Energy Analyze Plus

Online Help

Fluke Corporation

Fluke Energy Analyze Plus Software

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Introduction

Fluke Energy Analyze Plus (FEA+) is the PC software that supports the Fluke 173x family of Energy/Power Loggers (referred to as the Logger in this document). The software is compatible with Windows® Vista, Windows 7, and Windows 8.

With Fluke Energy Analyze Plus, you can:

- Download the results from a logging session for further processing and archiving.
- Analyze energy or load profiles, including zoom-in and zoom-out on details.
- Add comments, pictures, and other supplementary information to data.
- Overlay data from different logging sessions to identify and document changes.
- Create a report from the analysis you have done.
- Export measurement results for further processing with a third party tool.

This manual has instructions for the installation and how to use the software, as well as how to connect to a Logger. This manual also explains how to open, view, export, and create reports.

The most up-to-date information about Energy Analyze Plus is available from www.fluke.com.

How to Contact 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 3-6714-3114
- Singapore: +65-6799-5566
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's web site at www.fluke.com.

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

To view, download, or print the latest manual supplement, visit http://us.fluke.com/usen/support/manuals.

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

Requirements

- Free Hard Disk space 50 MB,
  >10 GB (for measurement data) recommended

- Installed Memory:

  - *1 GB minimum, >2 GB recommended for 32-bit systems*

  - *≥4 GB recommended for 64-bit systems*

- Monitor, 1280 x 1024 (@4:3) or 1440 x 900 (@16:10),
  wide-screen (16:10) at higher resolution recommended

- USB 2.0 ports

- Windows 7 32/64-bit, Windows 8 32/64-bit.

Note
Windows 7 Starter edition and Windows 8 RT are not supported.
Energy Analyze Plus also works on Windows XP systems, but is not
specifically tested because XP support is discontinued.

Installation

1. Insert the USB flash drive that came with your Logger into the PC you want to install the software on. Run FEA_Vx.xx_Install.exe and follow the on-screen instructions.

   Note
   The most recent version of Fluke Energy Analyze Plus is available
   from the Fluke website.

2. You must accept the Fluke Energy Analyze Plus License Agreement to install this software. The agreement text will be presented in the language you select. If you do not accept the agreement, Energy Analyze Plus does not install.

The installer has these options for a target directory where the user data will be stored.

- The default option is to save data into a location that can only be accessed by one specific user. This directory is located in the standard Windows directory "C:\Users\<user name>". You must have permissions to write in that directory. Choose this option if you consider it more important to let different users organize their data privately.

- The installer also has an option for "Shared by all users." If you copy the data files to this folder, access is allowed to multiple users.

After you choose to allocate a directory in either shared or private space, Energy Analyze Plus will use that directory as a default target when you download data from the Logger.

3. The installer will also let you modify the location from which you can start Fluke Energy Analyze Plus after installation. By default, **Fluke** > **Fluke Energy Analyze Plus** is added to the Windows Start button. These entries are created if they do not exist or overwritten. No user data is changed or deleted by overwriting an existing installation.

The installer adds:

- Microsoft C++ Redistributable Package SP1 (required for Fluke Energy Analyze Plus)

- USB drivers (automatically install when a Logger is plugged in for the first time)
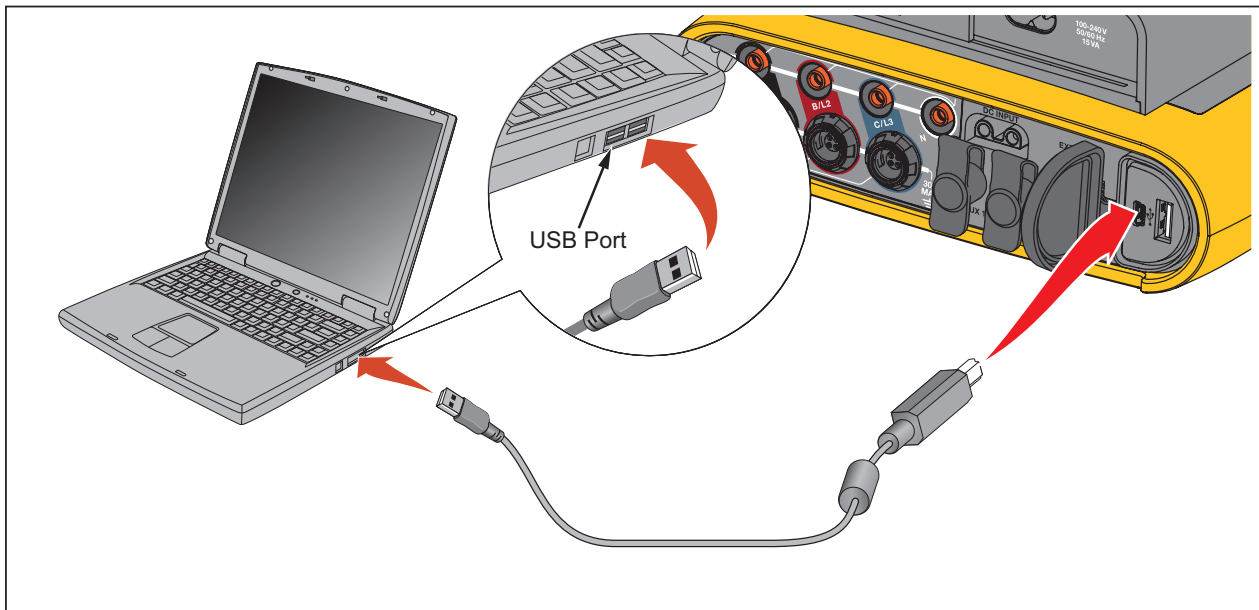
Connections

To connect the computer to the Logger:

1. Power on the computer and the Logger.
2. Wait for each to complete its startup routine.
3. Install the Energy Analyze Plus Software.
4. Connect the USB cable to the USB ports of the computer and the Logger as shown in Figure 1.

Note
The USB driver automatically installs the first time the Logger connects with the PC.

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Figure 1. System Connections

Note
To communicate with the Logger through a wireless connection, see the users manual for your instrument.
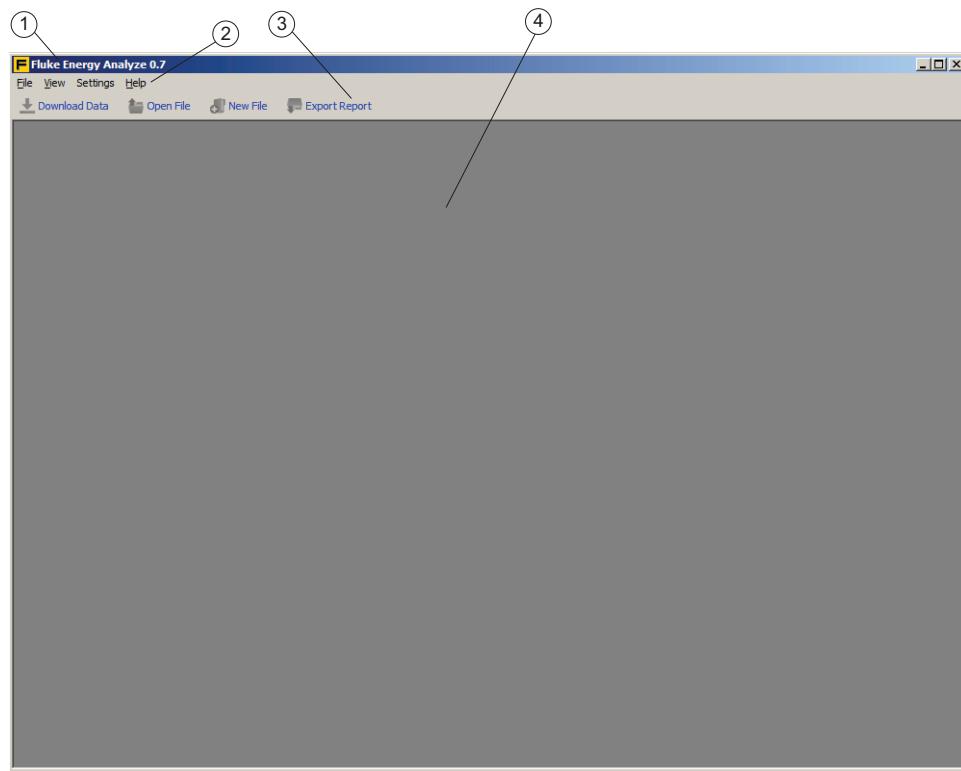
Get Started with Energy Analyze Plus

If you are new to Energy Analyze Plus, use these tips:

- When you start the software for the first time, a sample data file is available. Go to **File** > **Recent** to open this file. This file contains data that was downloaded from a Logger. You can use it as you become familiar with Energy Analyze Plus.

- Select a language for the user interface. On the Energy Analyze Plus Menu bar, go to **Settings** > **Language**.

After installation, start Fluke Energy Analyze Plus from the Windows Start button, or click on an associated file. Associated files have the file extension ".fca" (Fluke Compound Analysis). Energy Analyze Plus creates the .fca files when data is

downloaded from the Logger or at user request. At user request, Energy Analyze Plus will load and show the data contained in the selected file. See Create a New Analysis File for more information.

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When started from the Windows Start button, Energy Analyze Plus does not automatically load data – the main window title ① shows the software name and version, the menus ②, and the toolbar ③. The main panel ④ is empty.

From the toolbar you have these options:

• Download data from the Logger

• Open a file that you have worked with previously

• Create a new file and choose data from previous downloads

When a data file is selected with the "Open file" icon or the "File" menu, Fluke Energy Analyze Plus shows the Project Manager tab as an overview of the data in that file.

Data Format and Management

Logged data never changes in Fluke Energy Analyze Plus – regardless of what you add, combine, or modify.
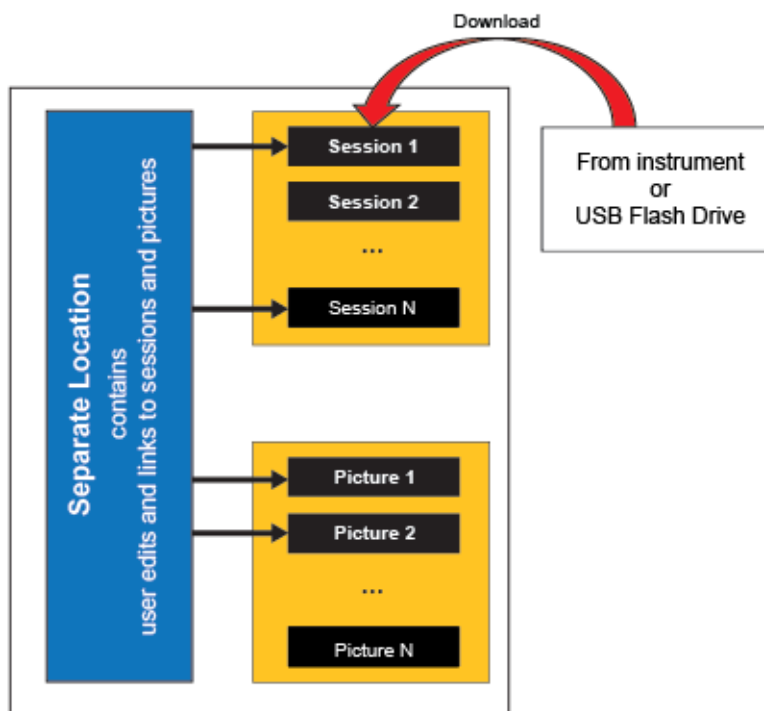
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The Fluke Compound Analysis (.fca) file keeps raw logging data separate from any other entries – logged data (session results) or pictures are stored inside the file and do not change. Any edits, such as changes to descriptions, are kept in another location within the file.

The software creates a single .fca file for each session when the logging data is loaded from the Logger or a USB flash drive.

Note
*Fluke recommends that you keep files that are created from down-loaded data in a dedicated directory.*

Fluke Energy Analyze Plus lets you combine data from up to four different logging sessions into one analysis file. See Download Data and Add Data to a File for more information about how to work with .fca files.

The Home Screen

From the Home screen, you can navigate through the software to set up and do necessary tasks.

Project Manager

The Project Manager is a summary of information about the data contained in a file.
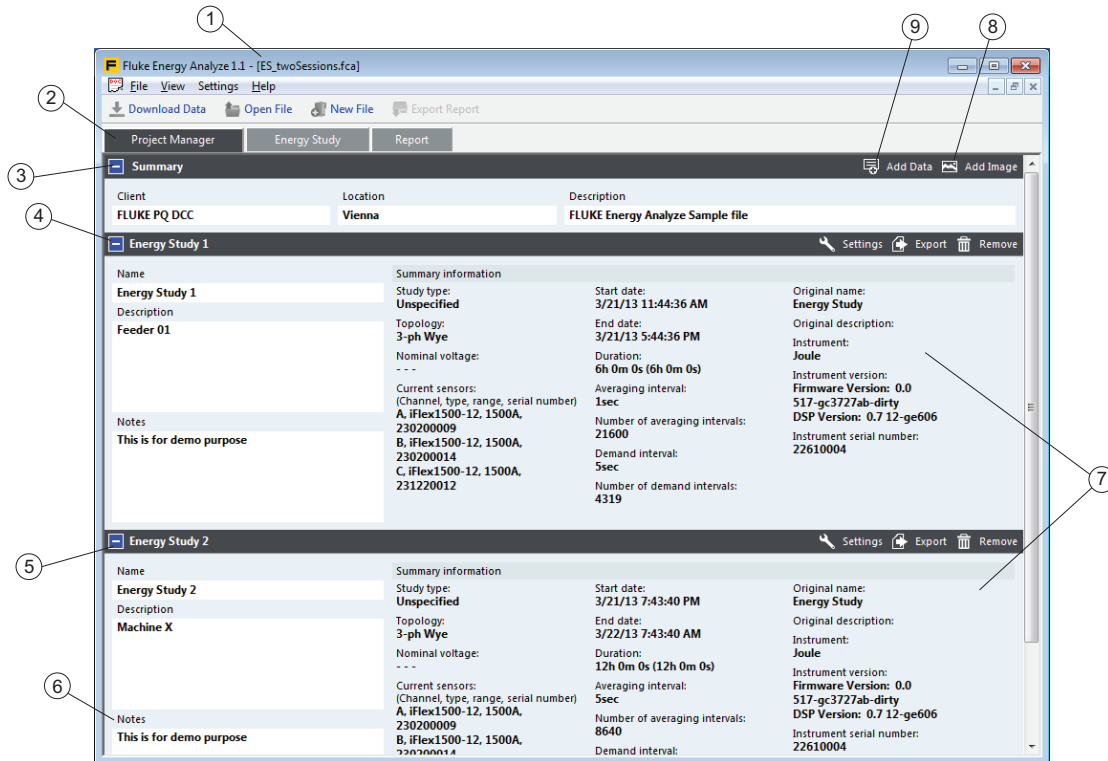
hjd036.eps

The name of the current open file is added to the title bar ① and data shows below the Project Manager tab ②. The data is organized into these categories:

- A generic summary ③ of text input fields (client, location, and description) for audience and purpose of the study. To edit these fields, click on the field and enter text. The client and location fields accept a single line of text, each limited to 250 characters. The description field accepts multiple lines of text (press Shift-Enter to start a new line) and is limited to 1000 characters.

- A list of up to four logging sessions (in this example there are two data sets contained – ④, ⑤). A data set contains all the information collected from one logging session. Use the widget ⑨ to add data to this currently loaded file. For more information on how to load Logger sessions to a file, refer to Download Data and Add Data to a File. Along with user editable text, the session summary also informs users about the Logger setup when logging that data ⑦.

- A list of screen shots (or pictures in general) that were manually added to the currently opened file ⑥. Screenshots can be amended with descriptive text in the "Name" and "Notes" fields. Use the widget ⑧ to add images to this open file. For more information on how to load screenshots (or pictures in general) to a file, refer to Download Data and Add Data to a File.

The Fluke 1730 Energy Logger supports these basic logging session types:

- Energy Studies: these logging sessions contain all parameters the Logger can log (see the 1730 Energy Logger Users Manual). You must attach the voltage leads and current sensors to get the full list of logged parameters.

- Load Studies: these logging sessions contain a subset of parameters that can be recorded if only current sensors are attached. This saves the user time and effort to attach voltage leads – (see the users manual for your instrument).

1736 Energy/Power Logger additionally logs data for the quality assessment of voltage and power in the system. Power quality data is logged at fixed intervals.

Energy Study

The Logger stores parameters that are accessible from a number of categories in the software. These are:

- RMS Power: find active, reactive, and apparent power results with harmonic content in this category.

- Demand: find active, reactive, and apparent energy results in this category.

- Fundamental Power: power parameters that, in contrast to those shown on the RMS Power category, do not include harmonic content.

- VAHz/THD: volts, amps, frequency, and THD readings.

- Calendar View: compare data grouped into hours, days, or weeks.

The Fundamental Power, and VAHz/THD categories follow a similar structure described by the example of the RMS Power category below. They only difference is the available parameter set.

Within the RMS Power category the focus is on these parameters:

- Active Power

- Reactive Power

- Apparent Power

- Power Factor

PQ+ Study

For the PQ+ Study, the Logger stores information about the quality of voltage and power in the system:

- Event Overview: find the number of registered voltage events (dips, swells) and interruptions sorted by duration and residual voltage in one table (UNIPEDE).

- Event Details: provides detail views on voltage and inrush current events.

  - *List view shows data in text format for voltage and inrush current events.*

  - *History view shows events by time of occurrence and voltage or current amplitude in a graph.*

  - *Severity view shows voltage events by severity according to selectable standards (ANSI, CBEMA, and ITIC).*

- Harmonics: view spectral distribution of harmonic content on volts and amps channels and time series plots of individual harmonics on one screen.

Advanced

The Advanced tab lets you compose plots that are not already covered by any of the predefined views. For example, to plot fundamental active energy in one chart with total harmonic content, use this tab to create the new view. The Advanced tab has table views (*overview* - contains all data of a session and *time-range* contains the data selected graphically on the graph view with the time range cursors). The functionality of the tables under the Advanced tab is modified so selected data can be exported.

RMS Power Overview Table

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The RMS Power screen is divided into sections. The first section ① contains the overview table that shows all minimum, maximum (with time and date), and averages of the parameters as numerical values for the entire duration of that logging session ③. Separate parameter entries collapse or expand with a click on the blue option box ④ to organize the information you see on screen. The widgets on the table header line ② provide quick access to create a bookmark for later reuse within a report or copy the table to the clipboard and paste into other Windows® applications.
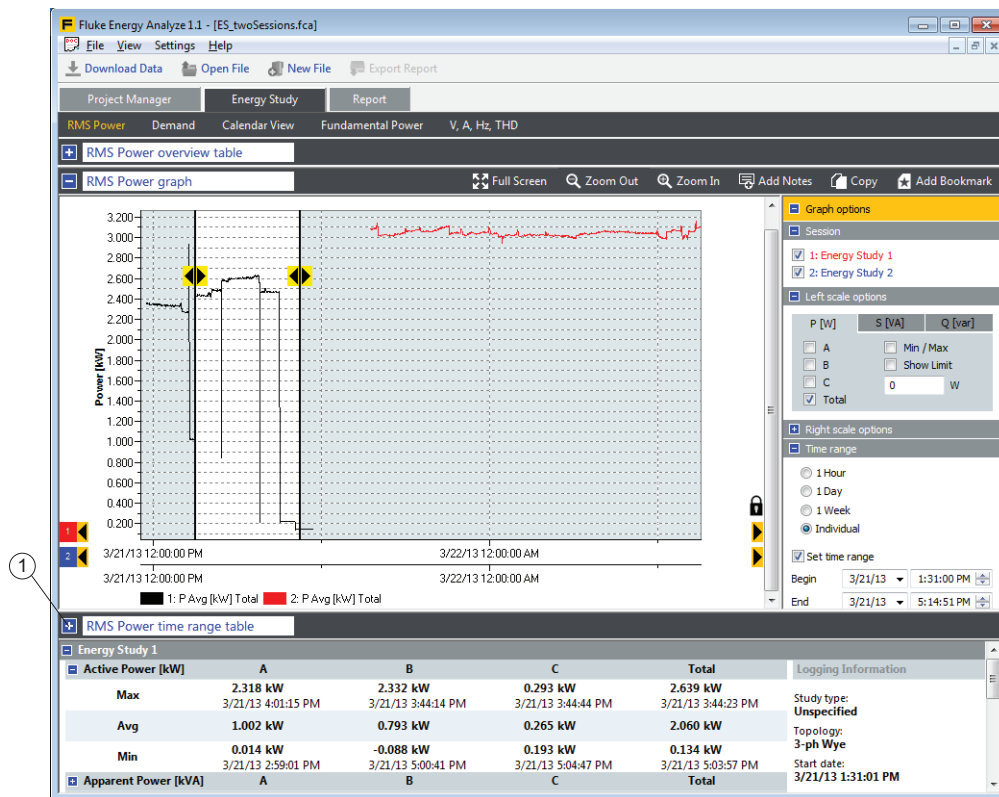
RMS Power Graph
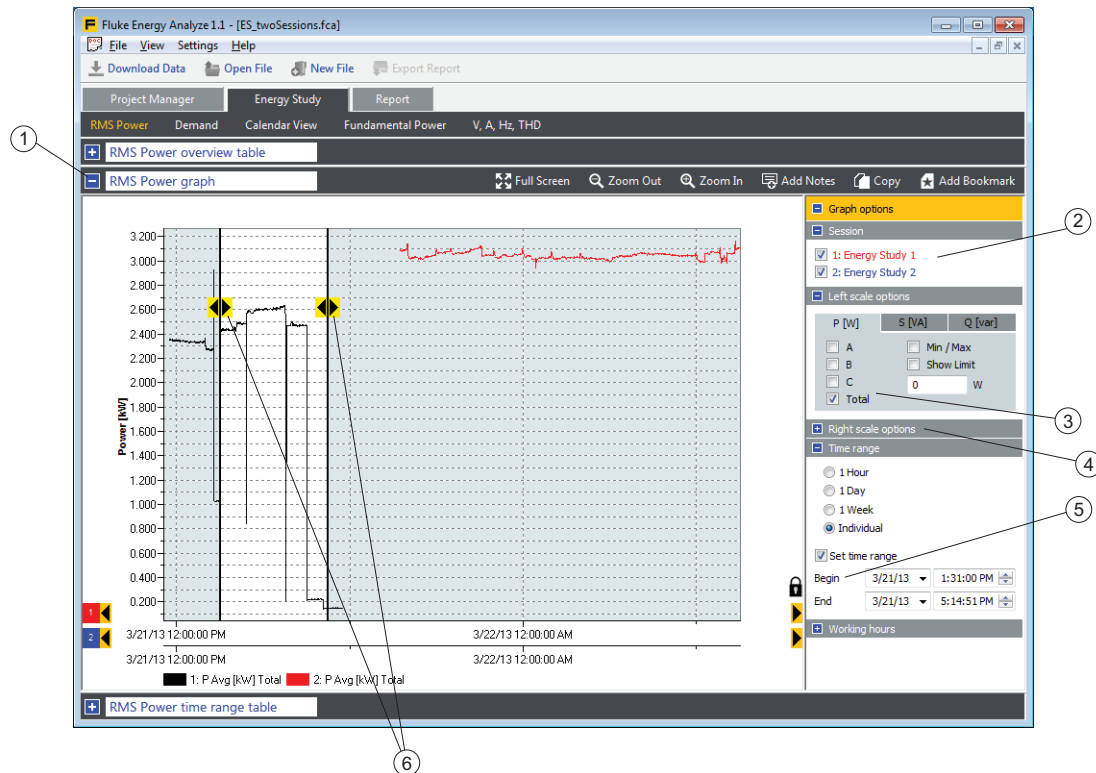
hjd033.eps

Click the blue option box next to the title line ① to open the RMS Power graph. This view lets you plot selected parameters ③ in more detail. If additional logging sessions are loaded, these list as sources ②. The plot contains the selected parameters ③ if the checkbox next to the source identification ② is checked. Additional parameters ④ can be added to the plot to allow comparison or documentation of influences.

The time range feature lets you select a specific time period for analysis and look at the data in more detail. The time range is adjustable with the "Begin" and "End" controls ⑤ that move the position of the vertical time range cursors ⑥. Or, click and drag to move the cursor position. Alternately, click on a curve point to snap the closest time-range selector to that point.

The zoom-in and zoom-out functions or moving the x-axis does not change the defined time range. The icon for the time range cursor changes to an arrow if zooming or moving an axis positions it outside of the plotted area. To move a time range selector back into the visible area, single-click on this arrow. This will change the selected time span. Numerical data that corresponds to the selected time range shows in the time range table.

Plot axes are scaled manually or automatically. Right-click the mouse button on the axis to open the context menu. Use the arrow icons (black on yellow background) to the left or right of the x-axis to step through the entire data series. The currently shown x-axis span is the step scale. In this case, the time range shifts to the same relative position on the screen.

RMS Power Time Range Table

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The third section – the time range table – uses the same layout as the overview table, but will only become available if the **Time Range** checkbox (see item ⑤ in the *Energy Study - RMS Power Graph* section) is checked. It shows results that are within the time range defined in the graph view.

The time range table can be pulled to any position on the screen so that the graph is visible at the same time. To minimize or maximize the time range table view, use the blue rectangle ①, or double click on the gray area in its title line.
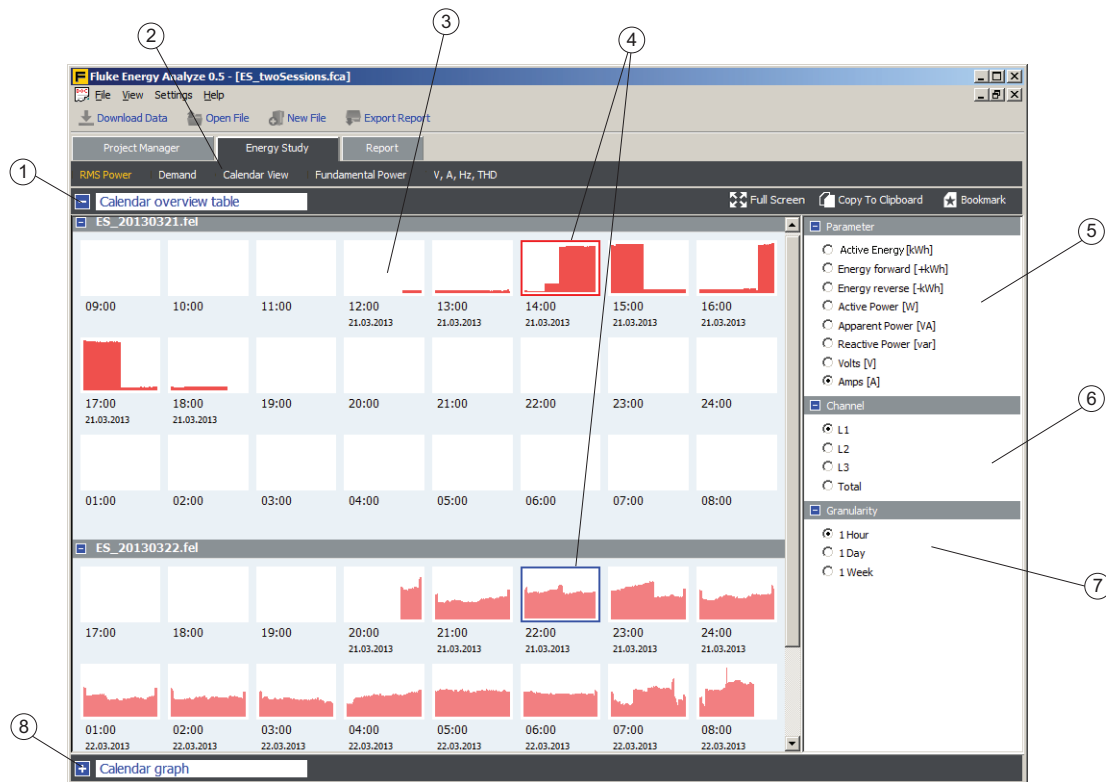
Demand Overview Table
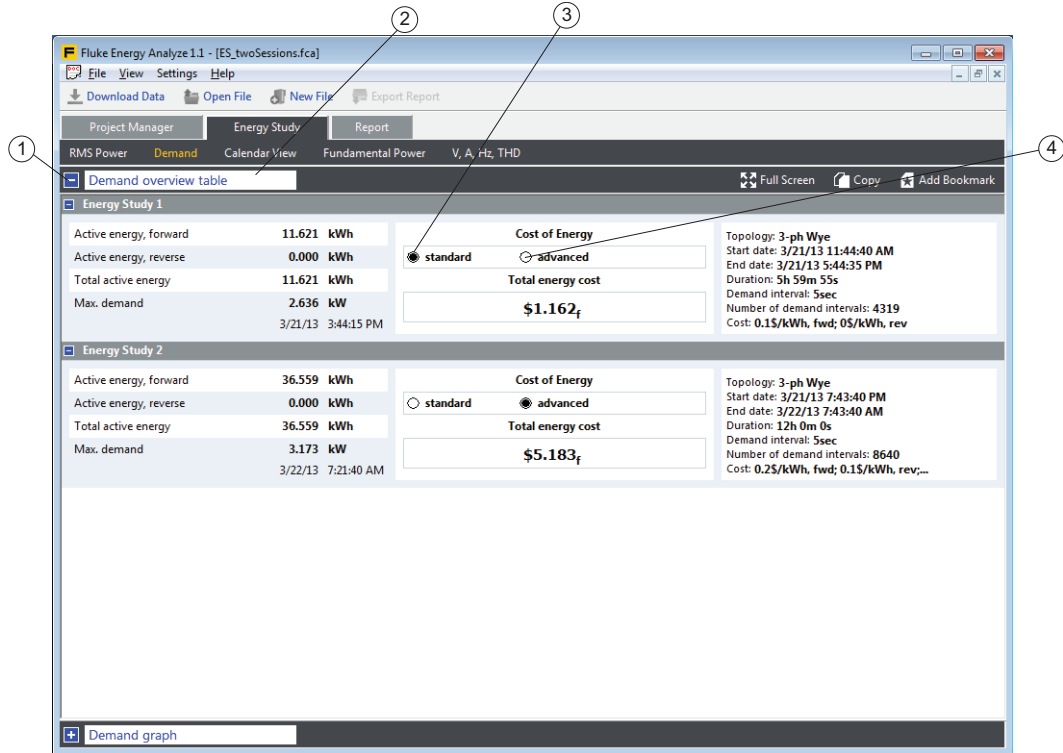
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The "Demand" category lets you focus on energy consumption and related cost with parameters for:

- Active Energy

  - Forward (taken from the distribution grid, consumed).

  - Reverse (fed into the distribution grid, delivered).

  - Total (forward – reverse).

- Reactive Energy

- Apparent Energy

- Power Factor

Demand ① is organized into sections. Click on the blue box next to the title ② to activate these views. The Overview table shows active energy logging results and peak demand power in one table. For cost of energy calculations you may choose to apply the cost parameters that were used on the instrument when logging ③. To override these parameters with what you put into Energy Analyze Plus, double-click **advanced** ④. Cost associated with forward or reverse active energy are reported separately and indicated by "f" and "r" subscripts to the cost positions in the result field.

Calendar Overview Table

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Calendar View ② helps to quickly identify change patterns in parameters and lets you compare these changes by parameter in detail.

The overview table shows pictograms that contain miniature plots of the selected parameter ⑤ over time ⑦. In the example above, the amps measurements of the A (L1) channel ⑥ are plotted, one hour ⑦ for each pictogram.

The Calendar View lets you compare the data from different logging sessions, such as, before and after an update to a power factor correction capacitor. In this case, both sessions would be loaded into an analysis file, and the total ⑥ reactive power ⑤ might be compared at a granularity setting of one day ⑦ in order to look at the effects the update had for a typical work week. See Adding Data to a File.

In order to compare two items with each other, click on the first thumbnail to select the base and chose a second one for comparison ④. The detail time plot of the selected thumbnails shows under the graph section ⑧.

Calendar Detail Graph
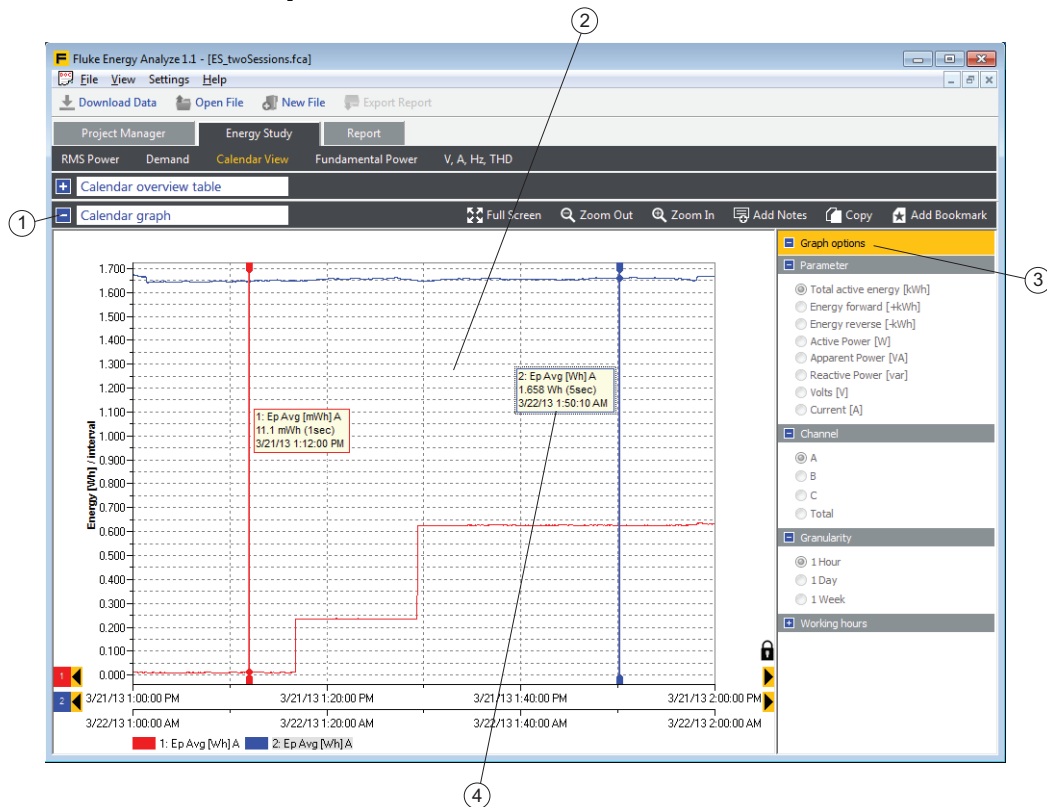
hfc030.eps

A detail plot ② of the data selected in the overview table shows in the graph section ①. Information about the plot traces is found in the "Graph Options" ③. As in other graph views, use the vertical cursors to get numerical readings of data "behind" curve points ④.

Load Study

The load study lets you check electrical load conditions in an installation without connection to voltage leads. You can manage the full list of parameters associated with an Load Study. Load Study measurement results can be represented in a single "Summary" category.

As in the Energy Study, you can use the Calendar View to identify specific load patterns or to compare data taken at different times.

For the "RMS Power" category, a value for the nominal voltage of the installation under test can be entered and the software makes calculations of the estimated apparent power. The results show in a tabular (Overview Table, Time Range Table) or graph format.

PQ+ Study

The Energy/Power Logger can be set up to configure, verify, and download measurement sessions with power quality data. For more information, see the users manual for your Logger. Power quality data is logged using a dedicated aggregation interval with a fixed length of 10 minutes (according to standard IEC61000-4-30), except for "events" that are captured and stored as they occur.

Event Overview

The Event Overview shows voltage events registered by the Logger:

- Dips: half-cycle RMS voltage readings of the system under test that go below the dip threshold defined as percentage of the nominal voltage of that system.

- Interruptions: half-cycle RMS voltage readings of the system under test that go below the interruption threshold defined as percentage of the nominal voltage of that system.

- Swells: half-cycle RMS voltage readings of the system under test that exceed the swell threshold defined as percentage of the nominal voltage of that system.

The view shows combined events. That is, events in poly-phase systems that overlap in time of occurrence will be counted as one event, even if the effect is visible on different phases. For more information, see the users manual for your Logger.

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If more than one session is loaded, these list as sources ① in Graph Options. Each has a checkbox that enables or disables a corresponding table section. Table sections expand or collapse with the blue icons ③ on the table headers.

To compare results, you can limit the time span for a specific session. The evaluation period dialog ② lets you define the start and end times used for the events counted in the overview table.

The overview table is divided into sections to show Interruptions ④, Swells ⑤, and Dips ⑥. Voltage thresholds are shown in percentage and absolute volts for each row of the table. Energy Analyze Plus uses the nominal voltage that is adjusted on the Logger for the specific session to show these values.

Event Details

For more detailed analysis, use the Event Details ① screen to show different parameters ② as a list, in a temporal context (History), or in an x/y plot that supports assessment of voltage event severity (Tolerance). List and History views support display of inrush-current events ③. In contrast to the Events Overview, the Events Details shows combined or single events ④. Single mode shows one event for each phase regardless of its time of occurrence related to other phases in a poly-phase system. The screen shot shows simulated data for this example.

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Event List View

The event list shows all event-related parameters that the Logger registers in one table for each session. Click on a table header cell to sort the entire table. A small triangle ① to the right of the table header cell marks the sorting parameter and the ascending or descending sequence of the list. Use the Event filter elements ② to optimize long lists of event records. The option to limit the number of list entries is available in this view. You cannot add notes to this view.
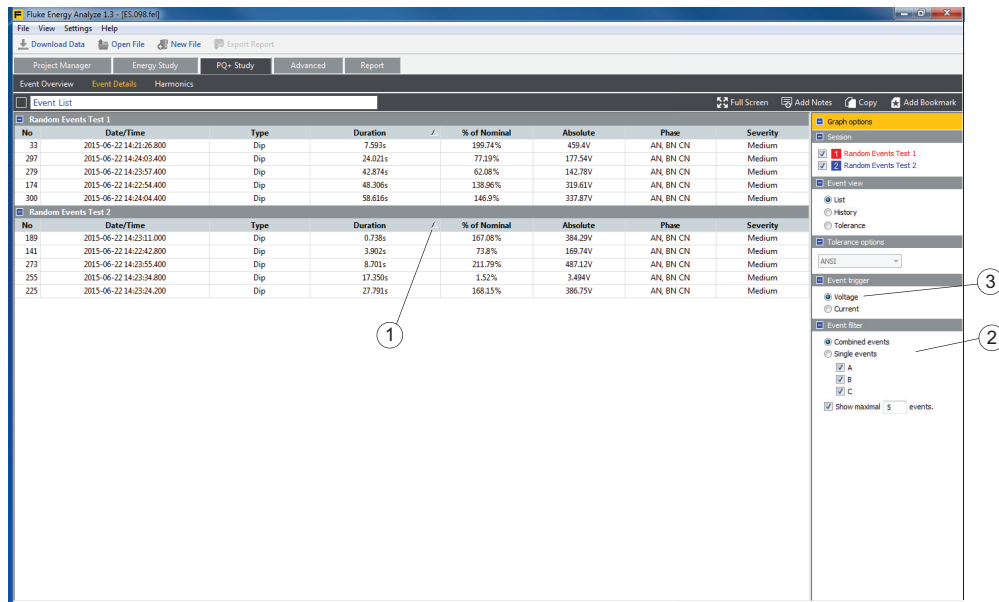

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The columns contain:

- **No**: Event reference number.

  The Logger stores events with a reference number shown in the first column. In case of poly-phase events, one reference number is allocated to the poly-phase record, and further references for each single-phase record that a poly-phase record contains. For example, if a dip occurred on phases A, B, and C of a three phase WYE system, four event reference IDs are shown.

- **Date/Time**: Start date and time of an event.

- **Type**: Dip, Swell, or Interruption when the Event trigger ③ is set to Voltage, otherwise, Inrush. For more information, see the users manual for your Logger.

- **Duration**: Duration of an event condition. For more information, see the users manual for your Logger.

- **% of Nominal**: Column populates only for voltage events.

- **Absolute**: Minimum half-cycle RMS voltage during the event condition or the maximum half-cycle RMS current during an inrush current condition.

- **Phase**: Phase on which an event condition was registered.

- **Severity**: Column populates only for voltage events. Values are low, medium, and critical. These ratings are assigned by the Logger at the time of logging and based on the potential damage to electrical equipment from an event at given duration and maximum voltage.

Event History View

The Event History view shows the occurrence of voltage or inrush events in a time line to help identify potential occurrence pattern over time. Click on a marker to place the cursor ① and have additional information show in the title. Use event filters ② to limit the items shown.
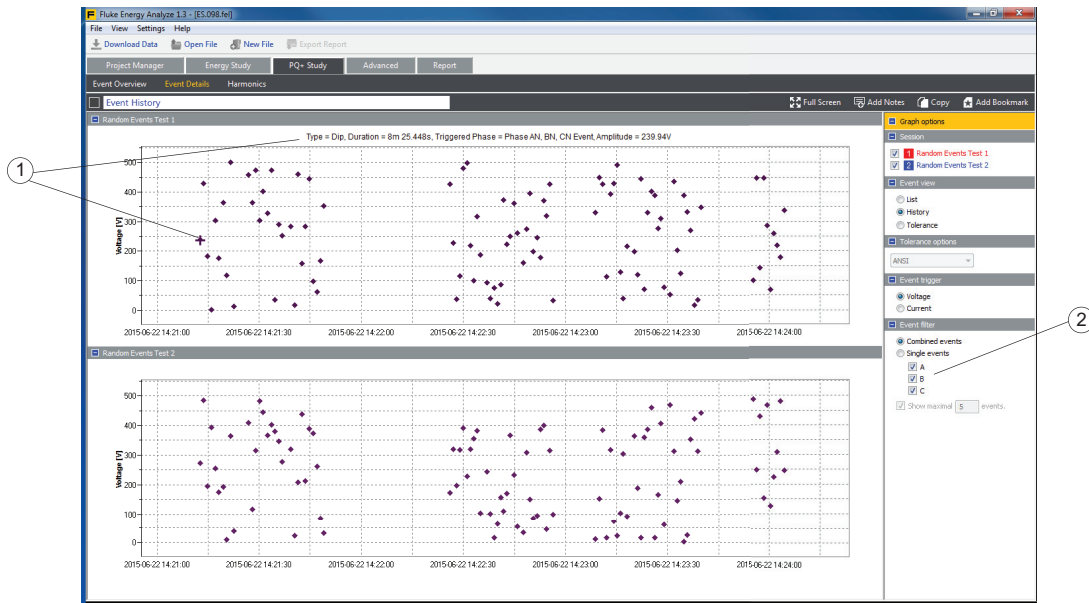
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Event Tolerance View

The Event Tolerance View shows voltage events in a plot 'Duration' vs. 'Percent of nominal voltage' of the system under test, along with severity limits according to different standards. Events of all selected sessions are mixed into one plot. Placing the cursor onto an event marker ① shows additional information in the title line. Use the Event filter ② to optimize the selection of events by phases.
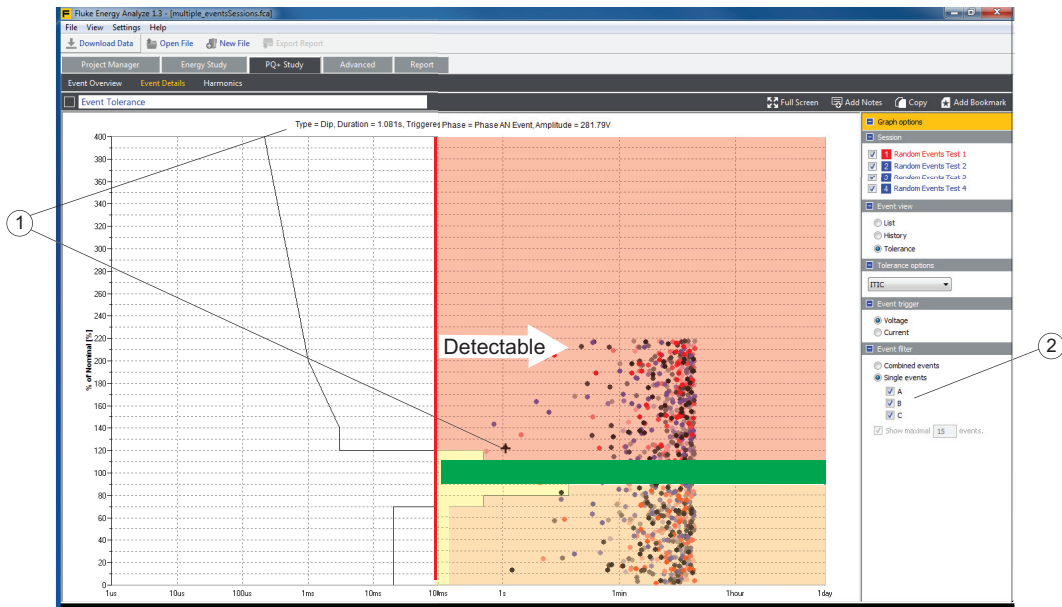
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The Logger detects events based on half-cycle RMS readings. For example, in 50 Hz systems, event durations shown in this screen are longer than 10 ms. Swells fall into the red-shaded area above and the Logger indicates high severity for these events. Depending on the duration, dips fall into the orange or yellow band and the resulting severity rating is medium or low. As long as the voltage stays within the green band, no events register.
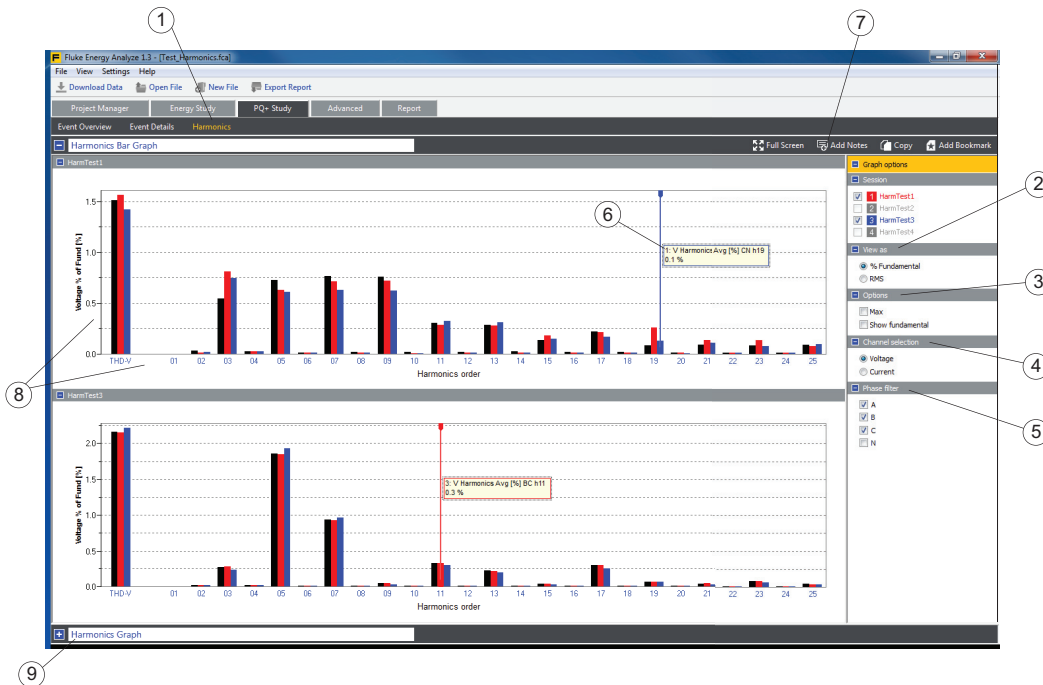
Note
The colored areas in the screen shot above are for explanation and do not show in the software.

Harmonics

Use the Harmonics view ① for in-depth analysis of harmonic content in voltage and current signals. To modify the content of the bar chart view, select the sessions to include and use these options:

- View as ② affects the scaling applied to the bar chart as well as its content:
    - *% fundamental: Energy Analyze Plus scales the bars in % of the fundamental amplitude. Select this view to make the THD readings for the selected channels visible. This works for voltage and current readings.*
    - *RMS: Energy Analyze scales the bars in [Vrms] or [Arms]. THD readings are not shown while scaling is set to RMS.*

- Options ③
    - *Max: shows the maximum levels per session in either RMS or %fund scaling, stacked on top of session averages.*
    - *Show fundamental: enables or disables the fundamental bar (harmonic order 01) in the chart.*

- Channel selection ④ lets you choose to either show voltage or current readings.

- Phase filter ⑤ lets you limit the content of the bar chart to selected phases.

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To zoom into more detail, draw a zoom rectangle with the mouse or open a context menu with a right-button mouse click on the axis you want to modify ⑧.

Use the Add Notes ⑦ widget to place text in the chart. Notes can float on the graphs white space, or you can attach to a bar. If latter case, the note text is pre-filled with data of item to which it was attached to. Floating notes remain visible regardless of zoom state and print in reports that use the bookmarked view. Attached notes remain visible as long as the data item it is attached to is visible. Depending on visibility, attached notes print (or not) in reports that use the bookmarked view.

Use the cursor ⑥ to get text readouts of bar values. The cursor can be moved with the mouse or with the cursor keys on your keyboard. The Harmonic Graph view automatically updates to the cursor position. To use this feature, pull up the splitter line ⑨ so the bar graph and time plot show together. You can view the session average in the bar chart and the time series plot of the selected harmonic in the graph view as shown in the screen shot below.
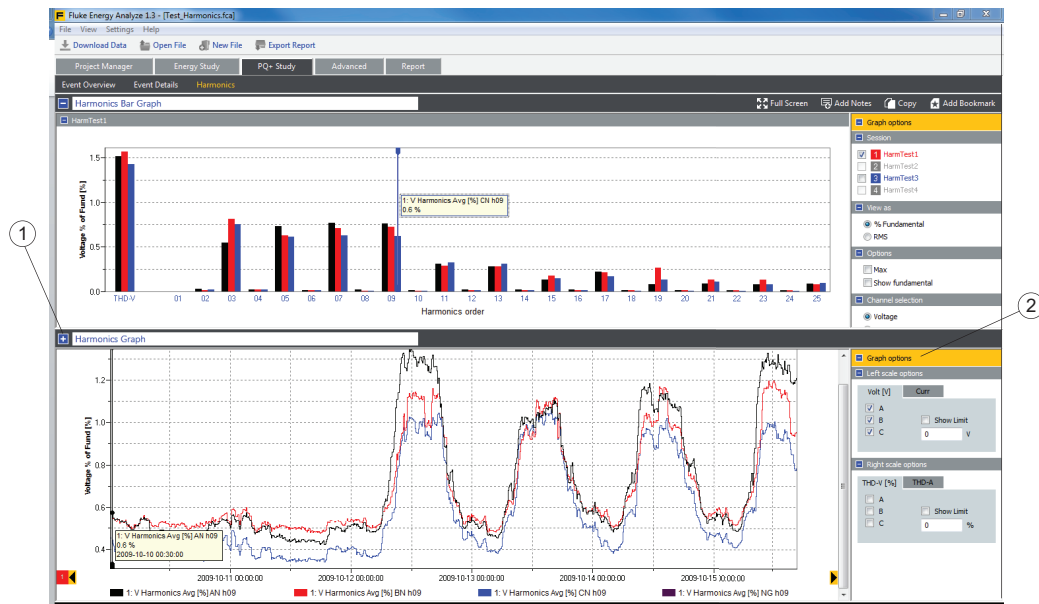
hjd056.eps

After you select the harmonic channel of interest in the bar chart view, you can drill down further into the time evolution plot. Use the blue rectangle ① to expand or collapse the time-evolution graph. Graph Options ② let you add or remove the related channels.

Use the Add Bookmark widget to bookmark the Harmonics Bar graph and the Harmonics graph views.

Advanced/Plot Configuration

The Advanced tab ① lets you define custom graphs and export selected data series in tabular format to other applications.
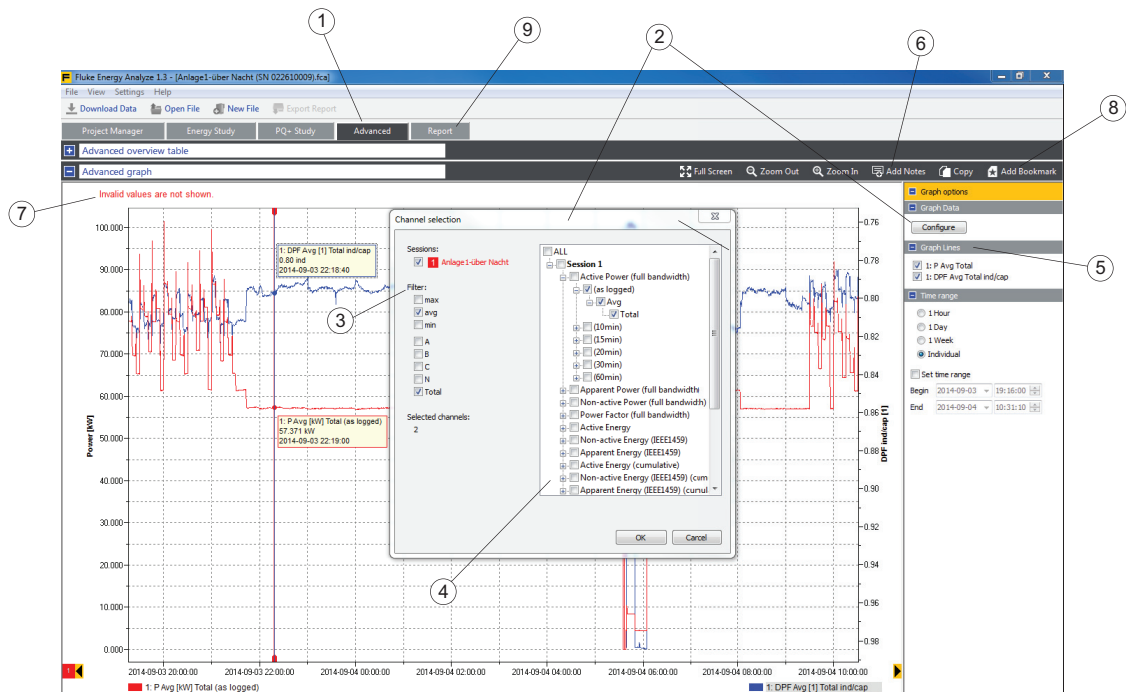
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Unless content has been defined before, the tab shows an empty graph. Click Configure ② to open the Channel selection panel. The panel offers a set of filters ③ that lets you optimize the list of available channels and a channel selection tree ④ that lets you choose the channels to plot. Click **OK** to plot the selected channels of interest. All selected channels list in the Graph lines section ⑤ in the Graph options side bar. It is useful to select more channels than will be plotted in one graph, and enable/disable them later. A maximum number of 36 different channels can be selected.

Use the Add notes widget ⑥ to make comments about the plots. Once a view is created and notes are added, edit the graph title ⑦ and use the **Add Bookmark** widget ⑧ to save this view. Saved bookmarks are listed under the 'Report' tab ⑨ shown below.


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Use the Restore Bookmark function to return to the original view that uses the same settings as when you created the bookmark. This function lets you use the Advanced tab to create, refine, and export different views into a report when done.

How to Use Fluke Energy Analyze Plus

The software is used to download data from a Fluke Logger, or to work with saved data that was downloaded before. Use Fluke Energy Analyze Plus to:

- Load and administer logged data with the Logger.

- Combine and compare logged data results.

- Create custom views of data in table or graph format.

- Copy data to other Windows® applications with copy-and-paste.

- Export data into a comma-separated values (.txt) file for use in other supported applications.

- Create a report to show cost saving potentials, effects, and issues.

Download Data
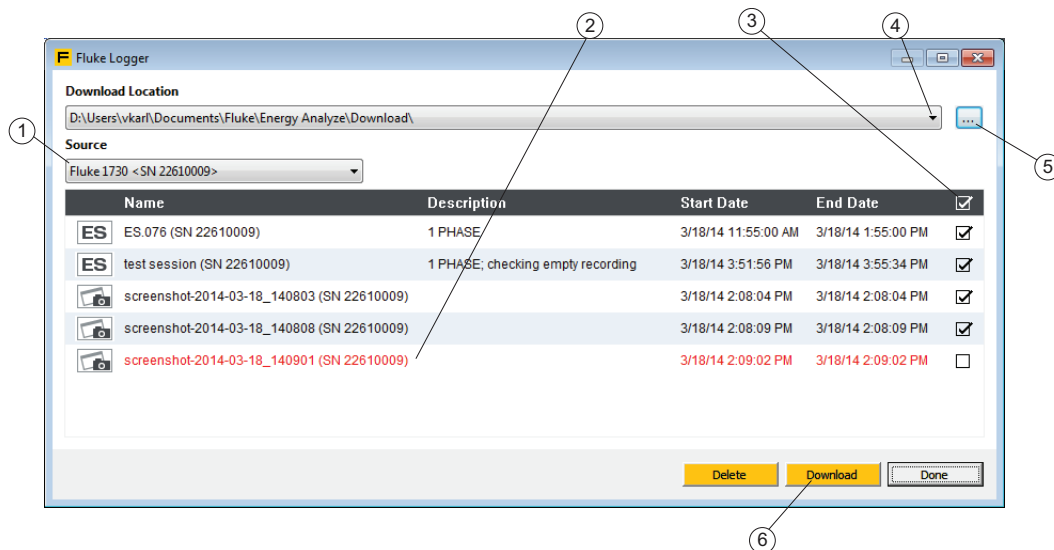
hjd039.eps

You can transfer logged data from the Logger to the PC through a direct USB connection to the PC, wireless with a Wi-Fi connection, or a USB flash drive. The software automatically detects the attached Logger and identifies it as the data source ①. If multiple sources are attached concurrently, users must manually select the source.

A default download location is allocated during the software installation. The download dialog offers an option to store data to a previously used location ④ or to define a new location ⑤. Once source and destination are set, select the data to be transferred ③ and click **Download** ⑥. Files that already exist at the selected location are shown in red text ②.

If the download is started nevertheless, the software will ask whether to overwrite, rename, or skip the logging session. After data is downloaded to the PC to use for analysis, you can remove this data from the logger. To do so, select the files to remove and click **Delete**. Click **Done** to close the dialog.

Download by USB Cable

You can download data directly from the Logger to a PC that has the Energy Analyze Plus software installed for further energy analysis and professional reports of the measurement results.

To download:

1. Use a USB cable to connect the Fluke Logger (mini-USB port) to the PC. The driver required to communicate with the device has been prepared for use during the installation process of Fluke Energy Analyze Plus, see <u>System Connections</u>.

2. Start the software and select **File** > **Download Data** from the main toolbar.

Download by Wi-Fi

With a commercially available USB Wi-Fi dongle you can download measurement data and screenshots to the Energy Analyze Plus software.

To download:

1. Insert a USB-to-Wi-Fi adaptor as described in the users manual for your Fluke Logger.

   After the installation on the Logger is successful, the next steps are necessary to connect the PC running Energy Analyze Plus by Wi-Fi to the Logger for the first time.

   Note
   When "Connect automatically" is not selected, the Security key must be entered each time you establish a Wi-Fi connection with the device.

2. Make sure the PC running Energy Analyze Plus has its Wi-Fi adaptor enabled.

3. To view available network connections, click on the network icon ① in the notification area of the Windows task bar (or use the "Network and Sharing Center" available from Windows Control Panel) to add a new connection.
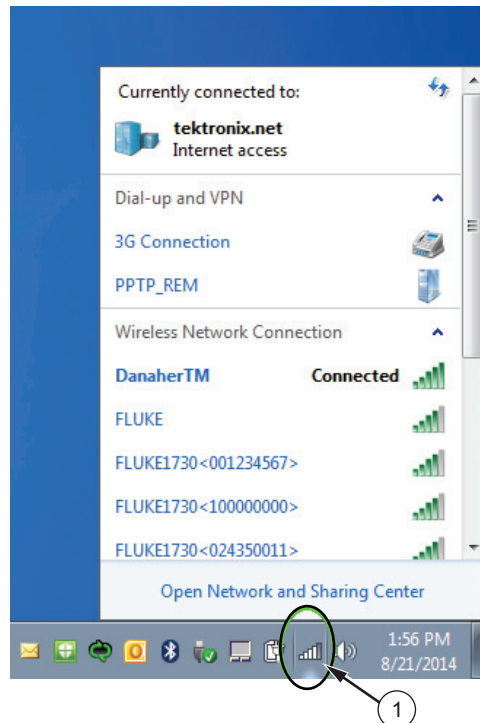
hjd045.eps

4. Select the Logger to connect to, compare the listed SSIDs with that shown on the Wi-Fi Configuration page (for more information, see the users manual for your Logger), and chose the matching one.

5. Enter the Security key as shown on the Logger's Wi-Fi Configuration page.

   A new network connection becomes available. Windows may ask you to select a network location, choose **Public network** when in doubt.
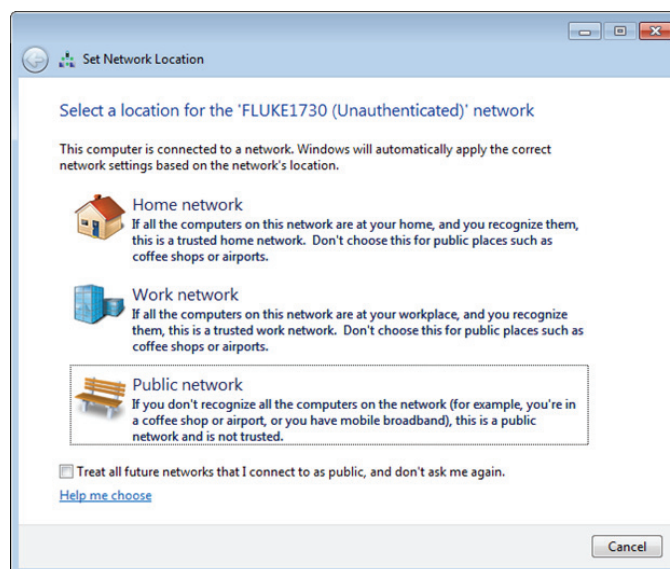
hjd046.eps

6. Start the software and select **File** > **Download Data** from the main toolbar. The Logger will be listed as a "Source" and includes a connection description (Wi-Fi).
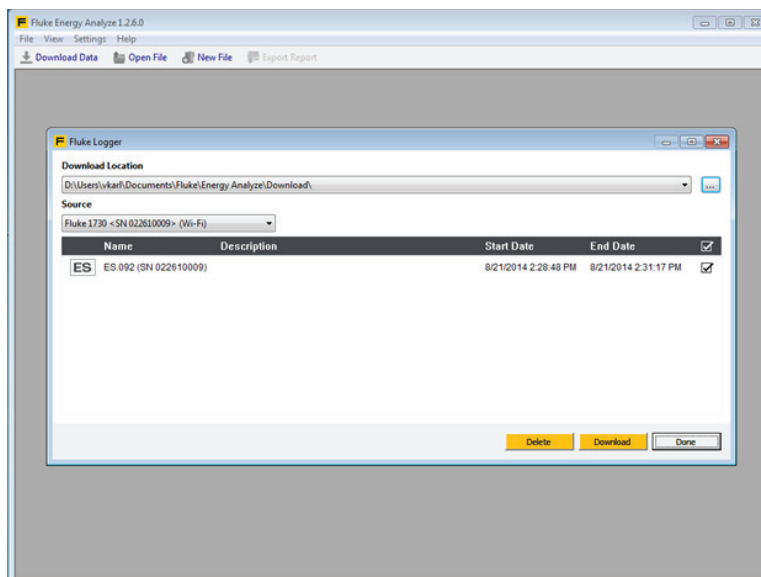
hjd047.eps

Download from USB Flash Drive

Data can be loaded from the same USB flash drive used to collect data from the Logger (see the users manual for your instrument). Insert the USB flash drive that holds logged data from the Logger into the PC, the software automatically recognizes data on that USB device.

To download:

1. Start the software and select **File** > **Download Data** from the main toolbar.
2. Select the USB flash drive as a data source.

How to Work with Files

Fluke Compound Analysis files (.fca) store the logged data separate from edits and keeps both in one file. See Data Format and Management for more information.

Create a New Analysis File

Click **File** > **New File** from the main toolbar. The software prompts you for a new file name and location. Once this information is provided, the software shows an empty file in the Project Manager view and accepts text input to the client, location, and description fields. See Project Manager for more information.

Note
It is recommended to keep user files created this way in a different directory than downloaded files.

Add Data to a File

Click located at the right side of the file summary title line. A file-open dialog pops up to let you chose the source file that contains the data to add. Once a source file for downloaded data is selected from the directory, the data is copied to the open file.

Note
If the source contains more than one data set, only the first set is copied.

A successful data addition includes a session summary field. See Project Manager.

Add Images to a File

Click (right side of the file summary title line) to open the popup dialog box and chose the image to import. This feature supports the addition of screenshots from the Logger, a smartphone, or a digital camera to an analysis file.

Create Bookmarks

Bookmarks have two purposes:

- To store a view for use within a report.

- To store a view you intend to continue to work on or reuse at a later time. The software can be closed and when the analysis file is loaded again, locate the bookmark in the report tab and return to the saved state.

is available from all data representation sections (overview tables, graphs, time range tables) on the Energy Study or Load Study tabs. Use the editable section title line to enter a custom name, then click to store a snapshot of the current view.

Create Reports

Navigate to the Report tab and find the list of report items at the left side of the screen. Drag and drop a report item into the right side of the screen to show that item in the final report in the order of appearance on the screen. To change this order, click on the item title and drag it to the new position within the content panel (on right-hand side).

Report items consist of all the items seen under the Project Manager tab completed by a list of all saved bookmarks. To remove an item from the report, drag it back to the left-hand side of the screen, or use the **Remove** widget located on the item title line.

To delete a bookmark from the current project, select it in the report item list, and press the delete key. To edit a stored bookmark, double click on that list element, or use **Edit** on the title line of the item in the report content panel. This will take you to the exact same view that was active when that bookmark was created.

When you click the Create Report icon on the main tool bar, Energy Analyze Plus creates a Portable Document File (PDF) from all items contained in the right-hand side of the screen in the order of their occurrence.

The **Copy to Clipboard** widget is available from all title lines of all sections on Energy Studies and Load Studies. Use this widget to copy the content shown below the corresponding title line into the Windows clipboard. From the Windows clipboard, you can paste it into other applications such as word-processing software or email.

Export Data to .txt File

Export Data allows you to export data from the current logging session. You will see this widget in the title line of each session summary on the Project Manager. Click to open the dialog and choose a specific data series from the corresponding session. Energy Studies contain two sets of data series known as "trend" and "demand" data. Demand data is recorded with the **sync to demand** interval setting on the instrument - for more information, see the users manual for your Logger.

The file export function creates a text file with delimited fields separated by the character (Separator) that you define.

After all adjustments are complete, click **Export** to create the data file.

Plot Usage

To select the data of interest, use **Graph Options** ①. The view can be modified to highlight the information that is most important for your report. In this example, two sessions have been recorded with one instrument.
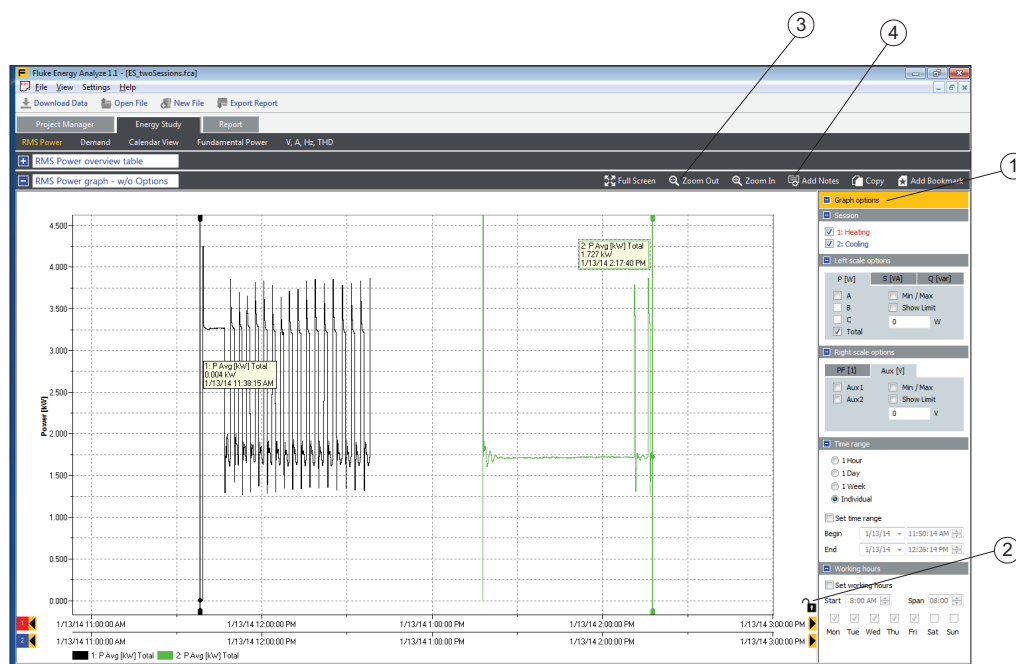
To compare data from both sessions in more detail:

1. Click the lock symbol ② to unlock the x-axes.

2. Right-button click on either x-axis to open the **Auto Scale X/Y to fit** context menu and use it to overlay both traces so that they start the plot at the same point.

    The context menu will also let you numerically enter a time span with the Manual Scale function.

3. Drag the lower x-axis to a new position to fine-adjust the overlap of both data series in the plot. Energy Analyze Plus will automatically snap curves so that alignment to the grid of the first x-axis (master axis) is achieved.

4. Use the zoom functions to adjust the granularity of the grid.

5. Click the lock symbol ② again to save the adjusted relative position.

6. Use the 'Alt' key (left of the space bar) to move any x-axis by grid position.

To view more or less detail of a plot, use the Zoom In and Zoom Out widgets ③. You can zoom in or zoom out both the x and y axis by approximately 20 %. To select which axis a zoom operation is applied to, press either the 'x' or 'y' key when you click on the corresponding widget. Alternatively, draw a rectangular across the area you want to zoom in on. Keep the left 'Alt' key pressed while you draw the selection to reduce the entire plot area to the defined rectangular area.

Use **Add Notes** ④ to add comments to the plot. If clicked, the cursor shape changes to indicate you can now pick a place for your note. This can be somewhere on the plot area if you want to make a generic comment that applies to the entire series. If you put the mouse pointer over a plot trace, the arrow will change to a hand symbol to indicate that a note is associated with this specific point of the trace. Click to place the note, and type the text into the entry field. For a note associated with a curve

point, the text entry field is prefilled with the values that represent the curve point. When done, the text entry field closes and a numbered box appears at the selected position. In reports, text is shown in a table below the plot and uses a reference number.

To edit existing notes, double-click on the numbered box, or right-click, to open a context menu that lets you edit, delete, move, or release a note.

Select **Move** and use a single-click at a new position. This also lets you associate notes with a different curve point.

Select **Delete** to permanently remove a note from the current project.
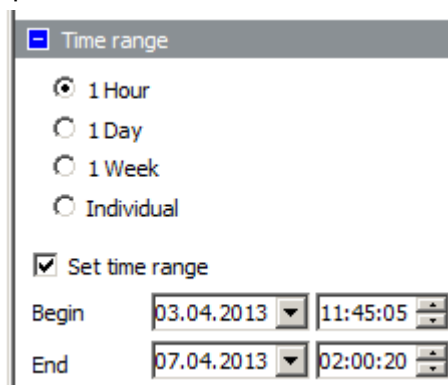
Select **Release** to disassociate a note from a curve point. This does not remove the reference values that are prefilled in the text field.

Time Range Usage

The Time Range feature lets you see the details of a specific graph and get numerical values that are associated with that selection. An example of this feature would be to find the energy consumption of a machine during a specific time period and document the process efficiency in terms of energy usage.

It is available from these graph sections:

- Energy Studies:
  - RMS Power graph
  - Demand graph
  - Fundamental Power graph
  - VAHz graph
- Load Studies:
  - RMS Power graph
  - A, Hz, THD graph

Time Range setting

A time range is set with the controls located under the Graph Options at the right-hand side of a graph screen. Use the radio buttons to quickly adjust the time-axis to contain the selected time span.

In order to get numerical values printed in a list, tick the **Set time range** checkbox. This shows two vertical cursors that define start and end time. The time span used to fill the time range table (available from the section below the graph) is shown with a white background. To view tabular values related to that selection, click on the blue option box next to the section title to expand the time range table.

You can drag the vertical time range cursors to change the selection, or use the Begin/End date and time pickers.

Working Hours Usage

The Working Hours feature is used to graphically delineate working- from non-working time. An example of this feature would be to quickly see high-load conditions that occur during out-of-office hours.

Working hours are set with the controls located under the Graph Options at the right-hand side of a graph screen.
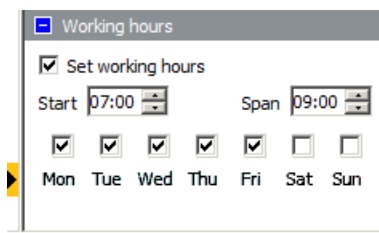

Working hours setting

Non-working hours are shown in a light-blue color on the plot area. The setting accepts the start time and the duration of the active period. To show working hours from 7 am to 4 pm (9 hours) on Monday through Friday, enter 07:00 as start time, 9:00 as the span, and tick the checkboxes for Mon, Tue, Wed, Thu, and Fri.

Set Instrument Time

Connect your instrument to the PC and open the Energy Analyze Plus program. From the main menu, go to **Settings** > **Synchronize time** to open the dialog box shown below. Make sure your instrument is listed in the **Units** field and click **Set Clock** to adjust the date and time on the Logger.
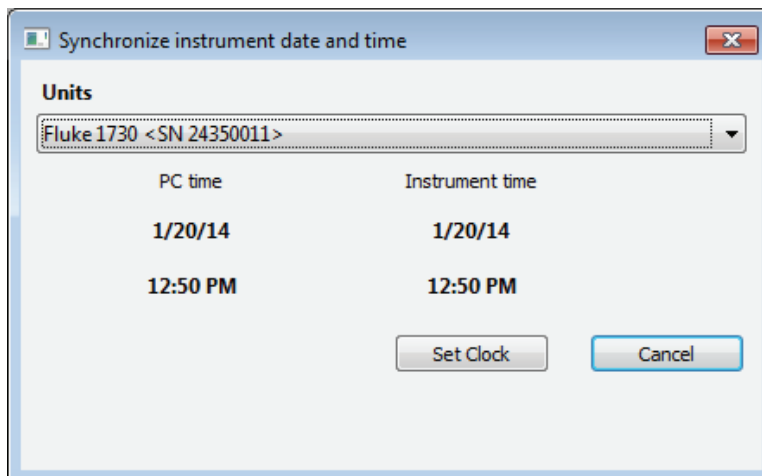

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Note
No time zone changes are made to the 173x with this setting. A time zone change is done manually on the 173x. For more information, see the users manual for your Logger.

Change Auxiliary Channel Scaling

You can log two channels of generic data in addition to the electrical parameters with the 1730. These channels are referred to as AUX 1 and AUX 2. The instrument is configurable for use with various sensors (for more information, see the users manual for your Logger). Fluke Energy Analyze Plus allows you to adjust this configuration after a session is complete.

In this example, the session has been recorded with a temperature sensor that has a 1 mV/°C readout and is connected to AUX 1. Energy Analyze Plus plots AUX 1 in volts instead of °C because this information was not entered at the time of logging.
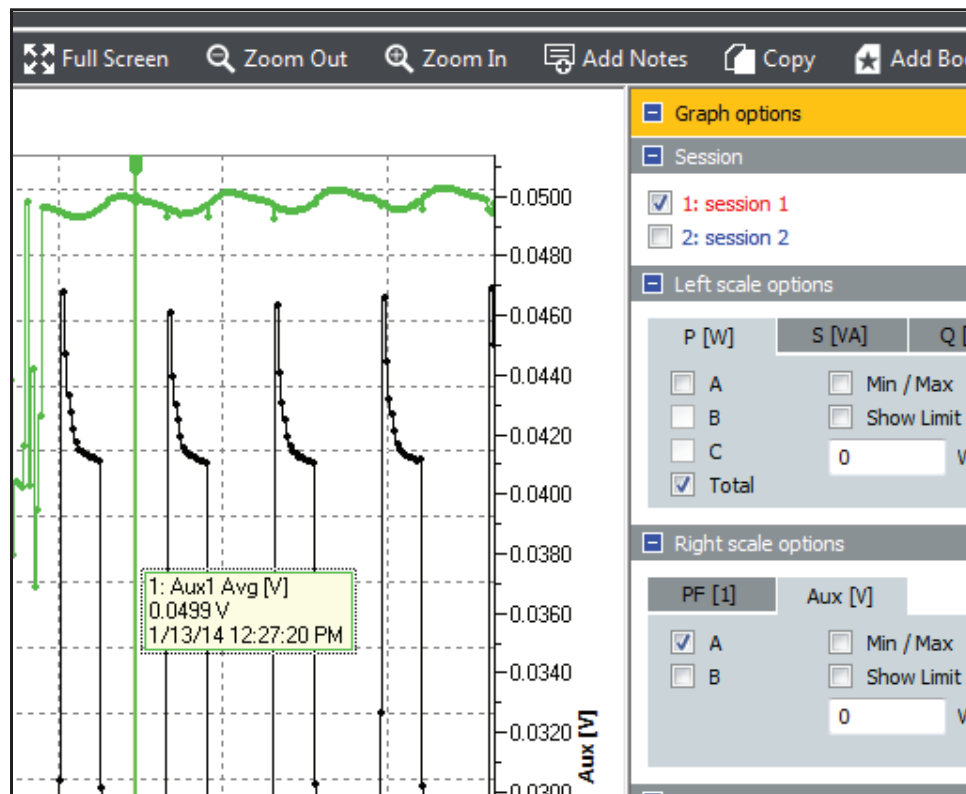

hcd042.eps

To correct, go to the 'Project Manager' tab, and click on **Settings** ① of the corresponding session.
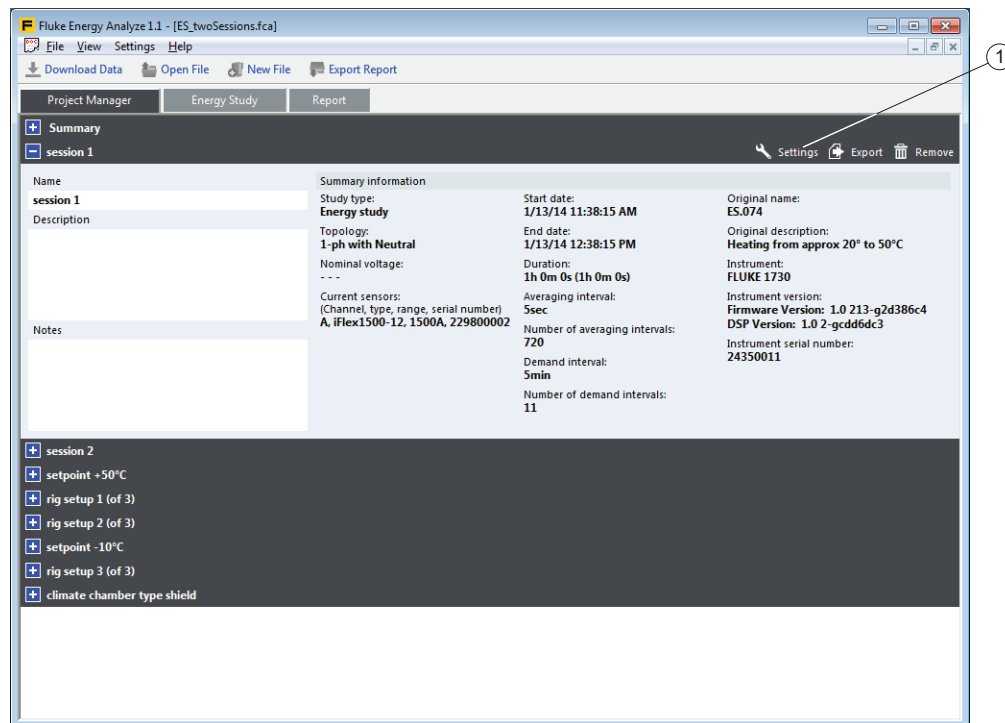
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This opens a dialog that lets you override the adjustment made on the Logger before the logging session was started. Select **Apply scaling correction** and enter gain and offset values (in this example, **1000** to rescale from [1mV/°C] to [°C]) and the proper unit. The sections below the input fields show the before and after values.
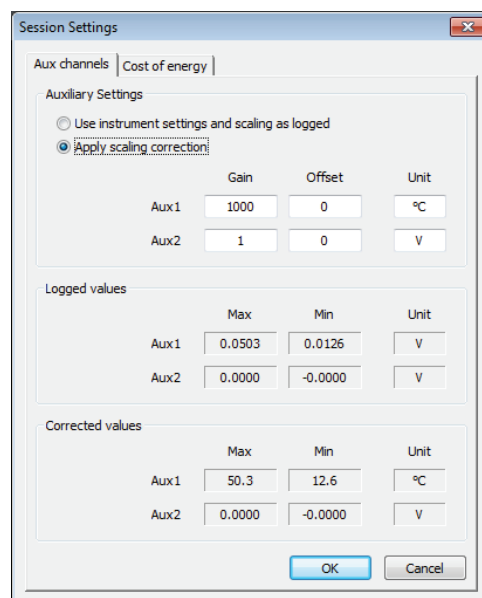
hjd049.eps

Click **OK** when the "Corrected values" match your expectations. Energy Analyze Plus now shows the corrected scaling of values.

Change Cost of Energy Parameters

Energy Analyze Plus, by default, uses a simple energy tariff scheme to calculate the cost of energy: you can set a price/unit of energy for forward energy and another price for reverse energy. If this does not meet the requirements, an advanced scheme can be defined that allows different rates depending on the time of day.

To set:

1. Go to the **Project Manager** > **Settings** to open the **Session Settings** dialog.

2. Click on the **Cost of Energy** tab to edit cost profiles for this session.

3. Define the base cost. The price/unit of energy defined here is applied for all time periods that have no different ratio defined.

4. Define the exceptions from the base cost.

5. Click on **Add new ratio** ① to add a set of cost parameters and determine the time slot for which these should be applied. You can add several ratios, or define several time slots for one ratio.

6. Use the blue **+** buttons to add a ratio or to add a time slot to an existing ratio. Use the red **x** buttons to remove ratios or time slots.
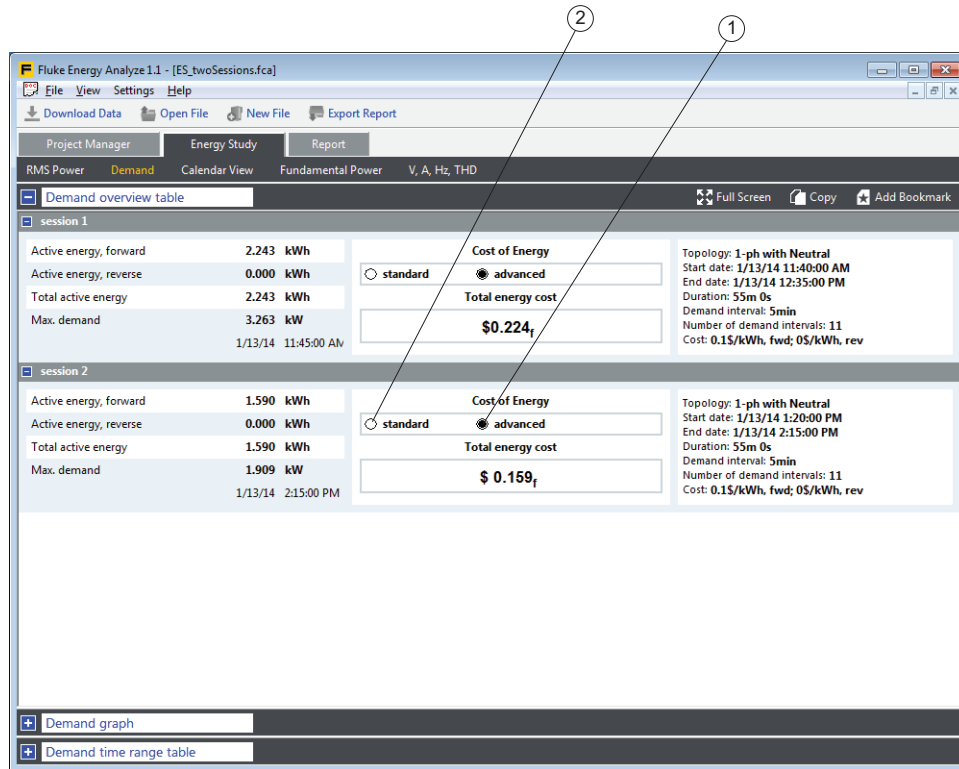

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When you edit the time slots, Energy Analyze Plus checks for overlaps to previously defined time slots that exist and indicates this condition with the time settings shown in red background. If overlapping slots remain defined, Energy Analyze Plus will use the last defined ratio for cost calculations. In this example, forward energy between 09:00 and 10:00 will be priced at $1/kWh.

7. Click **OK** when all adjustments are done.

Click the **advanced** ① checkbox in the Demand overview and time-range tables to apply the new price scheme. Select **standard** ② to use the settings from the instrument.

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