

POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

THREE-PHASE POWER QUALITY ANALYZERS



cover closed

POWERPAD® III MODEL 8436

Supplied with an 8 GB SD card for storing up to 2 GB trend recordings
(4) current and (5) voltage input terminals



* 3 YEAR WARRANTY ONLY APPLIES WHEN METER IS REGISTERED WITHIN 30 DAYS OF PURCHASE



DataView®

FEATURES

- Measurement of TRMS voltages up to 1000 Vrms AC/DC for two-, three-, four- or five-wire systems
- Measurement of TRMS currents up to 10,000 Arms (sensor dependent)
- 65 µs sample rate
- Direct measurement of neutral current and voltage
- Record and display trend data as fast as once per second for one month for up to 25 variables
- Transient detection on all V and I inputs (up to 210)
- Selectable PT and CT ratios
- Inrush current measurement
- Calculation of Crest Factors for V and A
- Calculation of Factor K for transformers
- Calculation of short and long term flicker and three-phase voltage unbalance
- Measures harmonics (referenced to the fundamental or RMS value) for voltage, current or power, up to 50th harmonic
- Displays of harmonic sequencing and direction and calculation of overall harmonics
- Real-time display of phasor diagrams including values and phase angles
- Measurement of active, reactive and apparent power per phase and their respective sum total
- Calculation of power factor, displacement power factor and tangent factor
- Recording, time stamping and characterization of disturbance (swells, sags and interruptions, exceedance of power and harmonic thresholds)
- 2 GB Trend Recording memory; Alarm, Snapshot and Transient/Inrush memories are separate
- Measurement of energy kVAh, kvarh & kWh
- The Max and Min RMS measurements are calculated every half-period
- Includes DataView® software for configuring, real-time display, analysis and report generation

MODEL	8436
ELECTRICAL	
Sampling Frequency	256 samples / cycle
Data Storage	SD card for trend recording; Additional separate 12.5 MB partitioned memory for snapshots, transient / Inrush & alarms
Voltage (TRMS)	Phase-to-Phase: 2000 V Phase-to-Neutral: 1000 V Voltage Ratio: up to 500 kV
Current (TRMS)	MN Clamp: (0 to 6) A / 120 A or (0 to 240) A SR Clamp: (0 to 1200) A MR Clamp: (0 to 1000) A _{AC} , (0 to 1400) A _{DC} MiniFlex®: (10 to 3000) A AmpFlex®: (10 to 10) kA ⁽¹⁾ SL261 Clamp: 50 mA to 100 A _{AC/DC}
Frequency (Hz)	(40 to 69) Hz
Other Measurements	kW, kvar, kVA, PF, DPF, kWh, kvarh, kVAh, Factor K, Flicker
Harmonics	1 st to 50 th , Direction, Sequence
Power Supply	9.6 V NiMH rechargeable battery pack (included) (110 to 1000) V DC to 400 Hz
Battery Life	≤ 10 h with display on; ≥ 15 h with display off (record mode)
MECHANICAL	
Communication Port	Optically isolated USB
Display	¼ VGA (320 x 240) color LCD display with adjustable brightness & contrast
Dimensions	(10.6 x 9.8 x 7.1) in (270 x 249 x 180) mm
Weight	8.2 lb (3.7 kg) with batteries
SAFETY	
Safety Rating	EN 61010, 600 V CAT IV ⁽²⁾ , 1000 V CAT III

(1) Crest factor at 6500=1 Consult factory for NIST Calibration prices.

(2) When used with SR193 or AmpFlex® probes
600 V CAT III with MN193 or MR193 probes

PRODUCT INCLUDES

8436 KIT CAT. #2136.44

Extra large tool bag, accessory pouch, 5 ft USB cable, (5) 10 ft black voltage leads with alligator clips, 110 V US power cord, line power cord 110-1000 V_{DC} to 400 Hz, (12) color-coded input ID markers, (4) water-tight AmpFlex® 196A-24-BK sensors, 9.6 V NiMH battery, SD card, printed quick start guide, high-voltage warning card, and a USB drive with DataView® software and user manual.



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THREE-PHASE POWER QUALITY ANALYZERS

INSTALLATION OF THE LEADS AND CURRENT SENSORS

Color-coded ID markers are supplied with the PowerPad® III to identify the leads and input terminals.



The voltage and current inputs, as well as the power cord connection are constructed with screw on, watertight connectors rated to IP67.



LEAD & ALLIGATOR CLIP
CAT. #2140.73



POWER CORD
CAT. #5000.63



AMPFLEX® SENSORS
CAT. #2140.75
(Included with
CAT. #2136.44 only)



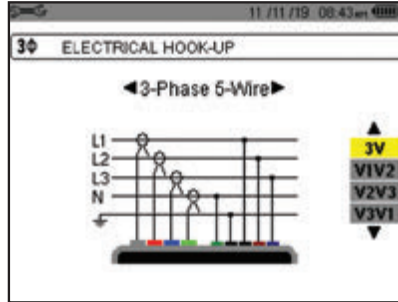
LINE POWER ADAPTER
CAT. #5000.89



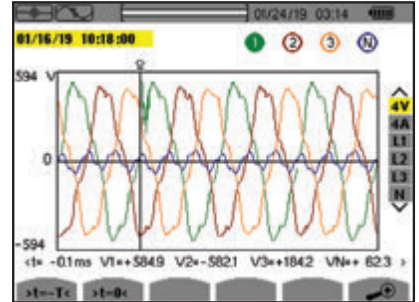
POLE MOUNTING KIT
CAT. #2137.82
Set of (2) with hardware

Large Color Functional Displays

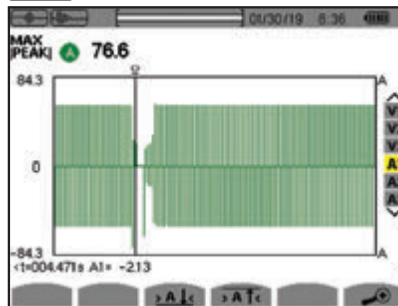
CONFIGURATION



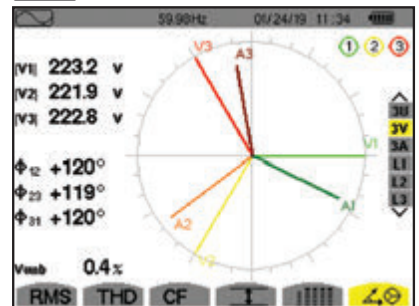
TRANSIENT MODE



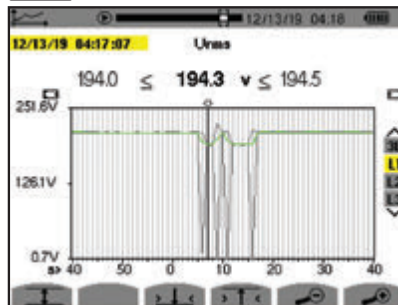
INRUSH PEAK



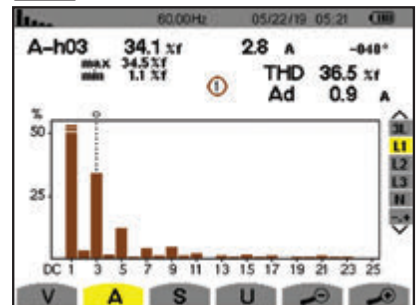
PHASOR DIAGRAM



TREND ANALYSIS



HARMONICS MODE



ACCESSORIES/REPLACEMENTS

CAT. #2133.73 Extra Large Classic Tool Bag (18 x 9 x 12) in

CAT. #2137.82 Pole Mounting Kit

CAT. #2140.19 Replacement - 9.6 V NiMH Rechargeable Battery

CAT. #2140.45 Set of (12) color-coded Input ID Markers

CAT. #2140.73 (1) 10 ft (3 M) Black Lead (waterproof cap) (Rated

1000 V CAT IV) and (1) Black Alligator Clip (Rated 1000 V CAT IV, 15 A, UL)

CAT. #2140.75 AmpFlex® Sensor 24 in Model 196A-24-BK (waterproof - IP67)

CAT. #2140.79 MiniFlex® Sensor 14 in Model MA196-14-BK (waterproof IP67)

CAT. #5000.43 Probe - Set of (2) Color-coded (red/black) Magnetize Voltage Probes (Rated 600 V CAT IV, 1000 V CAT III)

CAT. #5000.63 Power Cord 110 V for use only with Models 8435 and 8436

CAT. #5000.77 Cable Reeling Box

CAT. #5000.89 Line Power Adapter 110-1000 Vdc to 400 Hz

(Replacement - for use only with Model 8436)

CAT. #	DESCRIPTION
2136.43	PowerPad® III Model 8436 (No Sensors - Waterproof IP67)
2136.44	PowerPad® III Model 8436 w/(4) 196A-24-BK (AmpFlex® - Waterproof IP67)



POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

OPTIONAL ACCESSORIES

MODEL	MAX CONDUCTOR SIZE	ACCURACY (TYPICAL)	TYPICAL ERROR ON Φ AT (50 / 60) HZ	CURRENT RANGE	USED WITH MODEL	CAT. #
MiniFlex® Model MA193-10-BK* & MiniFlex® Model MA193-14-BK* & MiniFlex® Model MA194-24-BK* 	2.75 in (70 mm) (10 in sensor)	± 1 %	0.5 °	100 mA to 12,000 Aac [®]	PEL 52 PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.48 (10 in sensor)
	3.94 in (100 mm) (14 in sensor)	± 1 %	0.5 °			2140.50 (14 in sensor)
	7.64 in (194 mm) (24 in sensor)	± 1 %	0.5 °			2140.80 (24 in sensor)
10, 14 & 24 in Sensor						
AC / DC Current Probe Model MR193-BK 	1.6 in (41 mm)	± 2.5 %	-0.80 °	(1 to 1000) Aac (1 to 1300) Adc	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.28
AC Current Probe Model MN93-BK 	0.78 in (20 mm)	± 1 %	0.8 °	(0.5 to 240) Aac	PEL 52 PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.32
AC Current Probe Model SR193-BK 	2.05 in (52 mm)	± 0.3 %	0.2 °	(1 to 1200) Aac	PEL 52 PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.33
AmpFlex® Sensor 24 in Model 193-24-BK* 	7.64 in (194 mm) (24 in sensor)	± 1 %	0.5 °	100 mA to 12,000 Aac [®]	PEL 52 PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.34
AmpFlex® Sensor 36 in Model 193-36-BK* 	11.64 in (291 mm) (36 in sensor)	± 1 %	0.5 °	100 mA to 12,000 Aac [®]	PEL 52 PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.35

POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS OPTIONAL ACCESSORIES

MODEL	MAX CONDUCTOR SIZE	ACCURACY (TYPICAL)	TYPICAL ERROR ON ϕ AT (50 / 60) HZ	CURRENT RANGE		USED WITH MODEL	CAT. #
AC Current Probe Model MN193-BK 	0.78 in (20 mm)	± 1 %	0.75 °	100 A	200 mA to 120 AAC	PEL 52 PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.36
			1.7 °	5 A	5 mA to 6 AAC		
AmpFlex® Sensor 24 in Model 196A-24-BK* (Waterproof IP67) 	7.64 in (194 mm) (24 in sensor)	± 1 %	0 °	100 mA to 12,000 AAC [*]		PEL 105 8436	2140.75
MiniFlex® Sensor 14 in Model MA196-14-BK* (Waterproof IP67) 	3.9 in (99 mm) (14 in sensor)	± 1 %	0 °	100 mA to 12,000 AAC [*]		PEL 105 8436	2140.79
AC Current Probe Model MN94 	0.25 in (7 mm)	± 0.2 %	0.1 °	50 mA to 200 AAC		PEL 52 8345	2140.81
AC / DC Current Probe Model E94 	.464 in (11.8 mm)	± 3 %	1.5 °	10 A	100 mA to 10 AAC	8345	2140.82
		± 4 %	1 °	100 A	500 mA to 100 AAC		

* Maximum current reduced by a factor of 2 for 400 Hz fundamental frequency.

All current sensors can be used with Models PEL 105 and 8436. However, only the MA196-14-BK and 196A-24-BK flexible sensors are waterproof.

(1) Current range may be limited by sensor size or meter type.

Consult factory for NIST Calibration prices.

POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS SELECTION CHART

MODEL	CAT. #	INPUT TERMINALS	CHANNELS	RMS VOLTAGE MAX PHASE-TO-NEUTRAL	RMS VOLTAGE MAX PHASE-TO-PHASE	PEAK VOLTAGE MAX PHASE-TO-NEUTRAL	PEAK VOLTAGE MAX PHASE-TO-PHASE	DC VOLTAGE MAX	AC CURRENT MAX (PROBE DEPENDENT)	DC CURRENT MAX (PROBE DEPENDENT)	RATIOS VOLT	RATIOS AMPERE
8333	2136.10	4 V / 3 I	3 V / 4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 V _{DC}	10,000 A _{AC}	1300 A _{DC}		Yes
8336	2136.30	5 V / 4 I	4 V / 4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 V _{DC}	10,000 A _{AC}	5000 A _{DC}		Yes
8345	2136.35	5 V / 4 I	4 V / 4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 V _{DC}	10,000 A _{AC}	5000 A _{DC}		Yes
8436	2136.43	5 V / 4 I	4 V / 4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 V _{DC}	10,000 A _{AC}	5000 A _{DC}		Yes
PEL 52	2137.71	2 V / 2 I		600 Vrms	1200 Vrms	-			3600 A _{AC}	-	No	Yes
PEL 102	2137.51	4 V / 3 I	3 V / 3 I	1000 Vrms	1700 Vrms	1414 Vpk	2400 Vpk	1000 V _{DC}	12,000 A _{AC}	5000 A _{DC}		Yes
PEL 103	2137.52	4 V / 3 I	3 V / 3 I	1000 Vrms	1700 Vrms	1414 Vpk	2400 Vpk	1000 V _{DC}	12,000 A _{AC}	5000 A _{DC}		Yes
PEL 105	2137.57	5 V / 4 I	4 V / 4 I	1000 Vrms		1414 Vpk	2400 Vpk	1000 V _{DC}	12,000 A _{AC}	5000 A _{DC}		Yes

MODEL	CAT. #	DISTRIBUTION SYSTEMS	PHASE ROTATION	WAVEFORM MODE	TRANSIENT MODE	TRUE INRUSH [®] MODE / TYPE / DURATION	ALARM MODE	SNAPSHOT MODE	HARMONIC MODE / INTERHARMONIC MODE	TYPE LCD	POWER SOURCE
8333	2136.10	1 P-2 W, 2 P-3 W, 3 P-3 W, 3 P-4 W		Yes		No	10 types / up to 2 active / 4662 recorded	Yes (12)	Yes / No	TFT - 5.7 in diagonal 320 x 240 resolution	External adapter with internal NiMH battery pack
8336	2136.30	1 P-2 W, 1 P-3 W, 2 P-2 W, 2 P-3 W, 2 P-4 W, 3 P-3 W, 3 P-4 W, 3 P-5 W		Yes		Yes (RMS+PEAK & RMS) up to 1 & 10 min	40 types / up to 7 active / 16,362 recorded	Yes (50)	Yes / No	TFT - 5.7 in diagonal 320 x 240 resolution	External adapter with internal NiMH battery pack
8345	2136.35	1 P-2 W, 1 P-3 W, 2 P-2 W, 2 P-3 W, 2 P-4 W, 3 P-3 W, 3 P-4 W, 3 P-5 W		Yes		Yes (RMS+PEAK & RMS) up to 10 & 30 min	40 types / 20,000 w / email notifications	Yes (no limit with SD card)	DC to 127 th order; < 3 % U _{din} / 0 to 62 nd order; < 0.5 % U _{din}	7 in color LCD touch screen: 800 x 480 (WVGA)	External adapter with Li-ion battery pack
8436	2136.43	1 P-2 W, 1 P-3 W, 2 P-2 W, 2 P-3 W, 2 P-4 W, 3 P-3 W, 3 P-4 W, 3 P-5 W		Yes		Yes (RMS+PEAK & RMS) up to 1 & 10 min	40 types / up to 7 active / 16,362 recorded	Yes (50)	Yes / No	TFT - 5.7 in diagonal 320 x 240 resolution	Line Power with internal NiMH battery pack
PEL 52	2137.71	1 P-2 W, 2 P-3 W, 1 P-3 W	Yes				No			Monochrome LCD	Power phase input with internal NiMH battery pack
PEL 102	2137.51	1 P-2 W, 1 P-3 W, 3 P-3 W D2, 3 P-3 W O2, 3 P-3 W Y2, 3 P-3 W D3, 3 P-3 W O3, 3 P-3 W Y, 3P-3 W DB, 3 P-4 W Y, 3 P-4 W YB, 3 P-4 W Y2 1/2, 3 P-4 W D, 3 P-4 W OD, DC-2 W DC-3 W, DC-4 W	Yes			No			Yes / No	None	Line Power with internal NiMH battery pack
PEL 103	2137.52	1 P-2 W, 1 P-3 W, 3 P-3 W D2, 3 P-3 W O2, 3 P-3 W Y2, 3 P-3 W D3, 3 P-3 W O3, 3 P-3 W Y, 3P-3 W DB, 3 P-4 W Y, 3 P-4 W YB, 3 P-4 W Y2 1/2, 3 P-4 W D, 3 P-4 W OD, DC-2 W DC-3 W, DC-4 W	Yes			No			Yes / No	Monochrome LCD	Line Power with internal NiMH battery pack
PEL 105	2137.57	1 P-2 W, 1 P-3 W, 3 P-3 W D2, 3 P-3 W O2, 3 P-3 W Y2, 3 P-3 W D3, 3 P-3 W O3, 3 P-3 W Y, 3P-3 W DB, 3 P-4 W Y, 3 P-4 W YB, 3 P-4 W Y2 1/2, 3 P-4 W D, 3 P-4 W OD, DC-2 W DC-3 W, DC-4 W	Yes			No			Yes / No	Monochrome LCD	Power phase input or external adapter with internal NiMH battery pack

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DataView[®] Data Analysis and Reporting Software

Configure all functions:

- Display and analyze real-time data on your PC
- Configure functions and parameters from your PC
- Customize views, templates and reports to your exact needs
- Create and store a complete library of configurations that can be uploaded as needed
- Zoom in and out and pan through sections of the graph to analyze the data
- Download, display and analyze recorded data
- Display waveforms, trend graphs, harmonic spectrums, text summaries, transients, event logs and stored alarms
- Print reports using standard or custom templates you design
- Free updates available



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.

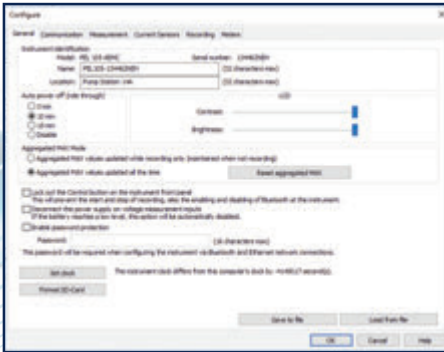


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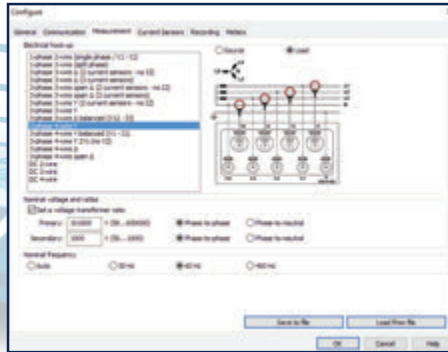
DataView® Data Analysis and Reporting Software



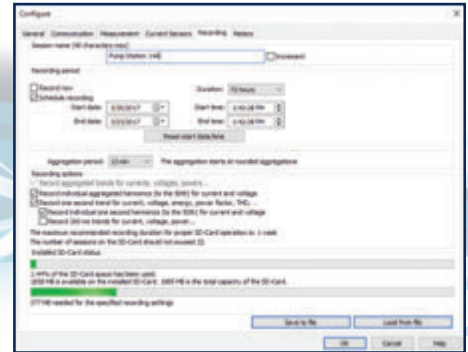
DataView® software, user manual and quick start guide are included in the USB Drive



Configure basic information regarding Auto Power OFF, instrument name and location, display contrast and brightness (*Models PEL 103 & PEL 105*), setting of the real-time clock and SD-card formatting is easily accomplished from the General tab.



The Measurement tab specifies the electrical distribution system, voltage ratios, and nominal frequency.

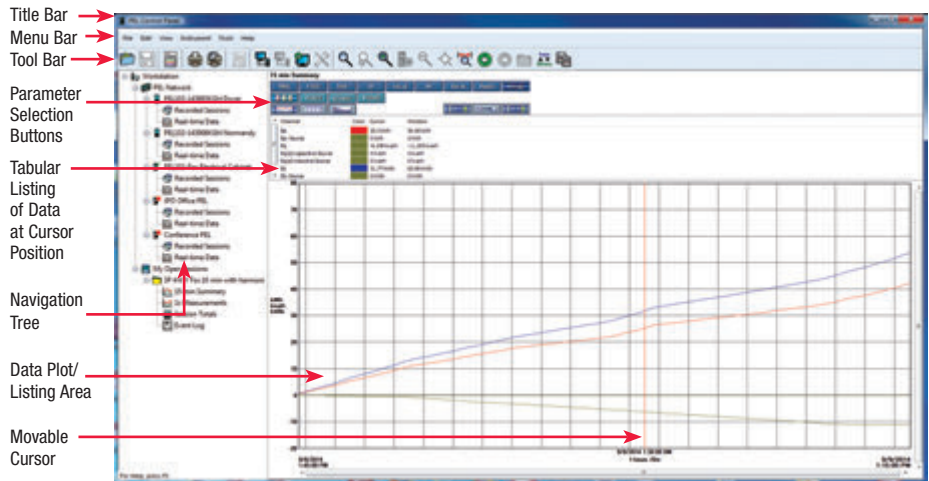


In the Recording tab, configure the instrument to measure (*and record*) over a user selectable recording period. Select demand intervals and view available memory for data storage.

Typical DataView® Functional Digital & Graphical Display

Control Panel Trend View

In the PEL Control Panel you will find all the necessary tools and selection buttons to review recorded data as trend plots or tabular lists.



NEW! Effortlessly Perform Load Study Analysis Meeting the NEC 220.87 Requirements with the PEL DataView® Control Panel Feature