EFFICIENTLY MANAGE AND MONITOR ELECTRICAL USE

E-Mon® Submeters

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WHY SUBMETER?

As energy costs rise for buildings, along with the demand to find efficiencies, turn to submetering to monitor and control energy use at the tenant or other unit level in order to achieve energy conservation targets.

MONITORING ELECTRICAL USAGE

Submetering systems provide accurate and timely snapshots of a facility's energy use —from a single circuit or device to an entire building and beyond. Automatic meter reading systems are essential to support energy management initiatives as they combine the facility's utility service data— electric, water, gas and others — into a single, easy-to-use system to show exactly how, when and where the facility is using energy.

E-Mon electric submeters provide energy monitoring functions including:

- Electrical usage analysis and identification of peak demand levels for load comparisons
- Time-of-use metering of electricity, gas, water, BTUs and other energy sources
- Fair and equitable cost allocation for tenant billing
- Measurement, verification and benchmarking of kW/kWh for energy and green building initiatives
- Net metering

SUBMETERS AT A GLANCE

Feed-thru type meters are expensive and require labor intensive installation.

CT-style socket meters require 400A and take up a lot of space in the electrical room due to the need for CT cabinets and meter bases. Another major disadvantage in many jurisdictions is that socket meters are not UL listed.

The third type is the electronic submeter, such as the E-Mon non-socket device which provides the data and analytics needed to control energy costs on the tenant level and helps you meet your energy reduction goals.

TABLE 1. SUBMETER TYPE

	SOCKET TYPE		
	FEED-THRU TYPE	CURRENT TRANSFORMER TYPE	NON-SOCKET TYPE
INSTALLATION			
Installed Cost (Estimated)			
Standalone, up to 3200A, 3Ø	$1,000	Not Applicable	$800
Standalone, over 3200A 3Ø	Not Applicable	$2000-$5000	$5,500
8-meter Unit, 200A 3Ø	$16,000	Not Applicable	1 hour
Installation Time	2-3 hours	6-8 hours	None
Power Interruption	2-3 hours	6-8 hours	None
Amperage Limitations	320 Amp Max.	None	0.25 Square Ft
Space Requirements	2 Square Ft	11.7 Square Ft	Anywhere
Installation Location	Utility Room	Utility Room	
FEATURES			
Multiple Meter Units (MMU)	Yes	Yes	Yes
Size of 8-unit Cabinet	18.1 Square Ft	18.1 Square Ft	2 Square Ft
Digital Readouts	Optional/Yes	Optional/Yes	Standard
Reset Capabilities	No/Yes	No/Yes	Standard
Multiple Load Monitoring	No	No	Yes
Subtractive Load Monitoring	No	No	Yes
Monitor Specific In-Panel Circuits	No	No	Yes
Amperage Modification In Field	No	w/CT Change	Yes
Meter UL Listed	No	No	Yes
ENHANCEMENTS			
Pulse Outputs	Yes	Yes	Yes
Software Monitoring	Yes	Yes	Yes
Upgradeable in the Field	No	No	Yes
Power Quality Functions	Available	Available	Yes
Net-Metering Capability	Yes	Yes	Yes
Form C Control Relay Output	No	No	Yes

ENERGY ANALYSIS

Master meters provide a broad indication of consumption and demand, but true load profiling requires specific interval usage data from key loads to isolate the causes of load peaks as a first step to eliminating them or moving them to off-peak hours when rates are lower.

Submeters provide high-accuracy interval data snapshots of energy use and demand from the enterprise level all the way down to a specific circuit or item of equipment. The use of meters and submetering systems provide energy information necessary for:

- Load profiling & benchmarking
- Measurement & verification
- BAS integration
- Power quality analysis
- Usage aggregation

E-Mon hardware and software systems are designed to provide accurate energy profile data for use in cutting costs, using energy resources more efficiently and improving your facility's bottom line.

ENERGY CONSERVATION & GREEN BUILDING INITIATIVES

With world focus on building sustainability, submeters offer environmentally conscious users the ability to establish benchmark energy usage data, monitor usage trends, record the impact of energy conservation efforts and measure & verify the ongoing effectiveness of energy saving programs. Meters and submetering systems with various programs including LEED, EPACT 2005, EISA 2007 & ASHRAE 90.1, demand response and renewable energy initiatives.

The country's leading sustainable building assessment system is currently the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) rating system. E-Mon submeters can assist with LEED certification points in several areas including M & V, fundamental commissioning, on-site renewable energy, green power and regional material. Of the system's nine categories, the left hand column in the following chart lists those areas prime for submetering applications, including Water Efficiency (WE) and Energy & Atmosphere (EA) credits.

TABLE 2. LEED V4 WATER EFFICIENCY (WE) AND ENERGY& ATMOSPHERE (EA) PREREQUISITES & CREDITS REQUIRING METER USE

		TYPE/ POINTS	DESCRIPTION	COMMENTS
Building Design & Construction (BD+C)	• New Construction (NC) • Core & Shell (CS) • Schools • Retail • Data Centers • Warehouse & Distribution Centers • Hospitality • Healthcare • Homes & Multifamily Lowrise • Multifamily Midrise	WE Prerequisite	Outdoor Water Use Reduction	Reduction in landscape water use by 30%
		WE Prerequisite	Building-level Water Metering	Permanently installed metering to measure potable water use; agree to share data with USGBC for 5 years
		WE Credit	Water Metering Cooling Tower	Rewards submetering of at least two water subsystems; e.g., irrigation, domestic hot water, reclaimed water, etc.
		WE Credit	Water Use Building -level Energy	Projects encouraged to analyze water source and maximize water cycles
		EA Prerequisite	Metering Energy Metering	Install metering to aggregate total facility energy use, viz., kWh, kW, gas, BTU, etc.; agree to share data with USGBC for 5 years
		EA Prerequisite	Advanced Energy Metering	Multifamily projects must meter or submeter each unit
		EA Credit	Demand Response	Permanently installed meters with 60-min interval data recording of kWh/kW; 36-mo min data storage; remote / LAN communications to BAS for all energy sources at 10% or more of total energy use.
		EA Credit	Building-level Water Metering	Install interval data recorders & other infrastructure for future DR program participation (1 pt) or actively participate in existing DR program (2 pts)
Building Operations & Maintenance (O+M)	• Existing Buildings • Schools • Retail • Data Centers • Hospitality • Warehouses & Distribution Centers	WE Prerequisite	Building-level Water Metering	Permanently installed metering to measure potable water use; agree to share data with USGBC for 5 years; 1-2 water subsystem meter credits also possible
		EA Prerequisite	Building-level Energy Metering	Install metering to aggregate total facility energy use, viz., kWh, kW, gas, BTU, etc.; monthly/annual summaries; agree to share data with USGBC for 5 years
		EA Credit	Advanced Energy Metering	Combines 2 previous criteria from LEED v3; permanently installed meters with 60-min interval data recording of kWh/kW; 36-mo min data storage; remote/LAN communications to BAS; applies to any whole bldg. system of 20% or more total energy use.
		EA Credit 1-3	Demand Response	Install interval data recorders & other infrastructure for future DR program participation (1 pt) or actively participate in existing DR program (3 pts)
Interior Design & Construction (ID&C)	• Commercial Interiors (CI) • Retail • Hospitality	EA Credit 1-2	Advanced Energy Metering	Today's version of LEED, LEED v4.1, raises the bar on building standards to address energy efficiency, water conservation, site selection, material selection, day lighting and waste reduction.

Source: LEED v4 User Guide, October 2013

EPACT 2005/EISA 2007 Compliance	
Section 102	Reduce gross square foot energy consumption by 20% by 2015
Section 103	All federal buildings must be metered by 2012
Section 1251	Net Metering
Section 1331	Support for $1.80 federal tax deduction
EISA Title IV, Sec. 434	Provide equivalent metering of gas by 2016

COST ALLOCATION

Metering individual departments, areas or buildings for cost center analysis, budgetary accountability and allocation offer visibility into energy consumption and usage trends. Armed with this critical information, managers are able to take advantage of energy saving opportunities that may be as simple as turning off lights or computers when rooms are not in use.

TENANT BILLING

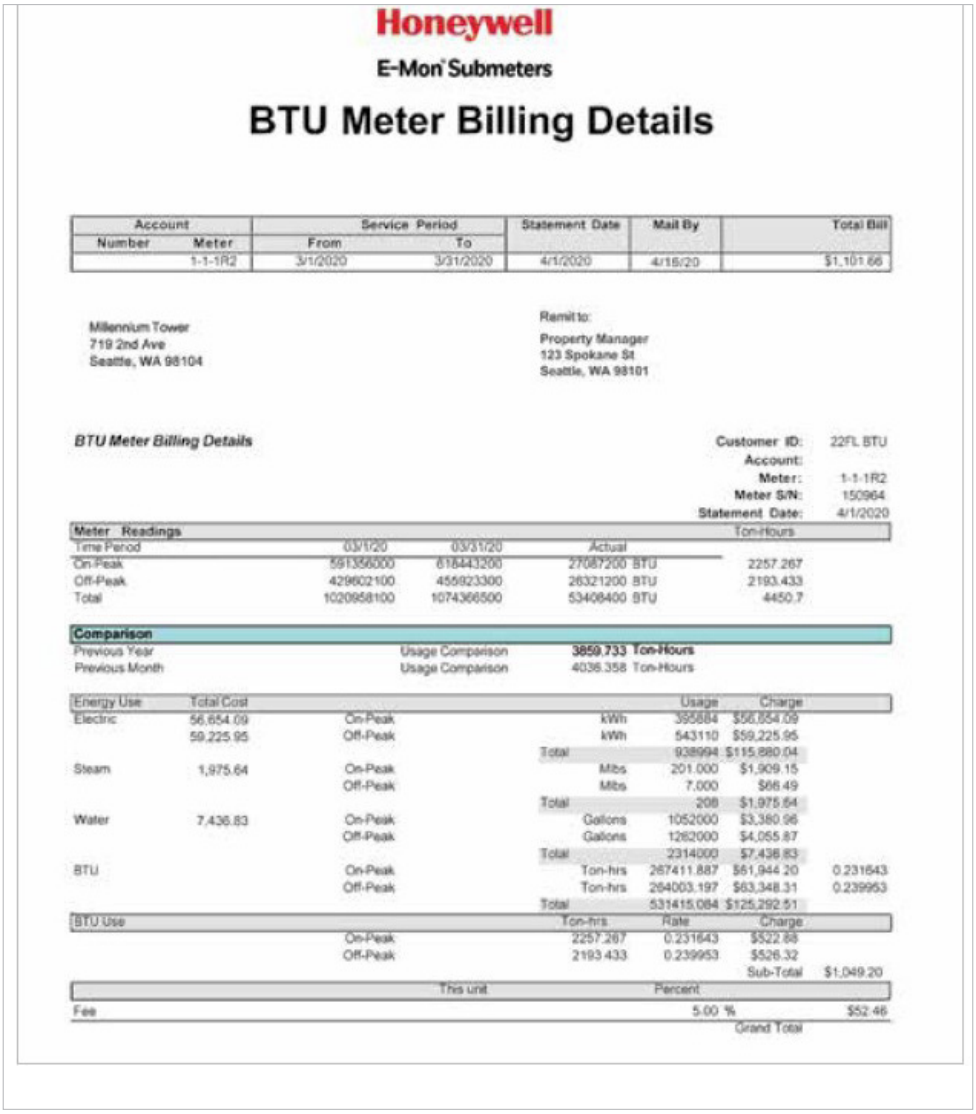
In facilities with multiple tenants, monitoring actual consumption is a win for both the building manager and the tenants.

Managers are able to allocate energy usage costs, including electric, gas, water and BTU costs, to the respective tenants. In addition, all common area usage can be monitored and distributed equitably between tenants. Tenant billing and common area allocation allows building managers to recoup energy expenses.

Tenants benefit from submetering of actual energy usage in two ways. First, tenants only pay for what they use. They are not burdened with over the flow cost of large users as they would be if billed a flat rate per square foot of space rented. Second, they gain control over their usage allowing them to conserve energy and save money.

INTEGRATE WITH BUILDING MANAGEMENT/ AUTOMATION SYSTEMS

A key element of today's sustainable building management system (BAS/ BMS) is providing the right data for advanced analysis and reporting of energy and environmental conditions within the facility. Submeters play an integral role in providing interval energy data to building automation systems to facilitate important energy decisions.



Honeywell

E-Mon Submeters

BTU Meter Billing Details

Account Number	Account Meter	Service Period From	Service Period To	Statement Date	Mail By	Total Bill
	1-1-1R2	3/1/2020	3/31/2020	4/1/2020	4/15/20	$1,101.66

Millennium Tower
719 2nd Ave
Seattle, WA 98104

Remit to:
Property Manager
123 Spokane St
Seattle, WA 98101

BTU Meter Billing Details

Customer ID: 22FL BTU
Account:
Meter: 1-1-1R2
Meter S/N: 150964
Statement Date: 4/1/2020

Meter Readings				Ton-Hours
Time Period	03/1/20	03/31/20	Actual	
On-Peak	591356000	618443200	27087200 BTU	2257.267
Off-Peak	429602100	455923300	26321200 BTU	2193.433
Total	1020958100	1074366500	53408400 BTU	4450.7

Comparison

Previous Year — Usage Comparison — 3859.733 Ton-Hours
Previous Month — Usage Comparison — 4036.358 Ton-Hours

Energy Use	Total Cost			Usage	Charge	
Electric	56,654.09	On-Peak	kWh	395884	$56,654.09	
	59,225.95	Off-Peak	kWh	543110	$59,225.95	
			Total	938994	$115,880.04	
Steam	1,975.64	On-Peak	Mlbs	201.000	$1,909.15	
		Off-Peak	Mlbs	7.000	$66.49	
			Total	208	$1,975.64	
Water	7,436.83	On-Peak	Gallons	1052000	$3,380.96	
		Off-Peak	Gallons	1262000	$4,055.87	
			Total	2314000	$7,436.83	
BTU		On-Peak	Ton-hrs	267411.887	$61,944.20	0.231643
		Off-Peak	Ton-hrs	264003.197	$63,348.31	0.239953
			Total	531415.084	$125,292.51	

BTU Use	Ton-hrs	Rate	Charge	
On-Peak	2257.267	0.231643	$522.88	
Off-Peak	2193.433	0.239953	$526.32	
			Sub-Total	$1,049.20

	This unit	Percent		
Fee		5.00 %		$52.46
			Grand Total	

E-Mon smart meters communicate through two protocols simultaneously. This allows users the advanced capability of running energy data to a billing system like E-Mon Energy and to a BAS system at the same time from one metering device.

Interval energy data can be presented through charts, graphs or utility statements through the BAS, local or remote PC or via the Web. With detailed data and customizable format options, users are able to effectively monitor and control usage and processes in their building.

Whether metering a commercial or residential tenant, department or common area, cost allocation and accurate billing practices help reduce costs, recoup energy expenses and promote energy conservation.

SUBMETERING APPLICATIONS

COMMERCIAL - OFFICE & RETAIL

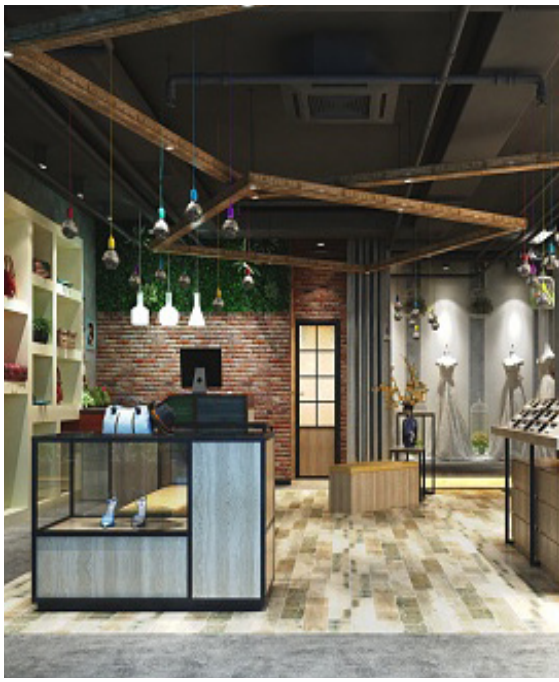
Submeters help facility managers track everything from common area usage and HVAC system performance to monitoring after-hours energy usage for recovering and allocating costs back to the using tenant.

From the tenant's perspective, submeters eliminate problems associated with arbitrary ratio- based measures like square-footage that favor high-volume users over low use tenants. Financial benefits are also possible if tenants implement energy conservation practices.

Submeters provide the usage data that allows managers to generate electric bills that put tenant fairness concerns to rest by including proof of exact use with every billing statement.

In addition, E-Mon hardware and software solutions were specifically designed to:

- Allocate energy costs to specific lease spaces, circuits or buildings
- Profile entire facility data for demand management, load shedding & energy initiative compliance
- Aggregate energy demand/use for bulk energy contracts
- Implement demand response/control to avoid costly demand charges



MULTI-FAMILY RESIDENTIAL

Rising energy rates are driving multi-family property owners to allocate utility costs back to tenants, recover revenue and promote resource conservation. Arbitrary square-footage cost allocation and other ratio billing measures do little to encourage energy conservation. Alternatively, tenants in high-rises, condos, co-ops and mixed-use buildings have been shown to use up to 25% less energy when submeters hold them accountable for the power they use.

Ideal for new or retrofit applications, versatile E-Mon metering solutions offer a range of capabilities from "walk up and read" to complete AMR (Automatic Meter Reading) solutions that can incorporate all utilities including gas and water into one easy-to-use system. Honeywell's complete selection of E-mon metering hardware and software is the perfect cost-effective solution for tenant metering and common area allocation.

HEALTHCARE & HOSPITALS

Design of Experiment's analysis of energy use in the healthcare sector, in which $5.3 billion is spent every year, is second only to the food service industry in terms of consumption.

Submetering hardware and software are easily installed and readily available to make the invisible visible.

Some specific uses for submeters in the healthcare environment include:

- Analysis, measurement, verification & benchmarking of peak demand (kW) & consumption (kWh) for compliance with energy initiatives
- Time-of-use metering of electricity, gas, water, BTUs and other energy sources
- Load comparisons and usage monitoring
- Cost allocation of actual usage to specific users, tenants and departments within the facility

INDUSTRIAL/MANUFACTURING

Plant operators need accurate, real-time energy data to evaluate the performance of individual processes, pieces of equipment and departments. In any type of industrial facility, whether process or discrete manufacturing, E-Mon submeters are an extremely cost-effective way to chart energy usage, isolate specific processes that are not energy efficient and provide real-time evaluation of critical load-shedding activities.

Submeters allow electric, water, gas, BTUs and other parameters to be easily factored into the facility energy profile for management. In addition to identifying poor performers by benchmarking energy levels at multiple facilities, submeters can also be used to help identify other energy saving opportunities.

Metering opportunities include:

- Allocate costs to offices and departments to identify administrative costs vs. production costs, or allocate costs to production lines, production runs and individual and/or groups of equipment
- Monitor and identify "high use" pieces of equipment for load shedding/ shifting programs or to identify maintenance issues for repair before critical equipment fails

EDUCATIONAL

Designed to install easily in new or retrofit applications, cost-effective E-Mon meters are ideal for departmental budget allocation, identifying peak energy inefficiencies, common area lighting and event metering. Student housing is a prime application for submetering. Submetering dorm rooms, suites or buildings allows billing according to actual usage. Installing Green Class meters in public areas allows students to immediately see the impact of their conservation efforts.

Key equipment can also be metered to profile energy use, allowing facility engineers to reduce downtime by diagnosing costly failures before they happen. In addition, analysis of energy oad trends highlight opportunities to shift energy loads to off-peak hours or stagger loads to reduce costly demand charges.

Applications:

- Campus
- Coffee shops
- Food service
- Bookstores
- Retail spaces

Metering opportunities include:

- Student housing & dormitory monitoring
- Departmental allocation/budgeting
- Leased spaces
- Event allocation
- Equipment maintenance

GOVERNMENT

As the nation's single largest energy user and a significant consumer in many areas of the country, federal and local governments are keenly aware of the need to conserve energy, to invest in reduction measures and contribute to operational efficiency and modernization. To achieve this goal, the Government established the "Energy Policy Act of 2005 (EPACT) to give guidance in achieving fully managed electrical systems.

"In accordance with guidelines established by the Secretary under paragraph (2), all Federal buildings shall, for the purpose of efficient use of energy and reduction in the cost of electricity used in such buildings, be metered."

Compliance with EPACT 2005 and EISA 2007 regulations and green building initiatives are particularly challenging for government facilities as each complex is unique. These complexes run the full range of building types; office, single and multi-family, plant/industrial, medical and educational. For over 25 years, agencies like DOE, GSA, DOD, VA, Postal Service and Homeland Security have employed advanced meters and submetering systems to measure entire buildings, individual tenants or areas, specific pieces of equipment or individual circuits quickly and accurately.

Metering applications include:

- Whole building metering
- Departmental/tenant cost allocation
- Measurement & verification
- Energy management & analysis
- Building automation system integration

TABLE 3. EPACT 2005/EISA 2007 COMPLIANCE

Section 102	Reduce gross square foot energy consumption by 20% by 2015
Section 103	All federal buildings must be metered
Section 1251	Net Metering
Section 1331	Support for $1.80 federal tax deduction
Title IV, Sec. 434	Provide equivalent metering of gas by 2016

NATIONAL, STATE & LOCAL PRODUCTS

NATIONAL APPROVALS
UL/CUL Listed
CSA Approved (Canadian Standards Assoc.)
All federal buildings must be metered

STATE APPROVALS
CA – California Bureau of Weights & Measures, DWP-Los Angeles, CSE-Westminster, SDG&E-San Diego
CO – Public Service of Colorado – Denver
FL – Tampa Electric – Tampa
MI – Detroit Edison – Detroit
NJ – NJ Dept. of Energy – Newark, PSE&G Approved for DSM program
NH – New Hampshire Electric Co. – Plymouth
PA – PECO Energy – Berwyn
SC – State of South Carolina – Columbia
VA – Appalachian Power Company – Roanoke
PR – PREPA Approved – Puerto Rico

SUBMETERING APPLICATIONS

- Office buildings
- Entertainment facilities
- Airports
- Industrial
- Malls & shopping centers
- Data centers/server farms
- Multi-family residential
- Hospitals/medical offices
- State/local government
- Colleges/universities
- K-12 education
- Government-DOD/military
- Government agencies

METERING PRODUCTS

PULSE OUTPUT METERS

Class 1000 Single-Phase, Class 2000 Three-Phase, Green Class 2000 & Class 6200 Meters

E-Mon Class 1000 & 2000 kWh/ Demand meters provide the basic building blocks of an affordable, effective and scalable energy management system. These easy-to-install meters can monitor anything from a single-phase circuit to a specific load panel to an entire building. Energy usage data can be viewed via the LCD display on the meter for easy, walk-up and read monitoring of energy consumption. Remote metering via E-Mon Energy Automatic Meter Reading (AMR) systems or Web-Mon Web Enabled Monitoring System is also easily interfaced for tenant billing, energy management and cost allocation based on actual usage, not estimation or ratio-based calculations.

Providing revenue-grade accuracy, Class 1000 & 2000 meters are independent lab- certified to ANSI C12.2012.20 national accuracy standards of +/- 0.2% from 1% to 100% of rated load. All models provide a direct read two-line alphanumeric LCD display (without multiplier) of cumulative kWh and real-time kW load.

E-Mon standard meters are offered in standard JIC steel enclosures or optional NEMA 4X outdoor enclosures at no additional cost. MMU (Multiple Meter Unit) cabinets are also available containing up to 24 meters in a single, compact enclosure.

Available models include:

Class 1000
1-phase/2-wire and 2-phase/3-wire configurations

Class 2000
2-phase/3-wire and 3-phase/3- or 4-wire configurations, with included current sensors from 100-3200A. A demand option displays the kW peak demand over a 15- or 30 minute demand interval

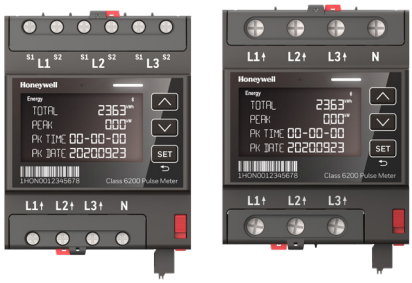
Class 6200
1-phase/2-wire, 2-phase/3-wire, 3-phase/3-wire or 3-phase/4-wire configurations, Fast and simple app-supported commissioning, Advanced cybersecurity with crypto chip, Integrated analysis functions for power quality and self-diagnosis

Note: All meter kits include split core current sensors.

Class 1000 Single-Phase

Class 2000

Class 6200 Three-Phase in a MMU-8 Cabinet



Class 6200

METERING PRODUCTS CONTINUED

RS-485 COMMUNICATION METER

Class 3200 Smart RS-485 Meter

Class 3200

Provides advanced display of energy data including kWh, kWh/Demand with peak date & time, power factor per phase, real-time load in kW and amps & volts per phase. Meter allows for on-board set up of meter date/time and ID code set up for communication options. Class 3200 meters are available as standalone units in NEMA 4X outdoor enclosures with optional JIC steel or MMU configuration for installation into Multiple Meter Unit cabinets. User can choose one communication protocol for this unit; EZ7 E-on protocol for this unit; EZ7 E-Mon Energy (standard), Modbus RTU or BACnet MS/TP.

Class 3200

E-MON RS-485 & ETHERNET DUAL COMMUNICATION PROTOCOL METERS

Class 3400, Green Class 5000 Smart Net Meters, Class 5000, & Multi-Mon

E-Mon smart meters are UL listed, independent lab-certified to ANSI C12.20 national accuracy standards (+/- 0.2% from 1% to 100% of rated load) and provide revenue grade accuracy. In addition, meters are available in a MV-90 compatible configuration.

Available models include:

Class 3400

The Class 3400 is the most advanced dual-protocol smart meter available on the market today. Features include advanced energy displays, on-board set up capabilities and dual protocol capabilities, but can also provide an optional expanded feature package which gives the user load control capabilities for load control/ shedding, two external meter inputs for water, gas, BTU, etc. meters & two pulse& two pulse outputs for kWh and kVARh. Class 3400 meters are supplied in NEMA 4X enclosures with JIC steel enclosures optionally available.

Green Class Net Meters

Smart meters are ideal for solar, wind and renewable energy applications where net metering energy data is required. This meter displays kWh delivered, received and Net kWh, kWh/Demand with peak date and time, Power Factor per Phase, Real-time load in kW, Amps per Phase and Volts per Phase. The dual-protocol communication capabilities allow users to not only "walk up and read" the meter display, but they can also monitor their energy usage via up to two building/ energy management systems. The Green Class Net meter communicates via industry standard methods including RS-485, Ethernet and Pulse via a variety of protocols such as EZ7 (E-Mon Energy), Modbus RTU, Modbus TCP/IP, BACnet MS/TP, BACnet IP.

Class 5000

In addition to advanced display features and on-board set up options, the Class 5000 Meter offers users the option of dual-protocol communication capabilities via RS-485 and Ethernet. Users can choose from a variety of industry-standard communication protocols including; EZ7 E-Mon Energy, Modbus RTU, Modbus TCP/IP, BACnet MS/TP or BACnet IP. Class 5000 meters also provide two pulse outputs and two external meter inputs for water, gas, BTU, etc. meters readable via E-Mon Energy software and phase loss alarming.

Note: All meters include one set of three (3) split-core current sensors

Class 3400

Green Class

Class 5000

METERING PRODUCTS CONTINUED

E-Mon Multi-Mon is a multiple branch circuit energy monitor that collects granular energy intelligence data for tenant billing, cost allocation and energymanagement. The device can accommodate up to 36 submetering points, giving total flexibility for configuration of up to 36 single-phase, 18 two-phase, 12 three-phase or any combination thereof. The Multi-Mon is ideal for submetering applications in apartment buildings, multi-tenant commercial facilities, institutions, data centers and more.

Multi-Mon is supplied with Power Software for meter set up and power quality analysis and is compatible with E-Mon Energy software via EZ7 protocol for automatic meter reading, energy billing and profiling. In addition, Modbus RTU via RS-485 communication is standard and Modbus TCP/IP via Ethernet is optionally available.

Multi-Mon is compatible with both split & solid core current sensors for increased flexibility in installation. (Current sensors ordered separately, see Multi-Mon current sensor specifications for details. Multi-Mon is also optionally available pre-installed inside a JIC steel enclosure with lockable window panel and 3-phase voltage terminal block.

POWER QUALITY METERS

PowerSmart+ Essential, PowerSmart+ Advanced & PowerSmart+ Socket Meters

E-Mon PowerSmart+ family of power quality energy monitors and revenue-grade power quality socket meters are ideal for commercial, industrial and institutional energy monitoring applications. This family of products offers users unprecedented granularity of energy measurement data combined with advanced power quality analysis via the included Power Software.

PowerSmart+ meters combine real-time energy monitoring, advanced power quality functions and BAS communication in one integrated platform that meets the building sector's growing need for metering and monitoring solutions that help operators achieve a better level of performance, efficiency and cost savings with more granular management of the facility's total energy envelope.

Features of the PowerSmart+ family of power quality meters include, but are not limited to:

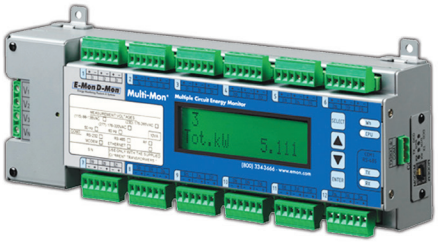
- Power Factor, THD, TDD, K-Factor, Sags, Swells, Spikes and Alarming
- Modbus RTU via RS-485 communication (standard) or Modbus TCP/IP via Ethernet (optional)
- Combines both static metering and time-of-use functionality
- Integral state-of-the-art EN50160-compliant power quality recorder
- Supplied with Power Software for meter set up and power quality analysis
- Selection of solid- and split-core current sensor options available

Available models include:

PowerSmart+ Essential Meter
Class 0.5S (+/- 0.5% accuracy) four-quadrant active and reactive energy polyphase static meter providing high-precision three-phase monitoring of V, I, PF, demand, V/I un-balance, THD up to the 40th order harmonic, frequency, load profile and more; offers panel-mount configuration for 4" round or 96x96 DIN opening; Graphical display provides real-time sine wave presentation, phasor diagrams and harmonics graphing.

PowerSmart+ Advanced Power Quality Energy Meter
Class 0.2 (+/- 0.2% accuracy) four- quadrant, multi-function three-phase energy meter with advanced power quality features including embedded harmonic analyzer, voltage and current THD, current TDD and K-Factor, inter-harmonics THD up to 50th order harmonic; optionally available pre-installed in a JIC steel enclosure with lockable window panel and 3-phase voltage terminal block.

PowerSmart+ Revenue-Grade Power Quality Socket Meter
Precision Class 0.2 (+/-2% accuracy) three-phase active energy and power demand meter provides multiple tariffs and time-of-use capability, transformer and line losses, harmonic analyzer (to the 63th harmonic), volts and amps, power harmonics and power factor, phasor and symmetrical components), unique anti-tampering and self-test functions, standard form 9S socket configuration allows easy new or retrofit installation.



Multi-Mon Branch Circuit

PowerSmart+Essential-Meter

PowerSmart+ Advanced


PowerSmart+ Revenue Grade

OTHER METERING PRODUCTS

Electric Gas, Water, BTU, Etc.

From standalone metering to full software integration, Honeywell offers a one-stop utility energy metering and monitoring solution with E-Mon products

Third-party metering products include both hot and cold water meters in standard pipe sizes from 3/4" up to 6 and 8 inches, respectively, with larger, non-standard sizes available upon request. All come with pulse outputs for interfacing with external interval data recorders. Typically used in potable water applications, meters for wastewater and other non-potable specialty water applications are also available.

Additional offerings such as E-Mon gas, BTU, and meters provide standard pulse outputs for interfacing with external interval data recorders. The gas meters come in a range of types and sizes and are generally used for gas, propane and other gases may also be used. Meters are available in a variety of sizes and configurations to meet your specific application.

CLASS 1000 SINGLE-PHASE KWH METER

Pulse Output Meter

Features

- Direct-read 2-line alpha-numeric LCD display without multiplier displays cumulative kWh and "real-time" kW load
- Revenue-grade accuracy
- Patented 0-2 volt output split-core current sensors promote enhanced safety and accurate remote mounting of current sensors up to 2,000 feet from meter without power interruption. Optional solid-core sensors available in 100 & 200 amp)
- Parallel up to three (3) sets of current sensors for cumulative reading
- Current sensor installation diagnostics
- Fixed pulse output
- Non-volatile memory
- Maintains reading in the event of power failure
- Meter can be used on the following configurations:
  - 1-Phase, 2-Wire
  - 2-Phase, 3-Wire
  - For other configurations, contact factory
- Available in MMU (Multiple Meter Unit) enclosures containing up to 24 meters in one compact enclosure
- Industrial grade JIC steel enclosure (standard) with padlocking hasp & mounting flanges for indoor installation

- Knockouts: 1 1/16" (3/4" cond.) bottom, 7/8" (1/2" cond.) top
- Optional NEMA 4X polycarbonate enclosure with padlocking hasp & mounting flanges for indoor/outdoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- UL/CUL listed
- Certified by independent test lab to ANSI C21.20 national accuracy standards. (+/- 0.2% from 1% to 100% of rated load)
- California CTEP approved for use with solid-core current sensors. Listed by the California Energy Commission

If your application requires a specialized meter that is not part of our standard catalog offering please contact us at (800) 334-3666 so that we can assist you in defining your requirements and specifying the appropriate product for your application.

CLASS 1000 MODELS		
120V, 1-PHASE, 2W (SUPPLIED WITH (1) SPLIT-CORE CURRENT SENSOR)	**120/208-240V, 1- OR 2-PHASE, 3W (SUPPLIED WITH (2) SPLIT-CORE CURRENT SENSORS)**	**277V, 1-PHASE, 2W (SUPPLIED WITH (1) SPLIT-CORE CURRENT SENSOR)**
E10-212025-JKIT (25 Amp)	E10-320825-JKIT (25 Amp)	E10-227725-JKIT (25 Amp)
E10-212050-JKIT (50 Amp)	E10-320850-JKIT (50 Amp)	E10-227750-JKIT (50 Amp)
E10-2120100JKIT (100 Amp)	E10-3208100JKIT (100 Amp)	E10-2277100JKIT (100 Amp)
E10-2120200JKIT (200 Amp)	E10-3208200JKIT (200 Amp)	E10-2277200JKIT (200 Amp)
OPTIONAL METER ENCLOSURES		
Replace "J" in model number with optional enclosure specification.		
Specification M - MMU Configuration (ex. E10-3208100MKIT)		
Specification R - NEMA 4X Raintight Enclosure (ex. E10-212025-RKIT)		
*For higher amperages contact factory at (800) 334-3666.		

CLASS 2000 THREE-PHASE KWH METER

Pulse Output Meter

Features

- Direct-read 2-line alpha-numeric LCD display without multiplier displays cumulative kWh and "real-time" kW load.
- Demand option displays kW/ Demand and kW Peak date and time (15 minute interval standard,30- or 60 minute interval available)
- Patented 0-2 volt output split-core current sensors promote enhanced safety and accurate remote mounting of current sensors up to 2,000 feet from meter without power interruption (Optional solid-core sensors available in 100 & 200 amp.) (three-phase meters include 3 split-core current sensors)
- Parallel up to three (3) sets of current sensors for cumulative reading
- Fixed-value pulse output
- Non-volatile memory
- Onboard installation diagnostics & verification system
- Meter can be used on the following configurations:
  - 3-Phase, 4-Wire
  - 3-phase, 3-Wire
  - For other configurations contact factory
- Available in MMU (Multiple Meter Unit) enclosures containing up to 24 meters in one compact enclosure
- Industrial grade JIC steel enclosure (standard) with padlocking hasp & mounting flanges for indoor installation.
- Knockouts 1 1/16" (3/4" cond.) bottom, 7/8" (1/2" cond.) top
- Optional NEMA 4X polycarbonate enclosure with padlocking hasp & mounting flanges for indoor/outdoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- UL/CUL listed
- Revenue Grade Accuracy. Certified by independent test lab to ANSI C12.20 national accuracy standards. (+/- 0.2% from 1% to 100% of rated load)
- California CTEP approved for use with solid-core current sensors. Listed by the California Energy Commission

CLASS 2000 MODELS		
120/208-240V, 3-PHASE		
AMPERAGE	**KWH METER**	**KWH/DEMAND METER**
100 Amp	E20-208100-JKIT	E20-208100-J-D-KIT
200 Amp	E20-208200-JKIT	E20-208200-J-D-KIT
400 Amp	E20-208400-JKIT	E20-208400-J-D-KIT
800 Amp	E20-208800-JKIT	E20-208800-J-D-KIT
1600 Amp	E20-2081600JKIT	E20-2081600J-D-KIT
3200 Amp	E20-2083200JKIT	E20-2083200J-D-KIT
277/480V, 3-PHASE		
AMPERAGE	**KWH METER**	**KWH/DEMAND METER**
100 Amp	E20-480100-JKIT	E20-480100-J-D-KIT
200 Amp	E20-480200-JKIT	E20-480200-J-D-KIT
400 Amp	E20-480400-JKIT	E20-480400-J-D-KIT
800 Amp	E20-480800-JKIT	E20-480800-J-D-KIT
1600 Amp	E20-4801600JKIT	E20-4801600J-D-KIT
3200 Amp	E20-4803200JKIT	E20-4803200J-D-KIT
347/600V, 3-PHASE (WYE CONFIGURATION)		
AMPERAGE	**KWH METER**	**KWH/DEMAND METER**
100 Amp	E20-600100-JKIT	E20-600100-J-D-KIT
200 Amp	E20-600200-JKIT	E20-600200-J-D-KIT
400 Amp	E20-600400-JKIT	E20-600400-J-D-KIT
800 Amp	E20-600800-JKIT	E20-600800-J-D-KIT
1600 Amp	E20-6001600JKIT	E20-6001600J-D-KIT
3200 Amp	E20-6003200JKIT	E20-6003200J-D-KIT

HIGH VOLTAGE APPLICATION METERS (FOR USE WITH CTS & PTS)
E20-12025HV-JKIT
OPTIONAL METER ENCLOSURES
Replace "J" in model number with optional enclosure specification.
Specification M - MMU Configuration (ex. E20-208100-MKIT)
Specification R - NEMA 4X Raintight Enclosure (ex. E20-6001600RKIT)

GREEN CLASS 2000 THREE-PHASE KWH METER

Pulse Output Meter

Features

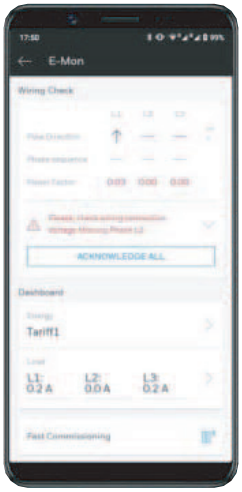
- Direct-read 2-line alpha-numeric LCD display without multiplier displays cumulative kWh, peak demand w/ date & time and "real-time" kW load
- User entered cost per kWh provides to-date energy cost and projected hourly cost based on metered load
- Displays total carbon (CO_2) emissions in pounds (lbs.) and indicates hourly emissions based on metered load
- 0-2 volt output split-core current sensors promote enhanced safety and allow remote mounting of current sensors up to 2,000 feet from meter without power interruption. (Optional solid-core sensors available in 100 & 200 amp.) (3-phase meters include 3 split-core current sensors.)
- Non-volatile memory
- Fixed-value pulse output
- Onboard installation diagnostics & verification system.
- Parallel up to three (3) sets of current sensors for cumulative reading
- Meter can be used on the following configurations:
  - 3-Phase, 4-Wire
  - 3-Phase, 3-Wire
  - For other configurations contact factory
- Available in MMU (Multiple Meter Unit) enclosures containing up to 24 meters in one compact enclosure
- Green industrial grade JIC steel enclosure (standard) with padlocking hasp and mounting flanges for indoor installation with 11/16"KO(3/4" cond.) bottom, 7/8" (1/2" cond.) top
- Optional gray NEMA 4X polycarbonate enclosure with padlocking hasp & mounting flanges for indoor/outdoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- UL/CUL listed
- Revenue Grade Accuracy. Certified by independent test lab to ANSI C12.20 national accuracy standards. (+/- 0.2% from 1% to 100% of rated load.
- In addition to complying with several Energy Policy Act of 2005 (EPACT) guidelines, E-Mon Green Class 2000 meters can materially help your facility gain points toward LEED Buildin Design + Construction (BD+C), Interior Design + Construction (ID+C) and Building Operations + Maintenance (O+M) certification. Available in a variety of voltage/current/wiring configurations, Green Class meters are also compatible with E-Mon Energy meter reading and billing software, and commercially available building automation systems

GREEN CLASS MODELS		
120/208-240V, 3-PHASE	**277/480V, 3-PHASE**	**347/600V, 3-PHASE (WYE CONFIGURATION)**
E20-208100-J-G-KIT (100 Amp)	E20-480100-J-G-KIT (100 Amp)	E20-600100-J-G-KIT (100 Amp)
E20-208200-J-G-KIT (200 Amp)	E20-480200-J-G-KIT (200 Amp)	E20-600200-J-G-KIT (200 Amp)
E20-208400-J-G-KIT (400 Amp)	E20-480400-J-G-KIT (400 Amp)	E20-600400-J-G-KIT (400 Amp)
E20-208800-J-G-KIT (800 Amp)	E20-480800-J-G-KIT (800 Amp)	E20-600800-J-G-KIT (800 Amp)
E20-2081600J-G-KIT (1600 Amp)	E20-4801600J-G-KIT (1600 Amp)	E20-6001600J-G-KIT (1600 Amp)
E20-2083200J-G-KIT (3200 Amp)	E20-4803200J-G-KIT (3200 Amp)	E20-6003200J-G-KIT (3200 Amp)
OPTIONAL METER ENCLOSURES		
Replace "J" in model number with optional enclosure specification.		
Specification M - MMU Configuration (ex. E20-208100-M-G-KIT)		
Specification R - NEMA 4X Raintight Enclosure (ex. E20-208400-R-G-KIT)		
* 3-phase meter kits include one set of three (3) split-core current sensors.		

Note: All meter kits include split core current sensors

CLASS 6200

Pulse Series



Features

- Three Phase Revenue-Grade Pulse Output Meter
- Operating voltages
  100-480 VAC, 50/60 Hz
- Three phase 3 wire Delta or 4 wire Wye
- Single phase single pole 120 and two pole 240 VAC
- Current sensor measurement with 0.333 or 2 VAC sensors
  0-2 volt output split-core
- Accuracy for active energy:
  Class 0.5 according ANSI C12.20
- UL 61010-2-030 listed
- Bluetooth low-energy 5.0 Class 1 interface
- App-based commissioning and meter reading

Application

- Honeywell E-Mon® Class 6200 poly-phase meters enabled users to better manage energy costs. Their innovative technology provides a completely new user experience thanks to a Bluetooth Low Energy interface. Installation and configuration can be carried out easily and flawlessly via a smart-phone app

CLASS 6200 MODELS

MODEL NUMBERS	DESCRIPTION
EM3S-V-P-D	DIN rail meter, no enclosure.
EM3S-V-P-R	Meter with NEMA 4X enclosure and inner dead-front swing panel.
EM3S-V-P-ER	Meter with NEMA 4X economy enclosure includes DIN rail.
EM3S-V-P-J	Meter with NEMA 1 indoor JIC steel enclosure includes DIN rail.
DRAK	DIN rail adapter kit for flush mount no enclosure or meter.
MMU	Multiple Meter Units in 8, 16, or 24 meters UL Type 4 outdoor steel enclosure factory pre-wired line voltage to meter terminal block. Please see MMU Configuration Sheet to order.

METERING PRODUCTS CONTINUED

IDR (Internal Data Recorder)

Features

- Advanced scrolling 4-line display showing:
  - kWh for each meter connected to the IDR
  - Real-time load for each meter connected to the IDR
- On-board set-up option for:
  - IP address
  - Date/time
  - ID codes for EZ7, Modbus & BACnet
- Standard IDR (RJ Jacks) reads & records up to 8 or 16 E-Mon electric meters. (Class 1000 & 2000 meters)
- IDR-8 ST (screw terminal) model can accept contact closure type pulse inputs from other types of meters (water, gas, BTU, etc.)
- Built-in RS-485 communication capability supports up to 52 Class 3200, 3400 and 5000 meters and/or IDR interval recorders (not to exceed 52 devices/channel). Cabling can either be daisy-chain or star configuration,3-cond.,18-22 AWG, up to 4,000 cable feet total per channel
- Built-in RS-485 and Ethernet communications.
- Protocols:
  - EZ7 Ethernet
  - Modbus TCP/IP
  - BACnet IP
  - Modbus RTU
  - BACnet MS/TP*
- Data stored in 15 minute intervals for up to 72 days or 5 minute intervals for up to 24 days. Maintains data in a first-in, first-out format
- Reads usage and reads demand in 15, 30 or 60 minute kW periods (15 minute standard)
- 120V power supply required and included with all IDRs
- Maintains data in case of power outage
- Industrial grade JIC steel enclosure (standard) with padlocking hasp & mounting flanges for indoor installation and three 11/16" knockouts (3/4" conduit) on bottom of enclosure
- Optional MMU style enclosure. (can be factory installed in MMU Multiple Meter Unit cabinets with meters)
- FCC approval
- MV-90 compatible (with EZ7 only)

IDR MODELS

COMMUNICATION PROTOCOL & OPTION PACKAGES

Specify protocol package when ordering all meters. Replace * in model number with protocol package specification below.

RS-485 PORT	ETHERNET PORT	SPECIFY
EZ7	EZ7 Ethernet	01
Modbus RTU	EZ7 Ethernet	02
BACnet MS/TP	EZ7 Ethernet	03
EZ7	Modbus TCP/IP	04
EZ7	BACnet IP	05
Modbus RTU	Modbus TCP/IP	06

STANDARD CONFIGURATION

EIDR-8-J*RJ (Up to 8 meters)
EIDR-16J*RJ (Up to 16 meters)

IDR SCREW TERMINAL OPTION FOR INTERFACE TO THIRD-PARTY METERING PRODUCTS

EIDR-8-J*ST (Up to 8 meters)

OPTIONAL ENCLOSURE

IDRs are supplied standard with JIC steel enclosure for indoor installation. For optional enclosure replace the first "J" in the model with optional enclosure specification. Specification M - MMU Configuration (ex. EIDR-8-M04ST)

CLASS 3200 METER

RS-485 Meters

Features

- Advanced 4-line display showing kWh, kW demand (with peak date & time), power factor per phase, real-time load in kW, amps per phase and volts per phase. Meter includes on-board set-up option for meter date/time and ID codes for communication options
- 0-2 volt output split-core current sensors allow for enhanced safety and accurate remote mounting of sensors up to 500 feet from meter without power interruption. (Optional solid-core sensors available)
- Onboard installation diagnostics and verification system
- Built-in RS-485 communication capability supports up to 52 Class 3200, 3400, 5000, and/or IDR interval recorders (not to exceed 52 devices/channel). Cabling can either be daisy-chain or star configuration, 3-cond., 18-22 AWG, up to 4,000 cable feet total per channel
- RS-485 protocol options include E-Mon Energy EZ7 (standard), Modbus RTU or BACnet MS/TP
- Records kWh and kVARh delivered, kWh & kVARh received in first 4 channels. Data stored in 15-min. intervals for up to 72 days or 5-min. intervals for up to 24 days. Maintains interval data storage in a first-in, first-out format
- Compatible with E-Mon Energy software via EZ7 protocol for automatic meter reading, billing and profiling of interval energy data. Ethernet communication available when used with Ether-Mon Key
- Meter is designed for use on both 3-phase, 3-wire (delta) and 3-phase, 4-wire (wye) circuits. (includes 3 split-core current sensors.) Optional single-phase, 3-wire configuration available. (includes 2 split-core current sensors)
- Available in MMU (Multiple Meter Unit) enclosures containing up to 24 meters in one compact enclosure
- Outdoor NEMA 4X polycarbonate enclosure (standard) with padlocking hasp & mounting flanges for indoor/outdoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- Optional Enclosure: Industrial grade JIC steel enclosure with padlocking hasp & mounting flanges for indoor installation. (standalone) Knockouts: 1 1/16" (3/4" cond) on bottom and 7/8" (1/2" cond) on top of enclosure
- UL/CUL listed. Certified by independent test lab to ANSIC 12.20 national accuracy standards. (+/- 0.2% from 1% to 100% of rated load)
- CE Mark approved
- Meter meets or exceeds MID accuracy standards
- MV-90 Compatible (EZ7 only)

CLASS 3200 MODELS	
120/208-240V, 3-PHASE	**220/380V, 230/400V, 240/415V, 3-PHASE**
E32-208100-REZ7KIT (100 Amp)	E32-400100-REZ7KIT (100 Amp)
E32-208200-REZ7KIT (200 Amp)	E32-400200-REZ7KIT (200 Amp)
E32-208400-REZ7KIT (400 Amp)	E32-400400-REZ7KIT (400 Amp)
E32-208800-REZ7KIT (800 Amp)	E32-400800-REZ7KIT (800 Amp)
E32-2081600REZ7KIT (1600 Amp)	E32-4001600REZ7KIT (1600 Amp)
E32-2083200REZ7KIT (3200 Amp)	E32-4003200REZ7KIT (3200 Amp)
347/600V, 3-PHASE (WYE CONFIGURATION)	**277/480V, 3-PHASE**
E32-600100-REZ7KIT (100 Amp)	E32-480100-REZ7KIT (100 Amp)
E32-600200-REZ7KIT (200 Amp)	E32-480200-REZ7KIT (200 Amp)
E32-600400-REZ7KIT (400 Amp)	E32-480400-REZ7KIT (400 Amp)
E32-600800-REZ7KIT (800 Amp)	E32-480800-REZ7KIT (800 Amp)
E32-6001600REZ7KIT (1600 Amp)	E32-4801600REZ7KIT (1600 Amp)
E32-6003200REZ7KIT (3200 Amp)	E32-4803200REZ7KIT (3200 Amp)

HIGH VOLTAGE APPLICATION METERS (FOR USE WITH CTS & PTS)
E32-12025HVREZ7KIT
SINGLE PHASE OPTION (2 CURRENT SENSORS)
To order a single-phase, 3-wire meter add "-SP" before KIT in the model number. Ex. E32-208100-REZ7-SPKIT
OPTIONAL METER ENCLOSURES
Meters supplied standard in NEMA 4X outdoor enclosures. To order a different enclosure replace "R" in model number with optional enclosure specification.
MMU Configuration - Specification M (ex. E32-208100-MEZ7KIT) JIC Steel Enclosure - Specification J (ex. E32-208400-JEZ7KIT)
COMMUNICATION PROTOCOL OPTIONS
Meters supplied standard with EZ7 protocol. To order a different communication protocol replace "EZ7" in model number with optional protocol specification.
Modbus RTU - Specify RTU (E32-480100-JRTUKIT) BACnet MS/TP - Specify BAC (E32-600100-RBACKIT)

CLASS 3400 METER

RS-485 & Ethernet Dual Communication Protocol Meters

Features

- Advanced 4-line large display showing kWh, kW demand (with peak date & time), power factor per phase, real-time load in kW, amps per phase and volts per phase. Meter includes on-board set-up option for IP address, meter date/time, ID codes for communication options and load control settings
- Optional expanded feature package provides additional features including load control option for load control/ shedding, two external meter inputs (water, gas, BTU, etc.) (stored in channels 5 & 6) and two pulse outputs (one kWh and one kVARh)
- 0-2 volt output split-core current sensors allow for enhanced safety & accurate remote mounting of sensors up to 500 feet from meter without power interruption. (Optional solid-core sensors available)
- Onboard installation diagnostics and verification system
- Built-in RS-485 communication capability supports up to 52 Class 3200, 3400, 5000, and/or IDR interval recorders (not to exceed 52 devices/ channel). Cabling can either be daisy-chain or star configuration,3- cond.,18-22AWG, up to 4, 000 cable feet total per channel
- Built-in communications include RS-485 & Ethernet and pulse output
- Protocols
  - EZ7
  - BACnet MS/TP*
  - Modbus RTU
  - BACnet IP*
  - Modbus TCP/IP
- Records kWh and kVARh delivered, kWh and kVARh received in first four channels. Data stored in 15-min intervals for up to 72 days or 5 minute intervals for up to 24 days. Maintains data in a first-in, first-out format
- Compatible with E-Mon Energy software via EZ7 protocol for automatic meter reading, energy illing and profiling
- Meter is designed for use on both 3-phase, 3-wire (delta) & 3-phase, 4-wire (wye) circuits. (includes 3 split-core current sensors) Optional single-phase, 3-wire configuration available. (includes 2 split-core current sensors)
- Outdoor NEMA 4X polycarbonate enclosure (standard) with padlocking hasp & mounting flanges for indoor/ outdoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- Optional industrial grade JIC steel enclosure with padlocking hasp & mounting flanges for indoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- Approvals:
  - UL/CUL listed
  - Certified by independent test lab to ANSI C12.20 accuracy standards (+/- 0.2% from 1% to 100% of rated load)
  - Meter meets or exceeds MID accuracy standards
  - BACnet protocol is BTL verified
- MV-90 compatible (with EZ7 only)

CLASS 3400 MODELS	
120/208-240V, 127/220V, 3-PHASE	**220/380V, 230/400V, 240/415V, 3-PHASE**
E34-208100-R*KIT (100 Amp)	E34-400100-R*KIT (100 Amp)
E34-208200-R*KIT (200 Amp)	E34-400200-R*KIT (200 Amp)
E34-208400-R*KIT (400 Amp)	E34-400400-R*KIT (400 Amp)
E34-208800-R*KIT (800 Amp)	E34-400800-R*KIT (800 Amp)
E34-2081600R*KIT (1600 Amp)	E34-4001600R*KIT (1600 Amp)
E34-2083200R*KIT (3200 Amp)	E34-4003200R*KIT (3200 Amp)
277/480V, 3-PHASE	**347/600V, 3-PHASE (WYE CONFIGURATION)**
E34-480100-R*KIT (100 Amp)	E34-600100-R*KIT (100 Amp)
E34-480200-R*KIT (200 Amp)	E34-600200-R*KIT (200 Amp)
E34-480400-R*KIT (400 Amp)	E34-600400-R*KIT (400 Amp)
E34-480800-R*KIT (800 Amp)	E34-600800-R*KIT (800 Amp)
E34-4801600R*KIT (1600 Amp)	E34-6001600R*KIT (1600 Amp)
E34-4803200R*KIT (3200 Amp)	E34-6003200R*KIT (3200 Amp)

RS-485 PORT		SPECIFY
EZ7	EZ7 Ethernet	01
Modbus RTU	EZ7 Ethernet	02
BACnet MS/TP	EZ7 Ethernet	03
EZ7	Modbus TCP/IP	04
EZ7	BACnet IP	05
Modbus RTU	Modbus TCP/IP	06

HIGH VOLTAGE APPLICATION METERS (FOR USE WITH CTS & PTS)

E34-12025HVR01KIT

OPTIONAL METER ENCLOSURES

Meters supplied standard in NEMA 4X outdoor enclosures. Not available in MMU Configuration. To order a JIC steel enclosure replace "R" in model number with "J" (E34-208100-J01KIT)

EXPANDED FEATURE PACKAGE

To order meters with the expanded feature package add "-X-" before the word KIT in the model. (E34-208100-R05-X-KIT)

COMMUNICATION PROTOCOL & OPTION PACKAGES

Specify protocol package when ordering all meters. Replace * in model number with protocol package specification

SINGLE PHASE OPTION (2 CURRENT SENSORS)

Single Phase Standard Meter: Add "-SP" before KIT in model. Example:
E34-208100-R01-SPKIT
Single Phase Expanded Feature Meter:
Add "XSP" before KIT in model.
(ex. E34-208100-R01XSPKIT)

GREEN CLASS NET METER

RS-485 & Ethernet Dual Communication Protocol Meters

Features

- Advanced 4-line display showing:
  - kWh delivered, received and Net kWh
  - Volts per phase
  - kW demand (with peak date & time)
  - Amps per Phase
  - Power factor per phase
  - Real-time load in kW

  On-board set-up option for:
  - IP address
  - Meter date/time
  - ID codes for EZ7, Modbus and BACnet
- 0-2 volt output split-core current sensors allow for enhanced safety & accurate remote mounting of sensors up to 500 feet from meter without power interruption. (Optional solid-core sensors available)
- Onboard installation diagnostics and verification system
- Two external meter inputs (water, gas, etc.) (Channels 5 & 6)
- Phase loss alarm. (N.O. Contact)
- Built-in RS-485 communication capability supports up to 52 Class 3200, 3400, 5000 meters, and/or IDR interval recorders (not to exceed 52 devices/channel). Cabling can either be daisy-chain or star configuration, 3-cond., 18-22 AWG, up to 4,000 cable feet total per channel
- Communications include built-in RS-485 & Ethernet
- Protocols
  - EZ7
  - BACnet MS/TP*
  - Modbus RTU
  - BACnet IP*
  - Modbus TCP/IP
- Records kWh and kVARh delivered, kWh and kVARh received in first four channels. Data stored in 15-min intervals for up to 72 days or 5 minute intervals for up to 24 days. Maintains data in a first-in, first-out format.
- Compatible with E-Mon Energy software via EZ7 protocol for automatic meter reading, energy billing and profiling
- Meter is designed for use on both 3-phase, 3-wire (delta) and 3-phase, 4-wire (wye) circuits (includes 3 split-core current sensors). Optional single-phase, 3-wire configuration available. (includes 2 split- core current sensors)
- Green JIC steel enclosure with padlocking hasp & mounting flanges for indoor installation with one 1 1/16" KO (3/4" cond.) on bottom of enclosure
- Optional gray NEMA 4X polycarbonate enclosure available with padlocking hasp & mounting flanges for indoor/outdoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- Approvals:
  - UL/CUL listed
  - Certified by independent test lab to ANSI C12.20 national accuracy standards. (+/- 0.2% from 1% to 100% of rated load)
  - CE Mark approved
  - Meter meets or exceeds MID accuracy standards
  - BACnet protocol is BTL certified
- MV-90 compatible (with EZ7 only)

GREEN CLASS NET METER MODELS		
120/208-240V, 127/220V, 3-PHASE	**220/380V, 230/400V, 240/415V, 3-PHASE**	
E50-208100-J*-N-KIT (100 Amp)	E50-400100-J*-N-KIT (100 Amp)	
E50-208200-J*-N-KIT (200 Amp)	E50-400200-J*-N-KIT (200 Amp)	
E50-208400-J*-N-KIT (400 Amp)	E50-400400-J*-N-KIT (400 Amp)	
E50-208800-J*-N-KIT (800 Amp)	E50-400800-J*-N-KIT (800 Amp)	
E50-2081600J*-N-KIT (1600 Amp)	E50-4001600J*-N-KIT (1600 Amp)	
E50-2083200J*-N-KIT (3200 Amp)	E50-4003200J*-N-KIT (3200 Amp)	
277/480V, 3-PHASE	**347/600V, 3-PHASE (WYE CONFIGURATION)**	
E50-480100-J*-N-KIT (100 Amp)	E50-600100-J*-N-KIT (100 Amp)	
E50-480200-J*-N-KIT (200 Amp)	E50-600200-J*-N-KIT (200 Amp)	
E50-480400-J*-N-KIT (400 Amp)	E50-600400-J*-N-KIT (400 Amp)	
E50-480800-J*-N-KIT (800 Amp)	E50-600800-J*-N-KIT (800 Amp)	
E50-4801600J*-N-KIT (1600 Amp)	E50-6001600J*-N-KIT (1600 Amp)	
E50-4803200J*-N-KIT (3200 Amp)	E50-6003200J*-N-KIT (3200 Amp)	
RS-485 PORT	**ETHERNET PORT**	**SPECIFY**
EZ7	EZ7 Ethernet	01
Modbus RTU	EZ7 Ethernet	02
BACnet MS/TP	EZ7 Ethernet	03
EZ7	Modbus TCP/IP	04
EZ7	BACnet IP	05
Modbus RTU	Modbus TCP/IP	06

OPTIONAL METER ENCLOSURES

Meters supplied standard in Green JIC steel enclosures. Not available in MMU Configuration. To order a Gray NEMA 4X outdoor enclosure replace "J" in model number with "R" (E50-208100-R01-N-KIT)

COMMUNICATION PROTOCOL & OPTION PACKAGES

Meters supplied standard in NEMA 4X outdoor enclosures. Not available in MMU Configuration. To order a JIC steel enclosure replace "R" in model number with "J" (E34-208100-J01KIT)

COMMUNICATION PROTOCOL & OPTION PACKAGES

Specify protocol package when ordering all meters. Replace * in model number with protocol package specification.

SINGLE PHASE OPTION 2 CURRENT SENSORS)

To order a single-phase, 3-wire meter kit replace "-N-" with "NSP" in the model number. Ex. E50-208100-J02NSPKIT

CLASS 5000 METER

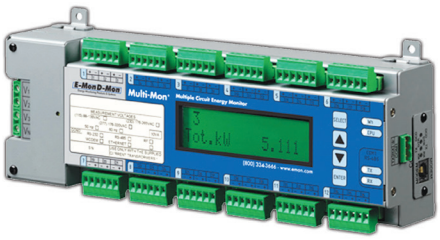
RS-485 & Ethernet Dual Communication Protocol Meters

Features

- Advanced 4-line display showing kWh, kW demand (with peak date & time), power factor per phase, real-time load in kW, amps per phase and volts per phase. Meter includes on-board set-up option for meter date/time, IP address and ID codes for communication options
- 0-2 volt output split-core current sensors allow for enhanced safety and accurate remote mounting of sensors up to 500 feet from meter without power interruption. (Optional solid-core sensors available)
- Onboard installation diagnostics and verification system
- Two pulse outputs & two external inputs (water, gas, BTU, etc.) (Channels 5 & 6, available from E-Mon Energy only)
- Phase loss alarm (N.O. contact)
- Built-in RS-485 communication capability supports up to 52 Class 3200, 3400, 5000, and/or IDR interval recorders (not to exceed 52 devices/channel). Cabling can either be daisy-chain or star configuration, 3-cond., 18-22 AWG, up to 4,000 cable feet total per channel
- Built-in RS-485 & Ethernet communications
- Protocols
  - EZ7 (E-Mon Energy)
  - BACnet MS/TP*
  - Modbus RTU
  - BACnet IP*
  - Modbus TCP/IP
- Records kWh and kVARh delivered, kWh & kVARh received in first 4 channels. Data stored in 15-min. intervals for up to 72 days or 5-min. intervals for up to 24 days. Maintains interval data storage in a first-in, first-out format
- Compatible with E-Mon Energy software via EZ7 protocol for automatic meter reading, energy billing and profiling
- Meter is designed for use on both 3-phase, 3-wire (delta) and 3-phase, 4-wire (wye) circuits. (includes 3 split-core current sensors.) Optional single-phase, 3-wire configuration available. (includes 2 split-core current sensors
- Outdoor NEMA 4X polycarbonate enclosure (standard) with padlocking hasp & mounting flanges for indoor/outdoor installation (standalone) with one 1 1/16" KO on bottom of enclosure
- Optional Industrial grade JIC steel enclosure with padlocking hasp & mounting flanges for indoor installation. (standalone) Knockouts: 1 1/16" (3/4" cond) bottom & 7/8" (1/2" cond) top
- Approvals:
  - UL/CUL listed
  - Certified by independent test lab to ANSI C12.20 accuracy standards (+/- 0.2% from 1% to 100% of rated load)
  - CE Mark approved
  - Meter meets or exceeds MID accuracy standards
  - BACnet protocol is BTL verified
- MV-90 compatible (with EZ7 only)

CLASS 5000 MODELS		
120/208-240V, 127/220V, 3-PHASE	**220/380V, 230/400V, 240/415V, 3-PHASE**	
E50-208100-R*KIT (100 Amp)	E50-400100-R*KIT (100 Amp)	
E50-208200-R*KIT (200 Amp)	E50-400200-R*KIT (200 Amp)	
E50-208400-R*KIT (400 Amp)	E50-400400-R*KIT (400 Amp)	
E50-208800-R*KIT (800 Amp)	E50-400800-R*KIT (800 Amp)	
E50-2081600JR*KIT (1600 Amp)	E50-4001600R*KIT (1600 Amp)	
E50-2083200R*KIT (3200 Amp)	E50-4003200R*KIT (3200 Amp)	
277/480V, 3-PHASE	**347/600V, 3-PHASE (WYE CONFIGURATION)**	
E50-480100-R*KIT (100 Amp)	E50-600100-R*KIT (100 Amp)	
E50-480200-R*KIT (200 Amp)	E50-600200-R*KIT (200 Amp)	
E50-480400-R*KIT (400 Amp)	E50-600400-R*KIT (400 Amp)	
E50-480800-R*KIT (800 Amp)	E50-600800-R*KIT (800 Amp)	
E50-4801600R*KIT (1600 Amp)	E50-6001600R*KIT (1600 Amp)	
E50-4803200R*KIT (3200 Amp)	E50-6003200R*KIT (3200 Amp)	
RS-485 PORT	**ETHERNET PORT**	**SPECIFY**
EZ7	EZ7 Ethernet	01
Modbus RTU	EZ7 Ethernet	02
BACnet MS/TP	EZ7 Ethernet	03
EZ7	Modbus TCP/IP	04
EZ7	BACnet IP	05
Modbus RTU	Modbus TCP/IP	06

HIGH VOLTAGE APPLICATION METERS (FOR USE WITH CTS & PTS)
E50-12025HVR01KIT
OPTIONAL METER ENCLOSURES
Meters supplied standard in NEMA 4X outdoor enclosures. Not available in MMU Configuration. To order a JIC steel enclosure replace "R" in model number with "J" (E50-208400-J01KIT)
COMMUNICATION PROTOCOL & OPTION PACKAGES
Specify protocol package when ordering all meters. Replace * in model number with protocol package specification.
SINGLE PHASE OPTION 2 CURRENT SENSORS)
To order a single-phase, 3-wire meter add "-SP" before KIT in the model number. Ex. E50-208100-REZ7-SPKIT



MULTI-MON

RS-485 & Ethernet

Features

- Multi-Mon is a multi-phase, multi-channel, multi-function Ampere/Volt demand meter suitable for use in single-phase and three-phase applications
- Multi-channel submetering - Up to 36 single-phase, 18 two-phase or 12 three- phase submeters in a single, compact device. Any combination of single-, two-, and/or three-phase loads can be monitored up to a total of 36 current inputs
- 2-row, 16-character backlit LCD display for easy set-up and programming
- Data recorders; programmable periodical data logs separate for each submetered point. Embedded programmable controller (4 control setpoints, programmable thresholds and delays) separate for each metered point. Event recorder for logging internal diagnostic events and setpoint operations
- Time-Of-Use, 4 energy/demand registers x 4 tariffs, 4 seasons x 4 types of days, 8 tariff changes per day, easy programmable tariff schedule
- Compatible with E-Mon Energy software via EZ7 protocol for automatic meter reading, energy billing and profiling.
- Supplied with Power Software for meter set up and power quality analysis. (requires RS-485 key for communication)
- Current sensors available in both split & solid-core configurations for increased flexibility in installation. Current sensor leads can be extended up to 500 feet for remote installation. (Current sensors ordered separately. See Multi-Mon current sensor spec for details)
- Communication options:
  - Modbus RTU via RS-485 communication (standard)
  - Modbus TCP/IP via Ethernet (optional)
- Easy field upgrading device firmware through any communication port
- Optionally available pre-installed inside a JIC steel enclosure with lockable window panel and 3-phase voltage terminal block. Dimensions: 9.06" H x 23.62" W x 6.1" D
- Real Time Clock storage upon loss of power: 24 hours minimum (1 week typical)
- 60 Hz operation
- UL listed for the US & Canada
- Self power supply: 3-phase and neutral fed from the metered voltages
- ANSI C12.20 Class 10/20 Class 0.5 Precision (Active Energy)
- Compliant with ANSI and IEC specifications
- Approvals: UL, CE, ISO, VNIIMS

MULTI-MON MODELS
MULTI-MON 36-CHANNEL BRANCH CIRCUIT ENERGY MONITOR (NO CURRENT SENSORS)
E10553 MM Branch Circuit Meter w/Modbus RTU, Wye w/out sensors
E10555 MM Branch Circuit Meter w/Modbus RTU, Delta w/out sensors
E10557 MM Branch Circuit Meter w/Modbus TCP/IP, Wye w/out sensors
E10559 MM Branch Circuit Meter w/Modbus TCP/IP, Delta w/out sensors
E10622 MM Branch Circuit Meter w/Modbus RTU, Wye w/out sensors w/ enclosure
E10623 MM Branch Circuit Meter w/Modbus RTU, Delta w/out sensors w/ enclosure
E10624 MM Branch Circuit Meter w/Modbus TCP/IP, Wye w/out sensors w/ enclosure
E10625 MM Branch Circuit Meter w/Modbus TCP/IP, Delta w/out sensors w/ enclosure
NOTE: CURRENT SENSORS ORDERED SEPARATELY. SEE MULTI-MON CURRENT SENSOR SPEC FOR DETAILS.
Note: RS-485 Key required for communicating with Power Software

POWERSMART+ ESSENTIAL METER

Power Quality Meters

Features

- Class 0.5S IEC 62053-22 four quadrant active and reactive energy polyphase static meter
- Ampere/Volt demand meter with TrueRMS, power, power factor, neutral current, voltage and current unbalance frequency
- Dual Panel mounting configuration for 4" round or 96x96 DIN new or retrofit installations
- High precision 3-phase meter monitoring:
  - Voltage
  - Current
  - Power factor
  - Neutral current
  - Energy
  - Demand
  - Frequency
  - Load profile
  - Voltage/current unbalance
- 3.5" monochromatic LCD display with 240x128 dots resolution, adjustable update time, backlit and user defined brightness settings
- LED bar graph showing percent load with respect to user-definable nominal load current
- Supplied with E-Mon Power Software for meter set up and power quality analysis. (requires RS-485 key for communication.)
- Voltage and current THD, current TDD and K-Factor, up to 40th order harmonic
- Voltage and current harmonic spectrum and angles
- Real-time "scope mode" waveform monitoring capability
- Simultaneous 6-channel one-cycle waveform capture at a rate of 64 samples per cycle
- 3 voltage inputs and 3 current transformer-isolated AC inputs for direct connection to power line or via potential and current transformers
- Current sensor options:
  - Available with integrated 5 Amp current sensors for use with existing 5 Amp output current transformers
  - Available as a meter only configuration for use with PowerSmart+ current sensors. Current sensor leads can be extended up to 500 feet for remote installation (sold separately, see PowerSmart+ current sensor spec for details)
- Standard 2-wire RS-485 communication port; Modbus RTU, DNP3 and ASCII communication protocols
- Optional Ethernet 10/100BaseT port for Modbus TCP/IP communication
- Optionally available pre-installed inside a JIC steel enclosure with lockable window panel and 3-phase voltage terminal block. Dimensions: 9.06" H x 23.62" W x 6.1" D
- Three-phase total and per phase energy measurements; active, reactive and apparent energy counters
- Time-of-use, 4 totalization and tariff energy/demand registers x 8 tariffs, 4 seasons x 4 types of days, 8 tariff changes per day
- Automatic daily energy and maximum demand profile log for total and tariff registers
- 16 control setpoints; programmable thresholds and delays
- 1-cycle response time
- Non-volatile memory for long-term event and data recording
- Event recorder for logging internal diagnostic events and setup changes. Two data recorders; programmable data logs on a periodic basis; automatic daily energy and maximum demand profile log
- Auto-scroll option with adjustable page exposition time; auto-return to a default page

POWERSMART+ ESSENTIAL MODELS
E10537 w/Modbus RTU and built-in 5 amp sensors
E10539 w/Modbus TCP/IP and built-in 5 amp sensors
E10614 w/Modbus RTU and built-in 5 amp sensors w/ enclosure
E10615 w/Modbus TCP/IP and built-in 5 amp sensors w/ enclosure
E10541 w/Modbus RTU w/out sensors
E10543 w/Modbus TCP/IP w/out sensors
E10616 w/Modbus RTU w/out sensors w/ enclosure
E10617 w/Modbus TCP/IP w/out sensors w/ enclosure
Note: RS-485 Key required for communicating with Power Software.

POWERSMART+ ADVANCED METER

Power Quality Meters

Features

- Class 0.2 four-quadrant multi-function 3-phase energy meter (TrueRMS, volts, amps, power, power factor, neutral current, voltage & current unbalance & frequency)
- Easy-to-read 3-row bright LED display, adjustable update time, auto-scroll option with adjustable page exposition time and auto-return to a default page
- LED bar graph showing percent load with respect to user-definable nominal load current
- Supplied with E-Mon Power Software for meter set up and power quality analysis (requires RS-485 key for communication)
- Ampere/Volt/THD/TDD demand meter with advanced power quality features including embedded harmonic analyzer, voltage and current THD, current TDD and K-Factor, inter-harmonics THD, up to the 50th order harmonic
- Real-time waveform capture and monitoring; simultaneous 6-channel 4-cycle capture at 128 samples per cycle
- 3 voltages and 3 current transformer-isolated AC inputs for direct connection to power line or via potential and current transformers
- Voltage and current harmonic spectrum and angles
- Current Sensor Options:
  - Available with integrated 5 Amp current sensors for use with existing 5 Amp output current transformers.
  - Available as a meter only configuration for use with PowerSmart+ current sensors, current sensor leads can be extended up to 500 feet for remote installation (sold separately, see PowerSmart+ current sensor spec for details)
- Standard 2-wire RS-485 communication port; Modbus RTU, DNP3 and ASCII communication protocols
- Optional Ethernet 10/100BaseT port for Modbus TCP/IP communication
- Two digital inputs for monitoring external contacts, and receiving pulses from energy, water and gas meters. Two relay outputs for alarms and controls, and for output of energy pulses
- Optionally available pre-installed inside a JIC steel enclosure with lockable window panel and 3-phase voltage terminal block. Dimensions: 14" H x 12" W x 8" D
- Time of Use (TOU), 8 totalization and tariff energy/demand registers x 8 tariffs, 4 seasons x 4 types of days, 8 tariff changes per day, easy programmable tariff schedule
- Automatic daily profile for energy and maximum demand readings (total and tariff registers)
- Embedded programmable controller; 16 control setpoints; programmable thresholds and delays; relay output control; 1/2 cycle response time
- Event recorder for logging and internal diagnostics events, control events and I/O operations. 16 data recorders; programmable data logs on a periodic basis and on any internal and external trigger
- Two waveform recorders; simultaneous 6-channel AC recording in a single plot; sampling rate of 32, 64 and 128 samples per cycle; 20 pre-fault cycles; up to 30 seconds of continuous recording at a rate of 32 samples per cycle
- EN50160 Power Quality recorder (EN50160 compliance statistics, EN50160 harmonics survey statistics, onboard power quality analyzer, programmable thresholds and hysteresis; ready-for-use reports)

POWERSMART+ ADVANCED MODELS
E10545 w/Modbus RTU and built-in 5 amp sensors
E10618 w/Modbus RTU, built-in 5 amp sensors w/ enclosure
E10547 w/Modbus TCP/IP, built-in 5 amp sensors
E10619 w/ Modbus TCP/IP, built-in 5 amp sensors w/ enclosure
E10549 w/Modbus RTU w/out sensors
E10620 w/Modbus RTU w/out sensors w/ enclosure
E10551 w/Modbus TCP/IP w/out sensors
E10621 w/Modbus TCP/IP w/out sensors w/ enclosure
Note: RS-485 Key required for communicating with Power Software.

POWERSMART+ SOCKET METER

Power Quality Meters

Features

- Precise Class 0.2 Active Energy & Power demand meter with easy to read 4" graphical display, multiple tariffs and Time Of Use (TOU), transformer and line losses, unique anti-tampering & self-test functions
- Form 9S configuration for new or retrofit socket-style installation
- State of the art power quality recorder (onboard PQ analyzer according to EN50160, programmable thresholds with hysteresis; ready-to-use reports, sags/ swells, interruptions, frequency variations, flicker, temporary over voltages, transient over voltages, voltage unbalance, harmonic and interharmonic voltages)
- Programmable controller (32 control set points, OR/AND logic, extensive triggers, programmable thresholds and delays, relay control, event-driven data recording)
- Supplied with E-Mon Power Software for meter set up and power quality analysis. (requires RS-485 key for communication)
- High-Class 3-phase demand power meter (amps, volts, harmonic demands, TrueRMS of volts and amps, powers, power factors and neutral current)
- Harmonic analyzer (to 63th harmonic volts and amps, power harmonics and power factor, phasor, symmetrical components)
- Event recorder for logging internal diagnostics events, control events and I/O operations. Digital fault recorder (onboard fault detector-programmable fault, up to 50 Amps fault currents, zero-sequence currents and volts, current and volt unbalance, under-voltage, neutral current
- PowerSmart+ Socket meter uses flash memory for storing device firmware that allows future upgrading of the device without replacing any hardware component. The new features can be easily added to your device by simply replacing the firmware through a local RS-232/RS-485, USB or Ethernet port
- Non-volatile memory - 16 MB for energy & tariff registers logging, EV-PQ-WV log
- Isolated three-phase power supply unit from the measured voltage inputs, according to the voltage measurement input range:
  - Low range measurement input nominal rating: 57.7V AC to 120V AC (L-N)
  - High range measurement input nominal rating: 120V AC to 277V AC (L-N)
- Four fast waveform recorders; selectable AC sampling rate of 32-1024 samples per cycle, 20 pre-fault cycles, 1-ms resolution for digital inputs monitoring, up to 3 min. of continuous recording with an 8 MB onboard memory at a rate of 32 samples per cycle
- Sixteen fast data recorders (from 1/2 cycle RMS to 2 hour RMS envelopes, up to 20 pre-fault cycles, programmable data logs on a periodic basis and on any internal and external trigger)
- 16 programmable timers from 1/2 cycle to 24 hours for periodic recording and triggering operations on a time basis
- Built-in (2) digital optically isolated fast inputs and 1 KYZ relay output
- Comunication capabilities:
  - Standard: On-board Infrared port, isolated RS-485 port and USB device port for Modbus RTU/ ASCII and DNP3.0 protocols.
  - Optional: Ethernet 10/100Base-T port for Modbus TCP/IP or DNP3.0 TCP protocols
- Approvals: UL/CSA 61010-1: ANSI C12.20: Class 10/20, IEC 62053-22: Class 0.25

POWERSMART+ SOCKET MODELS
POWERSMART+ SOCKET METER FORM 9S, THREE-PHASE, 60 HZ
E10561 w/Modbus RTU
E10565 w/Modbus TCP/IP
E10563 w/Modbus RTU, for use with PT's and CT's
E10567 w/Modbus TCP/IP, for use with PT's and CT's
Note: RS-485 Key required for communicating with Power Software.

ELECTRIC, GAS, WATER, BTU, FUEL & COMPRESSED AIR

Third-Party Products

BTU Meters w/Pulse Output

A wide variety of BTU meters are available for tracking the energy used in chilled and heating water loop systems. A BTU meter consists of 6 components; 1-flow meter (with installation kit), 2-temperature probes, 2-temperature wells that the temp probes fit into and a BTU calculating unit. The BTU calculating unit comes standard with a pulse output for interfacing with external data recorders. Modbus, BACnet, LonWorks, N2 and other communications are also available for interfacing with EMS/BMS. The flow meters are available in sizes from 3/4" to 72". Flow meters can handle a maximum fluid temperature of 248°F at up to 232 psi. Ultrasonic flow meters are also available for applications where non-invasive metering is required.

Cold Water Meters w/Pulse Output

Cold water meters are available in standard pipe sizes ranging from 5/8" up to 12". All cold water meters are equipped with a pulse output for interfacing with external interval data recorders for communication via Modbus, BACnet, LonWorks and EZ7 to E-Mon Energy software and/or EMS/BMS systems.

Multijet type meters are available in sizes up to 2". For higher flows starting at 1 1/2" heavy duty turbine meters are available. Ultrasonic flow meters are also available for applications where non-invasive metering is required.

All cold water meters are appropriate for potable water applications with a maximum temperature of no greater than 105°F and pressures up to 150 psi. All cold water meters are no-lead. Other meters are available for non-potable and specialty water metering applications such as industrial waste water, irrigation water, etc.

Hot Water Meters w/Pulse Output

Hot water meters are available in sizes from 1/2" up to 4". Meters up to 2" are available for standard temperature up to 194°F at 150 psi), meter 3" and 4" are for temperatures up to 248°F at max 232 PSI. All meters are no lead. All hot water meters come equipped with a pulse output for interfacing with external interval data recorders for communication via Modbus, BACnet, LonWorks and EZ7 to E-Mon Energy software and/or EMS/BMS systems. Ultrasonic fl ow meters are also available for applications where non-invasive metering is required.

Gas Meters w/Pulse Output

Gas meters are available for loads from 250 CuFt/Hr (250,000 BTUs/Hr) up to 56,000 CuFt/Hr (56 million BTUs/Hr). The meter connection sizes range from a Sprague #1 up to 4". Meters up to 1 1/4" pipe size are diaphragm meters. Larger size meters are Fluidic Oscillation type meters which have no moving parts. All gas meters include connection hardware kits and pulse output to interface with external interval data recorders for communication via Modbus, BACnet, LonWorks and EZ7 to E-Mon Energy software and/or EMS/BMS systems. These meters are traditionally for natural gas and propane use, although they can be used to meter other types of gases.

For other sizes and configurations of gas, water, and BTU Meters, contact General Technical Support: 1-800-334-3666, option 3 or email emon-techsupport@honeywell.com

E-MON SPLIT-CORE CURRENT SENSORS

Class 1000, 2000, 6200, 3200, 3400, 5000 & Green meter current sensor specifications

25-200 Amp
Interior Dim:
7/8" x 1 1/2"
Exterior Dim:
3 1/8" H x 3 3/4" W x 1 3/8" D

400 Amp
Interior Dim:
11/2" x 2 3/4"
Exterior Dim:
4 3/8" H x 3 3/4" W x 1 3/8" D

800-1600 Amp
Interior Dim:
3 1/4" x 4 1/2"
Exterior Dim:
5 3/4" H x 5 3/8" W x 1 3/8" D

3200 Amp
Interior Dim:
5 7/16" x 7 7/8"
Exterior Dim:
9 1/4" H x 7 7/8" W x 1 3/8" D

SPLIT-CORE CURRENT SENSOR MODELS		
SET OF 3	**AMPERAGE**	**1 PIECE**
E10013	25 amp	E10005
E10016	50 amp	E10008
E10010	100 amp	E10002
E10012	200 amp	E10004
E10015	400 amp	E1007
E10017	800 amp	E1009
E10011	1600 amp	E1003
E10014	3200 amp	E1006

NOTES:

The above split-core current sensors are supplied with E-Mon Class 1000, 2000, 6200, 3200, 3400, 5000, Green and Green Net meters.

Current sensors can be installed up to 2,000 feet away from meter (500 feet for Class 3200, 3400, 5000 and 6200 Green Net.) Leads supplied are 3' in length and can be extended using #14-22 AWG wire (stranded/twisted not required.)
See local electrical codes for proper sizing.

When paralleling current sensors, the meter reading must be multiplied by the number of sets of sensors in parallel.

Solid-core current sensors available in 100 & 200 amp.
Specify when ordering.

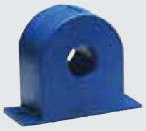
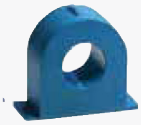
MULTI-MON & POWERSMART+ CURRENT SENSORS

Current Sensor Specifications

Multi-Mon & PowerSmart+ current sensors can only be used with Multi-Mon & PowerSmart+ meters. Split and solid core sensors are ordered by the piece and are not compatible with other styles of E-Mon meters.

All sensors are rated for 600 V and supplied with 2.5 meter cable length which can be extended up to 500 feet for remote installation.

TABLE 2. CURRENT SENSOR SPECIFICATIONS

MODEL		INSIDE DIM.	CORE	ACCURACY	BURDEN	WEIGHT
100 AMP SENSORS - ORDER BY PIECE						
E10569		12 mm /0.47 in	Solid	0.1 %	0.2 VA	0.34 lb
E10571		23 mm/0.9 in	Solid	0.1 %	0.2 VA	0.2 VA
E10575		16 mm/0.63 in	Split	0.5 %	0.2 VA	0.23 lb
200 AMP SENSORS - ORDER BY PIECE						
E10577		24.5 mm x 23.1 mm/ 0.96 in x 0.9 in	Split	0.5 %	0.2 VA	0.34 lb
400 AMP SENSORS - ORDER BY PIECE						
E10573		26 mm/1.02 in	Solid	0.1 %	0.2 VA	0.47 lb
E10579		43.2 mm x 33 mm/ 1.7 mm x 1.3 in	Split	0.5 %	0.2 VA	1 lb
800 AMP SENSORS - ORDER BY PIECE						
E10581		50 mm x 80 mm/ 1.9 mm x 3.1 in	Split	0.5 %	0.2 VA	2.2 lbs
1200 AMP SENSORS - ORDER BY PIECE						
E10583		121 mm x 80 mm/ 4.7 x 3.1 in	Split	0.5 %	0.2 VA	3.3 lbs

METERING SYSTEM OVERVIEW

E-MON ENERGY AUTOMATIC METER READING SYSTEM

Software System for Energy Statements, Tenant Billing, Graphing & Profiling of Energy Data

Ideal for new and retrofit applications, E-Mon Energy automatic meter reading systems allow users to accurately monitor interval energy data for a variety of applications including tenant billing/allocation, departmental allocation, common area management, demand/energy analysis, equipment maintenance programs, M & V for LEED certification and other green building initiatives.

With E-Mon Energy software, you can combine all of your utility service data — including gas, electric, and water — into a single location to see how, when and where your facility is using energy.

Features include:

- Software provides graphical profiling for 5-,15-,30- or 60 minute sampling rates and generates analytical charts and graphs of energy and demand usage
- Software generates and prints itemized electric bills (using coincidental peak demand date and time.) Software will generate bills from user-specific time periods via profile data (you need not be present to generate meter readings)
- Reads all E-Mon meters via IDR and Smart meters directly via EZ-7 communication protocol
- Reads gas, water, BTU and other third-party meters via IDR for billing purposes and graphical display of usage
- Exports data to spreadsheets for analysis (.CSV files) and to MV-90 systems (.hhf files)

Integration with Other Building Management/AMR Systems

COMMUNICATION PROTOCOLS ALLOW EASY INTERFACE TO EXISTING SYSTEMS

Emon submeters can interface with other building management and automatic meter reading systems.

Our line of Smart meters and IDRs allow energy users and facility managers to leverage their E-Mon submeters and integrate the interval energy data to their existing building management systems via industry standard protocols. Built-in communication capabilities allows you to choose the system that best fits your facility's energy needs.

E-Mon smart meters and IDRs provide dual-communication capabilities so that you can not only utilize your existing BMS system for energy management, but at the same time utilize E-Mon Energy AMR software for billing, allocation and graphic profiling of your energy consumption.

COMMUNICATION PROTOCOLS VIA SMART METERS & IDRS INCLUDE:

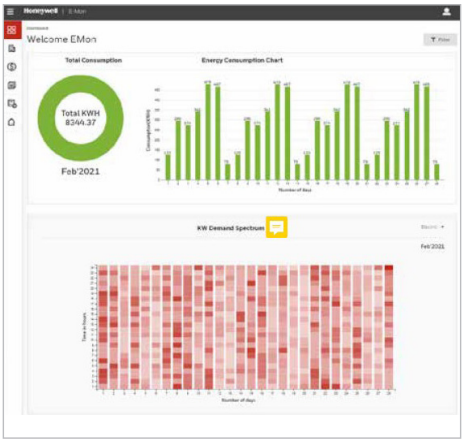
- EZ7 (E-Mon Energy) via RS-485, and/or Ethernet
- ModBus RTU
- BACnet MS/TP
- Modbus TCP/IP
- BACnet IP
- Pulse Output

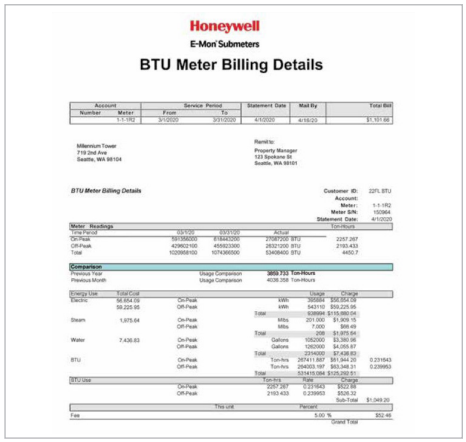
MATERIAL NUMBERS
E10030 - Software, 1 day startup (1-50 meters)
E10031 - Software, 2 days startup (51-100 meters)
E10032 - Software, 3 days startup (101-250 meters)
E10033 - Software andstartup (250+ meters)

Please consult factory for additional days of site startup

E-MON ENERGY METERING SYSTEM

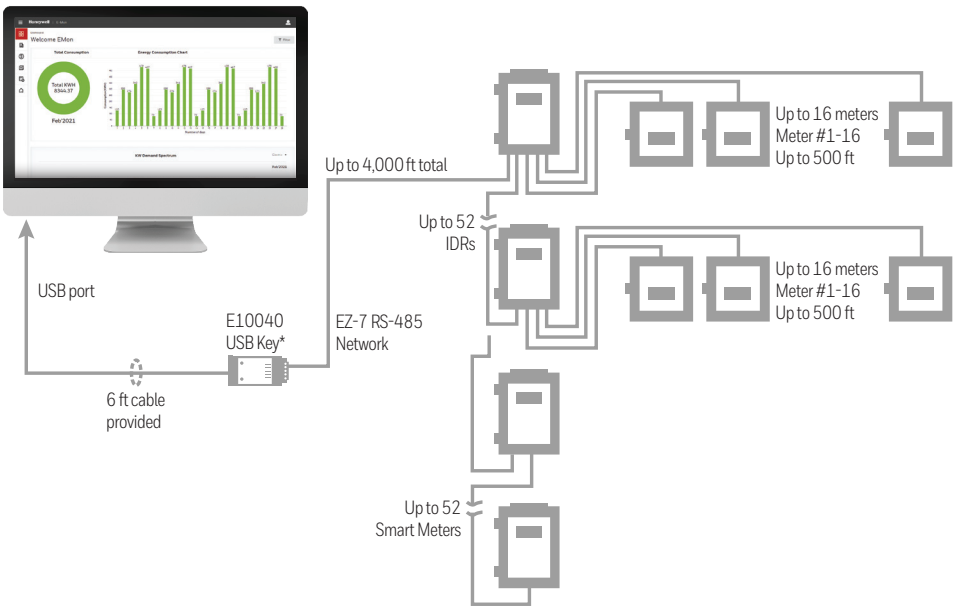
E-Mon Energy Sample Graph & Billing Statement E-Mon Energy Metering System





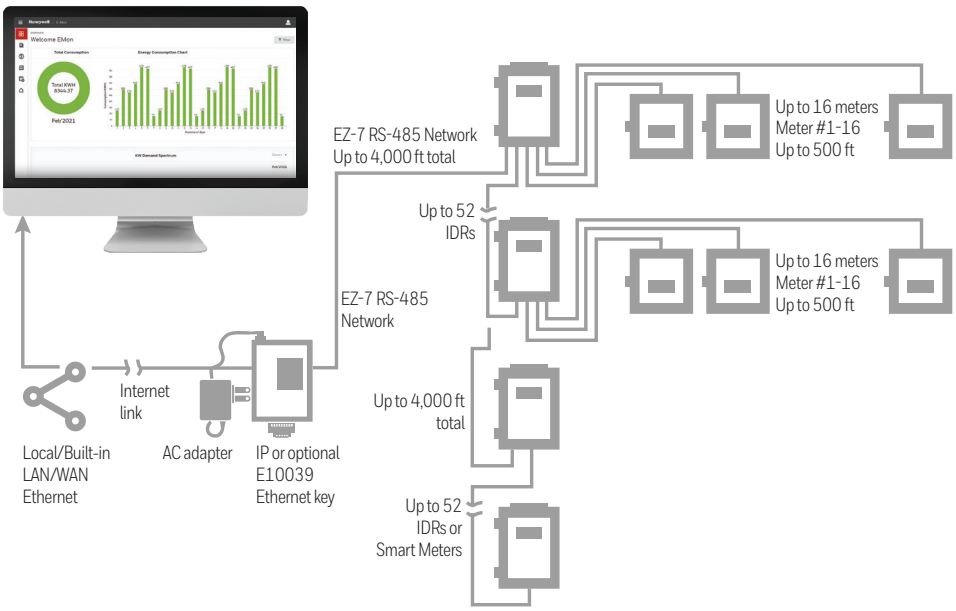
E-MON ENERGY SYSTEM CONFIGURATION

On-Site Monitoring with RS-485



Communication keys required for E-Mon energy AMR System. Visit buildings.honeywell.com/us/en/brands/ourbrands

Off-Site Monitoring with RS-485 and an Ethernet Key



METERING SERVICES

Honeywell Meter Billing Service (HMBS)

A wide array of services are available for commercial, industrial and multi-tenant facilities including reading energy meters, generating tenant or departmental bills and creating usage profiles.

Services include:

- Daily meter reading
- Monthly tenant billing
- Landlord summary statements
- Utility bill consolidation (Gas, Water, Electric on one bill)
- Virtual metering
- Tenant & landlord help desk
- Move-in and move-out statements
- Historical data storage
- Individual tenant load profile graphs
- Automatic rate & tariff update

Let E-Mon experts assist you in implementing a metering solution that lets you:

- Save energy and the environment
- Market your building more competitively
- Increase occupancy and lower turnover
- Watch your property value escalate
- Increase your facility's profitability

Turn-Key Solutions

Optional turn-key solutions are available including:

- Hardware procurement
- Installation through a network of certified installers
- System validation
- Meter reading
- Billing services

Meter Reading Technology

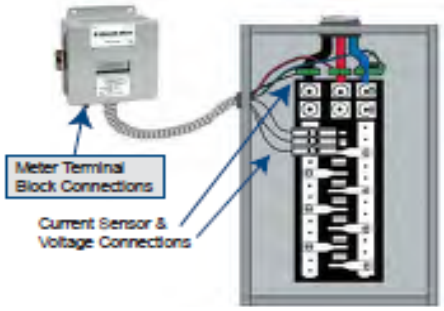
Meter reading services are performed remotely via automatic meter reading technology which increases accuracy and eliminates tenant disruptions.

Proven communication technologies via Ethernet.

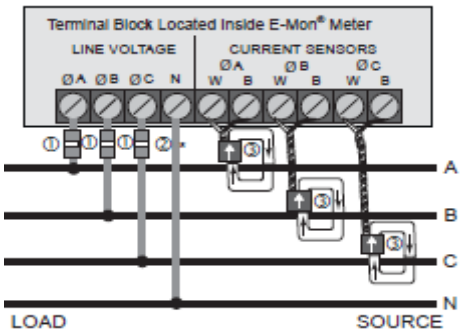
For details on E-Mon's meter reading services call (800) 334-3666

REFERENCE GUIDE

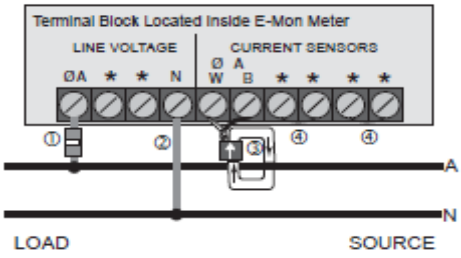
E-MON METER INSTALLATION OVERVIEW



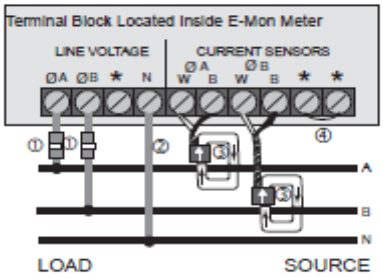
Installation Overview



3-Phase, 3-Wie or 3-Phase, 4-Wire Installation Diagram



1-Phase, 2-Wire 120 or 277 Volt Installation Diagram (Class 1000 Series Only)



Single-Phase, 3-Wire 120/240, 120/208 or 480 Volt Installation Diagram

* These terminals are not used in Class 1000 installations.

1. Recommended fuses or circuit breaker per the National Electrical Code (Meter load 6VA.)

*2. Neutral not used in delta system.

3. Split-core current sensors. Install according to instructions.

4. Install jumper wire,

Typical Fuses: Littlefuse KLDR. 100 (100 mA) Not included. (Consult local electrical codes for requirements.)

STANDALONE ENCLOSURE SPECIFICATIONS

JIC STEEL ENCLOSURES-SMALL

Standard Enclosure for: Class 1000, 2000 and Green Class Meters Optional for Class 3200 & Class 5000 Meters

Exterior Finish: Gray for all meters except Green Class Meter (Green Class meter provided in Green enclosure)

Exterior Dimensions: 6” H x 6” W x 3” D

Mounting Flange Dimensions: 4” between holes Left/Right, 6.75” between holes Top/Bottom

NEMA 4X OUTDOOR ENCLOSURE-SMALL

Standard Enclosure for: Class 3200 & 5000 Meters Optional for Class 1000, 2000 & Green Class Meters

Exterior Finish: Gray

Exterior Dimensions: 6” H x 6” W x 3” D

Mounting Flange Dimensions: 4” between holes Left/Right, 6.75” between holes Top/Bottom

JIC STEEL ENCLOSURE-LARGE

Standard Enclosure for: IDR Optional for Class 3400 Meters

Exterior Finish: Gray

Exterior Dimensions: 8” H x 6” W x 4.36” D

Mounting Flange Dimensions: 4” between holes Left/Right, 8.75” between holes Top/Bottom

NEMA 4X OUTDOOR ENCLOSURE-LARGE

Standard Enclosure for: Class 3400 Meters

Exterior Finish: Gray

Exterior Dimensions: 6.54” W x 8.54” H x 4” D

Mounting Flange Dimensions: 4” between holes Left/Right, 8.75” between holes Top/Bottom

Class 6200a in a MMU-8

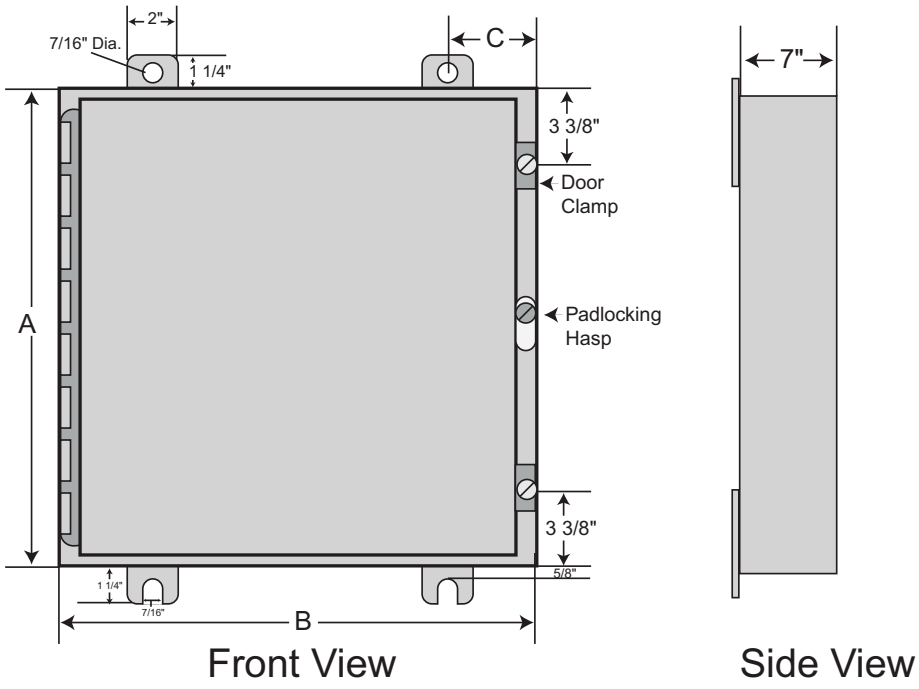
MMU MULTIPLE METER UNIT ENCLOSURE SPECIFICATIONS

Features

- Available in configurations containing upto 8, 16 or 24 meters
- MMU cabinets may contain E-Mon Class 1000, Class 2000 (kWh or kWh/Demand), Class 6200, Green Class and/or Class 3200 meters
- Compact installation of multiple meters allow for easy and centralized reading.
- IDRs (Interval Data Recorders) can be factory installed inside the MMU enclosures along with the meters allowing for easy interface to the E-Mon Energy software system. (IDRs are mounted on back wall of the enclosure).
- Three-phase MMU cabinets with Class 2000, 6200, 3200 or green meters are shipped with prewired voltage feeds. If IDR(s) are installed inside the MMU cabinets, the connections from the meters to the IDRs are also pre-wired at the factory.-

MMU MODELS
MMU CABINET SIZES
MMU-8
MMU-16
MMU-24
When ordering, specify configuration, meters to be contained inside cabinet, and blank spaces (if any).
Example:
1 MMU-8
6 E20-208200-MKIT
1 E20-480200-MKIT
1 Blank Space

MMU DIMENSIONS



MMU DIMENSIONS			
MMU	**DIMENSIONS IN INCHES**		
	A	**B**	**C**
MMU-8	24	12	1.25
MMU-16	24	20	3
MMU-25	30	24	3

MMU	METER CONFIGURATION		TOTAL METER SPACES
	ACROSS	DOWN	
MMU-8	2	4	8
MMU-16	4	4	16
MMU-25	5	5	24

MODBUS POINT MAP SAMPLE

The table below represents a sampling of the BACnet PIC Statement available from E-Mon meters and IDRs. Visit www.emon.com for specific information for each product.

BACNET PIC STATEMENT EXAMPLE

ADDRESS	REGISTERS	FORMAT	DESCRIPTION	UNITS	CL3200	CL3400 CL5000	NOTES
40001	2	Integer	Energy delivered	Wh Pulse	R/W	R/W	1
40003	2	Integer	Energy received	Wh Pulse	R/W	R/W	1
40005	2	Integer	Reactive energy delivered	VARh Pulse	R/W	R/W	1
40007	2	Integer	Reactive energy received	VARh Pulse	R/W	R/W	1
41001	2	Float	Energy delivered	kWh	R/W	R/W	1
41003	2	Float	Energy received	kWh	R/W	R/W	1
41005	2	Float	Reactive energy delivered	kVARh	R/W	R/W	1
41007	2	Float	Reactive energy received	kVARh	R/W	R/W	1
41009	2	Float	Real power	kW	R	R	
41011	2	Float	Reactive power	kVAR	R	R	
41013	2	Float	Apparent power	kVA	R	R	
41015	2	Float	Power factor	% PF	R	R	
41017	2	Float	Peak demand	kW	R/W	R/W	
41019	2	Float	Current average	Amps	R	R	
41021	2	Float	Voltage line-neutral	Volts-N	R	R	
41023	2	Float	Voltage line-line	Volts-L	R	R	
41025	2	Float	Frequency	Hz	R	R	
41027	2	Float	Phase angle	Degree	R	R	
41029	2	Float	Real power, phase A	kW	R	R	
41031	2	Float	Real power, phase B	kW	R	R	
41033	2	Float	Real power, phase C	kW	R	R	
41035	2	Float	Reactive power, phase A	kVAR	R	R	
41037	2	Float	Reactive power, phase B	kVAR	R	R	
41039	2	Float	Reactive power, phase C	kVAR	R	R	
41041	2	Float	Apparent power, phase A	kVA	R	R	
41043	2	Float	Apparent power, phase B	kVA	R	R	
41045	2	Float	Apparent power, phase C	kVA	R	R	
41047	2	Float	Power factor, phase A	% PF	R	R	
41049	2	Float	Power factor, phase B	% PF	R	R	
41051	2	Float	Power factor, phase C	% PF	R	R	
41053	2	Float	Current, phase A	Amps	R	R	
41055	2	Float	Current, phase B	Amps	R	R	
41057	2	Float	Current, phase C	Amps	R	R	
41059	2	Float	Voltage, line to neutral, phase A-N	Volts-N	R	R	
41061	2	Float	Voltage, line to neutral, phase B-N	Volts-N	R	R	
41063	2	Float	Voltage, line to neutral, phase C-N	Volts-N	R	R	
41065	2	Float	Voltage, line to line, phase A-B	Volts-L	R	R	
41067	2	Float	Voltage, line to line, phase B-C	Volts-L	R	R	
41069	2	Float	Voltage, line to line, phase C-A	Volts-L	R	R	
41071	2	Float	Phase angle, phase A	Degree	R	R	
41073	2	Float	Phase angle, phase B	Degree	R	R	
41075	2	Float	Phase angle, phase C	Degree	R	R	
41083	2	Float	External Input 1	Pulse		R/W	2
41085	2	Float	External Input 2	Pulse		R/W	2
44001	6	Custom	Interval Day Block		R/W	R/W	3
44007	1 per interval	Integer	Interval Data	Pulse	R	R	4
45501	2 per day	Custom	Interval Data Headers		R	R	5
46025	8	Custom	RTC Date/Time		R/W	R/W	6
46049	8	Custom	EZ7 ID, ModBus ID, Serial Number		R/W	R/W	7
46057	8	Custom	Recorder Info., Demand Interval		R/W	R/W	
46513	8	Custom	Flags L1: Power Failure, Battery		R	R	
46521	8	Custom	Flags L2: Power Failure Date		R	R	

BACNET OBJECT DESCRIPTOR SAMPLE

The table below represents a sampling of the BACnet object descriptors available from E-Mon meters and IDRs.Visit www.emon.com for specific information for each product.

BACNET OBJECT DESCRIPTORS EXAMPLE							
INSTANCE ID	BACNET OBJECT	DESCRIPTION	UNITS	BACNET PROPERTY	CL3200	CL3400 CL5000	NOTES
1	Analog Input	Energy delivered	kWh	Present Value	R	R	1
2	Analog Input	Energy received	kWh	Present Value	R	R	1
3	Analog Input	Reactive energy delivered	kVARh	Present Value	R	R	1
4	Analog Input	Reactive energy received	kVARh	Present Value	R	R	1
5	Analog Input	Real power	kW	Present Value	R	R	
6	Analog Input	Reactive power	kVAR	Present Value	R	R	
7	Analog Input	Apparent power	kVA	Present Value	R	R	
8	Analog Input	Power factor	% PF	Present Value	R	R	
9	Analog Input	Peak demand	kW	Present Value	R	R	
10	Analog Input	Current average	Amps	Present Value	R	R	
11	Analog Input	Voltage line-neutral	Volts-N	Present Value	R	R	
12	Analog Input	Voltage line-line	Volts-L	Present Value	R	R	
13	Analog Input	Frequency	Hz	Present Value	R	R	
14	Analog Input	Phase angle	Degree	Present Value	R	R	
15	Analog Input	Real power phase A	kW	Present Value	R	R	
16	Analog Input	Real power phase B	kW	Present Value	R	R	
17	Analog Input	Real power phase C	kW	Present Value	R	R	
18	Analog Input	Reactive power phase A	kVAR	Present Value	R	R	
19	Analog Input	Reactive power phase B	kVAR	Present Value	R	R	
20	Analog Input	Reactive power phase C	kVAR	Present Value	R	R	
21	Analog Input	Apparent power phase A	kVA	Present Value	R	R	
22	Analog Input	Apparent power phase B	kVA	Present Value	R	R	
23	Analog Input	Apparent power phase C	kVA	Present Value	R	R	
24	Analog Input	Power factor phase A	% PF	Present Value	R	R	
25	Analog Input	Power factor phase B	% PF	Present Value	R	R	
26	Analog Input	Power factor phase C	% PF	Present Value	R	R	
27	Analog Input	Current phase A	Amps	Present Value	R	R	
28	Analog Input	Current phase B	Amps	Present Value	R	R	
29	Analog Input	Current phase C	Amps	Present Value	R	R	
30	Analog Input	Voltage line-neutral phase A-N	Volts-N	Present Value	R	R	
31	Analog Input	Voltage line-neutral phase B-N	Volts-N	Present Value	R	R	
32	Analog Input	Voltage line-neutral phase C-N	Volts-N	Present Value	R	R	
33	Analog Input	Voltage line-line phase A-B	Volts-L	Present Value	R	R	
34	Analog Input	Voltage line-line phase B-C	Volts-L	Present Value	R	R	
35	Analog Input	Voltage line-line phase C-A	Volts-L	Present Value	R	R	
36	Analog Input	Phase angle phase A	Degree	Present Value	R	R	
37	Analog Input	Phase angle phase B	Degree	Present Value	R	R	
38	Analog Input	Phase angle phase C	Degree	Present Value	R	R	
39	Analog Input	Reserve A	No units	Present Value	R	R	
40	Analog Input	Reserve B	No units	Present Value	R	R	
41	Analog Input	Reserve C	No units	Present Value	R	R	
42	Analog Input	External Input 1	Pulse	Present Value		R	2
43	Analog Input	External Input 2	Pulse	Present Value		R	2

1.To clear single meter kWh/kVARh, select reset kW/kWh on the display menu of the meter. This function will also reset external inputs. Jumper J6 must be closed.

2. External inputs are standard on Class 5000 meters and optional on Class 3400 meters (Part of Expanded Feature Package).
To clear external inputs, select reset kW/kWh on the display menu of the meter. This function will also reset kW/kVARh. Jumper J6 must be closed.

INSTANCE ID	BACNET OBJECT	BACNET PROPERTY	CL3200	CL3400 CL5000	NOTES
BACnet Device ID	Device	Object identifier	R	R	
BACnet Device ID	Device	Object name	R	R	
BACnet Device ID	Device	Object type	R	R	
BACnet Device ID	Device	System status	R/W	R/W	
BACnet Device ID	Device	Vendor name	R	R	
BACnet Device ID	Device	Vendor Identifier	R	R	
BACnet Device ID	Device	Model name	R	R	
BACnet Device ID	Device	Firmware revision	R	R	
BACnet Device ID	Device	Application software version	R	R	
BACnet Device ID	Device	Location	R/W	R/W	
BACnet Device ID	Device	Description	R/W	R/W	

BACNET PIC STATEMENT SAMPLE

The table below represents a sampling of the BACnet PIC Statement available from E-Mon meters and IDRs. Visit www.emon.com for specific information for each product.

PIC STATEMENT FOR CLASS 3200, 3400, AND 5000 METERS & IDRS

BACnet Protocol Implementation Conformance Statement

Date:	October 2013
Vendor Name:	E-Mon
Vendor ID:	482
Product Name:	Class 3200 Meter, Class 3400 Meter, Class 5000 Meter, IDR
Product Model Numbers:	E32-208100-RBACKIT, E34-480200-R05KIT, E50-480200-R03KIT, EIDR-8-R05RJ
Product Description:	This product will provide bi-directional communication between E-Mon BACnet MS/TP meters, BACnet IP meters, and a BACnet system.

BACnet Standardized Device Profile (Annex L):

- BACnet Smart Sensor (B-SS)

BACnet Interoperability Building Blocks Supported (Annex K):

- K.1.2 BIBB - Data Sharing - ReadProperty-B (DS-RP-B)
- K.1.4 BIBB - Data Sharing - ReadPropertyMultiple-B (DS-RPM-B)
- K.5.2 BIBB - Device Management - Dynamic Device Binding-B (DM-DDB-B)
- K.5.4 BIBB - Device Management - Dynamic Object Binding-B (DM-DOB-B)
- K.5.12 BIBB – Device Management – TimeSynchonization-B (DM-TS-B)

Segmentation Capability:

None

Standard Object Types Supported:

- Device Object
- Analog Input

For all these properties the following apply:

1. Does not support BACnet CreateObject
2. Does not support BACnet DeleteObject
3. No additional writeable properties exist
4. No proprietary properties exist
5. No range restrictions exist

Data Link Layer Options:

- MS/TP master (Clause 9), baud rate(s): 9.6k, 19.2k, 38.4k, 76.8k bps
- BACnet IP, (Annex J): Class 3200 meter does not support BACnet IP

Static Device Address Binding:

Not supported

Character Sets Supported:

- ANSI X3.4

For more information,
https://hwll.co/emon

Honeywell Building Technologies
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Atlanta, Georgia 30308
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E-Mon Product Range | 2023-02-23