “^” - Constant value (Analog),
- “@” - Phase Shift (Analog),
- “e” - Adjusted envelope (Analog),
- “a” - Envelope (Analog),
- “<” - Under-trigger (Analog),
- “>” - Over-trigger (Analog),
- “h” - Harmonic for Channel (Analog),
- “h=” - Harmonic for all Back Operations (Analog),
- “x” - real component (Analog),
- “y” -imaginary component (Analog),
- “m” -magnitude (Analog),
- “d” -angle (Analog),
- “r” -true RMS (Analog),
- “f” -cyclic frequency (Analog),
- “q” -instantaneous frequency (Analog),
- “t” -delta time frequency (Analog),
- “s” - sin operator (Analog),
- “c” - cos operator (Analog)
- “b” -operate between bars only (Analog),
- “|” - Absolute Value (Analog),
- “p=” - Prefix (Analog),
- “u=” - Unit (Analog),
- “+” - And (Digital),
- “.” - Or (Digital),
- “/” - Instruction terminator (Analog & Digital)

NOTE: All SAC/SDC operations are performed in Reverse Polish Notation (one operation at a time).


The instruction set must always terminate with a “/”. An operation error is generated if the instruction formats are not followed.

See Also: [Software Digital Channels](#)

SOFTWARE DIGITAL CHANNELS

Location: Analysis

Description: Display the software digital channel dialog.

Activation: *Menu:* Alt-(C) Channels, (D) Software Digital Channels...
Ribbon, Channel Tab: 

Fields: *Titles:* The titles for the software digital channels.
Operators: Each digital operation followed by an operator terminator "/".

Options: *Enter/Ok:* Exit the dialog then save and execute the operators.
Esc/Cancel: Exit the dialog without saving or executing the operators.
F1/Help: Display the help window.

Comments: Software digital channels (SDC's) are extra channels provided by the system. The SDC window is split into two sections: the SDC titles, and the SDC operators. To navigate between fields, use the tab, up arrow and down arrow keys.

The specified SDC operators must be formatted as a stacked set of instructions.

An instruction is composed of three attributes:

- 1: the operation: "." for AND, "+" for OR.
- 2: the event or sensor to operate on "1", "2",.. "N".
- 3: an instruction termination character: "/".

All specified instructions must be terminated by a "/". Examples are:
 Ex-1: +2/.33/ means set to Event 2, then "and" with Event 33.

Note: In the set of instructions, the first operator must be set to the "OR" operation.

Example - +2/.44/+23/

The channels will not be computed if there is an "AND" operator as the first operator in the set of instructions.

Operation Error:

An operation error will be generated if the instruction formats are not adhered to such as, there is a missing instruction terminator "/", or a non-valid operator was specified in the SDC instruction sequence. The error message displays the channel number containing the error.

See Also: [Software Analog Channels](#)

SORT ALL ROWS

Location: All Tables

Description: Sort all the rows in the table in ascending or descending order.

Activation: *Menu:* Alt-(S) Sort, (A) Ascending
Menu: Alt-(S) Sort, (D) Descending
Direct: Mouse Click on the Column's header

Comments: All the rows in the active table are sorted with respect to the sort field displayed in the table's status field. Click on the Table column headers to toggle between ascending or descending order. The last column clicked on becomes the active sort field displayed in the status bar field.

See Also: [Ascending Sort](#)
[Descending Sort](#)
[Set Sort Field](#)

SORT DIGITAL CHANNELS

Location: Analysis

Description: Sort all displayed digital channels in ascending or descending order.

Activation: *Menu:* Alt-(C) Channels, Sort Digital Channels, Ascending, Descending or Restore Original



Ribbon, Channel Tab:

Comments: The Sort Digital Channels will sort the displayed digital channels according to the first change of state. This feature will sort the first change in state in Ascending order or sort the first change in state in Descending order. There is also an option to restore the order of the Digital Channels when the file was first opened. In the menu system use the submenu under the Channels menu called Sort Digital Channels. In the ribbon system use the drop-down menu in the Channel tab under the Arrange section.

See Also: [All Digital](#)

SORT FIELD

Location: All Tables (Status Field)

Description: Displays the active sort field.

Activation: *Direct:* Mouse Click on the Column's header

Comments: The column header with the up or down arrow next to the column title indicates the active sort field. The active sort field is also displayed in the status bar. Clicking on the column header toggles between an ascending and descending sort. To sort the columns directly and to set the sort field, click the column header button.

See Also: [Ascending Sort](#)
[Descending Sort](#)
[Sort All Rows](#)

START DATE FIELD

Location: IEEE Long File Name

Description: The first field in the IEEE long file naming format. The start date is extracted from the event files and structured in the following format: Year (2 digits) Month Day: 190409.

Example File Name:

190409,113109123,+3S,Barton Substation#12,SEL421-432#34,ArkElectric,,,.DAT

See Also: [IEEE Long File Naming Format](#)
[Start Time Field](#)

START TIME FIELD

Location: IEEE Long File Name**Description:** The second field in the IEEE long file naming format. The start time is extracted from the event files and structured in the following format: Hour Minute Second Millisecond:
113109234.

Example File Name:

190409,113109123,+3S,Barton Substation#12,SEL421-432#34,ArkElectric,,,,.DAT

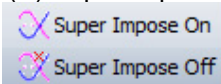
See Also: [IEEE Long File Naming Format](#)
[Start Date Field](#)**SUBSTATION FIELD**

Location: IEEE Long File Name**Description:** The fourth field in the IEEE long file naming format. The substation name is extracted from the device record.

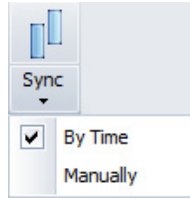
Example File Name:

190409,113109123,+3S,Barton Substation#12,SEL421-432#34,ArkElectric,,,,.DAT

See Also: [IEEE Long File Naming Format](#)**SUPER IMPOSE**

Location: Analysis**Description:** Superimpose the marked analog channels.**Activation:** *Direct:* F7*Menu:* Alt-(D) Data, (S) Super Impose*Ribbon, Data Tab:***Comments:** To superimpose two or more analog channels, mark the channels and press F7 or select the Super Impose On option under the Data tab. Multiple groups of channels can be superimposed in one display. To superimpose the current channels, mark the channels then press F7. The channels will automatically be unmarked after a superimposed operation. Next, mark the voltage channels and press F7 or select the Super Impose On option. To unsuperimpose the channels press F7 or select the Super Impose Off option under the data tab. If no channels are marked and the channels are superimposed then all channels will be un-superimposed, Press F7 to turn this feature ON/OFF.**See Also:** [Mark/Unmark All Channels](#)**SYNC DATA CURSORS**

Location: Analysis**Description:** Synchronize the data cursors for two or more open display windows by time or manually.**Activation:** *Menu:* Alt-(D) Data, (Y) Sync Data Cursors, (T) By Time
Menu: Alt-(D) Data, (Y) Sync Data Cursors, (M) Manually



Ribbon, Data Tab:

Options: *By Time:* When the By Time sync cursor feature is turned ON the data cursors in the non-active windows are moved to the sample value time in the active window. For example, if the active data cursor is positioned on sample time 01:12:34.560, all non-active data cursors are moved to the sample value at that time. If the time is not found in the non-active window, the cursor position is unchanged. The active window defines the master data cursor, and all other cursors follow this position.

Manually: The Manual feature allows for selection of different cursor positions in the open data windows before synchronization is turned ON. For example, open two data windows and tile horizontally, move the data cursors to the beginning of the fault cycle, and select the sync manual cursor option. When the left, right, ctrl-left, ctrl-right, page up, page down, ctrl-page up, ctrl-page down, home and end keys are pressed the data cursors move simultaneously.

Comments: A check mark indicates that the sync feature is ON. To turn synchronizing OFF click on the active sync menu option to remove the check mark. When synchronizing is ON the channel information displayed to the right of the traces is updated for all open data windows.

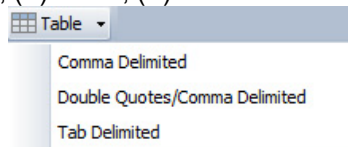
See Also: [Data Bar](#)

TAB DELIMITED TABLE DRIVER

Location: File Manager

Description: Display the tab delimited file at the cursor position in a table format. Tab delimited files have textual fields separated by tabs, such as: CHANNEL DATE TIME.

Activation: *Menu:* Alt-(D) Drivers, (T) Table, (T) Tab Delimited



Ribbon, Drivers Tab:

Comments: The data in the file is presented in tabular form. An unlimited number of rows and columns can be displayed.

See Also: [Associating File Types](#)
[Double Quotes/Comma Delimited Table Driver](#)
[Comma Delimited Table Driver](#)

TCODE FIELD

Location: IEEE Long File Name

Description: The third field in the IEEE long file naming format. The TCode is extracted from the device record.

Example File Name:

190409,113109123,+3S,Barton Substation#12,SEL421-432#34,ArkElectric,,,,.DAT

See Also: [IEEE Long File Naming Format](#)

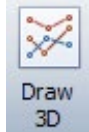
THREE-D PLOTS

Location: Analysis

Description: The Plot 3-D feature plots a maximum of 3 channels in 3-D. To plot the channels in 3-D first mark the 3 channels then click on the Draw 3-D icon under the Channels tab. Viewing channels in a 3-D fashion allows for viewing power flow.

To open the 3-D Plot chart first mark the channels then click on the Draw 3-D icon under the Channel tab.

Activation: *Menu:* Alt-(C) Channels, Draw 3D Plots



Ribbon, Channel Tab:

Comments: To the right of each channel is the channel number, the channel title, the instantaneous maximum and minimum values of the entire channel and the duration of the fault in cycles and milliseconds. The calculation for the duration is defined in the Display dialog located in the File Manager's Options tab. The values used in the duration calculation can be edited. The default setting is 15% of nominal for the voltage channels, and times 5 of nominal per unit for the current channels.

See Also: [Display Dialog](#)
[Rose Plots](#)
[SEMI F47-0706 Voltage Sag](#)

TIME BASED DISPLAY

Location: Analysis

Description: The time base display plots the channel data in time. Time base displays are useful for showing changes in line frequency.

Comments: To change the time-based display field, open the Properties dialog under the Waveform Tab. Click the Display Settings tab and change the Trace Display Type field to time based or sample based.

See Also: [Sample Based Display](#)

TOTAL HARMONICS DISTORTION

Location: Analysis (Harmonics Dialog)

Description: The Total Harmonic Distortion field displays the square root of the summation of the squares of DFT Magnitudes for harmonics 2 to the maximum harmonics and that quantity

divided by the DFT Magnitude of the Fundamental. The maximum harmonic is the number of samples per cycle (sampling frequency / line frequency) divided by 2.

See Also: [Harmonics Table](#)
[Histogram](#)

TOTFILES

Location: File Manager (Status Field)

Description: Displays the total number files/directories in the active directory. The "." and ".." navigation shortcuts are included in the total.

See Also: [TotMarks](#)

TOTMARKS

Location: All Tables (Status Field)

Description: Displays the total number of marked rows in the active table. Marked rows are displayed in light red.

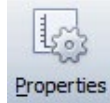
See Also: [AtRec](#)

TRACE SCALE MULTIPLIER

Location: Analysis (Window Properties Dialog)

Description: Used as a multiplier to increase/decrease the amplitude of the visible analog channels

Activation: *Menu:* Alt-(F) File, (T) Window Properties..., Display Settings Tab



Ribbon, Waveform Tab:

Range: Greater Than 1.00

Default: 1.75

Comments: When a channel's amplitude is increased, the trace scale value is multiplied with the current amplitude value, and when the channel's amplitude is decreased the trace scale value is divided by the current amplitude value.

See Also: [Auto Scaling](#)
[Decrease Amplitude](#)
[Increase Amplitude](#)

TRIGGER-TIME

Location: Waveform Summary (Events/Sensors Activity Log)

Description: Displays the time the digital channel changed state. This value is displayed in the third column of the Events/Sensors Activity Log.

Comments: The Events/Sensors Activity Log displays a time-sequenced list of all the events and sensors activity.

See Also: [Waveform Summary](#)

TRUERMS

Location: Harmonics Table (Analysis)

Description: Displays the RMS value for all the samples between the RMS bar (black dotted line) and the data bar (black solid line).

Comments: This value is taken directly from the RMS column inside the analog information table.

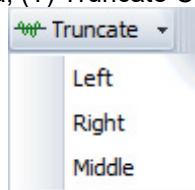
See Also: [Harmonics Table Histogram](#)

TRUNCATE CYCLES

Location: Analysis

Description: Remove beginning, middle or end cycles from the active analysis window.

Activation: *Menu:* Alt-(D) Data, (T) Truncate Cycles, (L) Left-Start to Data Bar
Menu: Alt-(D) Data, (T) Truncate Cycles, (R) Data Bar to End
Menu: Alt-(D) Data, (T) Truncate Cycles, (M) Data Bar to Reference Bar



Ribbon, Data Tab:

Comments: There are 3 options available under the Truncate Cycles menu option. Left removes the cycles from the first sample to the data bar (solid black vertical line). Right removes the cycles from the data bar to the last sample. Middle removes the cycles from the data bar to the reference bar (dotted blue vertical line)

See Also: [Duplicate Cycles](#)

TVE (TOTAL VECTOR ERROR) CALCULATOR

Location: Analysis

Description: The TVE (Total Vector Error) calculator is used to calculate the TVE for synchro-phasor measurements. TVE is defined as the square root of the difference squared between the real and imaginary parts of the theoretical actual phasor and the estimated phasor. The equation used in the calculator is from the IEEE C37.118-2005 Standard, Equation # 2.

The TVE is calculated on the first displayed channel or the first marked channel. To mark channels, use the spacebar or mouse. Marked channels are displayed in red.

Activation: *Menu:* Alt-(D) Data, (V) TVE Calculator

Ribbon, Data Tab: 

Fields:

| | |
|-----------------------------------|---|
| <i>Actual Values Magnitude:</i> | Enter the actual magnitude value. |
| <i>Actual Values Angle:</i> | Enter the actual angle value. |
| <i>Measured Values Magnitude:</i> | The measured magnitude is read from the RMS column in the data plotting window. |
| <i>Measured Values Angle:</i> | The measured angle is read from the Phase column in the data plotting window. |
| <i>Total Vector Error (TVE):</i> | Displays the TVE calculated between the measured and actual values. |

Options:

| | |
|------------------|--|
| Refresh: | Read the measured values at the data bar position. |
| Enter/Calculate: | Calculate the TVE. |
| Esc/Close: | Close the dialog. |

Comments: The TVE dialog is a stay on top dialog allowing for the data bar to be moved in the data window while the dialog is open. Use the cursor keys or the mouse to move the data bar. To populate the Measured values with the values at the data bar click the Refresh button. Enter the Actual values then click the Calculate button to show the TVE between the Actual values and the measured values.

UN/MARK ROWS

Location: All Tables

Description: Mark or unmark the row at the cursor position.

Activation: *Direct:* Spacebar - Ctrl-Mouse Button
Menu: Alt-(M) Mark, (M) Un/Mark

Ribbon, Files Tab: 

Comments: Marked rows are displayed in red. The TotMarks field displayed in the status bar is updated accordingly.

See Also: [Unmarked Marks](#)
[Group Marked Rows](#)

UNMARK MARKS

Location: All Tables

Description: Unmark all the marked rows in the table.

Activation: *Menu:* Alt-(M) Mark, (U) Unmark Marks

Ribbon, Files Tab: 

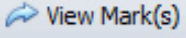
Comments: Marked rows are displayed in red. The TotMarks field, displayed in the status bar, is updated accordingly.

See Also: [Mark/Unmark Rows](#)
[Group Marked Rows](#)

VIEW MARK(S)

Location: Analysis

Description: Hide all the unmarked channels and resize the marked channels.

Activation: *Direct:* Enter
Menu: Alt-(C) Channels, (V) View Mark(s)
Ribbon, Channels Tab : 


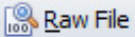
Comments: Individual channels are marked and unmarked by clicking the left mouse button on the channel's corresponding display ID number or channel information or by pressing the spacebar. Marked channels are displayed in red.

See Also: [Hide Mark\(s\)](#)
[Show All Hidden](#)
[Restore Mark\(s\)](#)

VIEW RAW DATA FILE

Location: Analysis

Description: View the contents of the active displayed file in an ASCII editor or a hexadecimal editor.

Activation: *Direct:* Menu button 
Menu: Alt-(F) File, (V) View Raw Data File...
Ribbon, Waveform Tab: 



Comments: The waveform file is displayed in an ASCII editor if the contents of the file are in text format and displayed in a hex editor if the file is in binary format.

See Also: [Restore Original](#)

WAVEFORM DATA

Location: File Manager

Description: If there are no marked waveform files in the table then plot the contents of the event file at the cursor position or plot all the marked waveform files.

Activation: *Direct:* <enter>, Plot menu button 
Menu: Alt-(O) Options, (W) Waveform File(s), (O) Open Selected File...
Menu: Alt-(O) Options, (W) Waveform File(s), (F) Open All Marked Files...
Ribbon, Files Tab: 



Comments: A maximum of 10 oscillography/log files can be opened simultaneously.

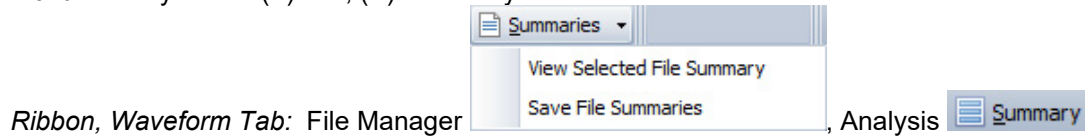
See Also: [Associating File Types](#)

WAVEFORM SUMMARY

Location: File Manager and Analysis

Description: Generates and displays analog and digital summaries for the active file in the file table or in the analysis window.

Activation: *Direct:* Summary menu buttons File Table , Analysis 
Menu: File Table: Alt-(O) Options, (S) Waveform Summaries,
Menu: Analysis: Alt-(F) File, (S) Summary...



Comments: The summary file displays the following information:

Waveform Information

Station: Name of the Station associated with the waveform.

Filename: The name of the waveform file.

File Size: The size of the file in kilobytes.

Prefault-Time: The date and time of the first prefault sample.

Fault-Time: The date and time of the first fault sample.

Save-Time: The date and time the file was saved to hard disk.

Process-Time: The date and time the file was processed into this summary.

Start Date & Time: Date and time of the first sample in the file.

End Date & Time: Date and time of the last sample in the file.

File Duration: Duration of the file measured in days, hours, seconds, milliseconds and/or microseconds, depending on the type of file.

Sampling Frequency: Sampling frequency and the time between each sample.

Line Frequency: Line Frequency defined in the file.

Fault Information

Fault Information is displayed for SEL, DLP and Transcan files. The fault information includes Fault Type, Fault Time, Location, Targets, Triggers, Frequency, Event and Targets.

Maximum/Minimum Analog Summary

Max-Inst: Instantaneous maximum values.

Min-Inst: Instantaneous minimum values.

Max-RMS: RMS maximum values.

Min-RMS: RMS minimum values.

OneBit: The channel's full-scale value divided by the channel's resolution.

Inst-Diff: The difference between the Max-Inst and Min-Inst values.

RMS-Diff: The difference between the Max-RMS and Min-RMS values.

pU: The channel's prefix and units.

Description: The number and title of the channel.

Events/Sensors Activity Summary

Fst: The state the channel started at, A=alarm, N=normal.

Lst: The state the channel ended at, A=alarm, N=normal.

Fst-Change: The date and time the channel first changed state.

Lst-Change: The date and time the channel last changed state.

Changes: The number of times the channel changed state.

Description: The number and title of the channel.

Events/Sensors Activity Log

State: The state of the channel at the triggered time, A=alarm, N=normal.

Trigger Time: The time the channel changed state.


Description: The number and title of the channel.

Note: An xx:xx:xx.xxx in the events/sensors activity summary indicates that the digital channel's state did not change from the initial state (Fst).

WINDOW PROPERTIES

Location: Analysis

Description: The Analysis Window Properties dialog allows for repositioning the columns in the analog table, change the fields displayed in the combination view, change the background colors and trace colors; change the driver's data type, change the trace/phasor scale multipliers and more refer to the fields below.

Activation: *Direct:* Properties Menu Button 
Menu: Alt-(F) File, (T) Window Properties

Ribbon, Waveform Tab:  Properties

| | |
|----------------|--|
| Fields: | <p><i>Analog Table Tab:</i> Reorder/Show/Hide the columns in the analog table.</p> <p><i>Analog Combination Tab:</i> Change the display positions in the analog combination view.</p> <p><i>Comtrade:</i> Define the Comtrade format for saving, the date and time format for display and set automatic conversion from RMS data to Peak data when using the Save As Comtrade option.</p> <p><i>Colors:</i> Change the background colors and trace colors.</p> <p><i>Display Settings:</i> Change the trace/phasor scale multipliers and set general display properties.</p> <p><i>Append/Merge:</i> Define the append type and merge analog titles.</p> <p><i>Driver Data Type:</i> Set the current display driver's data type to Peak type or RMS calibrated, convert the analog samples from primary to secondary and visa verse, edit the ration values and convert the line impedance values from primary to secondary or secondary to primary.</p> <p><i>Filters:</i> Delete spikes and set up spike properties.</p> |
|----------------|--|

Options: *OK:* Apply the selected changes and redraw the analysis window.
Cancel: Exit the dialog without executing the changes.

Comments: The active data window and all future opened files will be updated with the settings changed in the properties dialog.

ZIP FILES


Location: File Manager

Description: Zip a group of files or a single file using the Zip option under the File tab. All support files needed to display the selected files will be automatically included in the zip file. Support files include Comtrade configuration (*.CFG), header (*.HDR) & information (*.INF) files, DFR's

analog and digital information files such as: Hathaway DAU files, Rochester preamble and header files, Faxtrax/Director CTL files, Transcan SCF and TCF files.

Activation: *Direct:* Right Click Pop-up Menu Button  Zip
Menu: Alt-(F) Files, (Z) Zipped Marked Files...
Ribbon, Files Tab: 

Fields: *New Zip File Name:* Enter a path and name for the new zip file.
EncryptHeaders: Click to encryptheaders.

Comments: To zip files, mark the desired files in the file table and select the Zip Files option under the Files tab or right click on the file table and select the Zip  Zip option from the pop-up menu. All support files needed to display the file(s) are automatically included.

See Also: [Mark/Unmark Rows](#)

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