

Power Monitor

M850-MP1

MultiPower metering system for AC applications



- Complete 1-phase and 3-phase digital universal metering system
- Measures a standard range of 17 different parameters
- Four easy to access front control buttons to scroll up or down through the parameters
- Blue LED display is designed to be sunlight readable over a very wide viewing angle
- Plug-in communications modules for RS485, pulsed output and Ethernet
- MODBUS RTU and BACnet MS/TP communications protocols for use with PC, PLC, RTU, Data Loggers and SCADA programs
- Plug-in Ethernet module for 10/100 Base-T connectivity
- Communicate with up to 31 other meters or controllers
- UL listed
- Non-volatile eeprom memory retains all current ratios, demand time periods, and calibration data in power down (power loss) conditions
- Auxiliary power supply is a universal supply for both AC and DC volts
- 9 AC models to choose from
- Free software for monitoring and logging
- The only power meter with BACnet via RS485 on the market!

ELECTRICAL SPECIFICATIONS

SYSTEM TYPES

Single Phase	3-Phase 3-Wire Unbalanced
Single Phase 3-Wire	3-Phase 4-Wire Balanced
3-Phase 3-Wire Balanced	3-Phase 4-Wire Unbalanced

INPUTS

Voltage	28V to 347V,AC (L-N) 48V to 600V,AC (L-L)
Overload Burden	800V,AC continuous 0.5VA per phase
Current Input	0.5 to 6A,AC (via CT)
Input Overload	10 x In for 1 sec.
Input Burden	0.5VA per phase
Frequency	45-65Hz (Optional 360-440Hz)

ACCURACY

Volts/Amps	0.5% of reading \pm 2 digits
Frequency	0.1Hz \pm 1 digit
Active Power	1% of reading \pm 2 digits
Reactive Power	1% of reading \pm 2 digits
Apparent Power	1% of reading \pm 2 digits
Power Factor	1% of range
Energy	IEC 1036, Class I

AUXILIARY VOLTAGE

100 to 440V,AC; 100 to 420V,DC (Optional 19 to 69V,DC)
45-65Hz, Burden <10VA

INSULATION

Insulation Category	III (480V,AC L-L)
Degree of Pollution	2
Rated Impulse	IEC 60947-1-V
Withstand Voltage Meters, Front	imp: 4kV Class II
Electrical Security	IEC 61010-1

ELECTROMAGNETIC COMPATIBILITY

Immunity to:

Electrostatic Discharges	IEC 61000-4-2-Level III
Radiated Radio-Hz Fields	IEC 61000-4-3-Level III
Electrical Fast Transient/Bursts	IEC 61000-4-4-Level III
Impulse Waves	IEC 61000-4-5-Level III
Conducted Disturbances	IEC 61000-4-6-Level III
Voltage Dips & Short Interruptions	IEC 61000-4-11-Level III

Emissions to:

Conducted and Radiated	CISPR11-Class A
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For more information on this product, please contact:
PC&S, Inc. at +1 (800) 523-9194 or +1 (973) 448-9400
www.pc-s.com

M850-MP1 MultiPower metering system for AC

No matter what your requirement, there is an M850MP1 unit to handle it!

Built to the same specification as the standard M850MP1, choose from an extra level of functionality with the units shown below.

	BACnet protocol	<i>Part Number:</i> M850BAC
<p>All the measurements of the standard M850MP1 power meter but built with BACnet protocol. An RS485 (Modbus) plug-in communications module is required for this option.</p>		
	AC Volts measurement only	<i>Part Number:</i> M850MPV
<p>This special unit only displays L-N and L-L voltages.</p>		
	AC Current measurement only	<i>Part Number:</i> M850MPA
<p>This special unit only displays current and maximum demand.</p>		
	400Hz measurement	<i>Part Number:</i> M850MP1FC
<p>All the measurements of the standard M850MP1 power meter but this unit is calibrated for an input of 400Hz. <i>(Shown with optional red LED display; standard display is blue.)</i></p>		
	adds Total Harmonic Distortion	<i>Part Number:</i> M850THD
<p>All the measurements of the standard M850MP1 power meter with the additional capability of measuring the THD of the voltage and current inputs. Not available on M850BAC unit. Accuracy: 2% Range: 5-75% THD Frequency: 45-65Hz</p>		
	adds Hours Run	<i>Part Number:</i> M850MPH
<p>All the measurements of the standard M850MP1 power meter with the additional capability of measuring Hours Run.</p>		
	measures only AC Current and Watt Hours	<i>Part Number:</i> M850MKW
<p>This special unit only displays AC current and watt hours.</p>		
	330mV Current Clamp Input	<i>Part Number:</i> M850MVM
<p>All the measurements of the standard M850MP1 power meter but configured with 330mV inputs instead of the standard 5A current inputs. These voltages are usually provided by clamp-on miniature current transformers, which are ideal for retrofit applications.</p>		

COMMUNICATIONS OPTIONS VIA PLUG-IN CARDS

Versatile plug-in units for pulsed output, RS485 (MODBUS or BACNet MS/TP protocol) and Ethernet (10/100 Base-T) communications can be purchased with the M850 MultiPower meter, or they can be retrofitted when required. If required with the purchase with the M850 power meter, or ordered separately, please use the part numbers shown below.

M850 MODBUS RS485

(part number M850RS485)

The M850 has an optional 2-wire RS-485 MODBUS communications card available.

The default is 9600 baud, no parity, 8 data bits, 2 stop bits, and these parameters may be field adjusted from the front of the M850.

The default node address is 1. PC&S will be happy to pre-program the communications parameters as desired at time of sale.

All data is presented as 32 bit floating point in the 30000 range (a total of 96 registers). There is also some data mirrored & presented in the 40000 range. Please refer to the MODBUS map on the www.pc-s.com website for details.

M850 Ethernet

(part number M850ET)

The M850 has an optional Ethernet communications port that allows MODBUS-TCP communications over standard Ethernet.

The unit will support up to two (2) simultaneous data connections as a MODBUS-TCP server/slave.

There is a basic web server in the module that can be accessed via browser, but this is intended primarily as a function check. In normal operation, data transfer should take place by the unit acting as a MODBUS-TCP server/slave.

The module can be field-configured via a Telnet connection directly from a PC. PC&S will gladly pre-program the Ethernet modules with the desired Ethernet address & Modbus node number prior to shipping.

Unless otherwise specified, the default Ethernet address is 192.168.1.1, and the default MODBUS node is 1.

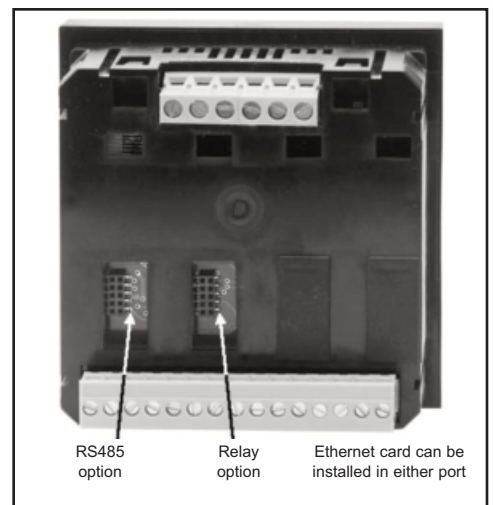
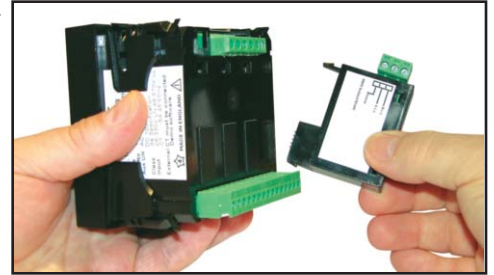
The unit uses the same MODBUS map for both MODBUS-TCP & MODBUS RS485. In both instances, all data is presented as 32 bit floating point. Please refer to the MODBUS map on the www.pc-s.com website for details.

M850 Pulsed Output

(part number M850Pulsed)

The M850 also has a communications option which can be assigned to W.h, or VAR.h. Pulses are supplied via a N/O Form A relay. The relay can be set-up via a sub-menu on the M850. If two relays are installed, the secondary relay is automatically set as the alternative type.

The pulse length of the relay can be set from a list provided in the sub-menu (from 0 to 200 milliseconds). Pulses per hour (PPH) can also be modified from the sub-menu of the M850.



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GENERAL SPECIFICATIONS

DISPLAY

Digits	3 lines 9999, Blue LED standard
Size	14.2 mm high, 7 segment
Update Time	1 second
Brightness	8 user-selectable levels

ENVIRONMENTAL

Working Temperature	-4°F to +158°F (-20°C to +70°C)
Storage Temperature	-40°F to +185°F (-40°C to +85°C)
Relative Humidity	0-95% non-condensing
Shock	30G in 2 planes

APPROVAL

UL	File No. E337752
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ENCLOSURE

Standard DIN Case	DIN 96 x 96 x 80mm
Panel Mount	via 4 retaining brackets
Panel Cutout	92 + 0.8 mm x 92 + 0.8 mm
Materials	Black Polycarbonate
Terminals	Current: 6 mm ² All others 2.5 mm ²
IP rating	Front: IP52; NEMA 12 and 12X Case: IP30; NEMA 3 and 3X
Weight	0.66 lbs; 0.25kg

ORDERING INFORMATION

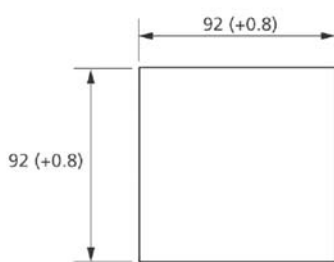
Part Number	Description	Input / Aux Supply*
M850MP1	Standard AC MultiPower unit	
M850MP1AB	with 1A,AC input	1A,AC
M850MP1FC	measures 400Hz	
M850MP1OS	includes internal RS485 communications card	
M850MP1PE	with 19-69V,DC auxiliary	19-69V,DC
M850BAC	with BACnet protocol (requires M850RS485 output module)	
M850MKW	measures AC Current and KWH only	
M850MPA	measures 3 phase AC Current & maximum demand current only	AC / Max Demand
M850MPH	with added Hours Run	
M850MPV	measures 3 phase AC Volts only	AC Volts only
M850MVM	with current clamp inputs of 333mV	333mV,DC
M850THD	with added THD (measures voltage and current inputs)	
M850Pulsed	Plug-in output module for pulsed output	
M850RS485	Plug-in output module for RS485 (MODBUS protocol)	
M850ET	Plug-in output module for Ethernet (10/100 Base-T)	
M850RTV	NEMA4 with RTV internal sealing and panel gasket	
M850*RED	any standard MultiPower unit with red LED display	

* All M850 versions shown above have a standard input 48-600V,AC (L-L)@5A,AC, 45-65Hz with 100-440V,AC / 100-420V,DC aux. supply unless otherwise noted.

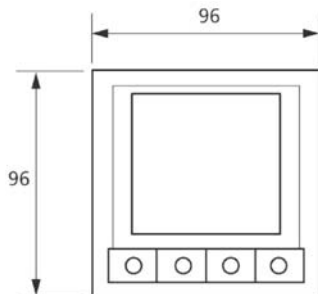
MEASURED PARAMETERS

- Phase Voltage (V)
- Phase to Neutral (V)
- Phase Current (I)
- Frequency (Hz)
- Active Power (W)
- Reactive Power (VAR)
- Apparent Power (VA)
- Active Energy (kW.h)
- Reactive Energy (VAR.h)
- Power Factor (P.F.)
- Instantaneous Amp Demand
- Instantaneous Watt Demand
- Instantaneous VA Demand
- Maximum Amp Demand
- Maximum Watt Demand
- Maximum VA Demand
- Neutral Current

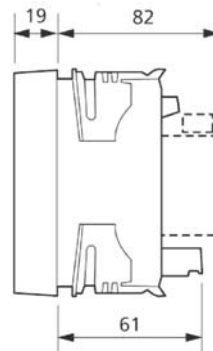
CUTOUTS, DIMENSIONS AND CONNECTIONS



Panel Cutout (in mm)

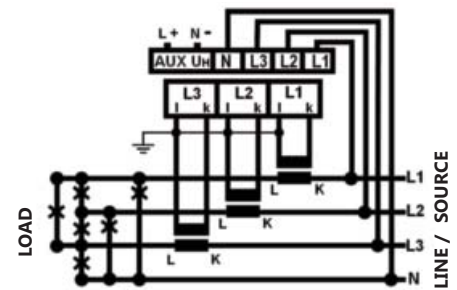


Meter Dimensions (in mm)



Wiring Connections

- k = X1 (white)
- l = X2 (black) = Grounded
- K = H1 = faces Source
- L = H2



	Voltage			Current		
	L1	L2	L3	L1	L2	L3
1ph	✓	✗	✗	✓	✓	✗
1ph 3W	✓	✗	✗	✓	✓	✗
3ph 3W	✓	✓	✓	✓	✓	✓
3ph 4W	✓	✓	✓	✓	✓	✓
3ph 3W BAL	✓	✓	✓	✗	✗	✗
3ph 4W BAL	✓	✗	✗	✓	✓	✗

Unused voltage terminals are internally connected.
Secondary of CTs must be connected to ground/earth.



www.pc-s.com

For more information and certifications, please contact:

Panel Components & Systems, Inc. ■ Phone: (800) 523-9194 ■ info@pc-s.com

Main Office:
South East:
South Central:
Canada:

Stanhope, NJ
Charlotte, NC
Tulsa, OK
Edmonton, AB

Phone: (973) 448-9400
Phone: (704) 535-3357
Phone: (862) 258-6974
Phone: (877) 962-0557