

# POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS

## POWER & ENERGY LOGGERS PEL 100 SERIES

### MODEL PEL 102

*Monitor your energy usage and 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 300 ft 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 panels

### PRODUCT INCLUDES

#### PEL 102 KIT CATALOG #2137.51 (SHOWN)

Small classic tool bag, (3) MiniFlex® MA193-10-BK sensors, 5 ft USB cable, (4) black test leads and alligator clips, 5 ft 115V power cord, (12) color-coded ID markers, safety and compliance sheets, 8 GB SD card with USB-SD card reader, printed quick start guide, and USB drive with DataView® software and a user manual.



### ACCESSORIES

#### CATALOG # 2137.83

Adapter - 600V Power Adapter for use with Models PEL 102 & PEL 103

**\*ADAPTER SOLD SEPARATELY**

**SEE PAGE 118 & 119 FOR MORE OPTIONAL ACCESSORIES**



### 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



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, No Sensors)

# POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS

## POWER & ENERGY LOGGERS PEL 100 SERIES

### SPECIFICATIONS

MODELS		PEL 102, PEL 103 & PEL 105		
<b>GENERAL</b>				
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 $\phi$ / 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			
<b>INPUTS</b>	<b>Voltage</b>	PEL 102/103: 3 input channels / PEL 105: 4 input channels via 4mm safety banana jacks		
<b>Current</b>	PEL 102/103: 3 input channels PEL 105: 4 input channels via custom 4 pin jacks that accept AEMC <sup>®</sup> probes and sensors			
<b>ELECTRICAL</b>				
<b>VOLTAGE MEASUREMENT</b>		<b>RANGE</b>	<b>RESOLUTION*</b>	<b>ACCURACY*</b>
	<b>50/60Hz</b>	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
	<b>400Hz</b>	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
	<b>DC</b>	100 to 1000V	0.1V	±1% Rdg ±3V (typical)
PT Ratios	Programmable from 50V to 650,000V		–	0.01 to 0.1V
<b>CURRENT MEASUREMENT</b>		A193*** (PEL 102/103)	196A*** (PEL 105)	–
Nominal range for current probes supplied with kit. (See chart on Pages 32 and 33 for other probes)		200mA to 10,000A		–
CT Ratios		Programmable from 1:1 to 25,000:1 (probe dependent)		
<b>POWER MEASUREMENTS</b>		<b>RANGE</b>	<b>RESOLUTION*</b>	<b>ACCURACY*</b>
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 $\phi$ (active/reactive power ratio)		-3.2 to 3.2	0.001	±0.02
<b>ENERGY MEASUREMENTS</b>		<b>RANGE</b>	<b>RESOLUTION*</b>	<b>ACCURACY*</b>
Active Energy (EP)		4 EWh	1Wh	±0.5% Rdg
Reactive Energy (EQ)		4 Evarh	1varh	±2% Rdg
Apparent Energy (ES)		4 EVah	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 600V Power Adapter Cat #2137.83 / 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			
<b>MECHANICAL</b>				
Communication	USB 2.0, Ethernet (RJ45), Wireless Bluetooth Class 1 **/ Wi-Fi (PEL 105)			
Dimension/Weight	PEL 102/103: 10.08 x 4.92 x 1.46" (256 x 125 x 37mm) / 2.20lbs (1kg) PEL 105: 9.8 x 7.8 x 2.6" (250 x 200 x 67mm) / 8.8lbs (4kg)			
Case	Double insulated, rubber over-molded, polycarbonate UL94 V1 rated			
Display Type for Models PEL 103 & 105	2.63 x 2.16" (67 x 55mm), four line, monochrome, backlit LCD with adjustable brightness and contrast			
<b>ENVIRONMENTAL / SAFETY</b>				
Operating Temperature/Relative Humidity	PEL 102/103/105: 32° to 108.5°F (0° to 42.5°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	PEL 102/103: Complies with IEC 61010-1, and IEC 61010-2-030 for 1000V CAT III / 600V CAT IV 1000V CAT IV (PEL 105), Pollution Degree 2 / Yes			
Ingress Protection	PEL 102/103: IP54 non operating / PEL 105: IP67 with cover closed			

Consult factory for NIST Calibration prices

\* Maximum value is current probe dependent.




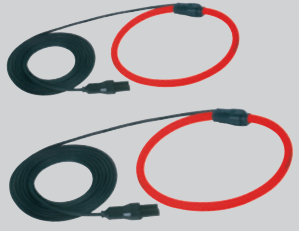

\*\* Computers with Class II Bluetooth will restrict range to 40 ft Computers without Bluetooth will require a Class I or Class II Bluetooth radio adapter.

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



# POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS

## OPTIONAL ACCESSORIES

SENSOR TYPE	CURRENT RANGE	ACCURACY (TYPICAL)	TYPICAL ERROR ON $\Phi$ AT 50/60HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	CATALOG NUMBER
<b>MiniFlex® MA193-BK*</b>  10,14 or 24" sensor	100mA to 12,000Aac <sup>(1)</sup>	±1%	0°	2.75" (70mm) (10" sensor)	PEL 102 PEL 103 PEL 105 8333 8336	2140.48 (10" sensor)
				3.94" (100mm) (14" sensor)		2140.50 (14" sensor)
				7.64" (190mm) (24" sensor)		2140.78 (24" sensor)
<b>MR193-BK</b>  Battery operated	1 to 1000Aac 1 to 1300Aac	±2.5%	-0.80°	1.6" (41mm)	PEL 102 PEL 103 PEL 105 8333 8336	2140.28
<b>SR193-BK</b> 	1 to 1200Aac	±0.3%	0.2°	2.05" (52mm)	PEL 102 PEL 103 PEL 105 8333 8336	2140.33
<b>AmpFlex® 193-BK*</b>  24" or 36" sensor	100mA to 12,000Aac <sup>(1)</sup>	±1%	11.46" (290mm)	7.64" (190mm) (24" sensor)	PEL 102 PEL 103 PEL 105 8333 8336	2140.34 (24" sensor)
				11.46" (290mm) (36" sensor)		2140.35 (36" sensor)
<b>MiniFlex® 196-BK*</b>  Waterproof, IP67 14 or 24" sensor	100mA to 12,000Aac <sup>(1)</sup>	±1%	0°	3.9" (100mm) (14" sensor)	PEL 105 8436	2140.79 (14" sensor)
				7.64" (190mm) (24" sensor)		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 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 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
MN93-BK 	0.5 to 240Aac		$\pm 1\%$	$0.8^\circ$	0.78" (20mm)	PEL 102 PEL 103 PEL 105 8333 8336	N/A	2140.32
MN193-BK 	100A	200mA to 120Aac	$\pm 1\%$	$0.75^\circ$	0.78" (20mm)	PEL 102 PEL 103 PEL 105 8333 8336	N/A	2140.36
	5A	5mA to 6Aac	$\pm 1\%$	$1.7^\circ$				
SL261 	100A	5 to 100Aac/dc	$\pm 4\%$	$\pm 0.5^\circ$	0.46" (11.8mm)	PEL 102 PEL 103 PEL 105 8333 8336	N/A	1201.51
	10A	50mA to 10Aac/dc	$\pm 3\%$	$\pm 1^\circ$				

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. Consult factory for NIST Calibration prices

## ACCESSORIES/REPLACEMENTS

### CATALOG #1201.51

AC/DC Current Probe  
Model SL261 (BNC)



### CATALOG #2137.83

600V Power Adapter for use with  
Models PEL 102 and PEL 103 only



### CATALOG #2140.28

AC/DC Current Probe  
Model MR193-BK



### CATALOG #2140.32

AC Current Probe  
Model MN93-BK



### CATALOG #2140.33

AC Current Probe  
Model SR193-BK



### CATALOG #2140.34

AmpFlex® Sensor 24"  
Model 193-24-BK



## ACCESSORIES/REPLACEMENTS

### CATALOG #2140.35

AmpFlex® Sensor 36"  
Model 193-36-BK



### CATALOG #2140.36

AC Current Probe  
Model MN193-BK



### CATALOG #2140.40

BNC Adapter for AC/DC Current Probe  
Model SL261



### CATALOG #2140.48

MiniFlex® Sensor 10" Model MA193-10-BK

### CATALOG #2140.50

MiniFlex® Sensor 14" Model MA193-14-BK

### CATALOG #2140.78

MiniFlex® Sensor 24" Model MA193-24-BK



### CATALOG #2140.75

AmpFlex® Sensor 24" (Waterproof - IP67)  
Model 196A-24-BK

### CATALOG #2140.79

MiniFlex® Sensor 14" Waterproof - IP67  
Model MA196-14-BK



# POWER QUALITY/ENERGY 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
8333	2136.10	4V/3I	3V/4I	1000Vrms	2000Vrms	1414Vpk	2828Vpk	1200Vdc	10,000AAC	5000Adc		Yes
8336	2136.30	5V/4I	4V/4I	1000Vrms	2000Vrms	1414Vpk	2828Vpk	1200Vdc	10,000AAC	5000Adc		Yes
8436	2136.43	5V/4I	4V/4I	1000Vrms	2000Vrms	1414Vpk	2828Vpk	1200Vdc	10,000AAC	5000Adc		Yes
PEL 102	2137.51	4V/3I	3V/3I	1000Vrms	1700Vrms	1414Vpk	2400Vpk	1000Vdc	10,000AAC	5000Adc		Yes
PEL 103	2137.52	4V/3I	3V/3I	1000Vrms	1700Vrms	1414Vpk	2400Vpk	1000Vdc	10,000AAC	5000Adc		Yes
PEL 105	2137.57	5V/4I	4V/4I	1000Vrms		1414Vpk	2400Vpk	1000Vdc	10,000AAC	5000Adc		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
8333	2136.10	1P-2W, 2P-3W, 3P-3W, 3P-4W		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 (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
8436	2136.43	1P-2W, 1P-3W, 2P-2W, 2P-3W, 2P-4W, 3P-3W, 3P-4W, 3P-5W		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	Line Power with internal NiMH battery pack
PEL 102	2137.51	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			Yes	None	Line Power with internal NiMH battery pack
PEL 103	2137.52		Yes			No			Yes	Mono-chrome LCD	Line Power with internal NiMH battery pack
PEL 105	2137.57		Yes			No			Yes	Mono-chrome LCD	Power phase input or external adapter with internal NiMH battery pack