Three Phase, *Class A*
Power Quality Analyzer
PowerPad® IV

MODEL 8345

Excel at Power Quality Analysis

Portable
Easy-To-Use
Shock-Resistant

- Voltage quality diagnostics
- Full compliance with IEC 61000-4-30 Class A standard
- Easy-to-use on-screen setup
- 5 V to 1000 V three-phase analyzer
- Works on all existing electrical networks (single phase, three phase wye, delta, ...)
- 7 inch color display touch screen
- TRMS voltage and current measurements
- Power W, VA and VAR (N, Q_1 and D) measurements
- PF, DPF, CF and THD measurements
- Webserver, Wi-Fi, Ethernet, and USB communication
- Auto recognition of current sensors and probes
- Includes FREE DataView® software for configuring, data retrieval, real-time display, analysis and report generation

POWERPAD IV
Class A

Our products are backed by over 125 years of experience in test and measurement equipment, and encompass the latest international standards for quality and safety.

Technical Hotline: (800) 343-1391
www.aemc.com

AEMC®
INSTRUMENTS
CHAUVIN ARNOUX GROUP

POWER & ENERGY QUALITY ANALYZER Model 8345

PowerPad® IV Model 8345 - Top Performance and Accuracy

Intended for inspection, maintenance and field service teams on industrial or commercial installations, the PowerPad® IV gives you a snapshot of the electrical network quality features. Class A instruments meet the most rigorous performance and measurement time accuracy requirements (better than +/- 0.3 sec/day) for parameters such as voltage, current, harmonics and power and other measurements as defined in the IEC61000-4-30 standard, and are capable of producing reliable and repeatable results when connected to the same signals.

Comfortable to handle and equipped with an intuitive graphical user interface, this analyzer offers high measurement accuracy. It also features numerous calculated values and several processing functions.

Measurement terminal strip with isolated inputs
(on top of instrument)

Theft-proofing
(on side of instrument)

Navigation buttons

RJ45 Ethernet connector
(on side of instrument)

USB type B PC connector
(on side of instrument)

4-point connector for external power supply
(on side of instrument)
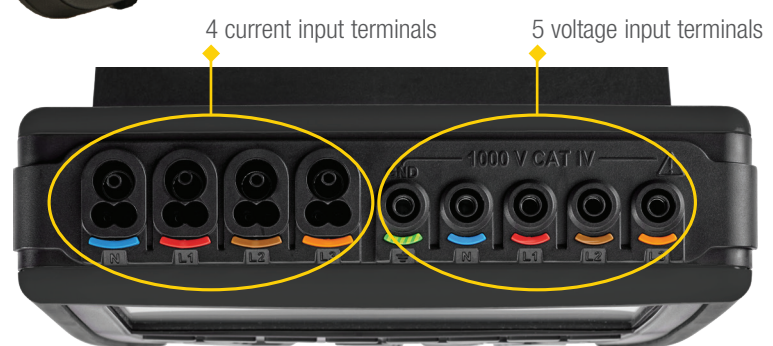
Direct access mode buttons

SD card slot

USB port

Large 7 inch color graphical backlit touch screen
800 x 480 (WVGA)

Function buttons

Configuration button

Screenshot button

Multilingual Help

ON/OFF Button

A Product that Protects and Works for the Environment!

Our Class A Power Quality Analyzer Model 8345 has been awarded the **PEP ECO PASSPORT®** label for compliance with environmental criteria of **ECO-DESIGN**.

All the data recorded is saved on an accessible SD card. It can be transferred to a PC by means of the DataView® software or by uploading to a USB drive connected directly to the PowerPad® IV. The memory card can also be removed.

4 current input terminals   5 voltage input terminals

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APPLICATIONS

Commercial and Industrial Sectors

Today, electrical distribution networks are judged according to their ability to power loads causing disturbances and loads sensitive to disturbances. The latter may take multiple forms.

Voltage quality analyzers can be used to detect and qualify each disturbance type: outage, voltage surges and sags, flicker, THD, voltage variations, transients, etc.

Energy Efficiency

For energy diagnostics on a site, a logger must be set up to record the electrical power and energy consumed. Once all the measurements have been taken, billing data is compared with the actual measurements to determine whether corrective action needs to be taken. This action may take different forms: resizing of a transformer, implementation of filtering systems, replacement of faulty equipment, etc. This analysis helps you understand and act at the right place and time to provide the best solution.

Electrical Maintenance

The increase of electronic power supplies in industrial processes has led to increases in harmonic disturbances on electrical networks which have a direct impact on the quality of the energy distributed. These disturbances may cause failures across all the electrical devices connected to the network.

Harmonic currents have negative effects on nearly all the components in the electrical system, creating new dielectric, thermal and/or mechanical stresses.

POWER & ENERGY QUALITY ANALYZER *Model 8345*

PowerPad® IV Model 8345

The PowerPad moves up a grade - Class A!

POWERPAD IV Class A

SPECIFICATIONS

MODEL	8345
ELECTRICAL	
Inputs	5 voltage / 4 current, isolated
Voltage	5 V to 1,000 V_{AC} and V_{DC}
Harmonics Mode	DC to 63rd order; < 3% Udin
Interharmonics Mode	0 to 62nd order; < 0.5% Udin
Inrush & Transient Capture	No maximum (limited by SD card)
Shockwaves (Fast transient)	Up to 12 kV sampled every 500 ns
Flicker (Pst)	< 0.1
Voltage Unbalance (u0,u2)	0.5 to 5 % (absolute); ±0.15 % (absolute)
Trend Recording	> 900 parameters 3 days with a sampling period of 200 ms 15 days with a sampling period of 1 s 45 days with a sampling period of 3 s
Sampling Rate	Voltage 400 kSps / Current 200 kSps / Surge 2 MSps
Alarm Mode Types / Number	52 / 20,000 with Email notifications
Real-time / Power / Energy Modes	Yes / Yes / Yes
Unbalance Mode	Composite
Screenshots	No maximum (limited by SD card)
Power Supply	Power from phase from 100 to 1000 V AC/DC with external supply block (included)
Carrier Current Detection	Yes
Battery	5.8 Ah Li-ion battery pack (included) / ≤6 hrs w/ display on; ≤10 hrs w/ display off
MECHANICAL	
Data Storage	16 GB SD-Card (included) for snapshot, transients, alarms and trend recording
Display	7 in color LCD touch screen: 800 x 480 (WVGA)
Clock / GPS	Yes, built-in
Operating Temperature	32 °F to 104 °F [+0 °C; +40 °C]
Communication	USB, Ethernet, Wi-Fi, Web server, IRD server, USB port (type A)
Dimensions	7.87 x 11.22 x 2.17 in (200 x 285 x 55 mm)
Weight (meter only)	4.19 lbs (1.9 kg)
COMPLIANCE & STANDARDS	
Safety / IP	IEC 61010 1000 V CAT IV / IP54
Environmental	IEC 61557-12 & IEC 62586
Measurement Standard	IEC 61000-4-30 (Ed 3) Class A (Full)
EN50160 Monitoring Mode	With DataView® software
Warranty	*3 years (registration must be done within 30 days of the date of purchase)

Download the user manual for complete specifications ▶

PRODUCT INCLUDES

CAT. # 2136.36 - POWERPAD® IV MODEL 8345
W/4 MA194-24-BK MINIFLEX® SENSORS

Meter, extra-large tool bag, internal carrying pouch, hand strap, (4) MA194-24-BK sensors, USB cable, (5) 10 ft black voltage leads with alligator clips, (12) color-coded input ID markers, power adapter (PA32ER) with US power cord, (2) 6 ft stackable leads, (2) 10 ft black voltage leads with alligator clips for power adapter PA32ER, (1) power plug adaptor for PA32ER, SD card, 5.8 Ah Li-ion battery pack, quick start guide, and a USB stick with DataView® software and user manual.

ACCESSORIES/REPLACEMENTS

CAT. #2140.80
MiniFlex® Sensor
Model MA194-24-BK

CAT. #2140.43
Lead - Set of 5, 10 ft (3M) Black
Leads w/5 Black Alligator Clips

CAT. #2140.44
Lead, (1) 10 ft (3M) Black Lead
w/1 Black Alligator Clip

CAT. #5100.14
Adapter - Replacement
Power Plug Adapter for PA32ER

CAT. #5100.15
Adapter - Replacement 1000 V
PA32ER Power Supply

CAT. #5100.16
Magnetic Hook for use with
PowerPad® IV Model 8345

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AEMC INSTRUMENTS

FEATURES, FUNCTIONS & MEASUREMENTS

GENERAL

- Easy-to-use, portable power quality analyzer
- Full compliance with IEC 61000-4-30 ed. 3.0 Class A functions
- Voltage quality diagnostics and communication options
- Records and stores hundreds of parameters in memory every 10/12 periods (200 ms)
- Measurements on all network types: three-phase, Aron connection, single phase, etc.
- Electrical network monitoring with setting of alarms
- Characterization with software for True RMS single-, two- and three-phase measurements at 512 samples/cycle, plus DC
- 7 inch color graphical, backlit TFT touch screen display
- Monitors user configured alarm parameters
- Fast transient events are captured and stored in memory
- True InRush capabilities to study loads during setup as well as ongoing

MEASUREMENTS

- Measurements and recordings accessible on the device's front-panel
- Measures all DC components
- Harmonics (amplitude and phase shift) from DC to the 63rd order
- Inter-harmonic subgroups from 0 to the 62nd order
- 2 line carrier signal frequencies monitored
- Measurement of active power (P), non-active power (N), reactive power (Q_1), apparent power (S) and distortion power (D) values *(total and per phase)*
- Measurement of energy values *(total and per phase)* with Energy valuation
- Internal GPS for precise UTC synchronization *(NTP possible too)*
- Real-time color waveforms *(5 voltage and 4 current)*
- Easy-to-use multilingual on-screen setup
- Automatic current probe/sensor recognition and scaling
- True RMS voltage and current measurement
- Shockwave measurement

CALCULATIONS

- Calculation of K factor & FHL
- Calculation of distorting voltages and currents
- Calculation of Displacement Power Factor (DPF) and True Power Factor (PF)
- Calculation of Pst & Plt flicker and the sliding Pst
- Calculation of unbalance (current and voltage)
- Waveform Inrush with a duration of up to 10 minutes
- RMS and Peak Inrush for up to 30 minutes
- Capture of hundreds of 2.5 µs transients
- Capture shockwaves up to 12 kV with a resolution of 500 ns
- Trend Recording
- Trend recording period from 200 ms to 2 hrs

COMMUNICATION

- Built-in GPS
- USB 2.0 external flash drive supported (host devices)
- USB 2.0 connection with a PC
- Ethernet 100 Mbps communication
- Built-in Wi-Fi 802.11b/g communication
- Web server for a remote user interface with Android, Microsoft and iOS applications
- Backup and recording of screenshots (image and data)
- Recording and export to a PC
- Includes DataView® software for real-time data recovery and communication with a PC

ERGONOMICS & EASE OF USE

- Wide 7-inch color LCD touch screen (WVGA)
- Real-time display of waveforms (4 voltage/4 current)
- DC current sensor power supply
- 5 x 50 Hz / 60 Hz AC/DC voltage inputs
- Intuitive, user-friendly and multilingual graphical interface
- Fully multi-task instrument with user profiles
- Automatic recognition of different current sensors
- Display of phasor diagrams
- Waveforms at 512 samples per cycle, with Min/Max 2.5 µs
- Real-time waveforms displayed from 1 cycle to 10/12 cycles (50/60 Hz)

STANDARD VERIFICATION CAMPAIGNS

ENERGY VALUATION

PowerPad IV Class A Model 8345 offers all the measurements required to successfully implement energy efficiency projects and monitor electricity distribution.
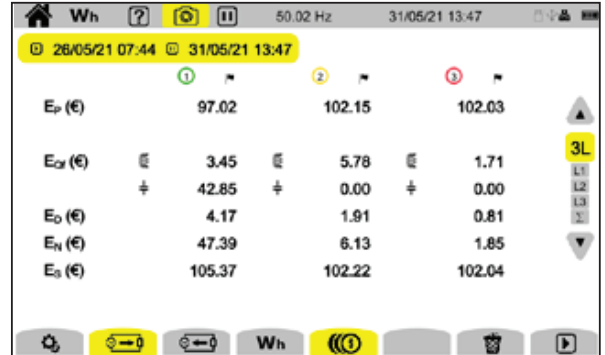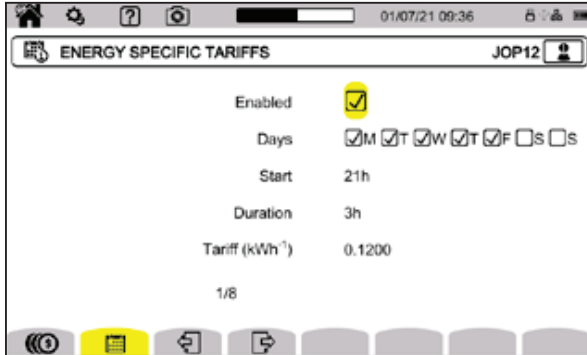

SHOCKWAVES

Shockwaves, usually caused by lightning, are spectacular instantaneous electrical voltage surges. They also propagate in the digital network. Model 8345 can withstand shockwaves up to 12 kV which are sampled every 500 ns.
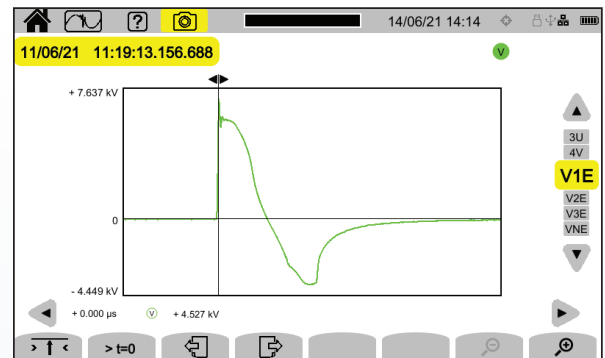

LINE CARRIER SIGNAL MEASUREMENT

In the harmonic analysis function, there is also a mode for monitoring carrier currents. After defining their frequency in the instrument, the command signals will then be measured.
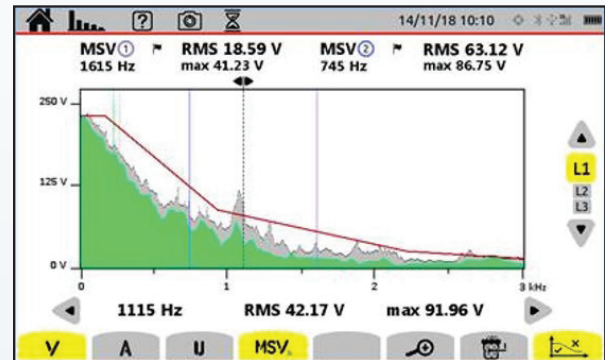
INTERHARMONICS (harmonic mode)

Model 8345 can be used to measure and display the interharmonics, as requested in IEC 61000-4-7, for very precise analysis of all the disturbances on an electrical network.

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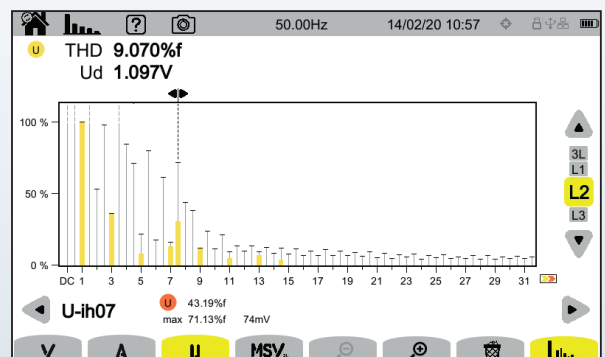
MONITORING MADE EASY

TREND

The trend graph shows the variations of the parameters measured over time as fast as 200 ms.
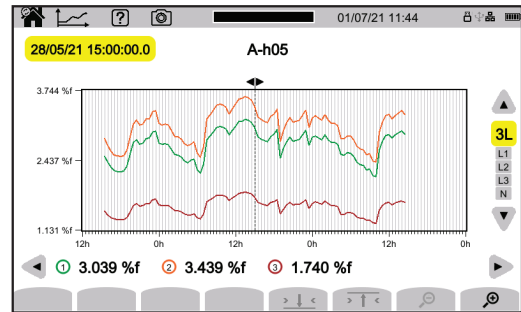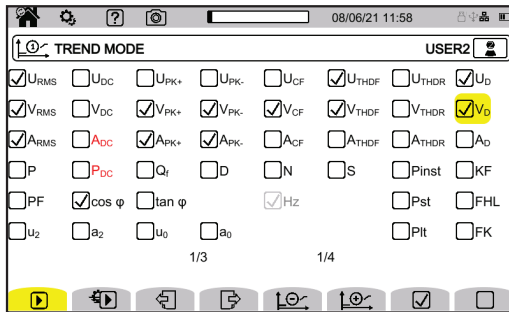
ALARMS

Alarms set points can be programmed to be monitored, which are then recorded and time-stamped with the duration and extreme values. Users can be informed directly by email when an alarm is triggered.
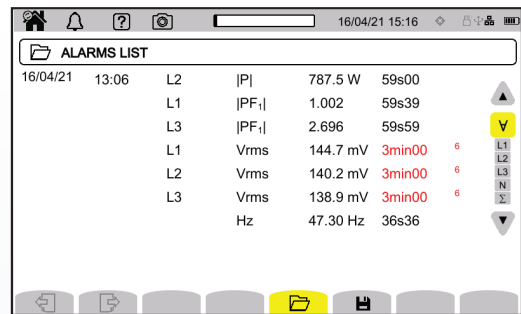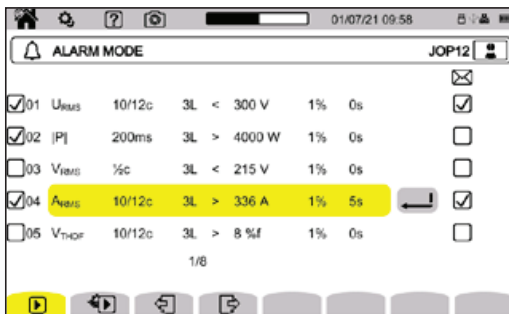
TRANSIENTS
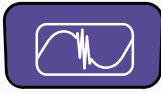
Transients correspond to peaks in the voltage or current waveform. Shockwaves are extremely fast transients with even greater possible amplitude.
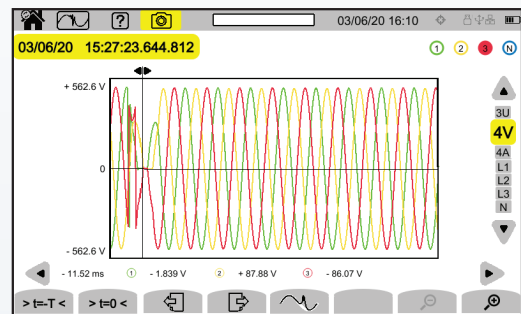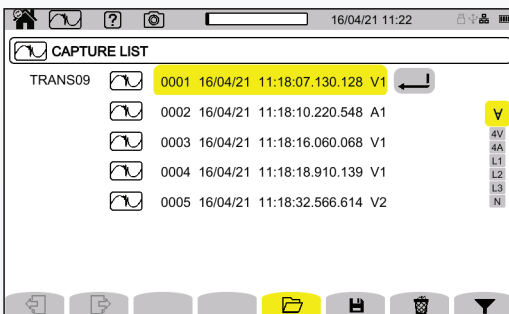
TRUE INRUSH®

For tests when starting up loads, model 8345 can record ½-period values covering more than 30 minutes and the waveforms of the signal can be captured.
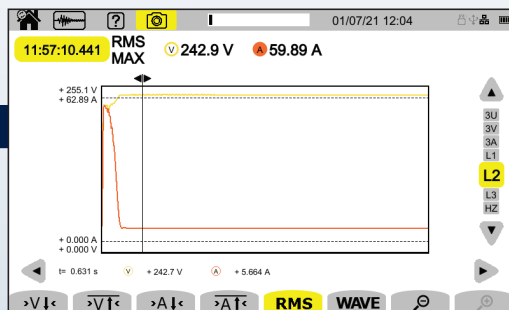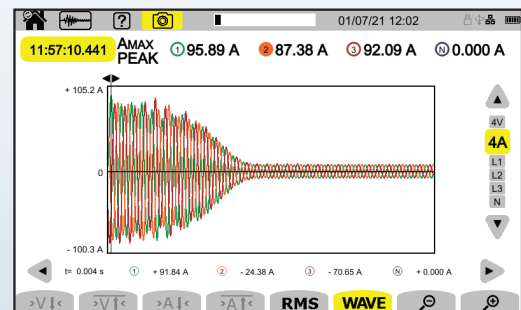
A VERSATILE COMMUNICATING INSTRUMENT

SOFTWARE

The DataView® Control Panel software processes the measurements made with the PowerPad® IV Class A Model 8345 including:

- Configuration of the instrument: *setup, recording, alarms*
- Real-time display
- Processing of all the recorded data
- Transfer of screenshots and transients
- Data export into spreadsheet (Excel, .CSV)
- Data export in graphic form in Windows™.
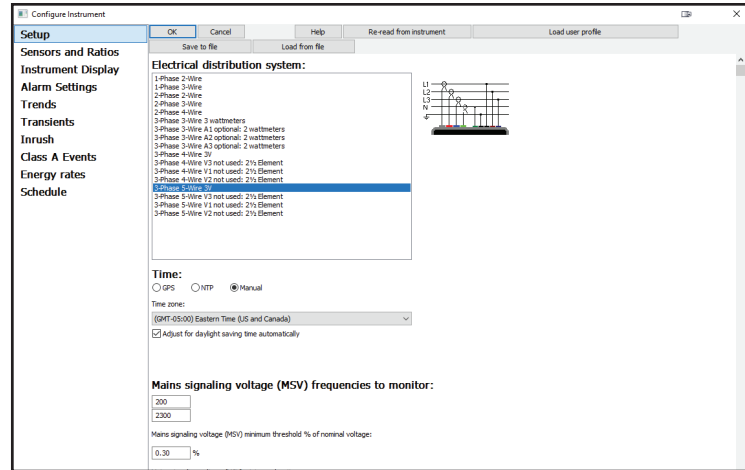
Use any iOS or Android PC, tablet or smartphone.
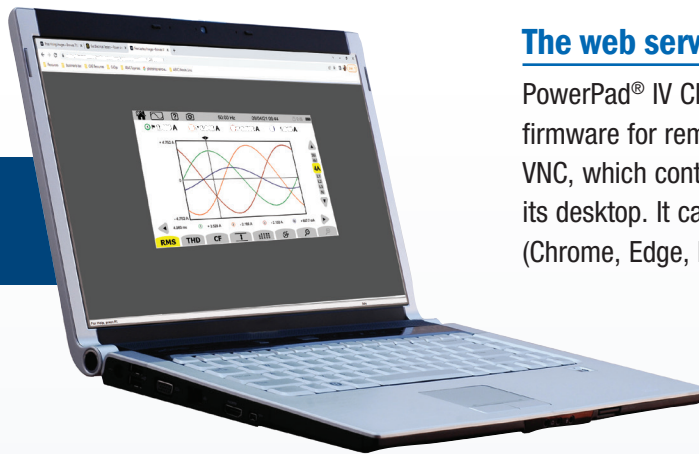
The web server

PowerPad® IV Class A Model 8345 is equipped with firmware for remote access. It can be controlled via VNC, which controls a remote machine while displaying its desktop. It can be activated from any browser (Chrome, Edge, Firefox, etc.).

Communication

In addition to using media such as SD cards and USB drivers, it is possible to download the measurements and communicate with the instrument remotely via USB, remote links, Wi-Fi (direct or via server) or the RJ45 (Ethernet connector).

(Refer to the User Manual for PC computer USB hardware requirements).

IRD server

Our IT networks are protected against external attack. Thanks to the provision of access to our IRD server, a single authorized IP output address allows you to transmit your measurements all over the world.

We recommend utilizing the IRD Server for configuring test measurements, and directly connecting to a PC for generating reports involving large packets of data.

SCPI commands

With an integrated interfacing software layer, it is possible to control the 8345 instrument via its own software application. SCPI commands are available for all the instrument's functions.

Data files in JSON format

Saved in JSON format, all the recordings are accessible and can be processed with a third-party and/or proprietary application.

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MEETING STANDARDS

IEC 61000-4-30

The International Electrotechnical Commission (IEC) IEC 61000-4-30 Edition 3.1 standard. This standard defines:

- the methods for measuring the quality parameters for the supply of power to electrical power networks
- and how to interpret the results

The measurement parameters are described for each applicable parameter in terms which provide reliable, repeatable results, however the method is implemented.
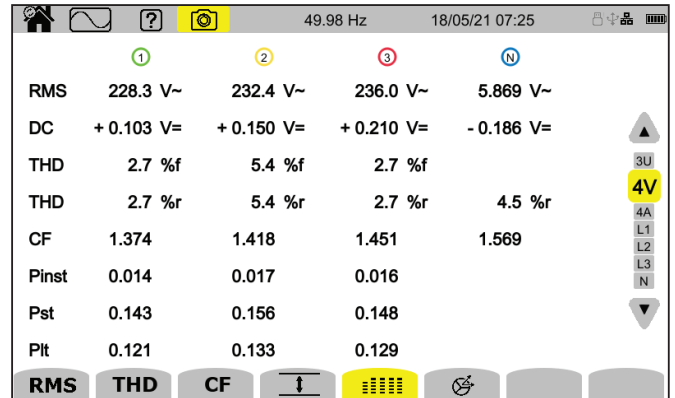
EN 50160

Homogeneous tolerances

The EN 50160 standard characterizes the quality of the voltage supplied. It presents the different types of disturbances which may affect the voltage on a network. It lists the parameters to be monitored and defines how long the parameters should be monitored for.

With the DataView® software, the Monitoring mode can be used to set up a simplified configuration of all the limits to be monitored and the parameters to be recorded.
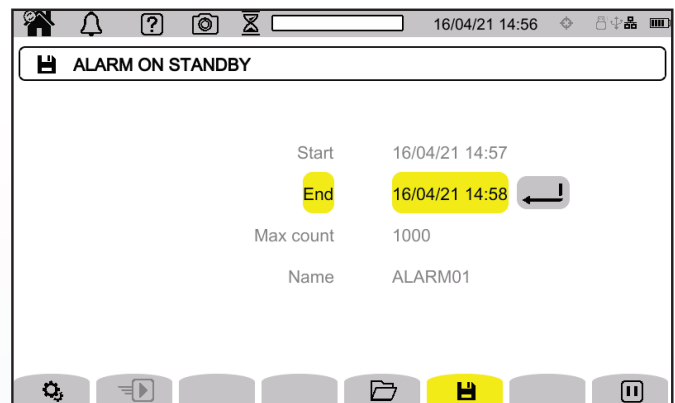
IEC 61000-4-7

Harmonics and interharmonics

The IEC 61000-4-7 standard defines the measurement methods for voltage quality analyzers so that they remain compliant with the emission levels stipulated in certain standards (e.g. the harmonic current limits specified by IEC 61000-3-2) and for the measurement of harmonic currents and voltages on the power networks themselves.
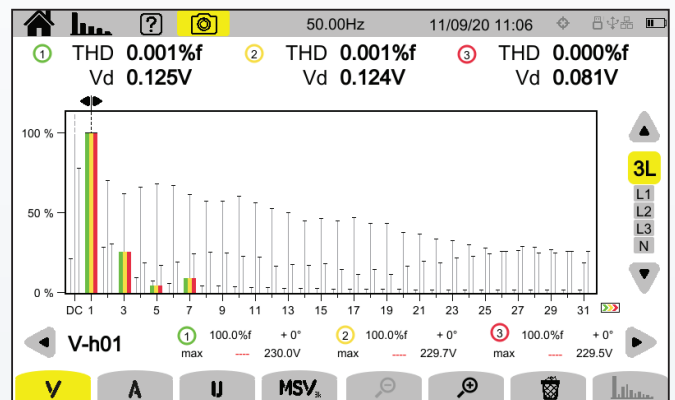
IEC 61000-4-15

Short or long-term flicker

This is caused by the power supply voltage modulation. When it affects lighting, it gives an impression of unstable vision due to a light stimulus whose luminance or spectral distribution fluctuates over time.

There are 2 parameters calculated from the power supply voltage.

- *Pst* which is a short-term assessment based on a 10-minute observation period
- *Plt* which is a long-term assessment, usually over a period of 2 hours
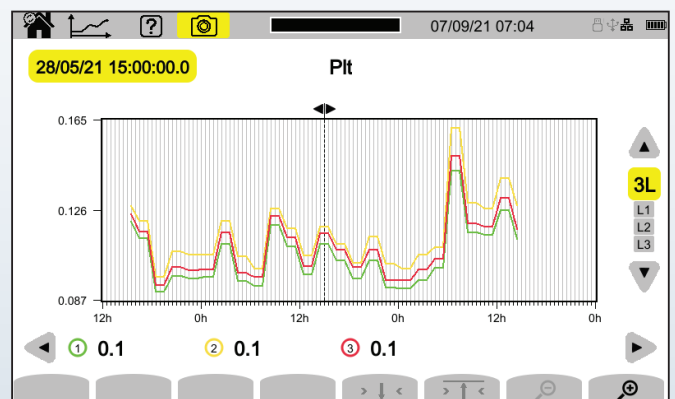
MODEL 8345: DIAGNOSTIC TOOL

Viewing the signal and its components

Model 8345 is an easy-to-use analytical tool. After connection, the 8345 immediately and totally automatically displays the voltages up to 1,000 V AC and DC and the currents, thanks to a function which automatically recognizes the sensor connected. A large number of sensors are compatible with the PowerPad.
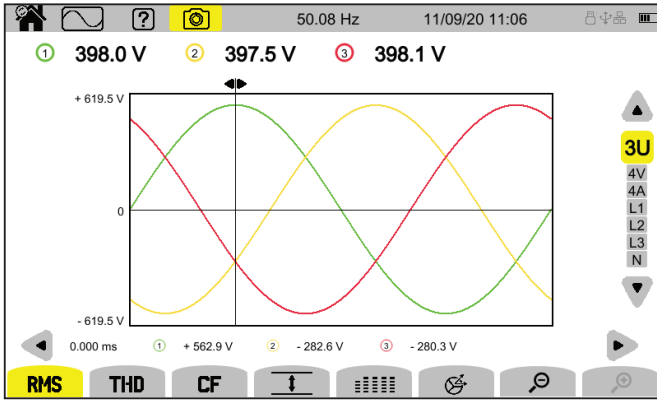

The Waveform mode automatically provides an oscillogram showing the voltage and/or current waveforms.
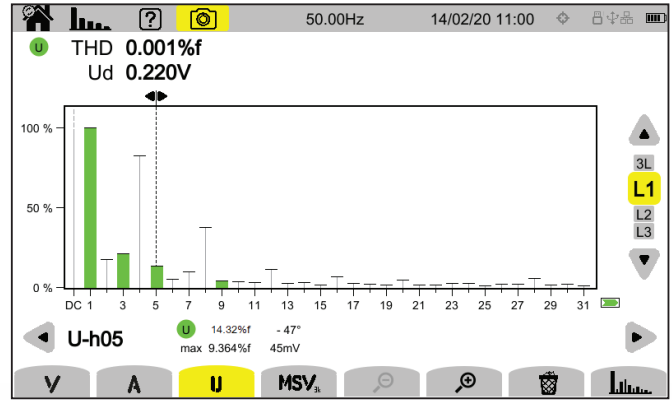
It is very simple to measure harmonics and interharmonics with Model 8345, which is very easy to use as an analytical tool.
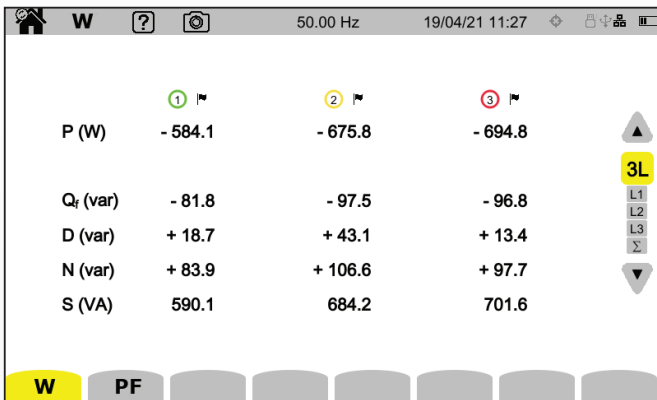
Model 8345 can be used to monitor all the power values (P, Q, D, etc.) in real time over periods of varying durations. Measurement and analysis of all the power values enables you to perform a full power survey in compliance with the standards.
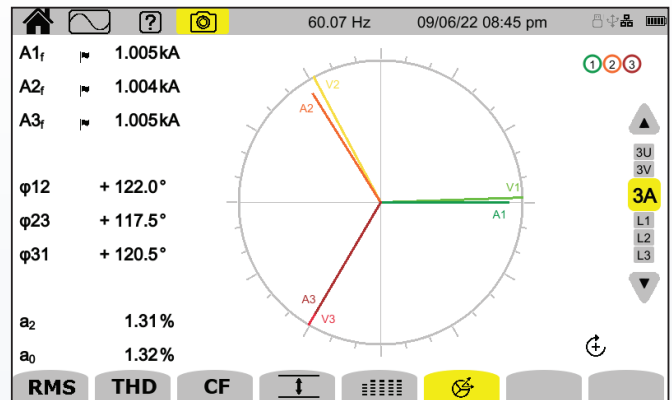
The phase relation between the voltages and currents is displayed with a phasor diagram. The vectorial representation allows you to confirm the instrument is properly connected to the electrical network.

Simplified configuration

We've simplified the configuration set up for ease of use.

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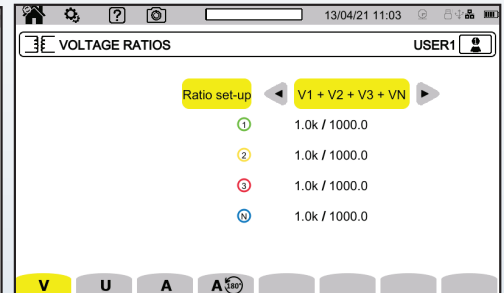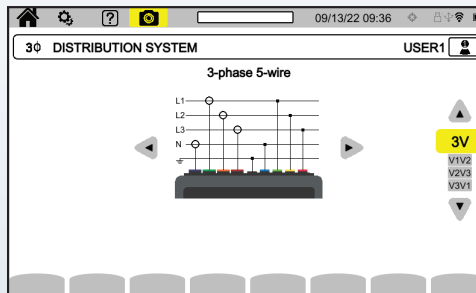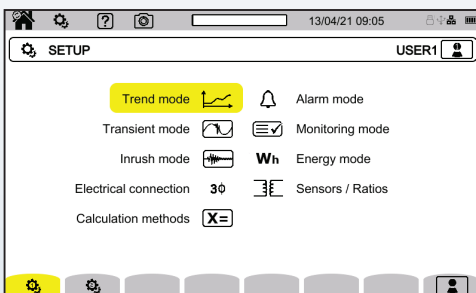
AEMC INSTRUMENTS

We offer a complete family of current measurement probes to meet most AC (or DC) measurement applications up to 10,000 Arms.

	Probe/Sensor Type	TRMS Current	Max Conductor Size	Accuracy on IRMS	Accuracy on Φ	Safety
	SR193-BK (1000 A) Catalog #2140.33 AC Current Probe with 10 ft lead	1 A - 3 A	2.05 in (52 mm)	±0.8 %	–	EN 61010-2-032, Pollution Degree 2, 600 V CAT IV, 1000 V CAT III
		3 A - 10 A			±1 °	
		10 A - 100 A		±0.8 %	±0.5 °	
		100 A - 1200 A		±0.8 %	±0.3 °	
	MR193-BK (1000 A$_{AC}$ / 1400 A$_{DC}$) Catalog #2140.28 AC Current Probe with 10 ft lead	1 A - 10 A	1.6 in (41 mm)	±(1.5 % + 1 A)	–	EN 61010-2-032, Pollution Degree 2, 300 V CAT IV, 600 V CAT III
		10 A - 100 A			±2 °	
		100 A - 800 A		±3 %	±1.5 °	
		800 A - 1200 A		±5%		
		1200 A - 1400 A				
	MN93-BK (200 A) Catalog #2140.32 AC Current Probe with 10 ft lead	0.5 A - 2 A	0.78 in (20 mm)	±(3 % + 1 A)	–	EN 61010-2-032, Pollution Degree 2, 300 V CAT IV, 600 V CAT III
		2 A - 10 A			±6 °	
		10 A - 100 A		±(2.5 % + 1 A)	±3 °	
		100 A - 240 A		±(1 % + 1 A)	±2 °	
	MN193-BK (100 A) Catalog #2140.36 AC Current Probe with 10 ft lead	100 mA - 300 mA	0.78 in (20 mm)	±(0.7 % + 2 mA)	–	EN 61010-2-032, Pollution Degree 2, 300 V CAT IV, 600 V CAT III
		300 mA - 1 A			±1.5 °	
		1 A - 120 A		±0.7 %	±0.7 °	
	MN193-BK (5 A) Catalog #2140.36 AC Current Probe with 10 ft lead	5 mA - 50 mA		±(1 % + 0.1 mA)	±1.7 °	
		50 mA - 500 mA		±1 %	±1 °	
		500 mA - 6 A		±0.7 %		
	AmpFlex® 193-24-BK (6500 A) Catalog #2140.34 Flexible Current Probe with 24 in sensors & 10 ft lead	10 A - 100 A	7.64 in (190 mm)	±3 %	±1 °	EN 61010-2-032, Pollution Degree 2, 600 V CAT IV, 1000 V CAT III
		100 A - 6500 A		±2 %	±0.5 °	
	AmpFlex® 193-36-BK (6500 A) Catalog #2140.35 Flexible Current Probe with 36 in sensors & 10 ft lead	10 A - 100 A	11.46 in (290 mm)	±3 %	±1 °	EN 61010-2-032, Pollution Degree 2, 600 V CAT IV, 1000 V CAT III
		100 A - 6500 A		±2 %	±0.5 °	
	MiniFlex® MA193-10-BK (1000 A$_{AC}$) Catalog #2140.48 MiniFlex® Sensor with 10 in sensor & 5 ft lead	10 A - 100 A	2.75 in (70 mm)	±3 %	±1 °	EN 61010-2-032, Pollution Degree 2, 600 V CAT IV, 1000 V CAT III
		100 A - 1000 A		±2 %	±0.5 °	
	MiniFlex® MA193-14-BK (1000 A$_{AC}$) Catalog #2140.50 MiniFlex® Sensor with 14 in sensor & 5 ft lead	10 A - 100 A	3.94 in (100 mm)	±3 %	±1 °	EN 61010-2-032, Pollution Degree 2, 600 V CAT IV, 1000 V CAT III
		100 A - 1000 A		±2 %	±0.5 °	
	MiniFlex® MA194-24-BK (1000 A$_{AC}$) Catalog #2140.80 MiniFlex® Sensor with 24 in sensor & 10 ft lead	10 A - 100 A	7.64 in (190 mm)	±3 %	±1 °	EN 61010-2-032, Pollution Degree 2, 600 V CAT IV, 1000 V CAT III
		100 A - 1000 A		±2 %	±0.5 °	

CE UKCA ▢ *All probes and sensors. For system accuracy calculations, add the probe accuracy to the meter accuracy.*
* Requires BNC adapter Catalog #2140.40

DataView®
Data Analysis and Reporting Software
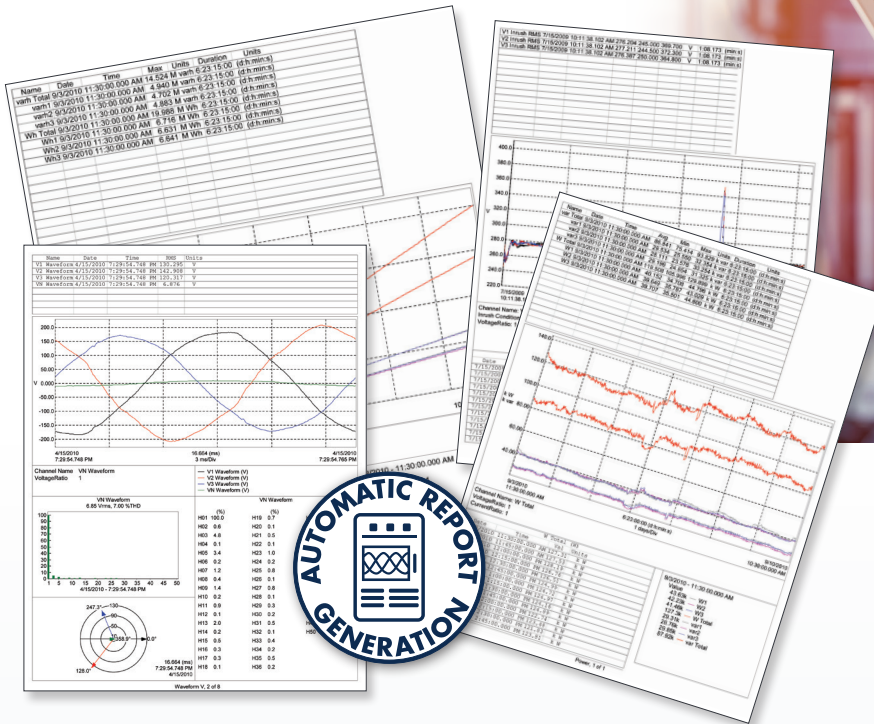
Reports can be displayed on a PC and printed. Each report includes all test results in a tabular and graphic format, as well as operator and test site information. Comments typed by the operator will also be included.

AUTOMATIC REPORT GENERATION

Display waveforms in real time on your computer.

DataView® software provides a convenient way to configure and control power analysis tests from a computer. Through the use of clear and easy-to-use tabbed dialog boxes, all PowerPad® IV Model 8345 functions can be configured and tests can be initiated. Results can be displayed in real-time and stored on a PC. Reports may be printed along with the operator's comments and analysis.

Configure all functions of the PowerPad® IV Model 8345

► Display and analyze real-time data on a PC

► Configure all PowerPad® functions and parameters from your PC

► Record trend data directly to the PC

► Customize views, templates and reports to meet specific needs

► Create and store a complete library of configurations that can be uploaded to the PowerPad® as needed

► Zoom in and out and pan through sections of the graph to analyze the data

► Display waveforms, trend graphs, harmonic spectrums, text summaries, transients, event logs and stored alarms

► Print reports using standard or user designed custom templates

► Selectively review individual channels, phases on total network recordings

► Keep track of accumulated energy over time and time of use

► Create user-specific cover sheets for reports identifying specific data that includes operator, tests site and narrative associated with the data

AEMC® INSTRUMENTS

DataView®
Data Analysis and Reporting Software

The DataView® Control Panel

The monitoring feature allows the user to set up a recording with selected parameters for which specific user-defined pass/fail criteria can be applied. The objective is to set up a measurement chart of relevant parameters and monitor them to establish whether an electrical network of source and loads is within control limits. Monitoring can also be set up without any thresholds for pass/fail criteria. The software structure of set up is flexible and allows the user full customization. The progress of the measurement set up can be viewed in real-time as the measurement is progressing. A customized report can automatically be generated at the end of the monitoring session.
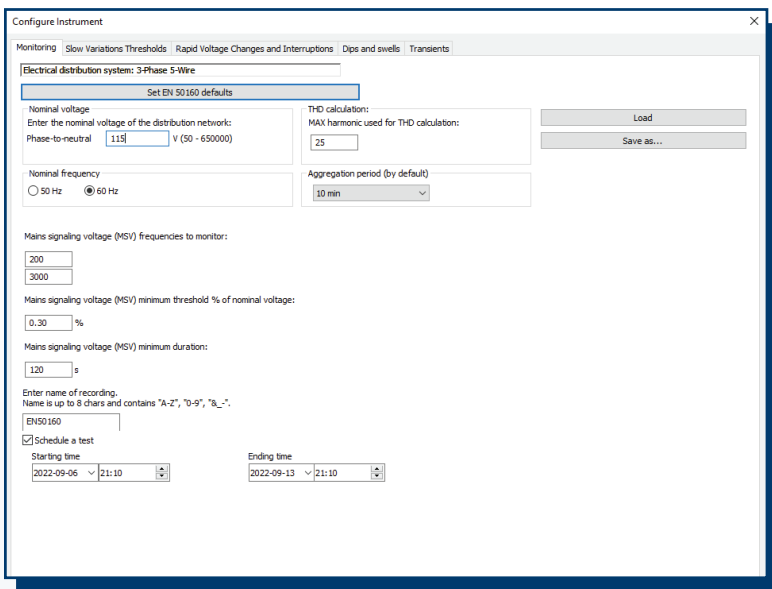
Monitoring tab allows complete control of Monitoring conditions.

The Control Panel Makes it Easy to:

▶ Name the Monitoring

▶ Select Aggregation period from 0.2 s to 2 hrs

▶ Schedule Monitoring by selecting Start and Stop Date/Time

▶ Load Parameters from a file

▶ Save all the Parameters to re-load later

▶ Edit Power Ratios

▶ Add to the Parameter list

▶ Edit conditions for any Parameter

▶ Delete a given Parameter from the list

▶ Monitor an active recording session or a saved session

▶ Reverse current probes that were incorrectly installed
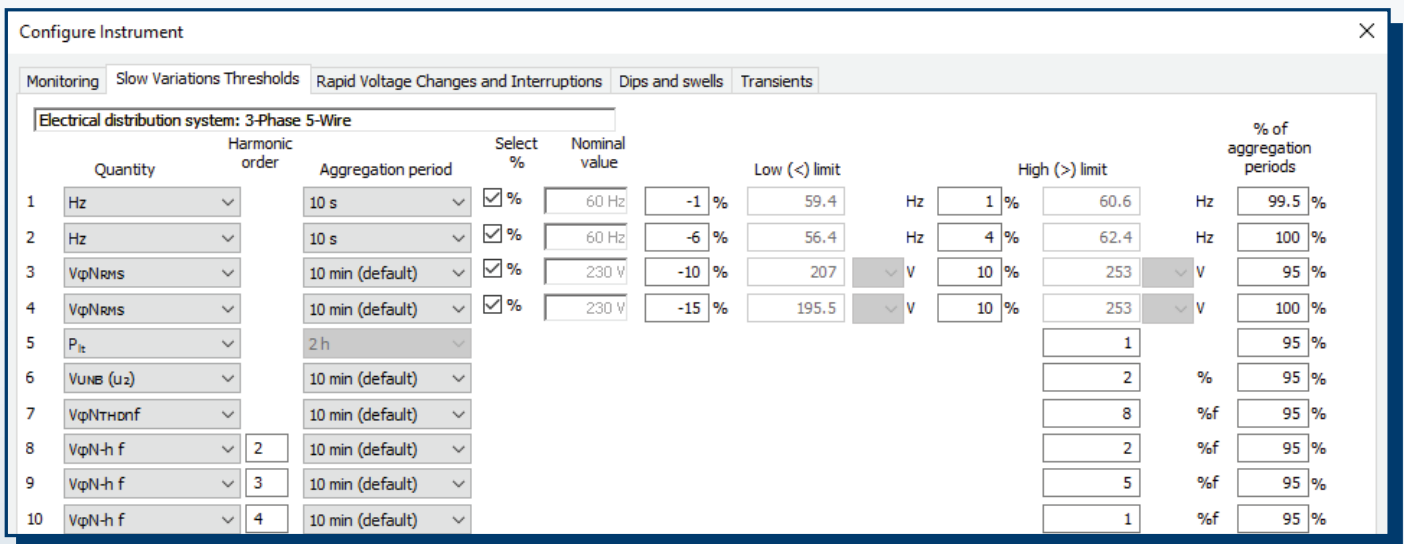
Configuration: Clear and easy setup of all functions from one tabbed dialog box.   Select Parameters and Monitoring conditions.

Data*View*® Data Analysis and Reporting Software
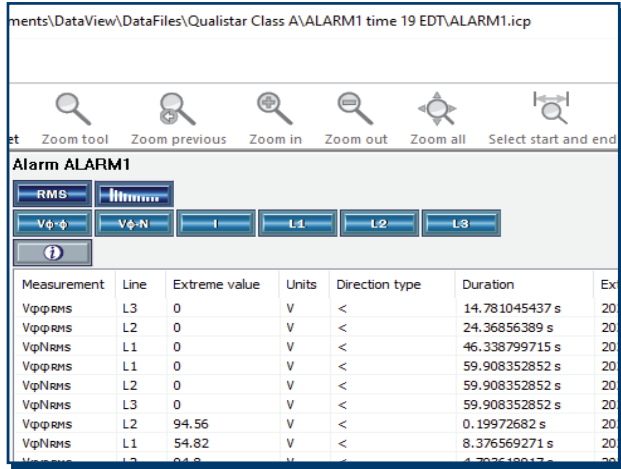
Configure and display alarm parameters, thresholds and tests results.
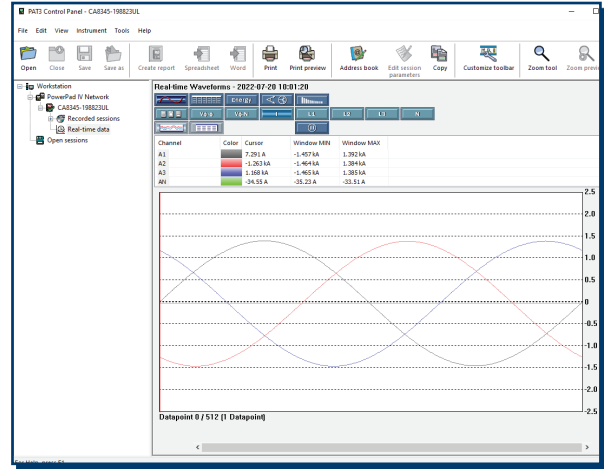
Display real-time waveforms by phase, parameter or total.
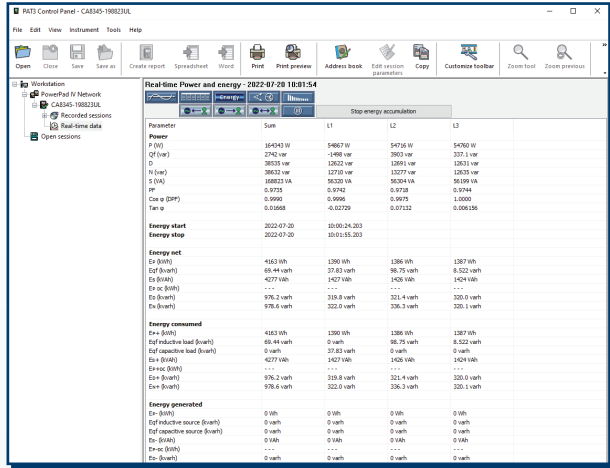
Display power and energy parameters – both instantaneous and total.
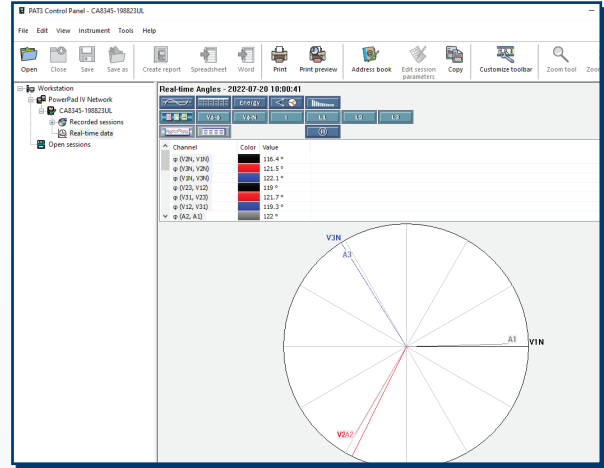
Display real-time phasor diagrams. Includes unbalance for both voltage and current.
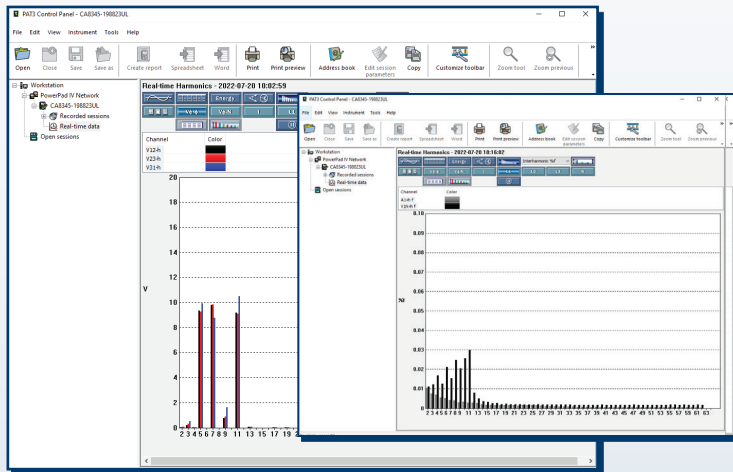
Display all harmonics from 1st to 63rd or interharmonics from 1st to 62nd in bar graph form for voltage, current and power.
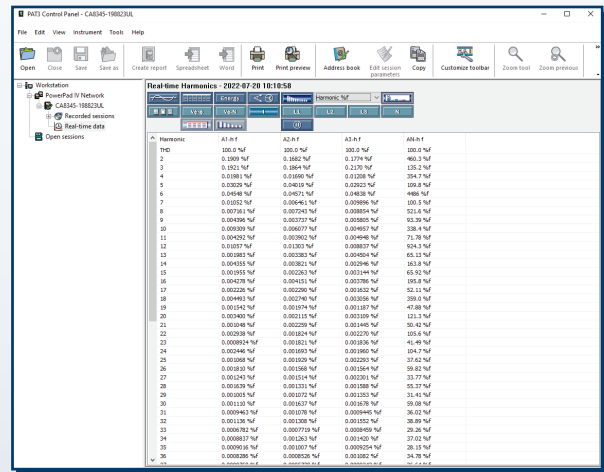
Display harmonics in a text table from harmonic 0 (DC) through the 63rd.

Technical Assistance (800) 343-1391

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DataView® Data Analysis and Reporting Software

Configure transient voltage and current detection.

Display transient waveforms.

Display Class A list.

Configure Class A events.

Configure trends.

Display InRush peak.

Trend Results.

AEMC® INSTRUMENTS
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CHAUVIN ARNOUX GROUP

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