

# POWER QUALITY ANALYZERS, METERS & LOGGERS



### MODEL 8220

A measurement tool for electrical parameters and distribution network disturbances

### SPECIFICATIONS

MODEL	8220
<b>ELECTRICAL</b>	
<b>Voltage (TRMS)</b>	Phase-to-Phase: 660V; Phase-to-Neutral: 600V
<b>Current (TRMS)</b>	MN Clamp: 0.2 to 6A/120A or 2 to 240A MR Clamp: 10 to 1000Aac, 10 to 1400Adc SR Clamp: 3 to 1200A MiniFlex <sup>®</sup> : 10 to 1000A AmpFlex <sup>®</sup> : 10 to 6500A <sup>(1)</sup>
<b>Frequency (Hz)</b>	40 to 70Hz
<b>Other Measurements</b>	kW, kvar, PF, DPF, kVA, kWh, kvarh, VAh, Phase Rotation, Temperature, RPM, Resistance, Continuity, Diode Test
<b>Harmonics</b>	1 <sup>st</sup> to 50 <sup>th</sup>
<b>Sampling Frequency</b>	256 samples / cycle
<b>Data Storage</b>	Stores nine sets of readings totaling up to 99 snapshots for volts, amps, power and harmonics
<b>Power Source</b>	Six 1.5V AA Alkaline batteries (included)
<b>Battery Life</b>	≥8 hrs with display on ≥40 hrs with display off (recording mode)
<b>MECHANICAL</b>	
<b>Communication Port</b>	Optically isolated USB
<b>Display</b>	Three-line backlit color LCD digital display with custom icons and adjustable brightness & contrast
<b>Dimensions</b>	8.3 x 4.3 x 2.4" (211 x 108 x 60mm)
<b>Weight</b>	1.9lbs (0.88kg)
<b>Safety Rating</b>	EN 61010, 600V CAT III, IP54, Pollution Degree 2

(1) Crest factor at 6500 = 1

### METERS INCLUDE

#### 8220

Meter, 10ft. color-coded voltage leads and alligator clips (red/black), optical USB cable, six 1.5V batteries, two safety test probes, carrying bag, and USB drive supplied with DataView<sup>®</sup> software and user manual.



SEE PAGES 123 & 124 FOR MORE OPTIONAL ACCESSORIES



### FEATURES

- Measures up to 660Vrms or Vbc
- Measures up to 6500Aac or 1400Adc (probe dependent)
- Displays Min, Max and Average Volts and Amps, Crest Factor, Peak Value and K-Factor
- Calculates and displays Watts, vars and VA, Power Factor and Displacement Power Factor for single-phase and balanced three-phase
- Measures and records power systems (kW, kVA, kvar)
- Energy metering (kAh, kvarh, kWh)
- Displays total harmonic distortion (THD-F and THD-R) for voltage and current
- Displays individual harmonic values and % for volts and amps through the 50<sup>th</sup> harmonic
- The Max and Min RMS measurements are calculated every half-period
- Captures and displays inrush current
- Calculates and displays phase rotation and RPM
- Displays temperature in both °F and °C
- Displays resistance up to 2000Ω
- Conducts continuity and diode tests
- Stores up to 99 complete sets of readings for all volt, amp, power and harmonic measurements
- Operates on batteries or optional power adapter
- Download stored data snapshots to DataView<sup>®</sup> software via optical USB cable (included)
- Includes FREE DataView<sup>®</sup> software for configuring data retrieval, real-time waveform display, analysis and report generation

CATALOG NO.	DESCRIPTION
2130.90	Power Quality Meter Model 8220 (no probes)
2130.93	Power Quality Meter Model 8220 193-24-BK (Sensor)
2130.96	Power Quality Meter Model 8220 w/MN193-BK (Probe)

### MODEL PEL 102

Monitor your energy usage & costs locally or from anywhere in the world!



### FEATURES

- Simple-to-use, single-, dual- (split-phase) and three-phase (Y, Δ) power & energy loggers
- Designed to work in 1000V CAT III and 600V CAT IV environments and fits in many distribution panels
- Power measurements: kVA, kW and kvar
- Energy measurements: kVAh, kWh (source, load) and kvarh (quadrant indication)
- Updated features in DataView® software for configuring real-time communication with a PC and report generation with pre-defined or user defined templates
- 8GB SD card supplied, can be upgraded up to 32GB
- USB, LAN, Ethernet and Bluetooth (Class 1 wireless communication, up to 300ft away)
- Satisfies the monitoring requirements of NEC Code 220.87
- Power adapter allows the PEL 102 to be powered from a phase measurement input
- Provides all the necessary functions for power and energy data logging for 50Hz, 60Hz, 400Hz and DC distribution systems
- Automatic recognition of the connected current sensors/probes
- Magnetic case – can be mounted inside power panel

### ACCESSORIES



\*ADAPTER SOLD SEPARATELY  
Cat. # 2137.77

Phase  
Powered

### CAT #2137.51 INCLUDES

#### PEL 102 KIT

Small classic tool bag, three MiniFlex® MA193-10-BK sensors, 5ft USB cable, four black test leads and alligator clips, power cord, twelve color-coded ID markers, safety data sheet, compliance sheet, SD-Card with USB-SD-Card reader, quick start user guide, and USB drive supplied with DataView® software and user manual.



#### ANDROID™ APP AVAILABLE

### FOR PEL 102, 103 & 105!

Configure Measurements and Recordings

Display Data in Real-Time

For Use on Devices with an Android Platform



SEE PAGES 123 & 124 FOR MORE OPTIONAL ACCESSORIES

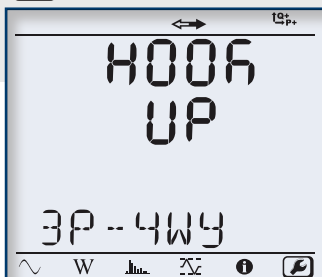
CATALOG NO.	DESCRIPTION
2137.51	Power & Energy Logger Model PEL 102 (no LCD w/3 MA193-10-BK Sensors)
2137.61	Power & Energy Logger Model PEL 102 (no LCD or Sensors)
2137.77	Adapter–Power Adapter for use with Models PEL 102 & PEL 103



### MODEL PEL 103

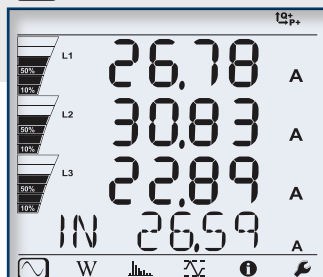
#### Large Functional Displays

##### INFORMATION MODE



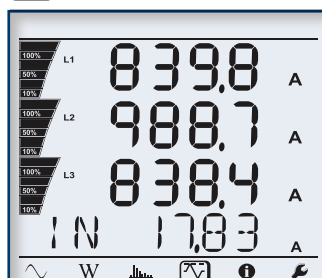
Hook up, voltage and current ratios and aggregation period can be configured from the front panel of the PEL 103.

##### MEASUREMENT MODE



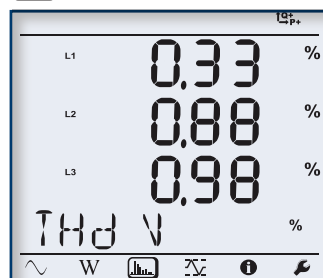
Real-time updates are displayed for voltage, current, power, frequency, power factor and tangent.

##### MAX MODE



Max values for voltage, current (including neutral current), power and harmonics.

##### HARMONIC MODE



Total Harmonic Distortion (THD) can be displayed by phase or phase to phase. Neutral current THD can also be displayed.

#### FEATURES

- Simple-to-use, single-, dual- (split-phase) and three-phase (Y, Δ) power & energy loggers
- Designed to work in 1000V CAT III and 600V CAT IV environments and fits in many distribution panels
- Power measurements: kVA, kW and kvar
- Energy measurements: kVAh, kWh (source, load) and kvarh (quadrant indication)
- Updated features in DataView® software for configuring real-time communication with a PC and report generation with pre-defined or user defined templates
- 8GB SD card supplied, can be upgraded up to 32GB
- USB, LAN, Ethernet and Bluetooth (Class 1 wireless communication, up to 300ft away)
- Satisfies the monitoring requirements of NEC Code 220.87
- PEL 103 can be configured from front panel, DataView® control panel or the FREE Android™ application
- Provides all the necessary functions for power and energy data logging for 50Hz, 60Hz, 400Hz and DC distribution systems
- Automatic recognition of the connected current sensors/probes
- Magnetic case – can be mounted inside power panel
- Supports 17 network configurations



#### CAT #2137.52 INCLUDES



##### PEL 103 KIT (W/ LCD)

Small classic tool bag, three MiniFlex® MA193-10-BK sensors, 5ft USB cable, four black test leads and alligator clips, power cord, twelve color-coded ID markers, safety data sheet, compliance sheet, SD-Card with USB-SD-Card reader, quick start user guide, and USB drive supplied with DataView® software and user manual.

#### ACCESSORIES

\*ADAPTER SOLD SEPARATELY

Cat. # 2137.77



#### CATALOG NO. DESCRIPTION

2137.52	Power & Energy Logger Model PEL 103 (with LCD w/3 MA193-10-BK Sensors)
2137.62	Power & Energy Logger Model PEL 103 (with LCD, no Sensors)
2137.77	Adapter-Power Adapter for use with Models PEL 102 & PEL 103





### MODEL PEL 105

Three-Phase Power and Energy Logger  
Watertight...great for outdoor use!

### CAT #2137.59 INCLUDES

#### PEL 105 Kit

Extra-large tool bag, accessory pouch, 5ft USB cable, five 10ft black voltage leads (watertight cap) with alligator clips, power adapter 110/230V with US power cord, four water-tight AmpFlex® 196A-24-BK (not included with Cat. #2137.57), 9.6V NiMH battery, 8GB SD-card, USB SD-card reader, twelve color-coded input ID markers, quick start guide, and a USB drive supplied with DataView® software and user manual.



cover closed



### FEATURES

- Simple-to-use, single-, dual- (split-phase) and three-phase (Y, Δ) power & energy loggers
- Designed to work in 1000V CAT III and 600V CAT IV environments
- Supports 17 different network connections
- Power measurements: kVA, kW and kvar
- Energy measurements: kVAh, kWh (source, load) and kvarh (four quadrant indication)
- Includes DataView® software for configuring, real-time display, analysis and report generation
- 8GB SD card supplied, can be upgraded up to 32GB
- USB, LAN, Ethernet, Wi-Fi and Bluetooth communication (Class 1 wireless communication, up to 300ft away)
- Satisfies the monitoring requirements of NEC Code 220.87
- PEL 105 can be configured from front panel, DataView® control panel or the FREE Android™ application
- Provides all the necessary functions for power and energy data logging for 50Hz, 60Hz, 400Hz and DC distribution systems
- Automatic recognition of the connected current sensors/probes
- Powers directly from phase input
- Pole mountable

### ACCESSORIES

#### POLE MOUNTING KIT

Catalog #2137.82 (optional)  
Set of two, with hardware



CATALOG NO.	DESCRIPTION
2137.57	Power & Energy Logger Model PEL 105 w/o Sensors (Watertight IP67)
2137.59	Power & Energy Logger Model PEL 105 w/4 196A-24-BK (AmpFlex® - Watertight IP67)
2137.82	Pole Mounting Kit

# POWER QUALITY ANALYZERS, METERS & LOGGERS

## POWER & ENERGY LOGGERS PEL 100 SERIES

### SPECIFICATIONS

MODELS		PEL 102, PEL 103 & PEL 105		
GENERAL				
Sampling Frequency		128 samples per cycle; 50/60Hz (16 samples/cycle 400Hz)		
Data Storage Rate		1 per second (200ms also available on PEL 105)		
Demand Period Storage Rate		User selectable (1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60 minutes)		
Recorded Parameters (Single- and Poly-Phase)		V, I, W, VA, var, PF, Tan, Wh, VAh, varh, THD (V and I), Individual harmonics (from 1 through 50 per phase); Crest Factor (CF), Cos f / DPF		
Event Log		Tracks and records status changes and error messages along with recorded data		
Front Panel Indicator LEDs		Bluetooth active, recording in progress, phase connection reversal, overload, battery charging and SD Card status		
Storage Capacity		8GB SD card included / SD cards up to 32GB formatted FAT32 are supported		
INPUTS	Voltage	PEL 102/103 – 3 input channels; PEL 105 – 4 input channels via 4mm safety banana jacks		
	Current	PEL 102/103 - 3 input channels; PEL 105 – 4 input channels via custom 4 pin jacks that accept AEMC <sup>®</sup> probes and sensors		
ELECTRICAL				
VOLTAGE MEASUREMENT		RANGE	RESOLUTION*	ACCURACY*
	50/60Hz	42.5 to 69Hz	–	±0.1Hz
Single-Phase RMS Voltages		10 to 1000Vrms	0.1V	±0.2% Rdg ±0.2V
Phase-to-Phase RMS Voltages		17 to 1700Vrms	0.1 to 1V	±0.2% Rdg ±0.4V
	400Hz	340 to 460Hz	–	–
Single-Phase RMS Voltages		10 to 600Vrms	0.1V	±1% Rdg ±1V
Phase-to-Phase RMS Voltages		17 to 1200Vrms	0.1 to 1V	±1% Rdg ±1V
	DC	100 to 1000V	0.1V	±1% Rdg ±3V (typical)
PT Ratios		Programmable from 50V to 650,000V	–	0.01 to 0.1V
CURRENT MEASUREMENT		A193*** (PEL 102/103)	196A*** (PEL 105)	
Nominal range for current probes supplied with kit. See chart on Pages 26 and 27 for other probes		200mA to 10,000A	200mA to 10,000A	–
CT Ratios		Programmable from 1:1 to 25,000:1 (probe dependent)		
POWER MEASUREMENTS		RANGE	RESOLUTION*	ACCURACY*
Active Power (P)*		-2 to 2GW	0.001W	±0.5% Rdg ±0.005% Pnom
Reactive Power (Q)*		-2 to 2Gvar	0.001var	±1% Rdg ±0.01% Qnom
Apparent Power (S)*		0 to 2GVA	0.001VA	±0.5% Rdg ±0.005% Snom
Power Factor		-1 to 1	0.001	±0.05
Tangent φ (active/reactive power ratio)		-3.2 to 3.2	0.001	±0.02
ENERGY MEASUREMENTS		RANGE	RESOLUTION*	ACCURACY*
Active Energy (EP)		0 to 4 x 10 <sup>8</sup>	1Wh	±0.5% Rdg
Reactive Energy (EQ)		0 to 4 x 10 <sup>8</sup>	1varh	±2% Rdg
Apparent Energy (ES)		0 to 4 x 10 <sup>8</sup>	1Vah	±0.5% Rdg
THD		±655%		
Individual Harmonics		1 to 50 displayed in percentage; 1 to 7 at 400Hz		
External Supply		110V/250V (10%) @ 50/60Hz; 400Hz		
Power From Phase Measurement		PEL 102/103 requires optional Power Adapter Cat #2137.77; PEL 105 Internal up to 1000Vac		
Back-Up Power Source/Charge Time		Rechargeable 8.4V NiMH battery pack / Approximately 5 hours		
Battery Life		30 minutes minimum, 60 minutes typical		
MECHANICAL				
Communication Ports		USB 2.0, Ethernet (RJ45), Wireless Bluetooth Class 1 **/ Wi-Fi (PEL 105 only)		
Dimension/Weight		10.08 x 4.92 x 1.46" (256 x 125 x 37mm) / 2.20lbs (1kg) (PEL 102 & PEL 103); 9.8 x 7.8 x 2.6" (250 x 200 x 67mm) / 8.8lbs (4kg) (PEL 105)		
Case		Double insulated, rubber over-molded, polycarbonate UL94 V1 rated		
DISPLAY				
Display Type for Model PEL 103 / PEL 105		2.63 x 2.16" (67 x 55mm), four line, monochrome, backlit LCD with adjustable brightness and contrast		
ENVIRONMENTAL / SAFETY				
Operating Temperature/Relative Humidity		50° to 122°F (10° to 50°C) / up to 85%; 32° to 108.5°F (0° to 42.5°C) / up to 85% (PEL 103 & PEL 105)		
Storage Temperature		-4° to 122°F (-20° to 50°C) with batteries; -4° to 158°F (-20° to 70°C) without batteries		
Safety Rating/CE Rating		Complies with IEC 61010-1, and IEC 61010-2-030 for 1000V CAT III / 600V CAT IV (PEL 102 & PEL 103) & 1000V CAT IV (PEL 105), Pollution Degree 2 / Yes		
Index of Protection		IP54 non operating (PEL 102 & PEL 103) / IP67 with cover closed (PEL 105)		

\* Maximum value is current probe dependent.

\*\* Computers with Class II Bluetooth will restrict range to 40ft. Computers without Bluetooth will require a Class I or Class II Bluetooth radio adapter.

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

# POWER QUALITY ANALYZERS, METERS & LOGGERS

## THREE-PHASE POWER QUALITY ANALYZER



MODEL #8333

MODEL #8336

### POWERPAD® III MODEL 8333 & MODEL 8336

SD card for trend recordings and data storage,  
extensive memory for high snapshot quantity,  
captured transients/inrush and alarm events

## SPECIFICATIONS

MODEL	8333	8336
Input Terminals	4 voltage / 3 current	5 voltage / 4 current
Inputs	3 voltage / 3 current	4 voltage / 4 current
Voltage (TRMS AC+DC)	2 to 1000V	
Voltage Ratio	up to 500kV	
Current (TRMS AC+DC)	MN93: 500mA to 200Aac; MN193: 0.005 to 100Aac SR193 Clamp: 1A to 1000Aac AmpFlex® or MA193 Clamps: 100mA to 10000Aac MR193 Clamp: 1A to 1300Aac/dc SL261 Clamp: 50mA to 100Aac/dc Current Ratio: up to 60kA	
Frequency (Hz)	40 to 69Hz	
Distribution Systems	1P 2W, 1P 3W, 2P 2W, 2P 3W, 2P 4W, 3P 3W, 3P 4W, Split-Phase 2W & 3W & Aron meters	1P 2W, 1P 3W, 2P 2W, 2P 3W, 2P 4W, 3P 3W, 3P 4W and 3p 5W, 2 ½ Element & Aron meters
Power Values	W, VA, var, VAD, PF, DPF, cos $\phi$ , tan $\phi$	
Energy Values	Wh, varh, VAh, VADh	
Harmonics	1 <sup>st</sup> to 50 <sup>th</sup> , Direction, Sequence; THD: 0 to 50, phase	
Transients	up to 51	up to 210
Flicker (Pst)	Yes	
Unbalance	Yes	
Recording	Yes	
Alarm Mode	10 types; 4000 recorded	40 types; 16,000 recorded
Peak	Yes	
Phasor Display	Automatic	
Display	Color ¼ VGA TFT screen (320 x 240) diagonal 5.82" (148mm)	
Snapshots	12	50
Electrical Safety	IEC 61010, 1000V CAT III / 600V CAT IV	
Protection	IP53	
Languages	more than 27	
Communication Interface	USB	
Battery Life	>13 hrs, 25 hrs in Record Mode	
Power Supply	9.6V NiMH rechargeable battery pack (included) External AC supply: 110/230Vac $\pm$ 10% (50/60Hz)	
Dimensions / Weight	9.8 x 7.8 x 2.6" (240 x 180 x 55mm) / 4.3lbs (1.95kg)	



## METER INCLUDES

### MODEL 8333

Four black 10ft voltage leads, 5ft USB cable, four black alligator clips, twelve color-coded input ID markers, NiMH battery, 110/240V power adapter with US power cord, carrying bag, soft carrying pouch, and USB drive supplied with product user manual and DataView® software.



### MODEL 8336

Five black 10ft voltage leads, five black alligator clips, twelve color-coded input ID markers, USB cable, NiMH battery, 110/240V power adapter with US power cord, large classic tool bag, soft carrying pouch, quick start user guide, and USB drive supplied with product user manual and DataView® software.



## KIT OPTION INCLUDES

### MODEL 8333

AS ABOVE, WITH AMPFLEX® 193 FLEXIBLE CURRENT PROBE (10KA)  
Catalog #2136.11, 24" rated 600V CAT IV



OR

AS ABOVE, MN193 CURRENT PROBE (5A/100A)  
Catalog #2136.12, Rated 600V CAT III



### MODEL 8336

AS ABOVE, WITH AMPFLEX® 193 FLEXIBLE CURRENT PROBE (10KA)  
Catalog #2136.31, 24" rated 600V CAT IV



OR

AS ABOVE, MN193 CURRENT PROBE (5A/100A)  
Catalog #2136.32, Rated 600V CAT III



## ACCESSORIES

PHASE POWER ADAPTER FOR MODELS 8333 & 8336  
Catalog #2140.77 (optional)





# POWER QUALITY ANALYZERS, METERS & LOGGERS

## THREE-PHASE POWER QUALITY ANALYZER



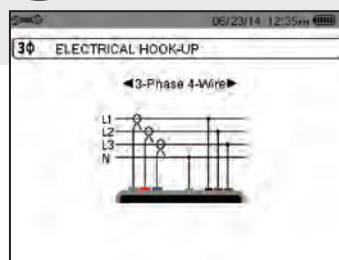
\* Registration must take place within 30 days of purchase

### FEATURES

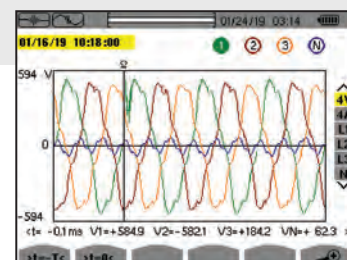
- True RMS single-, two- and three-phase measurements at 256 samples/cycle, plus DC
- Real-time color waveforms
- Easy-to-use on-screen setup
- Automatic current probe recognition and scaling
- True RMS voltage and current measurement
- Measures DC volts, amps and power
- Displays and captures voltage, current and power harmonics to 50<sup>th</sup> order, including direction, in real-time
- Captures transients down to 1/256<sup>th</sup> of a cycle
- Stores comprehensive data base of logged data
- Phasor diagram display
- kVA, kvar and kW per phase and total
- kVAh, kvarh and kWh per phase and total
- Neutral current calculated and displayed for three-phase
- Transformer K-Factor display (8220 and 8230)
- Transformer Factor K display (8333, 8336, 8436)
- Power Factor, displacement PF display
- Captures up to 51 transients
- Short term flicker display
- Phase unbalance (current and voltage)
- Harmonic Distortion (total and individual) from 1<sup>st</sup> to 50<sup>th</sup>
- Alarms, surges and sags
- Screen snapshot function captures waveforms or other information on the display
- Includes FREE DataView<sup>®</sup> software for configuring data retrieval, real-time display, analysis and report generation

### Large Color Functional Displays

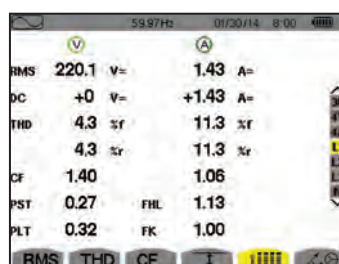
#### CONFIGURATION



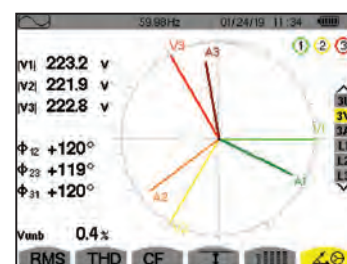
#### TRANSIENT MODE



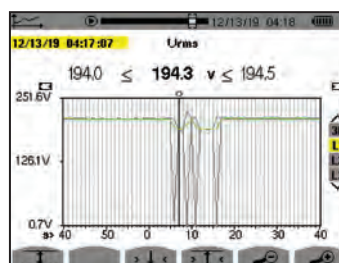
#### POWER AND ENERGY MODE



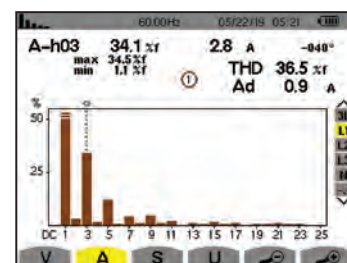
#### PHASOR DIAGRAM



#### RECORDING MODE



#### HARMONICS MODE



#### CATALOG NO.

#### DESCRIPTION

2136.10	PowerPad <sup>®</sup> III Model 8333 (no probes)
2136.11	PowerPad <sup>®</sup> III Model 8333 w/3 193-24-BK AmpFlex <sup>®</sup> Sensors
2136.12	PowerPad <sup>®</sup> III Model 8333 w/3 MN193-BK Probes
2136.30	PowerPad <sup>®</sup> III Model 8336 (no probes)
2136.31	PowerPad <sup>®</sup> III Model 8336 w/4 193-24-BK Sensors
2136.32	PowerPad <sup>®</sup> III Model 8336 w/4 MN193-BK Probes
2133.73	Extra Large Classic Tool Bag
2140.28	AC/DC Current Probe Model MR193-BK
2140.32	AC Current Probe Model MN193-BK
2140.33	AC Current Probe Model SR193-BK
2140.34	AmpFlex <sup>®</sup> Sensor 24" Model 193-24-BK
2140.35	AmpFlex <sup>®</sup> Sensor 36" Model 193-36-BK
2140.36	AC Current Probe Model MN193-BK
2140.40	BNC Adapter for use with AC/DC Current Probe Model SL261 & Models 8220, 8333, 8335, 8336, 8435, 8436, & PEL Series
2140.44	Lead, 110ft (3m) black lead w/black alligator clip
2140.48	MiniFlex <sup>®</sup> Sensor 10" Model MA193-10-BK
2140.50	MiniFlex <sup>®</sup> Sensor 14" Model MA193-14-BK
2140.77	Adapter - Phase Power Adapter for use with PowerPad Models 8333 & 8336



cover closed



Captures & records  
transients, events &  
waveforms  
simultaneously!



\* Registration must take place  
within 30 days of purchase



cover closed

Supplied with an 8GB SD card for storing  
up to 2GB trend recordings

Four current and five voltage input terminals

### SPECIFICATIONS

MODEL	8436
<b>ELECTRICAL</b>	
<b>Sampling Frequency</b>	256 samples/cycle
<b>Data Storage</b>	SD card for trend recording; Additional separate 12.5MB partitioned memory for snapshots, transient/inrush & alarms
<b>Voltage (TRMS)</b>	Phase-to-Phase: 2000V Phase-to-Neutral: 1000V Voltage Ratio: up to 500kV
<b>Current (TRMS)</b>	MN Clamp: 0 to 6A/120A or 0 to 240A SR Clamp: 0 to 1200A MR Clamp: 0 to 1000Aac, 0 to 1400Adc MiniFlex <sup>®</sup> : 10 to 3000A AmpFlex <sup>®</sup> : 10 to 10kA(1) SL261 Clamp: 50mA to 100Aac/dc J93: 50 to 3500Aac/dc Current Ratio: 10mA to 50kA
<b>Frequency (Hz)</b>	40 to 69Hz
<b>Other Measurements</b>	kW, kvar, kVA, PF, DPF, kWh, kvarh, kVAh, Factor K, Flicker
<b>Harmonics</b>	1st to 50th, Direction, Sequence
<b>Power Source</b>	9.6V NiMH rechargeable battery pack (included) 110V to 1000V DC to 400Hz
<b>Battery Life</b>	≥8 hours with display on; ≤35 hours with display off (record mode)
<b>MECHANICAL</b>	
<b>Communication Port</b>	Optically isolated USB
<b>Display</b>	¼ VGA (320 x 240) color LCD display with adjustable brightness & contrast
<b>Dimensions</b>	10.6 x 9.8 x 7.1" (270 x 250 x 180mm)
<b>Weight</b>	8.2lbs (3.7kg) with batteries
<b>Safety Rating</b>	EN 61010, 600V CAT IV(2), 1000V CAT III, Pollution Degree 2

(1) Crest factor at 6500=1.

(2) When used with SR193 or AmpFlex<sup>®</sup> probes.  
600V CAT III with MN193 or MR193 probes.

### FEATURES

- Measurement of TRMS voltages up to 1000Vrms AC/DC for two-, three-, four- or five-wire systems
- Measurement of TRMS currents up to 10,000Arms (sensor dependent)
- 65µs sample rate
- Direct measurement of neutral current & 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, exceedence of power and harmonic thresholds)
- 2GB 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<sup>®</sup> software for configuring, real-time display, analysis and report generation

### KIT OPTION INCLUDES

#### 8436 KIT

Cat. #2136.44

Extra large tool bag, accessory pouch,  
5ft USB cable, five 10ft black voltage  
leads with alligator clips, 110V US  
power cord, line power adapter  
110-1000V DC to 400Hz, four water-tight  
AmpFlex<sup>®</sup> 196A-24-BK, NiMH battery,  
SD card, twelve color-coded input ID  
markers, quick start guide, and a USB  
drive containing DataView<sup>®</sup> software  
and user manual.



# POWER QUALITY ANALYZERS, METERS & LOGGERS

## THREE-PHASE POWER QUALITY ANALYZER

Large Color Functional Displays

### 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.



Cat. #2140.73  
Lead & Alligator Clip



Cat. #5000.63  
Power Cord



Cat. #2140.75  
(For Cat. #2136.44 only)  
AmpFlex® Sensor

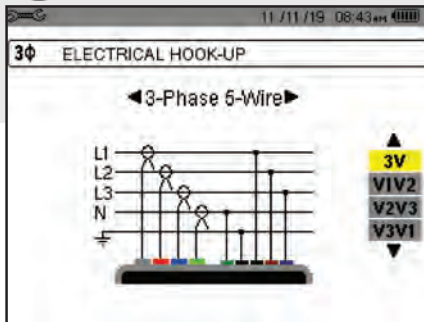


Cat. #5000.89  
Line Power Adapter

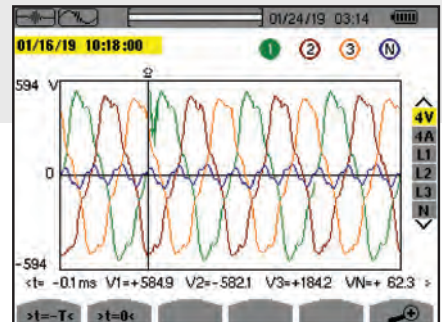


Cat. #2137.82 (Optional)  
Pole Mounting Kit

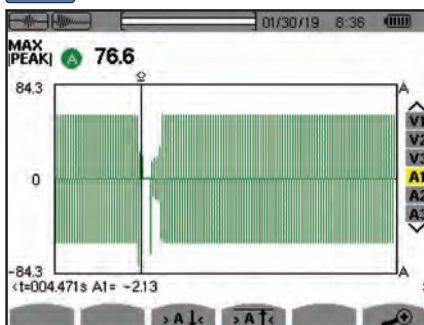
### Configuration



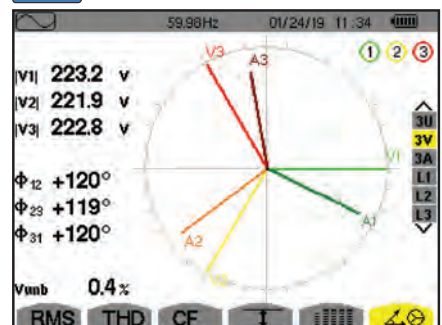
### Transient Mode



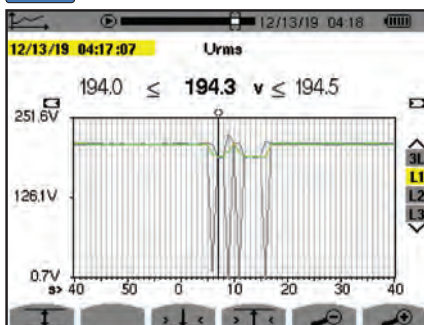
### Inrush Peak



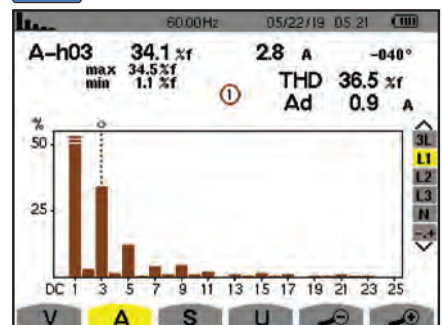
### Phasor Diagram



### Trend Analysis



### Harmonics Mode



CATALOG NO.	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)
<b>Accessories and Replacement Parts (Optional)</b>	
2133.73	Extra Large Classic Tool Bag
2137.82	Pole Mounting Kit
2140.19	Replacement – Battery 9.6V NiMH
2140.45	Replacement – Set of 12, Color-coded Input ID Markers
2140.73	Lead – One 10ft (3M) Black Lead (Waterproof cap) [Rated 1000V CATIV] & one Black Alligator Clip (Rated 1000V CAT IV, 15A,UL)
2140.75	AmpFlex® Sensor 24" (waterproof - IP67) Model 196A-24-BK
5000.43	Probe - Set of 2, Color-coded (Red/Black) Magnetized Voltage Probes [Rated 600V CATIV, 1000V CATIII]
5000.63	Power Cord 110V for use only with Models 8435 & 8436
5000.77	Cable Reeling Box
5000.89	Line Power Adapter 110-1000V DC to 400Hz (Replacement - for use only with Model 8436)



# POWER QUALITY ANALYZERS, METERS & LOGGERS




## OPTIONAL ACCESSORIES

SENSOR TYPE	CURRENT RANGE	ACCURACY (TYPICAL)	TYPICAL ERROR ON $\Phi$ AT 50/60HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	LIMITED RANGE IF USED WITH MODEL	CATALOG NUMBER
<b>MiniFlex® MA193-BK*</b>  10" or 14" sensor	100mA to 3000A <sub>AC</sub>	±1%	0°	2.75" (70mm)	PEL 102 PEL 103 PEL 105 8333 8336	8220 8230	2140.48 (10" sensor)
							2140.50 (13.93" sensor)
<b>MR193-BK</b>  Battery operated	1 to 1000A <sub>AC</sub> 1 to 1300A <sub>DC</sub>	±2.5%	-0.80°	1.6" (41mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336	N/A	2140.28
<b>SR193-BK</b> 	1 to 1200A <sub>AC</sub>	±0.3%	0.2°	2.05" (52mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336	N/A	2140.33
<b>AmpFlex® 193-BK*</b>  24" or 36" sensor	100mA to 12,000A <sub>AC</sub>	±1%	0°	7.64" (190mm) or 11.46" (290mm)	PEL 102 PEL 103 PEL 105 8333 8336	8220 8230	2140.34 (24" sensor)
							2140.35 (36" sensor)
<b>AmpFlex® 196-24-BK*</b>  Waterproof - 24" sensor IP67	100mA to 12,000A <sub>AC</sub>	±2%	0°	5.73" (145mm)	PEL 105 8436	N/A	2140.75 (24" sensor)

\*Maximum current reduced by a factor of 2 for 400Hz fundamental frequency.  
 All current sensors can be used with Models PEL 105, 8435 and 8436.  
 However, only the 196A-24-BK flexible sensors are waterproof.

# POWER QUALITY ANALYZERS, METERS & LOGGERS

## OPTIONAL ACCESSORIES

SENSOR TYPE	CURRENT RANGE		ACCURACY (TYPICAL)	TYPICAL ERROR ON AT 50/60HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	LIMITED RANGE IF USED WITH MODEL	CATALOG NUMBER
<b>MN93-BK</b> 	0.5 to 240Aac		±1%	0.8°	0.78" (20mm)	PEL 102 PEL 103 PEL 105 8333 8336	8220 8230	2140.32
					0.78" (20mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336	N/A	2140.36
<b>MN193-BK</b> 	100A	200mA to 120Aac	±1%	0.75°				
	5A	5mA to 6Aac	±1%	1.7°				
<b>SL261</b> 	100A	5 to 100Aac/dc	±4%	±0.5°	0.46" (11.8mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336	N/A	1201.51
	10A	50mA to 10Aac/dc	±3%	±1°				

All current sensors can be used with models PEL 105, 8435 and 8436.  
However, only the 196A-24-BK flexible sensors are waterproof.

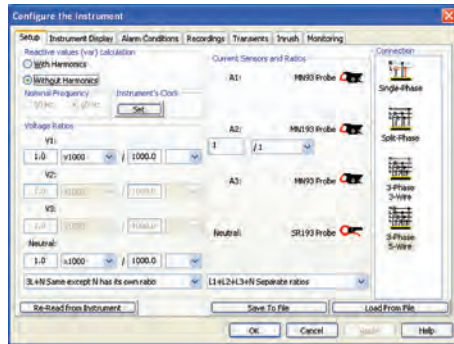
CATALOG NO.	DESCRIPTION
1201.51	AC/DC Current Probe Model SL261 (BNC)
2137.77	Adapter – Power Adapter <b>PEL 102 &amp; PEL 103 only</b>
2140.28	AC/DC Current Probe Model MR193-BK
2140.32	AC Current Probe Model MN93-BK
2140.33	AC Current Probe Model SR193-BK
2140.34	AmpFlex® Sensor 24" Model 193-24-BK
2140.35	AmpFlex® Sensor 36" Model 193-36-BK
2140.36	AC Current Probe Model MN193-BK
2140.37	Adapter – US 110V Power Adapter (eliminates need for batteries) <b>8220 &amp; 8230 only</b>
2140.40	AC/DC Current Probe BNC Adapter <b>Model SL261 only</b>
2140.48	MiniFlex® Sensor 10" Model MA193-10-BK
2140.50	MiniFlex® Sensor 14" Model MA193-14-BK
2140.75	AmpFlex® Sensor 24" (watertight - IP67) Model 196A-24-BK
2140.77	Adapter – Phase Power Adapter for use with PowerPad Models 8333 & 8336

## SOFTWARE FOR POWER QUALITY ANALYZERS & ENERGY LOGGERS

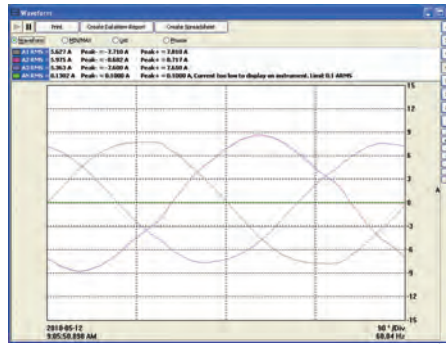
### Configure all functions:

- 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 are available on our website

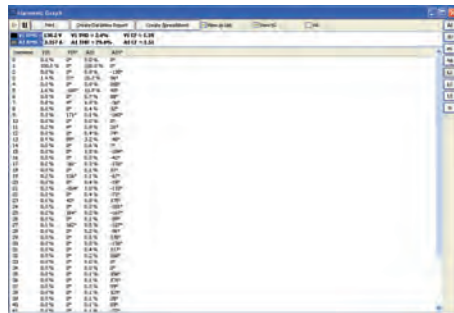
## TYPICAL DATAVIEW® FUNCTIONAL, DIGITAL & GRAPHICAL DISPLAYS



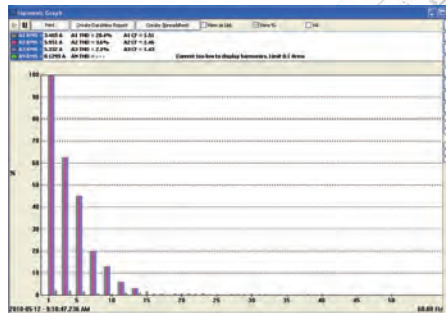
Clear and easy setup of all functions from one tabbed dialog box.



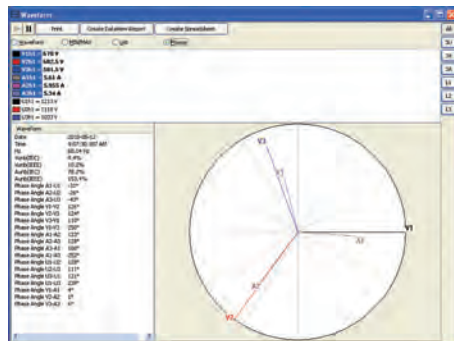
Display real-time waveforms by phase, parameter or total.



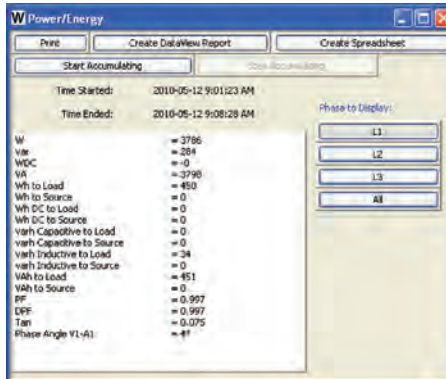
Display harmonics in a text table from harmonic 0 (DC) through the 50th.



Display all harmonics from 1st to 50th in bar graph form for voltage, current and power.



Display harmonics in a text table from harmonic 0 (DC) through the 50th.



Display all harmonics from 1st to 50th in bargraph form for voltage, current and power.





# POWER QUALITY ANALYZERS, METERS & LOGGERS

## SELECTION CHART

AEMC MODEL NUMBER	AEMC CATALOG NUMBER	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
8220	2130.90	1V/1A	1V/1A	600Vrms	660Vrms	850Vpk	935Vpk	600Vdc	6500Aac	1400Adc	Yes	No
8333	2136.10	4V/3I	3V/4I	1000Vrms	2000Vrms	1414Vpk	2828Vpk	1200Vdc	10,000Aac	5000Adc	Yes	Yes
8336	2136.30	5V/4I	4V/4I	1000Vrms	2000Vrms	1414Vpk	2828Vpk	1200Vdc	10,000Aac	5000Adc	Yes	Yes
PEL 102	213751	4V/3I	3V/3I	1000Vrms	1700Vrms	1414Vpk	2400Vpk	1000Vdc	10,000Aac	5000Adc	Yes	Yes
PEL 103	213752	4V/3I	3V/3I	1000Vrms	1700Vrms	1414Vpk	2400Vpk	1000Vdc	10,000Aac	5000Adc	Yes	Yes
PEL 105	213757	4V/3I	3V/3I	1000Vrms	1000Vrms	1414Vpk	2400Vpk	1000Vdc	10,000Aac	5000Adc	Yes	Yes

AEMC MODEL NUMBER	AEMC CATALOG NUMBER	DISTRIBUTION SYSTEMS	PHASE ROTATION	WAVEFORM MODE	TRANSIENT MODE	TRUE INRUSH MODE/TYPE/ DURATION	ALARM MODE	SNAPSHOT MODE	HARMONIC MODE	TYPE LCD	POWER SOURCE
8220	2130.90	1P-2W 3P-3W DB	Yes, 2-Wire Method	Yes, Realtime through <sup>®</sup> DataView (recordable to PC)	No	Yes (RMS) duration: unspecified	No	Yes (99)	Yes	Backlit LCD	6 x AA batteries or external adapter
8333	2136.10	1P-2W, 2P-3W, 3P-3W, 3P-4W	Yes	Yes	Yes	No	10 types/ up to 2 active/ 4662 recorded	Yes (12)	Yes	TFT - 5.7" diagonal 320 x 240 resolution	External adapter with internal NiMH battery pack
8336	2136.30	1P-2W, 1P-3W, 2P-2W, 2P-3W, 2P-4W, 3P-3W, 3P-4W, 3P-5W	Yes	Yes	Yes	Yes (RMS+PEAK & RMS) up to 1 & 10 mins	40 types/ up to 7 active/ 16,362 recorded	Yes (50)	Yes	TFT - 5.7" diagonal 320 x 240 resolution	External adapter with internal NiMH battery pack
PEL 102	213751	1P-2W, 1P-3W, 3P-3W D2, 3P-3W O2, 3P-3W Y2, 3P-3W D3, 3P-3W O3, 3P-3W Y, 3P- 3W DB, 3P-4W Y, 3P-4W YB, 3P-4W Y2 1/2, 3P-4W D, 3P-4WOD, DC-2W DC-3W, DC-4W	Yes	No	No	No	No	No	Yes	None	External adapter with internal NiMH battery pack
PEL 103	213752		Yes	No	No	No	No	No	Yes	Monochrome LCD	
PEL 105	213757		Yes	No	No	No	No	No	Yes		Power phase input or external adapter with internal NiMH battery pack