



# ***E-Mon D-Mon - Industry Leader for 25+ Years***

## ***Versatile Metering Products***

- Installed worldwide in commercial offices, industrial facilities, apartments, condominiums, campuses and governmental facilities for tenant billing, cost analysis and energy management.
- Monitor anything from one single-phase circuit to an entire distribution panel without power interruption with E-Mon's unique 0-2 V output split-core current sensors.
- Meters can be read manually or interfaced to E-Mon Energy automatic meter reading systems for tenant billing, energy management and cost allocation based on actual usage, not estimates or square foot basis.
- Whether displayed in lobbies, tenant spaces or electrical rooms, E-Mon D-Mon meters are key components to successful green building initiatives and programs such as LEED Certification, EPACT 2005, EISA 2007, renewable energy projects, net metering, demand response, measurement & verification and energy efficiency status.
- Compact meters are available in optional outdoor enclosures or space-saving Multiple Meter Unit (MMU) cabinets containing up to 24 meters in a 30" x 24" x 7" enclosure. No CT cabinets required.
- Third-Party metering products available to monitor other utilities including gas, water & BTU.
- Meters can interface with existing building automation systems for detailed energy information.



## ***Complete Metering Solutions***

- E-Mon Energy software allows users to allocate costs by tenant, department or process.
- Utility meters equipped with a pulse output such as electric, gas and water meters can be monitored with E-Mon Energy software.
- Users can generate a single, integrated bill for all utility services.
- Communication options include wireless, telephone, Ethernet, Modbus and BACnet.

Contact E-Mon's staff of metering experts at (800) 334-3666 to help you build a cost-effective, accurate and reliable metering solution for your facility. You may also visit us online for additional information at [www.emon.com](http://www.emon.com).

<b>Application Information (Blue Section)</b>	<b>Page</b>
Submetering Overview	1
Energy Management & Green Building Initiatives Overview	2
Cost Allocation & Tenant Metering Overview	3
Submetering Application Overview including Commercial Office/Retail & Multi-Family Residential	4
Submetering Application Overview including Industrial/Manufacturing & Educational	5
Submetering Application Overview - Government	6
Meter Installation Overview	7
<b>Metering Products (Green Section)</b>	
Metering Product Overview	8
Class 1000 Single Phase Meters	9
Class 2000 Three Phase Meters	10
Class 3000 Advanced Meters	11
Class 4000 Multi-Family Meters	12
Green Class Meters for Green Building Initiatives	13
Green Class Net Meters for Net Metering Applications	14
MMU Multiple Meter Unit Enclosure Specifications	15
Outdoor Meter Enclosure Specifications	16
Current Sensor Specifications	17
Meter Wiring Diagrams	18
Meter Options	19
<b>Metering Systems (Burgundy Section)</b>	
Metering System Overview	20
E-Mon Energy Software Specifications	21
IDR Interval Data Recorder Specifications	22
System Configuration Diagrams	23
E-Mon Energy Communication Option Specifications	24
E-Mon Energy System Option Specifications	25
Wireless Metering System Overview	26
Class 2100 Three Phase Wireless Meters	27
Class 4100 Multi-Family Wireless Meters	28
Wireless Socket Meters	29
External Wireless Modules for E-Mon and Third-Party Meters	30
Wireless Gateway Specifications	31
Wireless System Configuration Diagrams	32
<b>Third Party Products &amp; Services (Yellow Section)</b>	
Third Party Product Overview	33
Third Party Metering Products	34
Third Party Services	35
<b>Reference Guides (Gray Section)</b>	
Appendix A - Meter Technical Specifications	36
Appendix B - Meter Engineering Specifications	37
Appendix C - Modbus Point Map	38
Appendix D - System Engineering Specifications	39
Meter Installation Photos	40

# Submetering Overview

Rising energy costs continue to pressure operators of commercial, industrial, institutional and multi-family residential facilities to leave “no stone unturned” in finding ways to reduce operating expenses. Users have turned to submetering to identify when and where energy is used in order to implement energy conservation measures and programs.

## Monitoring Electrical Usage

E-Mon, the industry leader in submetering hardware and software, responded to the growing need for more sophisticated energy profiling by developing advanced metering products that provide usage data beyond the master meter. Used in conjunction with automatic meter reading (AMR) software, submetering systems provide accurate and timely snapshots of a facility's energy use-from a single circuit or device all the way up to an entire building and beyond. Essential to support energy management initiatives, submeter based AMR systems combine all of the facility's utility service data - electric, water, gas, steam and others-into a single, easy-to-use system to show exactly how, when and where the facility is using energy.

First introduced in the early 1980's, E-Mon D-Mon electric submeters are installed on the facility side of the master utility meter to provide a number of energy monitoring functions including:

- Electrical usage analysis and identification of peak demand levels for load comparisons
- Time-of-use metering of electricity, gas, water, steam, 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

	SUBMETER TYPE		
	Socket Type Electromechanical/Solid State		E-Mon D-Mon Electronic
	Feed-Thru Type	Current Transformer Type	Non-Socket Type
<b>INSTALLATION</b>			
Installed Cost (Estimated)			
Stand Alone, up to 320A, 3Ø	\$1,000	Not Applicable	\$700
Stand alone, over 320A 3Ø	Not Applicable	\$2000-\$5000	\$800
8-meter Unit, 200A 3Ø	\$16,000	Not Applicable	\$5,500
Installation Time	2-3 hours	6-8 hours	1 hour
Power Interruption	2-3 hours	6-8 hours	None
Amperage Limitations	320 Amp Max.	None	None
Space Requirements	2 Square Ft	11.7 Square Ft	0.25 Square Ft
Installation Location	Utility Room	Utility Room	Anywhere
<b>FEATURES</b>			
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
<b>ENHANCEMENTS</b>			
Digital to Analog Profiles	Yes	Yes	Yes
Pulse Outputs	Yes	Yes	Yes
Timed Metering	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

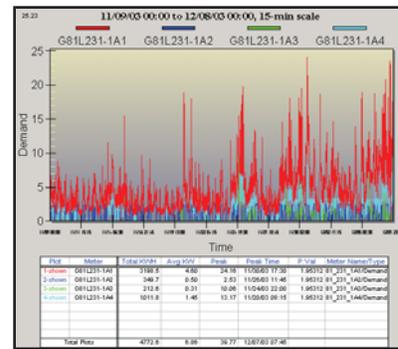
# Submetering Overview

## Energy Analysis

The type of energy data needed by today's sophisticated facility manager is well beyond the capability of the master utility meter at the main service entrance. 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.

As first-level data gathering tools in the facility load profiling process, submeters provide high-accuracy interval data snapshots of energy use and demand from 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
- Usage Aggregation
- BAS Integration
- Power Quality Analysis



E-Mon's line of submetering 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.

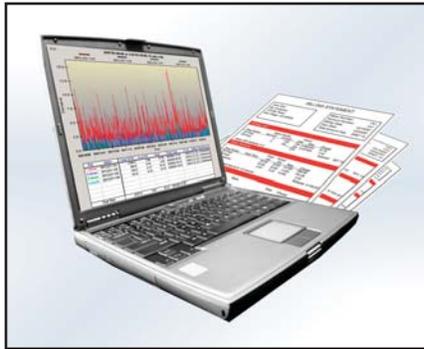
## Energy Conservation/Green Building Initiatives

With world focus on green 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 measurement & verification of the ongoing effectiveness of energy savings programs. Meters and submetering systems are ideal for complying with various programs including LEED, EPACT 2005 & EISA 2007 (page 6), demand response and renewable energy initiatives.

The country's most widely used sustainable building assessment system is currently the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) rating system. E-Mon 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 below lists those areas prime for submetering applications, including Water Efficiency (WE) and Energy & Atmosphere (EA) credits.

LEED Certification Category	Credit	Certification Points	Applicable Guideline
Core & Shell	EA Credit 5.1	1	Measurement & Verification-Base Building
Core & Shell	EA Credit 5.2	1	Measurement & Verification-Tenant Submetering
Existing Buildings	WE Credit 1.2	1	Water Performance Measurement: Submetering
Existing Buildings	EA Credit 3.2	1	Building Operations & Maintenance
Existing Buildings	EA Credit 3.3	1	Building Operations & Maintenance
Existing Buildings	EA Credit 5.1-5.3	1-3	Performance Measurement: Enhanced Metering
Existing Buildings	EA Credit 6	1	Documenting Sustainable Building Cost
New Construction	EA Prerequisite 3	-	Minimum Energy Performance
New Construction	EA Credit 5	1	Measurement & Verification
Commercial Interiors	EA Credit 1	1	Optimize Energy Performance
Commercial Interiors	EA Credit 3	1-2	Energy Use, Measurement & Payment Accountability
Schools	EA Credit 5	2-10	Optimize Energy Performance
Healthcare	WE Credit 2	1	Measurement & Verification
Healthcare	EA Credit 1	2-10	Optimize Energy Performance
Healthcare	EA Credit 5	1	Measurement & Verification

# Cost Allocation & Tenant Metering



Building owners and facility managers are faced with ever increasing utility costs that eat away at the bottom line. In order to begin managing these costs; users need to know where the energy is being used and be able to allocate them appropriately. Submetering products and systems allow users to see specifically where and when energy is consumed within the building envelope. Meters are used to monitor actual usage by department, tenant or common area and report back to a computerized system for billing, allocation and analysis.

## Cost Allocation

Metering individual departments, areas or buildings for cost center analysis, budgetary accountability and allocation allows 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. When department budgets include energy consumption, users will be inclined to take the necessary steps to ease the pressure on their budgets by reducing overall energy use.

Meter Billing Statement					
Emon L.P. One Oxford Valley Suite 418 Langhorne PA 19047			Meter: 1-4-173 Customer No: 00000031 Billing Date: 4/12/2004 Due Date: 4/27/2004 Amount: \$198.02		
Energy Use					
Time Period	Meter Display	Actual	kWh	Rate	Charge
02/01/04	02/16/04	1550	903	0.011000	9.93
Off Peak	647	1550	420	0.021000	8.99
On Peak	368	827	441	0.031000	13.67
					<b>Sub-Total</b>
					<b>\$32.59</b>
Demand Charge					
Time Period	Peak Time	Peak	Actual	Rate	Charge
02/05/04	12:15	17.56	17.56	1.7000	13.32
Off Peak	02/05/04 11:00	16.81	16.81	2.1000	35.30
On Peak	02/05/04 13:15	16.81	16.81	3.1000	52.11
Contingental		0.00	0.00	0.0000	0.00
Distribution Demand					16.13
					<b>Sub-Total</b>
					<b>\$106.79</b>
Other Charges					
Type	Units	Rate	Charge		
Rate Adjustment 1	1772 kWh	0.00165	2.92		
Rate Adjustment 2	1772 kWh	0.00770	13.64		
	1772	0.00000	0.00		
	1772	0.00000	0.00		
	1772	0.00000	0.00		

## Tenant Billing



In facilities where there are multiple tenants, monitoring actual consumption is a win-win situation for both the building manager and the tenants.

Managers are able to allocate energy usage costs directly to the tenants. Energy costs can include not only electric but gas, water and BTU costs as well. In addition, all common area usage can be monitored and distributed equitably between tenants. Both 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 the overflow cost of large users as they would be if billed a flat rate per square foot of space rented. The second benefit is that they gain control over their usage allowing them to conserve energy and benefit financially for their efforts.

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

# Submetering Application Overview

## Commercial - Office/Retail

In today's commercial office, retail and mixed-use facility environments, you'll find submeter-based energy monitoring solutions from E-Mon benefitting parties on both sides of the electric bill. At the enterprise level, 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. Tenants are also able to benefit financially from any energy conservation practices they implement.

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 designed specifically to:



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

Customers who have chosen E-Mon D-Mon for their metering solution include:

- Pier 1 Imports
- Wells Fargo Bank
- CB Richard Ellis
- Denver Conv. Center
- Verizon
- Canal Place
- Raven's Stadium
- Fed Ex
- Edison Properties

## Multi-Family

Rising energy rates are driving multi-family property owners to allocate utility costs back to the tenant, 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.



In high-rise applications, managers and owners from all multi-family type dwellings are turning to E-Mon to track and unbundle utility costs from their leases and association fees; a property value enhancing capability in many jurisdictions.

Ideal for new or retrofit applications, E-Mon's versatile 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.

Ideally suited for any multi-family residential application, E-Mon's complete selection of metering hardware and software, including wireless meters and accessories, is the perfect cost-effective solution for tenant metering and common area allocation.

Multi-Family facilities that have chosen E-Mon D-Mon for their metering solution include:

- Merrit River Apartments
- Webster Manor
- Esplanade Place

# Submetering Application Overview

## Industrial/Manufacturing



With the industrial sector consuming more than one-third of all U.S. energy, it's easy to see why facilities are seeking ways to reduce energy costs without compromising production. E-Mon's advanced metering hardware, communication options and E-Mon Energy™ software can help facility personnel zero in on the real costs and on investment of their industrial processes.

As part of the facility energy picture, 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 D-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, steam, 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:

- Cost Allocation:** 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.
- Energy Analysis:** Monitor and identify "high use" pieces of equipment for load shedding/shifting programs or to identify maintenance issues for repair before critical equipment fails.

Customers who have chosen E-Mon D-Mon for their metering solution include:

- Mash Petroleum
- Sematech
- Ricoh
- K & K Thermoforming

---

## Educational

With today's schools and universities facing mounting financial pressure, controlling the bottom line is key to maintaining current programs and keeping education affordable. However, in spite of tightening budgets, energy conservation and cost reduction are realistic goals that any district or educational facility can achieve using E-Mon D-Mon submetering products.



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 candidate for submeters. Submetering dorm rooms, suites or buildings allow billing according to actual usage. Installing green class meters in public areas allows students to immediately see the impact of their conservation efforts.

Other applications on campus include coffee shops, food service, bookstores and various retail spaces that use energy at different rates. Submeters are ideal for monitoring and generating accurate and fair energy statements based on individual use. 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 load trends highlight opportunities to shift energy loads to off-peak hours or stagger loads to reduce costly demand charges.

Customers who have chosen E-Mon D-Mon for their metering solution include:

- Beloit College
- Tufts University
- Univ. of Louisville
- SUNY Stonybrook
- Rockhurst Univ.
- Univ. of UT
- Milton High School
- Stockton State College

# Government Submetering Overview

## Be Compliant With Advanced Meters & Submetering Systems

Energy conservation and management are key issues facing government officials and agencies responsible for facility and building management. EPACT 2005, more recently expanded by EISA, clearly outlines the government's requirement to significantly reduce energy usage in buildings within its control.



Some requirements include:

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
Title IV, Sec. 434	Provide equivalent metering of gas and steam by 2016

Compliance with these regulations 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.

Meters are used for:

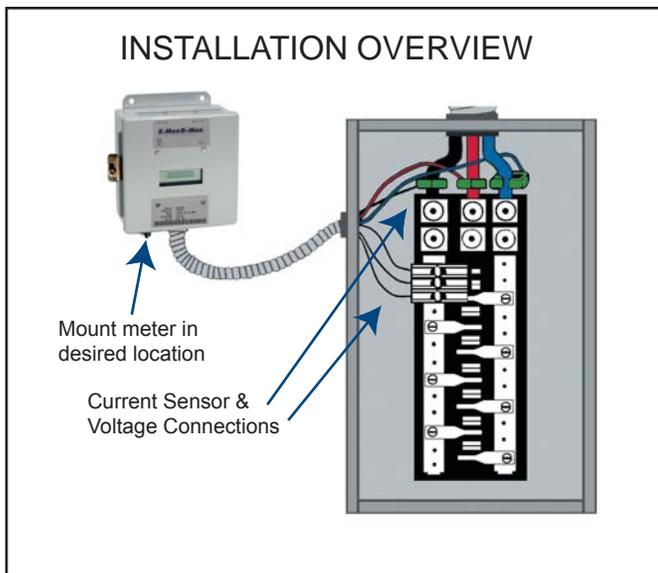
- Whole Building Metering
- Tenant/Departmental Cost Allocation
- Measurement & Verification
- Energy Management & Analysis
- Benchmarking
- Building Automation System Integration



Government facilities already using E-Mon D-Mon products include:

- Smithsonian Institution, Washington, DC
- Dobbins Air Force Base, GA
- Camp Pendleton, CA
- Los Angeles Air Force Base, CA
- Army National Guard, HI
- Kirkland Air Force Base, NM
- Navy Weapons Depot, CA
- US Mint, Denver, CO
- City of Oceanside, CA
- US Naval Air Station, PR
- US GSA Office, NY
- Dover Air Force Base, DE

# Meter Installation Overview



Compact meters can be mounted virtually anyway in either stand-alone or MMU configuration (shown above). Meters can be mounted up to 2,000 feet by extending the current sensor leads to the load(s) being monitored.



Split-core current sensors install without power interruption in new or retrofit applications.

Many E-Mon D-Mon products have been tested and approved by independent agencies including:

#### National Approvals

UL Listed

CSA Approved (Canadian Standards Assoc.)

ANSI C12.1 and C12.16 Certified (National Accuracy Standards) by MET Testing Labs

#### State and Local 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

NY - NYC Approved for RSP program, City of NY-Bureau of Electrical Control, ConEd Approved for RSP

PA - PECO Energy-Berwyn

SC - State of SC-Columbia

VA - Appalachian Power Company-Roanoke

PR - PREPA Approved-Puerto Rico

# E-Mon D-Mon Metering Products

## The Industry's Choice For Metering

- Commercial
- Multi-Family
- Industrial
- Education
- Government



E-Mon D-Mon submetering products measure energy & monitor anything from a single circuit to an entire distribution system. E-Mon meters provide accurate and reliable energy information to help identify conservation opportunities and validate energy saving programs in your facility and can be installed quickly without rewiring or powering down.

#### Applications Include:

- Tenant Metering & Billing
- Cost Allocation & Demand Management
- Real-Time Metering
- Load Control
- Load Profiling & Aggregation
- EPACT & LEED Certification Requirements

# Class 1000 Single-Phase KWH Meter

## Features

- Direct-read 8-digit LCD display without multiplier displays accumulative 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 2000 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.
- Meter can be used in the following configurations:  
     1-Phase, 2-Wire  
     2-Phase, 3-Wire  
     For other configurations, contact factory.
- Industrial grade JIC steel enclosure for indoor installations with 1 1/16" KO (3/4" cond.) on bottom of enclosure.
- Optional enclosures:  
     MMU (Multiple Meter Unit) Cabinets  
     NEMA 4X outdoor enclosure available
- Padlocking hasp & mounting flanges.
- Maintains reading in the event of power failure.
- Compatible with E-Mon D-Mon accessories.
- Non-volatile Memory.
- UL Listed/CSA Approved.
- Certified to ANSI C12.1 and C12.16 electronic meter national accuracy standards. (+/- 1% from 1%-100% of rated load.)
- Certified to California metering standards by the Bureau of Weights and Measures. Listed by the California Energy Commission.
- New York City approved, Con Edison approved for RSP program.

MMU Style  
(Multiple Meter Unit)



Stand-Alone Configuration  
Dim: 6 3/4" H x 5 3/16" W x 3 1/4" D

## Model Numbers

### 120V, 1-Phase, 2W

(Supplied with (1) split-core current sensor)

212025-SA KIT (25 amp)\*

212050-SA KIT (50 amp)\*

2120100-SA KIT (100 amp)\*

2120200-SA KIT (200 amp)\*

### 120/208-240V, 1- or 2-Phase, 3W

(Supplied with (2) split-core current sensors)

320825-SA KIT (25 amp)\*

320850-SA KIT (50 amp)\*

3208100-SA KIT (100 amp)\*

3208200-SA KIT (200 amp)\*

### 277V, 1-Phase, 2W (4-Digit Display)

(Supplied with (1) split-core current sensor)

227725-SA KIT (25 amp)

227750-SA KIT (50 amp)

2277100-SA KIT (100 amp)

2277200-SA KIT (200 amp)

Note: 1 Ph, 277 V meters not available in MMU or Outdoor Enclosures.

For MMU-style add suffix "M" to the model number  
e.g., 3208200-SAM KIT

\*For outdoor enclosure add suffix "R" to the model number, e.g., 3208100-SAR KIT

# Class 2000 Three-Phase kWh/Demand Meters

## Features

- Direct-read 8-digit LCD display without multiplier displays accumulative kWh and "real-time" kW load.
- Demand option displays kW/Demand and kW Peak date and time (15 minute interval standard, 30 minute interval available.)
- Utility Grade Metering Accuracy.
- 0-2 volt output split-core current sensors promote enhanced safety and accurate remote mounting of current sensors up to 2000 feet from meter without power interruption. (Optional solid-core sensors available for 100 & 200 Amp meters.)
- Current sensor installation diagnostic indicator.
- 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
  - 2-Phase, 3-WireFor other configurations contact factory.
- Optional removable terminal block for pulse output.
- Industrial-grade JIC steel enclosure with padlocking hasp and mounting flanges for indoor installations with 1 1/16" KO (3/4" Cond.) on bottom of enclosure.
- Optional Enclosures:
  - MMU (Multiple-Meter Unit) Cabinets
  - NEMA 4X Raintight Enclosure
- Compatible with E-Mon D-Mon<sup>®</sup> accessories.
- Non-volatile Memory.
- UL Listed/CSA Approved.
- Certified to ANSI C12.1 and C12.16 electronic meter National Accuracy Standards. (+/- 1% from 1%-100% of the rated load.)
- Certified to California metering standards Bureau of Weights and Measures. Listed by the California Energy Commission.
- New York City approved, Con Edison approved for RSP program.



Dimensions: 7 1/4" H x 7" W x 3 1/4" D

## Model Numbers

120/208-240V, 3-Phase, 4W  
240V, 3-Phase, 3W

208100 KIT (100 amp)  
208200 KIT (200 amp)  
208400 KIT (400 amp)  
208800 KIT (800 amp)  
2081600 KIT (1600 amp)  
2083200 KIT (3200 amp)

277/480V, 3-Phase, 4W  
480V, 3-Phase, 3W

480100 KIT (100 amp)  
480200 KIT (200 amp)  
480400 KIT (400 amp)  
480800 KIT (800 amp)  
4801600 KIT (1600 amp)  
4803200 KIT (3200 amp)

NOTE: All meter kits include one set of three (3) split-core current sensors

For demand option add suffix "D" to the model number.  
e.g., 208400D KIT

For MMU-style add suffix "M" to the model number.  
e.g., 4803200M KIT

For outdoor enclosure add suffix "R" to the model number.  
e.g., 208200R KIT

For optional removable terminal block for pulse output add suffix "ST" to the model number. e.g. 2081600ST KIT

\* Also available with built-in wireless communication, see page 27 ( Class 2100 meters).

# Class 3000 Advanced kWh/Demand Meters

## Features

- Easy-to-read cycling 4-line by 20-character backlit LCD display:
  - kWh
  - Power factor per phase
  - Amps per phase
  - kW (with peak date and time)
  - Real-time load in kW
  - Volts per phase
- 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 for 100 amp & 200 amp meters only.)
- Installation diagnostics and verification system.
- RS-485 communications capability supports up to 52 Class 3000 meters or Interval Data Recorders via 4-conductor cable (up to 4000 feet total 24-26 AWG). Cabling can be "daisy chain," "star" configuration, or a combination thereof.
- Communication Options:
  - Telephone Modem
  - RS-232/RS-485
  - Ethernet/IP Addressable
  - Modbus
  - BACnet
- Records kWh and kVARh data for two channels. Data stored in 15-minute intervals for up to 36 days or 5-minute intervals for up to 12 days. Maintains the last 36 days of data in a first-in, first-out format.
- External meter input (water, gas, BTU, etc.) on 3<sup>rd</sup> channel.
- Meter is designed for use on both 3-phase, 3-wire (delta) and 3-phase, 4-wire (wye) circuits. (Specify when ordering.)
- Industrial-grade JIC (Joint Industrial Council) enclosure with padlocking hasp and mounting flanges for indoor installation with three 1 1/16" KO (3/4" cond.) on bottom of enclosure.
- UL-listed. Meets or exceeds ANSI C12 national accuracy standards.
- Optional load control/alarm relay (3A, 240V max.) with high and low threshold adjustment.
- MV-90 Compatible.



Dimensions: 9 1/2" H x 6 3/4" W x 3 3/4" D

## Model Numbers

### 120/208-240V, 3-Phase\*

- 208100C\* KIT (100 amp)
- 208200C\* KIT (200 amp)
- 208400C\* KIT (400 amp)
- 208800C\* KIT (800 amp)
- 2081600C\* KIT (1600 amp)
- 2083200C\* KIT (3200 amp)

### 277/480V, 3-Phase\*

- 480100C\* KIT (100 amp)
- 480200C\* KIT (200 amp)
- 480400C\* KIT (400 amp)
- 480800C\* KIT (800 amp)
- 4801600C\* KIT (1600 amp)
- 4803200C\* KIT (3200 amp)

## Options

- Telephone Modem (Suffix M)
- Ethernet Communication (Suffix E)
- Modbus Communication (Suffix RTU)
- BACnet Communication (Suffix B)
- Load Control Option (Suffix LC)

To order options, add the specified suffix to the end of the model number (e.g., 480100CMY KIT).

NOTE: All meter kits include one set of three (3) split-core current sensors.

NOTE: Specify Delta or Wye when ordering. Add suffix "Y" for Wye configuration or "T" for Delta configuration. (e.g., 480100CEY or 480100CET)

# Class 4000 Multi-Family Single-Phase Meters

The Class 4000 single-phase electric meter is designed for multi-family applications and features a compact, attractive housing, very low installed cost and easily interfaces with E-Mon Energy™ software and/or alternative third-party billing service providers. The Class 4000 meter is especially useful in applications where the meter needs to be installed in the residence itself, as in apartments and condominiums, while providing limited interruption to tenants.

## Features

- Easy-to-read 6-digit electro-mechanical display
- Revenue grade accuracy
- Certified to ANSI C12.1 and C12.16 national accuracy standards (+/- 1% from 1% to 100% of rated load.)
- Certified to California measuring standards Bureau of Weights & Measures
- 0-2 volt output split-core current sensors allow for enhanced safety and accurate remote mounting of current sensors up to 2000 feet from meter without power interruption (Optional solid-core sensors available)
- Meter can be used on the following configurations:
  - 1-Phase, 2-Wire
  - 2-Phase, 3-Wire
- Non-metallic enclosure, optional flush mount kit available
- Optional multi-level tamper alarm
- UL Listed
- New York City approved, Con Edison approved for RSP program
- Measurement Canada approved for revenue metering



Dim: 7" H x 6" W x 2" D

## Model Numbers

120V, 1-Phase, 2W  
(Supplied with (1) split-core current sensor)  
2120100W KIT (100 amp)  
2120200W KIT (200 amp)

120/208-240V, 1- or 2-Phase, 3W  
(Supplied with (2) split-core current sensors)  
3208100W KIT (100 amp)  
3208200W KIT (200 amp)

\* Also available with built-in wireless communication, see page 28 ( Class 4100 meters).

# Green Class Meters

## Features

- Direct-read 8-digit LCD display without multiplier displays accumulative kWh 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<sub>2</sub>) emissions in pounds (lbs.) and indicates hourly emissions based on metered load.
- Utility Grade Metering Accuracy.
- 0-2 volt output split-core current sensors promote enhanced safety and allow remote mounting of current sensors up to 2000 feet from meter without power interruption. (Optional solid-core sensors available for 100 amp & 200 amp meters only.)
- Current sensor installation diagnostic indicator.
- 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
  - 2-Phase, 3-WireFor other configurations contact factory.
- Optional removable terminal block for pulse output.
- Industrial-grade JIC steel enclosure with padlocking hasp and mounting flanges for indoor installations with 1 1/16" KO (3/4" Cond.) on bottom of enclosure.
- Optional Enclosures:
  - MMU (Multiple-Meter Unit) Cabinets
  - NEMA 4X Raintight Enclosure
- Non-volatile Memory.
- UL Listed/CSA Approved.
- Certified to ANSI C12.1 and C12.16 electronic meter National Accuracy Standards. (+/- 1% from 1% to 100% of the rated load)
- Certified to California metering standards Bureau of Weights and Measures.
- New York City approved, Con Edison approved for RSP program.



Dimensions: 7 1/4" H x 7" W x 3 1/4" D

## Model Numbers

120/208-240V, 3-Phase, 4W  
240V, 3-Phase, 3W  
G208100 KIT (100 amp)  
G208200 KIT (200 amp)  
G208400 KIT (400 amp)  
G208800 KIT (800 amp)  
G2081600 KIT (1600 amp)  
G2083200 KIT (3200 amp)

277/480V, 3-Phase, 4W  
480V, 3-Phase, 3W  
G480100 KIT (100 amp)  
G480200 KIT (200 amp)  
G480400 KIT (400 amp)  
G480800 KIT (800 amp)  
G4801600 KIT (1600 amp)  
G4803200 KIT (3200 amp)

NOTE: All meter kits include one set of three (3) split-core current sensors

For MMU-style add suffix "M" to the model number.  
e.g., G4803200M KIT

For outdoor enclosure add suffix "R" to the model number.  
e.g., G208200R KIT

# Green Class Net Meters

## Features

- Direct-read 8-digit LCD display of:
  - Delivered kWh
  - Received kWh
  - Net kWh
  - Real-time kW load
- Meter provides load profile data of delivered kWh, delivered kVARh and received kWh along with real-time readings of Power Factor, kW, kVA, kVAR, Amps per phase, Volts per phase and Frequency; available via E-Mon Energy software.
- User entered cost per KWH provides to-date energy cost and projected hourly cost based on metered load.
- Displays total CO2 emissions in pounds (lbs.) and indicates hourly emissions based on metered load.
- Communication options include:
  - Telephone Modem
  - RS-232/RS-485
  - Ethernet
  - Modbus
- MV-90 Compatible.
- 0-2 volt output split-core current sensors promote enhanced safety and allow remote mounting of current sensors up to 500 feet from meter without power interruption. (Optional solid-core sensors available.) Parallel up to (3) sets of current sensors for cumulative reading.
- Current sensor installation diagnostic indicator.
- Non-volatile memory.
- Industrial-grade JIC steel enclosure with padlocking hasp and mounting flanges for indoor installations with 1 1/16" KO (3/4" Cond.) on bottom of enclosure.
- Optional NEMA 4X Raintight Enclosure
- UL Listed/CSA Approved.
- Certified to ANSI C12.1 and C12.16 electronic meter National Accuracy Standards (+/- 1% from 1%-100% of rated load.)
- Listed as eligible system performance meter by California Solar Initiative Emerging Renewables Program.



Dimensions: 7 1/4" H x 7" W x 3 1/4" D

## Model Numbers

120/208-240V, 3-Phase, 4W  
240V, 3-Phase, 3W  
GN208100 KIT (100 amp)  
GN208200 KIT (200 amp)  
GN208400 KIT (400 amp)  
GN208800 KIT (800 amp)  
GN2081600 KIT (1600 amp)  
GN2083200 KIT (3200 amp)

277/480V, 3-Phase, 4W  
480V, 3-Phase, 3W  
GN480100 KIT (100 amp)  
GN480200 KIT (200 amp)  
GN480400 KIT (400 amp)  
GN480800 KIT (800 amp)  
GN4801600 KIT (1600 amp)  
GN4803200 KIT (3200 amp)

## Options

Telephone Modem (Suffix M)  
Ethernet Communications (Suffix E)  
Modbus Communications (Suffix RTU)

NOTE: All meter kits include one set of three (3) split-core current sensors

For outdoor enclosure add suffix "R" to the model number. e.g., GN208200R KIT

# MMU (Multiple Meter Unit) Cabinets

## Features

- Available in configurations containing up to 8, 16, or 24 meters.
  - MMU cabinets may contain E-Mon D-Mon<sup>®</sup> Class 1000\*, Class 2000 (kWh or kWh/demand), and standard Green Class Meters.
  - Compact installation of multiple meters allows 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 the back wall of the enclosure.)
  - Three-phase MMU cabinets come with prewired voltage feeds. If IDR(s) are installed inside MMU cabinets, the connections from the meters to the IDR are also prewired at the factory.
  - MMU cabinets may contain meters of different voltage configurations. (i.e. 208V & 480V meters inside a single MMU enclosure.)
- \* NOTE: Single-Phase 277V meters not compatible with MMU cabinets.



## Model Numbers

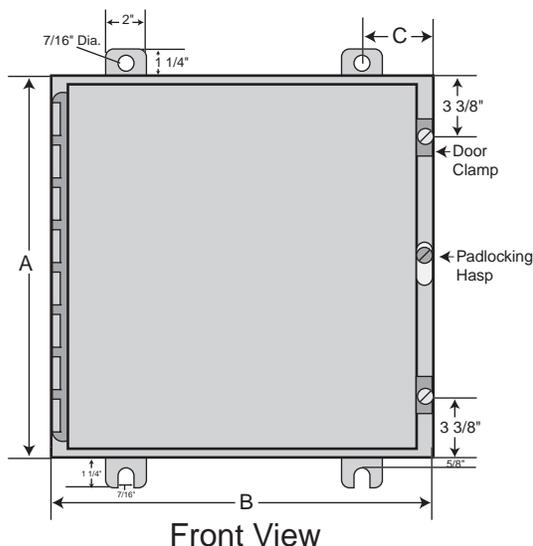
When ordering, specify configuration, meters to be contained inside cabinet, and blank spaces (if any).  
Example:

- 1 MMU16
- 9 208200M KIT
- 2 480400M KIT
- 5 Blank Spaces

Available Configurations:

- MMU8
- MMU16
- MMU24

## MMU Dimensions



Side View

MMU	Dimensions (in inches)		
	A	B	C
MMU8	24	12	1 1/4
MMU16	24	20	3
MMU24	30	24	3

MMU	Meter Configuration		Total Meter Spaces
	Across	Down	
MMU8	2	4	8
MMU16	4	4	16
MMU24	5	5	24

# NEMA 4X Outdoor Enclosures

## Features

- Outdoor meter enclosures may contain E-Mon D-Mon<sup>®</sup> Class 1000, 2000, 2100 and Green Class Meters (Not available in 1 PH, 277V Configurations.)
- NEMA 4X rated outdoor enclosure made of hot compression molded fiberglass reinforced polyester.
- 1<sup>1</sup>/<sub>16</sub>" KO (3/4" cond.) on bottom of enclosure.
- Padlocking hasp.
- Available Configurations:
  - 3-Phase, 4-Wire
  - 3-Phase, 3-Wire
  - 2-Phase, 3-Wire
- Temp. Range:
  - (-20°C to +55°C)
- Flammability Rating: UL94-5V
- Self Extinguishing: Non-flame propagating



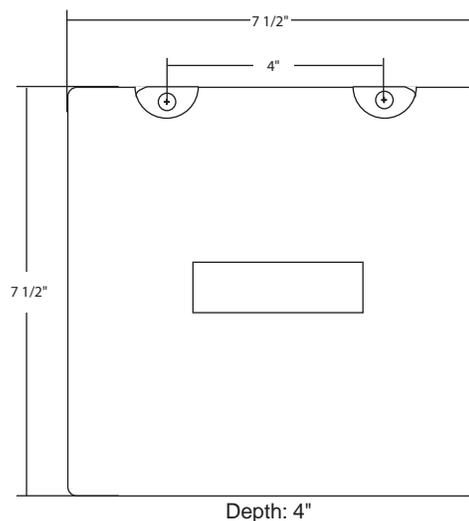
## Model Numbers

When ordering, add suffix "R" to the end of the standard meter model number.

Example: 208200-R KIT

Note: Outdoor meter enclosures are available for E-Mon D-Mon Class 1000 (except 277V 2-wire meters) , 2000, 2100 and Green Class meters only.

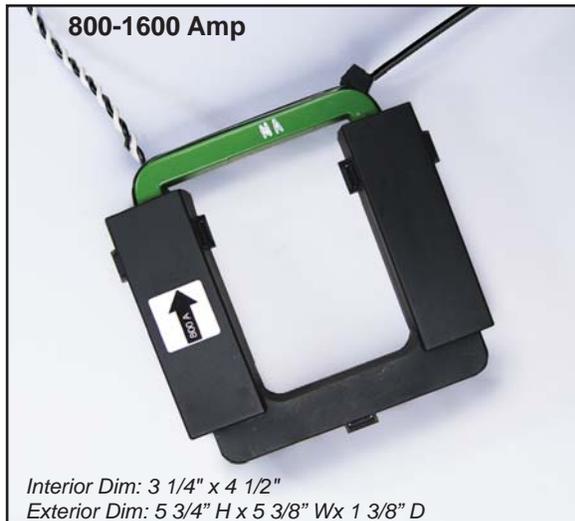
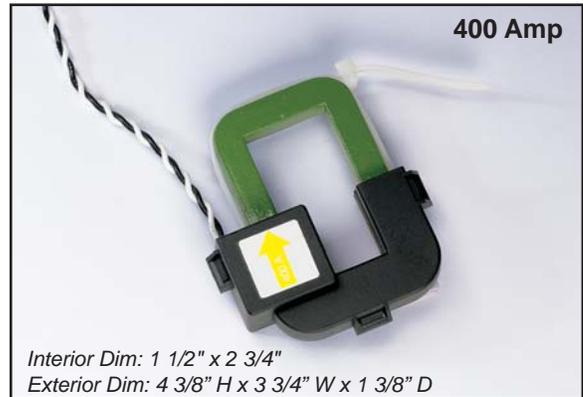
## Enclosure Dimensions



**Front View**

# Split-Core Current Sensors

Note: All current sensors are split-core type. (Solid-core option available; specify when ordering.)  
All current sensors shipped in complete sets of three (3).



**Notes:**

The above split-core current sensors are supplied with E-Mon D-Mon® Class 1000, 2000, 2100, 3000, 4000 and 4100 meters.

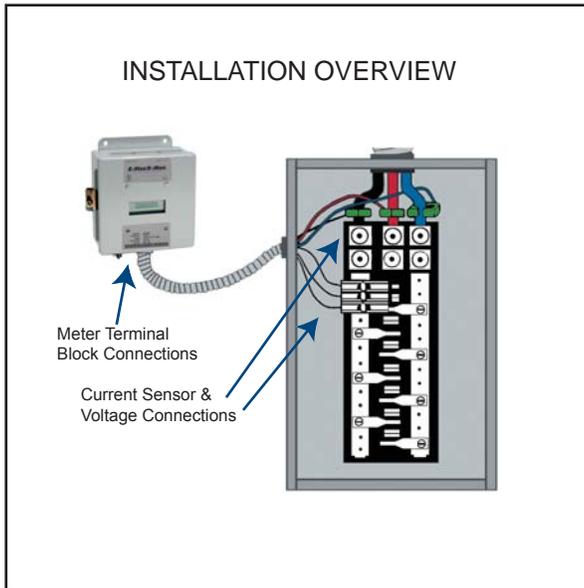
Current sensors can be installed up to 2000 feet away from meter (500 feet for Class 3000 meters). Leads supplied are 3' in length and can be extended up to 2000 feet using low voltage #14-22 AWG wire. (stranded/twisted not required) See local electrical codes for proper sizing.

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

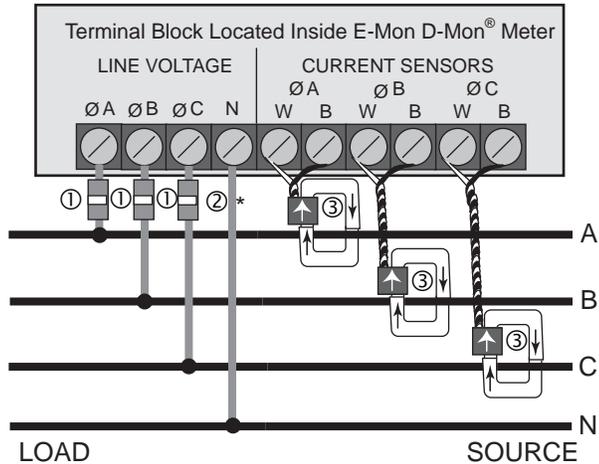
\* Solid-core current sensors available in 100 & 200 amp configuration. Specify when ordering.

<b>Model Numbers</b>		
Model #	Amperage	Interior Dim.
S25CS	25 amp	7/8" x 1 1/2"
S50CS	50 amp	7/8" x 1 1/2"
S100CS	100 amp	7/8" x 1 1/2"
S200CS	200 amp	7/8" x 1 1/2"
S400CS	400 amp	1 1/2" x 2 3/4"
S800CS	800 amp	3 1/4" x 4 1/2"
S1600CS	1600 amp	3 1/4" x 4 1/2"
S3200CS	3200 amp	6" x 8"

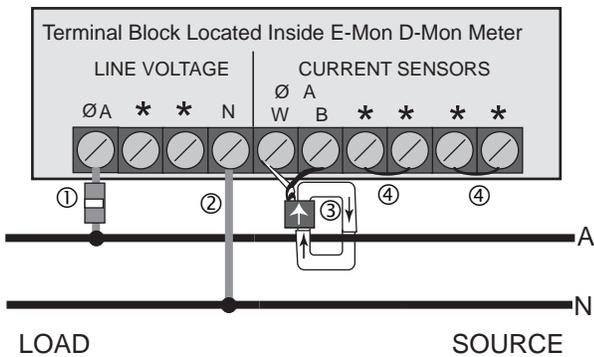
# E-Mon D-Mon Meter Wiring Diagrams



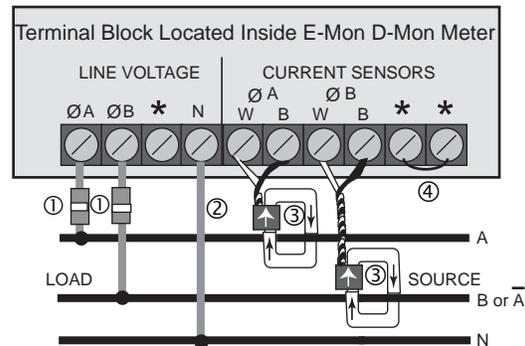
### 3-PHASE, 3-WIRE OR 3-PHASE, 4-WIRE INSTALLATION DIAGRAM



### 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 required in delta system.
- ③ Split-core current sensors. Install according to instructions.
- ④ Install jumper.

Typical Fuses: Littlefuse KLDR.1.00 (Consult local electrical codes for requirements.)

# Meter Options

## P2 Pulser

The E-Mon D-Mon<sup>®</sup> P2 Pulser is an optically-coupled interface device that allows Class 1000, 2000 and standard Green Class meters to be integrated into an Energy/Building Management System (EMS), such as Johnson Controls or Honeywell, for the purpose of reading and/or data-gathering. The pulse width and value are selected using 2 DIP switches and can be tailored to fit specific requirements in the field. A modular plug connects to the E-Mon D-Mon meter; a two-screw terminal provides easy connection to the EMS/BAS. An LED on the pulser shows the rate and duration of the pulse. The pulser has an operating range from 4.5 to 28 Vdc.



### Ordering Information

Order Model Number P2 Pulser

## D/A Converter

The D/A (digital-to-analog) converter module is used in conjunction with the E-Mon D-Mon meter(s) to interface with analog meters, chart recorders and programmable logic controllers.

Input Voltage: 120VAC, 60 Hz

Available Outputs: 0-10 Vdc (at 10 mA maximum)  
 0-1 mA (into load of 0-10K ohms)  
 4-20 mA (into load of 0-250 ohms)



### Ordering Information

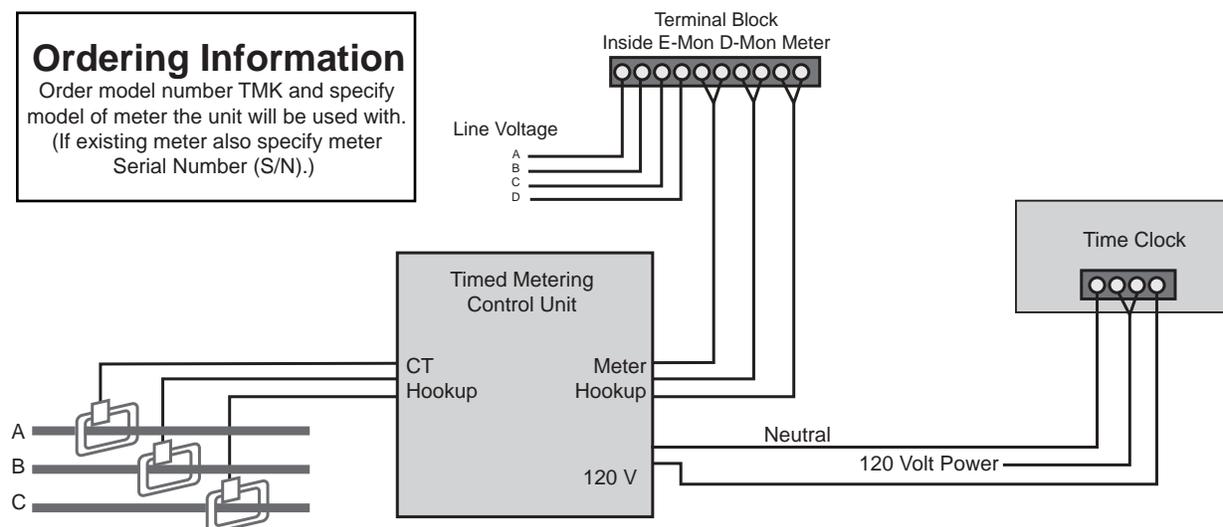
Order model number D/A Converter and specify output and model of meter the unit will be used with. (If existing meter also specify meter Serial Number (S/N).)

## Timed Metering Kit

The timed metering kit allows users to monitor electrical usage during a specific time period. Applications include overtime monitoring, after-hours usage, etc. The timed metering kit maintains time and program in the event of a power failure. The kit is capable of functioning 16 events per day and provides for skip-a-day function.

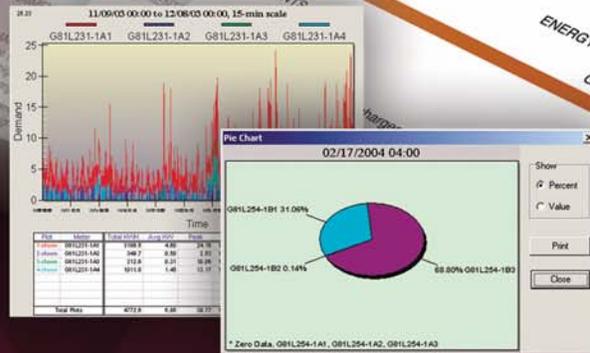
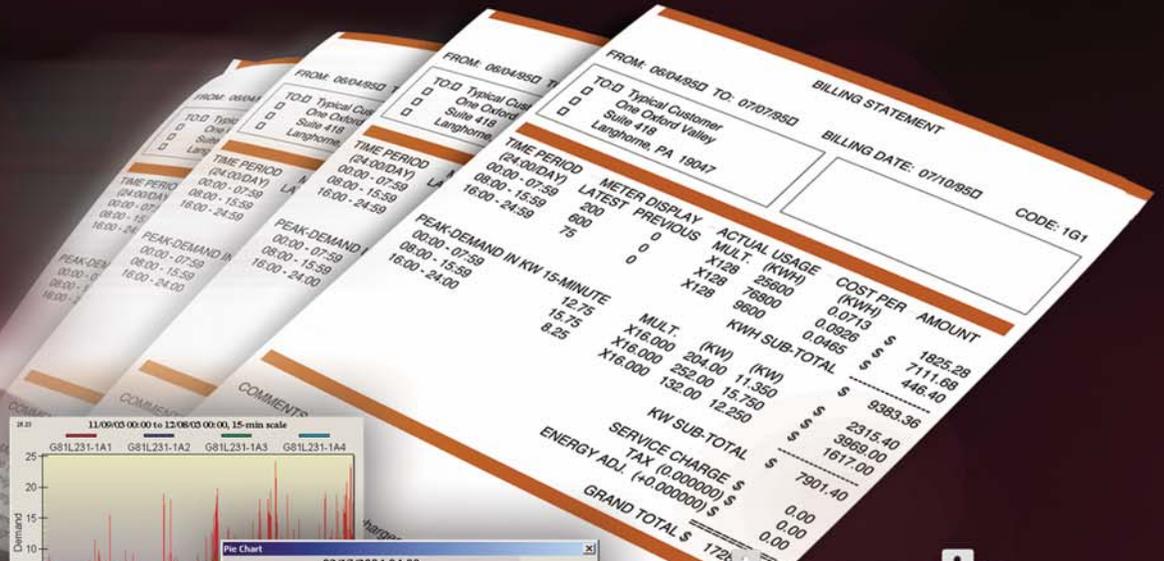
### Ordering Information

Order model number TMK and specify model of meter the unit will be used with. (If existing meter also specify meter Serial Number (S/N).)



# E-Mon Energy Software®

- Tenant Billing
- Cost Allocation
- Energy Management
- Metering & Verification
- Benchmarking



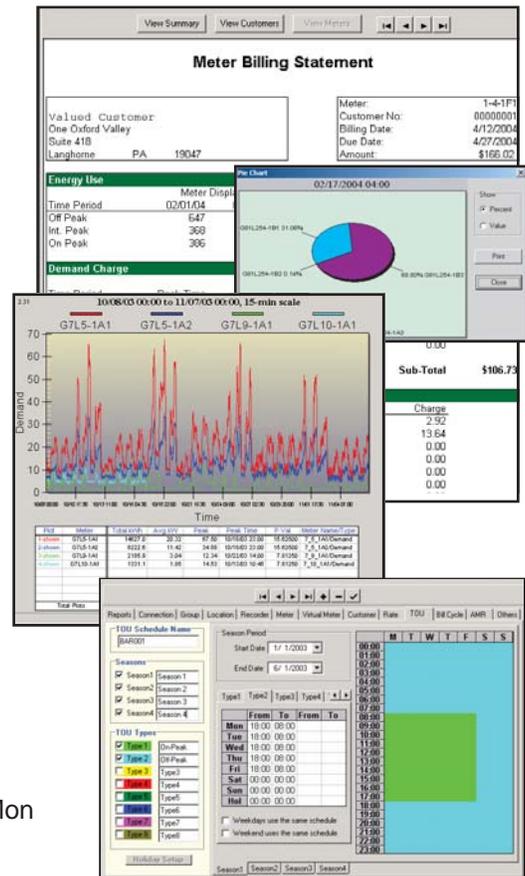
Accurate and timely snapshots of energy usage are essential in supporting energy management and green building initiatives. With E-Mon Energy, you can combine all of your energy data — including electricity, gas, water and steam — into a single software package to see how, when and where your facility is using energy. E-Mon Energy gives commercial, industrial, institutional and multi-family users the data needed for tenant metering & billing, departmental allocation, common area management, demand analysis, equipment maintenance programs and M & V for LEED and green building initiatives.

# E-Mon Energy™ Software

E-Mon Energy software is an energy-monitoring system that allows users to read and monitor energy consumption easily and effectively via on-site or off-site non-dedicated computers. The software allows the user to generate graphs and profiles of usage for demand analysis and usage reduction. E-Mon Energy will also generate itemized tenant electrical bills for tenant allocation, departmental allocation, and usage verification. Communication options include Telephone, Ethernet, Internet and Wireless.

## Features

- E-Mon Energy software operates with computers running Windows 2000, XP or Vista.
- Graphic profiling provides analytical charts and graphs with demand profiling for 5-, 15-, 30- or 60-minute sampling rates.
- Generate and print 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 up to 8 time periods, 4 seasons and multiple holidays for time-of-use (TOU) monitoring.
- Reads E-Mon D-Mon® meters, either on-site or off-site, via modem (cellular or telephone), Ethernet or a directly connected computer.
- Optional wireless metering option allows users to remotely read Class 2100, Class 4100 E-Mon D-Mon meters and E-Mon third-party wireless socket meters via Internet, Ethernet or telephone communication.
- Reads all E-Mon D-Mon meters via IDR's and Class 3000 meters directly. Can also read gas, water, BTU and steam for billing purposes and graphical displays of usage.
- Exports data to spreadsheets for analysis (\*.csv files).
- Exports data to MV-90 system (\*.hhf files).
- Optional modems can be used with E-Mon Energy allowing meters to be read anywhere in the world where telephone or cellular service is available.
- Meter reading and billing services are available for both E-Mon D-Mon and utility-type meters.



## Model Numbers

EMONENERGYSW (Software)\*  
WRSOFT (Wireless Option for Software)  
IDR-8 (1-8 Meter IDR)\*\*  
IDR-16 (1-16 Meter IDR)\*\*  
RS232K (E-Mon Energy Key)  
USBK (USB Key)  
EKM-T (Telephone Key/Modem)  
EKM-E (Ethernet Key/Modem)

\*E-Mon Energy software packages includes RS-232K Key (RS-485 to RS-232 converter.)

\*\* IDRs are available with optional two-screw removable terminal blocks. Add suffix "ST" to the end of the model number. (i.e. IDR-8-ST)

# IDR Interval Data Recorder

## Features

- Reads & records up to 8 or 16 meters.
- External meter input (water, gas, BTU, etc.) available with IDR-ST models.
- RS-485 communications capability supports up to 52 Class 3000 meters or IDRs via 4-conductor cable (up to 4000 feet total 24-26 AWG). Cabling can be either "daisy chain" or "star" configuration or any combination thereof.
  - 14.4K baud modem (optional)
- Internal data storage - 36 days of 15-minute intervals. Maintains last 36 days of data.
- Selectable baud rate up to 19200 bps.
- Standard IDRs do not require a separate power source (power supplied by E-Mon D-Mon meters.) IDR-ST models require a separate 120V power source (included with IDR-ST models.)
- Maintains data in case of power failure.
- Industrial-grade JIC steel enclosure with padlocking hasp and mounting flanges.
- Three 1 1/16" KO (3/4" cond.) on bottom of enclosure.
- IDR data accumulators can be mounted on the inside back wall of the MMU cabinet and shipped from the factory in one complete package.
- Available in configurations for 1-8 meters or 1-16 meters.
- External meter input (water, gas, BTU, etc.)
- Reads kWh (kilowatt-hours) and reads kW (Demand) in 15, 30 or 60-minute kW periods.
- Read meters individually or in groups.



Dim: 9 1/2" H x 6 3/4" W x 3 3/4" D

## Model Numbers

IDR-8 (Up to 8 meters)

IDR-16 (Up to 16 meters)

\*For optional screw terminals in place of all RJ jacks add suffix ST to the end of the model (IDR-8-ST)

\*For IDR-16 with 8 RJ Jacks and 8 screw terminals add suffix RJST to the end of the model (IDR-16-RJST)

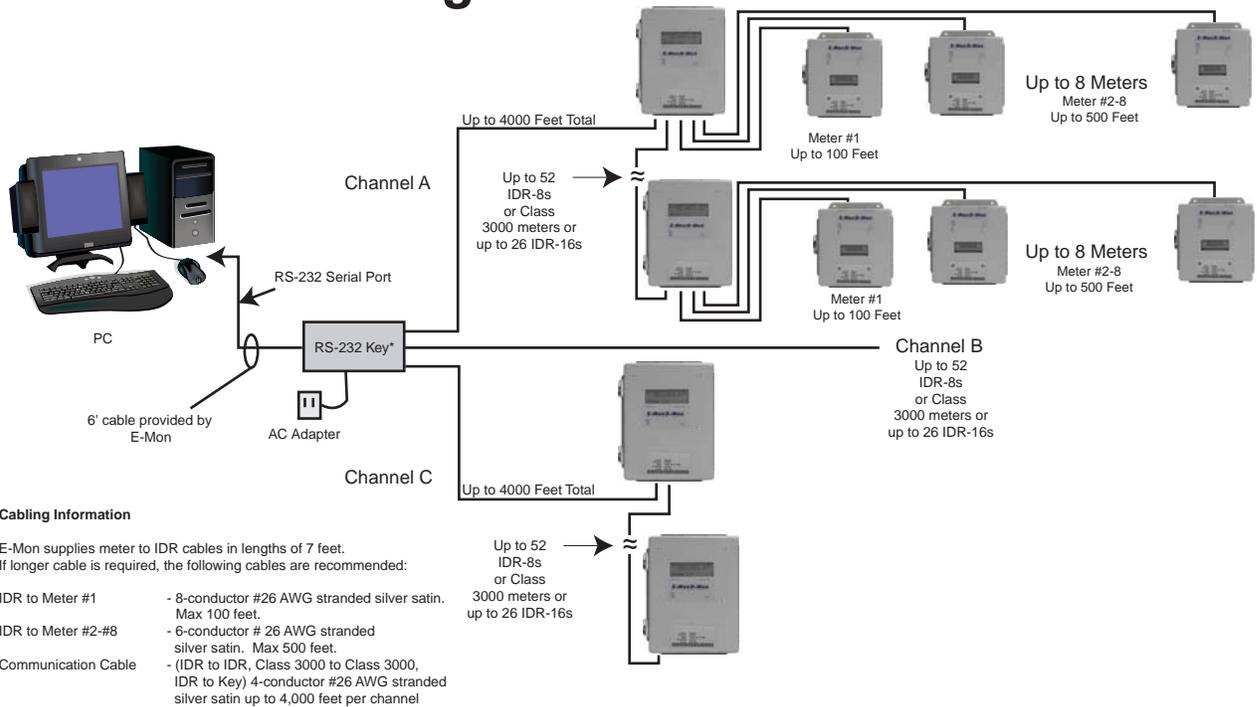
## Built-In Communication Options

Telephone Modem (Suffix M)

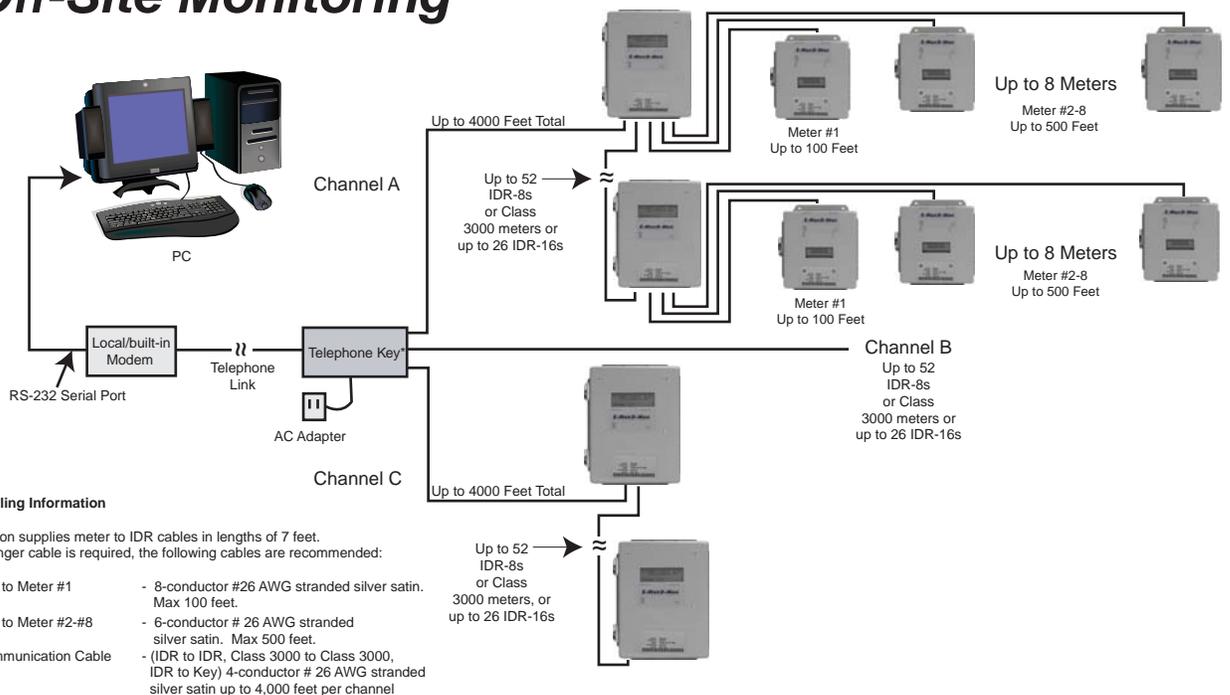
Modbus Communication (Suffix RTU)

# E-Mon Energy™ System Configuration

## On-Site Monitoring



## Off-Site Monitoring



\* Other configurations available, contact factory for details at (800) 334-3666.

# ***E-Mon Energy™ Communication Options***

## ***RS232K - Additional RS-232 Key***

Connects AMR system to host computer for reading meters with the E-Mon Energy software program.

- Converts RS-485 to RS-232 for input into computer serial port.
- Three (3) RS-485 inputs (RJ-11 modular jack) from AMR system.
- 4000-foot RS-485 cable maximum at each RS-485 input.
- Supports up to 52 IDR units (416 meters) or Class 3000 units in any configuration per channel (3 channels.)
- Up to 19200 baud.
- AC adapter included.

## ***USBK - Additional USB Key***

Connects AMR system to host computer with USB port for reading meters with the E-Mon Energy software program.

- Converts RS-485 to USB for input into computer USB port.
- One (1) RS-485 input terminal block.
- Powered from USB port.
- Supports up to 32 IDR units or Class 3000 meters.

## ***EKM-T - External Key with Modem for Telephone Access***

Connects AMR system to host computer with modem for reading meters with the E-Mon Energy software program.

- Converts RS-485 to RS-232 for input into computer serial port.
- Three (3) RS-485 inputs (RJ-11 modular jack) from AMR system.
- 4000-foot RS-485 cable maximum at each RS-485 input.
- Supports up to 52 IDR units (416 meters) or Class 3000 units in any configuration per channel (3 channels.)
- Up to 19200 baud.
- Includes built-in telephone modem for easy connection to a telephone line.
- AC adapter included.

## ***EKM-E - External Key with Modem for Ethernet Access***

Connects AMR system to host computer with Ethernet card for reading meters with the E-Mon Energy software program.

- Converts RS-485 (meter) to 10Mbps Ethernet for connection to an Ethernet network.
- AC adapter included.

# E-Mon Energy™ System Options

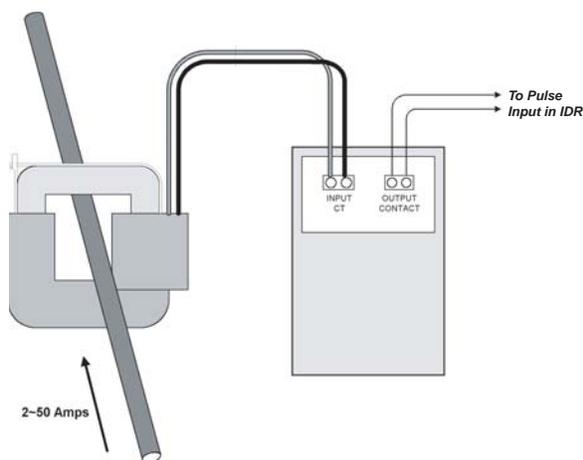
## ECA ( External Contact Adapter)

The ECA is designed to allow users to monitor the utility meter with the E-Mon Energy system. A pulse contact provided by the utility meter sends energy information via the ECA to the IDR (Interval Data Recorder). The E-Mon Energy software, in turn, reads the kilowatt-hour and demand data from the IDR. Additionally, the ECA can be used with water, gas and BTU meters with a contact (pulse) output.



## Run-Time Sensor

The Run-Time Sensor is designed to provide a convenient way of providing "run-time" information to the IDR. The split-core CT allows the unit to be installed without the need of a contact or switch on the monitored equipment. When the sensor's contact closes it is read by the E-Mon Energy Software and can be utilized to account for the run-time of the equipment in 5 or 15 minute intervals.



# Wireless Metering Systems

Wireless Mesh Technology Allows Installation of Metering Devices Without Expensive Communication Wiring

Ideal for New or Retrofit Installation!



**E-Mon**  
Energy Monitoring Products

Wireless Technology for:

## New or Retrofit E-Mon D-Mon Meters

- Single- and three-phase meters with built-in transceivers for new installations
- External "plug-in" modules to upgrade previously installed E-Mon D-Mon meters
- Gas Meters
- Water Meters
- Electric Socket Meters

# Class 2100 Three-Phase Wireless Meters

## Features

- Direct-read 8-digit LCD display without multiplier displays accumulative kWh and "real-time" kW load.
- Meter has built-in wireless transceiver for in-building remote meter data collection and can interface with E-Mon wireless gateways to automatically compile data in PC-based E-Mon metering software.
- Fully self-configuring wireless mesh network allows for easy installation and configuration with no network management required.
- Demand option displays kW/Demand and kW Peak date and time (15 minute interval standard, 30 minute interval available.)
- NEMA 4X outdoor enclosure with 1 1/16" KO (3/4" cond.) on bottom of enclosure.
- Non-volatile Memory
- Utility Grade Metering Accuracy. Certified to ANSI C12.1 and C12.16 electronic meter National Accuracy Standards. (+/- 1% from 1%-100% of the rated load.)
- Wireless transceiver is FCC certified not to interfere with existing infrastructure.
- Wireless mesh network operates in the 915 MHz frequency hopping spread-spectrum license-free band. No cellular wireless service contracts are required.
- Meters with built-in wireless transceivers can be mounted inside buildings within approximately 500 feet line-of-sight from each other and up to 200 feet through walls, depending on wall material.
- 0-2 volt output split-core current sensors promote enhanced safety and accurate remote mounting of current sensors up to 2000 feet from meter without power interruption. (Optional solid-core sensors available for 100 amp & 200 amp meters.)
- Meters are equipped with a current sensor diagnostics indicator to assist in installation.
- 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
  - 2-Phase, 3-WireFor other configurations contact factory.



Dimensions: 7 1/2" H x 7 1/2" W x 4" D

## Model Numbers

120/208-240V, 3-Phase, 4W  
240V, 3-Phase, 3W  
208100RWT KIT (100 amp)  
208200RWT KIT (200 amp)  
208400RWT KIT (400 amp)  
208800RWT KIT (800 amp)  
2081600RWT KIT (1600 amp)  
2083200RWT KIT (3200 amp)

277/480V, 3-Phase, 4W  
480V, 3-Phase, 3W  
480100RWT KIT (100 amp)  
480200RWT KIT (200 amp)  
480400RWT KIT (400 amp)  
480800RWT KIT (800 amp)  
4801600RWT KIT (1600 amp)  
4803200RWT KIT (3200 amp)

NOTE: All meter kits include one set of three (3) split-core current sensors

For demand option add suffix "D" to the model number. e.g., 208400RWTD KIT

# Class 4100 Single-Phase Wireless Meters

## Features

- Easy-to-read 6-digit electro-mechanical display for diagnostics.
- Meter has built-in wireless transceiver for in-building remote meter data collection and can interface with E-Mon wireless gateways to automatically compile data in PC-based E-Mon metering software.
- Meters with built-in wireless transceivers can be mounted inside buildings within approximately 500 feet line-of-sight from each other and up to approximately 200 feet through walls, depending on wall material.
- Revenue grade accuracy.
- On-board memory.
- Meter can be used on the following configurations:
  - 1-Phase, 2-Wire
  - 2-Phase, 3-Wire
- 0-2 volt output split-core current sensors allow for safe 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.)
- Non-metallic enclosure is ideal for installation inside tenant and residential spaces.
- Wireless mesh network operates in the 915 MHz license-free band. No cellular wireless service contracts are required.
- Fully self-configuring wireless mesh network allows for easy installation and configuration with no network management required.
- FCC certified not to interfere with existing infrastructure.
- Meets national accuracy standards of ANSI C12.1 and C12.16.
- UL Listed. New York City approved, Con Edison approved for RSP program. Measurement Canada approved for revenue metering. California Bureau of Weights and Measures certified. Listed by the California Energy Commission.



Dim: 7" H x 6" W x 2" D

## Model Numbers

120V, 1-Phase, 2W  
(Supplied with 1 split-core current sensor)  
2120100WT KIT (100 amp)  
2120200WT KIT (200 amp)

120/208-240V, 1- or 2-Phase, 3W  
(Supplied with 2 split-core current sensors)  
3208100WT KIT (100 amp)  
3208200WT KIT (200 amp)

Note: All meter kits include the appropriate number of split-core current sensors.

## Additional Components

Wireless Gateway	WGATEWAY
Wireless Meter	
Reading Software	WRSOFT

# Wireless Socket Meters

## Features

Complete wireless socket meter package compatible with E-Mon D-Mon wireless metering solutions.

Meter Features:

- Electronic LCD Display
- Polycarbonate Cover
- Demand Reset
- Optical Tower
- Test Mode Push Button
- Test LED
- Meets ANSI, IEC and FCC standards.
- Available Configurations:
  - Two or Three Wire
  - 120 or 240 Volt
  - Form 1S, 2S, 3S, 4S or 12S
  - Class 20, 100, 200 or 320
- Temperature -40 to +85 degrees C.
- Humidity 0% to 95% non-condensing
- ANSI C12.20 0.5 Accuracy Class



Dim: 6.29" Diameter x 4.98" Depth

Wireless Features:

- Operates in 915 MHz license-free bands
- Installed "under the glass"
- Fully self-configuring wireless mesh network
- Automatic time synchronization
- Local non-volatile data storage
- Internal and external antenna options
- Provides real-time access to interval data
- Provides full wireless routing capability
- Full peer-to-peer communication
- Multiple redundant paths
- No network address management required
- Automatic network acquisition at Power ON
- Automatic time synchronization of all meters in the network.

## Metering Packages

### Multi-Family Residential

Voltage	Element	Form	Model
120/240V	1	2S	EMON2S
120/208V	2	12S	EMON12S

### Three-Phase Commercial

Contact Factory at (800) 334-3666.

## Additional Components

Wireless Gateway	WGATEWAY
Wireless Meter Reading Software	WRSOFT

# External Wireless Modules

**External modules allow users to interface existing E-Mon D-Mon meters and other utility meters with the wireless metering system.**

## Features (All Modules)

- Integrate with E-Mon wireless metering systems.
- Plug-and-play installation. Self-configures to the wireless mesh network.
- Allows creation of usage graphs, charts and usage statements via E-Mon Energy software.
- Contains local storage for 2+ months of 15 minute interval data.
- Wireless transceiver is FCC certified not to interfere with existing infrastructure.
- Wireless mesh network operates in the 915 MHz frequency hopping spread-spectrum license-free band. No cellular wireless service contracts are required.
- Wireless modules can be mounted inside buildings within approximately 500 feet line-of-sight from each other and up to 200 feet through walls, depending on wall material.
- Automatic time synchronization.
- Automatic network acquisition at power ON.
- Utilizes EKA Systems technology.

## EWM Module

### For interface with existing E-Mon D-Mon Meters

- Stand-alone wireless mesh network module for retrofit of existing E-Mon D-Mon Class 1000 and 2000 meters. Ideal for upgrading existing installations to an automatic meter reading system.
- Module powered by E-Mon D-Mon meter.



#### Ordering Information

Order model number EWM.

## GW1 Module

### For interface with Gas & Water Meters

- Interface with gas & water meters equipped with pulse output (solid-state or reed switch.)
- Includes 120 VAC power supply module.



#### Ordering Information

Order model number GW1.

# Wireless Gateway Specifications

## Description

The wireless gateway is a reliable, fully bidirectional gateway between the Internet/backbone network and the E-Mon wireless mesh network. It is compatible with standard communication protocols and can support multiple meter types on the same network. The wireless gateway provides simple remote configuration of the wireless devices and accurately transmits the energy data via Ethernet from the wireless network to E-Mon meter reading software for billing and analysis.



## Features

- Compiles data from wireless transceivers and transmits data to E-Mon's meter reading software for billing and analysis.
- Interfaces with E-Mon D-Mon Class 2100 & 4100 meters with built-in wireless transceivers, E-Mon's wireless socket meter packages as well as EWM and GW1 modules which are stand-alone transceivers connected to existing E-Mon D-Mon meters or other metering devices such as gas, water and utility electric meters.
- Wireless mesh network operates in the 915 MHz license-free band. No cellular wireless service contracts are required.
- Fully self-configuring wireless mesh network allows for easy installation and configuration with no network management required.
- FCC certified not to interfere with existing infrastructure.
- 128 bit encryption on wireless network.
- Expandable local storage.
- Communication logs and automatic data recovery features.
- User and administration access control.

## Model Numbers

Wireless Gateway	WGATEWAY
------------------	----------

## Additional Components

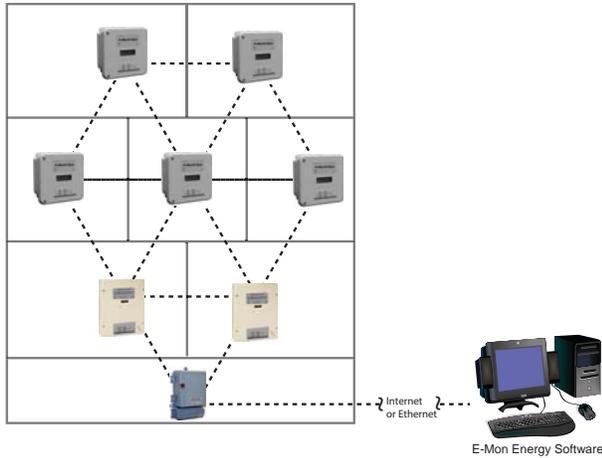
Wireless Meter Reading Software	WRSOFT
---------------------------------	--------

# Wireless System Configuration

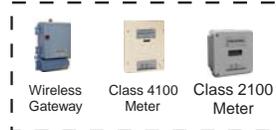
Fully self-configuring wireless mesh network allows for easy installation and configuration with no network management required. Wireless system can monitor E-Mon D-Mon electric submeters and other types of utility meters equipped with wireless transceivers supplied by E-Mon. (contact factory for details.)

One wireless gateway (per building) transmits meter data to E-Mon Energy™ software via Internet or Ethernet communication.

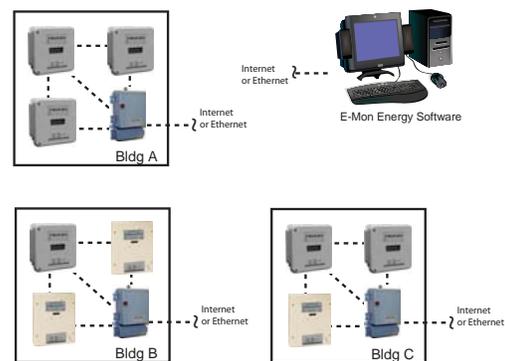
Multi-Floor Facility



Symbol Key



Multiple Building Facilities



## Radio Specifications

Operating Frequency:	902-928 MHz
RF output power:	(Max.) 20 dBm
Mode:	Frequency hopping spread spectrum
Receiver sensitivity:	Max transmit power 20 dBm Sensitivity-93 dBm (@0.1%BER,+25°C)

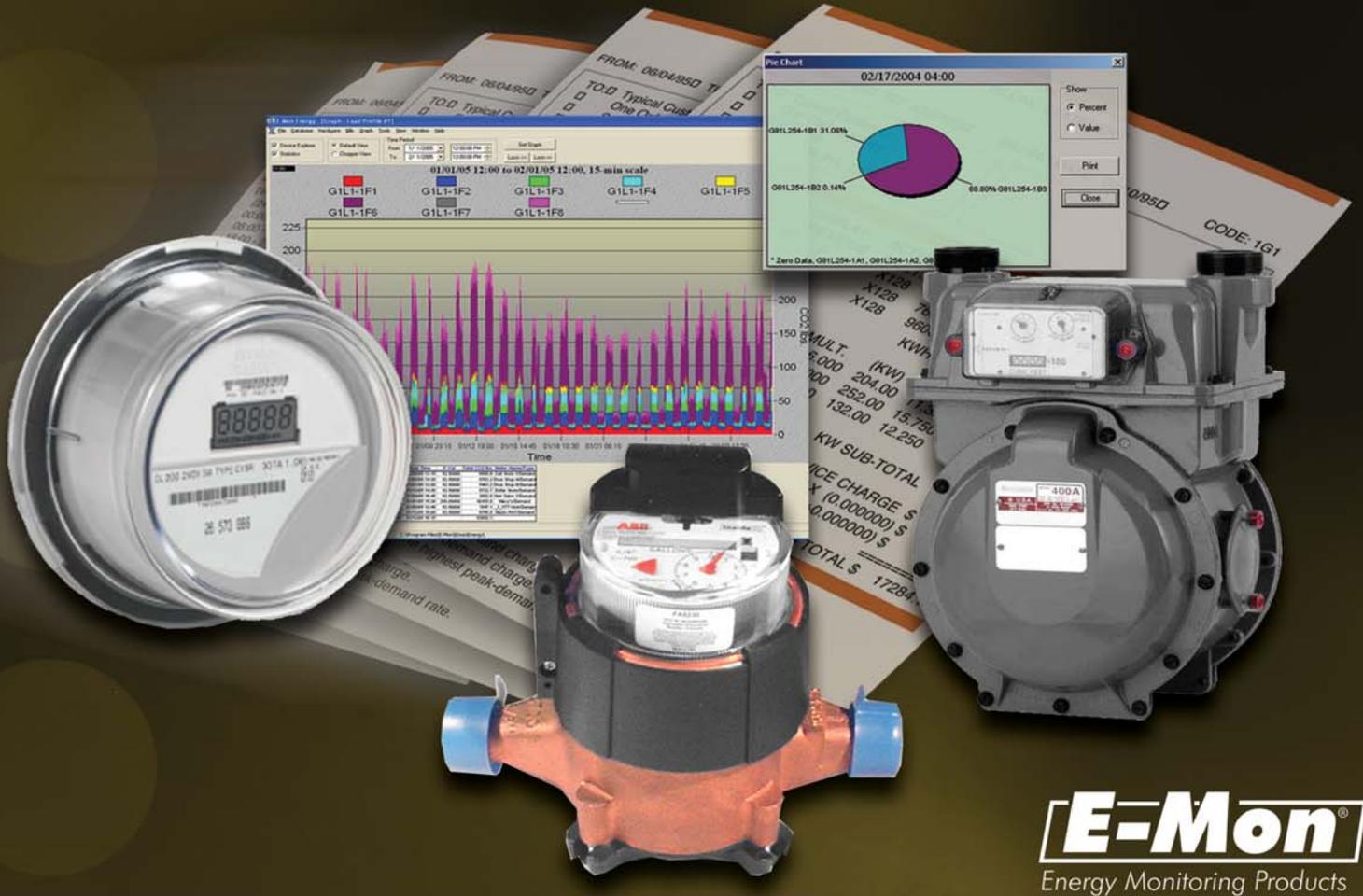
## Network Specifications

- Full peer-to-peer communication
- Fully self-configuring
- Multiple redundant paths
- No network address management required
- Automatic network acquisition on Power ON
- Automatic time synchronization of all nodes in the network
- 128 bit authentication/encryption

# Third-Party Metering Products

Gas - Water - BTU - Electric Socket Type Meters

Monitor and manage all of your utility energy data!



E-Mon offers a wide variety of third-party products to meet your energy monitoring requirements. Whether you are looking for stand-alone meters, or would like to monitor all of your utility data from E-Mon Energy software, we can supply you with products that will support your energy management needs.

# ***Third-Party Metering Products***

## ***Cold Water Meters with Pulse Output***

Cold water meters are available in standard pipe sizes ranging from 3/4" up to 8". (For larger sizes contact E-Mon.) All cold water meters are equipped with a pulse output for interfacing with external interval data recorders. The C700 series, which are positive displacement type meters, come in sizes up to 2". For higher flows, starting at 2", we offer the T4000 series, which are heavy duty turbine meters.

All cold water meters are appropriate for potable water applications with a maximum temperature of no greater than 120°F and pressures up to 150 psi. For non-potable and specialty water metering applications (industrial waste water, irrigation water, etc.) please contact E-Mon.



## ***Hot Water Meter with Pulse Output***

Hot water meters are available in sizes from 3/4" up to 6". Meters 1" and larger are available for standard temperature, (up to 195°F at 150 psi), as well as for high temperature applications (266°F at 230 psi.) The 3/4" hot water meter is a single jet inferential impeller type meter. Sizes 1" and larger are multi-jet, inferential impeller type meters. All hot water meters come equipped with a pulse output for interfacing with external interval data recorders.

## ***Gas Meters with Pulse Output***

Gas meters are available for loads from 200 CuFt/Hr (200,000 BTU's/Hr) up to 56,000 CuFt/Hr (56 million BTU's/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. These meters are traditionally for natural gas and propane use, although they can be used to meter other types of gases.



## ***BTU Meters with 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, 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. The flow meters are available in sizes from 1/2" to 10". Coupling hardware for the flow meters are included for sizes up to 1 1/2". Sizes 2" and larger are furnished with gaskets only. Flow meters can handle a maximum fluid temperature of 248°F at up to 232 psi.

## ***Steam Meter with Pulse Output***

Steam meters employ Vortex shedder technology and are available in both in-line and insertion type. The meters are available in sizes from 1/2" up to 8". The meters are supplied with a pulse output to interface with external data recorders. The meter requires AC power to operate. The steam meters are available for standard temperature (-40 to 400°F) and for high temperature (-40 to 750°F), at a maximum pressure of 150 psi.

To purchase third-party metering products, contact E-Mon at (800) 334-3666.

# ***Third-Party Meter Reading & Billing Services***

As more and more tenants demand actual energy usage data and the ability to manage energy consumption, property managers are turning to submetering to correctly assess energy usage. However, in areas where multi-tiered TOU (Time of Use) rate structures prevail, expert help may be required.

E-Mon can assist with third-party meter reading service providers to help property owners and tenants formulate a complete approach to accurate and reliable tenant energy use allocation and billing. Third-party metering experts can review your facility and structure a solution that is most suitable for your application.

## ***Services***

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

Let us 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 project management, hardware procurement, installation through a network of certified installers, system validation and meter reading services.



Electric



Water



Gas

## ***Meter Reading Technology***

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

Proven communication technologies include:

- Telephone Modem
- Wireless
- Ethernet
- BAS Interface

For details on meter reading services contact E-Mon at (800) 334-3666.

# Appendix A - Meter Technical Specifications

Voltage Input Configuration	2-wire, 3-wire and 4-wire. This covers all secondary voltage supplies; single-phase, split-secondary and three-phase, both grounded and ungrounded.
Voltage Input	Up to 480 volts rms AC
Current Range	Up to 3200 amps rms AC
Power Factor	0.5 leading or lagging
Frequency	50 Hz to 400 Hz
Accuracy	Certified to ANSI C12.1 and C12.16 National Accuracy Standards
Humidity	0-95% non-condensing
Temperature Range	-20°C to +50°C
Voltage overload	+25% continuously
Current Overload	Can be overloaded 100% without damaging meter
Display	Fully electronic LCD display (electromechanical on Class 4000 & 4100) Manual reset to zero (Class 1000, 2000, 2100 and Green Class only)
Options	Peak demand, pulse output, digital-to-analog converter, demand control module, timed metering kit, multiple meter unit (MMU) enclosures for 8, 16 or 24 meters, solid-core current sensors (100& 200 amp only)
Standard Ranges	120 volts; 25, 50, 100 or 200 amps 120/240 volts; 25, 50, 100, 200, 400, 800, 1600 or 3200 amps 120/208 volts; 100, 200, 400, 800, 1600 or 3200 amps 277/480 volts; 100, 200, 400, 800, 1600 or 3200 amps
High Voltage	For 2100V, 4160V and other high-voltage applications contact E-Mon at (800) 334-3666.
Outdoor Installation	Class 1000, 2000, 2100 and Green Class meters are available with optional NEMA 4X outdoor enclosures (3W & 4W configurations only.)

Many E-Mon D-Mon products have been tested and approved by independent agencies including:

<p>National Approvals          UL Listed          CSA Approved (Canadian Standards Assoc.)          ANSI C12.1 and C12.16 Certified (National Accuracy Standards) by MET Testing Labs</p>
<p>State and Local Approvals</p> <p>CA - California Bureau of Weights &amp; Measures, DWP-Los Angeles, CSE-Westminster, SDG&amp;E-San Diego          CO - Public Service of Colorado-Denver          FL - Tampa Electric-Tampa          MI - Detroit Edison-Detroit          NJ - NJ Dept. of Energy-Newark, PSE&amp;G Approved for DSM program          NH - New Hampshire Electric Co.-Plymouth          NY - NYC Approved for RSP program, City of NY-Bureau of Electrical Control, ConEd Approved for RSP          PA - PECO Energy-Berwyn          SC - State of SC-Columbia          VA - Appalachian Power Company-Roanoke          PR - PREPA Approved-Puerto Rico</p>

# Appendix B - Meter Engineering Specifications

- Meter shall be fully electronic with digital LCD display for kilowatt-hour readings. Meter shall provide rate of consumption indication and also a segment test button (CPU) to ensure integrity of the display (Class 1000, 2000, 2100 and standard Green Class meters only.)
- Meter shall provide a load indicator to indicate real-time consumption levels for field testing and certification.
- Meter shall be enclosed in a heavy-duty JIC steel enclosure suitable for indoor installation. Meter enclosure provides a method of locking to prevent unauthorized access. (Class 1000, 2000, 2100 & 3000.)
- Meter shall be optionally available in an outdoor NEMA 4X enclosure. (Class 1000, 2000, Green Class, 3- or 4-wire meters only.)
- Meter shall be UL listed, CSA Approved and certified by a nationally recognized independent test facility to ANSI C12.1 and C12.16 specifications with split-core current sensors.
- Meter shall be optionally available with a Demand (kW) reading. Demand reading will show the highest peak demand and date and time peak occurred. (Class 2000, 3000 and Green Class only.)
- Meter shall be provided with a non-volatile memory to maintain reading during power failures.
- Meter shall use 0-2 volt output current sensors to allow paralleling and/or mounting up to 2,000 feet from the meter (500 feet for Class 3000 meters.) Sensors shall be of split-core configuration to allow installation without powering down. Sensors shall be available from 25 amp to 3200 amp. Sensors shall be optionally available in solid-core configuration (100 & 200 amp.)
- Meter shall be provided with modular connector(s) to provide interfacing for:
  - AMR (Automatic Meter Reading)
  - Pulse modules
  - Analog signal modules
  - Energy control modules
  - Instantaneous demand displays
- Meter shall be available in multiple meter unit (MMU) configurations of up to 24 meters. (Class 1000 & 2000 meters only.)
- Meters shall be compatible with E-Mon Energy™ software.

Feature	Class 1000	Class 2000	Class 2000 w/Demand	Class 2100 Integrated Wireless	Class 3000	Class 4000	Class 4100 Integrated Wireless	Green Class	Green Class Net Meter
KWH	X	X	X	X	X	X	X	X	X
Real-time load	X	X	X	X	X			X	X
Peak Demand w/ date/time stamp			X		X				
Cost per kWh, CO2 emissions on display								X	
Delivered, Received & Net kWh									X
Non-volatile memory	X	X	X	X	Lithium Battery	X	X	X	X
Sensors may extend 2,000 ft	X	X	X	X		X	X	X	X
Sensors may extend 500 ft					X				
Solid-core sensors available*	X	X	X	X	X	X	X	X	X
Lockable enclosure	X	X	X	X	X	X	X	X	X
Nema 4X enclosure	X	X	X	X	X	X	X	X	X
MMU Configuration	X	X	X	X		X	X	X	X
Wireless capability**	X	X	X	X	X	X	X	X	X
Output port for IDR	X	X	X	N/A	Integrated Data Logger	X	N/A	X	X
Volts, amps per phase, power factor, phase angle, on-board data logging & communication.	X	X	X	X	X	X	X	X	X

\*100 & 200 amp only

\*\* Class 2100 & 4100 equipped with built-in wireless transmitters, all other meters compatible with external wireless modules.

# Appendix C - E-Mon D-Mon Modbus Point Map

Modbus Point Map				1.03		12/23/03						
ITEM	PM-I	W	PM-F	UOM	CALC.	MEM	OP	DESCRIPTION		CL 3000	CL 5000	
1	40001	2	41001	kWh	T-del	NV	R/W	Energy delivered		Y	Y	
2	40003	2	41003	kWh	T-rec	NV	R/W	Energy received		Y	Y	
3	40005	2	41005	kVARh	T-del	NV	R/W	Reactive energy delivered		Y	Y	
4	40007	2	41007	kVARh	T-rec	NV	R/W	Reactive energy received		Y	Y	
5			41009	kW	T		R	Real power		Y	Y	
6			41011	kVAR	T		R	Reactive power		Y	Y	
7			41013	kVA	T		R	Apparent power		Y	Y	
8			41015	%	T		R	Power factor		Y	Y	
9			41017	Amps	T		R	Current total		Y	Y	
10			41019	Amps	A		R	Current average		Y	Y	
11			41021	Volts-N	A		R	Voltage line-neutral		Y	Y	
12			41023	Volts-L	A		R	Voltage line-line		Y	Y	
13			41025	Hz	A		R	Frequency		Y	Y	
14			41027	Degree	A		R	Phase angle		Y	Y	
15			41029	kW	ØA		R	Real power, phase A		Y	Y	
16			41031	kW	ØB		R	Real power, phase B		Y	Y	
17			41033	kW	ØC		R	Real power, phase C		Y	Y	
18			41035	kVAR	ØA		R	Reactive power, phase A		Y	Y	
19			41037	kVAR	ØB		R	Reactive power, phase B		Y	Y	
20			41039	kVAR	ØC		R	Reactive power, phase C		Y	Y	
21			41041	kVA	ØA		R	Apparent power, phase A		Y	Y	
22			41043	kVA	ØB		R	Apparent power, phase B		Y	Y	
23			41045	kVA	ØC		R	Apparent power, phase C		Y	Y	
24			41047	% PF	ØA		R	Power factor, phase A		Y	Y	
25			41049	% PF	ØB		R	Power factor, phase B		Y	Y	
26			41051	% PF	ØC		R	Power factor, phase C		Y	Y	
27			41053	Amps	ØA		R	Current, phase A		Y	Y	
28			41055	Amps	ØB		R	Current, phase B		Y	Y	
29			41057	Amps	ØC		R	Current, phase C		Y	Y	
30			41059	Volts-N	ØA		R	Voltage, line to neutral, phase A-N		Y	Y	
31			41061	Volts-N	ØB		R	Voltage, line to neutral, phase B-N		Y	Y	
32			41063	Volts-N	ØC		R	Voltage, line to neutral, phase C-N		Y	Y	
33			41065	Volts-L	ØA		R	Voltage, line to line, phase A-B		Y	Y	
34			41067	Volts-L	ØB		R	Voltage, line to line, phase B-C		Y	Y	
35			41069	Volts-L	ØC		R	Voltage, line to line, phase C-A		Y	Y	
36			41071	Degree	ØA		R	Phase angle, phase A		Y	Y	
37			41073	Degree	ØB		R	Phase angle, phase B		Y	Y	
38			41075	Degree	ØC		R	Phase angle, phase C		Y	Y	
ITEM	PM-I	W	DATA (SAMPLE)						DESCRIPTION			
	46001	8	504D 324B 0102 1016 0300 454D 4F4E 2020						Firmware version: PM 5K, Ver, Ver date/time, EMON			R
	46009	8	456E 6572 6779 204D 6574 6572 0000 0000						Device description: Emon Dmon Energy Meter			R
	46017	8	1356 4503 0613 0300 0000 0000 0000 0000						Initialize device with date/time			W
	46025	8	1356 4503 0613 0300 0000 0000 0000 0000						RTC date/time, will accept broadcast command			R/W
	46033	8	1356 4503 0527 0300 0000 0000 0000 0000						CPU date/time (7 bytes, rest is reserved for other future formats)			R/W
	46041	8	0001 0001 0000 0000 0000 0311 0020 1100						Group, location, Device ID number			R/W
	46049	8	0041 0000 0000 0000 0000 0311 0020 1100						Dev. ID, Hookup, Serial numbers....			R/W
	46057	8	0592 0007 0000 0000 0000 0000 0000 0000						Recorder info.: idr, dem. int., dem. win., dem. syn., timezone, DST...			R/W
	46065	8	0101 0001 0D03 3531 1000 0320 0000 0000						Meter info.: SN1&2, pulse rate, Volt/Amp/CTs, PF/mult1&2, CT, PT			R/W
	46513	8	0000 0101 0000 0000 0000 0100 0000 0000						Flags L1			
	46521	8	0000 0000 0000 0000 0000 0000 0613 0316						Flags L2			
	46529	8	0000 0000 0000 0000 0000 0000 0000 0000						Flags L3			
	46537	8	0000 0000 0000 0000 0000 0000 0000 0000						Flags L4			

Note: To change device ID, set single point at 46049 with data set to new device ID (e.g., 1 to 247).  
 To set date/time, set multiple points at 46025 for 4 points with data set to HHMM SSSD MMDD YYYY (DW=day of week).  
 To clear single meter kWh/kW, set single point at 41001 with data set to 0000 (similarly for 41003, 41005, 41007).  
 To clear multiple meter readings, set multiple point at 41001 for 8 points with data set to 0000's.  
 Note: Jumper J5 & J6 must be closed in order for kWh del/rec and kVARh del/rec to be cleared.

# ***Appendix D - System Engineering Specifications***

## ***System Overview Specifications***

System shall be capable of reading E-Mon D-Mon® Class 1000, 2000, 3000, 4000 (via IDR), Class 2100 and 4100 meters (via wireless gateway) through a PC.

System shall be capable of reading utility type meters such as gas, water, electric or BTU equipped with a pulse output.

System shall consist of IDR (Interval Data Recorders) and E-Mon Energy software for Windows 2000, XP and Vista with software key.

System shall utilize RS-232/485 communications and will operate at a baud rate of up to 19,200 BPS.

## ***IDR Specifications***

IDR Interval data recorder shall be independently capable of reading eight (8) or sixteen (16) E-Mon D-Mon meters and storing data for up to 36 days, until downloaded into computer. IDR maintains the last 36 days of data.

RS485 communication capability supports up to 52 Class 3000 meters or IDRs (IDR-16 counts as two units) via 4-conductor cable (up to 4,000 feet total 26 AWG) per key input port. Key supports up to three (3) inputs. Cabling can either be “daisy chain” or “star” configuration thereof. 14.4K baud modem optionally available.

IDR interval data recorder shall be capable of reading utility type meters such as gas, water, electric or BTU equipped with a pulse output (Model IDR-ST.)

IDR shall not require a separate power source when used with E-Mon D-Mon meter(s) as source(s) of operating power. Meter powering IDR must be located within 100 cable feet of IDR, all others within 500 feet.

IDR shall contain a backup power system to maintain memory in case of a power failure.

IDR shall be MV-90 compatible (Specify when ordering.)

## ***E-Mon Energy Software Specifications***

E-Mon Energy software shall operate with a PC with the following minimum specifications:

- CD-Rom Drive
- 200 MB hard drive space available
- (1) RS-232 Serial port
- Microsoft Windows 2000/XP/Vista

E-Mon Energy software shall provide for reading kilowatt hours and demand from the IDR or wireless gateway connected to E-Mon D-Mon meters and provide this information for analysis and/or billing.

E-Mon Energy software shall be capable of reading “real-time” data from Class 3000 meters (kW, kVAR, kVa, Amps, Volts, Power Factor and Frequency.)

E-Mon Energy software shall be capable of printing out electric bills and usage information.

E-Mon Energy software shall have graphic capabilities (profile) to provide analytical charts and graphs, with demand profiling for 5-, 15-, 30- or 60-minute sampling rates.

E-Mon Energy software shall be capable of supporting declining block tariffs, up to eight time-of-use rates and up to four seasonal rates.

E-Mon Energy software shall provide file export to spreadsheets for specialized applications.

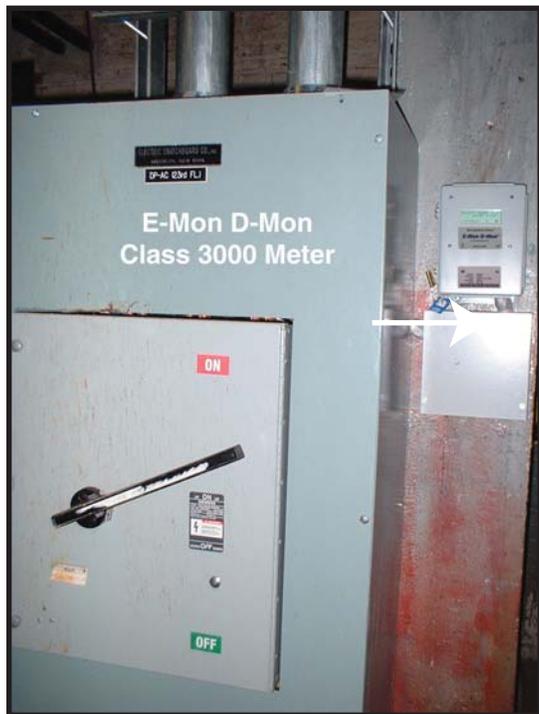
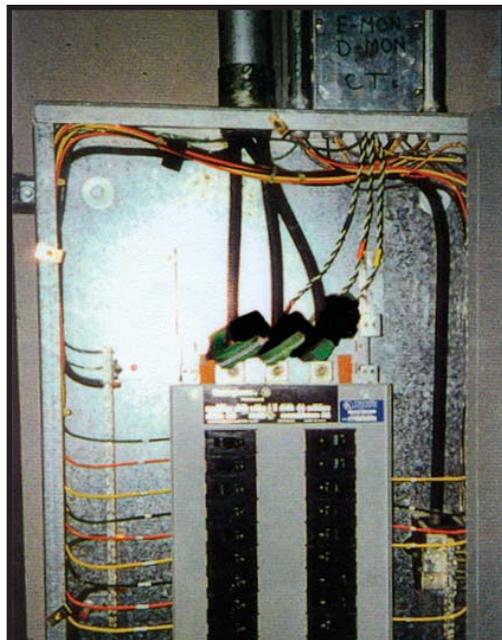
E-Mon Energy software shall read for gas, water and other meter types with pulse output.

E-Mon Energy software shall be capable of supporting 1,000 locations.

E-Mon Energy software shall be capable of exporting MV-90 (hhf) files.

# *E-Mon D-Mon - Ideal for New or Retrofit Installation*

Unique 0-2 Volt output split-core current sensors install easily in existing electrical panels.



Stand-alone meters are designed for installation in locations where space is at a premium.

Space-saving MMU cabinets allow for installation of multiple meters in one compact enclosure. An MMU containing 8 meters requires 2 square feet of space versus 26.9 square feet required for 8 traditional glass meters. The cabinets shown to the right contain 72 meters.



# **E-Mon D-Mon**

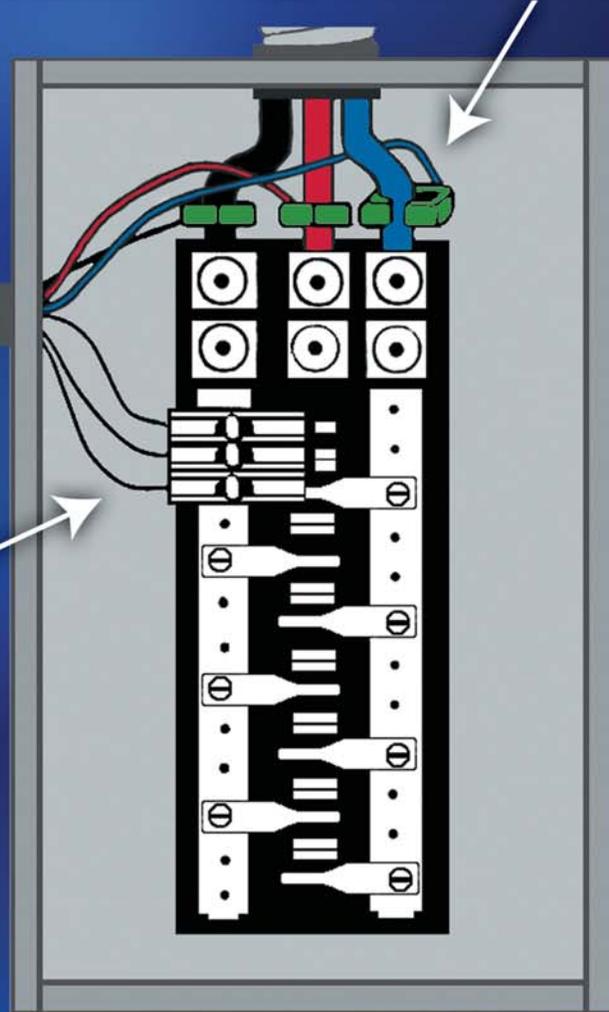
The Industry's Choice For Submetering For Over 25 Years.

## Installs Easily In Minutes!

Step 1: Mount the E-Mon D-Mon Meter.



Step 2: Install E-Mon's split-core current sensors around wire(s) to be monitored.



Step 3: Connect voltage wires.

# **E-Mon**

Energy Monitoring Products

(800) 334-3666  
info@emon.com  
www.emon.com

