

POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

POWER & ENERGY LOGGER PEL 52



MODEL PEL 52

Time/date stamped electrical measuring instrument to understand and improve electrical consumption

Coming Later this Year!

SPECIFICATIONS

MODEL	PEL 52		
GENERAL			
Inputs	2V / 2I		
Types of installations	Single phase, split phase or 2 single-phase channels		
Recording / Data Storage Rate	Unlimited duration (4 GB max recording size) / 1 s to 1 h (Min/Avg/Max)		
Network Frequency	(45 to 65) Hz		
Voltage	(10 to 600) V		
ELECTRICAL			
VOLTAGE	RANGE	RESOLUTION	ACCURACY
Vrms	(10 to 660) V P to N	0.1 V	± 0.2 % Reading ± 0.2 V
Urms	(20 to 1200) V P to P	0.1 V	± 0.2 % Reading ± 0.4 V
CURRENT MEASUREMENT @ (50 and 60) HZ	RANGE	RESOLUTION	ACCURACY
Amps (1 V nominal) (excluding clamp accuracy)	Probe dependent (0.2 % < I < 120 % Inom)	Probe dependent	± 0.2 % Reading ± 0.02 Inom
POWER	RANGE	RESOLUTION	ACCURACY
Watts P-Q-S (W-var-VA)	V = (100 to 660) V I = (5 to 120) % Inom	Probe dependent	± 0.3 % R ± 0.003 % Pnom ± 1 % R ± 0.01 % Qnom ± 0.3 % R ± 0.003 % Snom
Power Factor	-1 to 1	0.001	±0.02 %
Cos φ (DPF)	-1 to 1	0.001	±0.05 %
ENERGY	RANGE	RESOLUTION	ACCURACY
Ep-Eq-Es (Wh, varh, VAh)	V = (100 to 660) V I = (5 to 120) % Inom	0.001 and ±0.02%	±0.5 % Reading ±2.5 % Reading ±0.5 % Reading
MECHANICAL			
Communication	Wi-Fi (access point and hot spot)		
Data Storage	8 GB SD-Card (included); expandable to 32 GB		
Dimension	(7.08 x 3.46 x 1.45) in (180 x 88 x 37) mm		
Weight	14.10 oz (400 g)		
Case	Compact and rugged, shock and vibration IEC 61010		
Display Type	LCD with blue backlight		
Real-Time Clock	Time and date stamp for Trend mode		
Power Supply	From phase 1 (90 to 660) V battery backup when power OFF		
Battery Life	3 h without Wi-Fi, 1 h typical with Wi-Fi enabled		
ENVIRONMENTAL			
Operating Temperature / Relative Humidity	(-4 to 122) °F (-20 to 50) °C / (10 to 85) % RH		
Storage Temperature	(-40° to 158) °F (-40 to 70) °C / (0 to 95) % RH w/out battery		
SAFETY			
Electro-Magnetic-Compatibility (EMC)	EN 61326-1 for emission and immunity		
Safety Rating / CE Rating	IEC/EN 61010-2-30 (600 V CAT III) / Yes		
IP Rating	IP54 per IEC 60529		

* Minimum and maximum values are current probe dependent.

Consult factory for NIST Calibration prices



DataView®

PRODUCT INCLUDES

CATALOG #2137.69 (WITH PROBES)

Soft carrying bag, (2) MiniFlex® MA193-10-BK sensors, (3) black test leads and alligator clips, 110 V US power Cord, (1) adapter for power cord, 8 GB SD card, USB SD card reader, (2) AAA rechargeable batteries, quick start guide, and USB drive with DataView® software and user manual.

CATALOG #2137.71 (NO PROBES)

Soft carrying bag, (3) black test leads and alligator clips, 110 V US power Cord, (1) adapter for power cord, 8 GB SD card, USB SD card reader, (2) AAA rechargeable batteries, quick start guide, and USB drive with DataView® software and user manual.

CATALOG NO.	DESCRIPTION
2137.69	Power & Energy Logger Model PEL 52 (w/LCD, w/2 MA193-10-BK sensors)
2137.71	Power & Energy Logger Model PEL 52 (w/LCD, no sensors)

POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS

FEATURES

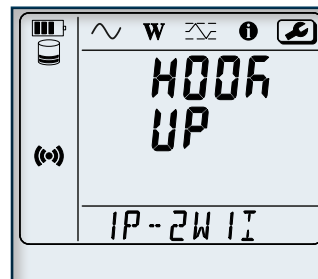
- Low cost, simple-to-use, portable, single- and dual- (split-phase) power & energy data logger
- Wide backlit LCD display
- Install without cutting off the electrical network being monitored
- Vital energy data is easily measured, recorded and analyzed
- TRMS voltage and current measurement up to 600 V
- Powered via the measuring phase
- Measurement of the AC phase currents (I1, I2) *(dependent on sensor)*
- RMS AC measurements (50 Hz and 60 Hz), aggregation every second without missing measurements
- Easy to use, automatic recognition of current sensors
- W, VA and var (P, Q, S, N and D) power measurements
- Calculation of the Cos ϕ and Power Factor (DPF)
- Aggregation measurements over a period from 1 minute to 1 hour
- Storage of the 1 s and aggregated measurements on SD/SDHC card; data can be read directly on a PC
- Remote connectivity via IRD server
- Integrated web server for remote viewing *(Android™, iOS, Windows, etc.)*
- Wi-Fi offers accessibility to diagnose problems in real-time and/or multi-station operation.
- Data saved on SD card for easier transport
- Includes FREE DataView® software for configuring, data retrieval, real-time measurement display, data analysis and report generation
- Compact casing with built-in magnets to facilitate mounting for easier implementation in electrical cabinets 2-year warranty
- ECO-DESIGN - environmental aspects considered during product development to make the lowest possible environmental impact throughout the product life cycle

APPLICATIONS

- Load surveys - Find out how much energy each item of equipment consumes operating at its min/max power level.
- Energy analysis - Estimate energy consumption before and after the improvements.
- Energy surveys - The measurements for energy surveys must be performed at several locations on the evaluation site. Starting with the main power, compare the power and energy measurements on the electricity meter and bills. Sub metering can then be performed on downstream of the installation.

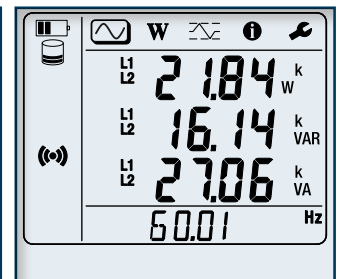
Large Functional Displays

INFORMATION MODE



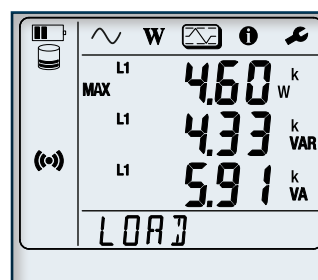
Hook up, Wi-Fi, aggregation period, can be configured from the front panel of the PEL 52. Current ratios and number of turns need to be configured via the PEL Transer software based on the current sensor type.

MEASUREMENT MODE (2P-3W2I)



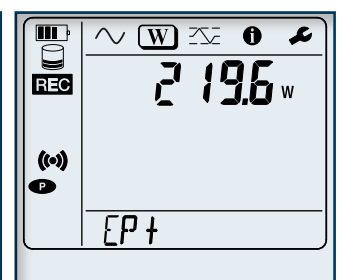
Real-time updates are displayed for voltage (V), current (A) active power (P), reactive power (Q), apparent power (S), frequency (Hz), power factor (PF).

MAX MODE (1P-2W1I)



Max aggregated values of measurements and energy.

ENERGY MODE



Active energy (Wh), reactive energy (varh), apparent energy (VAh). The energies displayed are the total energies, of the source or of the load.

(The "h" symbol is not displayed on the screen. You will see W, VA, var for Wh, VAh and varh. Downloaded recordings will show the "h")

ACCESSORIES/REPLACEMENTS

CATALOG #2140.32 AC Current Probe Model MN93-BK

CATALOG #2140.33 AC Current Probe Model SR193-BK

CATALOG #2140.34 AmpFlex® Sensor 24 in Model 193-24-BK

CATALOG #2140.35 AmpFlex® Sensor 36 in Model 193-36-BK

CATALOG #2140.36 AC Current Probe Model MN193-BK

CATALOG #2140.48 MiniFlex® Sensor 10 in Model MA193-10-BK

CATALOG #2140.50 MiniFlex® Sensor 14 in Model MA193-14-BK

CATALOG #2140.80 MiniFlex® Sensor 24 in Model MA194-24-BK

CATALOG #2140.81 AC Current Probe Model MN94

CATALOG #2140.44 (1) 10 ft (3 M) Black Lead w/(1) Black Alligator Clip (Lead rated 1000 V CAT IV 15 A, Clip rated 1000 V CAT IV 15 A, UL)

CATALOG #2140.45 Set of (12), color-coded Input ID Markers

CATALOG #5000.43 Magnetized Voltage Probe Set of (2) color-coded (Red/Black) magnetized voltage probes (Rated 600 V CAT IV, 1000 V CAT III)

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; (50/60) 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 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	8 GB 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 4 mm safety banana jacks		
Current	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		(17 to 1700) 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		(17 to 1200) 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 32 and 33 for other probes)	200 mA to 10,000 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 Vac			
Back-Up Power Supply/Charge Time	Rechargeable 8.4 V NiMH battery pack / Approximately 5 hr			
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, 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

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* & MiniFlex® MA194-BK*  10, 14 or 24 in sensor	100 mA to 12,000 Aac ⁽¹⁾	± 1 %	0 °	2.75 in (70 mm) (10 in sensor)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.48 (10 in sensor)
				3.94 in (100 mm) (14 in sensor)		2140.50 (14 in sensor)
				7.64 in (194 mm) (24 in sensor)		2140.80 (24 in sensor)
MR193-BK  Battery operated	(1 to 1000) Aac (1 to 1300) Adc	± 2.5 %	-0.80 °	1.6 in (41 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.28
SR193-BK 	(1 to 1200) Aac	± 0.3 %	0.2 °	2.05 in (52 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.33
AmpFlex® 193-BK*  24 in or 36 in sensor	100 mA to 12,000 Aac ⁽¹⁾	± 1 %	0 °	7.64 in (194 mm) (24 in sensor)	PEL 102 PEL 103 PEL 105 8333 8336 8436 8345	2140.34 (24 in sensor)
				11.46 in (291 mm) (36 in sensor)		2140.35 (36 in sensor)
MiniFlex® 196-BK*  Waterproof, IP67 14 in or 24 in sensor	100 mA to 12,000 Aac ⁽¹⁾	± 1 %	0 °	3.9 in (99 mm) (14 in sensor)	PEL 105 8436	2140.79 (14 in sensor)
				7.64 in (194 mm) (24 in sensor)		2140.75 (24 in sensor)

*Maximum current reduced by a factor of 2 for 400 Hz 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 (50/60) HZ	MAX CONDUCTOR SIZE	USED WITH MODEL	LIMITED RANGE IF USED WITH MODEL	CATALOG NUMBER
MN93-BK 	(0.5 to 240) AAC		$\pm 1\%$	0.8°	0.78 in (20 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8345	N/A	2140.32
MN193-BK 	100 A	200 mA to 120 AAC	$\pm 1\%$	0.75°	0.78 in (20 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8345	N/A	2140.36
	5 A	5 mA to 6 AAC	$\pm 1\%$	1.7°				
SL261 	100 A	(5 to 100) AAC/DC	$\pm 4\%$	$\pm 0.5^\circ$	0.46 in (12 mm)	PEL 102 PEL 103 PEL 105 8333 8336 8345	N/A	1201.51
	10 A	50 mA to 10 AAC/DC	$\pm 3\%$	$\pm 1^\circ$				
MN94 	50 mA to 200 AAC		$\pm 0.2\%$	0.1°	0.25 in (16 mm)	PEL 52 8345	N/A	2140.81
E94 	10 A	100 mA to 10 AAC	$\pm 3\%$	1.5°	.464 in (11.8 mm)	8345	N/A	2140.82
	100 A	500 mA to 100 AAC	$\pm 4\%$	1°				

All current sensors can be used with models PEL 105 and 8436. However, only the MA196-14-BK and 196 A-24-BK flexible sensors are waterproof. Consult factory for NIST Calibration prices

ACCESSORIES/REPLACEMENTS

CATALOG #2140.40

BNC Adapter for AC/DC Current Probe
Model SL261



CATALOG #2140.77

Phase Power Adapter for use with
PowerPad Models 8333 & 8336



CATALOG #2137.90

600 V CAT III Power to Phase Adapter for use
with Models PEL 102 and PEL 103 only



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	4 V/3 I	3 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 AAC	5000 Adc	Yes	Yes
8336	2136.30	5 V/4 I	4 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 AAC	5000 Adc	Yes	Yes
8345	2136.35	5 V/4 I	4 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 AAC	5000 Adc	Yes	Yes
8436	2136.43	5 V/4 I	4 V/4 I	1000 Vrms	2000 Vrms	1414 Vpk	2828 Vpk	1200 Vdc	10,000 AAC	5000 Adc	Yes	Yes
PEL 52	2137.71	2 V/2 I	2 V/2 I	660 Vrms	1200 Vrms	–	–	–	3600 AAC	–	No	Yes
PEL 102	2137.51	4 V/3 I	3 V/3 I	1000 Vrms	1700 Vrms	1414 Vpk	2400 Vpk	1000 Vdc	10,000 AAC	5000 Adc	Yes	Yes
PEL 103	2137.52	4 V/3 I	3 V/3 I	1000 Vrms	1700 Vrms	1414 Vpk	2400 Vpk	1000 Vdc	10,000 AAC	5000 Adc	Yes	Yes
PEL 105	2137.57	5 V/4 I	4 V/4 I	1000 Vrms		1414 Vpk	2400 Vpk	1000 Vdc	10,000 AAC	5000 Adc	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/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 63 rd order; < 3 % U _{din} / 0 to 62 nd order; < 0.5 % U _{din}	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			No / 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 W OD, 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		Yes			No		Yes / No	Monochrome LCD		
PEL 105	2137.57		Yes			No		Yes / No	Monochrome LCD	Power phase input or external adapter with internal NiMH battery pack	