

E-Mon D-Mon[®] Installation Manual

Green Class KWH/Demand Meter
with Net Metering Capabilities



Dear Valued Customer,

We are pleased that you chose to buy one of our products, and want you to be just as pleased with owning it. Before installing your new E-Mon product, please read the information on the following pages carefully.

We believe that you will find the E-Mon D-Mon meters easy to install and to use for monitoring and evaluating your electrical usage.

To be sure that you are 100% satisfied with your products, we provide toll-free technical and sales support Monday through Friday, 8:00 am to 7:30 pm, EST: (800) 334-3666. You may also reach us via e-mail at info@emon.com.

If you have questions, we can handle them quickly and effectively with a telephone call. Please let us try to help you BEFORE you remove your meter. And to help us help you, we ask that you have all relevant information on hand when you call (model or part numbers, nature of difficulty, etc.)

Be sure to forward this manual to the owner after installation is complete, so that they may use it as a reference guide when reading the E-Mon D-Mon meter.

Thank you.

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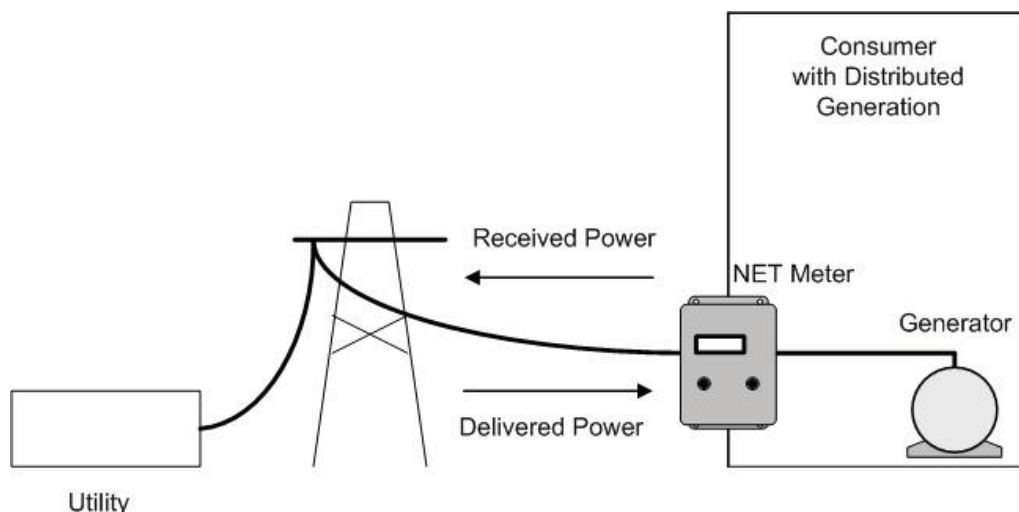
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1.0 Introduction

In many meter installations, it is becoming increasingly important to account for the electricity that is both delivered and received. Delivered power is that which is supplied to a facility by the Utility or ESP (Energy Service Provider.) Received power is that which is sent back into the electrical service grid from the facility. This would be the case if the facility had an on-site generator that can supply power in excess of what the facility requires. Many utilities will either purchase this extra power at wholesale rates, or give the consumer credit for the received power on his next utility bill.

The Green Class Net Meter is designed to display the “Net” result of the energy used by the consumer. The received power is automatically subtracted from the delivered power. In certain cases, where the consumer sends more power into the grid than the utility has supplied, the meter is capable of displaying negative kWh information.

In addition to the meter’s display, which will show delivered kWh, received kWh, net kWh, net kW, total CO2 and CO2 load, the Green Class Net Meter records 15 minute interval data that can be used by the E-Mon Energy automatic meter reading system to provide graphing and charts that detail energy usage and flow. The software also utilizes a spreadsheet approach to customizable billing and accounting. Net metering interval data is supplied for both the delivered and the received power, making it a very valuable tool in this type of application.



1.0 Introduction (Continued)

The E-Mon D-Mon Green Class Net Meter is a 3-element meter with communications. The device is used to monitor electric power usage of individual loads after the utility meter and store kW and delivered kVAR data for automatic meter reading. Installation must only be performed by qualified personnel and in accordance with these instructions and all applicable local and national electrical codes. E-Mon or its representatives assume no responsibility for damages or injury resulting from the improper installation of this meter.

Units designated by the “R” suffix on the model number have an extended environmental range and are enclosed in a NEMA 4X housing to accommodate outdoor environments.

VERIFY the input voltage rating and configuration on the unit panel label to ensure it is suitable for the intended electrical service. Meters labeled for 120/208V service MUST NOT be installed on the service feeds of 277/480 volt and vice versa.

VERIFY the meter’s current sensors are sized suitably for the load being monitored. Compare the color of the arrows on the current sensors to the chart below to confirm the correct current sensor is being used.

SENSOR ARROW COLOR CODE		SENSOR RATING
Brown	-	100 Amp
Red	-	200 Amp
Yellow	-	400 Amp
Black	-	800 Amp
Blue	-	1600 Amp
White/Black	-	3200 Amp

CAUTION: Internal circuit card components are extremely sensitive to electrostatic discharge. Prior to handling or touching internal circuitry, discharge any static buildup on your person. To discharge yourself, touch a grounded metal object such as conduit or an Earth Grounded metal enclosure.

WARNING: Use of this instrument, Green Class Net Meter, in a manner inconsistent with this manual or not specified by the manufacturer in writing, can cause permanent damage to the unit and/or serious injury to the operator. The protection and safety features provided by this equipment may become impaired or otherwise compromised.

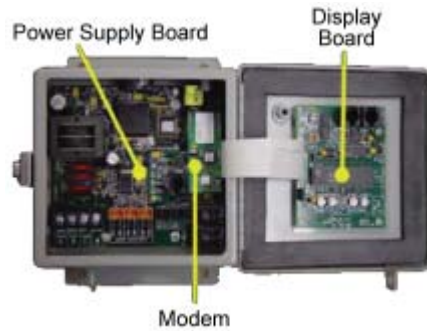
NOTE: If any trouble arises during the installation or functional verification operations, do not immediately remove the unit. Before removing the unit, contact E-Mon’s technical support department at (800) 334-3666 (PA) or (800) 810-3666 (CA). E-Mon’s technical department will assist you in detailed troubleshooting of the Green Class Net Meter installation and assist you in getting the unit operating correctly.

1.0 Introduction (continued)

Internal Electronic Assemblies

The unit is comprised of two or three major subassembly boards; main power board, optional modem board and display board. All three circuit cards are mounted inside either a NEMA 12/13 or NEMA 4X enclosure.

NOTE: Units supplied in a NEMA 12/13 metal enclosure are suitable for indoor applications only. Units supplied in a NEMA 4X fiberglass enclosure are suitable for either indoor or outdoor applications, within the defined specifications. Refer to section 2.0 for a definition of suitable environmental conditions for indoor and outdoor units.



Main Power Board

Connections to this board include the MAINS input voltage and current sensors. The MAINS input terminals are covered with a protective clear shield for safety purposes. The current sensor assemblies interface to three header connectors, TB2, TB3 and TB4. Each header connector input corresponds to an input voltage phase therefore care must be exercised to ensure each current sensor is connected to the correct input header.



Display Board

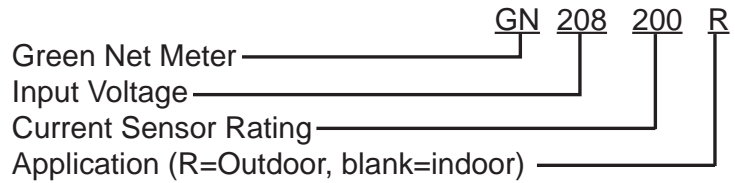
The display board interconnects to the main power board via a flex ribbon cable and the board mounts on the inside of the housing door. The only required connection is for RS485 communications. When operated as a stand-alone unit using the optional modem for communications, the RS485 connections are not required. The display board LCD readout cycles through the available data which is described later.

Optional Modem Board

The optional modem module is mounted to the main power supply board via four standoffs. At the bottom of the module is an RJ44 (4-wire) connector used to interface cable to a phone line. The optional modem is configured to operate at 9600 Baud, No parity, 8 Data Bits and 1 Stop Bit.

2.0 Meter Technical Specifications

Ordering Information: Define input voltage, current sensor rating, application



Input Voltage Configuration:	3-Wire (Delta) or 4-Wire (Wye)
MAINS Voltage Input:	Up to 480 VAC RMS Available
Input Power:	6VA Maximum Rating
Current Sensor Rating:	Up to 3200 Amp RMS AC Available
Power Factor:	.5 leading or lagging
Line Frequency:	50-60 Hz
Metering Accuracy:	Certified to ANSI C12.16
Voltage Operating Range:	+/-10% of rated load
Temperature Range (Indoor):	-20 degrees C to +50 degrees C
Temperature Range (Outdoor):	-20 degrees C to +70 degrees C
Relative Humidity Range:	0-95% Non-Condensing
Voltage Overload:	+25% Continuously; +100% for 20 Cycles
Current Sensor Overload:	100% for 1 minute without damaging meter
Pollution Degree:	Degree 2 In Accordance with IEC 664
Installation (Overvoltage) Category:	Category III
Measurement Category:	Category III
Indoor Housing Rating:	NEMA 12/13
Outdoor Housing Rating:	NEMA 4X
Display Readout:	kWh Accumulated

2.0 Meter Technical Specifications (continued)

Standard Ranges:

4-Wire, Wye	120/208 VAC: 100, 200, 400, 800, 1600, 3200 Amp
4-Wire, Wye	277/480 VAC: 100, 200, 400, 800, 1600, 3200 Amp
3-Wire, Delta	220/240 VAC: 100, 200, 400, 800, 1600, 3200 Amp
3-Wire, Delta	480 VAC: 100, 200, 400, 800, 1600, 3200 Amp

Modem Interface

Cable:	UL Listed/rated telephone cord, 4-conductor, 300 VAC, stranded conductors, 22-26 AWG
Cable Connector:	RJ-11 IDC Termination
Ckt Input Isolation:	2120 VDC, UL File # 150299, Std. 60950
Baud Rate:	9600

RS485 Serial Communication Interface

Cable:	UL Listed/rated telephone cord, 4-conductor, 300 VAC, stranded conductors, 22-26 AWG
In/Output Voltage:	Ground Isolated +/- 5.4 VDC
Cable Connector:	RJ45 male IDC or screw terminal termination
Ckt Input Isolation:	5.3K VAC
Max Cable Distance:	2,000 Feet
Max Network Nodes:	Maximum cabling nodes 64 including master node
Baud Rate:	9600

Recommended In-Line Fuse:

Manufacturer:	Littlefuse
Mfg Part No.:	KLDR.100
Rating:	100mA, Time Delay, 600 VAC Cartridge Fuse

Battery Cell:

Description:	Non-rechargeable cell used for memory retention
Manufacturer:	Eagle-Picher
Mfg Part No.:	LTC-3PN
Working Voltage:	3.5 VDC
Current Capacity:	350mAHr
Electrolyte:	Lithium Thionyl Nitrate

3.0 Safety Label Definitions and Information

The E-Mon D-Mon® Green Class Net Meter may contain one or more of the following labels. Operator(s) should familiarize themselves with the meaning of each label to minimize risk.



The presence of this label is a cautionary indicator identifying a danger risk. The manual should be consulted prior to proceeding.



The presence of this label indicates an electrical shock hazard exists in the location or area where the label is placed. Prior to proceeding, the MAINS power must be disconnected and the manual consulted for safety information prior to proceeding.

4.0 Precautionary / Safety Information



Caution: Internal Circuit Card Components are extremely sensitive to electrostatic discharge. Be careful not to touch internal circuitry prior to discharging any static buildup on your person. To discharge yourself, touch a grounded metal object such as conduit or an earth grounded metal enclosure.



Warning: High Voltages present on Main Power Terminal Block, TB1. Risk of serious injury and/or electrical shock exists. Prior to performing any wiring operations, review all contents of the users manual and de-energize the MAINS power switch. Only qualified personnel should perform installation wiring. Installation wiring must comply with all local and national electrical codes.



Warning: Failure to ground the enclosure creates a possible shock hazard. Do not operate the E-Mon D-Mon® Green Class Net Meter without a protective earth wire attached securely to the PE terminal screw. After installing Protective Earth wiring, secure the screw tightly (10 N-m Torque).



Warning: NEVER open front panel of unit while unit has MAINS power applied. Failure to comply can increase the risk of serious injury and for electrical shock.

5.0 Meter Installation

5.1 Mounting the E-Mon Green Class Net Meter

STEP 1: Using the appropriate sized mounting hardware, fasten the enclosure to the selected mounting surface. The four housing mounting holes are centered 6.75" H x 4" W. The mounting hole spacing is identical for either the NEMA 4X or NEMA 12/13 enclosures.

NOTE: Only the NEMA 4X enclosed unit is suitable for outdoor environmental conditions. Units housed in NEMA 12/13 enclosure units must only be installed in indoor environments where it will not be affected by the elements.

5.2 Main Power Board Connections

STEP 1: Installing a temporary ground for ESD protection.
With all circuits de-energized, connect a temporary protective earth ground connection for ESD protection. **Prior to performing any unit wiring, be sure to discharge any static on your person.**

STEP 2: Installing the Green Class Net Meter protective earth ground.
Connect an earth ground wire to the meter protective earth ground terminal screw located on the bottom right side of the main power PCB. After installing the protective earth ground wire, securely fasten the protective earth ground screw.

WARNING: Failure to attach the protective earth ground wire securely to the enclosure creates a potential shock hazard. Do not operate the meter without a protective earth ground connection securely installed.

STEP 3: Wire Entry

Two openings exist on the unit enclosure; one for 1/2" conduit and one for 3/4" conduit. The 3/4" conduit opening located on the bottom edge of the housing is used to bring in MAINS power and current sensor wiring. The 1/2" conduit opening is located on the top edge of the housing and is used to interface the optional modem telephone line, low voltage signals, and RS485 communication wiring to the unit. Route the appropriate cabling to and through the respective enclosure opening. Outdoor applications require the use of the NEMA 4X enclosure. The conduit and fittings interfacing the enclosure entrances must be UL listed, properly sized to the enclosure port diameter, and rated for outdoor use. The interfacing fitting must use a gasketed seal ring to interface between the conduit fitting and the enclosure entry point. After installing the conduit fitting and conduit, verify the conduit fittings are aligned properly to their respective enclosure entrance ports and tightened securely to prevent moisture entry. **VERIFY** each conduit slip nut is securely tightened to its respective conduit fitting.

STEP 3: Wire Entry (continued)

Indoor application units are installed in the metallic NEMA 12/13 enclosures. The same principals outlined for the outdoor meter installation as defined in the aforementioned paragraph carry over and apply to indoor installations with one exception. This one exception is the conduit and fittings used for indoor installations do not require an outdoor materials rating.

STEP 4: Unit MAINS wiring

Remove the clear shield located over terminal block TB1 on the main power board. This shield can be removed by pressing in on each locking tab located at the top of each standoff. While pressing the tabs inward, lift the shield from the standoffs. Wire each connection to terminal block TB1 with stranded wire 14-12 AWG, rated at 600 VAC.

Strip back all wire insulation to expose between 1/4" and 3/8" of the copper conductors. Gently twist each wire conductor to prevent fraying. Insert the conductors into their respective terminal block positions and tighten down the terminal block screw to securely fasten the conductor. Terminal block TB1 is clearly labeled PHASE A, PHASE B, PHASE C and NEUTRAL.

Connect the NEUTRAL wire to the appropriate terminal block position.

NOTE: For 3-wire delta MAINS input wiring, DO NOT connect the NEUTRAL wire. Remove the terminal block screw for this position.

Connect the three AC mains power wires (Phase A, Phase B and Phase C) to their respective positions as labeled on terminal block TB1. After all conductors are connected to their respective terminal block positions and tightened down, verify each terminal block screw is securely fastened by gently tugging on each conductor. Verify no conductor wires are frayed or shorting to adjacent terminal block positions.

STEP 5: External switch mechanism/In-line fuse installation

To ensure a safe installation, the Green Class Net Meter requires an external switch mechanism, such as a circuit breaker, be installed to the meter's MAINS input wiring. The switch mechanism must be installed in close proximity to the Green Class Net Meter and easily reachable for the operator. This device must also be marked as the disconnecting device for the meter. Install 1/10 Amp slow activation inline fuses with the suitable voltage rating for each conductor phase at the MAINS input to the meter. The fuses must be labeled to indicate voltage and current rating as well as element characteristics. The fuse element must be slow activating type.

STEP 6: Once the MAINS wiring is complete, close the enclosure front panel and secure the panel to the enclosure using the locking mechanism.

Activate the external circuit breaker or equivalent switch to apply AC MAINS power to the unit. The Green Class Net Meter's display should turn on and begin cycling through its multiple screens.

STEP 7: Using an AC Voltmeter, verify that the input voltage readings are within the limits specified below.

NOTE: For a 3-Wire system, the voltages are measured Phase to Phase. On 4-Wire systems the voltages are measured Phase to Neutral.

Meter Input Voltage	Nominal Voltage	Limits (+/-10%)
120/208V, 3 Ph, 4 Wire	120 VAC	108 to 132 VAC
277/480V, 3 Ph, 4 Wire	277 VAC	249 to 305 VAC
240 V, 3 Ph, 3 Wire	240 VAC	216 to 264 VAC
480 V, 3 Ph, 3 Wire	480 VAC	432 to 528 VAC

STEP 8: Remove power from the unit by de-energizing the external switch.

5.3 Current Sensor Installation and Wiring

Once the AC voltages have been confirmed to be within acceptable limits, you are ready to install the current sensors. The main power board contains three header connectors located at the bottom center of the board, TB2, TB3 and TB4.

TB2: Phase A Current Sensor Input
TB3: Phase B Current Sensor Input
TB4: Phase C Current Sensor Input

The Green Class Net Meter will be used with two basic types of current sensors:

1. Split-Core Current Sensor: This sensor opens so that it can be attached around the circuit conductor being monitored without interrupting power. Unless otherwise specified, all Green Class Net Meters are supplied with this sensor type.
2. Solid-Core Current Sensor: This sensor does not open and requires the monitored conductor be removed from the circuit to install the current sensor. This type is only supplied when specified at time of order.

NOTE: The unit serial label specifies if the unit is setup for split-core or solid-core current sensors. Meters labeled for split-core current sensors cannot be used with solid-core current sensors and vice versa.

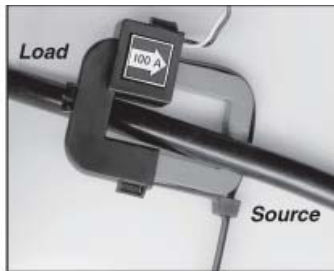
Both current sensor types output a 0-2 VAC signal proportional to the current being measured.

Installing the Split-Core Current Sensor Assembly

STEP 1: Each phase being monitored will require one two-piece current sensor assembly. Therefore, a three-phase meter will require three (3) assemblies. Open the two-piece current sensor assembly by releasing the nylon clamp using a flat head screwdriver.



STEP 2 : Reassemble the current sensor assembly around the conductor(s) to be monitored. Ensure the current sensor halves marked “Load” are both facing the load side of the conductor. The colored arrow will be on the source side of the conductor being monitored and **MUST** be pointed in a clockwise direction around the conductor being monitored. Tighten the nylon clamp to complete the assembly.



IMPORTANT: When looking from the source side of the conductor(s) being monitored, you should see the arrow on the current sensor assembly. The arrow should be pointing in a clockwise direction around the conductor(s) being monitored. If the arrow is not positioned on the source side, inaccurate readings will result.

Current Sensor Wiring

Once all the current sensors are installed onto their appropriate phase conductors, you can begin terminating the current sensors onto the E-Mon D-Mon® Green Class Net Meter Main Board.

The current sensor leads can be extended up to 500 feet for remote monitoring applications. *To extend the length of the wires, use #22 AWG twisted pair wire with a black and white conductor, rated for 600VAC.*

The Current Sensor connection points are located on the bottom center of the Main Power Board. Three removable plugs exist, one for each Current Sensor Phase Input. The Header portions of the connectors are labeled TB2, TB3, and TB4. Silkscreen located in front of each connector instructs you which terminal of the plug is for the white conductor and which terminal is wired to the black conductor. Once each current sensor is wired to its respective plug, insert each plug into the appropriate header.

5.4 MAINS Line Voltage and Current Sensor Wiring Diagrams

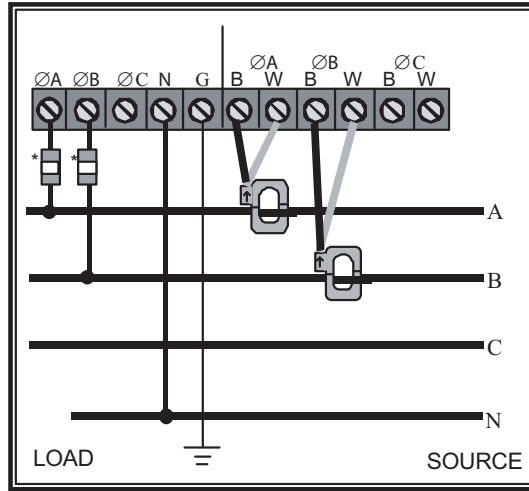
Single Phase, 3-Wire Installation Diagram

Line Voltage Connections: # 14-22 AWG

Sensor Connections: B = Black Lead
W = White Lead

* 1/10 A, 600 VAC inline fuse per conductor.
Littlefuse part number KLDR .100.

** Neutral not used in delta system.
Remove neutral terminal block screw for
Delta systems.



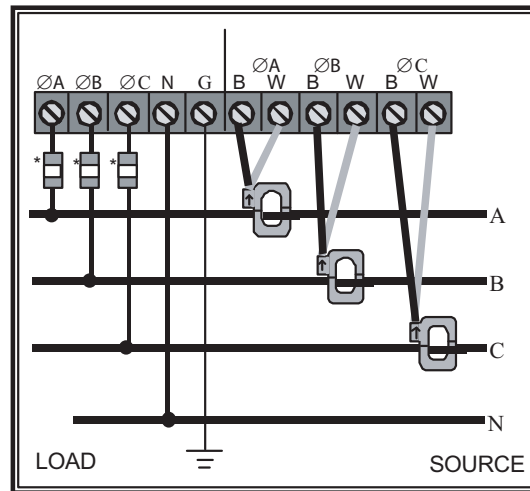
3-Phase, 4-Wire Installation Diagram

Line Voltage Connections: # 14-22 AWG

Sensor Connections: B = Black Lead
W = White Lead

* 1/10 A, 600 VAC inline fuse per conductor.
Littlefuse part number KLDR .100.

** Neutral not used in delta system.
Remove neutral terminal block screw for
Delta systems.



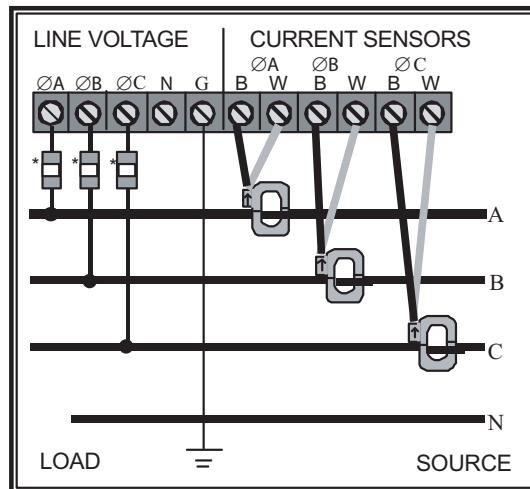
3-Phase, 3-Wire Installation Diagram

Line Voltage Connections: # 14-22 AWG

Sensor Connections: B = Black Lead
W = White Lead

* 1/10 A, 600 VAC inline fuse per conductor.
Littlefuse part number KLDR .100.

** Neutral not used in delta system.
Remove neutral terminal block screw for
Delta Systems.



5.5 Line Voltage/Current Sensor Diagnostics

The three-phase AC MAINS voltage wiring and the current sensor wiring must be connected in the proper phase sequence. If there is a phase sequence error, the Display LCD will display a message “Check Sensor” in the upper right hand corner. Additionally, LED D5 labeled “MTR” will flash at a rate of twice per second in the event of a phase error or missing phase voltage(s).

Verify the AC MAINS voltage wires are all connected to the correct positions on terminal block TB1. Inspect the MAINS input wiring to verify each conductor is terminated at the correct terminal block position. Using an AC voltmeter, measure the AC voltage for each Phase to Neutral terminal and to the frame ground point.



Verify each current sensor by running at least 1% of the full scale rated current through the conductor being monitored by each phase. (e.g. a 200 amp meter requires a 2 amp load for each phase to perform sensor diagnostic procedures.)

Verify the current sensor white and black conductors are installed in the correct header positions.

Verify the current sensors are installed in the correct direction on the conductor being monitored.

Verify the current sensor plugs are terminated in the correct header on the main power board.

If the error messages still haven't been cleared, measure the AC voltage output across the plug terminals of each current sensor individually. Set the AC voltmeter to the 20 Volt scale. If a reading of zero is indicated on the voltmeter, check for an open circuit. An open circuit could exist at the plug terminals or at a splicing junction. Also verify a tight connection exists between the core halves.

If the error is still appearing, contact E-Mon's technical support department at (800) 334-3666 (PA) or (800) 810-3666 (CA) for further assistance.

Final Main Power Board checks

Once the phase error has been corrected, the display LCD “Check Sensor” error should extinguish and the main power board LED D5 should flash at a rate of once per second. Also verify LED D4, labeled “CPU” is flashing at a rate of once per second and synchronously with LED D5.

5.6 RS-485 Wiring

The Green Class Net Meter contains an RS-485 serial communication port allowing it to communicate with a computer. The units can be daisy chained together over distances of up to 4,000 feet. Using an E-Mon RS232/485 key, up to 64 unit nodes, including one master node, can be networked together. Communication wiring should enter/exit the enclosure through the 1/2" hole located on the upper side surface of the enclosure using 4-conductor UL approved telephone cord terminated with an RJ11 male connector.

NOTE: When multiple meters are used, the meter ID (1A to 8Z) must be different on each unit installed.

NOTE: The Green Class Net Meter will not function as a master in a master-slave configuration. An E-Mon IDR or Class 3000 unit must serve the role of master in this configuration.

CAUTION: Be sure you do not confuse the optional modem's telephone jack(s) with the RS485 jacks. Reversing the wiring can cause permanent unit damage to either communication port.

There are two methods for connecting Green Class Net Meters together.

Method 1: Daisy chain with modular jacks

1. Each display board has two RJ11 jacks available to facilitate RS485 daisy chain connections. Using RJ11 4-conductor cable, wire each cable end pin to pin. Interconnect all units together with the RJ11 cabling.
2. After daisy chaining the units is complete, you need to decide what device will be used to communicate with this network of Green Class Net Meters.
 - a. Option 1: Internal modem - installing a master unit such as Class 3000 or E-Mon IDR within the daisy chain of Green Class Net Meter units. The selected units' internal modem will then communicate via the RS485 network. Simply connect a phone line to one of the two telephone jacks inside the Class 3000/E-Mon IDR to the telephone line to complete the installation.
 - b. Option 2: Local Computer - If adding the Class 3000 or E-Mon IDR is not an option, a locally residing computer can communicate with the RS-485 network. The computer must be connected to the E-Mon RS232/485 key. The RS232/495 key is then connected to one of the daisy chained Green Class Net Meter units' available RS-485 jacks using RJ11 cabling.

Method 2: Daisy Chain with Wire Terminal

1. Connect the “HI” terminal (display PCB J3 Pin 1) of each Green Class Net Meter unit together so that all unit HI terminals are linked. (HI to HI to HI, etc.)
2. Connect the “LO” terminal (display PCB J3 Pin 2) of each Green Class Net Meter unit together so that all unit LO terminals are linked. (LO to LO to LO, etc.)
3. Connect the “GND” terminal (Display PCB J3 Pin 3) of each Green Class Net Meter unit together so that all unit GND terminals are linked. (GND to GND to GND, etc.)
4. After completing the wiring of connector J3 for all units, you need to decide what device will be used to communicate with this network of Green Class Net Meters.
 - A. Option 1: Internal Modem - installing a master unit such as Class 3000 or E-Mon IDR within the daisy chain of Green Class Net Meter units. The selected units internal modem will then communicate via the RS485 network. Simply connect a phone line to one of the two telephone jacks inside the Class 3000/E-Mon IDR to the telephone line to complete the installation.
 - B. Option 2: Local Computer - If adding the Class 3000 or E-Mon IDR is not an option, a locally residing computer can communicate with the RS-485 network. The computer must be connected to the E-Mon RS232/485 key. The RS232/485 key is then connected to one of the daisy chained Green Class Net Meters available RS-485 jacks using RJ-11 cabling.

5.7 Optional Modem Wiring

For Green Class Net Meter units installed as stand-alone devices, the only communications interface required is a telephone line for interfacing to the optional modem module. Connect one end of the phone line cable plug into the RJ-11 jack located on the modem interface card and the other end to a functional telephone outlet.

NOTE: If the unit is sharing a phone line with a DSL device, a DSL filter must be installed between the phone line and phone jack to ensure reliable operations.

6.0 Configuring the Green Class Net Meter using E-Mon Energy Software

E-Mon Energy is a product of E-Mon, LLC. This software operates on a computer running Windows 2000, XP or Vista and is used to interface with a number of E-Mon products, including the Green Class Net Meter.

Reference E-Mon Energy software for specific instructions to perform the following operations:

- Modem Initialization
- Downloading Profile Data
- Unit Initialization
- Setting/Changing Unit ID, Group and Location information
- Resetting Meter Display

7.0 Preventative/Scheduled Maintenance

The unit is shipped in a calibrated and full functionally tested condition. Since the unit is factory calibrated using proprietary firmware algorithms, no internal unit adjustments are necessary. This unit contains no internal adjustments, therefore no preventative or scheduled maintenance is required. No cleaning or decontamination procedures are required for this instrument.

8.0 Lithium Battery Replacement Instructions

The E-Mon D-Mon® Green Class Net Meter has a Lithium Battery Cell, which is used to retain the contents of SRAM and the RTC during power outages. The battery has a life expectancy greater than 8 years.

Battery Specifications: 25 Degree Celsius

Nominal Working Voltage:	3.5VDC Output
Nominal Current Capacity:	350 mAHr
Cell Chemical:	Lithium-Thionyl Chloride
Operating Temperature Range:	-40 to +95 Celsius
Manufacturer:	Eagle-Picher
Manufacturers Part Number:	LTC-3PN

WARNING: Only replace battery with exact manufacturer and manufacturer part number specified above.



The Battery Cell is mounted in a socket on the upper right side of the Main Power Board. Should the battery drop below 2.4 VDC in capacity, the display will illuminate a Battery symbol on the left margin indicating a low battery condition. Additionally, the internal unit firmware will set a flag indicating the low battery condition. When the unit data is next downloaded, the monitoring facility will be alerted of the low battery condition and schedule a service call.

Use the following procedure to replace the Lithium Battery Cell.

CAUTION: The battery is not completely discharged, therefore **DO NOT** short the terminals on the battery with any conductive material.

CAUTION: Internal Circuit Card Components are extremely sensitive to electrostatic discharge. Be careful not to touch internal circuitry prior to discharging any static buildup on your person. To discharge yourself, touch a grounded metal object such as conduit or a metal enclosure exterior.

8.0 Lithium Battery Replacement Instructions (Continued)

Step 1 : Disconnect power from the E-Mon D-Mon® Green Class Net Meter at the unit external circuit breaker.

Step 2 : Remove the battery from its socket and place on a non-conductive surface.

Step 3: Install new battery into the PCB Battery socket

NOTE: The Main Power Board Battery socket is keyed to prevent user from inserting the new battery in the wrong polarity. No damage to unit or battery will occur if battery is inadvertently installed in wrong direction.

Step 4: Visually inspect new battery to verify that all leads are fully inserted into their respective socket positions.

Step 5: Dispose of the used battery in accordance with the manufacturers' (Eagle Picher) instructions.

9.0 Display Screens

The Green Class Net Meter cycles through eight (8) separate display screens. These screens are described in further detail below.

Screen 1 - kWh Delivered



This screen displays the amount of energy (kWh) delivered from the serving utility/energy provider.

Screen 2 - kWh Received



This screen displays the amount of energy (kWh) received by the serving utility/energy provider. It shows the energy that was pushed back into the electrical grid from excess capacity in a building with a cogeneration, solar or wind powered supply system.

Screen 3 - Net (Delivered minus Received)



This screen displays the Net reading of both the delivered and received energy. In this example, the received amount (2 kWh) is subtracted from the delivered amount (7 kWh). If more energy is received into the electrical grid this can be a negative number.

Screen 4 - Not Utilized



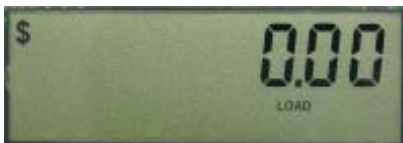
This screen is not utilized at this time.

Screen 5 - Real-Time Net Load in kW



This screen displays the “real-time” Net load in kW (Kilowatts.) It indicates the present load of this service.

Screen 6 - Not Utilized



This screen is not utilized at this time.

9.0 Display Screens

Screen 7 - CO2 Carbon Footprint



This screen displays the estimated carbon footprint (CO2) of the emissions created by the utility to generate the total delivered energy. The figures are based on the national averages as listed by the U.S. Department of Energy.

Screen 8 - CO2 Carbon Footprint Based On Present Load



This screen displays the estimated carbon footprint (CO2) of the emissions that will be generated by the utility in an hour based on the present load requirements of the building. The figures are based on the national averages as listed by the U.S. Department of Energy.

10.0 Stored Data

The Green Class Net Meter stores up to 36 days of interval data in 15-minute segments. There are three (3) channels of data that can be accessed through E-Mon Energy, E-Mon's automatic meter reading software. This data can then be utilized for billing and/or load analysis and graphics.

Channel one (1) stores interval data for the kWh delivered.

Channel two (2) stores interval data for the kVAR delivered.

Channel three (3) stores interval data for the kWh received.

11.0 Frequently Asked Questions

Q When providing line voltage to the meter, can I tap off of the same breaker I am monitoring?

A Yes, the voltage can be pulled from the same breaker being monitored.

Q Can the meter line voltage wires be run in the same conduit as the current sensor leads?

A Yes, there will be no effect on the meter if the sensor leads and line voltage wires are run in the same conduit.

Q Can the meter's communication wires and line voltage wires be run in the same conduit?

A It is not recommended to run these wires together due to noise concerns and their effects on the communication signal integrity. Communication wires can be routed separately using the 1/2" conduit port.

Q How do I find the cost for kWh to bill my tenants?

A Your local utility bill should list the cost per kWh. If not, simply call your utility and ask them to provide you with the cost per kWh.

Q What size wire do I use for the line voltage leads?

A These wires are normally sized at #14 AWG but be sure to confirm this requirement with your local and national electrical code requirements.

Q What size wire should I use to extend the current sensor leads?

A These wires are normally #14-22 AWG twisted pair arrangement. Consult your local electrical codes for proper sizing requirements.

Q I've gone through the troubleshooting guides and I still can't get my meter to work, what should I do?

A Before removing the unit, contact E-Mon's technical department at (800) 334-3666 (PA) or (800) 810-3666 (CA). E-Mon's technical support team will assist you in detailed troubleshooting of the meter installation and assist you in getting the unit running without having to remove and return the unit.

12.0 Meter Limited Warranty

Subject to the exclusions listed below, E-Mon will either repair or replace (at its option) any product that it manufactures and which contains a defect in material or workmanship.

The following exclusions apply:

1. This Limited Warranty is only effective for a period of (18) eighteen months following the date of manufacture when installed in accordance with manufacturer's instructions by qualified personnel.
2. E-Mon must be notified of the defect within ninety (90) days after the defect becomes apparent or known.
3. Buyer's remedies shall be limited to repair or replacement of the product or component which failed to conform to E-mon's express warranty set forth above.
4. Buyer shall be responsible for all freight costs and shall bear all risk of loss or damage to returned goods while in transit.
5. This Limited Warranty does not cover installation, removal, reinstallation, or labor costs, and excludes normal wear and tear. Buyer shall provide labor for the removal of the defective component or item and installation of its replacement at no charge to E-Mon.
6. This Limited Warranty does not cover any product if: (i) a product is altered or modified from its original manufactured condition, (ii) any repairs, alterations or other work has been performed by Buyer or others on such item, other than work performed with E-Mon's authorization and according to its approved procedures; (iii) the alleged defect is a result of abuse, misuse, improper maintenance, improper installation, accident or the negligence of any party; (iv) damaged as a result of events beyond E-Mon's control or other force majeure events or (v) used in conjunction with equipment, components, accessories, parts or materials not supplied or approved by E-Mon.
7. This Limited Warranty is limited to the obligation to repair or replace the manufactured product. This is the sole and exclusive remedy for any breach of warranty. IN NO EVENT SHALL E-MON BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES (INCLUDING ANY DAMAGE FOR LOST PROFITS) ARISING OUT OF OR IN CONNECTION WITH THE FURNISHING OF PRODUCTS, PARTS OR SERVICES, OR THE PERFORMANCE, USE OF, OR INABILITY TO USE ANY PRODUCTS, PARTS OR SERVICES, SALE OF OR OTHERWISE, WHETHER BASED IN CONTRACT, WARRANTY, TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, OR ANY OTHER LEGAL OR EQUITABLE THEORY.
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