Power Log

PC Application Software

Users Manual

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Fluke Corporation

FLUKE Power Log Software

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Table of Contents

List of Tables

Table	Title	Page

List of Figures

Figure	Title	Page

Introduction

Power Log (the Software) is the PC software for Fluke 345, 435, VR1710 and 1735. The Fluke 433 and 434 also use Power Log if the 434 logger function is installed. These models are referred to throughout this manual as the instrument. The software accepts data downloaded from the instrument. The software is designed for Microsoft Windows® XP and verified to run with Vista.

After transferring logged data to a PC for graphical and tabular evaluation, data may be exported to a spreadsheet for generating and printing reports.

With Power Log:

- Download recorded logged data to a PC
- Generate data tables
- View, print, and export time plots of all channels
- Perform harmonic studies
- Print tables, graphs, and comprehensive, formatted reports
- Export data for manipulation in other programs (Excel, for example)

This manual provides instruction for installing and using the Software, as well as limited instruction for connecting to Fluke power quality instruments. Brief introductions to opening, viewing, filtering, and exporting data guide users through most features of Power Log.

Contacting Fluke

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-3434-0181
- Singapore: +65-738-5655
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at www.fluke.com.

To register your product, visit http://register.fluke.com.

To view, print, or download the latest manual supplement, visit

http://us.fluke.com/usen/support/manuals.

To contact Technical Support: fpqsupport@fluke.com or 888-257-9897

System Requirements

The minimum computer requirements are shown in Table 1.

Table 1. System Requirements

Component	Necessary	Recommended
Free hard disk space	10 MB	>50 MB
CD-ROM drive	✓	
Monitor	800 x 600 pixels	1024 x 768 pixels
USB or RS-232 Serial Interface, dependant on instrument	✓	
Designed for Windows® XP and verified to run with Vista	✓	
Color printer		✓

Installing Power Log

Installing from CD

Insert the instrument CD into a PC. The installation should start automatically. If not, run the launch.exe program on the CD. Follow on-screen instructions to install the Software in the desired language. The 435 uses autorun.exe to install the Software.

Note

The most recent version of Power Log is available at the Fluke website.

The manuals and all application software install in the application directory, with a shortcut in the programs menu. A Power Log quick-launch shortcut can also be added to the desktop during installation.

Installing from Fluke Website

Navigate to the Fluke website at www.fluke.com and install using the on-screen instructions available from the product page for the instrument. Installing from the website requires a short registration.

Connecting to a Power Quality Instrument

⚠⚠ Warning

To avoid electrical shock or damage to the equipment, and before making any connections to the instrument, read and follow the safety warnings and cautions included in the instrument Users Manual.

Regardless of the instrument used, install the Software before connecting to the instrument. The 345, 435, VR1710 and 1735 instruments use either the RS232 serial or USB interface to connect directly to a PC.

Connect the instrument to a power source and turn it on before starting Power Log. USB cables must be connected prior to running the Software.

Note

For more information such as loading USB drivers and more, refer to the manual provided with your instrument.

Connecting a 345

Connect a 345 to the PC using the standard USB cable supplied with the instrument. The USB port is located on the right side of the instrument.

Connecting a 435

To connect a 435 to a PC or printer, use the optical interface.

Use the optical interface cable (model OC4USB) provided with the 435 to make the connection with the USB.

The interface connection, located on the right side of the 435, is accessed by folding out the tilt stand.

Connecting a VR1710

Load the USB driver as described in the *VR1710 Users Manual*.

Connect the USB cable and plug the VR1710 power cord into an electrical outlet. To configure VR1710 settings, run Power Log and select .

Available options are:

- Recording Interval from 1 second to 20 minutes. To change the interval setting, recorded data must first be erased.

- Dip and Swell thresholds from 0 V to 300 V.

- Circular memory on or off. Circular memory on will continuously record, writing over old data when memory is full. Circular memory off will stop recording when memory is full.

- Disable transients will not record detected transients.

- Transient sensitivity from 2 V to 20 V. To detect transients, a typical waveform is first determined through sampling. This waveform will change over time as the input waveform changes. An envelope around the typical waveform is created based on the sensitivity setting. If any point of a sampled waveform falls outside of the envelope, the waveform is recorded as a transient.

- Erase stored settings

- Read stored settings

Note

VR1710 firmware version 1.15 or greater is required for circular memory and transient settings.

Connecting a 1735

Note

Turn the power on before connecting the serial/USB cable to the instrument.

Using the provided serial/USB cable, connect the instrument to an available serial/USB port on the PC.

COM Port Number

The COM port number must be 9 or lower (COM1 to COM9). If a higher COM port number was selected when a USB driver was loaded, use the Windows Device Manager to change it:

1. Open the Device Manager located in **Control Panel/System/Hardware/Device Manager** (Windows XP).

2. Locate the device in **Ports** and double-click.

3. Go to **Port Settings/Advanced** and select **COM Port 9** or lower.

4. Press **OK**.

5. To update the Device Manager, select **Action** from the menu and scan for hardware changes.

Loading USB Drivers

USB drivers are located on the CD that came with the instrument. Follow the on-screen instructions and note that some drivers will automatically load twice. See instrument manuals for more details.

Using Power Log

Power Log may be used with existing, saved recorded data, or with newly recorded data from a connected instrument.

Starting Power Log

To start the Software:

1. If communication with an instrument is desired, refer to Connecting to a Power Quality Instrument.

2. Start the Software by selecting the **Power Log** program icon ![icon] from the menu:

   Start | **Programs** | **Fluke** | **Power Log** | **Power Log**

   Alternatively, use the **Power Log** icon shortcut on your PC desktop.

The Power Log welcome screen displays briefly during the launch sequence. See Figure 1.

eto001.bmp

Figure 1. Power Log Welcome Screen

The welcome screen is replaced by the following menu bar with a blank pane. The main menu displays the communications port and menu options. See Figure 2.
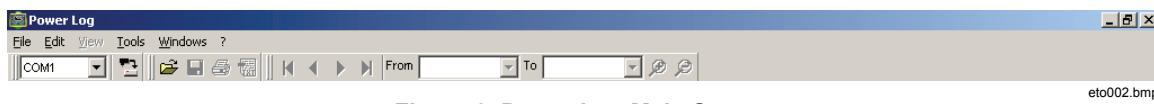

eto002.bmp

Figure 2. Power Log Main Screen

Downloading Logged Data to a PC

Data stored in the instrument can be transferred to a PC.

Note

Do not download data while the instrument is still logging; wait until logging is finished before downloading.

1. The instrument should be connected as described in Connecting to a Power Quality Instrument with the Software running.

   To download stored data from a 434 or 435:

   a. Press the MEMORY button.

   b. Select RECALL/DELETE (F1).

   c. Select saved data file to load.

   d. Select USE (F5).

2. Select the COM port from the drop down list. USB-based instruments may display as the instrument model.

3. Select from the menu **File | Download**, or press the download icon. The data transfer can take seconds or minutes, depending on the baud rate and the amount of data. Once the download is complete, a time plot of the data appears.

   VR1710 prompts: **Download complete. Keep Measuring?**

   1. **Yes**

   2. **Yes, and Erase memory**

   3. **No**

5

Note

The window that opens on the PC desktop depends upon the mode the instrument was in when the information was recorded.

Using Saved Measurement Data

Open a saved data set using Power Log with the following steps:

1. If it is not already running, start **Power Log**.

   After the welcome screen and reminders have displayed, the menu offers limited options.

2. Select **File | Open**, and navigate to the DataFiles folder in the **Fluke | Power Log** folder. Or, if the data files are at another location on the PC, browse to the location.

3. Select a file to use and press **Open**.

The window that opens defaults to the mode last used, or the mode the instrument was in when the data was recorded and saved. The tabs displayed are dependant on the instrument and saved data.

Uninstalling Power Log

Uninstall Power Log from a PC using the uninstall feature included with the Software.

To uninstall Power Log, follow this path from the Windows Start button:

Start | Programs | Fluke | PowerLog | Uninstall

The uninstall wizard completes the removal of the Software from the PC. The data files remain untouched.

Menu Options

Menu options are available based on the Windows tab selected. The sections below briefly explain the options.

Print

Prints current window view.

Copy

Copies current window view to the PC clipboard which can be pasted into other applications. Not available for all windows.

Preferences

Select from menu or windows that have mouse right-click menus. Select trace colors for all windows.

Zoom

Select from menu, icons or windows that have mouse right-click menus. Mouse right-click menus also have a restore zoom selection.

Axis Vertical Scale

Select from windows that have mouse right-click menus. Set the scale to automatic or define minimum and maximum. Scaling can also be applied to all graphs.

Save File as EMF

Select from windows that have right-click menus. Saves current view as EMF (Enhanced Windows Metafile) format.

Events

Windows that have events can be viewed by using the Tools menu or the arrow icons. Examples of events are dips, swells or transients.

Data Selection

Data sets can be selected using dates, zooming or events. The data set selected will be used for exporting data.

View Legend

Select from menu or windows that have mouse right-click menus.

View Cursors

Select from menu or windows that have mouse right-click menus or double-click on the graph.

Analyzing Data

Data can be viewed and printed, or exported for use in other software, such as Microsoft Excel and database programs. Whether downloaded from a connected instrument or opened from files, the same tabs and window options are visible. Tabs displayed will be dependant on the instrument and the saved data.

- Summary
- Spreadsheet
- Voltage and Amps
- Statistics
- Harmonics
- Frequency/Unbalance
- Power

- Screens
- Energy
- Transients
- Dips and Swells
- Flicker
- Mains Signaling
- Power Harmonics
- Event Profiles

Summary Tab

The Summary tab shown in Figure 3 allows you to enter information about the session, the client, and any notes that may be useful.
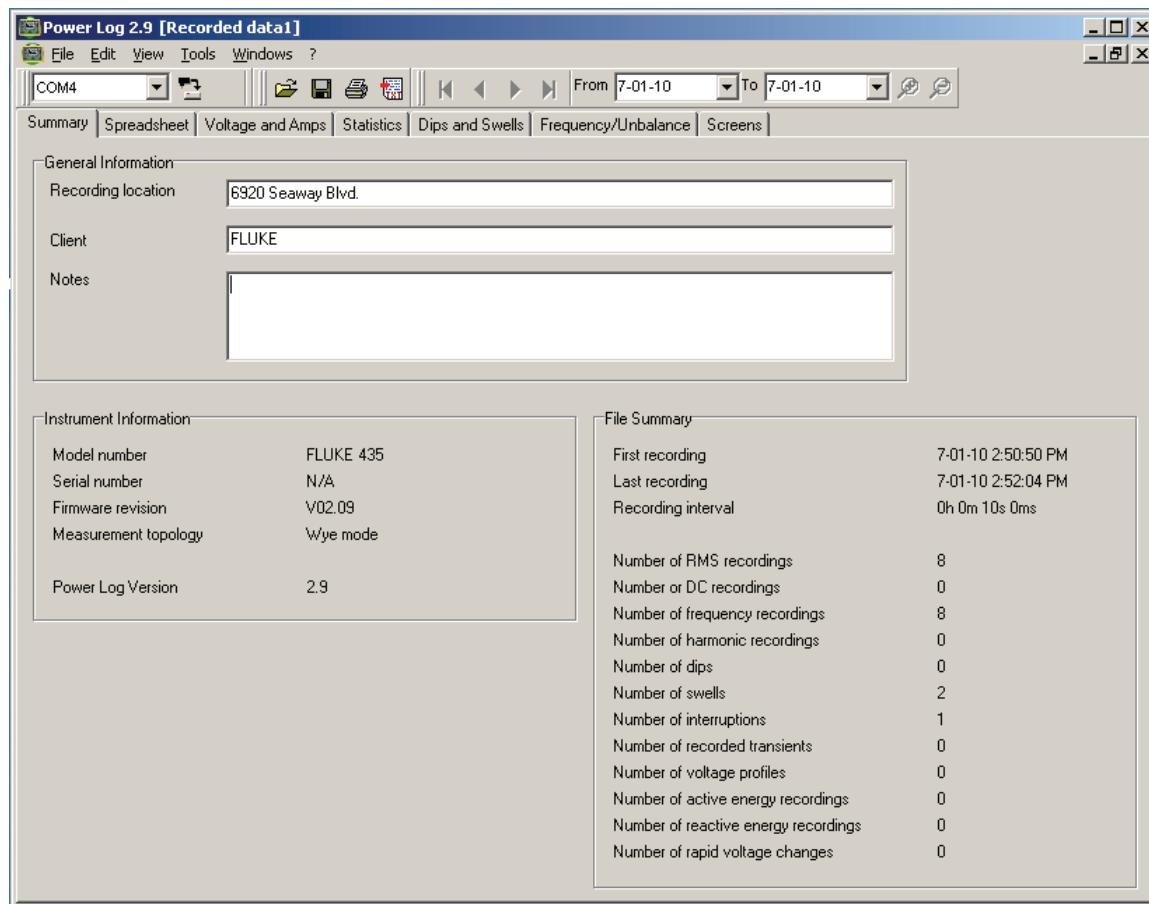

eto016.bmp

Figure 3. Summary Display for User Input

Spreadsheet Tab

The Spreadsheet tab allows viewing of the recorded dates and time, and additionally allows filtering of the data by de-selecting the checkboxes in the top line. Figure 4 shows the Duration checkbox unselected, and only selected channels and options are visible. The data displayed is dependant on the instrument used.

Date	Function	Duration	L1 Min	L1 Avg	L1 Max	L2 Min	L2 Avg	L2 Max	L3 Min	L3 Avg	L3 Max	N N
10/15/2007 12:07:45 PM 0ms	Voltage		234.443 V	234.744 V	234.914 V	233.345 V	233.594 V	233.738 V	234.417 V	234.639 V	234.757 V	
10/15/2007 12:07:45 PM 0ms	Current		9.032 A	9.045 A	9.055 A	4.964 A	5.136 A	5.25 A	5.845 A	5.9 A	5.968 A	7.9
10/15/2007 12:07:45 PM 0ms	Frequency		49.97 Hz	49.97 Hz	49.98 Hz							
10/15/2007 12:07:45 PM 0ms	THD V		1.8%	1.8%	1.9%	1.7%	1.7%	1.8%	2.1%	2.1%	2.1%	
10/15/2007 12:07:45 PM 0ms	THD A		22.5%	22.2%	262.8%	96.5%	92.9%	0.6%	63.3%	61%	31.5%	70.
10/15/2007 12:07:50 PM 0ms	Voltage		234.417 V	234.639 V	234.887 V	233.189 V	233.476 V	233.738 V	234.286 V	234.522 V	234.757 V	
10/15/2007 12:07:50 PM 0ms	Current		9.018 A	9.041 A	9.055 A	4.95 A	4.986 A	5.045 A	5.832 A	5.882 A	5.977 A	7.9
10/15/2007 12:07:50 PM 0ms	Frequency		49.96 Hz	49.97 Hz	49.98 Hz							
10/15/2007 12:07:50 PM 0ms	THD V		1.8%	1.8%	1.9%	1.7%	1.7%	1.7%	2%	2%	2.1%	
10/15/2007 12:07:50 PM 0ms	THD A		22.5%	22.2%	263.1%	96.9%	94.3%	0.6%	63.6%	61.1%	31.1%	70.
10/15/2007 12:07:55 PM 0ms	Voltage		234.26 V	234.43 V	234.652 V	233.189 V	233.411 V	233.607 V	234.313 V	234.43 V	234.548 V	
10/15/2007 12:07:55 PM 0ms	Current		9.009 A	9.023 A	9.041 A	4.955 A	4.977 A	5.036 A	5.85 A	5.918 A	6.014 A	7.9
10/15/2007 12:07:55 PM 0ms	Frequency		49.96 Hz	49.96 Hz	49.97 Hz							
10/15/2007 12:07:55 PM 0ms	THD V		1.7%	1.7%	1.8%	1.7%	1.7%	1.7%	2%	2%	2.1%	
10/15/2007 12:07:55 PM 0ms	THD A		22.5%	21.7%	262.7%	96.8%	95.8%	0.6%	63.4%	60.4%	31.2%	70.
10/15/2007 12:08:00 PM 0ms	Voltage		234.391 V	234.535 V	234.678 V	233.241 V	233.437 V	233.581 V	234.182 V	234.391 V	234.574 V	
10/15/2007 12:08:00 PM 0ms	Current		9.023 A	9.036 A	9.045 A	4.941 A	4.977 A	5.014 A	5.832 A	5.886 A	5.964 A	7.9
10/15/2007 12:08:00 PM 0ms	Frequency		49.97 Hz	49.97 Hz	49.98 Hz							
10/15/2007 12:08:00 PM 0ms	THD V		1.8%	1.8%	1.8%	1.7%	1.7%	1.7%	2%	2%	2.1%	
10/15/2007 12:08:00 PM 0ms	THD A		22.6%	22%	262.6%	96.9%	95.1%	0.6%	63.6%	60.7%	31.5%	70.
10/15/2007 12:08:05 PM 0ms	Voltage		234.417 V	234.639 V	234.835 V	233.372 V	233.541 V	233.738 V	234.495 V	234.613 V	234.783 V	
10/15/2007 12:08:05 PM 0ms	Current		9.023 A	9.036 A	9.045 A	4.964 A	5 A	5.095 A	5.814 A	5.909 A	6.032 A	7.9
10/15/2007 12:08:05 PM 0ms	Frequency		49.98 Hz	49.98 Hz	49.98 Hz							
10/15/2007 12:08:05 PM 0ms	THD V		1.7%	1.7%	1.8%	1.6%	1.6%	1.7%	2%	2%	2%	
10/15/2007 12:08:05 PM 0ms	THD A		22.6%	22.1%	261.5%	99.9%	95.6%	0.6%	63.9%	60.2%	31.3%	70.
10/15/2007 12:08:10 PM 0ms	Voltage		234.391 V	234.626 V	234.835 V	233.215 V	233.45 V	233.659 V	234.391 V	234.548 V	234.757 V	
10/15/2007 12:08:10 PM 0ms	Current		9.018 A	9.032 A	9.05 A	4.941 A	4.973 A	5.014 A	5.927 A	5.973 A	6.036 A	7.9
10/15/2007 12:08:10 PM 0ms	Frequency		49.97 Hz	49.97 Hz	49.98 Hz							
10/15/2007 12:08:10 PM 0ms	THD V		1.7%	1.7%	1.8%	1.7%	1.7%	1.7%	2%	2%	2.1%	
10/15/2007 12:08:10 PM 0ms	THD A		22.5%	22.2%	261.8%	97%	95.5%	0.6%	62.2%	59.9%	31.1%	71.
10/15/2007 12:08:15 PM 0ms	Voltage		234.443 V	234.587 V	234.861 V	233.319 V	233.411 V	233.581 V	234.417 V	234.561 V	234.705 V	
10/15/2007 12:08:15 PM 0ms	Current		9.023 A	9.032 A	9.045 A	4.959 A	5 A	5.141 A	5.936 A	5.982 A	6.041 A	7.9
10/15/2007 12:08:15 PM 0ms	Frequency		49.98 Hz	49.98 Hz	49.99 Hz							
10/15/2007 12:08:15 PM 0ms	THD V		1.7%	1.7%	1.8%	1.7%	1.7%	1.7%	2%	2%	2.1%	
10/15/2007 12:08:15 PM 0ms	THD A		22.8%	22.2%	262%	98%	95%	0.6%	62.5%	60%	31.2%	71.
10/15/2007 12:08:20 PM 0ms	Voltage		234.548 V	234.718 V	234.887 V	233.293 V	233.528 V	233.711 V	234.6 V	234.77 V	234.94 V	
10/15/2007 12:08:20 PM 0ms	Current		9.018 A	9.036 A	9.045 A	4.932 A	4.968 A	5.018 A	5.932 A	5.982 A	6.095 A	7.9
10/15/2007 12:08:20 PM 0ms	Frequency		49.98 Hz	49.98 Hz	49.99 Hz							
10/15/2007 12:08:20 PM 0ms	THD V		1.8%	1.8%	1.9%	1.7%	1.7%	1.8%	2.1%	2.1%	2.2%	
10/15/2007 12:08:20 PM 0ms	THD A		22.6%	22.2%	261.3%	98.8%	94.5%	0.6%	62.4%	60.1%	31.4%	71.

eto017.bmp

Figure 4. Spreadsheet for Saved Data

Voltage and Amps Tab

The Voltage and Amps tab displays a time plot showing the recorded voltages for the selected channels shown in Figure 5. Use the mouse to select data points on the plot and view data details in pop up window.
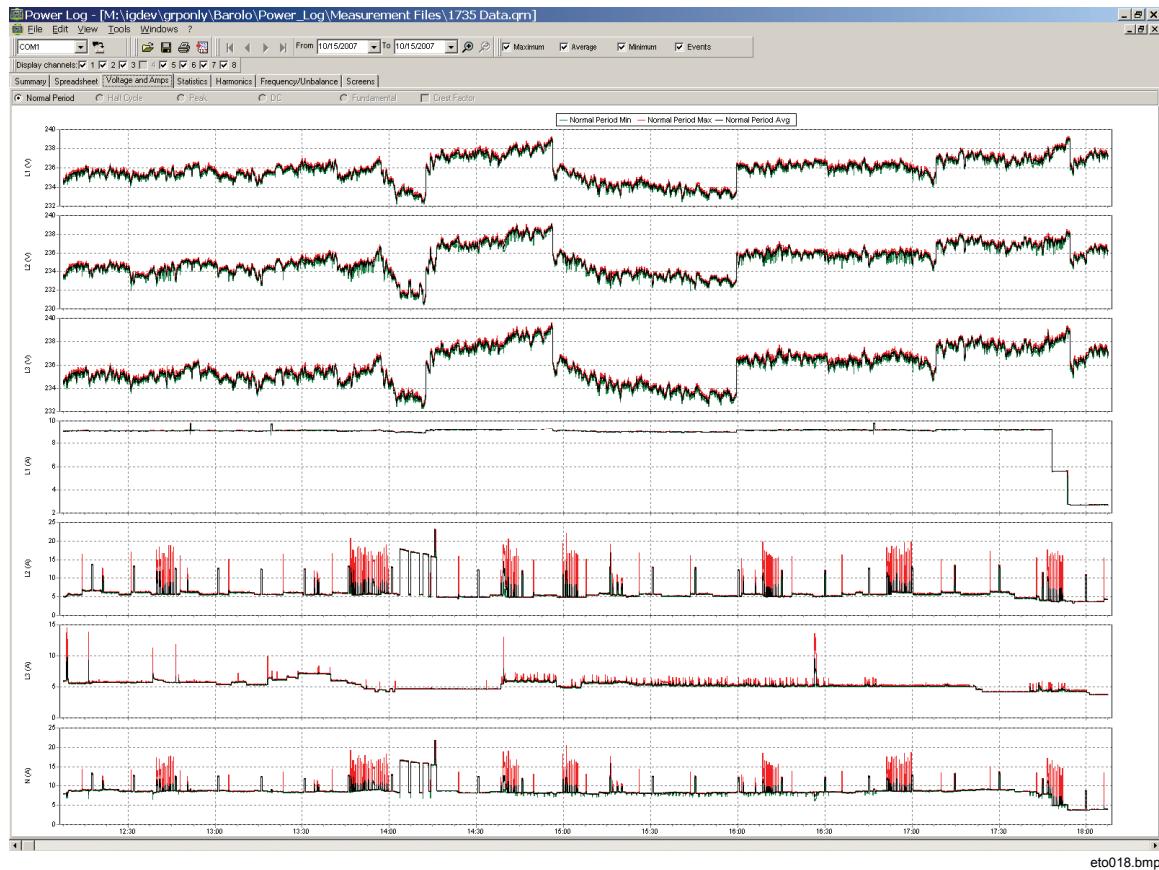
Figure 5. Voltage and Amps Time Plot with Selected Channels Visible

Statistics Tab

Selecting the statistics tab allows filtering by Maximum, Average, and Minimum values, as well as Selected Channel for the recorded or saved data.

Statistical information to support the image is provided in addition to the graphic display of the recorded data. See Figure 6.

eto019.bmp
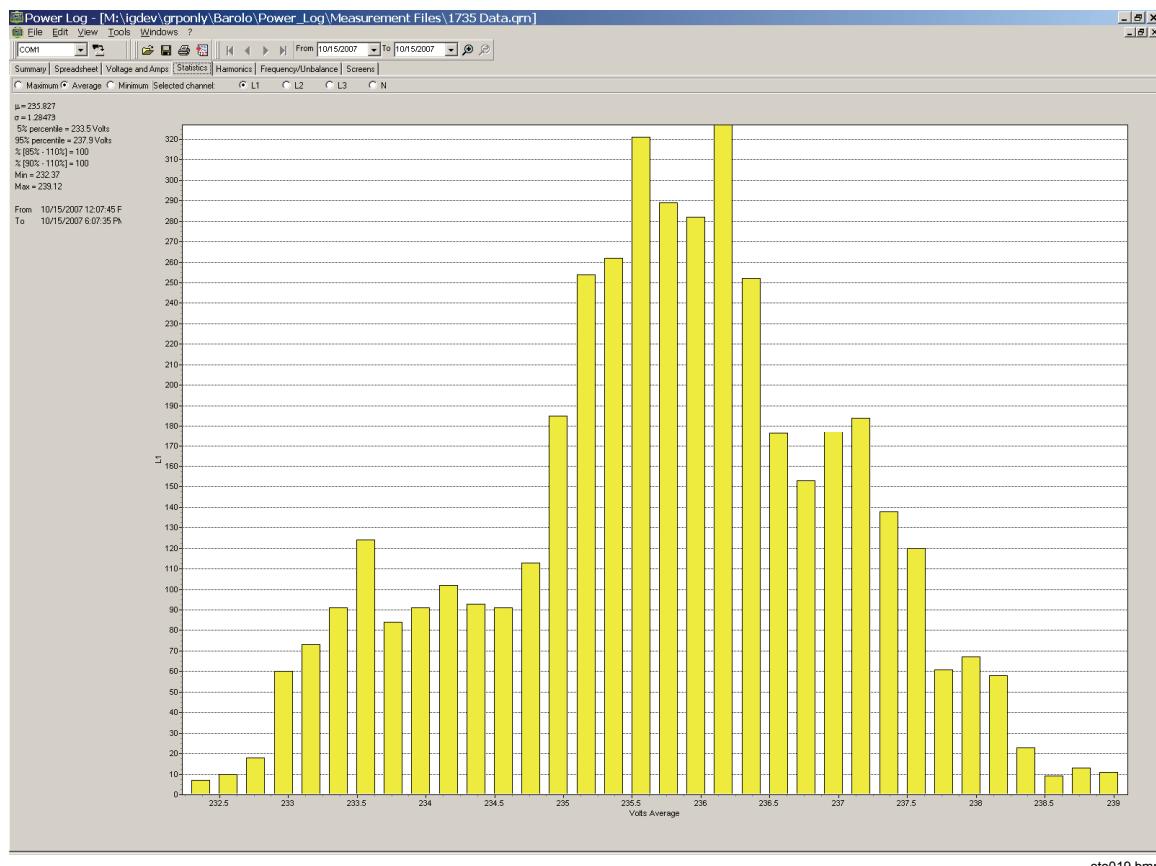
Figure 6. Statistics with Channel A Selected

Harmonics Tab

Harmonics are periodic distortions of voltage, current, or power sine waves. Each waveform can be considered as a combination of various sine waves with different frequencies and magnitudes.

Harmonics are often caused by non-linear loads such as dc power supplies in computers and other adjustable motor drives. Excessive harmonics may result in overheating of transformers, conductors, or damage to other equipment.

Harmonics tab offers two options for the display: histogram or time evolution. Time evolution plots harmonics data over time. The histogram displays the data in a bar graph, with the % of the fundamental (50 or 60 Hz) on the left side (vertical, or Y axis) and harmonic order on the X axis (horizontal), as shown in Figure 7. This tab is visible only if you captured relevant harmonics data.

eto021.bmp
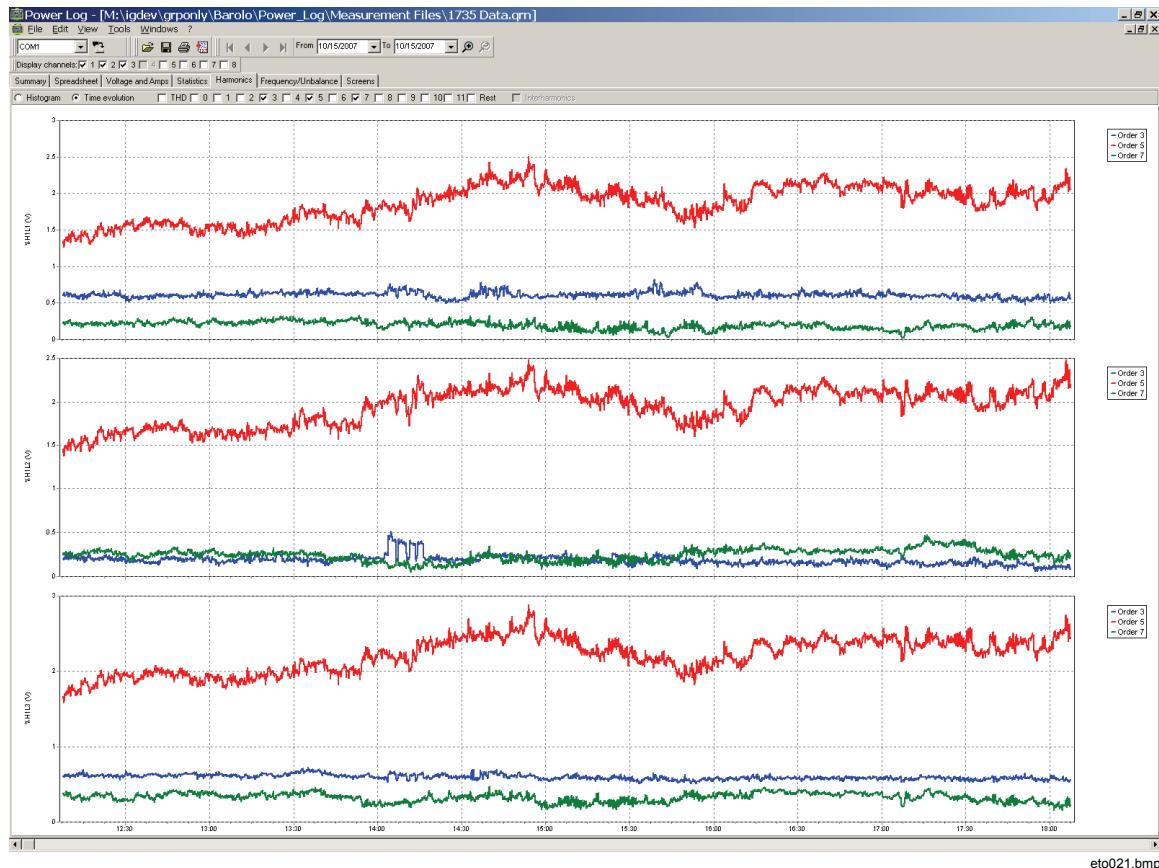
Figure 7. Harmonics Time Evolution with Selected Channels

Figure 8 shows another way of looking at harmonics data.

Number	Explanation
①	Minimum
②	Average
③	Maximum
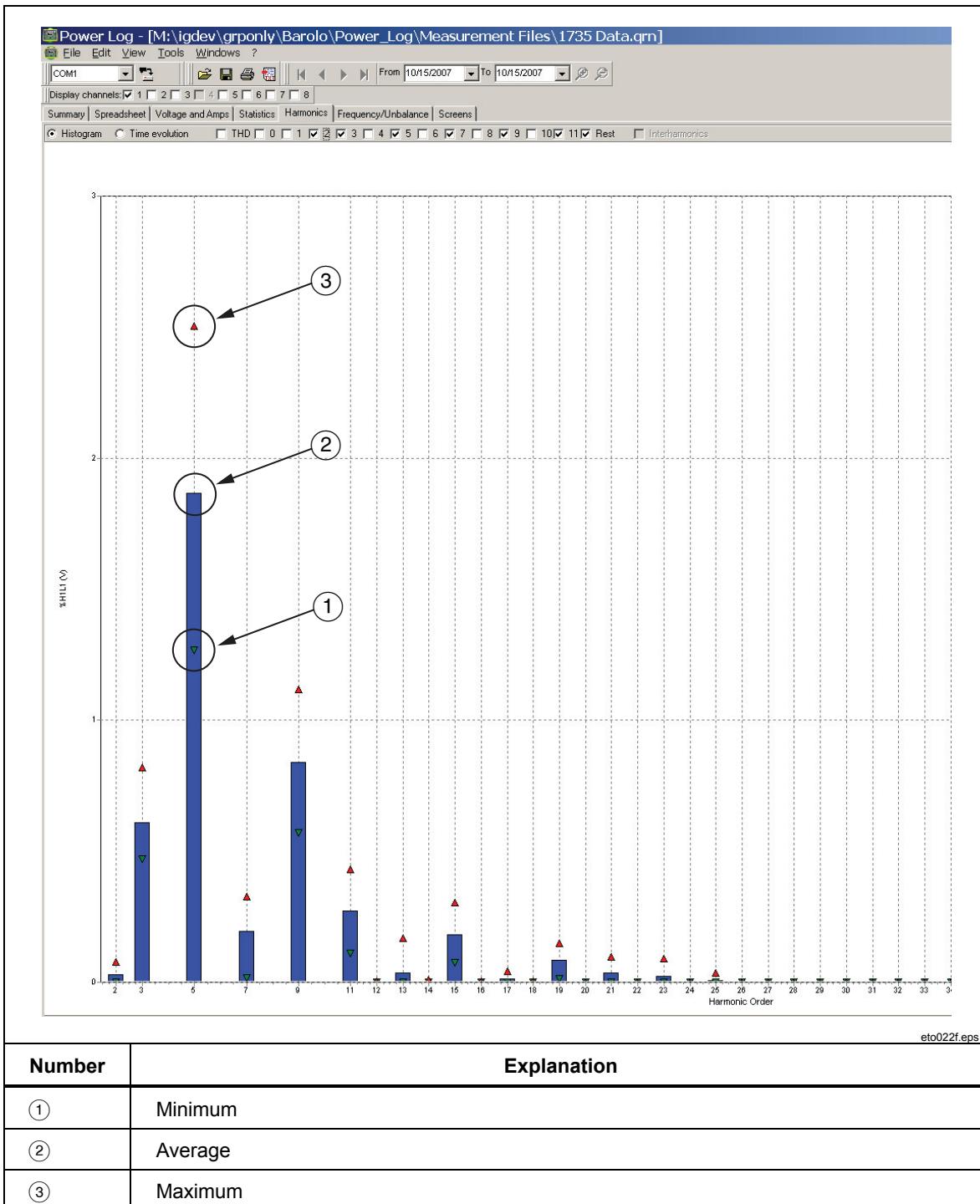
Figure 8. Histogram

Note

With either the histogram or Time evolution display, harmonics may be selected and un-selected as needed using the check boxes at the top of the display window.

Select the **Time evolution** radio button to change the display to a graph displaying the time along the X (horizontal) axis, as shown in the example data in Figure 7.

Dips and Swells Tab

Dips and swells are displayed by voltage range and time of the event with number of events in the vertical axis. The time of the event is shown in the legend and the number of events is flagged on the top of each bar. Displayed data will be based on the zoom level of the Voltage and Amps tabs. See Figure 9.

eto020.bmp
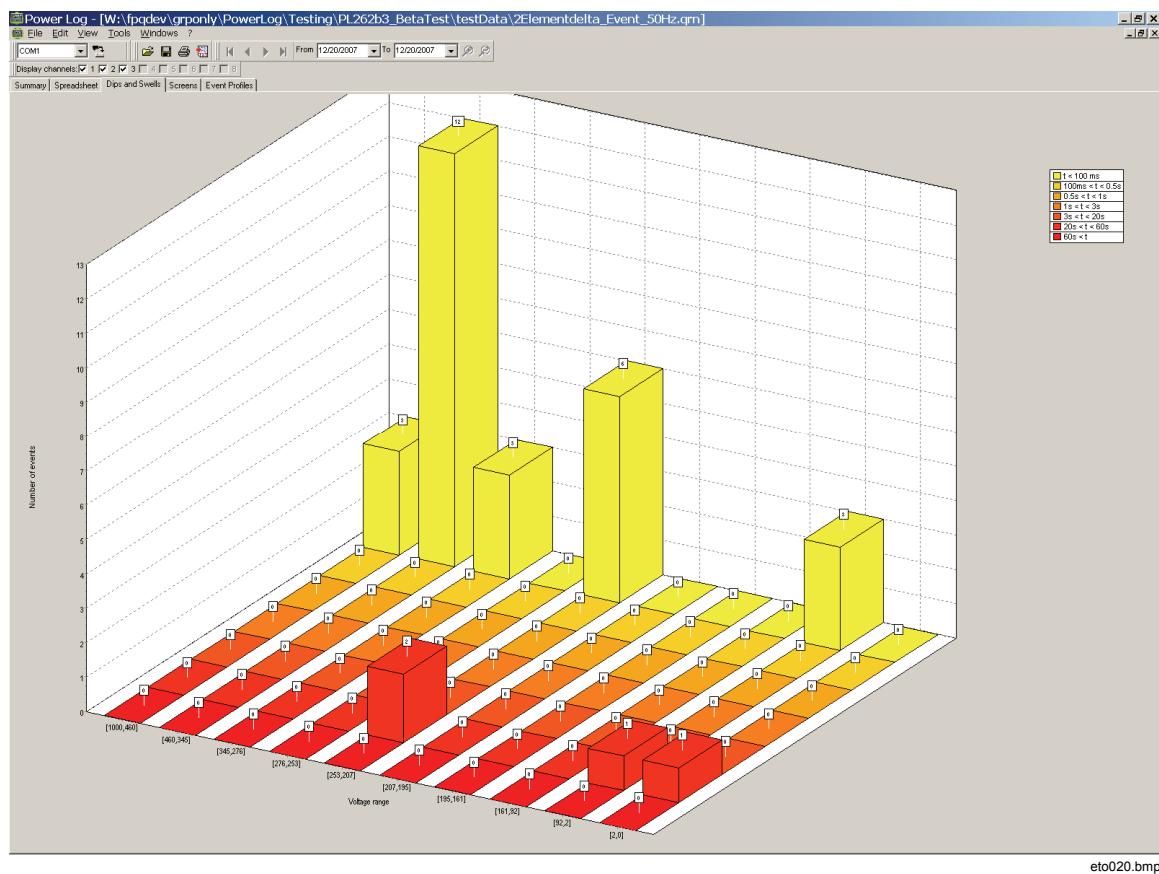
Figure 9. Dips and Swells

14

Frequency/Unbalance Tab

Unbalance displays the voltage unbalance (%) in multi-phase systems. An important measurement in the case of electric motors, which will run hotter when voltage is not balanced. The method of calculation used is the ratio of positive-sequence symmetrical components divided by negative sequence components. This is the measurement method defined by the international standard IEC 61000-4-30. Unbalance is not available for all instruments. Figure 10 shows the frequency time plot.

eto023.bmp
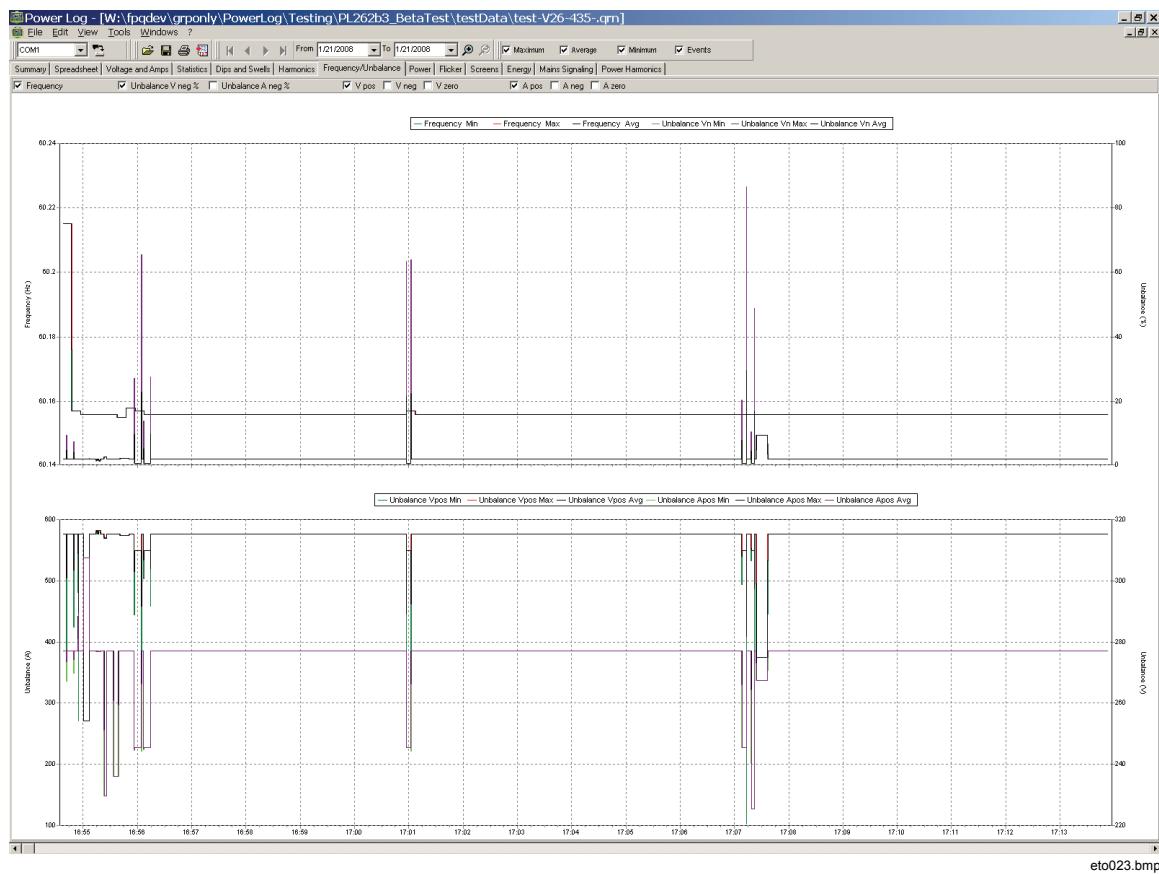
Figure 10. Frequency/Unbalance Time Plot–Frequency Displayed

Power Tab

The Power tab allows filtering the information by using the checkboxes at the top of the display window. In Figure 11 the Y axis shows the Total power (kW, KVAR, and three phases). The X or horizontal axis shows the time data. The legend explains the colors used in the graph to distinguish between Active and Reactive power.
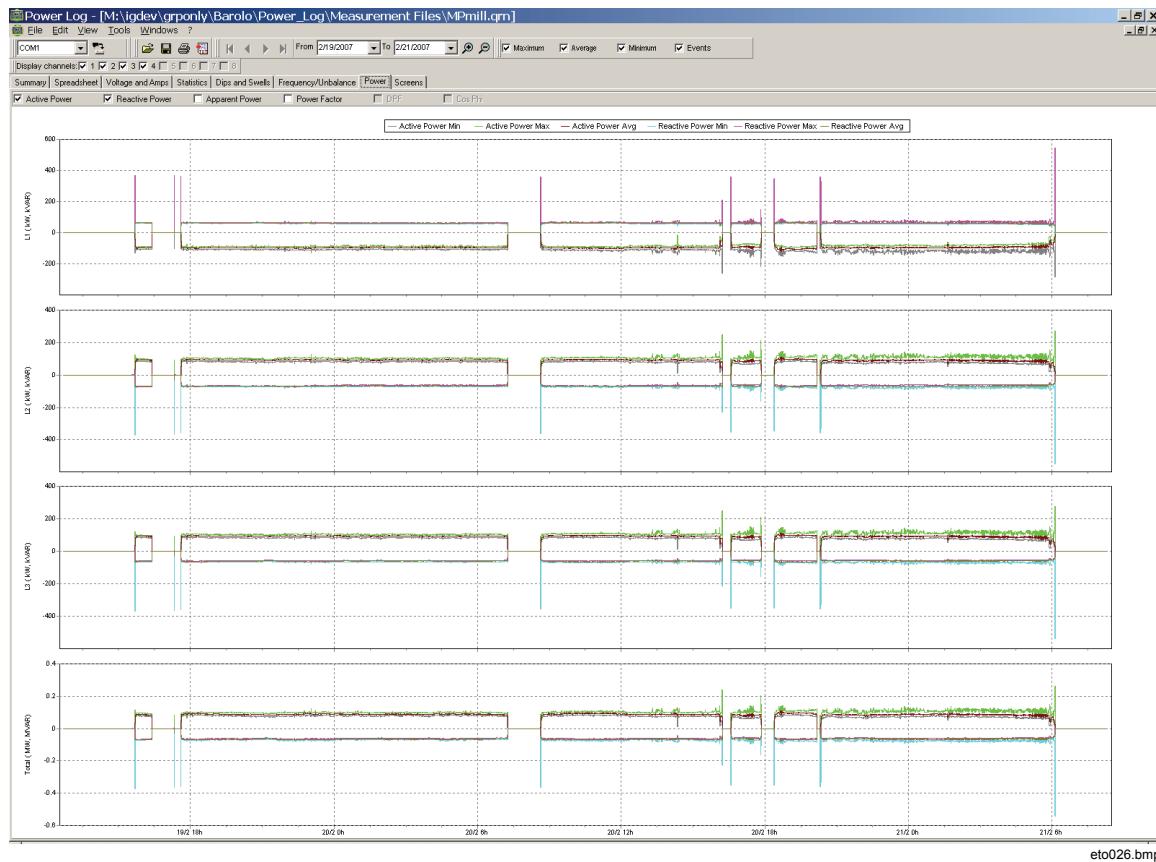
Figure 11. Power Time Plot with Active and Reactive Power Selected

Transient Tab

All detected transient waveforms are recorded. Use the arrow icons to move through all transient wave forms. See Figure 12.

eto024.bmp
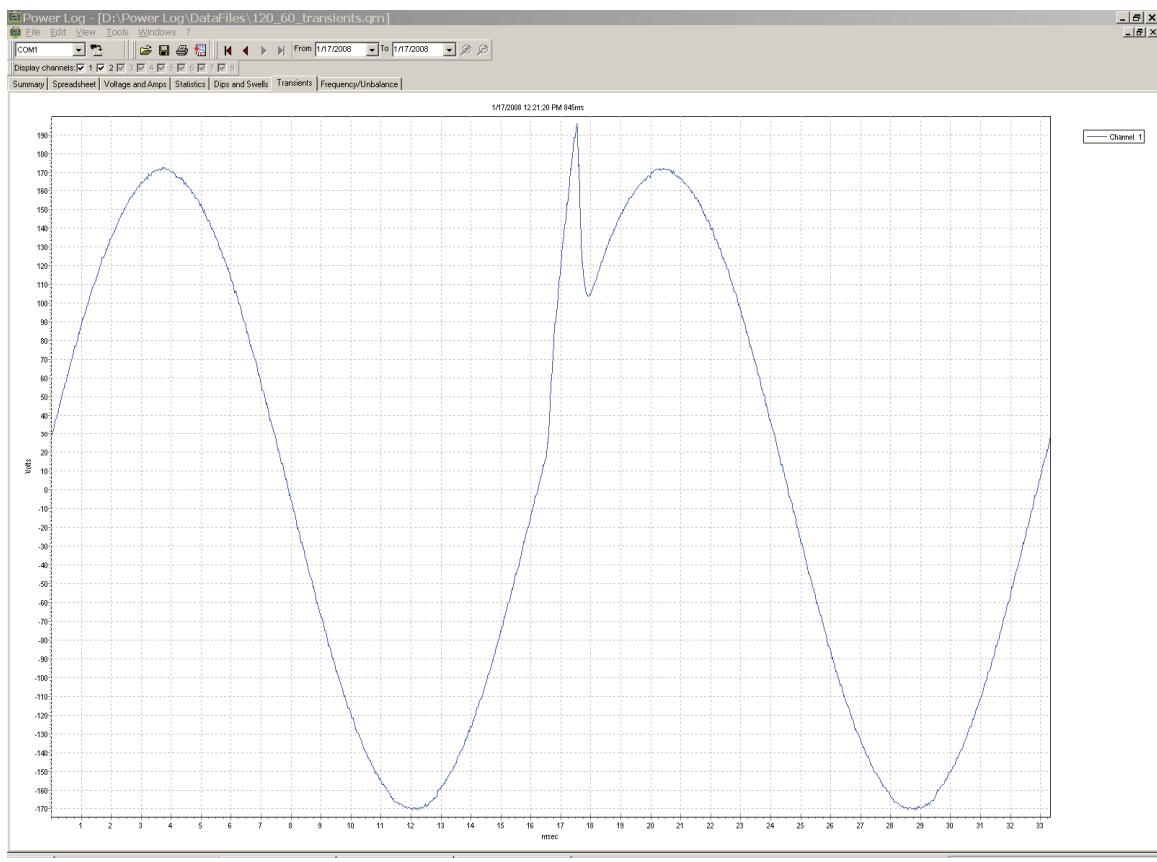
Figure 12. Transient Waveform

Flicker Tab

The Flicker tab allows plotting of Instantaneous Flicker PF5 (435 only), short-term flicker (Pst) and long-term flicker (Plt). Short-term flicker is a value measured over 10-minute intervals and long-term flicker is measured over two hours. A value of 1.0 indicates it is likely to notice a light bulb flickering. See Figure 13.
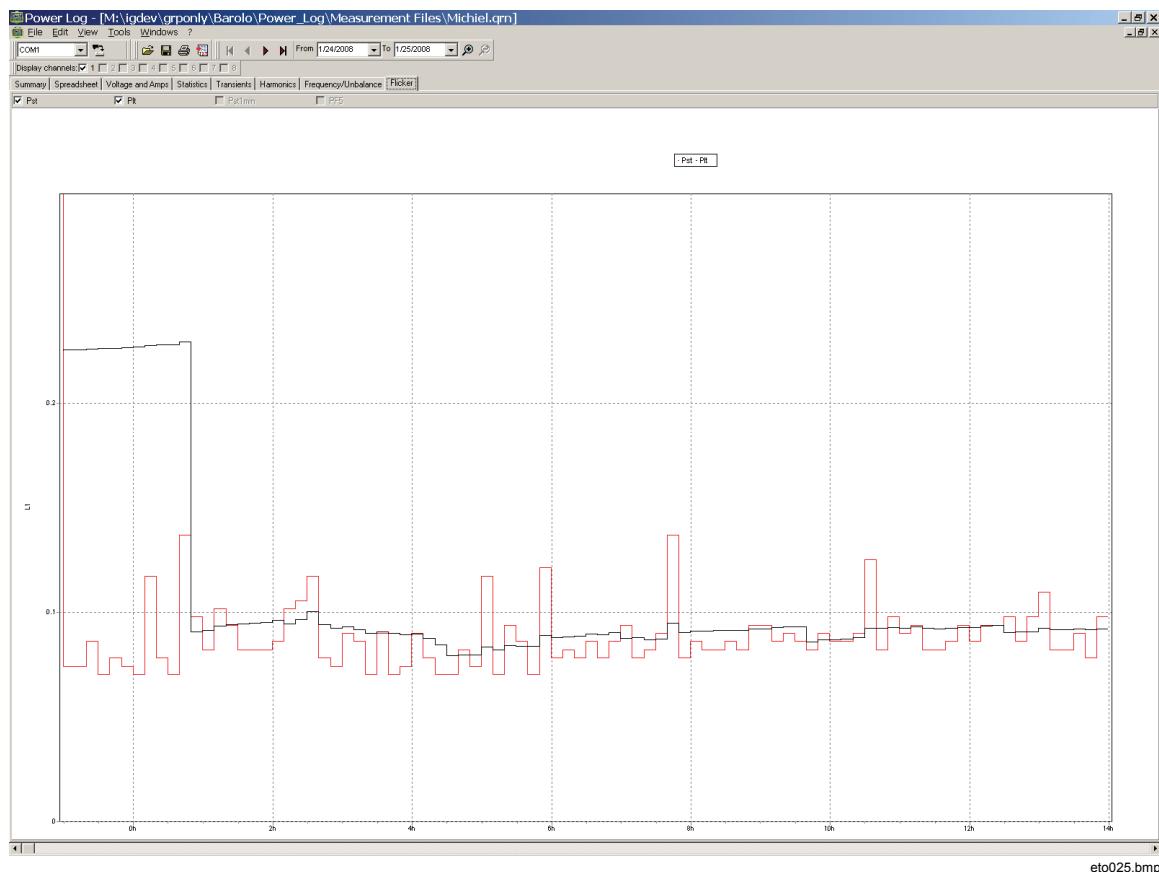
Figure 13. Flicker Waveforms

Screens Tab

The Screens tab illustrates the screen mode in use by the logger or instrument with which the data was recorded, or screens saved by pressing the **SAVE** button on the instrument. In the example in Figure 14, the power logger in use was the Fluke 1735, and the recording mode set to Harmonics. Use the right and left arrowhead buttons on the top toolbar to display additional screens.
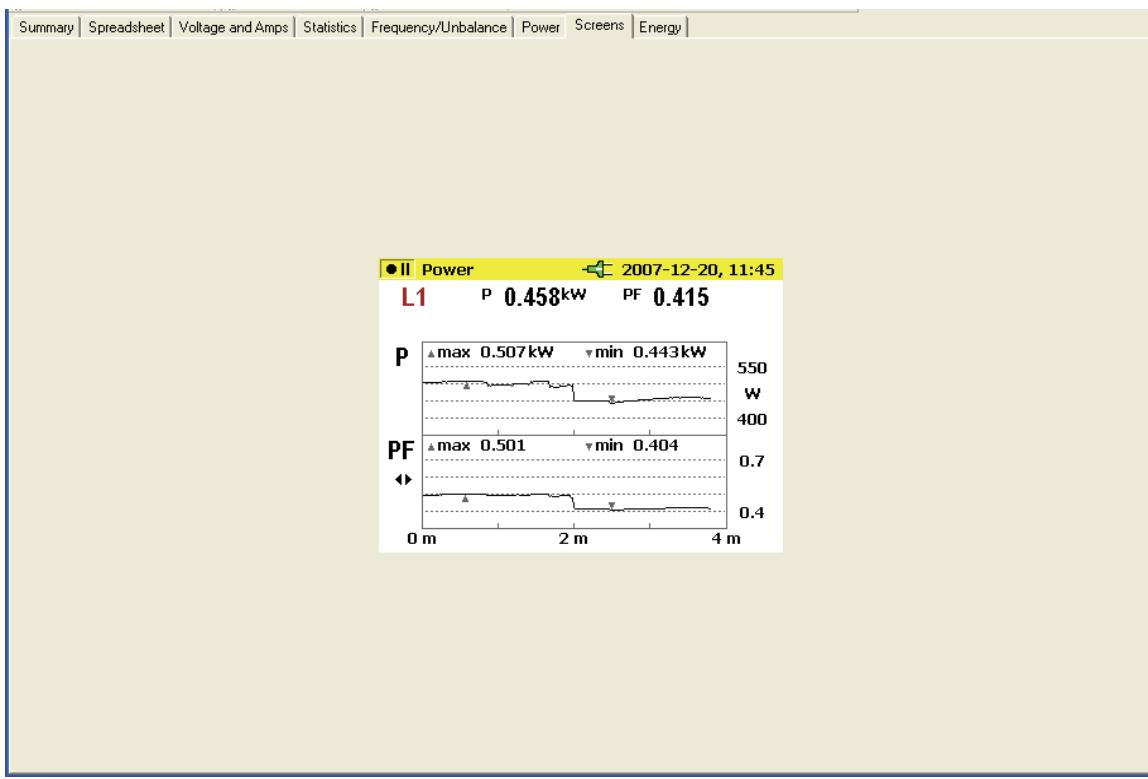

Figure 14. Screens Pane with Instrument Display Image

Energy Tab

This mode displays energy cumulatively or in running averages. For example, the Y axis in Figure 15 displays Total energy and energy by phase. The X axis displays the time.

The checkboxes allow selection of Active energy (in kWh), Reactive Energy (in kVAh), and viewing of cumulative energy. When **Aggregate** is selected, the data can be further broken out into time intervals, illustrated with 10-minute intervals.

Use the refresh button to apply new aggregation settings using m and s inputs. Refresh redraws the screen with the new settings.

eto028.bmp
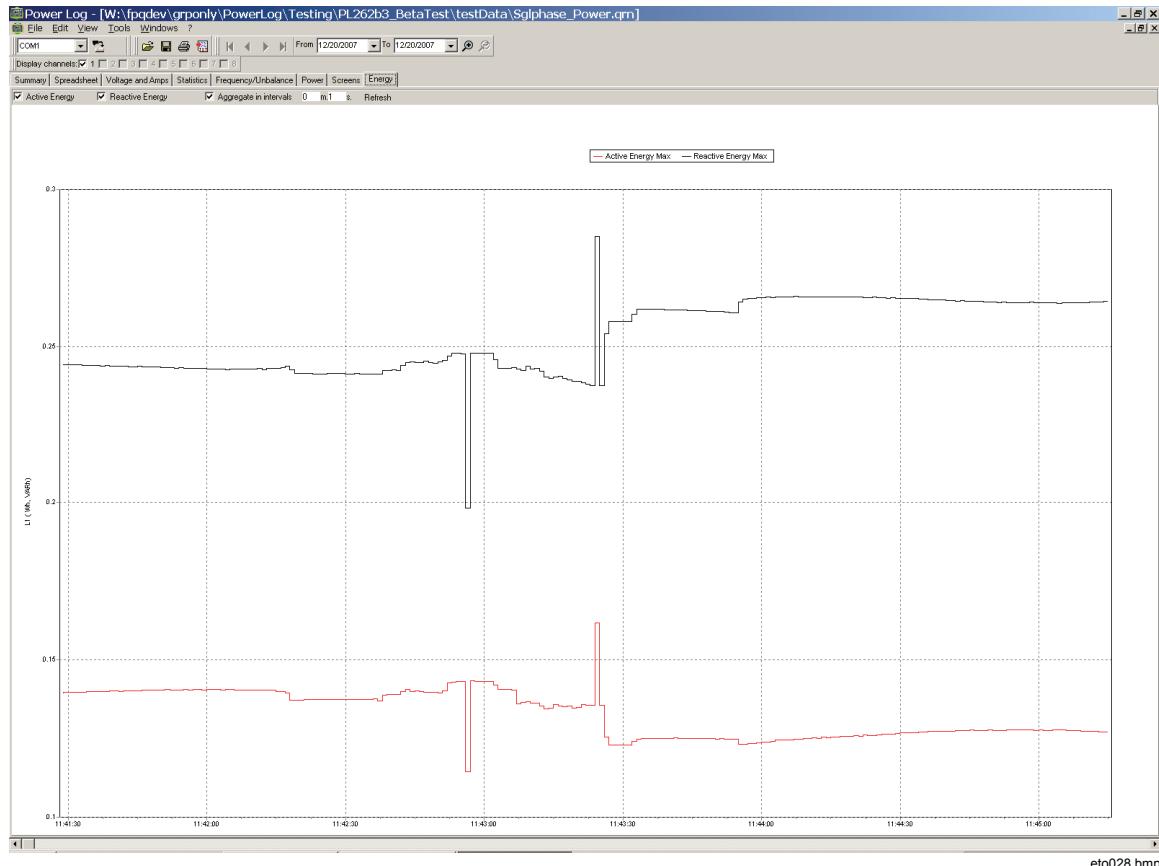
Figure 15. Energy Time Plot for Selected Period

Event Profiles Tab

Event profiles display event details such as dips and swells voltage over time. Use the arrow icons to move through all events. See Figure 16.
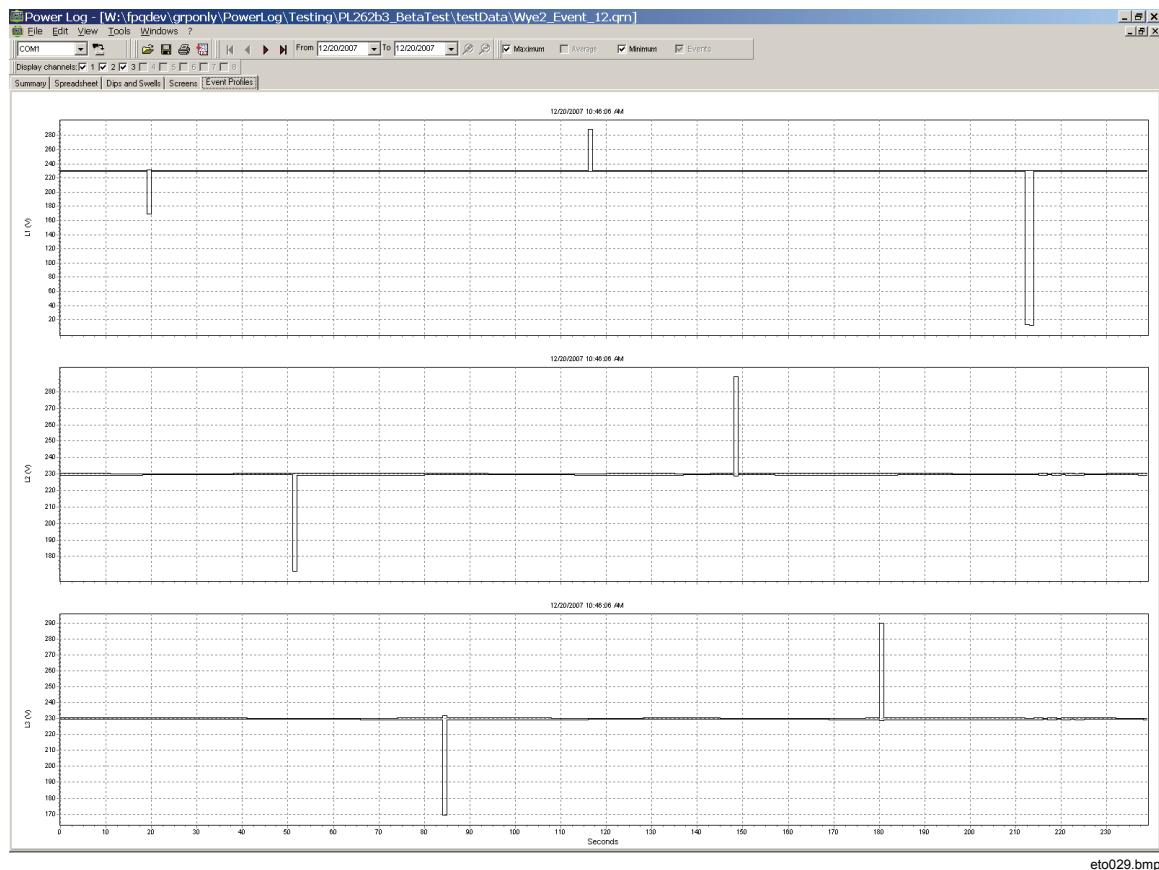

Figure 16. Event Profiles

eto029.bmp

Power Harmonics Tab

Power harmonics is similar to voltage harmonics, but based on power. See Figure 17.

eto030.bmp
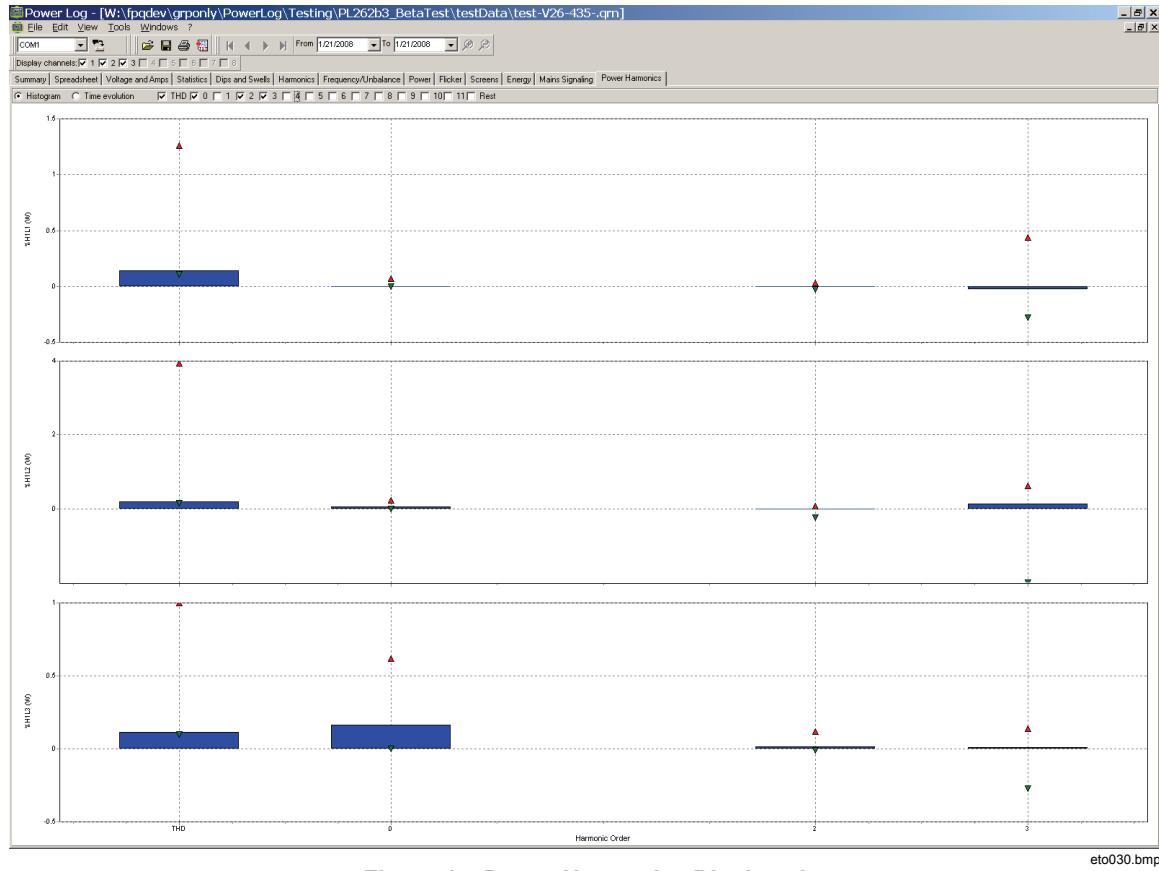
Figure 17. Power Harmonics Displayed

Mains Signaling Tab

Mains signaling, available with the 43x instruments, displays control signals on the power line for remotely controlling appliances. See Figure 18.


eto031.bmp
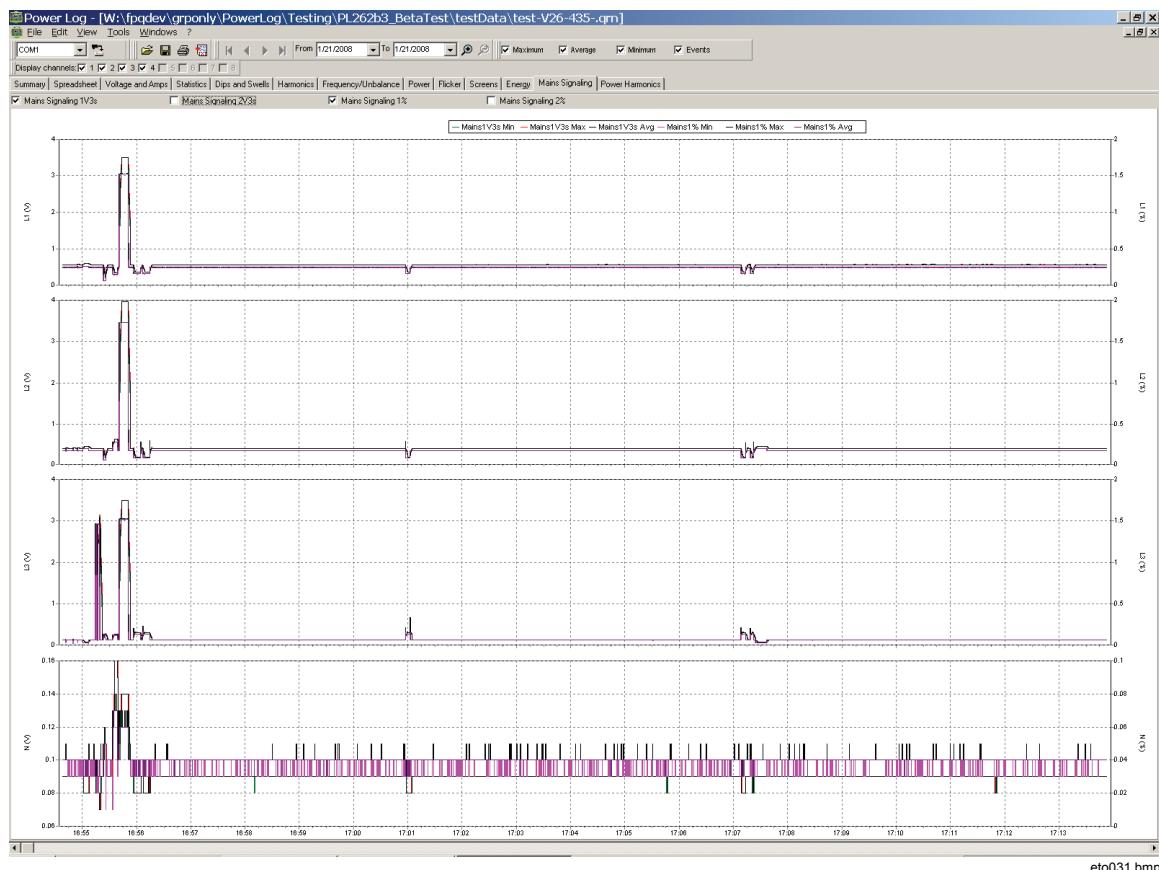
Figure 18. Mains Signaling Waveforms

Printing Reports and Exporting Data

In addition to viewing recorded and saved data, users have the option of printing reports for review, and exporting data for use in other software programs.

Printing Reports

Print a report of saved data with these steps:

1. Select **File | Print Report**

   The Report Writer Assistant window opens. See Figure 19.

eto032.bmp
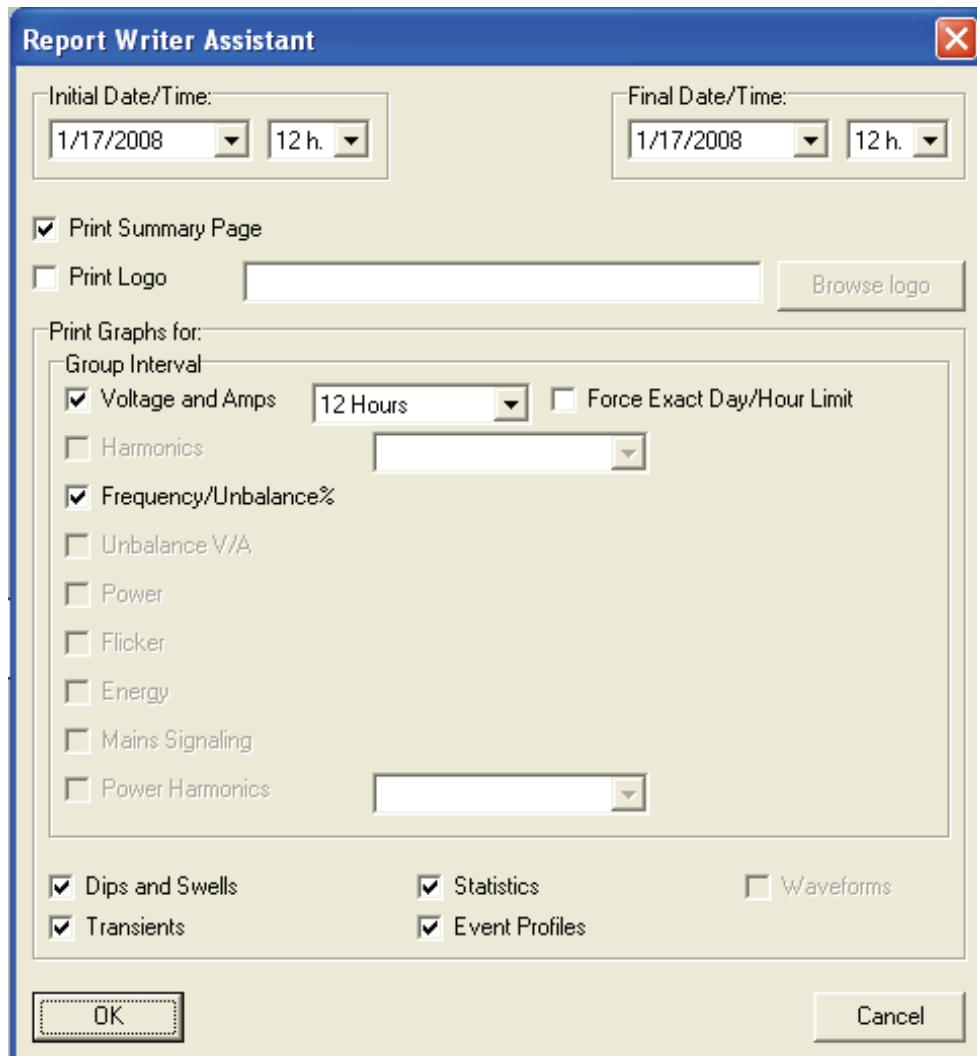
Figure 19. Report Writer Assistant Selection Options

2. Use the selection box in the upper left of the dialog box to select **Initial Date/Time**.

3. Use the selection box in the upper right of the dialog box to select **Final Date/Time**.

4. **Print Summary Page** adds the information entered on the summary page to the report.

5. **Print Logo** allows you to add a custom logo to reports. Use **Browse Logo** to select your logo file.

Note

Data can also be selected by zooming in time plot displays prior to selecting print report.

6. Deselect any of the selected options in the **Print Graphs for** section to further limit the printed data.

7. Limit the time interval using the **Group Interval** selection box, with **1 Week** as the default.

8. Click **O.K.**

   The file is sent to the selected printer. The **Print** dialog box allows printer configuration (copies, landscape or portrait layout, and other Properties).

Exporting Data

Set up data for export from the Spreadsheet window. For interval data, select the measurement rows to be exported, as well as the month, date, and year intervals. If items are disabled, no related measurement data exists. Events cannot be exported with other data. If events are selected, all other data will be unchecked. See Figure 20.
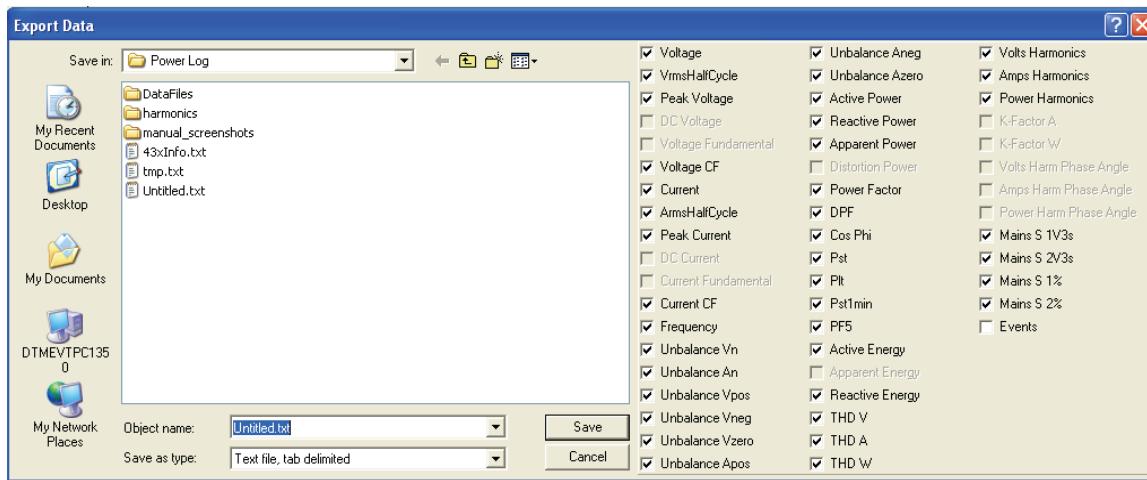

Figure 20. Export Dialog Screen

To export data files:

1. Open a measurement data file, **File | Export**.

   Note any of the fields using the checkboxes at the bottom of this dialog box can be deselected, in addition to creating a file name for the exported data. The **Save as type** field remains empty, with no selections available.

   The default format works for data processed with Microsoft Excel.

2. Click **Save** to export data.

3. Open the exported data from within the preferred spreadsheet or database management software.

Note

Microsoft Excel limits the amount of data that can be opened in a spreadsheet. Avoid errors in data exporting by limiting the date intervals if there are large amounts of data to manage.