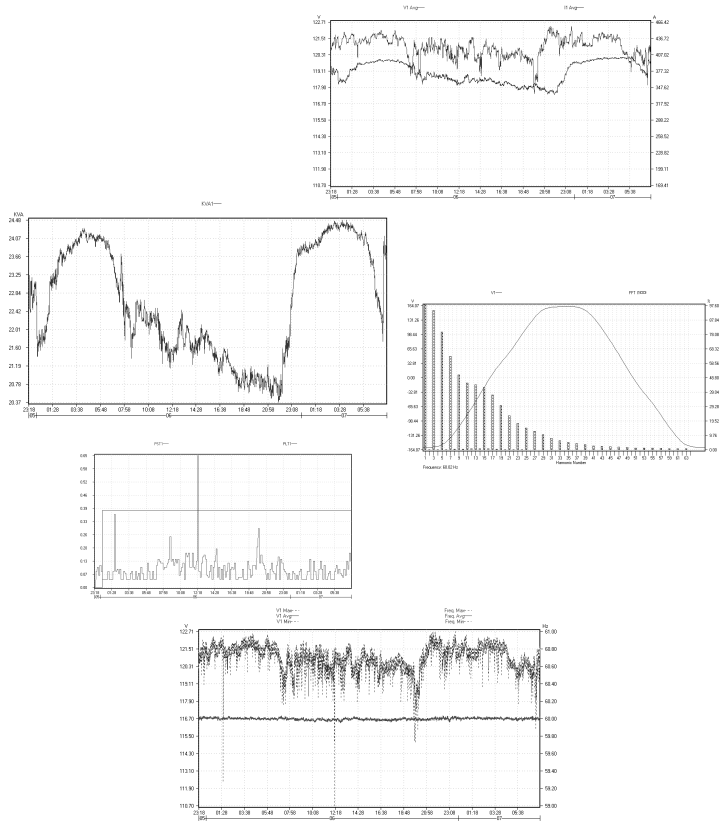# PowerView
Data Analysis Software

User's Guide

PowerView User's Guide

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Appendix A - Total Survey Summary

Introduction

PowerView is an analysis tool to be used with the PowerPro Logger. It provides the user with a simple, yet powerful set of tools for interpreting recorded surveys.

Some data loggers have a built-in display screen for data statistics such as RMS, THD, Waveforms, Power, and Flicker. This data can be viewed in real time when using a logger with a display. *PowerView* can enhance those statistics by presenting the data in detailed graphical forms. The software has tools that can zoom in and out of a region in the graph, as well as pinpointing an exact co-ordinate and display all the related information at that point. It can also generate a complete report of the events captured, as well as an hourly, daily, weekly, monthly and a survey summary. All of the graphs can be printed out or copied to the clipboard for pasting into a Microsoft Word document. All data can be exported to a file which can then be imported by Microsoft EXCEL for presentation in a report.

System Requirements:

- Pentium Processor, Windows 95/98/ME
- 32MB RAM, 20MB Hard Disk Space
- VGA Display, 16 bit High Color 800 x 600 pixels screen area
- Mouse, Keyboard
- PCMCIA Slot (*Optional*)
- SanDisk Parallel Port or USB Flash Card Reader (*Optional*)

Software Installation

To run the installation file from the *PowerView CD*, follow the procedures:

1. Insert CD into the CD ROM
2. Click on the "Start" button of Windows
3. Go to "Run"
4. Type in D:\pvinstall.exe

Note: The CD ROM drive letter may be different in your computer.

Quick Start

There are three ways to load a file in *Power View*:

Open an existing file from a drive.
There are two types of files that can be opened from *PowerView*. These are the RAM card files recorded by the logger (*.TST) and the *.PPS file. Before a memory card file can be viewed, the file must first be processed. This can be done by opening the *.TST file. The installation of *PowerView* places two memory card files in the Surveys directory. To open one of these files for viewing, perform the following:

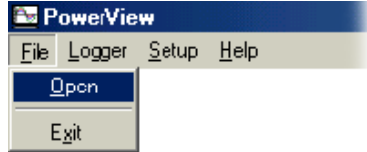- Go to 'File' in the menu bar and select 'Open'.

Fig 2.1

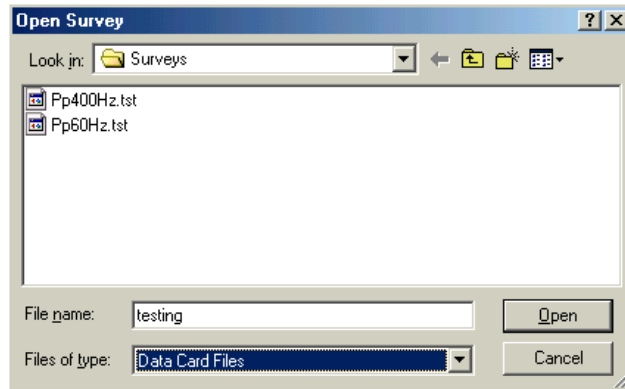- Change the files of type to Data Card Files as follows:

Fig 2.2

Continued....

Quick Start (opening an existing file from a drive) continued

- Select the PP400Hz file or the PP60Hz file for viewing and select Open. The following Dialog Box (Fig 2.3) should appear with the Title and Notes blank. Enter some information in the Title and Notes box of the dialog. The Title and the Notes are not required, but are displayed in the Reports generated by *PowerView*. Select OK.
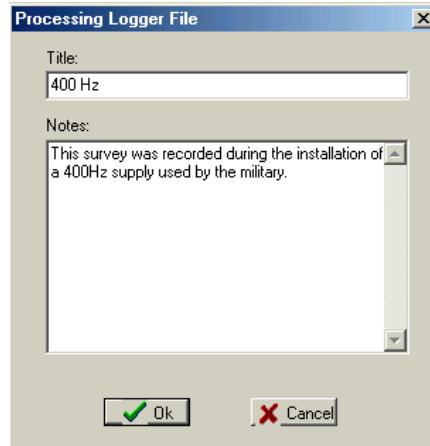
Fig 2.3

- A Save As dialog box will appear which prompts the user to enter a file name for saving the processed file. Select Enter and accept the default file name. The file will be processed and saved accordingly. *PowerView* will then display a Processing Successful dialog Box. After the Processing Successful is acknowledged by the user, *PowerView* will display the RMS Voltage and RMS Current graph. The next time that the file is viewed, the *.PPS file can be opened without re-processing the file.

Download recorded data from a logger

While a logger is recording, *PowerView* can directly transfer data from a logger to the computer via a serial port cable. To do so, connect one end of the serial cable to the logger and the other end of the serial cable to the PC. Setup the ComPort settings for *PowerView* using the Setup - ComPort menu selection.

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Quick Start (Download recorded data from a logger)

- Go to 'Logger' in the menu bar and select 'Download logger'.
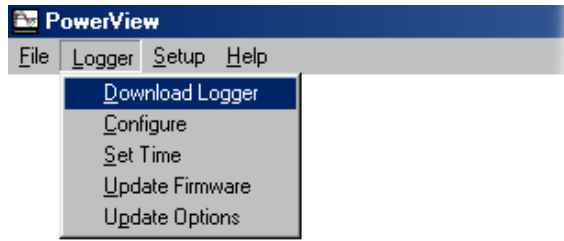
Fig 2.4

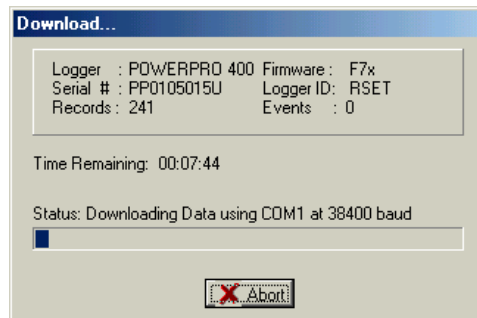If the download is successful, a status screen will pop up and display the download process. (Fig 2.5)

Fig 2.5

If **PowerView** can not detect any data coming from the logger in 30 seconds, a warning screen will pop up (Fig 2.6). To correct the problem, check the connection of the cable and make sure it is secure. Also keep in mind that some loggers will not have any data to download until a record is recorded.
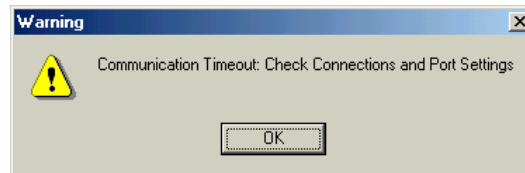

Fig 2.6

Continued....

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Quick Start (Download recorded data from a logger) continued

When the download is complete, **PowerView** will ask which directory to save the file. The file will be automatically saved in *.PPF* (default) extension. The user can also enter additional information about the file such as the Title and Notes as previously explained in the *Opening an Existing File from Disk*.

Download recorded data from a Memory Card.

Data that is recorded to the Memory Card is saved as a *.TST* file. To open a data card file, the computer must have a PCMCIA slot or an external SANDISK flash card reader.

- Insert the card into the PCMCIA slot of the computer or the external SANDISK flash card reader.
- Click on the file open speed bar icon
- Select the Files of type 'Data Card Files' in the dialog box.
- Find the recorded survey and open the file. Note that the memory card should show up as a disk drive.
- Enter in the Title and Notes in the Processing Logger File dialog box and select OK.

PowerView will ask which directory to save the processed file. The file will be automatically saved as a *.PPF* (default) extension. The next time that this file is to be viewed, the *.PPF file can be opened directly without processing the file.

Speed Bar Icons

File Open brings up the Open Survey Dialog Box. Used for opening a file for viewing.

Export Data brings up the Export Data dialog. Export data to a comma delimited file which can then be imported into EXCEL.

Print Graph brings up the Print dialog box. Print a graph via the printer.

RMS Voltage and Current Graph displays the RMS Voltage plotted on the left axis with the RMS current plotted on the right axis.

THD Graph displays the voltage THD plotted on the left axis with the current THD plotted on the right axis.

Frequency Graph displays the frequency plotted on the left axis.

KW and PF Graph displays the real power plotted on the left axis with the power factor plotted on the right axis.

KVA and KVAR Graph displays the apparent power plotted on the left axis with the reactive power plotted on the right axis.

Flicker Graph displays the short term and long term perception plotted on the left axis. Note that this item may appear disabled if the survey did not include flicker.

Neutral: 1st and 3rd Harmonics displays the Neutral 1st and 3rd voltage harmonics plotted on the left axis with the Neutral 1st and 3rd Current harmonics plotted on the right axis. Note that this item may appear disabled if the survey did not include neutral reading.

Speed Bar Icons continued

FFT Magnitude Graph displays the voltage harmonics plotted on the left axis with the current harmonics plotted on the right axis. Note that the harmonics are plotted as a percentage of the fundamental and all results are based on the waveforms recorded during the survey.

WaveForm Voltage and Current Graph displays the voltage waveforms plotted on the left axis with the current waveforms plotted on the right axis. Note that the FFT Magnitude Graph is derived from these waveforms.

Set Up Graph displays the Graph Setup dialog box.

Event Table will display a list of events that were recorded in the survey. Note that this may appear disabled if the survey did not capture on any events.

Zoom In will enable zooming. The cursor will turn into a magnifying glass indicating that zoom is enabled.

Zoom Out will disable zooming and restores the graph to its original size.

Data Box will enable the data box feature of *PowerView*. When this is enabled, the cursor becomes a cross hair. Moving the crosshair around the graph will display the data box. The data box appears as follows:

```
Record #: 21
Date: 01/01/2000
Time: 3:55:15 PM
V1=649.3/650.9/652.2 V
V2=648.9/650.6/651.9 V
V3=648.7/650.4/651.9 V
I1=0.3/0.6/0.9 A
I2=0.3/0.3/0.9 A
I3=1.2/1.2/1.5 A
```

Right click on the mouse and the a pop up option will appear:

Add Box To Graph

When this option is selected, the data box will be

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Speed Bar Icons

added into the graph, and multiple data box can be added using the same method, similar to the following figure:
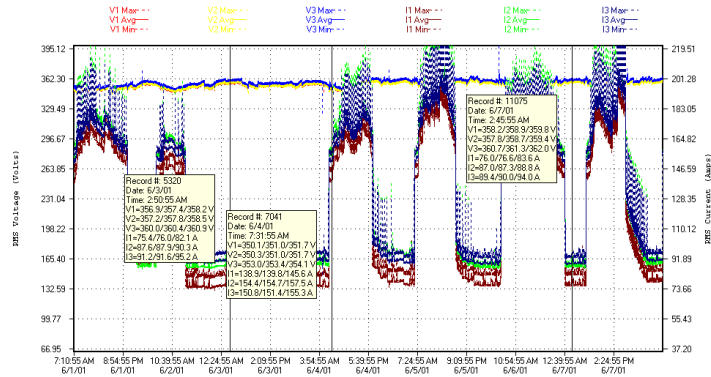

Fig 3.1

To Remove the data box, click on the desired graphing icons and *PowerView* will re-plot the graph.

Arrow disables the zoom and data box.

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Main Menu - File

Once a File is opened, the File Menu selections appear as follows:

Fig 4.1

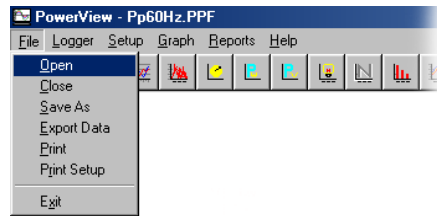**Open** is used to open a pre-processed survey or for downloading data directly from a data card.

Close is used to close an existing survey.

Save As can be used to save the existing survey as another file name.

Export Data
This function is used to export the data to a comma delimited ASCII file which can be imported into an EXCEL spreadsheet for formatting and editing.
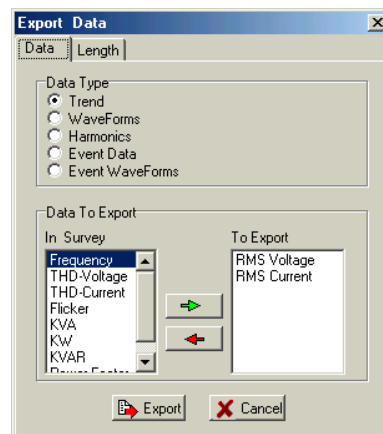

Fig 4.2: Export Data Dialog Box

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Main Menu (Export Data) continued

Under the "Data" tab, there are two settings that requires parameters set by the user.

Data type
Defines the data which the user wishes to export. Select one from the list.

Data To Export
Represents the data which is to be exported. The user can add or remove data to be exported by using the following controls:

	Adds data to the Export Box
	Removes data from the Export Box
	Starts the export process. This will bring up a save dialog box that will permit the user to specify the export filename. Specifying a filename and selecting "OK" will generate a comma delimited ASCII file for importing into an EXCEL spreadsheet.
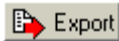
Print is used to print the current graph on a printer.

Print Setup is used to setup the printer.

Exit will terminate *PowerView*.

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Main Menu - Logger

The Logger Menu selection appears as follows:
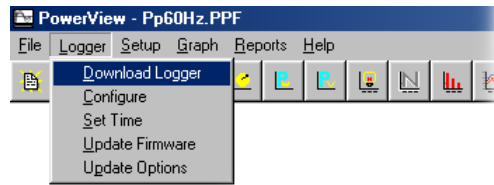

Fig 5.1

This selection of menu commands is used to communicate with the Logger. These commands require that the logger be connected to an unused serial port on the computer via an RS-232 cable. These commands also require that the RS-232 port is configured properly. See the Main Menu – Setup section of this document for setting up the COMPORT.

Download Logger

Used for retrieving data directly from the logger. The logger can be recording a survey or stopped. For instantaneous file transmission, it is recommended that RAM cards be read directly from the PCMCIA port or on external FLASH card reader.

Configure Logger

Used for setting up the logger. This selection permits the user to configure a logger from the PC. A configuration can be saved and loaded for easy logger setup. Once the logger configuration has been read from the logger, the following dialog box appears:
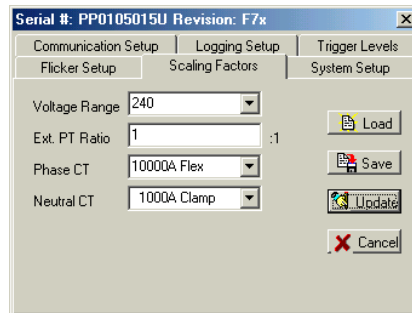

Fig 5.2

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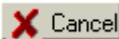
Main Menu - Logger (Configure Logger) continued

For the various parameters which can be set, please refer to firmware manual for the logger in use. The buttons on the dialog perform the following functions:

Load	Loads configuration file from disk for easy setup of a logger.
Save	Saves the configuration to disk for future use.
Update	Writes the configuration to the logger.
Cancel	Cancel Logger Configuration and return to main program.

Set Time

This command will set the time on the logger to the computer time. Note that the logger cannot be recording.

Update Firmware

This command is used for re-programming the logger with new firmware. Any firmware updates can be downloaded from the internet. When this item is selected, an open file dialog box will be displayed. Find the new firmware file (*.PPS) and select it. Select OK and *PowerView* will display the following dialog box:

Fig 5.3

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Main Menu - Logger (Update Firmware)

To start the file transfer and reprogramming of the logger, the user must hold down F3, F4, F5 and F6 simultaneously and release. The file will then start transmission and the logger will reprogram it self. The dialog box that appears is as follows:
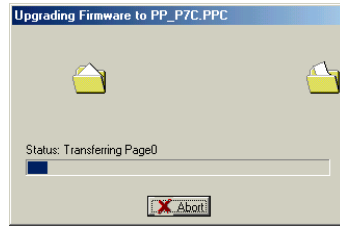
Fig 5.4
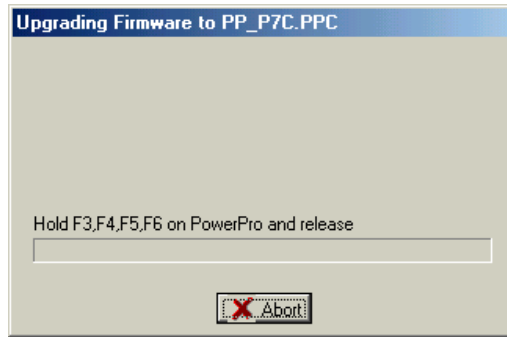
When the transfer is complete, a successful transfer dialog will be displayed and the logger will reset itself after 30 seconds. The logger has now been reprogrammed and is ready for use. Note that this program is non-volatile and will remain in the logger until the device is reprogrammed, even if the device is put to sleep.

Update Options

Update options is used to update a loggers configuration. A logger can be purchased as a base unit and have functions added to it in the field. Some options that are available are as follows:

- flicker

Note that the flicker option must be purchased from the factory. When the flicker option is purchased, the user will be supplied a password for updating a loggers options. When the Update Options menu selection is selected, a dialog box will display. The password supplied by CANDURA instruments will be typed into the memo box on the dialog and if the password is correct, the logger will be updated. The dialog box appears as follows:

Fig 5.5

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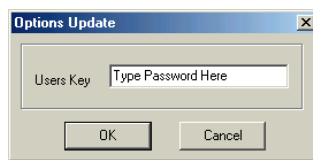
Main Menu - Setup

The Setup Menu selection appears as follows:
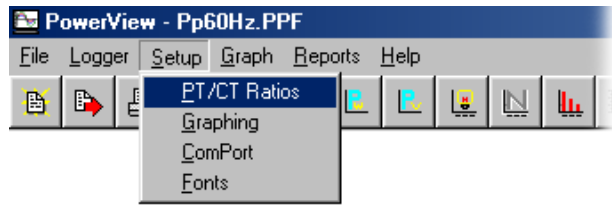
Fig 6.1

PT/CT Ratios

When the logger is setup for recording, the user can set the PT ratios and the CT ratios on the logger. This ratio determines the scaling of the readings. The logger has limits as to the scaling that can be done internally, but the data can be scaled in software when generating reports or viewing the survey. The PT/CT ratio dialog appears as follows:
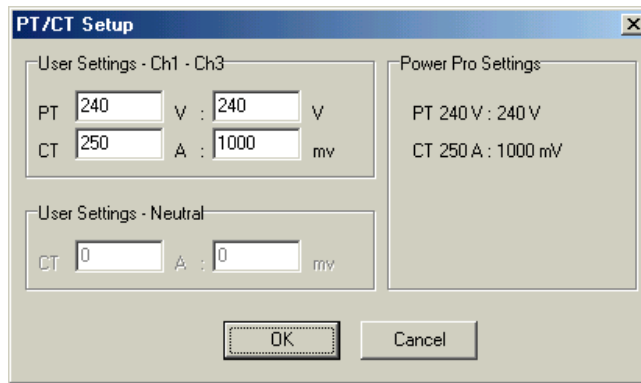
Fig 6.2

To change the PT settings or the CT settings, simply enter the appropriate ratios and let the software take care of the rest. Note that this information is saved for the next time that the file is viewed.

Graphing

This menu item is used by the user for configuring and customizing the appearance of the various graphs. When the item is selected, a dialog box displays with five tabs. The tabs on the dialog box are as follows:

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Main Menu - Setup (Graphing)

Y-Axis Tab
Speed buttons have been setup to enable the user to plot pre-defined graphs at the click of a button, such as the *RMS Voltage and Current graph* (See Section on Speed Bar Icons). This tab permits the user to customize the graph. (Fig 6.3)
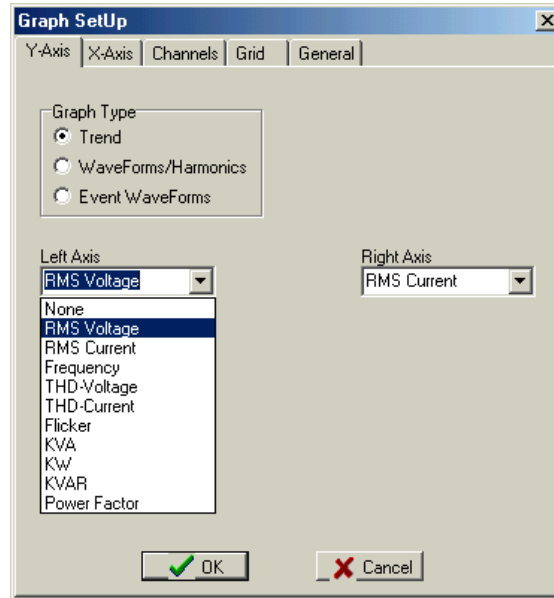
Fig 6.3

The Graph Type radio buttons determines the type of graph that the user will plot. The graph types are

Trend data plots the data that is recorded every storage interval.

Waveforms/harmonics plots the waveforms/harmonics that are recorded during the survey. Selecting this permits the use to plot waveforms with the harmonic components of the waveforms.

Event waveforms plot the event waveforms that were recorded during the survey. This may not appear if there wasn't any events recorded.

Main Menu - Setup (Graphing - Y axis Tab) continued

The Left Axis and Right Axis drop down selections specifies what the user wants to plot on the Y-Axis. This permits the user to specify the data to plot on the Left axis with the data to plot on the right axis.

X-Axis Tab

The X-Axis tab permits the user to set the duration of the X-Axis for plotting. Under 'Reference Setup', The duration can be defined by stating the number of records to display in the graph using the following parameters:

- **Start Record** – User can input the starting record number which will set the graph to display data from that specific record and forward.
- **Record Per Graph** – User can input the number of records to display in the graph.

Note that 'Reference Setup' also display the Start Time corresponding to the starting record number, and the End Time corresponding to the last record in the graph. The yellow text indicate that the time setting is out of the survey.

The X Axis Tab dialog box appears as follows:
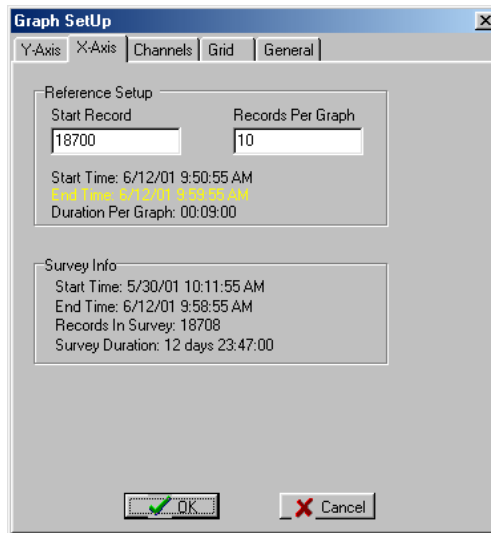
Fig 6.4

Main Menu - Setup (Graphing)

Channels Tab

      This tab is used to turn on and off the traces on the graph. A box with a checkmark indicates that a trace or channel is to be displayed. Turning off a channel will turn the channel off in the graph and during the export data process. The color box associated with each trace indicates the color of the trace on the graph. Double clicking on a colour box will bring up a color dialog box which enables the user to change the color of a trace. The color of the traces are saved on exit and will be loaded the next time that a file is opened.

      The scaling box enables the user to select the scaling that is to be used on the Y-axis. There is three types of scaling for the Y-Axis. These are as follows:

Auto Scale – The software sets up the Y-Axis scaling based on the maximum values obtained from the survey.

Full Scale – The software sets up the Y-Axis scaling based on the maximum full scale reading that can be obtained with the logger.

Manual Scale – This setting enables the user to set the Y-Axis scaling to user defined limits. When this is checked, the min and max boxes become active. To change the Y-Axis scaling, simply enter the user defined scaling values in the min and max boxes.

Fig 6.5

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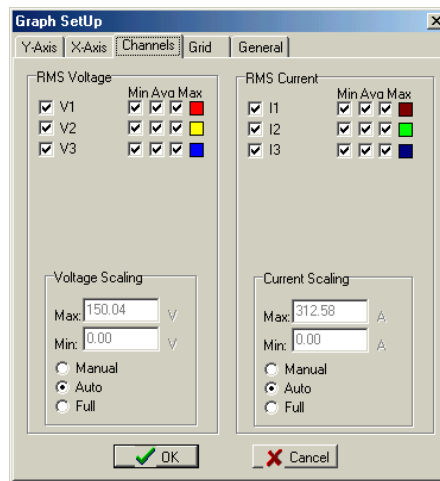
Main Menu - Setup (Graphing)

Grid Tab
This tab enables the user to turn on and off the grid on the graphs.
The dialog box appears as follows:
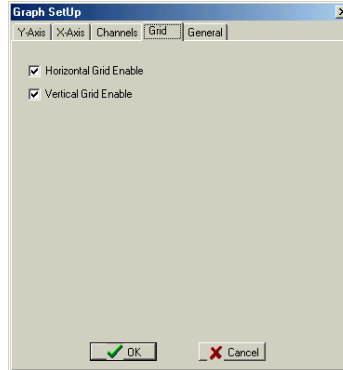
Fig 6.6

General Tab
This tab permits the user to customize the overall setup of the graph. It permits the user to change the color of the back ground on the graph, the color of the borders of the graph, as well as the color of the data box. To change a color, double click on a color box to bring up the color dialog box. Note that to change the color of the fonts, the user must change the fonts using the SetUp, Fonts menu selection. The dialog appears as follows:

Fig 6.7

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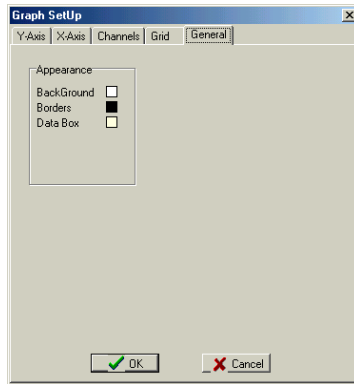
Main Menu - Setup

ComPort

When **PowerView** communicates with a logger connected via the serial port, **PowerView** must know which Port that the logger is connected to and the speed at which it is to communicate. This can be setup from the dialog box:
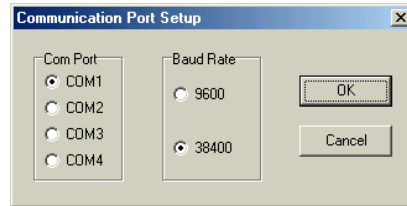
Fig 6.8

Note that the BaudRate should be setup for 38400 for maximum download speed.

Fonts

The setup of the Fonts for PowerView is done through this dialog box. To change the Fonts on the graph, this dialog box must be activated, modified and Applied to the graph by clicking the Apply button on the dialog box. Note that the font color for the graphs is set using this dialog box. The font dialog box appears as follows:

Fig 6.9

20
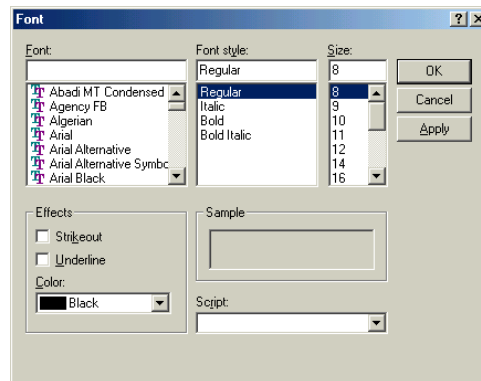
Main Menu - Graph

This menu selection is used for selecting a predefined graph or copying a graph to the clipboard for pasting into another document. The menu appears as follows:
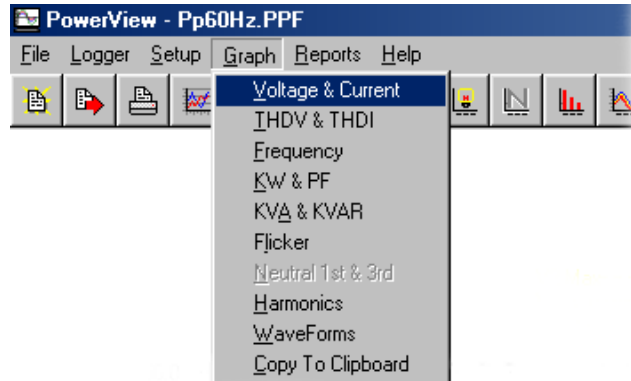
Fig 7.1

The predefined graphs are as follows:

- **Voltage & Current** displays the RMS Voltage plotted on the left axis with the RMS Current plotted on the right axis.
- **THDV & THDI** displays the voltage THD plotted on the left axis with the current THD plotted on the right axis.
- **Frequency** displays the frequency plotted on the left axis.
- **KW & PF** displays the real power plotted on the left axis with the power factor plotted on the right axis.
- **KVA and KVAR** displays the apparent power plotted on the left axis with the reactive power plotted on the right axis.
- **Flicker** plots the perception long term and the perception short term on the left axis. Note that this item may appear disabled if the survey did not include flicker.
- **Neutral 1st & 3rd** displays the Neutral 1st and 3rd voltage harmonics plotted on the left axis with the Neutral 1st and 3rd Current harmonics plotted on the right axis. Note that this item may appear disabled if the survey did not include neutral readings.
- **Harmonics** displays the voltage harmonics plotted on the left axis with the current harmonics plotted on the right axis. Note that the harmonics are plotted as a percentage of the fundamental and all results are based on the waveforms recorded during the survey.

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Main Menu - Graph

- **WaveForms** displays the voltage waveforms plotted on the left axis with the current waveforms plotted on the right axis. Note that the FFT Magnitude Graph is derived from these waveforms.
- **Copy To ClipBoard** will copy the graph on the screen to the clipboard. This graph can then be pasted into another document.

Main Menu - Report

This menu selection appears as follows:

Fig 8.1

There are two items to this menu:

Summary
For generating reports from the recorded survey. When Summary is selected, the following dialog box occurs.
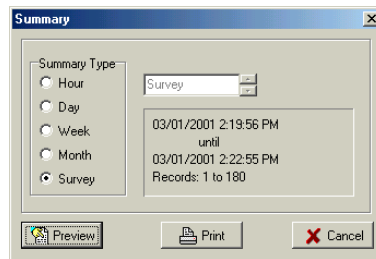
Fig 8.2

The software is capable of automatically generating reports for the survey. It can generate Hourly, Daily, Weekly, Monthly and Total Survey reports. If a summary type is selected which does not include the entire survey, the memo box can be used to select the Hour, Day, Week or Month which is to have its summary produced.

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Main Menu - Report (Summary) continued

✗ Cancel	Terminate the dialog box and returns back to the main program.
🖨 Print	Prints the report that has been specified.
Preview	Brings up the preview window for viewing the survey summary. The window appears as follows:
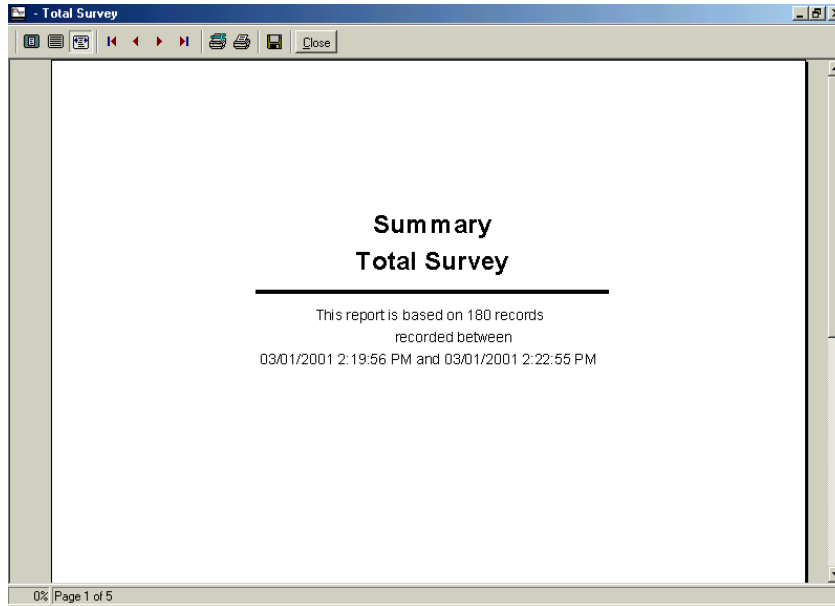
Fig 8.3

While previewing a survey summary, the user can print the document or save it as a rich text file for importing into Microsoft WORD. The speed bar icons are defined as follows:

	Enables the user to changes from Zoom to fit, 100%, Zoom to width.
	These controls permit the user to page through the document.

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Main Menu - Report (Summary)

Permits the user to setup the printer and print the document.

Permits the user to save the document as a rich text file (*.RTF) which can be opened in Microsoft Word

Closes the preview window.

Events

This menu selection may appear disabled if the survey did not record any events. If there are events, selecting this menu item will display the event table which appears as follows:

PowerView - Pp60Hz.PPF

File Logger Setup Graph Reports Help

Event Records
10 Events captured from 03/01/2001 2:19:57 PM to 03/01/2001 2:21:43 PM

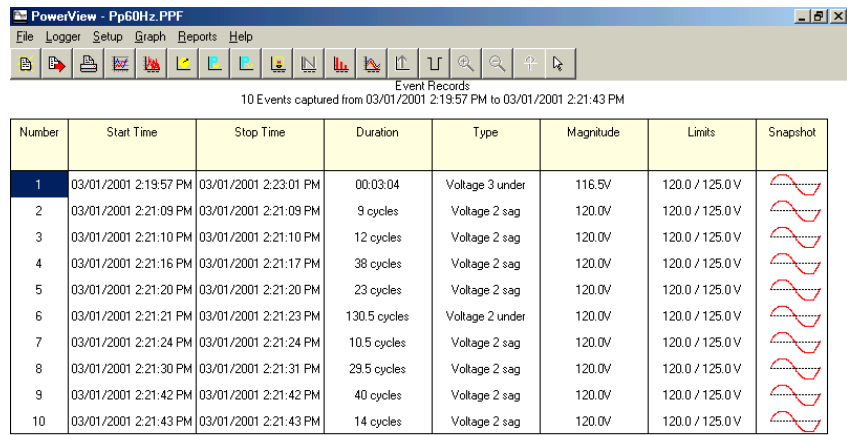| Number	Start Time	Stop Time	Duration	Type	Magnitude	Limits	Snapshot
1	03/01/2001 2:19:57 PM	03/01/2001 2:23:01 PM	00:03:04	Voltage 3 under	116.5V	120.0 / 125.0 V	
2	03/01/2001 2:21:09 PM	03/01/2001 2:21:09 PM	9 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	
3	03/01/2001 2:21:10 PM	03/01/2001 2:21:10 PM	12 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	
4	03/01/2001 2:21:16 PM	03/01/2001 2:21:17 PM	38 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	
5	03/01/2001 2:21:20 PM	03/01/2001 2:21:20 PM	23 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	
6	03/01/2001 2:21:21 PM	03/01/2001 2:21:23 PM	130.5 cycles	Voltage 2 under	120.0V	120.0 / 125.0 V	
7	03/01/2001 2:21:24 PM	03/01/2001 2:21:24 PM	10.5 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	
8	03/01/2001 2:21:30 PM	03/01/2001 2:21:31 PM	29.5 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	
9	03/01/2001 2:21:42 PM	03/01/2001 2:21:42 PM	40 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	
10	03/01/2001 2:21:43 PM	03/01/2001 2:21:43 PM	14 cycles	Voltage 2 sag	120.0V	120.0 / 125.0 V	

Fig 8.4

This table contains the event information captured during the recording of the survey. It displays the start and stop time of the event, the duration, type, magnitude and limits of the event. To view the waveform that was captured during the event, click on the sinusoidal graphic for the particular waveform that may be of interest.

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Report Writing with PowerView

Extracting data from the survey

PowerView has a powerful tool called the databox. With the databox enabled, the user can obtain instantaneous readings for any data point displayed on the graph. This includes the following:

- RMS Voltage
- RMS Current
- Total Harmonic Distortion
- Frequency
- KW
- Power Factor
- KVA
- KVAR
- Flicker
- Neutral (1st and 3rd)
- Reactive Power
- Waveforms
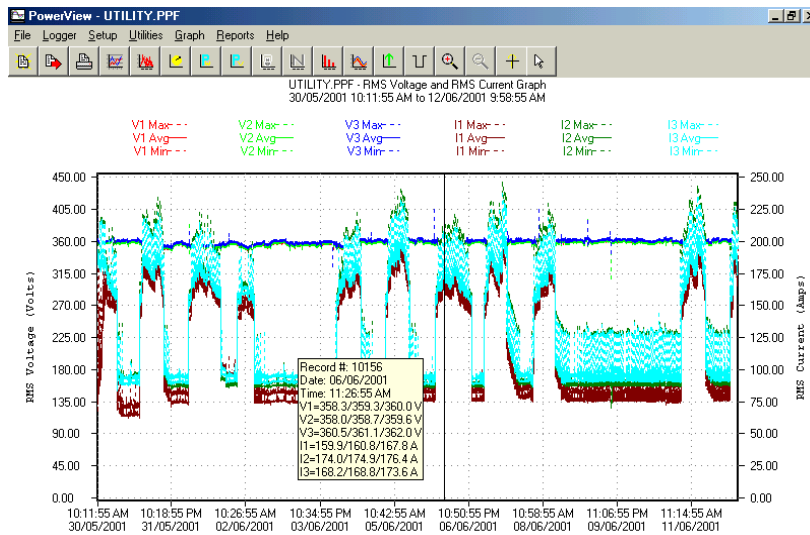- Harmonic Components of waveforms (Magnitude and Angles)

Fig 10.1: Screen capture of PowerView with the databox enabled

Report Writing with PowerView

Copying graphs into a word document

Any graph that is plotted in *PowerView* can be copied to a word document using the clipboard. Figure 2 was copied using this feature. This graph contains a snapshot of the waveforms for Phase A. Notice that in the legend of the graph, the software displays the RMS value of the waveform, the crest factor and the angle of the fundamental relative to V1.
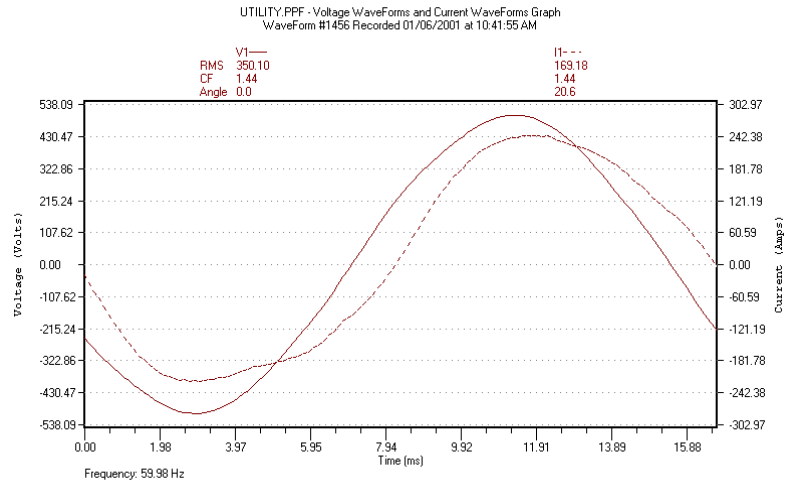

Fig 10.2: *PowerView* graph pasted into document

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Report Writing with PowerView

Exporting Data

A tabular report of the data is easy to do using PowerView. The software enables the user to export data to a file. This file can then be opened in Excel, manipulated and formatted. It can then be copied into the user's Word document. The RMS average for V1 and I1 had its first 20 points exported. It was formatted in Excel and presented in Table1.

Record	Date	Time	V1 Avg (V)	I1 Avg (A)
1	30/05/2001	10:11:55 AM	358	77.8
2	30/05/2001	10:12:55 AM	357.4	76.6
3	30/05/2001	10:13:55 AM	357.4	73.9
4	30/05/2001	10:14:55 AM	357.2	73.9
5	30/05/2001	10:15:55 AM	357.2	74.2
6	30/05/2001	10:16:55 AM	357.1	74.8
7	30/05/2001	10:17:55 AM	357.2	74.8
8	30/05/2001	10:18:55 AM	357.2	75.1
9	30/05/2001	10:19:55 AM	357.1	75.4
10	30/05/2001	10:20:55 AM	357.1	76
11	30/05/2001	10:21:55 AM	357.1	76
12	30/05/2001	10:22:55 AM	356.9	76.9
13	30/05/2001	10:23:55 AM	356.9	76.9
14	30/05/2001	10:24:55 AM	356.7	79
15	30/05/2001	10:25:55 AM	356.5	79
16	30/05/2001	10:26:55 AM	356.3	88.8
17	30/05/2001	10:27:55 AM	356.5	80.3
18	30/05/2001	10:28:55 AM	356.7	79
19	30/05/2001	10:29:55 AM	356.7	80
20	30/05/2001	10:30:55 AM	356.7	80.9

Report Writing with PowerView

Software flexibility

PowerView was designed to be user friendly, yet powerful! The user can select the data which is to be plotted on the left and right axis. This provides the user with full control over the software's output.
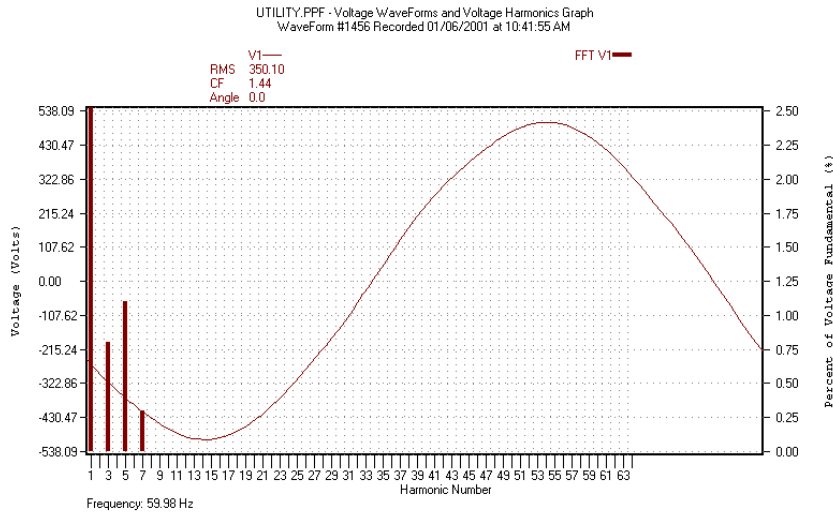

Fig 10.3: V1 waveform plotted with V1 Harmonics

Including The Survey Summary

PowerView will generate hourly, daily, weekly and total survey summaries. To generate a Microsoft Word survey summary is simple. Generate a survey summary in *PowerView* and save the document as a *.RTF file from the summary preview. In your current document, use the insert file function from Microsoft Word and insert the Rich Text Document generated by *PowerView*. Adjust the margins for the inserted document and it now appears in the report. The total survey summary was generated by *PowerView* and appears in Appendix A.

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