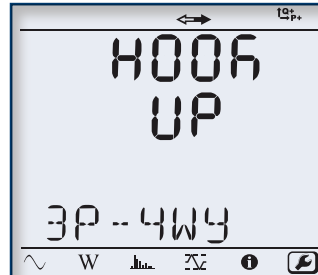


# Model PEL 103

## Large Functional Displays

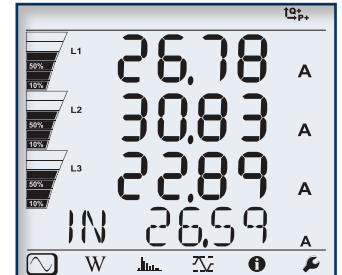


### Information Mode



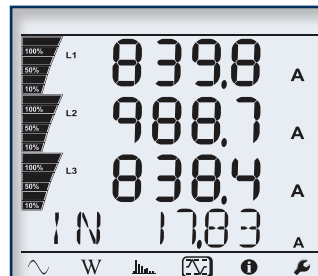
Hook up, voltage and current ratios and aggregation period can be configured from the front panel of the PEL 103.

### Measurement Mode



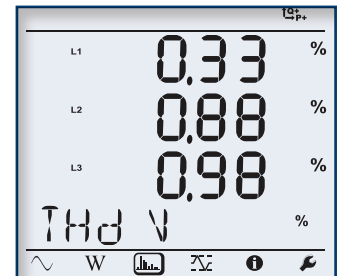
Real-time updates are displayed for voltage, current, power, frequency, power factor and tangent.

### Max Mode

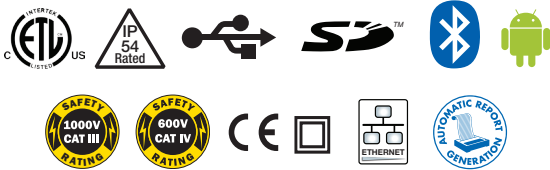


Max values for voltage, current (including neutral current), power and harmonics.

### 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: 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 300ft 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 5000Aac & 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
- Magnetic case – can be mounted inside power panel
- Supports 17 network configurations

## KIT OPTION INCLUDES

### PEL 103 Kit

Small classic tool bag, three MiniFlex® MA193-10-BK sensors, 5ft 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 drive supplied with DataView® software and user manual.



\*Adapter sold separately

## 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 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	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		
<b>ELECTRICAL</b>				
<b>VOLTAGE MEASUREMENT</b>		<b>RANGE</b>	<b>RESOLUTION*</b>	<b>ACCURACY*</b>
	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
<b>CURRENT MEASUREMENT</b>		<b>A193*** (PEL 102/103)</b>	<b>196A*** (PEL 105)</b>	
Nominal range for current probes supplied with kit. See chart on Pages 26 and 27 for other probes	200mA to 10,000A		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 φ (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)	0 to 4 x 10 <sup>10</sup>		1Wh	±0.5% Rdg
Reactive Energy (EQ)	0 to 4 x 10 <sup>10</sup>		1varh	±2% Rdg
Apparent Energy (ES)	0 to 4 x 10 <sup>10</sup>		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 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			
<b>MECHANICAL</b>				
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			
<b>DISPLAY</b>				
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			
<b>ENVIRONMENTAL / SAFETY</b>				
Operating Temperature/Relative Humidity	50° to 122°F (10° to 50°C) / up to 85%; 32° to 108.5°F (0° to 42.5°C) / up to 85% (PEL 103 & PEL 105)			
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)			

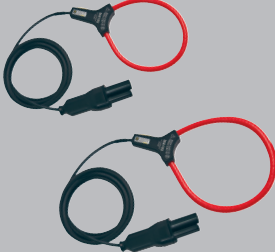


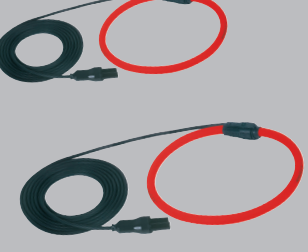

\* Maximum value is current probe dependent.

\*\* Computers with Class II Bluetooth will restrict range to 40ft. 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 $\Phi$ AT 50/60Hz	MAX CONDUCTOR SIZE	USED WITH MODEL	LIMITED RANGE IF USED WITH MODEL	CATALOG NUMBER
 <p>10" or 14" sensor</p>	100mA to 3000Aac	±1%	0°	2.75" (70mm)	PEL 102 PEL 103 PEL 105** 8333 8336	8220 8230 8435	2140.48 (10" sensor)  2140.50 (14" sensor)
 <p>Battery operated</p>	1 to 1000Aac 1 to 1300Aac	±2.5%	-0.80°	1.6" (41mm)	8220 8230 PEL 102 PEL 103 PEL 105** 8333 8336 8435**	N/A	2140.28
	1 to 1200Aac	±0.3%	0.2°	2.05" (52mm)	8220 8230 PEL 102 PEL 103 PEL 105** 8333 8336 8435**	N/A	2140.33
 <p>24" or 36" sensor</p>	100mA to 12,000Aac	±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)
 <p>24" sensor IP67</p>	100mA to 12,000Aac	±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.

\*\* Not waterproof with Model 8435 & PEL 105.

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
<b>MN93-BK</b> 	0.5 to 240Aac		±1%	0.8°	0.78" (20mm)	PEL 102 PEL 103 PEL 105** 8333 8336 8435**	8220 8230	2140.32
<b>MN193-BK</b> 	<b>100A</b>	200mA to 120Aac	±1%	0.75°	0.78" (20mm)	8220 8230 PEL 102 PEL 103 PEL 105** 8333 8336 8435**	N/A	2140.36
	<b>5A</b>	5mA to 6Aac	±1%	1.7°				
<b>SL261 **</b>  Battery operated	<b>100A</b>	5 to 100Aac/dc	±4%	±0.5°	0.46" (11.8mm)	8220 8230 PEL 102 PEL 103 PEL 105** 8333 8336 8435**	N/A	1201.51
	<b>10A</b>	50mA to 10Aac/dc	±3%	±1°				
<b>J93</b>  Battery operated	50 to 3500Aac 50 to 5000Adc		±1%	±1°	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 **PEL 102 & PEL 103**.  
 However, only the **196A** flexible sensors are waterproof.

Power Adapter for Models PEL 102 & PEL 103 only  
 Catalog #2137.77



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



CATALOG NO.	DESCRIPTION	PRICE	NIST CALIBRATION
1201.51	AC/DC Current Probe Model SL261 (BNC)	\$ 449.00	\$68.00
2137.77	Adapter – Power Adapter <b>PEL 102 &amp; PEL 103 only</b>	\$ 199.95	–
2140.28	AC/DC Current Probe Model MR193-BK	\$ 399.00	\$68.00
2140.32	AC Current Probe Model MN93-BK	\$ 185.00	\$68.00
2140.33	AC Current Probe Model SR193-BK	\$ 299.00	\$68.00
2140.34	AmpFlex® Sensor 24" Model 193-24-BK	\$ 269.00	\$68.00
2140.35	AmpFlex® Sensor 36" Model 193-36-BK	\$ 319.00	\$68.00
2140.36	AC Current Probe Model MN193-BK	\$ 249.00	\$68.00
2140.37	Adapter – US 110V Power Adapter (eliminates need for batteries) <b>8220 &amp; 8230 only</b>	\$ 135.00	–
2140.48	MiniFlex® Sensor 10" Model MA193-10-BK	\$ 219.00	\$68.00
2140.49	AC/DC Current Probe Model J93-BK	\$2,425.00	\$98.00
2140.50	MiniFlex® Sensor 14" Model MA193-14-BK	\$ 249.00	\$68.00
2140.75	AmpFlex® Sensor 24" (waterproof - IP67) Model 196A-24-BK	\$ 289.00	\$68.00
2140.77	Adapter – Phase Power Adapter for use with PowerPad Models 8333 & 8336	\$ 299.95	–

# DataView®

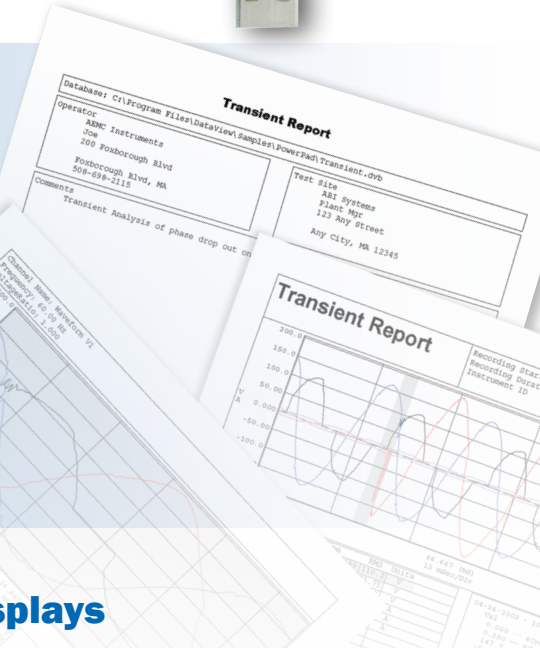
## Data Analysis and Reporting Software



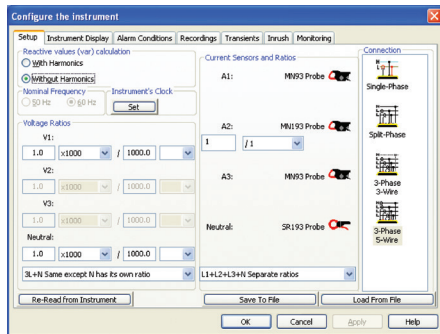
### Configure all functions of the Power & Energy Loggers



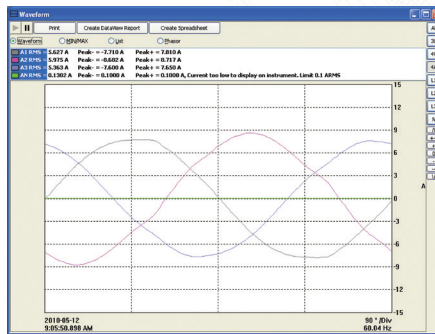
- Display and analyze real-time data on your PC
- Configure functions and parameters from your PC
- Customize views, templates and reports to your exact needs
- Create and store a complete library of configurations that can be uploaded as needed
- Zoom in and out and pan through sections of the graph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



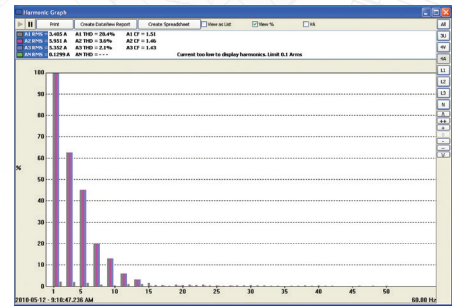
## Typical DataView® Functional, Digital & Graphical Displays



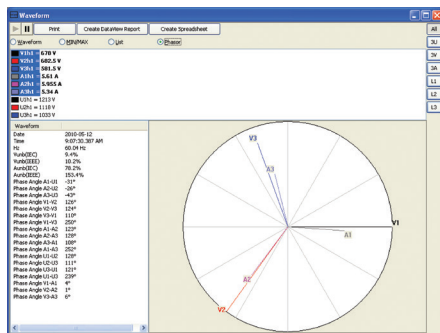
Clear and easy setup of all functions from one tabbed dialog box.



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



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



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

Parameter	Value
W	= 3786
Var	= 254
WDC	= -0
VA	= 3798
Wh to Load	= 450
Wh to Source	= 0
Wh DC to Load	= 0
Wh DC to Source	= 0
varh Capacitive to Load	= 0
varh Inductive to Load	= 34
varh Inductive to Source	= 0
VAh to Load	= 451
VAh to Source	= 0
PF	= 0.997
DPF	= 0.997
Tan	= 0.075
Phase Angle V1-A1	= 4°

Display power and energy parameters – both instantaneous and total.

Harmonic	V%	I%	P%
0	0.0%	0%	0%
1	0.0%	0%	0%
2	1.4%	25%	96%
3	0.0%	0%	0%
4	0.0%	0%	0%
5	0.0%	0%	0%
6	0.0%	0%	0%
7	0.0%	0%	0%
8	0.0%	0%	0%
9	0.0%	0%	0%
10	0.0%	0%	0%
11	0.0%	0%	0%
12	0.0%	0%	0%
13	0.0%	0%	0%
14	0.0%	0%	0%
15	0.0%	0%	0%
16	0.0%	0%	0%
17	0.0%	0%	0%
18	0.0%	0%	0%
19	0.0%	0%	0%
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36	0.0%	0%	0%
37	0.0%	0%	0%
38	0.0%	0%	0%
39	0.0%	0%	0%
40	0.0%	0%	0%
41	0.0%	0%	0%
42	0.0%	0%	0%
43	0.0%	0%	0%
44	0.0%	0%	0%
45	0.0%	0%	0%
46	0.0%	0%	0%
47	0.0%	0%	0%
48	0.0%	0%	0%
49	0.0%	0%	0%
50	0.0%	0%	0%

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

# POWER QUALITY 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
8220	2130.90	1V/1A	1V/1A	600Vrms	660Vrms	850Vpk	935Vpk	600Vdc	6500Aac	1400Adc	Yes	No
8230	2130.81	1V/1A	1V/1A	600Vrms	660Vrms	850Vpk	935Vpk	600Vdc	6500Aac	1400Adc	Yes	No
8333	2136.10	4V/3I	3V/4I	1000Vrms	2000Vrms	1414Vpk	2828Vpk	1200Vdc	10,000Aac	5000Adc	Yes	Yes
8336	2136.30	5V/4I	4V/4I	1000Vrms	2000Vrms	1414Vpk	2828Vpk	1200Vdc	10,000Aac	5000Adc	Yes	Yes
8435	2136.41	5V/4I	4V/4I	1000Vrms	2000Vrms	1697Vpk	3394Vpk	1697Vdc	10,000Aac	5000Adc	Yes	Yes
PEL 102	2137.51	4V/3I	3V/3I	1000Vrms	1700Vrms	1414Vpk	2400Vpk	1000Vdc	10,000Aac	5000Adc	Yes	Yes
PEL 103	2137.52	4V/3I	3V/3I	1000Vrms	1700Vrms	1414Vpk	2400Vpk	1000Vdc	10,000Aac	5000Adc	Yes	Yes
PEL 105	2137.57	4V/3I	3V/3I	1000Vrms	1000Vrms	1414Vpk	2400Vpk	1000Vdc	10,000Aac	5000Adc	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	TYPE LCD	POWER SOURCE
8220	2130.90	1P-2W 3P-3W DB	Yes, 2-Wire Method	Yes, Realtime through DataView® (recordable to PC)	No	Yes (RMS) duration: unspecified	No	Yes (9)	Yes	Backlit LCD	6 x AA batteries or external adapter
8230	2130.81	1P-2W 3P-3W DB	Yes, 2-Wire Method	Yes	No	Yes (RMS) <15 seconds at 60Hz	18 types/ up to 10 active/ 4096 recorded	Yes (8)	Yes	Color LCD	External adapter with internal NiMH battery pack
8333	2136.10	1P-2W, 2P-3W, 3P-3W, 3P-4W	Yes	Yes	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	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
8435	2136.41	1P-2W, 1P-3W, 2P-2W, 2P-3W, 2P-4W, 3P-3W, 3P-4W, 3P-5W	Yes	Yes	Yes	Yes (RMS+PEAK & RMS) up to 1 & 10 mins	40 types/ up to 7 active/ 16,362 recorded	Yes (50)	Yes	STN	External adapter 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,	Yes	No	No	No	No	No	Yes	None	External adapter with internal NiMH battery pack
PEL 103	2137.52	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	No	No	No	No	Yes	Monochrome LCD	
PEL 105	2137.57		Yes	No	No	No	No	Yes			