

Model PEL 102

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



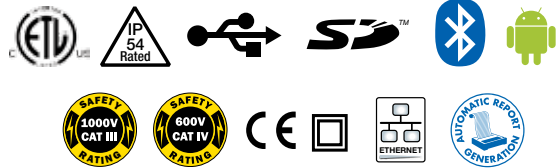
Visit the PEL 100 Series website for more information on software, specifications and more!



Android™ App Available for PEL 102, 103 & 105!



- Configure Measurements and Recordings
- Display Data in Real-Time
- For Use on any Device with an Android Platform



► KIT OPTION INCLUDES

PEL 102 Kit

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



► FEATURES

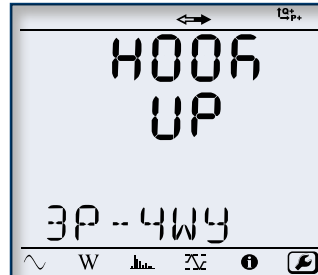
- Simple-to-use, single-, dual- (split-phase) and three-phase (Y, Δ) power & energy loggers
- Designed to work in 1000V CAT III and 600V CAT IV environments and fits in many distribution panels
- Power measurements: VA, W and var
- Energy measurements: VAh, Wh (source, load) and varh (quadrant indication)
- Updated features in DataView® software for configuring real-time communication with a PC and report generation with pre-defined or user defined templates
- USB, LAN, Ethernet and *Bluetooth* (Class 1 wireless communication, up to 300 ft away)
- Satisfies the monitoring requirements of NEC Code 220.87
- AC/DC Current Probe, Model J93, is available for measuring current up to 5000A_{DC} & 3500A_{AC}
- 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

Model PEL 103

Large Functional Displays

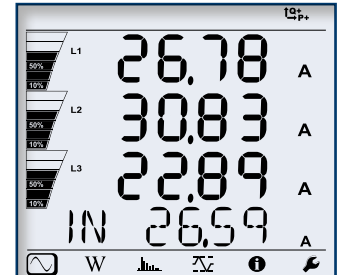


Information Mode



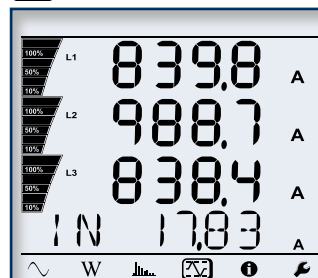
Hook up, voltage and current ratios and aggregation period can be configured from the front panel of the PEL 103.

Measurement Mode



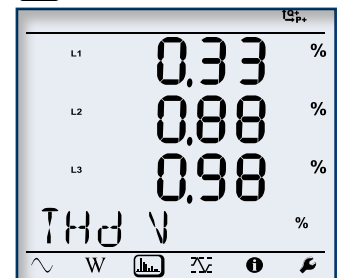
Real-time updates are displayed for voltage, current, power, frequency, power factor and tangent.

Max Mode

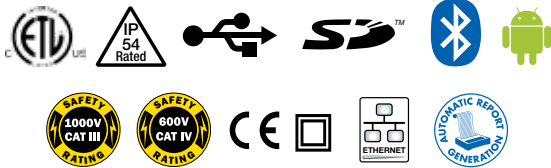


Max values for voltage, current (including neutral current), power and harmonics.

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: VA, W and var
- Energy measurements: VAh, Wh (source, load) and varh (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
- USB, LAN, Ethernet and *Bluetooth* (Class 1 wireless communication, up to 300 ft 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
- AC/DC Current Probe, Model J93, is available for measuring current up to 5000Adc & 3500Aac
- 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

KIT OPTION INCLUDES

PEL 103 Kit

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



POWER QUALITY ANALYZERS, METERS & LOGGERS

Power & Energy Loggers PEL 100 Series

Model PEL 105

Waterproof...great for outdoor use!



▶ KIT OPTION INCLUDES

PEL 105 Kit

Extra-large tool bag, accessory pouch, 5 ft USB cable, five 10 ft black voltage leads (waterproof cap) with alligator clips, power adapter 110/230V with US power cord, four water-tight AmpFlex® A196-24-BK (included with Cat. #2137.59 only), 9.6V NiMH battery, SD-card, USB SD-card reader, twelve color-coded input ID markers, quick start guide, and a USB stick supplied with DataView® software and user manual.



▶ ACCESSORIES

▶ Pole Mounting Kit
Catalog #2137.82 (optional)
Set of two, with hardware



▶ 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: VA, W and var
- Energy measurements: VAh, Wh (source, load) and varh (four quadrant indication)
- Includes DataView® software for configuring, real-time display, analysis and report generation
- USB, LAN, Ethernet, Wi-Fi and Bluetooth communication (Class 1 wireless communication, up to 300 ft 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
- Supports AC/DC Current Probe Model J93 for measuring current up to 5000Adc & 3500Aac
- 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 measurement
- Pole mountable

CATALOG NO.	DESCRIPTION
2137.51	Power & Energy Logger Model PEL 102 (no LCD w/3 MA193-10-BK Sensors)
2137.52	Power & Energy Logger Model PEL 103 (with LCD w/3 MA193-10-BK Sensors)
2137.57	Power & Energy Logger Model PEL 105 w/o Sensors (Waterproof IP67)
2137.59	Power & Energy Logger Model PEL 105 w/4 A916-24-BK (AmpFlex® – Waterproof IP67)
2137.61	Power & Energy Logger Model PEL 102 (no LCD or Sensors)
2137.62	Power & Energy Logger Model PEL 103 (with LCD, no Sensors)
Accessories (Optional)	
2137.77	Adapter–Power Adapter for use with Models PEL 102 & PEL 103
2137.82	Pole Mounting Kit

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 ϕ / 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	SD card included / SD cards up to 32 GB 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 current input channels ; PEL 105 – 4 input channels via custom 4 pin jacks that accept AEMC® probes and sensors		
ELECTRICAL				
VOLTAGE MEASUREMENT		PEL 102/103 RANGE	PEL 105 RANGE	RESOLUTION/ACCURACY*
	50/60Hz	42.5 to 69Hz	42.5 to 69Hz	$\pm 0.1\text{Hz}$
Single-Phase RMS Voltages		10 to 1000Vrms	10 to 1000Vrms	$0.1\text{V} \pm 0.2\% \text{Rdg} \pm 0.2\text{V}$
Phase-to-Phase RMS Voltages		17 to 1700Vrms	17 to 1000Vrms	$0.1 \text{ to } 1\text{V} \pm 0.2\% \text{Rdg} \pm 0.4\text{V}$
	400Hz	340 to 460Hz	340 to 460Hz	–
Single-Phase RMS Voltages		10 to 600Vrms	10 to 600Vrms	$0.1\text{V} \pm 1\% \text{Rdg} \pm 1\text{V}$
Phase-to-Phase RMS Voltages		17 to 1200Vrms	17 to 1200Vrms	$0.1 \text{ to } 1\text{V} \pm 1\% \text{Rdg} \pm 1\text{V}$
	DC	100 to 1000V	10 to 1000V	$0.1\text{V} \pm 1\% \text{Rdg} \pm 3\text{V}$ (typical)
PT Ratios		Programmable from 50V to 650,000V	–	0.01 to 0.1V
CURRENT MEASUREMENT		A193***	A196***	
Nominal range for current probes supplied with kit. See chart on Pages 26 and 27 for other probes		200mA to 3000Arms	200mA to 10,000A	–
CT Ratios		Programmable from 1:1 to 25,000:1 (probe dependent)		
POWER MEASUREMENTS				
Active Power (P)*		-2 to 2GW	0.001W	$\pm 0.5\% \text{Rdg} \pm 0.005\% \text{Pnom}$
Reactive Power (Q)*		-2 to 2Gvar	0.001var	$\pm 1\% \text{Rdg} \pm 0.01\% \text{Qnom}$
Apparent Power (S)*		0 to 2GVA	0.001VA	$\pm 0.5\% \text{Rdg} \pm 0.005\% \text{Snom}$
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				
Active Energy (EP)		0 to 4 x 10 ⁹	1Wh	$\pm 0.5\% \text{Rdg}$
Reactive Energy (EQ)		0 to 4 x 10 ⁹	1varh	$\pm 2\% \text{Rdg}$
Apparent Energy (ES)		0 to 4 x 10 ⁹	1Vah	$\pm 0.5\% \text{Rdg}$
THD			$\pm 655\%$	
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		
Mounting/Security		Kensington anti-theft system (PEL 102 & PEL 103) / Embedded magnets on back side, keyhole slot on back side		
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%		
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:Ed3, and IEC 61010-2-030: Ed1 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.

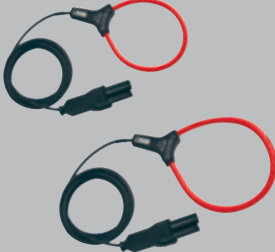


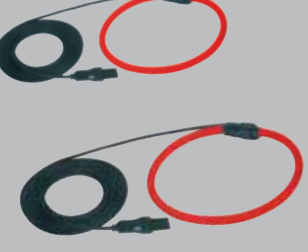

** Computers with Class II Bluetooth will restrict range to 40 ft Computers without Bluetooth will require a Class I or Class II Bluetooth radio adapter.

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







POWER QUALITY ANALYZERS, METERS & LOGGERS

Optional Accessories

SENSOR TYPE	CURRENT RANGE	ACCURACY (TYPICAL)	TYPICAL ERROR ON Φ AT 50/60HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	LIMITED RANGE IF USED WITH MODEL	CATALOG NUMBER
MiniFlex® MA193-BK *  10" or 14" sensor	100mA to 3000A _{AC}	±1%	0°	2.75" (70mm)	PEL 102 PEL 103 PEL 105 8333 8336	8220 8230 8435	2140.48 (10" sensor)
							2140.50 (14" sensor)
MR193-BK  Battery operated	1 to 1000A _{AC} 1 to 1300A _{DC}	±2.5%	-0.80°	1.6" (41mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336 8435	N/A	2140.28
SR193-BK 	1 to 1200A _{AC}	±0.3%	0.2°	2.05" (52mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336 8435	N/A	2140.33
AmpFlex® 193-BK *  24" or 36" sensor	100mA to 12,000A _{AC}	±1%	0°	7.64" (190mm) or 11.46" (290mm)	PEL 102 PEL 103 PEL 105 8333 8336	8220 8230 8435	2140.34 (24" sensor)
							2140.35 (36" sensor)
AmpFlex® A196  24" sensor IP67	10 to 10,000A _{AC}	±2%	0°	5.73" (145mm)	PEL 105 8435	N/A	2140.75 (24" sensor)

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

SENSOR TYPE	CURRENT RANGE		ACCURACY (TYPICAL)	TYPICAL ERROR ON Φ AT 50/60HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	LIMITED RANGE IF USED WITH MODEL	CATALOG NUMBER
MN93-BK 	0.5 to 240Aac		$\pm 1\%$	0.8°	0.78" (20mm)	PEL 102 PEL 103 PEL 105 8333 8336 8435	8220 8230	2140.32
MN193-BK 	100A	200mA to 120Aac	$\pm 1\%$	0.75°	0.78" (20mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336 8435	N/A	2140.36
	5A	5mA to 6Aac	$\pm 1\%$	1.7°				
SL261 **  Battery operated	100A	5 to 100Aac/dc	$\pm 4\%$	$\pm 0.5^\circ$	0.46" (11.8mm)	8220 8230 PEL 102 PEL 103 PEL 105 8333 8336 8435	N/A	1201.51
	10A	50mA to 10Aac/dc	$\pm 3\%$	$\pm 1^\circ$				
J93  Battery operated	50 to 3500Aac 50 to 5000Adc		$\pm 1\%$	$\pm 1^\circ$	2.83" (72mm) Busbar: 5 x 1.69" (127 x 43mm)	PEL 102 PEL 103 PEL 105 8333 8336 8435	N/A	2140.49

Note: Refer to the Power Meter's product user manual for complete specifications.

All current sensors can be used with the Models 8435 and PEL 105. However, only the A196 flexible sensors are waterproof.

** AC/DC Current Probe BNC Adapter for Model SL261 only
Catalog #2140.40



CATALOG NO.	DESCRIPTION
1201.51	AC/DC Current Probe Model SL261 (BNC)
2140.37	Adapter – US 110V Power Adapter (eliminates need for batteries) 8220 & 8230 only
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
2140.48	MiniFlex® Sensor 10" Model MA193-10-BK
2140.49	AC/DC Current Probe Model J93-BK
2140.50	MiniFlex® Sensor 14" Model MA193-14-BK
2140.75	AmpFlex® Sensor 24" (waterproof - IP67) Model A196-24-BK

DataView®

Data Analysis and Reporting Software



Configure all functions of the Power & Energy Loggers

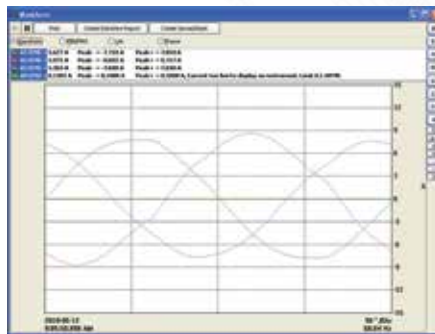


- Display and analyze real-time data on your PC
- Configure functions and parameters from your PC
- Customize views, templates and reports to your exact needs
- Create and store a complete library of configurations that can be uploaded as needed
- Zoom in and out and pan through sections of the graph 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 www.aemc.com

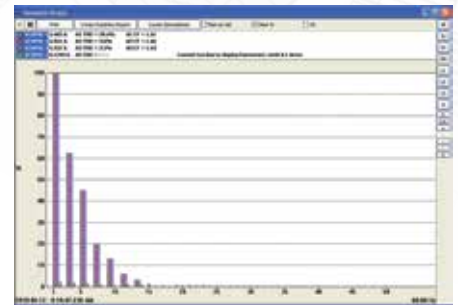
Typical DataView® Functional, Digital & Graphical Displays



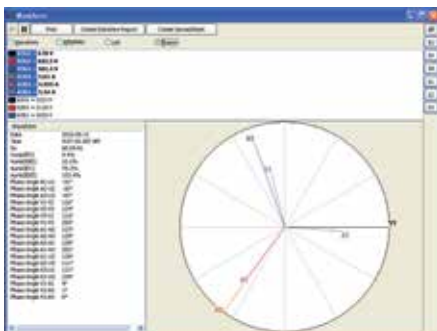
Clear and easy setup of all functions from one tabbed dialog box.



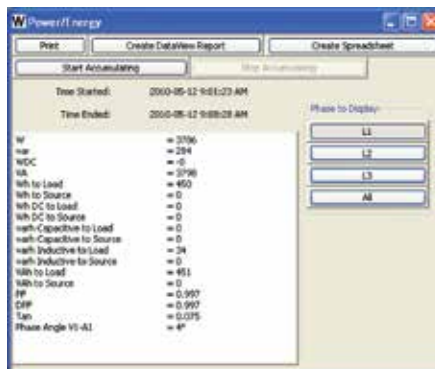
Display real-time waveforms by phase, parameter or total.



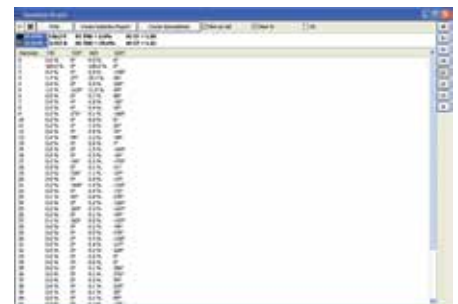
Display all harmonics from 1st to 50th in bargraph form for voltage, current and power.



Display real-time Phasor diagrams. Includes unbalance for both voltage and current.



Display power and energy parameters – both instantaneous and total.



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