

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 #2137.98

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

***ADAPTER SOLD SEPARATELY**

SEE PAGE 120 & 121 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 | | |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------|------------------------|
| 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 | 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 [®] 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 32 and 33 for other probes) | | 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) | | 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 / 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 | 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 | | | |
| ENVIRONMENTAL / SAFETY | | | | |
| 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.



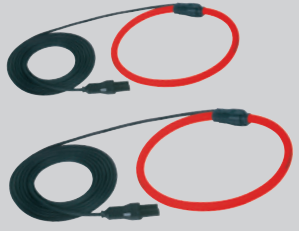

** Computers with Class II Bluetooth will restrict range to 40 ft Computers without Bluetooth will require a Class I or Class II Bluetooth radio adapter.

*** 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 Φ AT 50/60 HZ | MAX CONDUCTOR SIZE | USED WITH MODEL | CATALOG NUMBER |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------|-------------------------------------|-----------------------------------|-----------------------------------------------|-------------------------|
| MiniFlex® MA193-BK*  10,14 or 24" sensor | 100mA to 12,000Aac ⁽¹⁾ | ±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) |
| MR193-BK  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 |
| SR193-BK  | 1 to 1200Aac | ±0.3% | 0.2° | 2.05" (52mm) | PEL 102 PEL 103 PEL 105 8333 8336 | 2140.33 |
| AmpFlex® 193-BK*  24" or 36" sensor | 100mA to 12,000Aac ⁽¹⁾ | ±1% | 0° | 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) |
| MiniFlex® 196-BK*  Waterproof, IP67 14 or 24" sensor | 100mA to 12,000Aac ⁽¹⁾ | ±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 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 | N/A | 2140.32 |
| MN193-BK  | 100A | 200mA to 120Aac | $\pm 1\%$ | 0.75° | 0.78" (20mm) | PEL 102 PEL 103 PEL 105 8333 8336 | N/A | 2140.36 |
| | 5A | 5mA to 6Aac | $\pm 1\%$ | 1.7° | | | | |
| 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 #2137.98

600 V CAT III 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 |