



# KW1850

## 18 Channel Power Meter, 0.5 Class Accuracy

The KW1850 Series DIN rail mounted meters combine high performance with ease of integration to provide an energy measurement and monitoring solution. The meter supports unidirectional monitoring up to 18 single-phase or 6 three-phase circuits simultaneously for multi-point energy measurement. The compact design is suited for high density applications to be used in conjunction with commercial, industrial, and residential multi-tenant energy management systems. Key functions include multi-tariff time-of-use (TOU), billing mode feature, and power quality analysis- see table 1 for additional measurement functions and parameters. The meter has either 8MB (KW1850-P1-D-S) or 8GB (KW1850-P1-D-W) memory for data logging, recording system events, and over/under limit alarming information that can be retrieved via a serial connection or remotely by Ethernet, depending on the model selected. The KW1850 Series

incorporates Snap On CT technology which reduces polarity errors, installation time, and eliminate CT wiring configuration. For CT connection, the CTs are terminated and plugged directly into the meter using the provided connectors. The meter features a built-in LCD display and a five button keypad designed to simplify setup and provide local readings of all measurements of meter data. Many of the advanced meter functions are accessed via the Accuview Software which requires an RS-485 to USB converter for the KW1850-P1-D-S to connect to a PC or laptop, or the KW1850-P1-D-W which utilizes either Ethernet or Wi-Fi. The meter supports multiple user-selectable communication protocols, pulse output communication, 18 digital inputs, 6 digital outputs, and 2 alarm relays which allows seamless integration with data acquisition systems. The tamper-proof design is approved for revenue applications. The KW1850 Series is compatible with multiple Current Transformer input options, however, 333mV CT or Flexible Rogowski Coil CTs should not be intermixed within a specific meter.

Current Transformers are sold separately as shown on the Hinged, Split Core, Solid Core, or Rogowski Coils CT product data sheets.

**Applications:** Multi Point Sub-Metering Electrical Panel for Tenant Billing, Equipment Load Monitoring, Power Quality Monitoring, Data Centers, Industrial Applications, Predicted Maintenance, Renewable Energy, Overhead Cost Reduction, "NET ZERO", LEED, Green Buildings and Refrigeration

**The KW1850 Power Meters are covered by ACI's Five (5) Year Limited Warranty. The warranty can be found in the front of ACI's Sensors & Transmitters catalog, as well as on ACI's web site, [workaci.com](http://workaci.com).**

### PRODUCT SPECIFICATIONS

|  |  |
|--|--|
| <b>Service Type:</b>                   | Single Phase, 3 Phase – Four Wire (WYE), Three Phase – Three Wire (Delta)  |
| <b>Power Supply:</b>                   | 100 - 415Vac, 50/60Hz, 100 - 300Vdc on terminals L and N   |
| <b>Power Consumption:</b>              | 5W   |
| <b>Rated Voltage:</b>                  | 100-400VAC Line to Neutral (L-N) or 100-690VAC Line to Line (L-L) RMS for three phase or 100-400VAC RMS for single phase   |
| <b>Input Impedance:</b>                | 2MΩ/Phase  |
| <b>PT Burden:</b>                      | <0.2VA   |
| <b>Number of CT Inputs:</b>            | 18   |
| <b>Acceptable CT Inputs:</b>           | 333mV or Rogowski Coil (cannot mix CT's)   |
| <b>Accuracy:</b>                       | ANSI C 12.20 class 0.5; IEC62053-22 Class 0.5s - See Table 2 for parameter accuracy, resolution, and range   |
| <b>AC Protection:</b>                  | 1A/250VAC External Fuse (not provided)   |
| <b>Measurement Type:</b>               | Real-time, True RMS measurement of instantaneous Voltage, Current, Power, Frequency, Harmonics, Phase Angle, Demand, Unbalance Factor, Running Time, and Power Factor      |
| <b>Line Frequency:</b>                 | 45/65Hz  |
| <b>Digital Inputs / Type:</b>          | 18 Digital Inputs for Water and Gas Metering Pulse Counting / Dry Node   |
| <b>Input Current (MAX):</b>            | 2mA  |
| <b>Input Voltage:</b>                  | 15-30VDC   |
| <b>Pulse Frequency (MAX):</b>          | 100Hz, 50% Duty Cycle  |
| <b>SOE Resolution:</b>                 | 2ms  |
| <b>Auxiliary Power Output:</b>         | 15VDC, 1W  |
| <b>Relay Output</b>                    |  |
| <b>Load Voltage:</b>                   | 250VAC, 30VDC  |
| <b>Max Load Current:</b>               | 3A (Resistant Load)  |
| <b>Isolation Voltage:</b>              | 4000VAC (1 min)  |
| <b>Action Time (MAX):</b>              | 10 milliseconds  |
| <b>Mechanical Life:</b>                | >5,000,000 cycles, typical   |
| <b>Conduction Impedance (MAX):</b>     | 100mΩ  |
| <b>Measurement Data Parameters:</b>    | Energy, time of Use, Power Demand, Current Demand, Real Time Metering, Power Quality, Time, Alarming, Data Logging – See Table 1 complete list of Functions and Parameters |
| <b>Multi-Tariff Time of Use (TOU):</b> | 4 tariffs (sharp, peak, normal, valley), 14 schedules, 14 segments, weekends and 10-year holiday settings  |



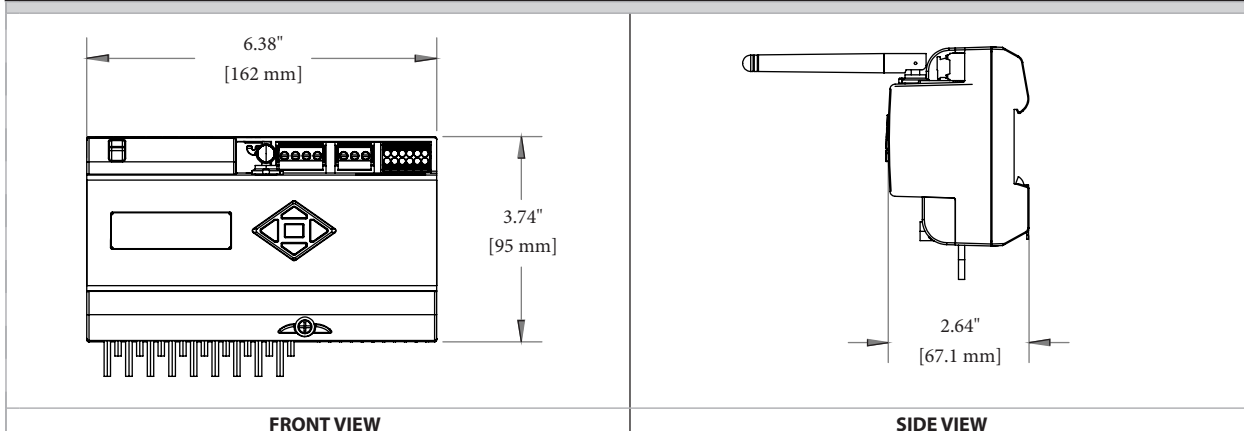


**PRODUCT SPECIFICATIONS** *(Continued)*

|  |   |
|--|---|
| <b>Over/Limit Alarms:</b>                        | Ten limit alarms configured for peak demand, current, or power quality  |
| <b>Display:</b>                                  | LCD Graphic Display with Backlight High-resolution Display  |
| <b>Pulse Output:</b>                             | Two-wire pulse train, Isolation Voltage 2500VAC, 0-30 VDC Load Voltage, 10mA Max Load Current, Pulse Width 20~100ms (80ms Default), Pulse Constant 1~60,000 (50000 Default) IMP/kWh |
| <b>Hardware:</b>                                 | RS-485 Serial, Dual Ethernet (KW1850-P1-D-W Only), Wireless Network Card (KW1850-P1-D-W Only)   |
| <b>Memory Capacity:</b>                          | 8GB or 8MB (based on model selection) onboard memory for data-logging and historical trend analysis<br>KW1850-P1-D-S: Modbus-RTU via RS485  |
| <b>Supported Protocols:</b>                      | KW1850-P1-D-W: Modbus TCP, BACnet IP, SNMP, SNTp, WiFi, WPA, WPA2, HTTP/HTTPS, FTP, SMTP, NTP, SNMP MQTT, RSTP, IPV6  |
| <b>Maximum Distance:</b>                         | 1200 meters (3,937 Feet) with data range of 100K bits/second or less  |
| <b>Supported Modbus Baud Rates:</b>              | 1200 to 115200 Baud Rate (19200 Modbus Default)   |
| <b>Data Bits / Parity / Stop Bit</b>             | 8 / None (default), Even, Odd / 2, 1 (default)  |
| <b>Modbus Address Range:</b>                     | 1 to 247 (The default is 1)   |
| <b>Operating Temperature Range:</b>              | -13 to 158°F (-25 to 70°C)  |
| <b>Storage Temperature Range:</b>                | -40 to 185°F (-40 to 85°C)  |
| <b>Operating / Storage Humidity Range:</b>       | 5 to 95%, non-condensing  |
| <b>Enclosure Material / Flammability Rating:</b> | Polycarbonate / 94-V0   |
| <b>Wire Size:</b>                                | 16-22 AWG (1.5 to 0.6 mm <sup>2</sup> )   |
| <b>Mounting:</b>                                 | IEC 35mm DIN Standard   |
| <b>Software:</b>                                 | Accuview Utility Software, Windows Based. USB-RS485 converter is required to connect to computer for KW1850-P1-D-S only.  |
| <b>Security:</b>                                 | Password Protected to access Settings. Sealed and Tamper Proof Cover.   |
| <b>Agency Approvals:</b>                         | BTL Certified, CE, RoHS2, cULus Listed (File # E359521)   |
| <b>Product Dimensions (L x W x H):</b>           | 6.38" (162 mm) x 3.74" (95 mm) x 2.64" (67 mm)  |
| <b>Optional Meter Enclosure (KW1850-ENC)</b>     |   |
| <b>Ingress Protection:</b>                       | IP66/IP67   |
| <b>Base / Cover Material:</b>                    | Fiberglass Reinforced Polycarbonate / Polycarbonate (opaque)  |
| <b>Latches:</b>                                  | Steel Mounting Plate  |
| <b>Mounting:</b>                                 | Quick-release latches that can be secured via screw lock or with a padlock  |
| <b>Flammability Rating:</b>                      | UL 746C 5-inch flame test   |
| <b>Certifications:</b>                           | UL 508A, EN 62208   |
| <b>Impact Strength:</b>                          | IK 08   |
| <b>Enclosure Dimensions (L x W x H):</b>         | 11.8" (300 mm) x 11.8" (300 mm) x 7.4" (187 mm)   |

**Note 1:** A fuse or small-sized circuit breaker is mandatory. A power supply can be an independent power supply and a fuse (typical 1A/250Vac) is suggested to be used when connecting the power supply to the meter. If a circuit breaker is utilized, it must be CE certified and comply with IEC 947 standard. An isolated transformer or EMC filter should be used in the auxiliary power supply loop if there is a power quality issue in the power supply.

**DIMENSIONAL DRAWING**





**TABLE # 1**

| Function           |   | Parameters                        | KW1850-P1-D-S | KW1850-P1-D-W |
|--------------------|---|-----------------------------------|---------------|---------------|
| Energy             | Active Energy   | Ep                                | •             | •             |
|                    | Reactive Energy   | Eq                                | •             | •             |
|                    | Apparent Energy   | Es                                | •             | •             |
| Time Of Use        | 4 Tariffs, 14 Schedules                                       | TOU                               | •             | •             |
| Power Demand       | Active Power Demand   | Demand_P                          | •             | •             |
|                    | Reactive Power Demand   | Demand_Q                          | •             | •             |
|                    | Apparent Power Demand   | Demand_S                          | •             | •             |
|                    | Peak Power Demand   | Demand_P_max                      | •             | •             |
| Current Demand     | Current Demand  | Total and each circuit            | •             | •             |
|                    | Peak Current Demand   | Total and each circuit            | •             | •             |
| Real Time Metering | Phase Voltage   | V1,V2,V3                          | •             | •             |
|                    | Line Voltage  | V12,V23,V31                       | •             | •             |
|                    | Current   | Total and each circuit            | •             | •             |
|                    | Power   | Total and each circuit            | •             | •             |
|                    | Reactive Power  | Total and each circuit            | •             | •             |
|                    | Apparent Power  | Total and each circuit            | •             | •             |
|                    | Power Factor  | Total and each circuit            | •             | •             |
|                    | Frequency   | F                                 | •             | •             |
| Power Quality      | Total Harmonic Distortion                                     | THD*                              | •             | •             |
|                    | Individual Harmonics  | 2nd ~ 31st (Voltage and Current)* | •             | •             |
|                    | Current K Factor  | KF                                | •             | •             |
|                    | Voltage Crest Factor  | CF                                | •             | •             |
|                    | Voltage Unbalance   | U_unbl                            | •             | •             |
|                    | Current Unbalance   | I_unbl                            | •             | •             |
| Time               | Real Time Clock (Year, Month, Date, Hour, Minute, Second)     |                                   | •             | •             |
| Alarming           | Over/Under Limit Alarming                                     |                                   | •             | •             |
| Data Logging       | 8MB Memory  |                                   | •             | •             |
|                    | 8GB Memory  |                                   |               | •             |
|                    | RS485 Modbus®-RTU   |                                   | •             | •             |
|                    | Ethernet Modbus®-TCP, HTTP, BACnet-IP, SMTP, SNMP, SNTP, SNMP |                                   |               | •             |
|                    | WiFi  |                                   |               | •             |
| I/O Option         | 18 Digital Inputs with 15Vdc power supply                     |                                   | •             | •             |
|                    | 6 Digital Outputs, Second Pulse, Demand Cycle                 |                                   | •             | •             |
|                    | 2 Relay Outputs   |                                   | •             | •             |
| Display            | LCD   |                                   | •             | •             |





| TABLE #2              |                             |            |                   |
|-----------------------|-----------------------------|------------|-------------------|
| MEASURE               |                             |            |                   |
| Parameters            | Accuracy                    | Resolution | Range             |
| Active Energy         | 0.5s                        | 0.1kWh     | 0~99999999.9kWh   |
| Reactive Energy       | 1%                          | 0.1kvarh   | 0~99999999.9kvarh |
| Apparent Energy       | 1%                          | 0.1kVAh    | 0~99999999.9kVAh  |
| Voltage               | 0.5%                        | 0.1V       | 10~400V           |
| Current               | 0.5%                        | 0.001A     | 5mA~10,000A       |
| Real Power            | 0.5%                        | 0.1W       | 4000.0kW          |
| Reactive Power        | 0.5%                        | 0.1var     | 4000.0kvar        |
| Apparent Power        | 0.5%                        | 0.1VA      | 4000.0kVA         |
| Power Factor          | 0.5%                        | 0.001      | -1.000~1.000      |
| Frequency             | 0.2%                        | 0.01Hz     | 45~65Hz           |
| Real Power Demand     | 0.5%                        | 0.1W       | 4000.0kW          |
| Reactive Power Demand | 0.5%                        | 0.1var     | 4000.0kvar        |
| Apparent Power Demand | 0.5%                        | 0.1VA      | 4000.0kVA         |
| Current Demand        | 0.5%                        | 0.001A     | 5mA~10,000A       |
| Unbalance             | 2%                          | 0.01%      | 0~300%            |
| Harmonics             | 2%                          | 0.01%      | 0~100%            |
| Meter Running Time    |                             | 0.01hour   | 0~999999.9h       |
| Temperature Drift     | less than 100ppm/°C(0-50°C) |            |                   |

| STANDARD ORDERING |        |   |
|-------------------|--------|---|
| Model #           | Item # | Description   |
| KW1850-P1-D-S     | 148259 | 18 Circuit, 0.5 Class Accuracy, Power Meter w/LCD, and serial communication protocols                             |
| KW1850-P1-D-W     | 148258 | 18 Circuit, 0.5 Class Accuracy, Power Meter w/LCD, Serial and Ethernet Communication protocols, and Wi-Fi enabled |

| ACCESSORIES ORDERING |        |  |
|----------------------|--------|--|
| Model #              | Item # | Description  |
| KW1850-ENC           | 148260 | NEMA 4X/IP66 Wall Mount Enclosure, includes: Din Rail Mounting Hardware, Swing Panel Kit, Tamper Proof Locking Options |
| SO-SP1               | 148261 | Snap On CT Replacement Connector Kit (Package of 20)   |
| USB-RS485            | 148243 | RS485 to USB Converter to connect KW1850-P1-D-S to PC  |