Fluke Energy Analyze Release Information

Table of Contents

Current

Fluke Energy Analyze Plus V3.13.0

September 2025

- New: adjusted to 177x firmware V3.2.1
  Older revisions of FEA+ may malfunction with data download from 177x instruments running V3.2.1 or newer.
- NEW: SEMI F47 tolerance curve in Events Tolerance view.
- Improved: Renaming bookmark in report view (the renamed bookmark appears correctly in the restored view's toolbar).
- Improved: Visibility of dialog items in the sidebar when collapsing and expanding sections.
- Improved: Fix incorrect font size in FEA after opening the unit dialog.
- Improved: Better handling of DPI scaling to ensure that text information remains fully visible.
- Improved: Stricter handling of SSL certificates (as utilized in the download dialog).
- Improved: Protected credentials (user + password) are never sent over insecured connection.
- Improved: Reworked error messages for better user information in empty views.
- Improved: Extended information on error message boxes.
- Improved: Fix Energy loss grid colors, so they correspond to the device's screen.
- Improved: Fix "Set time range" radio button behavior when there is no session selected.

Known issues and Utilization Analysis see V3.12.0

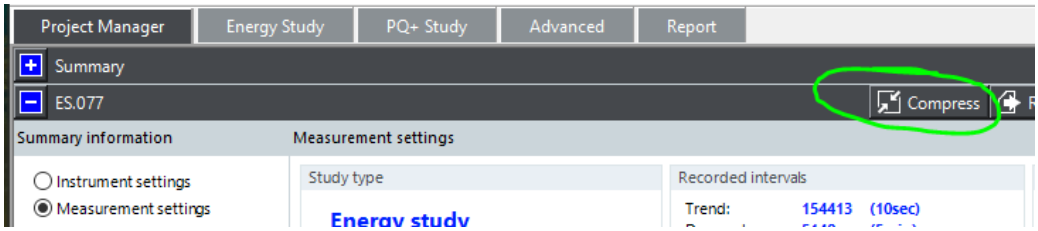
Revision History

Fluke Energy Analyze Plus V3.12.0

~~April 2025~~ has not been released.

- Improved: Entering line breaks in combination with quotes in the session description could break report generation.
- Improved: installer supports /InstallType=PRIVATE and /InstallType=ALLUSERS switches; utilize /DataDir="C:\path\to\all-users-data\" to define a common data directory in case the installation type is "ALLUSERS".
- Improved: display scaling in tables that show line loss power now is independent from other results in the group. The previous state prevented scaling into e.g. kilo-Watt even when adequate.
- Improved: improved stability when moving FEA+ between monitors with different resolution and font scaling.
- Improved: Corrected column labels for inductive or capacitive PF readings were shown as e.g. "PFFwdRev_A_avg" in the csv export to now show correctly.
- Improved: FEA+ could have stopped working if directly after a change to DPI settings the "Add Bookmark" widget was used.

- Improved: User notes in the Harmonics view in PQ+ Study occasionally were not visible.
- Improved: library updates:
    - Arrow 17.0.0 (from 11.0.0)
    - Boost 1.86 (from 1.81)
    - OpenSSL 3.0.15 (from 3.0.8)
- Improved: updated to .NET 8.0.4 for all .net based modules.
  The installer includes the update and provides for a choice to apply unless 8.0.4 or a newer version was already found on the target PC.
  Silent (scripted) installation requires the .NET update to be installed *before* FEA+ 3.12.0 is installed!
- Improved: date/time picker in Data Export dialog.
- NEW: tool tips in overview tables now give more information about how a parameter is calculated. Hover over the result in a table cell to get the tool tip shown.
- NEW: option to remove backup data from (healthy) .fca2 files.
  Files that contain raw data as read from the instrument as well as translated data for use in FEA+ will show an option "Compress" that removes the raw-data backup.



  If selected, raw data will be removed when closing the .fca2 file that contains it.
- NEW: Support for analysis and reporting according to DACHCZ 2023.
- NEW: PQ+ Study contains a new "THD" view that lets you pick a point in time of interest in the top view, then see the harmonic spectrum at that point in the bottom view.
- NEW: Adding telemetry to FEA+. Users can opt-out at first start after an update, and any time from the "About" menu.

Known Issues (this release):

- Incomplete translations, e.g. DACH-CZ related screens only exist in German and English language.

Utilization Analysis and Data Privacy

With FEA+ release 3.12.0 we introduce utilization analysis.

We record series of "events" that occur while working with Fluke Energy Analyze as users click the different buttons. These events are buffered on your PC and synchronized to our service partner, Mixpanel, for storage in a location within the EU.

Information contained in all events:

- Pseudonymous user ID (one per Windows account that the software is utilized with).
- Date and time of the event, and of the synchronization.

- Region (city, country).
- Windows culture settings.

We collect these specific events with additional data:

- Application start
    - CPU details.
    - RAM, available and utilized.
    - Screen resolution.
- Application close
    - Uptime.
- Open file, Close file
    - File extension, size, number of sessions and instrument type.
- New file
- Download Data
    -
- Add data, Remove data
    -
- Remove Raw data
    -
- Add image, Remove image
    -
- Device setup (17xx Setup)
    - Instrument type
- Export data
    - Type of target data (csv, xml, …)
    - Sessions contained in the file
    - Type of export (Template, NeQual, …)
- Export report
- Export bookmarks
- Change views
    - View type
- Click Zoom-in, zoom-out
    - View type
- Click Copy
    - View type
- Click FullScreen
    - View type
- Calendar View
    - Granularity (day, hour, week)
    - Study type
    - Viewed parameter

- Time Range View
    - View type
    - Changes of time range status and visibility status.

Users who acknowledged utilization analysis can opt out at any time by clicking the corresponding button on the Help | About panel.

Please find additional information at Fluke's Privacy Policy.

Fluke Energy Analyze Plus V3.11.2

April 2024, release notes updated May 2024

- NEW: added standard compliance report according to EIFS 2023:3
- NEW: added support for EN50160:2022
- Improved: Changing trace color on event detail graph affected chart selection property (RMS | waveshape).
- Improved: changed calculation of effective power in ELC; requires firmware v 3.1.0 to run on 177x.

Note: ELC is designed for use on consuming loads only.

- Improved: rendering issues with text on high-DPI screens utilized with font-scaling >100%
- Improved: adjusted FEA+ data translation to be more resilient in handling simple data defects in downloads.
- Improved: updated limits for EN50160:2022, fixed invalid use of flagging for low voltage (<1kV) systems (Amendment 2).
- Improved: new version of vcredist_x86 is 14.38.33135.0
- Improved: added tool tips to the Energy-Loss-Calculator summary view.
- Improved: FEA+ may stop to work normally after stepping through a series of actions that involve disabling channel selection checkboxes, view switches, and use of the "Copy" widget.
- Fixed: cost of energy calculation showed x1000 too high. Power readings in GB/T exports showed x1000 too high.
- Fixed: limit unit in Advanced tab showed [%] when it should show [A].
- Fixed: completed options for inter-harmonics in data selection trees for export and advanced view.
- Fixed: corrupted letters in the installer's EULA view.
- Fixed: an issue with the data aggregator caused 0 values printed in the first row of exported Vrms-min and Irms-min values.

Note: Future versions of Fluke Energy Analyze will require Windows 10 or higher.

Fluke Energy Analyze Plus V3.11.1

November 2023

- NEW: added standard compliance report according to EIFS 2013:1
- Improved: Changing trace color on event detail graph affected chart selection property (RMS | waveshape).
- Improved: changed calculation of effective power in ELC; requires firmware v 3.1.0 to run on 177x.

Note: ELC is designed for use on consuming loads only.

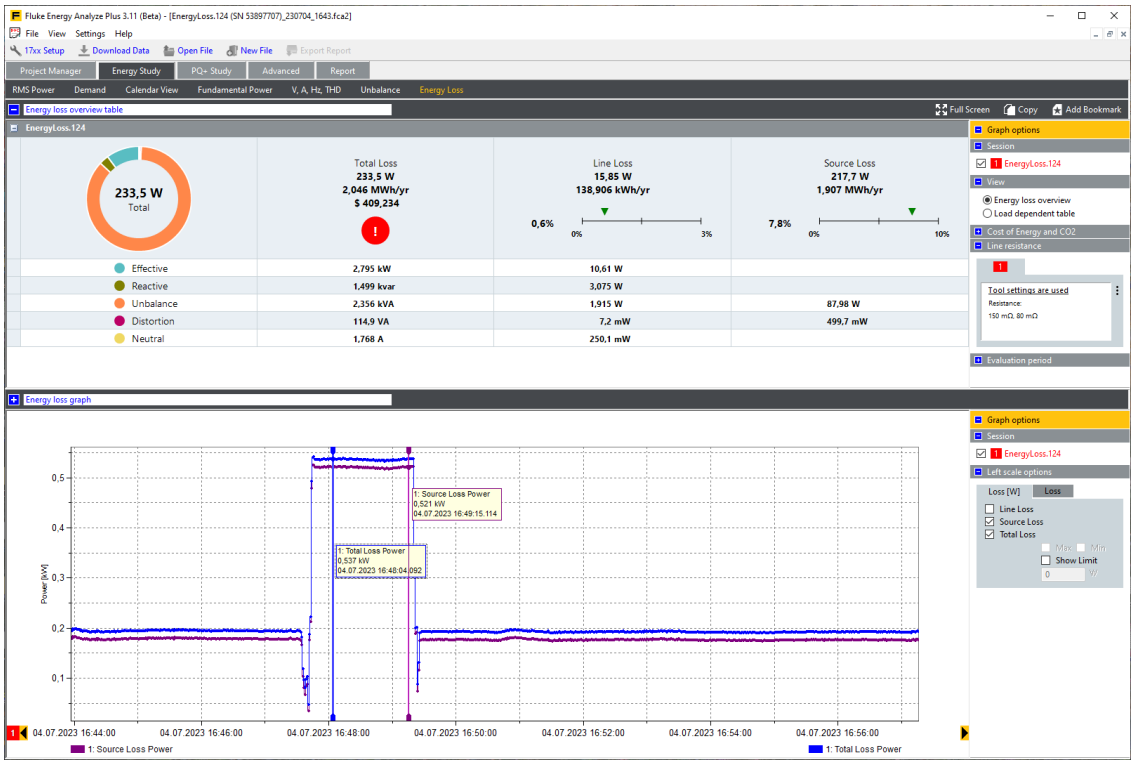
- Improved: rendering issues with text on high-DPI screens utilized with font-scaling >100%
- Improved: adjusted FEA+ data translation to be more resilient in handling simple data defects in downloads.
- Fixed: cost of energy calculation showed x1000 too high. Power readings in GB/T exports showed x1000 too high.
- Fixed: limit unit in Advanced tab.
- Fixed: labels for inter-harmonics.

Fluke Energy Analyze Plus V3.11.0

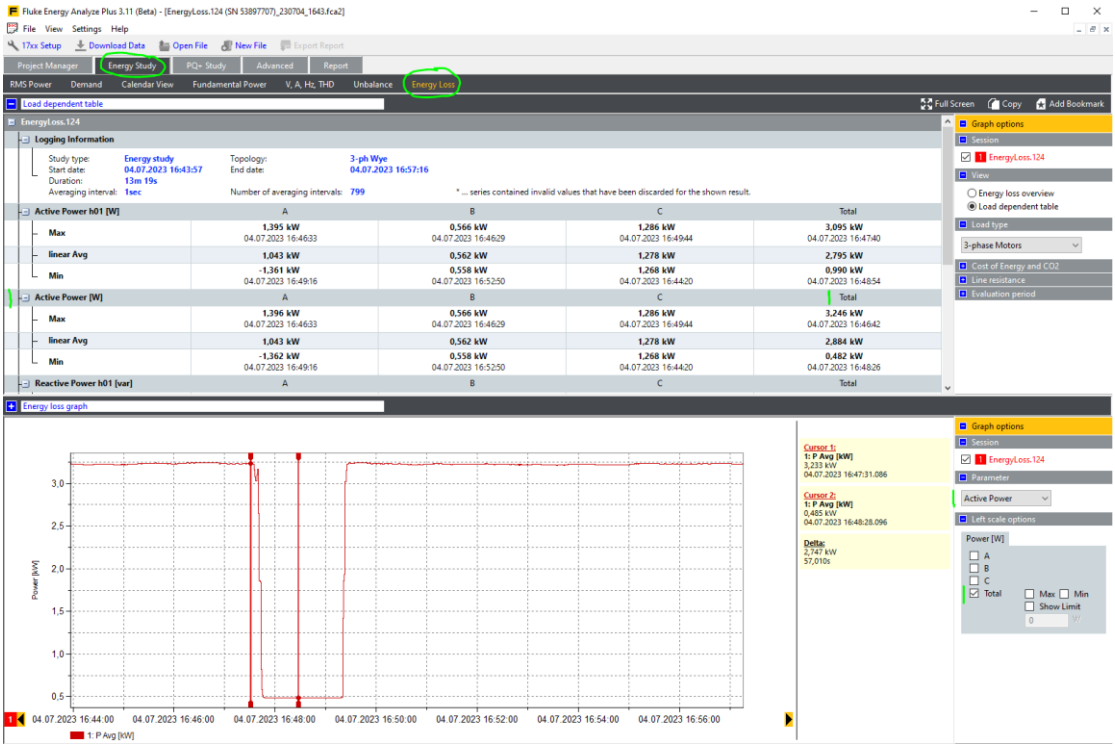
August 2023

From revision 3.11.0 on, .NET based components of FEA+ require .NET 7;
.NET 4 (Framework) is no longer required.
The FEA+ 3.11 installer will offer an option to install .NET Core unless it found a suitable version was already present.

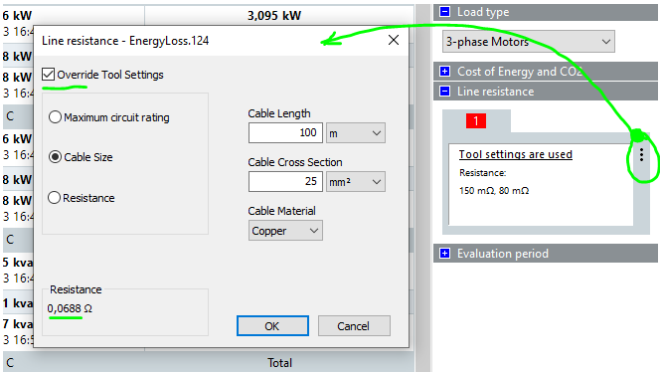
- NEW: Energy Loss Calculator feature in combination with Fluke 177x instruments running firmware newer than v3.0.0 (published version at the time of writing this is v2.1.0).
  Use the Energy Loss overview to pinpoint loss components and when they occur.


Fluke Energy Analyze Plus 3.11 (Beta) - [EnergyLoss.124 (SN 53897707)_230704_1643.fca2]
File View Settings Help
17xx Setup Download Data Open File New File Export Report
Project Manager Energy Study PQ+ Study Advanced Report
RMS Power Demand Calendar View Fundamental Power V, A, Hz, THD Unbalance Energy Loss
Energy loss overview table
Full Screen Copy Add Bookmark
EnergyLoss.124
233,5 W
Total
Total Loss
233,5 W
2,046 MWh/yr
$ 409,234
Line Loss
15,85 W
138,906 kWh/yr
0,6%
0%
3%
Source Loss
217,7 W
1,907 MWh/yr
7,8%
0%
10%
Effective 2,795 kW 10,61 W
Reactive 1,499 kvar 3,075 W
Unbalance 2,356 kVA 1,915 W 87,98 W
Distortion 114,9 VA 7,2 mW 499,7 mW
Neutral 1,768 A 250,1 mW
Graph options
Session
EnergyLoss.124
View
Energy loss overview
Load dependent table
Cost of Energy and CO2
Line resistance
Tool settings are used
Resistance:
150 mΩ, 80 mΩ
Evaluation period
Energy loss graph
1: Source Loss Power
0,521 kW
04.07.2023 16:49:15.114
1: Total Loss Power
0,537 kW
04.07.2023 16:48:04.092
Power [kW]
0,5
0,4
0,3
0,2
0,1
04.07.2023 16:44:00
04.07.2023 16:46:00
04.07.2023 16:48:00
04.07.2023 16:50:00
04.07.2023 16:52:00
04.07.2023 16:54:00
04.07.2023 16:56:00
1: Source Loss Power
1: Total Loss Power
Left scale options
Loss [W]
Loss
Line Loss
Source Loss
Total Loss
Max
Min
Show Limit
0
W

The Load dependent table view lets you go into more detail. The “Load type” selector helps focusing on the most relevant loss components based on the type of loads are under observation. Refer to the appendix for more information on the power.



For the calculation of losses, the new instrument firmware lets you input supply line properties (line resistance) that enable the calculation of line losses. FEA+ receives these settings, but also lets you override them and apply changes to the loss model, so you can see *what happens if* …

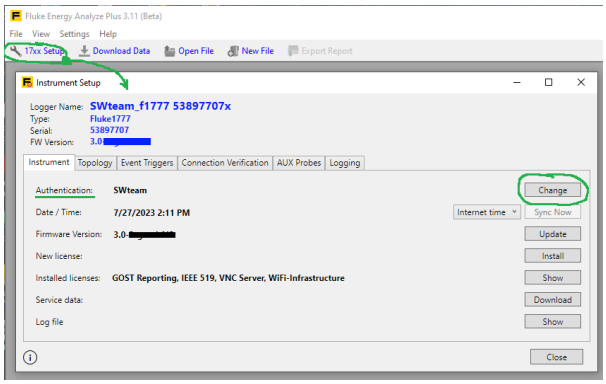


Note:
Simulated data was used for the screenshots above, these may not reflect real-world applications in all aspects.
Refer to the Appendix for more information about Energy Loss Calculator.

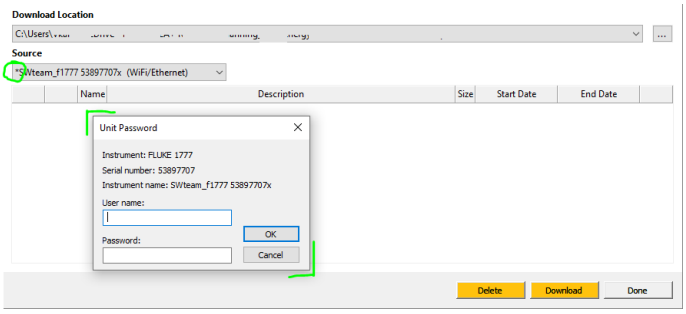
Energy Analyze utilizes these short forms for data identifiers in “Export” and “Advanced” data pickers:

FEA+ short form (screen text)	Description
• Ph01+	Positive sequence fundamental active power, P_1^+
• Qh01+	Positive-sequence reactive power, Q_1^+
• Sh01	Positive-sequence fundamental apparent power, S_1^+
• Ph01u	Unbalance active power, P_U
• Qh01u	Unbalance reactive power, Q_U
• Nh01u	Unbalance non-active power, N_U
• Sh01u	Unbalance apparent power, S_U
• Ph01	Fundamental active power, P_1
• Qh01	Fundamental reactive power, Q_1
• Sh01	Fundamental apparent power, S_U
• Pd	Distortion active power, P_D
• Nd	Distortion non-active power, N_D
• Sd	Distortion apparent power, S_D
• P	Total active power, P
• N	Total non-active power, N
• S	Total apparent power, S
• Ih01a+	Virtual current; positive-sequence fundamental active current. Used to derive I^2R losses caused by the load and line resistance.
• Ih01r+	Virtual current, positive sequence fundamental reactive current Used to derive I^2R losses caused by the load and line resistance.
• Ih01u	Virtual current; fundamental unbalance current Used to derive I^2R losses caused by the load and line resistance.
• Id	Virtual current; distortion current Used to derive I^2R losses caused by the load and line resistance.
• In	Current on neutral conductor. Used to derive I^2R losses caused by the load and line resistance.

- NEW: Fluke 177x instruments support authentication for data downloads. Use the “17xx Setup” function to change the username and password of your 177x instrument. For subsequent accesses to that instrument, FEA+ will require users to enter the correct username and password combination. That is, for both, instrument setup and data download.



Password-protected instruments are shown with an asterisk in FEA+'s device lists…



Data transfers between instruments and FEA+ are encrypted utilizing TLS 1.2.

- Improved: FEA+ shows "given" 177x instrument names in all device lists. If you had more than one 177x instrument and accessed it remotely, you may wish to name them differently and so help to prevent accessing an item by mistake.
- Improved: GB/T exports (excel) now defaults to utilize 3sec harmonic data if present, and utilizes updated limit calculations, and shows additional information on the data export panel to help users with selecting correct voltage ratings.
- Fixed: an issue with taking bookmarks occurred in earlier revisions. Occasionally, clicking the "Bookmark" widget showed a progress bar but no result was available for use in the "Report" tab. In some instances, graphical representations in bookmarks rendered with a black area.
- Fixed: the "Calendar" view had an issue that caused a wrong date to be shown with calendar tiles.
- Fixed: when executing a firmware update utilizing the "17xx Setup" feature on high-resolution screens, due to a scaling issue, the "OK" and "Cancel" buttons on the confirmation panel may not have been accessible in case very many sessions were stored on the connected instrument.
- Fixed: erroneous file filter settings on Open File dialogs caused available files from being hidden to Chinese users.

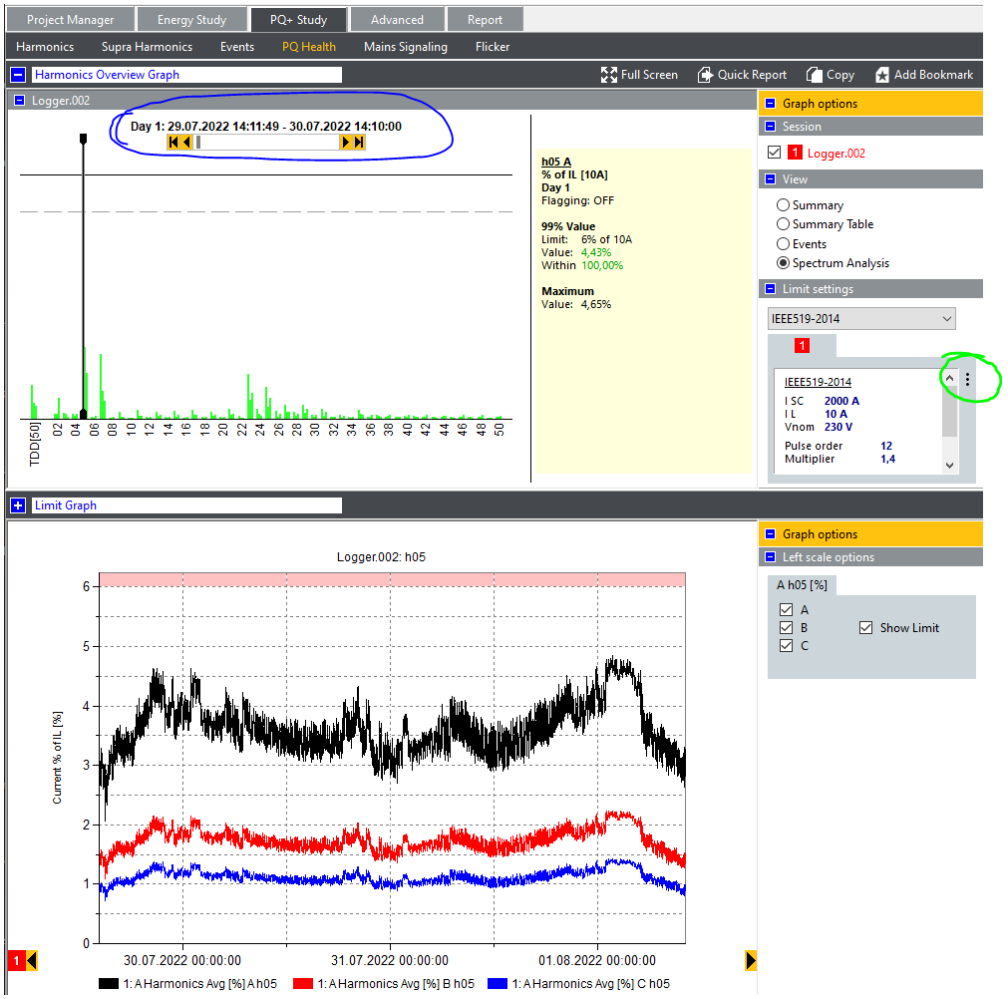
Fluke Energy Analyze Plus V3.10.1

February 2023

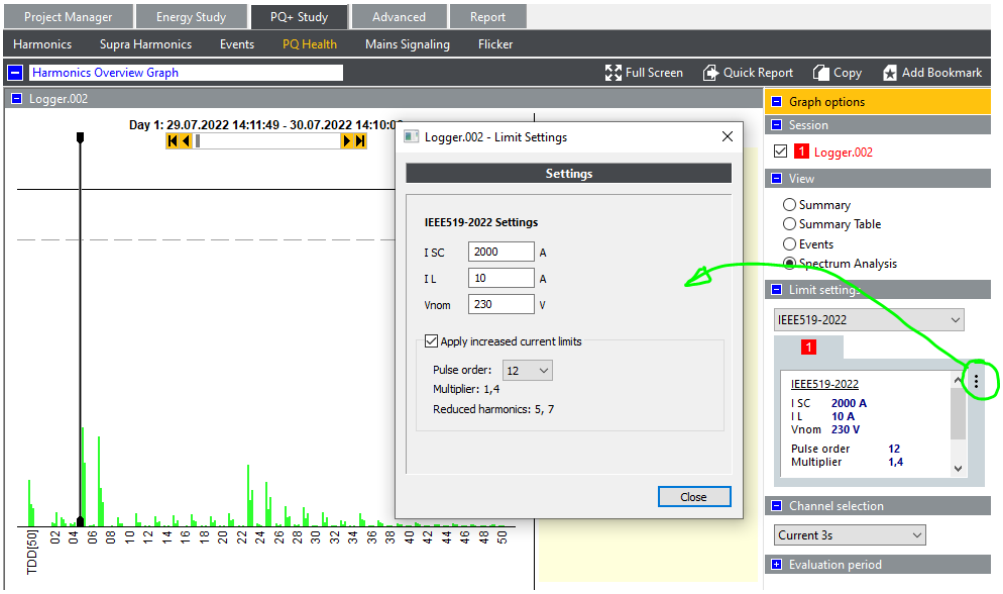
- NEW: IEEE519-2014 update supports daily evaluation and reporting. Also, clause 5.5 "Recommendations for increasing harmonic current limits" is incorporated.
  If a session contains data for multiple days, use the left- and right arrows (marked blue) at the

top of the overview chart to step through days.

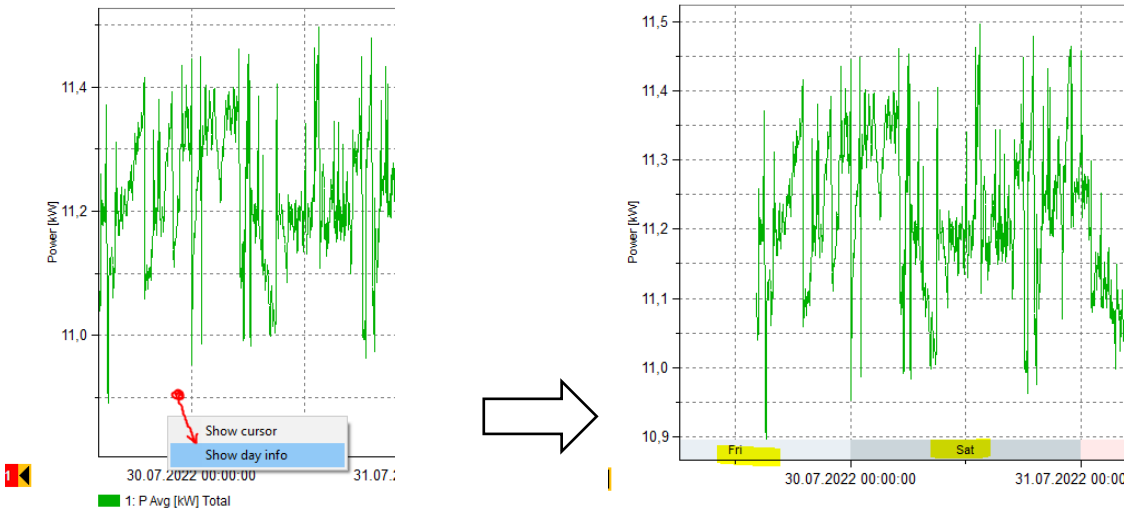
To change I_{SC}, I_L, V_{nom}, and to apply increased current limits, click on the three dots to the right of the text box for limit settings (marked green).



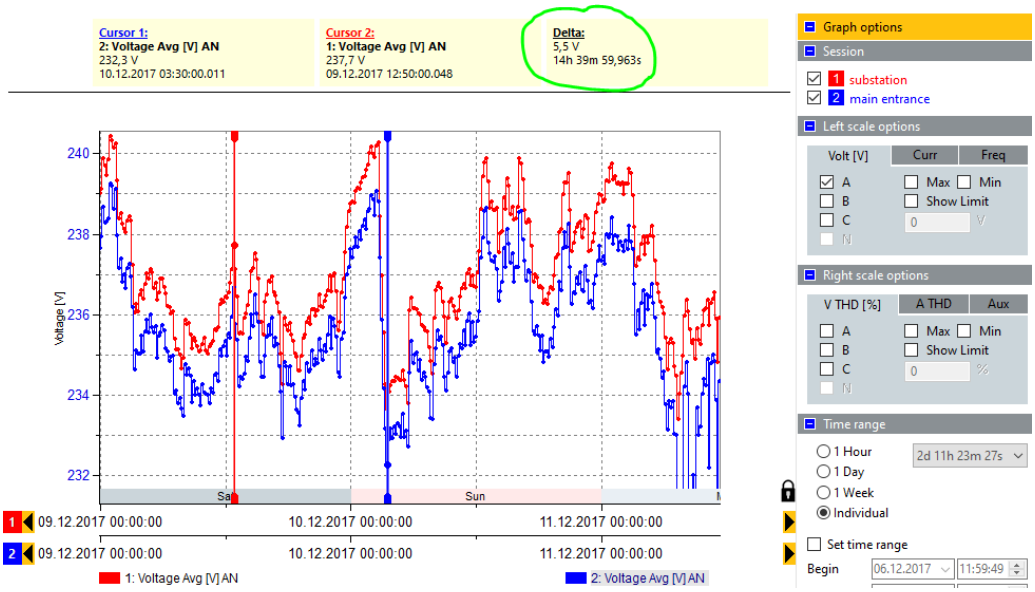
- NEW: Added IEEE519-2022, including clause 5.6 “Recommendations for increasing harmonic current limits”.



- NEW: show week-day information for event views. This is available for all time-series plots and for Event History view. It is not available for Event detail and Harmonic detail plots.
  To show day-of-week info, use the context menu (right-button click into white space within the plot area) and select “show day info”. Visibility settings for day-of-week information in different views are discarded when closing Energy Analyze.



- Improved: “delta cursor” readouts work on data from different sessions if the same parameter is compared.



- Improved: all SW quality logs now use .log extension.
- Improved: corrected minor issues with DPI scaling (fonts, icons, …)
- Fixed: corrected Power Factor “PF”, and Displacement Power Factor “DPF” in table views. This also affected visibility of “capacitive/inductive” indication.
  The issue become public *after* FEA V3.6.4
- Fixed: corrected display of voltage readings from sessions on single-phase IT topology.
  This issue occurred with data from 174x and 177x, not 173x.
- Fixed: changing color on harmonics detail graph resets phase selection settings.
- Fixed: time stamps in PQDIF exports came with an erroneous offset.
- Fixed: erroneous file filter settings on Open File dialog from “Add Data” widget prevented Norwegian and Czech users from being able to select all available options (.fca, .fca2 files).

Fluke Energy Analyze Plus V3.10.0

October 2022

- New: added support for compliance analysis according to Netcode2020 and ENA G5-5 (planning and compatibility levels).
- New: extended PQ+Study | Harmonics view to show up to 100 harmonics. This feature depends on Fluke 177x firmware revision 2.0.
- Fixed: reports in languages that use non-latin characters (Simplified Chinese, Korean, Japanese, Russian) contained unreadable text.
- Fixed: bookmarks and reports contained graphics with black area.
- Improved: working with multiple monitors – FEA will remember up to three scenarios and monitors incl associated DPI scaling. For instance, if a user works on two monitors while in office, but uses just the laptop monitor while working on-site, FEA+ will start on the last used monitor in each of the settings.

Known issue: when moving FEA+ between different monitors or monitors with different font-scaling settings, in some cases live auto-rescaling on screen content may not function as expected. To work-around this issue, move FEA+ before session data is loaded.

- Improved: Live screen content rescaling under Windows10 and Windows11.
- Improved: we changed the progress indicator that is shown during data download to be more informative during the data translation phase. On slow hardware, users can see processing progress in numeric data additionally to the overall progress bar.
- Improved: the update-notification feature is back! FEA+ tells you once an update to the firmware of an attached instrument or to FEA+ itself is available. You still can mute this feature.
- Improved: added THD, total harmonic distortion, to the list of exportable data. Options are THD40, THD50, THD100 – where the numeric suffix indicates the bandwidth utilized in calculating the item.
- Improved: added flagging information for use with all supported standards to the list of exportable data.
  (Netcode2020 users please choose „interruptions“ as flagging source from the data selection tree).
- Improved: Extended parameter naming to include bandwidth for THD readings in FEA+ standard compliance analysis. For instance, PQHealth | Summary view will show THD40 for EN50160 compliance analysis, but THD100 if checking against ENA G5-5 limits.
  For datasets that do not contain 100 harmonics, FEA+ will default to the highest available bandwith:

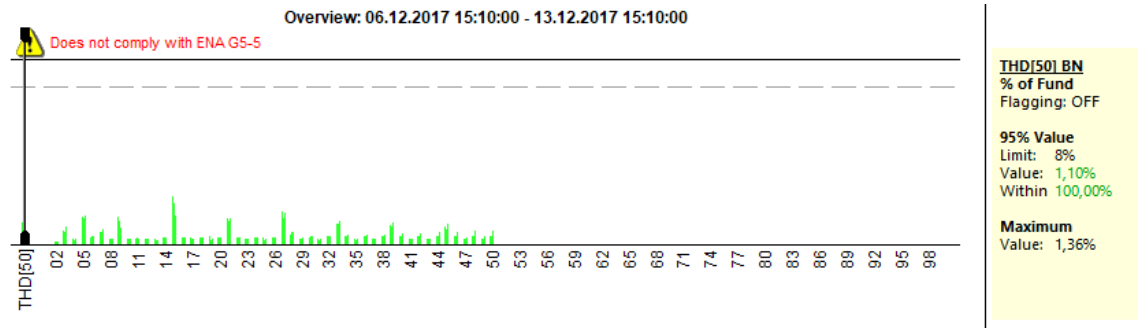


Image 1: ENA G5-5 results from a limited data set; 100 harmonics are expected.

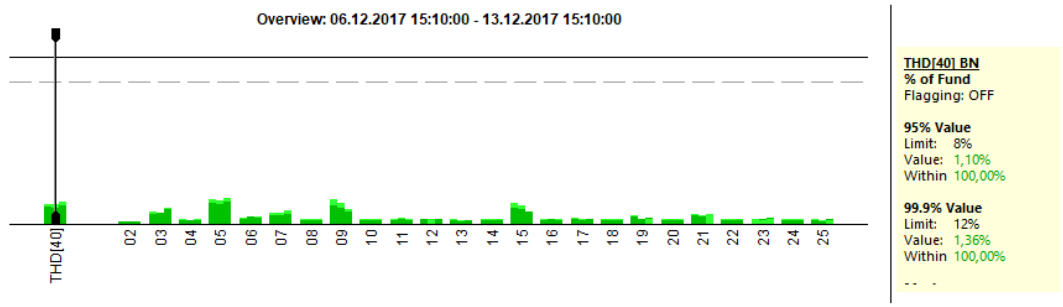
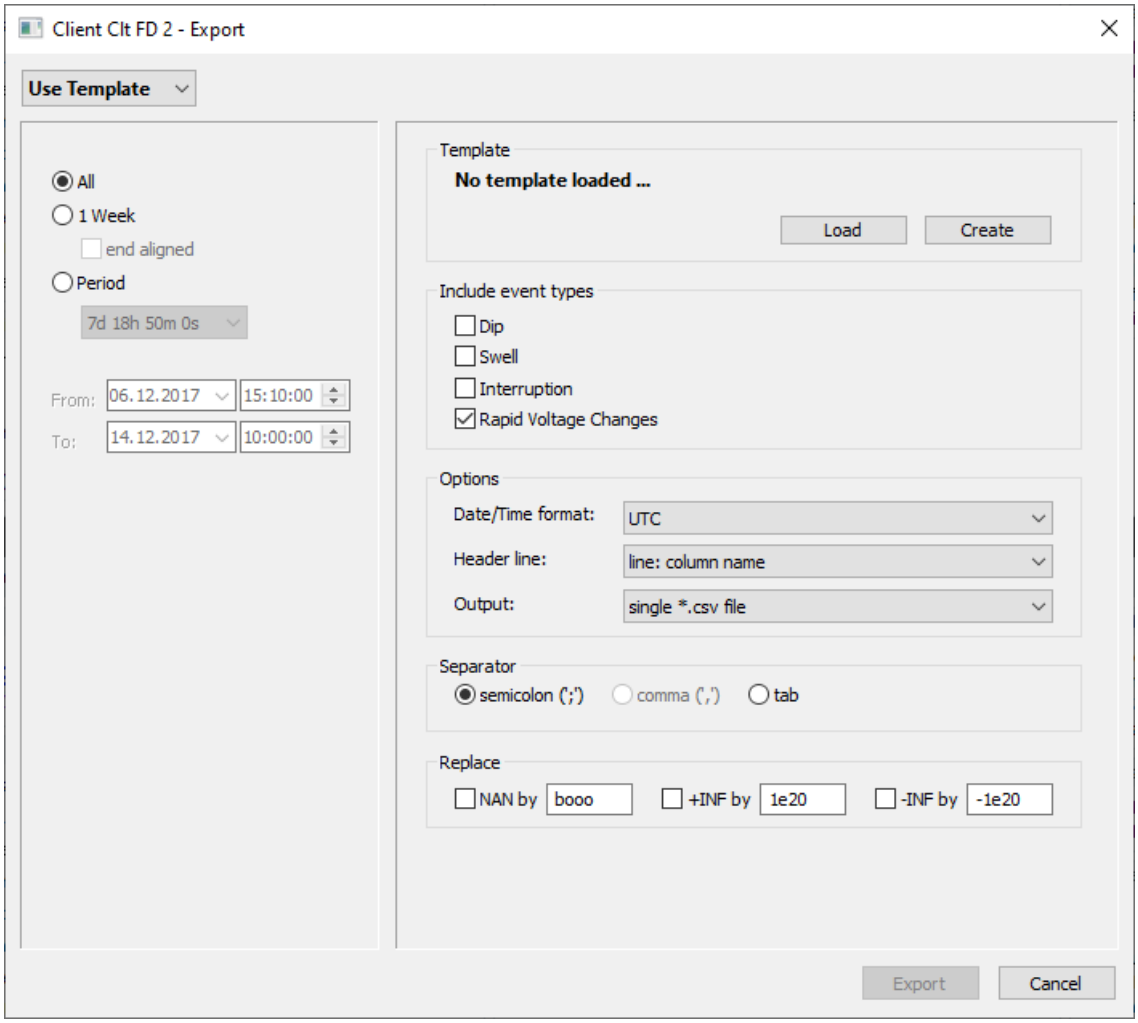


Image 2: Netcode 2020 results from the same data set.

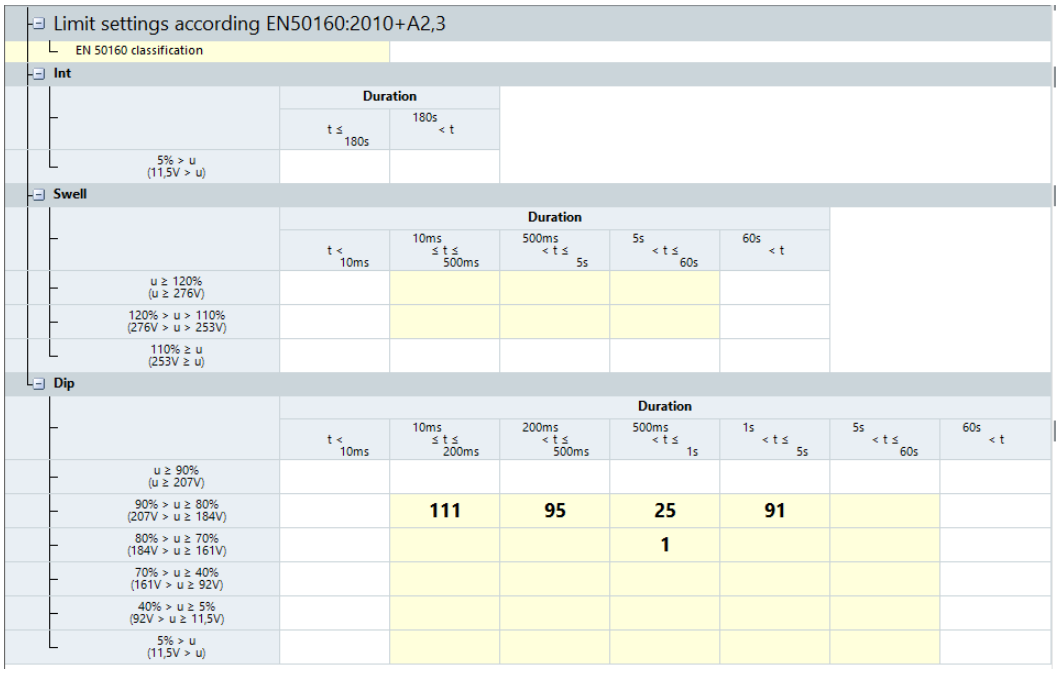
- Improved: added ability to export all available data including events in one operation; the „Use Template“ option has been reworked to a more generic approach:



  - Select the time range from which to export data using the settings to the left on the panel. All data exported, including events, will become filtered by the selection made. The checkbox „end-aligned“ lets users choose a week from end of a session vs from start. Time pickers and duration display update accordingly.
  - Use the „Create“ Template button to select items from all available time-series data. This includes data that FEA+ infers from measured data, e.g. „Over Deviation Voltage [%]“.
  - Click checkboxes „Dip“, „Swell“, „Interruption“, „Rapid Voltage Change“ to add corresponding event records to the expored data.
  - FEA+ lets you select from additional „Options“:
    - Date/Time format: exported text data will always be printed in ISO-like format. Users can choose how time stamps get exported – either as UTC (as used by instruments), or with time-zone adjustments applied, that is, according to your Windows locale setting.
    - Header line: choose to either use a single-line header that contains column names, or a two-lined header that additionally gives parameter units.

- Output: all data that has been selected for export can be written into one single file. The resulting text file content will hold sections that correspond to the categories chosen for a given template (refer „Create“ template). Alternatively, choose „split by category“ to receive one text file per category. Categories refers to time-intervals that data has been taken with – e.g. 10min PQ Interval contains 10min aggregates. An exception are event data that do not fall into any interval category.

- Improved: Custom report logos scaling has been improved; it is no longer possible to have logos occupy more than 2 lines in the header. Larger logos are scaled-down to meet this requirement.
- Improved: The Disdip table shows content according to standards selection. Previous FEA versions always showed event classification according to EN50160. With release 3.10 we added the standard selector also to the PQHealth | Events view and show Netcode2020 clasiffication. or EN50160. For standards that do not deal with events categories, FEA+ 3.10 defaults to the EN50160 classification. A new „legend“ line details the relevant categories.



Limit settings according EN50160:2010+A2,3

EN 50160 classification

Int

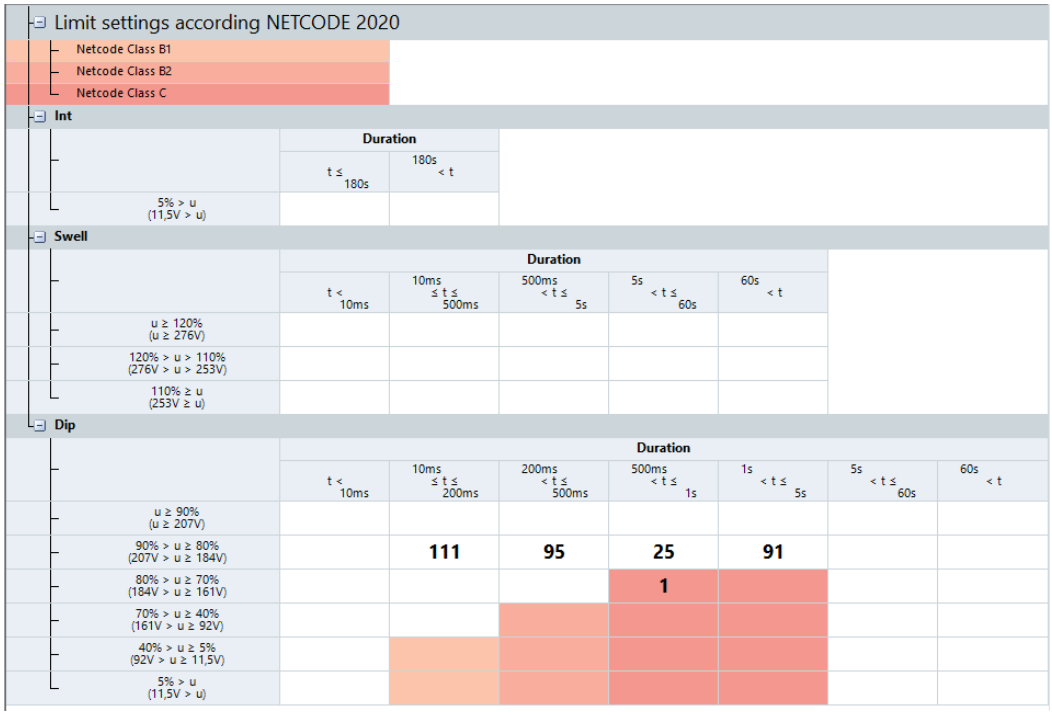
	Duration	
	t ≤ 180s	180s < t
5% > u (11,5V > u)		

Swell

	Duration				
	t < 10ms	10ms ≤ t ≤ 500ms	500ms < t ≤ 5s	5s < t ≤ 60s	60s < t
u ≥ 120% (u ≥ 276V)					
120% > u > 110% (276V > u > 253V)					
110% ≥ u (253V ≥ u)					

Dip

	Duration						
	t < 10ms	10ms ≤ t ≤ 200ms	200ms < t ≤ 500ms	500ms < t ≤ 1s	1s < t ≤ 5s	5s < t ≤ 60s	60s < t
u ≥ 90% (u ≥ 207V)							
90% > u ≥ 80% (207V > u ≥ 184V)		**111**	**95**	**25**	**91**		
80% > u ≥ 70% (184V > u ≥ 161V)				**1**			
70% > u ≥ 40% (161V > u ≥ 92V)							
40% > u ≥ 5% (92V > u ≥ 11,5V)							
5% > u (11,5V > u)							



Fluke Energy Analyze Plus V3.9.1

May 2022

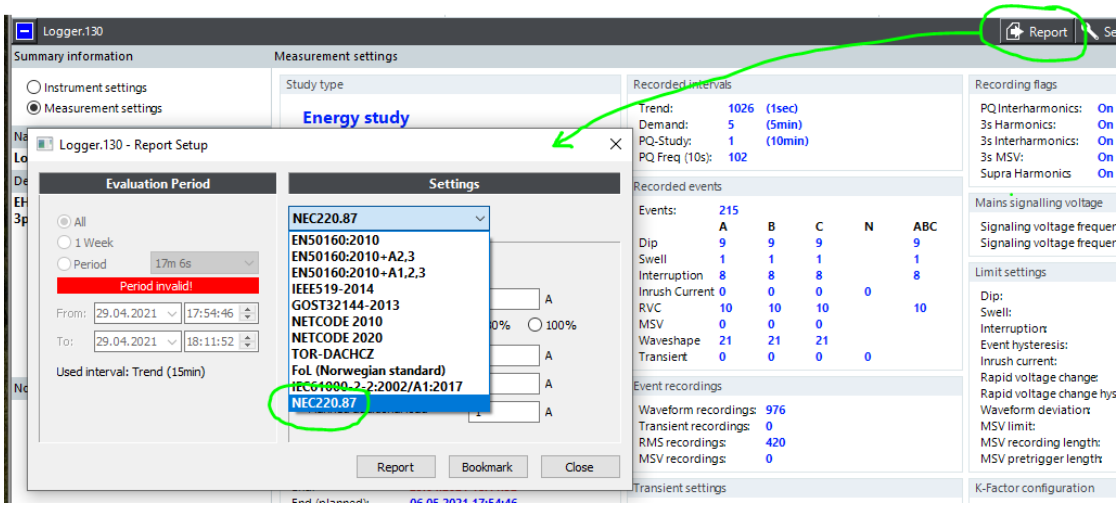
- New: supports new feature “Change WiFi Access Point password” for Fluke 174x. This feature requires firmware version 2.1.
- Fixed: 3.9.1 adds basic DPI awareness to Energy Analyze. Previous versions produced ‘distorted’ bookmarks when used on systems that require >150% font scaling (mostly seen with UHD screens).
  We recommend large screens (24” or larger) over UHD for work with FEA+.
  Please note minimum requirements: Windows versions older than 8.1 are no longer supported.
- Fixed: an issue during data translation (after downloading from tools) that could have prevented FEA+ from finishing the transfers.
- Improved: by default, “Graph Options” are hidden when saving a bookmark. This leaves more space for charts and tables. In reports, no information is lost because all settings are available from text descriptions.

Fluke Energy Analyze Plus V3.9

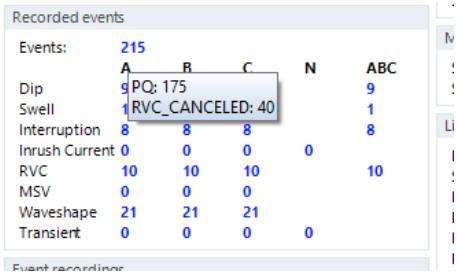
March 2022

- New: updated FEA+ installer.
  Please note minimum requirements: Windows versions older than 8.1 are no longer supported.
- New: support for reports according to NEC 220.87.
  The new report is available from the “Report” widget for each session listed in the “Project

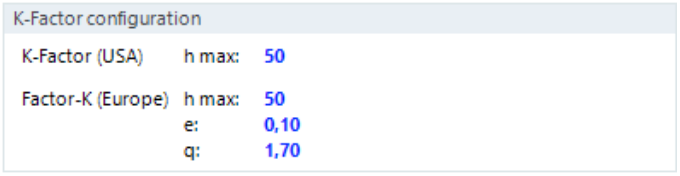
Manager” tab.



- Improved: PM tab now shows detailed PQ-events counts. The example below shows a total of 215 PQ events have been recorded. Hover the mouse pointer over the number to get additional information about event types. In below case, the session also contained 40 canceled RVC events that are not shown graphically.



- Improved: more understandable K-Factor settings display on Project Manager tab.



- Improved: FEA+ now decimates data before creating thumbnails for the Calendar View.
- Improved: Japanese translations.
- Improved: changed to bar-chart type for showing Supra Harmonics.
- Improved: FEA+ prevents repeated “find min/max” operations on chart traces; if min/max markers are already shown for a trace, no duplicate markers will be created anymore.
- Improved: PQ+ Study | Supra Harmonics view shows bar charts instead of line charts.
- Improved: Phase labels for transient detail data (1MS/s, 20MS/s) now correctly show Phase-to-Ground voltages in table, chart title, legend, and cursor readouts.
- Fixed: depending on monitor resolution, bookmarks may have shown with a black area in “Reports” tab and in resulting reports.
- Fixed: an issue that caused FEA+ to freeze when loading compound analysis files that contain multiple sessions.
- Fixed: “File Open” dialogue in Norwegian language did not allow to open *.fca2 files.

- Fixed: PQ+Study | Harmonics view had an issue with checkboxes in the “Graph Options” that caused Interharmonics to remain disabled. Also, in “Graph Options”, the “Channel Selector” did not offer 3-second interval results in some cases; 3-second “Power Harmonics” channel was added.
- Fixed: issues with downloading data. Depending on download volume (multiple sessions) and PC errors occurred that prevented downloads to complete successfully.
    - increased a time-out value for starting the stream processing which removed errors related to “pipe” and “adapter” on affected (older) PCs.
    - reworked the download process, FEA+ 3.9 will show “downloading …” and “processing …” states on the data download progress bar. The overall process now is more robust and will always offer an option to access downloaded raw data.
    - fixed an issue that caused a different instrument to become selected in the “Source” dropdown on the data download panel AFTER a download finished.
      The same issue could have caused FEA+ to stop working.
- Fixed: an issue that caused 173x and 174x based .fel file imports from USB key to fail.
- Fixed: an issue that caused FEA+ to stop working while accessing data for IEEE519 reports.

Fluke Engergy Analyze Plus V3.8.1

This revision has not been publicly released!

- Improved: chart y-scaling resolution is now better aligned with the zoom level. Scale resolution gradually increases when zooming in and decreases when zooming out, respectively. Cursor read-outs are also following the zoom level.
- New: “Advanced” tab now provides Over- and Undercompliance results in % of nominal voltage additionally to absolute readings.

Fluke Energy Analyze Plus V3.8

October 2021

- Improved: time-stamp resolution for Waveform and Transient event detail graphs.
  The minimum time resolution on wave-shape sample data is 12.5 µsec, for transient sample data

50 nsec (Fluke 1777).

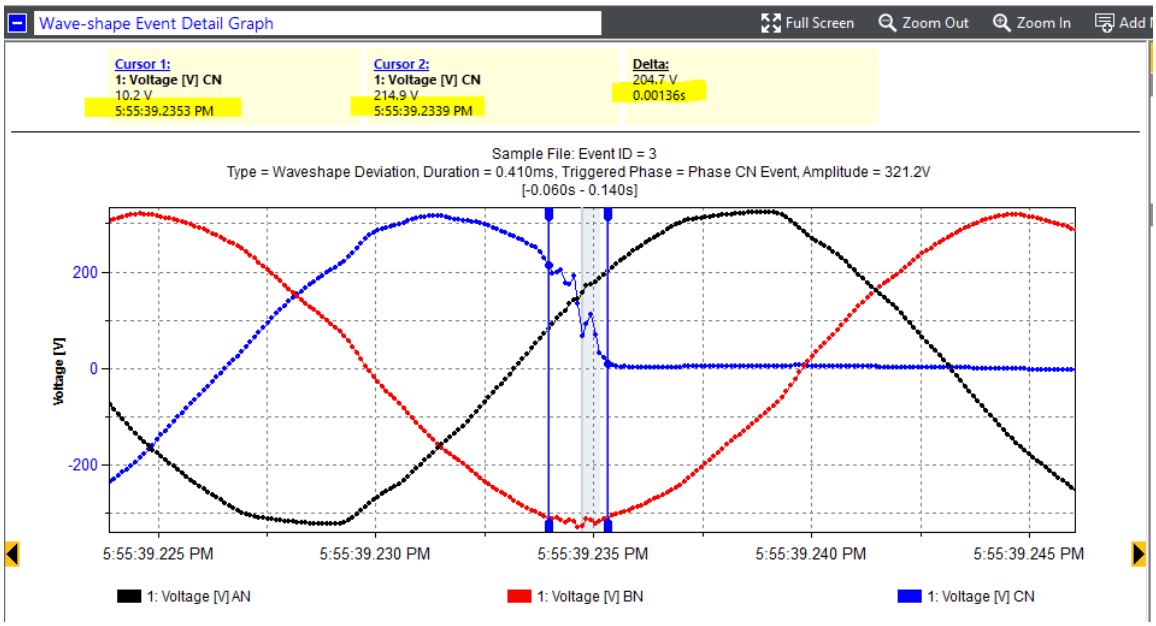


Figure 1Waveshape Deviation Event (80kS/S)

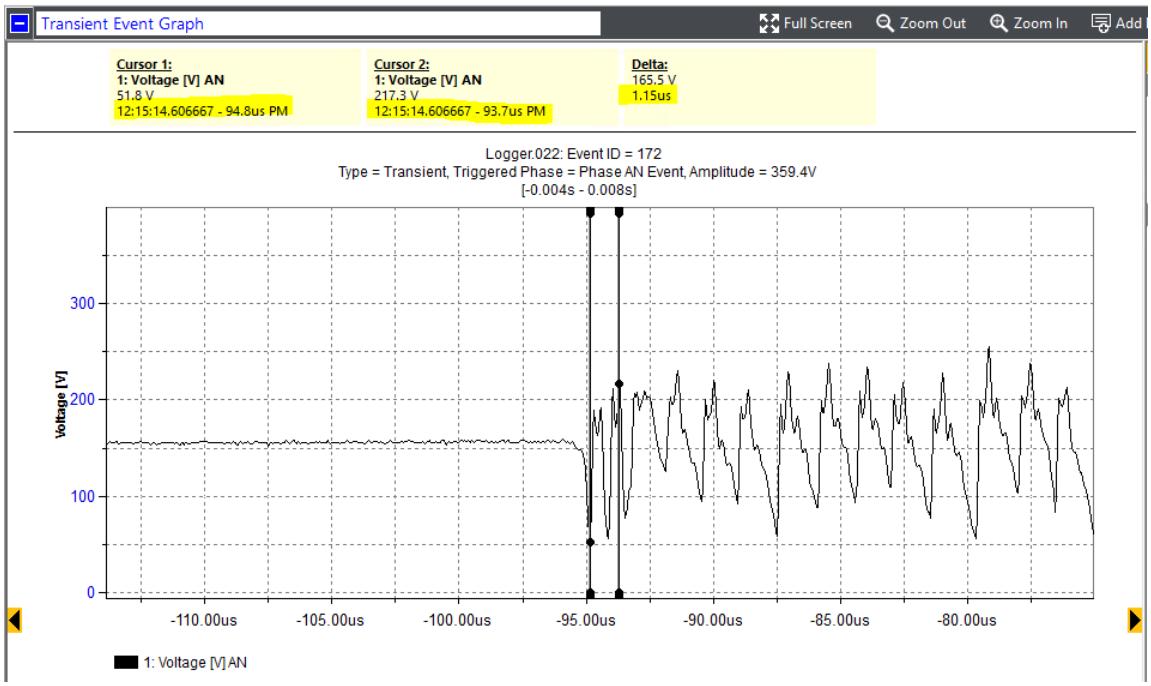


Figure 2Transient Event (20MS/s)

- <u>New:</u> Support for Fluke 177x data – including fast Transient Event recordings up to 20MS/s additionally to the known event types.

<u>Known Issues:</u>

- "Project Manager" view shows the number of event detail data sets that were loaded from instruments rather than the number of events that have event detail data associated.

Recorded events	
PQ Freq (10s):	589 (31529)
Events:	3
Waveform recordings:	63
Transient recordings:	0
RMS recordings:	10
MSV recordings:	0

Similarly, K-Factor configuration shows configuration parameters that belong to the EU-method even if US-method was selected.
This will be improved in a following release.

- When closing a session that had large data sets removed, FEA+ will show an estimate of reduced size before the original file becomes cleaned up. During the clean-up phase, FEA+ shows the wait cursor, but may report “not responding” in the main window title. Do not interrupt FEA+.

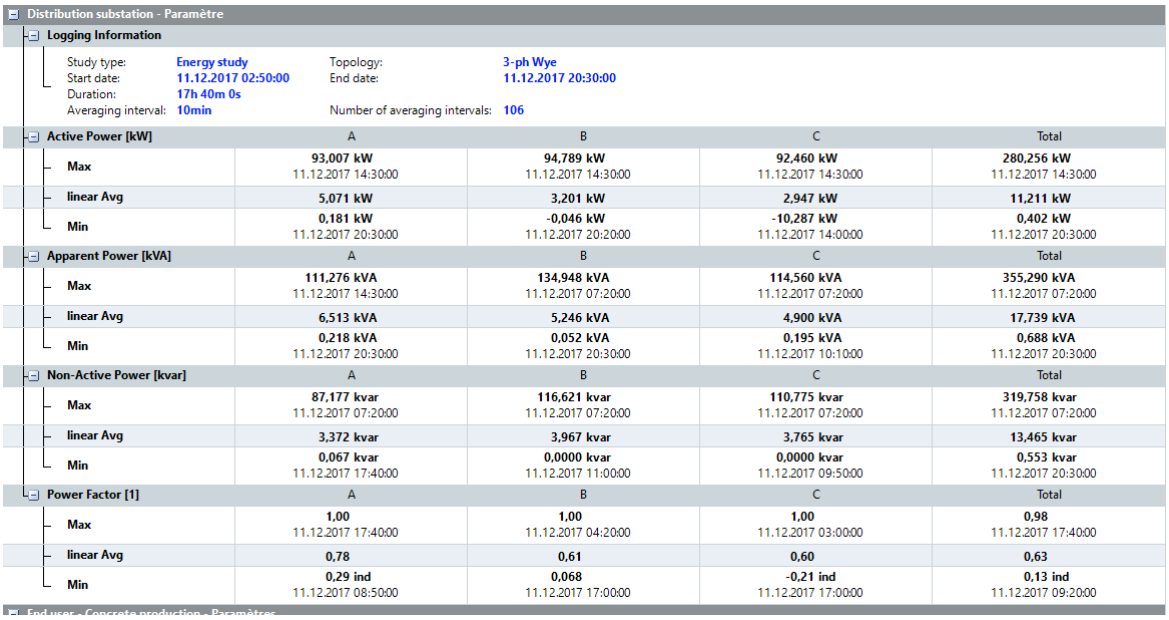
Fluke Energy Analyze Plus V3.7

This revision has not been publicly released!

- New: FEA+ utilizes an updated library, we reworked all table views and Project Manager view. Tabular data view under “Advanced” is not affected. New overview- and time-range tables now show “Logging Information” within a separate horizontal splitter.

Distribution substation - Paramètre					
Active Power [kW]	**A**	**B**	**C**	**Total**	Logging Information
Max	93,007 kW 11.12.2017 14:30:00	94,789 kW 11.12.2017 14:30:00	92,460 kW 11.12.2017 14:30:00	280,256 kW 11.12.2017 14:30:00	Study type: **Energy study**
linear Avg	5,071 kW	3,201 kW	2,947 kW	11,211 kW	Topology: **3-ph Wye**
Min	0,181 kW 11.12.2017 20:30:00	-0,046 kW 11.12.2017 20:20:00	-10,287 kW 11.12.2017 14:00:00	0,402 kW 11.12.2017 20:30:00	Start date: **11.12.2017 02:50:00**
Apparent Power [kVA]	**A**	**B**	**C**	**Total**	End date: **11.12.2017 20:30:00**
Max	111,276 kVA 11.12.2017 14:30:00	134,948 kVA 11.12.2017 07:20:00	114,560 kVA 11.12.2017 07:20:00	355,290 kVA 11.12.2017 07:20:00	Duration: **17h 40m 0s**
linear Avg	6,513 kVA	5,246 kVA	4,900 kVA	17,739 kVA	Averaging interval: **10min**
Min	0,218 kVA 11.12.2017 20:30:00	0,052 kVA 11.12.2017 20:30:00	0,195 kVA 11.12.2017 10:10:00	0,688 kVA 11.12.2017 20:30:00	Number of averaging intervals: **106 (106)**
Non-Active Power [kvar]	**A**	**B**	**C**	**Total**	
Max	87,177 kvar 11.12.2017 07:20:00	116,621 kvar 11.12.2017 07:20:00	110,775 kvar 11.12.2017 07:20:00	319,758 kvar 11.12.2017 07:20:00	
linear Avg	3,372 kvar	3,967 kvar	3,765 kvar	13,465 kvar	
Min	0,067 kvar 11.12.2017 17:40:00	0,0000 kvar 11.12.2017 11:00:00	0,0000 kvar 11.12.2017 09:50:00	0,553 kvar 11.12.2017 20:30:00	
Power Factor [1]	**A**	**B**	**C**	**Total**	
Max	1,00 11.12.2017 17:40:00	1,00 11.12.2017 04:20:00	1,00 11.12.2017 03:00:00	0,98 cap 11.12.2017 17:40:00	
linear Avg	0,78	0,61	0,60	0,63	
Min	0,29 ind 11.12.2017 08:50:00	0,068 11.12.2017 17:00:00	-0,21 ind 11.12.2017 17:00:00	0,13 ind 11.12.2017 09:20:00	
End user - Concrete production - Paramètres					

Figure 3 Time-Range Table view rev 3.6.4 (old)



Distribution substation - Paramètre

Logging Information

Study type:	Energy study	Topology:	3-ph Wye
Start date:	11.12.2017 02:50:00	End date:	11.12.2017 20:30:00
Duration:	17h 40m 0s		
Averaging interval:	10min	Number of averaging intervals:	106

Active Power [kW]	A	B	C	Total
Max	93,007 kW 11.12.2017 14:30:00	94,789 kW 11.12.2017 14:30:00	92,460 kW 11.12.2017 14:30:00	280,256 kW 11.12.2017 14:30:00
linear Avg	5,071 kW	3,201 kW	2,947 kW	11,211 kW
Min	0,181 kW 11.12.2017 20:30:00	-0,046 kW 11.12.2017 20:20:00	-10,287 kW 11.12.2017 14:00:00	0,402 kW 11.12.2017 20:30:00

Apparent Power [kVA]	A	B	C	Total
Max	111,276 kVA 11.12.2017 14:30:00	134,948 kVA 11.12.2017 07:20:00	114,560 kVA 11.12.2017 07:20:00	355,290 kVA 11.12.2017 07:20:00
linear Avg	6,513 kVA	5,246 kVA	4,900 kVA	17,739 kVA
Min	0,218 kVA 11.12.2017 20:30:00	0,052 kVA 11.12.2017 20:30:00	0,195 kVA 11.12.2017 10:10:00	0,688 kVA 11.12.2017 20:30:00

Non-Active Power [kvar]	A	B	C	Total
Max	87,177 kvar 11.12.2017 07:20:00	116,621 kvar 11.12.2017 07:20:00	110,775 kvar 11.12.2017 07:20:00	319,758 kvar 11.12.2017 07:20:00
linear Avg	3,372 kvar	3,967 kvar	3,765 kvar	13,465 kvar
Min	0,067 kvar 11.12.2017 17:40:00	0,0000 kvar 11.12.2017 11:00:00	0,0000 kvar 11.12.2017 09:50:00	0,553 kvar 11.12.2017 20:30:00

Power Factor [1]	A	B	C	Total
Max	1,00 11.12.2017 17:40:00	1,00 11.12.2017 04:20:00	1,00 11.12.2017 03:00:00	0,98 11.12.2017 17:40:00
linear Avg	0,78	0,61	0,60	0,63
Min	0,29 ind 11.12.2017 08:50:00	0,068 11.12.2017 17:00:00	-0,21 ind 11.12.2017 17:00:00	0,13 ind 11.12.2017 09:20:00

Figure 4 Time-Range Table view rev 3.7 (new)

- New: reworked und updated FEA+'s internal file- and memory management. This allows for larger session files. For 173x and 174x users, only little changes in faster time to load (open) an analysis file will be noticeable. For Fluke 177x users, a previously existing limitation to 4GB .fca-file size has been extended, so that single sessions >4GB can continue to be loaded and combined for comparison. FEA+ 37 utilizes new ".fca2" files to achieve this; raw data as downloaded from instruments continues to be preserved. All users will see an increase in memory consumption in the first public release; further steps to reduce resulting file size are to follow.
- New: introduced a separate view for "Unbalance" data under the "Energy Study" tab. Earlier revisions showed unbalance ratios within the "V, A, Hz, THD" view. The new view, as well as "Advanced" tab, also host volts and amps sequence components.
- New: Added Fluke 177x feature support.
    - "Neutral Voltage" channels added to all views that show voltage readings.
    - PQ+ Study contains a new view "Supra Harmonics".
    - New event type "Transient" shows high-speed sample data. Improved time stamp resolution also for data from 173x and 174x.
    - "Advanced" tab shows all new data items from 177x instruments. The channel selection tree now shows top-level data categories as they are defined by instrument capabilities.

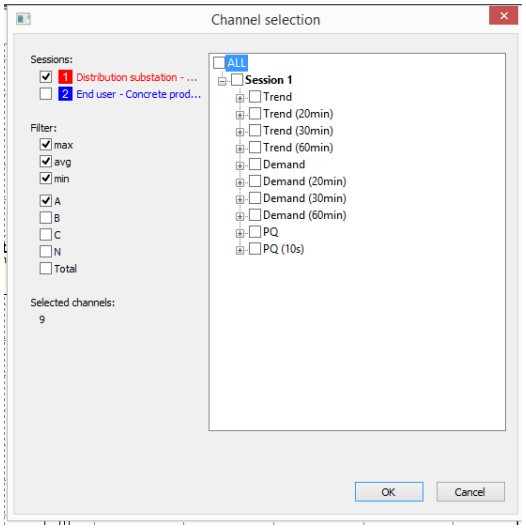


Figure 5 Channel selection FEA 3.7 (new)

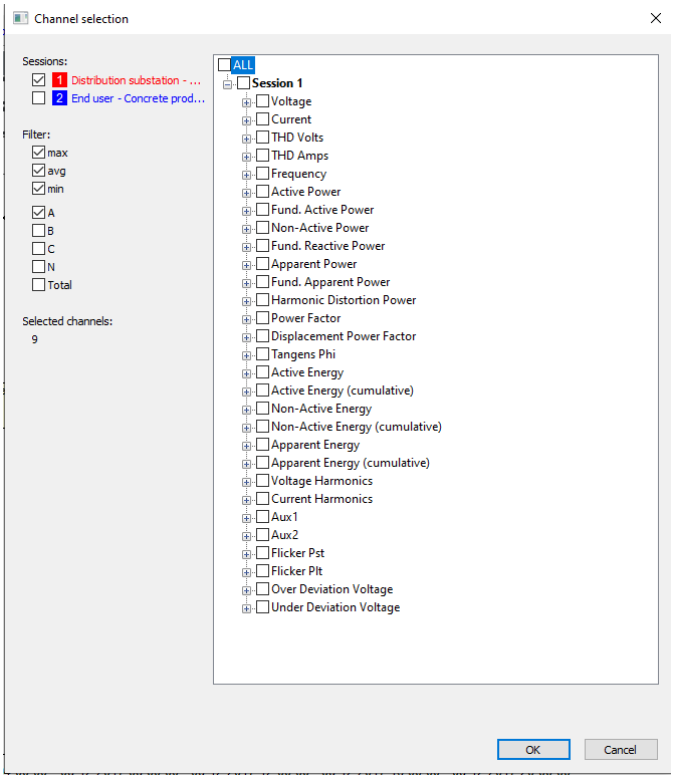
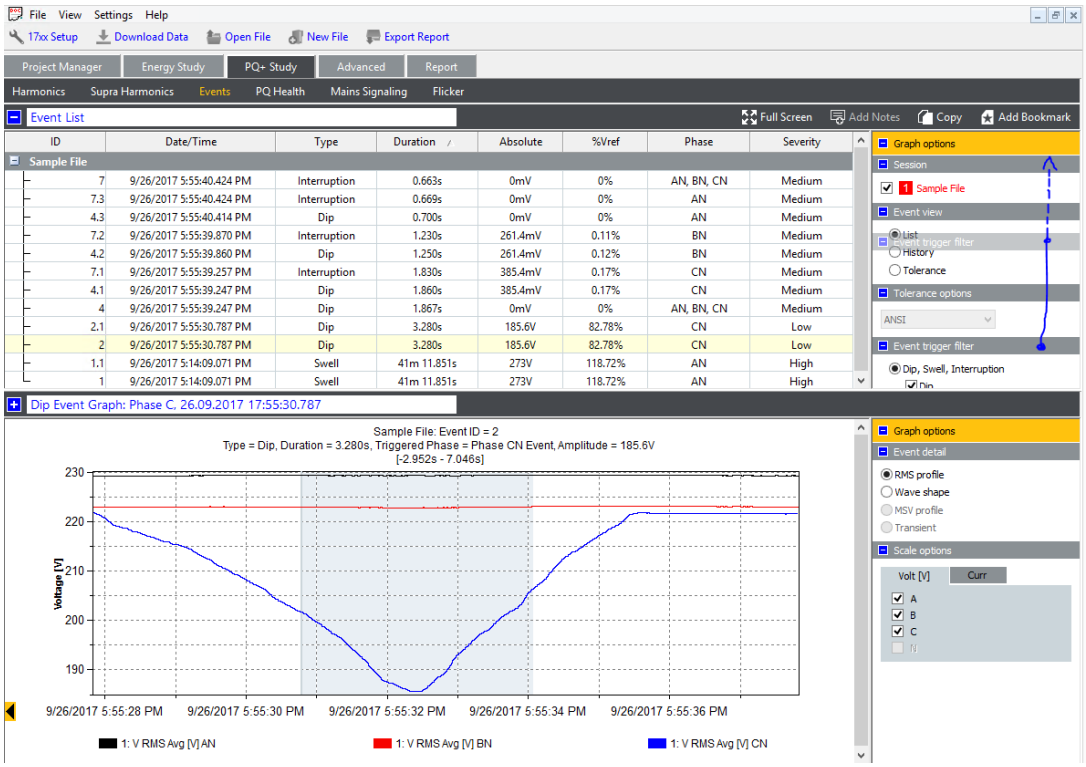


Figure 6 Channel Selection FEA3.6.4 (old)

- <u>New:</u> Items in “Graph Options” can be moved within the Graph Options pane. When utilizing split screens (concurrently view e.g. table and graph), you can move the most relevant item into visible space. To do so, drag the item title (here “Event trigger filter”) to the desired position.

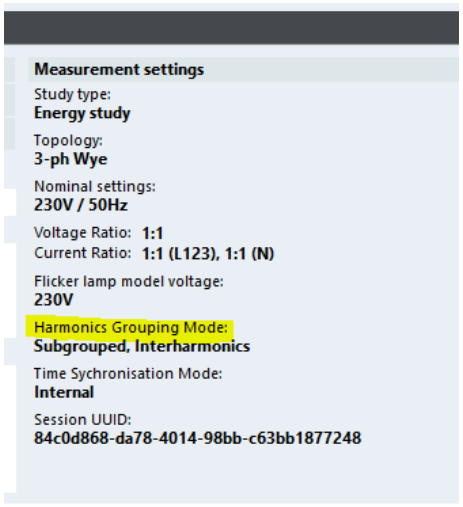


- New: The Event History View (PQ+Study | Events) now allows to blend in all voltage event types. Previous revisions required select either “DSI” or “Waveshape Deviation”, or …
- New: Updated standard compliance reports (EN 50160 + 2019 - amendments A1, A2, A3; IEC61000-2-2:2002/A1:2017, NETCODE 2020, G.O.S.T. 32144-2013).
    - Due to this addition, also “custom limit files” became reworked. It is required for FEA+ 3.7 and later to update any custom limit files for purposes that are not already covered by the new options (e.g. for EN50160 +A3:2019 you no longer need to use a custom limit file because it is available by default selections).
    - FEA+ 3.7 and later show additional information for each selection. This also includes custom limit files – you may wish to edit the tag “<Information> *editable text* </Information>” in new custom files.
- Improved: We removed a limitation to “one seat” installations from our End-User-License. FEA+ users may install several copies on different PCs.
- Fixed: Template-based data export erroneously skipped the last available data row.
- Improved: Settings for “Calendar Graph” view are now inherited from the Overview Table view. In previous revisions, having Graph Options for the detail view cloned only partially caused confusion.
- Fixed: time picker controls on the “Report Setup” panel were truncated in some cases.

Fluke Energy Analyze Plus V3.6.4

Release 3.6.4 is published on Fluke web sites.

- Fixed: “Harmonics Grouping Mode” got reported as “Components” for 1742, even though 1742 does not support harmonics logging.
  For 1746 and 1748, the new firmware release 2.0.5 is required to correctly show the configured Harmonic Grouping Modes in Energy Analyze’s “Project Manager” tab. Previous versions properly *applied* the setting and delivered correct data but caused a different setting to be shown in FEA+.



- Improved: The “Update firmware” function in “174x Setup” now allows more time to complete in order to prevent time-out errors during firmware updates.

Fluke Energy Analyze Plus V3.6.3

Release 3.6.3 is published on Fluke web sites.
For changes see change list V3.6.2., additionally

- New: Fluke 1742/46/48 users can update their instrument's firmware without having to use a USB Drive. This feature works with 174x firmware revision 2.0.1 and newer.
- Improved: reduced number of error messages shown in case of loss of connection with the instrument.
- Fixed: 174x Setup – the "Start" button on "Logging" tab remained disabled when it should have been enabled.
- Fixed: phase labels in csv export occasionally showed incorrect values.

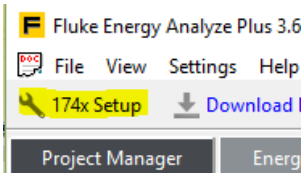
Fluke Energy Analyze Plus V3.6.2

Version 3.6.2 has not been published on Fluke web sites.

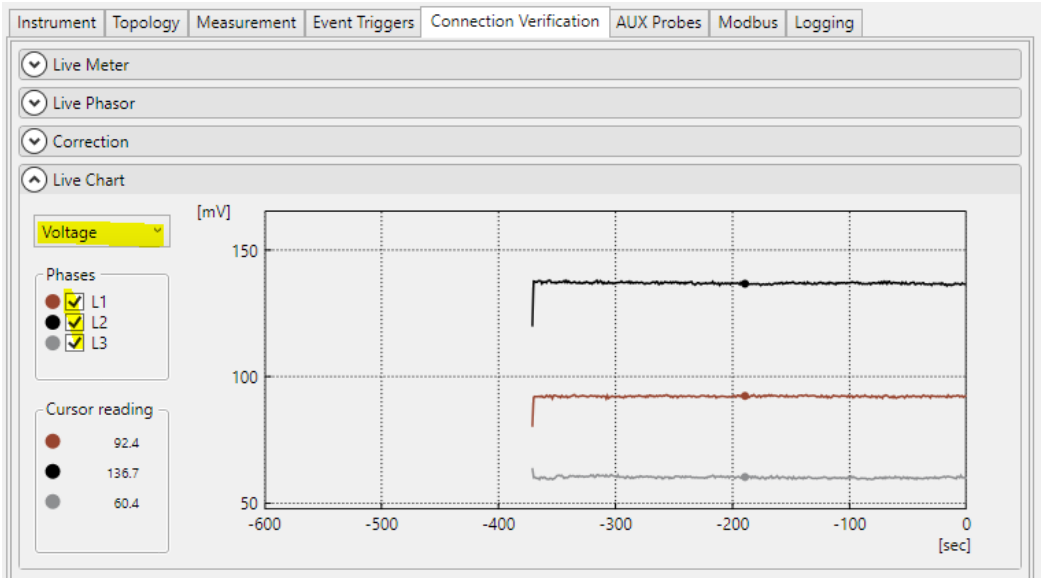
- Improved: new, template-oriented data export. Users can now define a template that determines which data will be exported to text files (.csv). FEA+ saves your templates for later reuse.
- Improved: tables on the "RMS Power" tab apply linear averaging of interval results to show session overall powers and power factor readings.
- Extended: additional entries in the data selection panel under the "Advanced" tab let users pick re-aggregated parameters. E.g. if a session was conducted at 5 minute intervals, users can now also pick 10, 15, 20, … minute aggregates.

Fluke Energy Analyze Plus V3.6.1

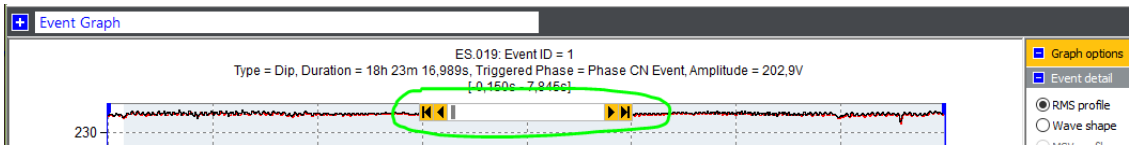
- Fixed: corrected data series labels in PQHealth and Harmonics views for IEEE519 data; affects THD, THC, TDD, TID labels.
- Fixed: language DLLs digital signature.
- Fixed: nominal voltage indicators on "Event triggers" tab in 174x Setup function.
- Improved: x-axis labels occasionally overlapped in detached-cursors mode.
- Improved: export report function now remembers the last used target path, so you no longer have to adjust the path for each report saved.
- Improved: THD re-aggregation in table views now correctly indicates less than 95% valid values present. Previous revisions gave results for signals below specified measurement levels, i.e. 'invalid', signal amplitudes.
- Improved: translations to French language.
- Improved: renamed button label to give proper context for the "instrument setup" function. This function is available for 1742/46/48 instruments, only.



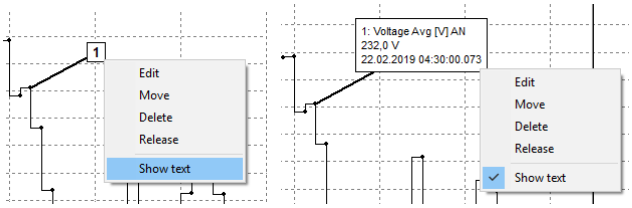
- Improved: added text hints to “Mains Signaling Voltage” measurement configuration for 1742/46/48 instruments.
- Improved: in “174x Setup” function, tab names are colored red if changes were made on that tab but have not yet been applied.
- New: added SIGET compatible csv export. This export format utilizes new Flicker P_{ST} readings provided by 1742/46/48 firmware 2.0 at user configurable intervals (trend).
- New: added “Nordics” language support to FEA+ UI.
- New: 1742/46/48 setup now also shows live charts on the “Connection Verification” tab. Select parameters (voltage, current, power) and phases to be charted. To get cursor readouts from the chart, move the mouse pointer to the chart area, and keep the left mouse button pressed. The mouse pointer changes to a cross – make sure the cross is located in an area of the x-axis that already contains data.



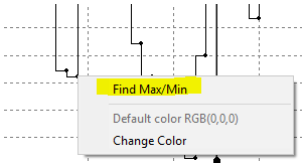
- New: added extended event recordings; for Dips, Swells, and Interruptions. 1742/46/48 instruments running firmware revision 2.0 will capture event detail data (waveform and RMS profile) also at the end of an event. FEA+ V3.6 adds navigation buttons to event detail displays that span more than one event detail data block.



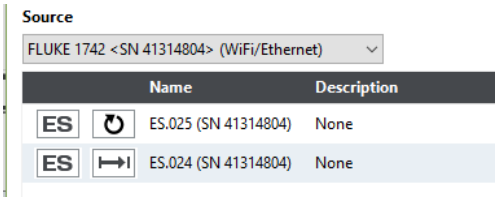
- New: floating and anchored notes can now either show full text or their index number.



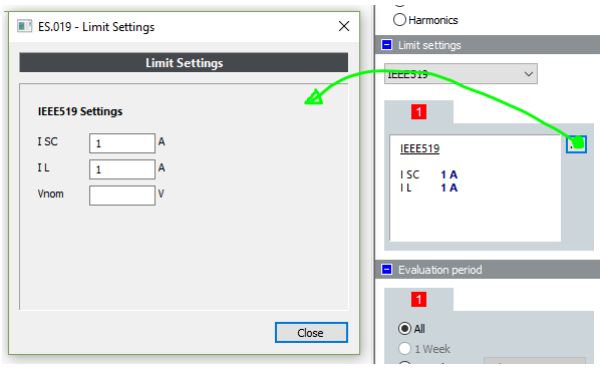
- New: added an item to the graph-context menu that automatically marks minimum and maximum in a graph trace.



- New: support for “circular memory” mode. In this mode, 1742/46/48 instruments continuously log data until users stop a session. This is achieved by overwriting oldest data in memory instead of stopping a session once **all memory** has been filled. (there is no option to select a specific portion of memory)
  FEA+ V3.6 can *always* be used to retrieve data that is currently buffered, regardless of the session state being active or stopped. The session download dialogue now shows different memory models of a session: linear (stop once full) and circular (overwrite old data).



  Note: FEA+ V3.6 will allow deletion of an active session if the command is selected on the confirmation popup message.
  In “174x Setup”, navigate to the “logging” tab and select “Offline, circular (overwrite data)” mode to configure circular model for your session.
- New: nominal voltage setting can be overwritten on PQHealth tab. Where data was logged using an invalid nominal voltage setting, the function still allows use of the data for reporting according to IEEE 519.



  Note: this is not available for EN 50160.
- New: 1742/46/48 instrument configuration templates can be stored to disk and re-loaded to an instrument. This allows reuse of working configurations easily instead of having to re- adjust every parameter.
- New: 1742/46/48 instruments running FW 2.0 accept a new license that enables MODBUS/TCP based communication with the instrument. To configure the Modbus interface on instruments that have the license installed, use FEA+’ “174x Setup” function. You can enable or disable the Modbus interface, and configure the Modbus slave ID and TCP port.
  Interface documentation as well as C# source files are available at request.

Fluke Energy Analyze Plus V3.6

Not published. Changes planned with rev 3.6 are published as rev 3.6.1, described above.

Fluke Energy Analyze Plus V3.5

- Fixed an issue that caused FEA+ to stop working while exporting data sets from Fluke 1730 instruments.
- Improved connected devices selection on the Data Download panel will default to the last selected device.
- Improved table design for reports.
- New: option to show minimum and maximum curve points – new menu entry in chart trace context menu.
- New: option to toggle showing notes as small boxes with indices, or showing note's text.
- New: reworked PQ+Study/PQHealth view to show separate bars for defined limits for each parameter. Bars will either be green (within limit) or red (exceeding limit). This removes the need to show amber bars.
- New: data shown in the PQHealth view is also presented as a table view. Select the view type from the Graph Options menu to the right. Table cells can be copy/pasted to other applications.
- New: added a live data chart under the "Connection Verification" tab of the Instrument Setup function. Clicking on the chart freezes updates and shows cursors and text readouts to the left of the strip chart. Data continues to capture in background, and refreshes when releasing the mouse button.
- New: standard compliance reports contain PASS/FAIL indications on all parameters for which a limit is given. A summary section shows results of all tested parameters.
- New: added Norwegian (FoL) standard compliance evaluation, and reporting.
- Improved: Project Manager tab informs of channel mapping (voltage and current channels), as well as current channel inversion status that has been adjusted for the session loaded. The same information is also available in reports.
- Improved: added an option to scale mains signaling voltage readings (MSV event details) in % of nominal voltage.
- New: "Distortion Power" added to the parameter list for "Advanced" views.

Fluke Energy Analyze Plus V3.4.1

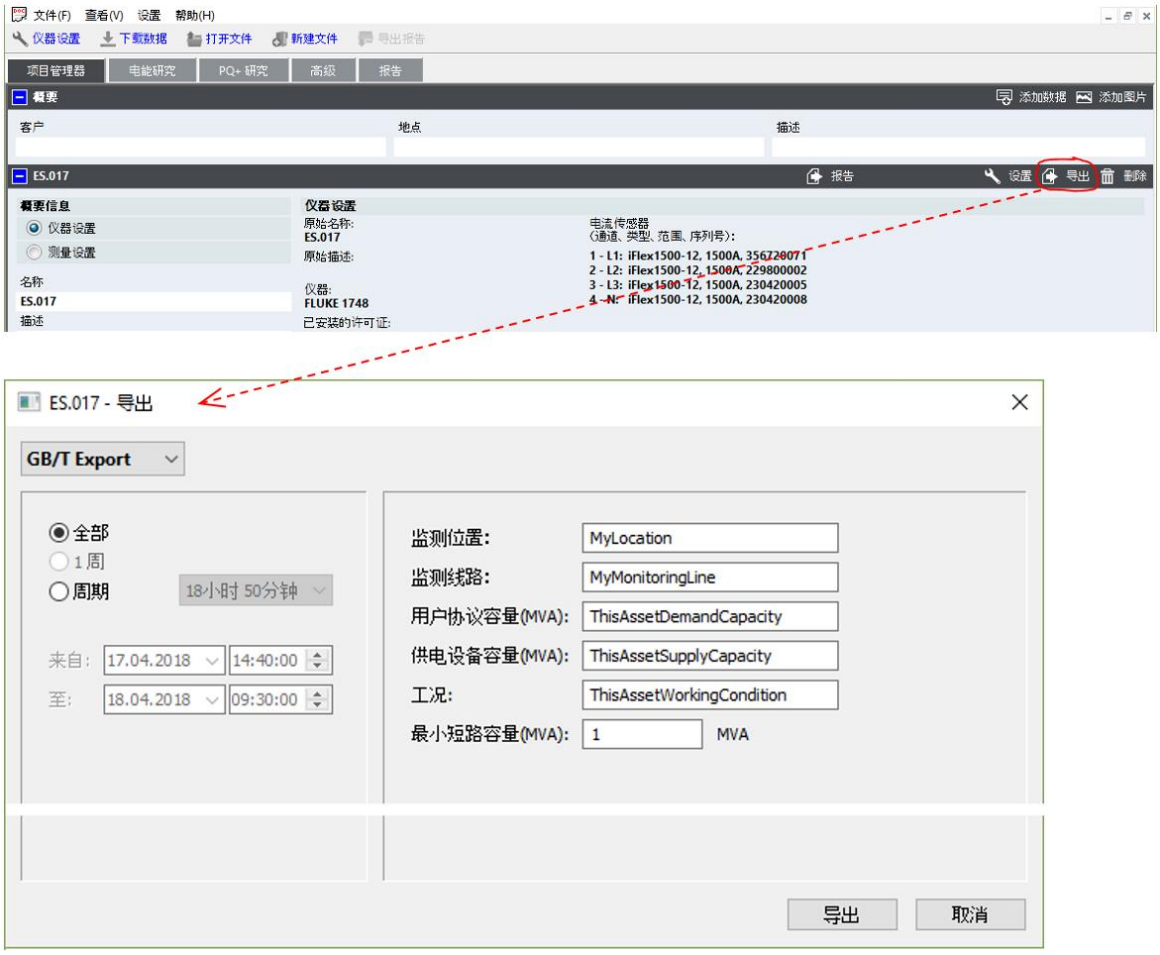
- Fixed an issue in PQ+Study/PQHealth/Summary view that caused EN51060, GOST, NETCODE evaluation to show incorrect results for quantities that are evaluated utilizing only one percentile (e.g. limit is given for 100% of values, but not for the 95^{th} percentile). In these cases, the limit evaluation always passed. The issue was introduced with rev 3.4.
- Fixed a wrong translation to German on the Advanced tab.
- Fixed missing default or custom logos in reports.
- Fixed X-axis labels for THD if "Voltage 3s" is displayed. Rev 3.4 showed "A THD" when it should show "V THD" in PQ+Study/Harmonics.
- Fixed display of "I_L" in the Limit Settings sidebar under PQ+Study/PQHealth/Summary for GOST. Showing I_L or I_{SC} applies to IEEE519 evaluations only.

- Improved installer execution. The installer will now automatically detect a previous installation of FEA+ and update that installation without changes to the actual location.
  If you need to modify the install location, please uninstall the current instance(s) of FEA+ and run the installer after uninstalling finished; if no active installation is detected, rev 3.4.1 installer will provide an option to override the default installation target location.
  Admins/Advanced Users: you can always override the default behavior by calling the installer from CLI utilizing '/DIR' and '/GROUP' parameters.
  Example:
  ```
  FEA_V3.4_1_Install.exe /DIR="C:\Program Files (x86)\Fluke\FEA341" /GROUP="\Fluke"
  ```
  … this will install Energy Analyze to the directory given by the /DIR parameter and place a shortcut into a start menu group called "Fluke".

Fluke Energy Analyze Plus V3.4

- Improved line spacing in detached cursor hint texts for locales that utilize non-Latin character sets.
- Improved: detached cursor text now also shows time range selections.
- Improved: the instrument setup panel occasionally opened in the background on Windows 10.
- Fixed an issue that caused Energy Analyze to stop working when trying to connect to an instrument at an unknown IP address / name.
- Disabled importing data from unsupported instruments.
- Fixed display of limit lines in ANSI, ITIC, and CBEMA event tolerance evaluation. A previous change rendered these lines invisible.
- New: option to export data to a GB/T14549 (reporting for China power utilities) compliant Excel-formatted report. Users utilize the *export* widget (Project Manager tab) on the header line of the

session that contains the data to be used.



Known issues: see rev 3.0.0, below.

Fluke Energy Analyze Plus V3.3

- Fixed storing sample files during installation. Two sample files now available in FEA+' data directory.
- Fixed typos in French and German language.
- Fixed flagging feature for events that occur on single phases in a poly-phase topology.
- Improved color settings. Users can choose to apply customizable colors to min/max traces in plots.
- Improved: do not show the full file path in footers of exported reports.
- Improved: occasionally standard name references were truncated the exported reports.
- Improved scale labels of vertical axes showing % readings. Previous revisions showed milli-%.
- New: View configurations in Advanced tab can be stored to a file and reused.
- New: Users can add limit lines to plots on Advanced tab.
- New: Added evaluation of current harmonics per T.O.R. – D2.
  As part of this change, limits configuration in the graph options section under PQ+Study/PQHealth has been modified – press the '…' button to modify limit configuration for IEEE519 and the new TOR compliant evaluation.

- New: FEA+ supports data exports that comply with NeQual (Switzerland) requirements.

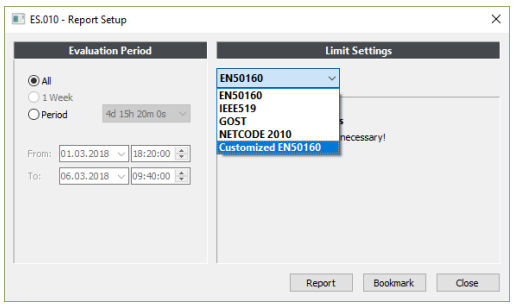
Known issues: see rev 3.0.0, below.

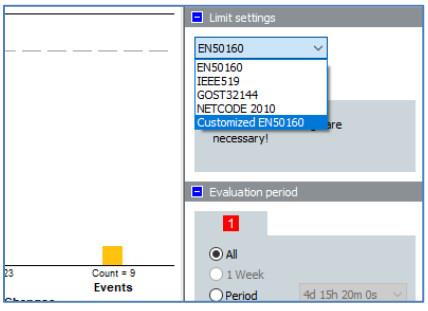
Fluke Energy Analyze Plus V3.2.1

- Improved French translations.
- Fixed an issue that caused FEA+ to stop working when creating bookmarks from views that have no cursors (tabular views, calendar view).

Fluke Energy Analyze Plus V3.2

- New: color settings can be stored to file for sharing.
- New: cursors can be hidden (for nicer reports).
- New: cursor readouts can be plotted to the right of graphs or on top additionally to showing read-outs as movable bubble text next to the corresponding cursor line.
  Read-outs have been extended to show delta-values for all instances that utilize dual cursor lines (i.e. time-series charts).
- New: FEA+ rev 3.2 installs a new directory that contains limit templates in xml format. Users can edit these custom limit templates, import them into compound analysis files, and so apply customized limits to statistical evaluation. Recommended procedure:
  - Locate the “CustomLimits” directory in the Fluke\EnergyAnalyze folder. The default installation for single users (option “private for this user” checked during installation) creates this folder in the current user’s “documents” folder.
  - Select a suitable template file (*.xml) based on the type (e.g. IEEE 519, EN50160, …) of evaluation desired. Create a copy of this file, rename and open it in a text editor.
  - Change the text in the <Name> section. FEA+ will show this name as an option in standard selections with the Quick-Reports dialog and PQ+Study/PQHealth/Summary view.
  - Import the new limit set into FEA+: with an analysis file (.fca) loaded, select “Custom Limits Definitions” from the File menu. Select “Add” and pick the limit file you edited.
  - Use your custom limit set with PQHealth or Quick-Reports





Fluke Energy Analyze Plus V3.1.1

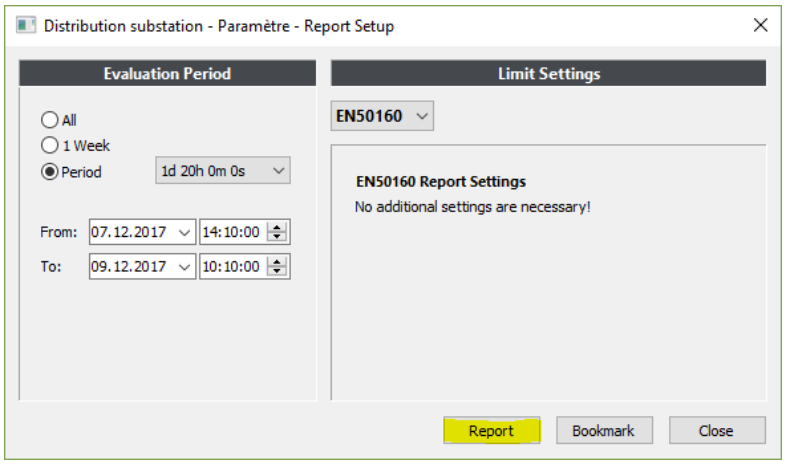
- Improved installation procedure ‘for all users’. A component required for the “Instrument Setup” feature.
- Improved: “Instrument Setup” correctly shows memory consumed on the attached 174x instrument.

- Improved the checkbox “align to 10min boundary”. Occasionally this checkbox had no effect.

Fluke Energy Analyze Plus V3.1.0

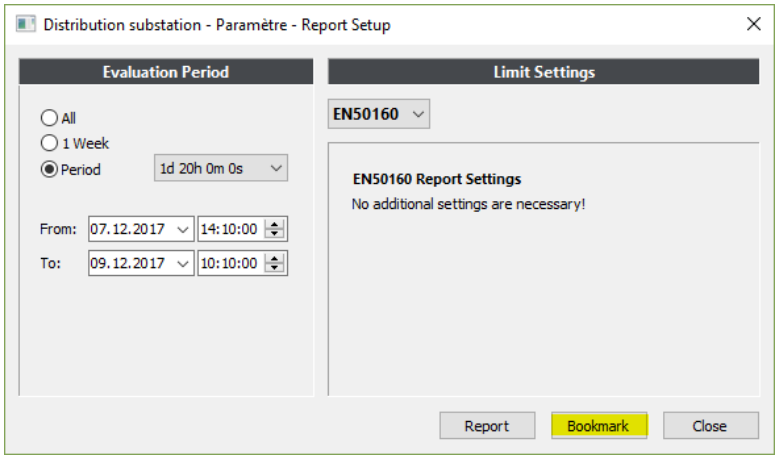
- New: added support for evaluation of Mains Signaling Voltages. Instrument can be configured to log voltage amplitudes at two custom-defined frequencies. A new event trigger allows definition of thresholds, resulting events are listed for detail evaluation in Energy Analyze. MSV logging data is available for exports and reports.
- New: the “Connection Verification” tab at “Instrument Setup” now also shows a phasor diagram along with live readings of phase angle relations and fundamental voltage and current readings.
- New: the instrument can be configured to log two additional parameters. Users can decide to either utilize analogue AUX inputs located at the instrument’s front panel, or connect up to two Fluke FC modules (BLE). Configuration also includes an option customize scaling and units for data from the additional channels.
- New: added GOST 33073-2014 compliant reporting. Users need to obtain a license in order to utilize this function. An option “GOST” is provided at the report-widget on the “Project Manager” tab for data from all enabled instruments.
- New: added Dutch “NetCode” compliant reporting. An option “NetCode” is provided at the report-widget on the “Project Manager” tab.
- Improved: session timing on the “Logging” tab under “Instrument Configuration” lets users apply the desired aggregation intervals and check the resulting maximum logging period.
- Improved: trace colors in the calendar graph view always match the reference frame color set in the calendar overview table.
- Improved: Flicker and Mains Signaling logs are shown in separated tabs under PQ+Study. The new views can become bookmarked and added to customized reports.
- Improved: reports utilize the decimal character specified in the system locale settings.
- Improved: now using more informative default bookmark names in section headers. It is still recommended to custom-name bookmarks before creating them. This will make reporting of many items more readable.
- Improved: optimized colors of the “High Contrast” color scheme for readability. Improved utilization of this color scheme on the “Advanced” tab to avoid two traces of a custom defined plot to have the same color.
- Improved: in “Graph Options”, separated “min/max” into two checkboxes so users can show minima, or maxima, or both.
- Changed: added a checkbox ”Align to 10min boundary” to the “Recording Period” section under “Logging” tab in “Instrument Setup”.
  Placing a tick mark there ensures the instrument will take at least 1008 10min intervals if “1 week” duration is selected, and so prevent too short EN510160 compliant logging sessions.
  The session planning feature will be further improved with the next revision of FEA+.
- Changed: previous revisions of Energy Analyze used to attach standard-compliance reports to bookmarks created from the “PQHealth” view. With the new “Report” function on the “Project Manager” tab, bookmarked “PQHealth” views ***no longer*** create standard reports.
  Instead, the “Report” widget on the “Project Manager” tab offers two workflows –

a) Directly export a standard-compliance report from the widget function



Click “Report” to directly create a standard-compliance report document utilizing the output-format selected under “Settings/Report Output Format”. The resulting report contains information from the *summary* and *session* items, and the results from statistical evaluation.

b) Create a standard-report bookmark for use in the report tab.



Click “Bookmark” and find the standard-compliance report-item under the “Report” tab in the left column. Amend the item to your needs by using it along with other bookmarked report items on the space to the right. Bookmarked report items can be e.g. detail graph views, detail event views, PQSummary overview, etc.

Solved issues:

- Some occasions of FEA+ have issues accessing default data locations. This may manifest in error messages when trying to access Calendar View, or saving downloaded data to the target directory.
- Full assessment of Mains Signaling Voltage levels, including derived events, will be published with a subsequent release of instrument firmware and FEA+.
- 1742 users should access Flicker data from the Advanced tab. 1746/48 users can access Flicker data from the PQ+Study/PQHealth-summary view.

Known Issues: see rev 3.0.0, below.

Fluke Energy Analyze Plus V3.0.1

- Corrected data path handling in installer and EnergyAnalyze Plus. This solves an issue with unresolvable data path evaluation that occurred in new FEA+ 3.0.0 installations.
- Improved En50160 statistics calculation.

Known Issues: see rev 3.0.0

Fluke Energy Analyze Plus V3.0.0

- New: support for Fluke 1742/46/48 Firmware rev 1.0.1
    - Export of data to PQDIF.
    - Quick reports from Project Manager tab.
    - Extended session- and instrument-information on PM tab.
    - Extended parameter set 1746/48.
    - New PQEvent functions – Rapid Voltage Changes, Waveform Deviation.
    - Extended EN50160 and IEEE519 PQHealth Summary views and reports.
    - 1742/46/48 Instrument Setup.
    - Increased resolution for cursor-readouts in events detail recording views.

Known Issues:

- Windows Device Manager may show failed installation of 173x and 174x serial port drivers. This is **not an issue** for Energy Analyze Plus, because these instruments do not use serial port communication.
- Energy Analyze may show duplicate entries of found 174x instruments in dropdown selectors (data download, instrument setup). This occurs if several connections are possible, e.g. by WiFi, USB cable and Ethernet.
- ~~Translations are incomplete – some text item are displayed in English language when a different language is selected. This also affects reports.~~
- ~~Some occasions of FEA+ being unable to access data locations. This may manifest in error messages when trying to access Calendar View, or saving downloaded data to the target directory – issue is not fully understood yet.~~
- FEA+ may not be able to find instruments if these are connected to a different LAN segment than the PC running FEA+.
  FEA+ utilizes below listed ports. Please contact your IT specialist for assistance on routing issues. The installer will by default attempt to add exceptions to the PC's firewall, network policy may prevent these exceptions.
    - 18571 (UDP), and 18572 (TCP) for device discovery and communication.
    - 443 (HTTPS) for all activities related to Instrument Setup.
- ~~Creating pdf documents from the report preview window fails. Select "PDF" as desired report print output format from FEA+ Preferences menu to work around.~~
- ~~Full assessment of Mains Signaling Voltage levels, including derived events, will be published with a subsequent release of instrument firmware and FEA+.~~

- ~~1742 users should access Flicker data from the Advanced tab. 1746/48 users can access Flicker data from the PQ+Study/PQHealth summary view.~~
- Over-/underdeviation data is available from the Advanced tab.
- ~~Unbalance readings are available from the Advanced tab, only.~~
- The Advanced tab does not honor color scheme settings.

Fluke Energy Analyze Plus V2.3

- New Feature: support for Fluke 1732/34 Firmware rev 2.1
- New Feature – download data from an instrument even if it is locked. FEA+ does not support changing the screen lock code.
- Improved instrument identification in download and set-time panels.
- Improved export to csv.
- Improved storing/restoring of bookmarks.
- Corrected calculation of THD results.
- Corrected input of energy cost schemes.
- Changed communication through USB cable to utilize Ethernet-over-USB style of transfers (RNDIS). This approach works around an issue encountered with the previously utilized mode under Windows 10. **IMPORTANT**:
    - Users of 1732/34/36/38 who have FEA+ rev 2.2 (or earlier) already installed MUST choose to remove 173x USB drivers during installation of revision 2.3!
    - Users of 1730 must who have FEA+ rev 2.2 (or earlier) already installed, need not re-install Fluke 1730 drivers, but can choose an option to leave drivers unchanged.

Known issues:

- It may take up to 90 seconds for Windows to provide required functionality for Energy Analyze to communicate with an instrument attached by USB cable.
- Windows' Device Manager may show an unknown CDC device after connecting 173x instruments to the USB port (Windows7); this device is not used.

Fluke Energy Analyze Plus V2.2

- New Feature: support for Fluke 1730 Firmware rev 1.3
    - Improved handling of time stamps from instrument firmware results in millisecond resolution. Backward compatible with data collected using previous firmware revisions of 1730, these do not support millisecond resolution in time stamps.
- Improved FEA+ UI to fully support non-Latin character sets. This removes a character corruption issue.
- Disabled showing firmware update information if the connected instrument has the latest state firmware installed.
- Change order of tabs under "PQ+ Study" to show "Harmonics" view by default when first opening a new session. FEA+ rev 2.1 by default showed the feature "Harmonics Limit Evaluation" which requires a firmware license.

- Disabled “phase-to-phase” selection for nominal voltage input in single phase topologies on “Load Study/Demand Table” view.
- Removed context menu from “PQ+ Study/PQHealth” views erroneously enabled in rev 2.1

Known issues: see revision 2.1, below.

Fluke Energy Analyze Plus V2.1

- New Feature: support for Fluke 1738 instrument
    - Extended “PQ+ Study” tab to support analysis according to EN 50160 and IEEE 519.
    - IEEE 519 based analysis allows users to correct instruments settings I_{SC} and I_L.
    - Extended report functionality to provide all relevant data in pdf/rtf reports.
    - Extended Events tab to support event RMS profile and wave-shape plots. Modified Event List view to show hierarchical structure of “combined events” and components.
    - Extended export function to handle new datasets.
- Added support for licensed features “1736/Upgrade”, “IEEE 519”, “WiFi Infrastructure”.
- Extended information shown on “Project Manager” tab.
- Extended “Advanced” tab to handle new data.
- Improved Version lookup and compare.

Known issues:

- Adding a high-resolution image on the 'Project Manager' tab will show distorted colors. Pictures are printed properly in reports, though!
- Reports created in Japanese language result in large .pdf files (font embedding).

Fluke Energy Analyze Plus V2.0

- New Feature: support for Fluke 1736 instrument
    - Added “PQ+ Study” tab to support analysis of “Events” and harmonic content recorded by the 1736.
    - Added neutral line current to selectors on existing “Energy Study” and “Load Study” tabs.
    - Added voltage unbalance selector to “Energy Study/V, A, Hz, THD” view.
- New Feature: use the “Advanced” tab to create custom defined graphs. This tab allows you to compare data series in one graph beyond the combinations available from the “Energy Study”, “Load Study” and “PQ+ Study” tabs. You can also export data used within the custom graph using the table view.
- New Feature: FEA+ looks up availability of Firmware (1730 and 1736) and Software updates and informs users accordingly. Users can disable this function and decide to check for updates at their discretion using “Help/Updates”.
- New Feature: go to “Settings/Report Logo” and select the FLUKE or a custom logo for reports.
- Fixed: Energy Analyze 1.2 occasionally stopped working when comparing multiple sessions in “Calendar” view.
- Improved: The “Auto Scale” context menu item in graph views sometimes produced erroneous results.

Fluke Energy Analyze V1.2

- New Feature: “Time-range tables” and “Graph views” can be shown concurrently. Pull time-range table up to do this. Use blue expand/collapse icons to switch views.
- New Feature: “Download data” from instrument using a Wi-Fi connection. FEA 1.1 and previous connected to instruments through USB, only.
- New Feature: Show “inductive/capacitive loads” or “load direction” with Power Factor results in graphs and tables.
- New Feature: “Customize trace colors” – users can pick custom colors to be used for individual traces on plots.
- New Feature: “Create reports in .rtf” – Rich text format has been added as a choice for report output formats (menu ‘Setting/Report output format/…).
- New Feature: “Project Manager” shows extended session information (transducer ratio, time zone adjusted on instrument when logging, …)
- New Feature: Exported data contains time zone information.
- New Feature: If a session description is truncated on the “data download” panel, point to that entry and get the full description shown in a tool tip.
- New Feature: Bookmark items can be renamed from within the report tab.
- Improved: Users can open a .fel file (e.g. received USB thumb drive contents by email) from the file-open dialog and do not have to use the file download panel any more.
- Improved: Option to choose data logged within trend or demand interval for graph view under Energy Study/Demand tab. Additionally to the data source (trend or demand), the drop-down selection lets you define aggregation intervals to be applied to all shown data. A function that automatically re-calculates data to a common aggregation interval for all shown sessions is also offered in order to help comparing data that was (erroneously) logged at different interval lengths.
- Improved: Working with notes – text input box can be resized.
- Improved: Working with zoom in graph views – occasionally the zoom rectangle was not shown.
- Improved: Occasionally, time-range tables were not shown correctly after restarting FEA.
- Improved: Last shown graph views were not restored properly when restarting FEA.
- Improved: Collapsed/expanded state of table views were not restored properly when restarting FEA.
- Improved: Readability of axis (x and y) labeling in all graph views.
- Improved: FEA memory management has been reworked leading to slightly faster starting, lower memory and OS resource consumption.
- Fixed: Calculation and display of Power Factor results.
- Fixed: Recalculation of volts, amps, and estimated apparent power to different aggregation intervals.
- Fixed: FEA occasionally stopped working when a large session file was shown at high granularity in calendar tab (e.g. months-long logging shown in hours).

Fluke Energy Analyze V1.1

- New Feature: “Add Notes” to graphs. Notes can be attached to a curve point or become placed on the graph area. Notes that are anchored with a curve will be prefilled with clear-text readings of the corresponding curve point and will only be printed in reports if they are visible at the time of creating the report item. Notes that are placed on the graph area (not anchored with a curve point) will remain visible regardless of the adjusted zoom levels and will always be printed in reports. Notes can be edited, removed, or moved/attached, select either action from a context menu (right-mouse button click on a note).
- New Feature: “Add Image” accepts generic .jpg images.
- New Feature: Instrument screen shots are shown and can be loaded from the data download dialog. Data on the instrument can be after downloading from the same dialog.
- New Feature: Users can adjust what data to export when using the ‘Export’ widget in the ‘Project Manager’ tab.
- New Feature: the ‘Settings’ widget in the ‘Project Manager’ tab can be used to correct/adjust scaling parameters for AUX channels, and to enter cost of energy parameters.
- New Feature: use ‘Synchronize time…’ from the ‘Settings’ menu to adjust the instrument time. This function is not available during logging.
- New Feature: Time range tables can be viewed concurrently with graph views; tables are switched off if no time range is selected.
- Added Japanese UI translation.
- Improved: display of icons on the ‘Calendar’ tab after removing sessions from a project.
- Improved: occasional data corruption caused by removing sessions.
- Improved: application stability with different date/time format settings.
- Improved: corrected display of Power Factor min/max values.
- Improved: multiple limit lines were shown when only one was expected.

Known issues:

- Adding a high-resolution image on the 'Project Manager' tab will show distorted colors. Pictures are printed properly in reports.
- If notes are placed in close proximity on a curve they will overlap. Zooming out can cause notes to become hidden. All notes are printed OK according to the actual visibility in reports.
- The state of table views may become distorted – i.e. some tables may be shown in collapsed state though they should be shown in expanded state. Reopening the analysis file resets this error.
- Reports created in Japanese language result in large .pdf files (font embedding).
- Energy Analyze Help will give information related to V1.0 – new help topics will be made available at www.fluke.com shortly.

Fluke Energy Analyze V1.0

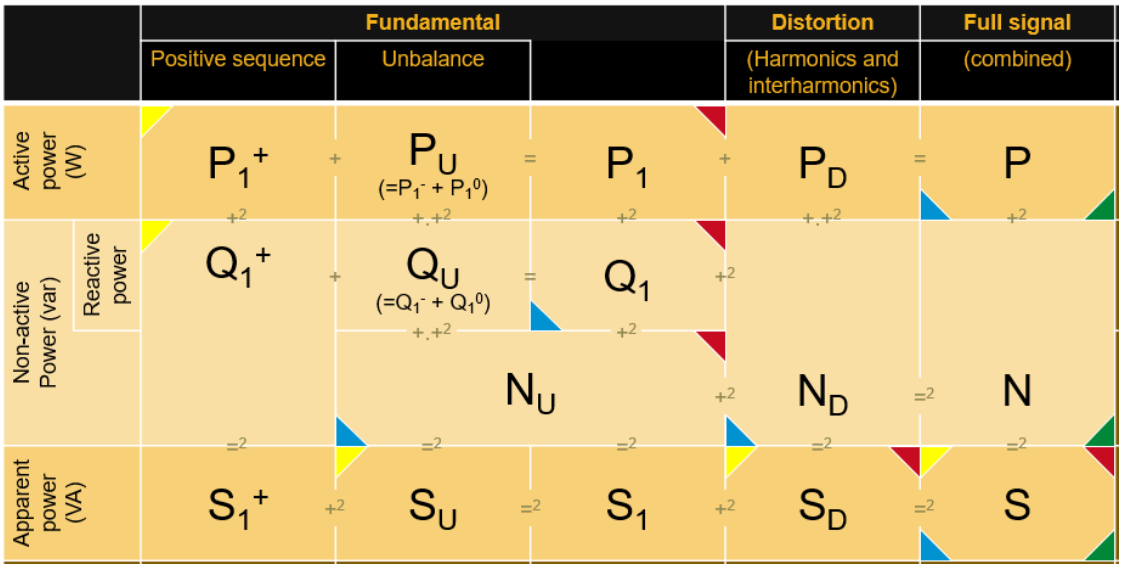
Initial Release

FAQ

2023-07-27: FAQ items that date back to early versions of Energy Analyze (Windows XP) have been removed.

Appendix 1 “Energy Loss Calculator”

The Energy Loss Calculator feature – available on Fluke 177x instruments – helps you pin-point different types of losses in your electrical installation. For this purpose, the total power consumption is broken down into components that can be assigned to specific causes as shown in the table below.



Three-phase motors

The only useful power for a three-phase motor is the positive-sequence fundamental active power P_1^+. P_U and P_D are real losses and could even damage the motor. Nevertheless, customers usually pay for P_U and P_D as well as for P_1^+. The relation between useful power P_1^+ and total received power S can be shown as:

$$\mathbf{S^2 = (P_1^+)^2 + (Q_1^+)^2 + S_U^2 + S_D^2}$$

Single-phase motors

For three single phase motors on a three-phase network, the useful power is the fundamental active power P_1. The relation between useful Power P_1 and total received power S can be shown as:

$$\mathbf{S^2 = P_1^2 + Q_1^2 + N_U^2 + S_D^2}$$

Heating, Lighting and Recitifiers

For these types of loads, all active power will likely be used so the useful power will bi the full active power P. The relation between useful power P and total received power S can be shown as:

$$\mathbf{S^2 = P^2 + Q_1^2 + N_U^2 + N_D^2}$$

General loads

Once the components of active power that are turned into useful power for a particular load are known, the power relation formulae from the table above can be used for efficiency calculations. The most generic relation, however, is given by:

$$\mathbf{S^2 = P^2 + N^2}$$

F177x and FEA+ utilize these components to show the relation between useful active power and loss components in a summary view (“Energy Loss Overview”, left) and for different types of loads (“Load dependent table”, right).