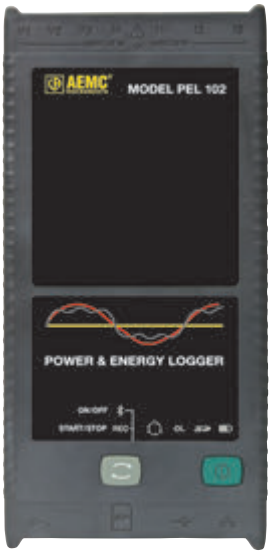
POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

PEL 100 SERIES

IP 54 | 1000 V CAT III | 600 V CAT IV

MODEL PEL 102

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



DataView®

FEATURES

- Simple-to-use, single-, dual- *(split-phase)* and three-phase (Y, Δ) power & energy loggers
- Designed to work in 1000 V CAT III and 600 V 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
- 8 GB SD card supplied, can be upgraded up to 32 GB
- 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 (50, 60, 400) Hz and DC distribution systems
- Automatic recognition of the connected current sensors/probes
- Magnetic case allows for mounting inside power panels

PRODUCT INCLUDES

PEL 102 KIT
CAT. #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 115 V 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 user manual.

ACCESSORIES

CAT. #2137.90
Adapter – 600 V CAT III Power to Phase Adapter for use with Models PEL 102 & PEL 103
***ADAPTER SOLD SEPARATELY**

SEE PAGE 130-131 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
- ***NEW*** software sensors providing all comprehensive and instantaneous motors electrical parameters such as rotation speed, efficiency and torque

CAT. #	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)

AEMC® INSTRUMENTS

MODELS	PEL 102, PEL 103 & PEL 105		
GENERAL			
Sampling Frequency	128 samples per cycle; (50 / 60) Hz (16 samples / cycle 400 Hz)		
Data Storage Rate	1 per second *(200 ms also available on PEL 105)*		
Demand Period Storage Rate	User selectable (1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60) min		
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	8 GB SD card included / SD cards up to 32 GB formatted FAT32 are supported		
Voltage Input	PEL 102 / 103: 3 input channels / PEL 105: 4 input channels via 4 mm safety banana jacks		
Current Input	PEL 102 / 103: 3 input channels PEL 105: 4 input channels via custom 4 pin jacks that accept AEMC® Instruments probes and sensors		
ELECTRICAL			
VOLTAGE MEASUREMENT	RANGE	RESOLUTION*	ACCURACY*
(50 / 60) Hz	(42.5 to 69) Hz	–	± 0.1 Hz
Single-Phase RMS Voltages	(10 to 1000) Vrms	0.1 V	± 0.2 % Reading ± 0.2 V
Phase-to-Phase RMS Voltages	PEL 102 / 103: (17 to 1700) Vrms PEL 105: (17 to 1000) Vrms	(0.1 to 1) V	± 0.2 % Reading ± 0.4 V
400 Hz	(340 to 460) Hz	–	
Single-Phase RMS Voltages	(10 to 600) Vrms	0.1 V	± 1 % Reading ± 1 V
Phase-to-Phase RMS Voltages	PEL 102 / 103: (17 to 1200) Vrms PEL 105: (17 to 600) Vrms	(0.1 to 1) V	± 1 % Reading ± 1 V
DC	(100 to 1000) V	0.1 V	± 1 % Reading ± 3 V *(typical)*
PT Ratios	Programmable from (50 to 650,000) V	–	(0.01 to 0.1) V
CURRENT MEASUREMENT	A193 A*** (PEL 102 / 103)	196 A*** (PEL 105)	–
Nominal range for current probes supplied with kit. *(See chart on Pages 44 to 46 for other probes)*	200 mA to 12,000 A		–
CT Ratios	Programmable from 1:1 to 25,000:1 *(probe dependent)*		
POWER MEASUREMENTS	RANGE	RESOLUTION*	ACCURACY*
Active Power (P)*	(-2 to 2) GW	0.001 W	± 0.5 % Reading ± 0.005 % Pnom
Reactive Power (Q)*	(-2 to 2) Gvar	0.001 var	± 1 % Reading ± 0.01 % Qnom
Apparent Power (S)*	(0 to 2) GVA	0.001 VA	± 0.5 % Reading ± 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)	4 EWh	1 Wh	± 0.5 % Reading
Reactive Energy (EQ)	4 Evarh	1 varh	± 2 % Reading
Apparent Energy (ES)	4 EVAh	1 VAh	± 0.5 % Reading
THD	± 655 %		
Individual Harmonics	1 to 50 displayed in percentage; 1 to 7 at 400 Hz		
External Supply	110 / 250 V (10 %) @ (50 / 60) Hz; 400 Hz		
Power From Phase Measurement	PEL 102 / 103: Requires optional 600 V Power Adapter / PEL 105: Internal up to 1000 V_{AC}		
Back-Up Power Supply / Charge Time	Rechargeable 8.4 V NiMH battery pack / Approximately 5 h		
Battery Life	30 min minimum, 60 min typical		
MECHANICAL			
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) in (256 x 125 x 37) mm / 2.20 lb (1 kg) PEL 105: (9.8 x 7.8 x 2.6) in (249 x 198 x 66) mm / 8.8 lb (4 kg)		
Case	Double insulated, rubber over-molded *(PEL 102 & 103 only)*, polycarbonate UL94 V1 rated		
Display Type for Models PEL 103 & 105	(2.63 x 2.16) in (67 x 55) mm, four line, monochrome, backlit LCD with adjustable brightness and contrast		
ENVIRONMENTAL / SAFETY			
Operating Temperature / Relative Humidity	PEL 102 / 103 / 105: (32 to 108.5) °F (0 to 42.5) °C / up to 85 % RH		
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 1000 V CAT III / 600 V CAT IV 1000 V 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 400 Hz fundamental frequency.

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*  **10, 14 & 24 in Sensor**	2.75 in (70 mm) (10 in sensor)	± 1 %	0.5 °	100 mA to 12,000 AAC(1)	**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)
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(1)	**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(1)	**PEL 52 PEL 102 PEL 103 PEL 105 8333 8336 8436 8345**	2140.35

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 (1)		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 (1)		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 127th order; < 3 % Udin / 0 to 62nd order; < 0.5 % Udin	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 WOD, 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 WOD, 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 WOD, 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

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.

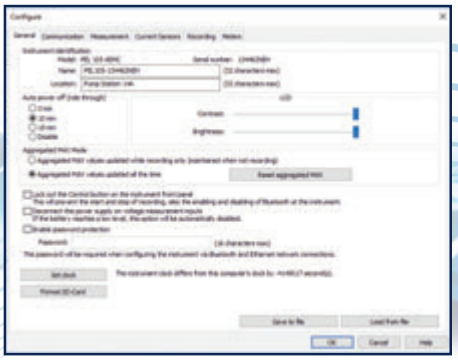
DataView®

Data Analysis and Reporting Software

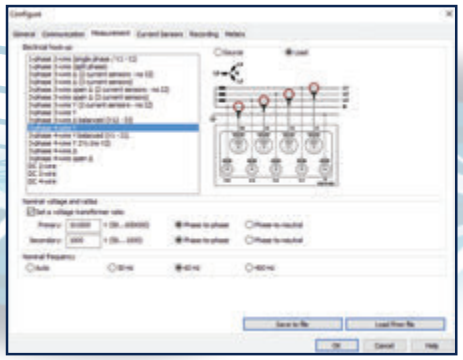
AUTOMATIC REPORT GENERATION

AEMC INSTRUMENTS www.aemc.com

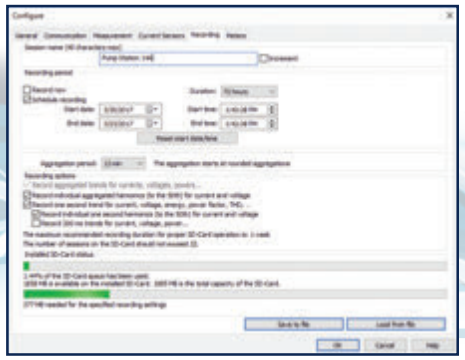
DataView® software, user manual and quick start guide are included in the USB Drive



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.

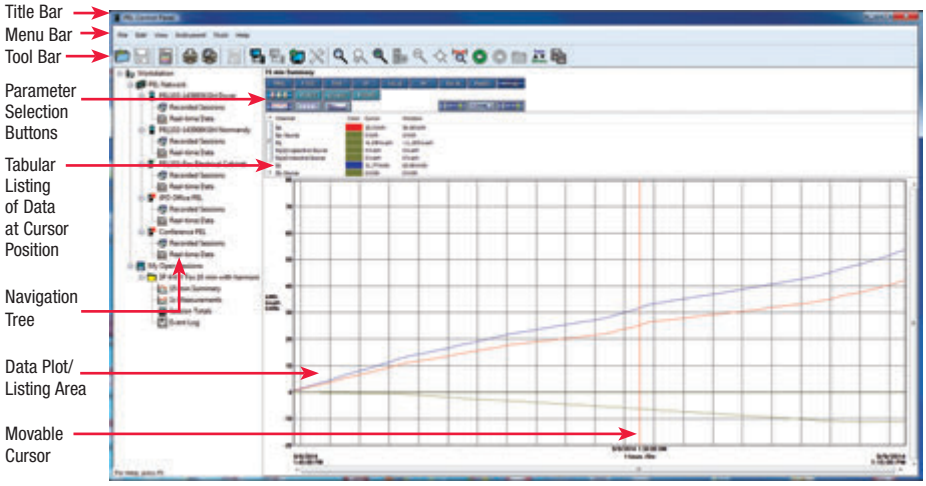


In the Recording tab, configure the instrument to measure *(and record)* over a user selectable recording period. Select demand intervals and view available memory for data storage.

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

AEMC® INSTRUMENTS