

# POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

**NEW**

## PowerPad® IV Model 8345

*The PowerPad® moves up a grade - Class A!*

**POWERPAD IV**  
Class A



DataView®



### SPECIFICATIONS

|  |  |
|--|--|
| MODEL  | 8345   |
| <b>ELECTRICAL</b>                            |  |
| Inputs                                       | 5 x voltage / 4 x current, isolated  |
| Voltage                                      | (5 to 1,000) V <sub>AC</sub> and V <sub>DC</sub>   |
| Harmonics Mode                               | DC to 63 <sup>rd</sup> order   |
| Interharmonics Mode                          | 0 to 62 <sup>nd</sup> order  |
| Inrush & Transient Capture (number)          | No maximum (limited by SD card)  |
| Shockwaves (Fast transient)                  | Up to 12 kV sampled every 500 ns   |
| Flicker (Pst)                                | < 0.1  |
| Voltage Unbalance (u0,u2)                    | (0.5 to 5) % (absolute); ± 0.15 % (absolute)   |
| Trend Recording                              | > 900 parameters<br>3 d with a sampling period of 200 ms<br>15 d with a sampling period of 1 s<br>45 d with a sampling period of 3 s |
| Sampling Rate                                | Voltage 400 kSps / Current 200 kSps / Surge 2 MSps   |
| Alarm Mode (types / number)                  | 52 / 20,000 with Email notifications   |
| Real-time / Power / Energy / Unbalance Modes | Yes / Yes / Yes / Composite  |
| Screenshots                                  | No maximum (limited by SD card)  |
| Power Supply                                 | Power from phase from (100 to 1000) V AC/DC with external supply block (included)  |
| Carrier Current Detection                    | Yes  |
| Battery Life                                 | Cartridge Li-ion – 5800 A-h battery pack (included) ≤ 6 h w/ display ON; ≤ 10 h w/ display OFF                                       |
| <b>MECHANICAL</b>                            |  |
| Data Storage                                 | 16 GB SD-Card (included) for snapshot, transients, alarms and trend recording  |
| Display                                      | 7 in color LCD touch screen: 800 x 480 (WVGA)  |
| Clock / GPS                                  | Yes, built-in  |
| Operating Temperature                        | (32 to 104) °F (0 to 40) °C  |
| Communication                                | USB, Ethernet, Wi-Fi, Web server, IRD server, USB stick port (Type A)  |
| Dimensions                                   | (7.87 x 11.22 x 2.17) in (200 x 285 x 55) mm   |
| Weight (meter only)                          | 4.19 lb (1.9 kg)   |
| <b>COMPLIANCE &amp; STANDARDS</b>            |  |
| Safety                                       | IEC 61010 1000 V CAT IV  |
| Environmental                                | IEC 61557-12 & IEC 62586   |
| Measurement Standard                         | IEC 61000-4-30 (Ed 3) Class A (Full)   |
| EN50160 Monitoring Mode                      | With PAT3 software   |
| Warranty                                     | *3 y (registration must be done within 30 d of the date of purchase)   |

Consult factory for NIST Calibration prices

| CATALOG NO. | DESCRIPTION   |
|-------------|---|
| 2136.35     | PowerPad® IV Model 8345 (no probes)                     |
| 2136.36     | PowerPad® IV Model 8345 w/4 194-24-BK MiniFlex® Sensors |



### PRODUCT INCLUDES

CAT. # 2136.35 - POWERPAD IV MODEL 8345 (NO PROBES)

CAT. # 2136.36 - POWERPAD IV MODEL 8345 (WITH (4) MINIFLEX® MA194-24-BK FLEXIBLE CURRENT SENSORS )

Extra large tool bag, internal carrying pouch, hand strap, USB cable, (5) 10 ft black voltage leads with alligator clips, (12) color-coded input ID markers, power adapter (PA32ER) with US power cord, (2) 6 ft stackable leads, (2) 10 ft black voltage leads with alligator clips for power adapter PA32ER, (1) power plug adaptor for PA32ER, 5.8 A-h Li-ion battery pack, quick start guide, and a USB stick with DataView® software and user manual.



(4) MINIFLEX® MA194-24-BK FLEXIBLE CURRENT SENSORS (WITH CAT.# 2136.36)

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# POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS FEATURES

## FEATURES

- Full compliance with IEC 61000-4-30 ed. 3.0 Class A functions
- Voltage quality diagnostics
- Real-time display of color waveforms (5 voltage/4 current) from 1 cycle to 10/12 cycles
- Calculation of unbalance (current and voltage)
- Automatic recognition of different current sensors
- Capture shockwaves up to 12 kV with a resolution of 500 ns
- Trend recording period from 200 ms to 2 h
- RMS and Peak InRush for up to 30 min
- Display of phasor diagrams
- Waveforms at 512 samples per cycle, with Min/Max 2.5  $\mu$ s
- True InRush capabilities to study loads during setup
- Parameterization with software for True RMS single-, two- and three-phase measurements at 512 samples/cycle, plus DC
- Records and stores hundreds of parameters in memory every 10/12 periods
- Measurements and recordings accessible on 7 inch color touch screen display
- True RMS voltage and current measurement
- Measurements on all installation types: three-phase, Aron connection, etc.
- Electrical network monitoring with setting of alarms
- Fast transient events are captured and stored in memory
- Communication options: Webserver, Wi-Fi, Ethernet and USB
- Power W, VA and var (P, N, Q1, S and D) measurements
- Measurement of energy values (total and per phase) with energy valuation
- PF, DPF, CF and THD calculations and measurements
- Calculation so Pst & PIt flicker and sliding Pst
- Harmonics (amplitude/phase shift) from DC to the 63<sup>rd</sup> order
- Inter-harmonic subgroups from 0 to the 62<sup>nd</sup> order
- Calculations of K factor & FHL
- 2 carrier current frequencies monitored

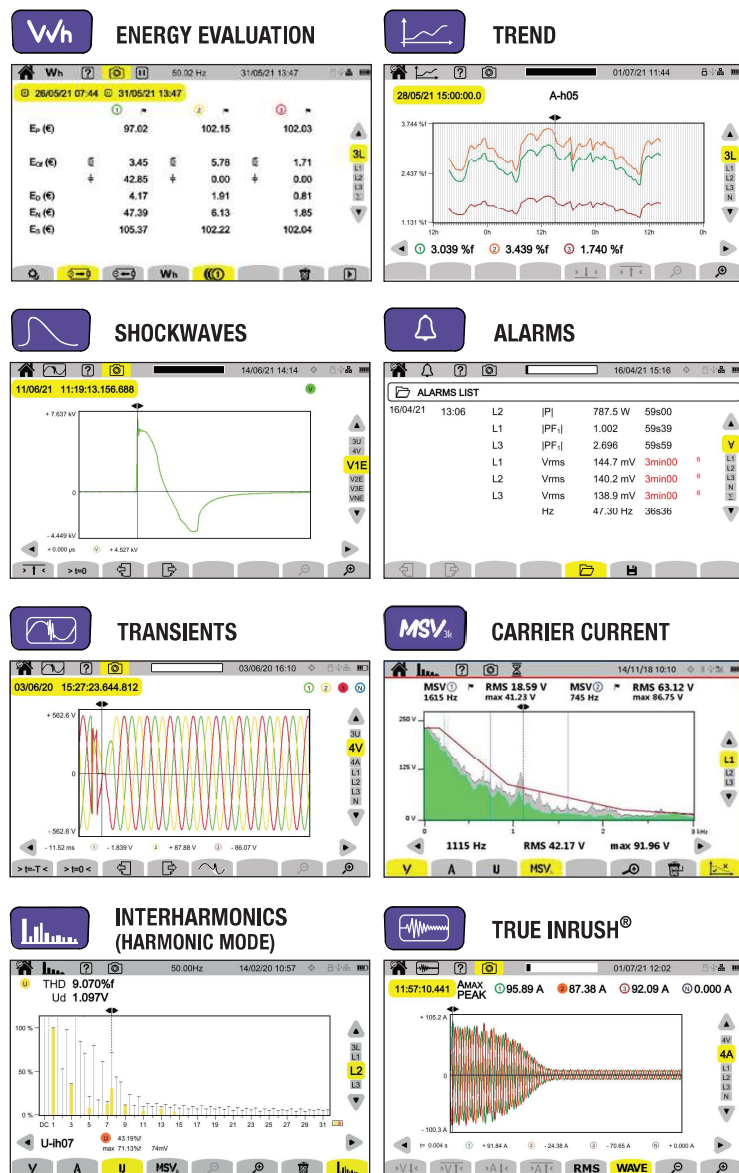
## ACCESSORIES/REPLACEMENTS

- 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 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 #5100.16** Magnetic Hook



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## Large Functional Displays



Includes **FREE DataView®** software for configuring, data retrieval, real-time display, analysis and report generation

- CATALOG #2133.76** Carrying Bag
- CATALOG #2140.43** Lead - Set of 5, 10 ft (3M) Black Leads w/5 Black Alligator Clips (Leads rated 600 V CAT IV 10 A, Clips rated 1000 V CAT IV 15 A, UL)
- 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 #2140.46** Cable - Replacement 5 ft USB Cable
- CATALOG #2140.80** Sensor - MiniFlex® Sensor Model MA194-24-BK
- CATALOG #2960.47** Battery - Replacement 5.8 A-h 61.9 W-h Li-ion Battery Pack
- CATALOG #5100.14** Adapter - Replacement Power Plug Adapter for PA32ER
- CATALOG #5100.15** Adapter - Replacement 1000 V PA32ER Power Supply

# POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS OPTIONAL ACCESSORIES

| SENSOR TYPE   | CURRENT RANGE                       | ACCURACY (TYPICAL) | TYPICAL ERROR ON $\Phi$ AT (50/60) HZ | MAX CONDUCTOR SIZE               | USED WITH MODEL   | CATALOG NUMBER         |
|---|-------------------------------------|--------------------|---------------------------------------|----------------------------------|---|------------------------|
| <b>MiniFlex® MA193-BK* &amp; MiniFlex® MA194-BK*</b><br><br>10, 14 or 24 in sensor | 100 mA to 12,000 Aac <sup>(1)</sup> | ± 1 %              | 0 °                                   | 2.75 in (70 mm) (10 in sensor)   | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>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) |
| <b>MR193-BK</b><br><br>Battery operated  | (1 to 1000) Aac<br>(1 to 1300) Aac  | ± 2.5 %            | -0.80 °                               | 1.6 in (41 mm)                   | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>8345 | 2140.28                |
| <b>SR193-BK</b><br>  | (1 to 1200) Aac                     | ± 0.3 %            | 0.2 °                                 | 2.05 in (52 mm)                  | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>8345 | 2140.33                |
| <b>AmpFlex® 193-BK*</b><br><br>24 in or 36 in sensor                             | 100 mA to 12,000 Aac <sup>(1)</sup> | ± 1 %              | 0 °                                   | 7.64 in (194 mm) (24 in sensor)  | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>8345 | 2140.34 (24 in sensor) |
|   |                                     |                    |                                       | 11.46 in (291 mm) (36 in sensor) |   | 2140.35 (36 in sensor) |
| <b>MiniFlex® 196-BK*</b><br><br>Waterproof, IP67<br>14 in or 24 in sensor        | 100 mA to 12,000 Aac <sup>(1)</sup> | ± 1 %              | 0 °                                   | 3.9 in (99 mm) (14 in sensor)    | PEL 105<br>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 $\phi$ AT (50/60) HZ | MAX CONDUCTOR SIZE | USED WITH MODEL                                       | LIMITED RANGE IF USED WITH MODEL | CATALOG NUMBER |
|---|------------------|--------------------|--------------------|---------------------------------------|--------------------|---|----------------------------------|----------------|
| MN93-BK<br>  | (0.5 to 240) AAC |                    | $\pm 1\%$          | $0.8^\circ$                           | 0.78 in (20 mm)    | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8345 | N/A                              | 2140.32        |
| MN193-BK<br> | 100 A            | 200 mA to 120 AAC  | $\pm 1\%$          | $0.75^\circ$                          | 0.78 in (20 mm)    | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8345 | N/A                              | 2140.36        |
|   | 5 A              | 5 mA to 6 AAC      | $\pm 1\%$          | $1.7^\circ$                           |                    |   |                                  |                |
| SL261<br>    | 100 A            | (5 to 100) AAC/DC  | $\pm 4\%$          | $\pm 0.5^\circ$                       | 0.46 in (12 mm)    | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8345 | N/A                              | 1201.51        |
|   | 10 A             | 50 mA to 10 AAC/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 196 A-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 #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 #2137.98

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



## ACCESSORIES/REPLACEMENTS

### 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 #2140.75

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

### CATALOG #2140.79

MiniFlex® Sensor 14 in (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             | 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/TIME/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 notificatoins   | Yes (no limit with SD card) | DC to 63 <sup>rd</sup> order; < 3 % U <sub>din</sub> / 0 to 62 <sup>nd</sup> order; < 0.5 % U <sub>din</sub> | 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             |   | 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 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   | Monochrome LCD                                | Line Power with internal NiMH battery pack                            |
| PEL 105           | 2137.57             |   | Yes            |               |                | No                                     |   |                             | Yes / No   | Monochrome LCD                                | Power phase input or external adapter with internal NiMH battery pack |