EPM 4500

Multi-point submetering system

Engineered for retrofit and new construction
with power line communication capability

imagination at work

EPM 4500 at a Glance

Key benefits
- Multi-point energy demand data logging
- Revenue certifiable metering
- Meets ANSI C12.1 and C12.16 accuracy
- Wall mountable, easy-to-install enclosures
- Local LCD viewing
- Communication over existing AC power lines (PLC) or with optional Modbus RTU

Applications
Ideal for commercial, residential and industrial submetering applications requiring multi-point energy data logging. This includes multi-point high-rise, garden style apartment, condos or office suites.

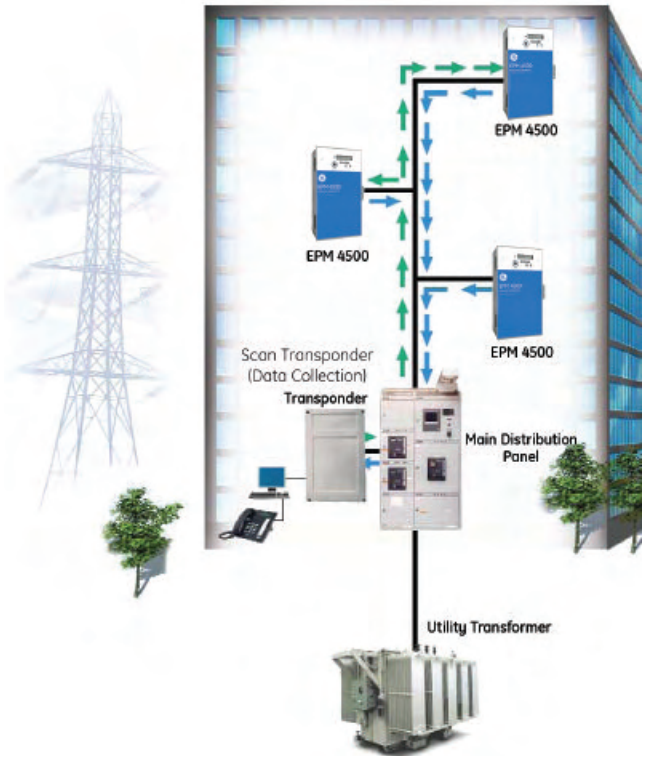
Features
- Monitoring and Metering
  - Real-time per-phase viewing of voltage, current, power factor, phase angle, watts, VARs, VA and frequency
  - Event reporting with time and date stamps regarding power consumption, demand resets, power-ups/power-downs, available via LCD for viewing
- User Interface
  - Modbus RS-485 (optional)
  - Up to 4 pulse inputs (optional)
  - IEC optical front panel interface for programming

Standard Features
The GE EPM4500 is an easy-to-use multi-tenant energy/demand data logging meter suitable for new construction or retrofit applications. The integral LCD display provides access to electrical parameters in real-time or historical formats. The EPM 4500 is available in 120/208V, 120/240V delta, 277/480V, 480V delta or 347/600V. Other optional packages include delta configuration for 480V or 600V configurations. CTs are available in solid or split core applications. The EPM 4500 can be ordered in specific circuit sizes, depending on application and electrical service requirements.

Mounting Versatility
The EPM 4500 is a single wall mountable, tamper resistant enclosure that can be located away from the electrical circuits to be monitored. Its single rugged metal enclosure is designed for fast installation.

Metering
The EPM 4500 meter provides local, real-time viewing, per-phase of voltage, current, power factor, phase angle, watts, kVARs, kVA and frequency. Event reporting with time and date stamps regarding consumption, demand resets, power ups/downs, and time changes is available through LCD display. Non-volatile flash memory retains daily and interval metering data during power outages. Backup battery is also provided to maintain time during power outages.
- Ia Ib Ic
- Va Vb Vc Vab Vbc Vca
- PF
- W var VA
- Wh
- F

Typical High-Rise Application



Ordering

Residential

Family	Voltage	Phase	Wires	Application	Metering Points	CTs	Options	
PL4500	*	*	*	*	*	*	*	Description
	120							120/208 Volts - Single Phase Only
	240							240 Volts -Single Phase Only
	277							277/480 Volts - 3 Phase Only
	347							347/600 Volts - 3 Phase Only
		1						Single phase
		3						Three phase
			3					3 Wire
			4					4 Wire
				R				Residential Single Phase
					3			3 Points
					6			6 Points
					9			9 Points
					12			12 Points
					24			24 Points
						L		0.1 Amps Secondary Input
						H		5 Amps Secondary Input
							P	pulse data module

Commercial

Family	Voltage	Phase	Wires	Application	Metering Points	CTs	Options	
PL4500	*	*	*	*	*	*	*	Description
	120							120/208 Volts Connection Three Phase Only
	277							277/480 Volts - 3 Phase Only
	347							347/600 Volts - 3 Phase Only
		3						Three Phase
			3					3 Wire
			4					4 Wire
				C				Commercial or Delta 3-Phase, 3 Wire
					6			6 Points
					8			8 Points
					12			12 Points - Delta Configuration Only
						L		0.1 Amps Secondary Input
						H		5 Amps Secondary Input
							P	Pulse Data Module
							M	Modem
							RS	RS485 Connection
							MOD	Modbus Communication

Transponders

Description	Cat. No.
120/208V with modem	TRANS120M
120/208V with RS485 and RS233 connections	TRANS120RS
277/480V with modem	TRANS277M
277/480V with RS485 and RS232 connections	TRANS277RS
347/600V with modem	TRANS347M
347/600V with RS485 and RS232 connections	TRANS347RS

Pulse Input Module

Cat. No.
PL4500PULSINA
PL4500PULSINB
PL4500PULSINC
PL4500PULSIND

CTs

Type	Description	Cat. No.
Solid Core - 0.1 A Secondary	CT-50 (50/0.1A)	PLSUBCTSL050
	CT-1 (100/0.1A)	PLSUBCTSL101
	CT-2 (200/0.1A)	PLSUBCTSL201
	CT-4 (400/0.1A)	PLSUBCTSL401
Solid Core - Canadian	CT-2/5DARL (200A/5A)	PLSUBCTSL201CDN
Split Core - 0.1 A Secondary	CTSP-50 (50/0.1A)	PLSUBCTSP050
	CTSP-1 (100/0.1A)	PLSUBCTSP101
	CTSP-2 (200/0.1A)	PLSUBCTSP201
	CTSP-4 (400/0.1A)	PLSUBCTSP401
	CTSP-8 (800/0.1A)	PLSUBCTSP801
	CTSP-1600 (1600/0.1A)	PLSUBCTSP162
	CTSP-3200 (3200/0.1A)	PLSUBCTSP322

Communications

The EPM 4500 provides standard communication over PLC (Power Line Communications) where the AC lines act as the communication medium – perfect for retrofit applications where placing new communication lines can be difficult and expensive. Data can be retrieved via GE or third-party software through the use of a transponder. Modbus communication is also available as an option.

EPM 4500 utilizes a patented, two-way Power Line Communications technology as a standard feature to send and receive data over the existing power lines without the need of additional communication wiring. GE's PLC technology is an extremely reliable and cost-effective solution.

Modbus Communication

Optional RS-485 Modbus Open Protocol Communication is available for networking to GE and third-party systems.

Transponder Communication

The transponder is the central data collector for the power line communication (PLC) system. It is installed on the secondary of the utility transformers and will communicate with all meters installed on the load side of the transformer. The transponder is typically installed in the main electric room, close to the service entrance of the utility transformer secondary. In properties with multiple utility services, a transponder is required for each transformer/service. One transponder can handle as many as 240 metering points.

Multiple transponders can be tied together as a data link network utilizing RS-485. In some applications, a wireless network approach can replace the data link network, and may be preferable. The transponder network is accessed utilizing a telephone modem or local RS-232 connection to an on-site PC for data transfers.

Each transponder has a database or "cross reference" of installed meters (by serial number) on its particular electrical service. The transponder collects data for each of these meters and stores it in internal, non-volatile flash memory for up to 40 days for typical billing requirements. This design provides data redundancy for the data stored in the meter.

Using the transponder, the signal can communicate through distribution transformers. With the transponder installed at the main (120/208, 277/480 or 347/600) distribution panel, the transponder will communicate through any existing step-down transformer with any meter fed from that particular distribution panel.

GE's PLC complies with IEC Signaling Standard (10-90Khz), and less than 4W is transmitted. It does not interfere with any existing equipment. The system produces a round signal with no harmonics. The signal is sensed only by other GE PLC devices.

Local Viewing Display

Simple pushbutton access allows instant viewing of real-time and historical data on easy-to-read front LCD.

- Push button scroll
- 32 digit liquid crystal display (16 digit x 2 rows)
- 6 whole digit consumption register
- Data digit height: 0.31"
- Programmable display scroll & decimal place display

Comprehensive Package

EPM 4500 is available with solid or split core current transformer options. A comprehensive packaged selection of CT size, amperes and dimensions is available for new construction (solid core/lower cost options) or split core (for retrofit/existing) applications.

EPM 4500 Package

Package includes wall mountable metal enclosure with built-in LCD, IEC optical port, fuse block and CT shorting assembly.

Accuracy Requirements

EPM 4500 meets ANSI C12.1 and C12.16 revenue grade accuracy specifications, and the stringent requirements of Measurement Canada (AE-1148).

Options

There are a variety of options available to the user, allowing a range of custom configurations:

Pulse Inputs

Up to 48 Form A pulse inputs are available for additional energy information inputs derived from water. gas, steam and similar meters that utilize Form A outputs. Information can then be read on the LCD display.

Modbus Communication

RS-485 Modbus RTU Open Protocol Communication is available for networking to GE and third-party systems.

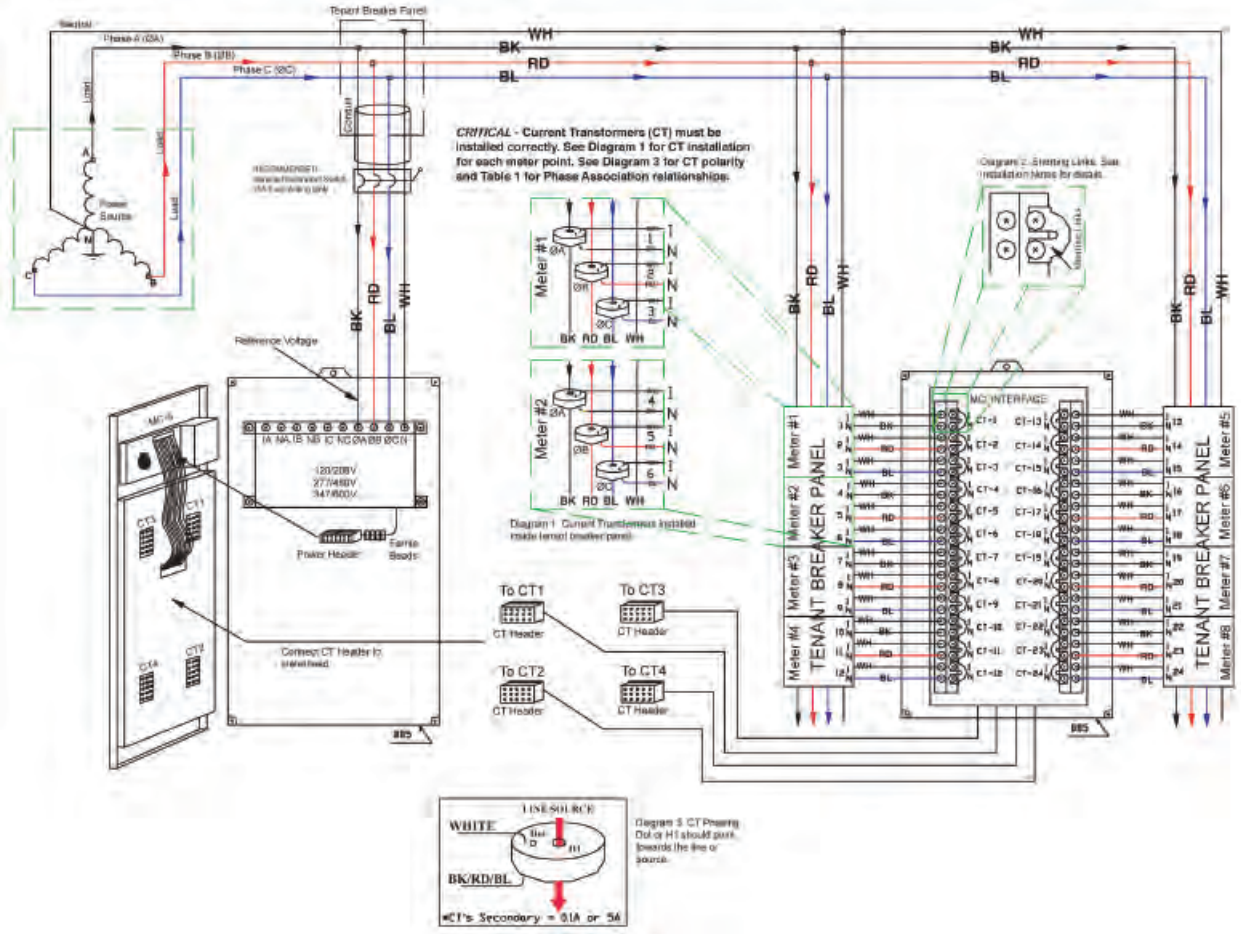
Eneractive Energy Management Software

The Eneractive Energy Management Software provides a complete reporting and billing solution for electrical, water, gas, and BTU submetering. It consists of three software modules:

- Eneractive Configurator
- Eneractive Logger
- Eneractive Custom Reports for billing.

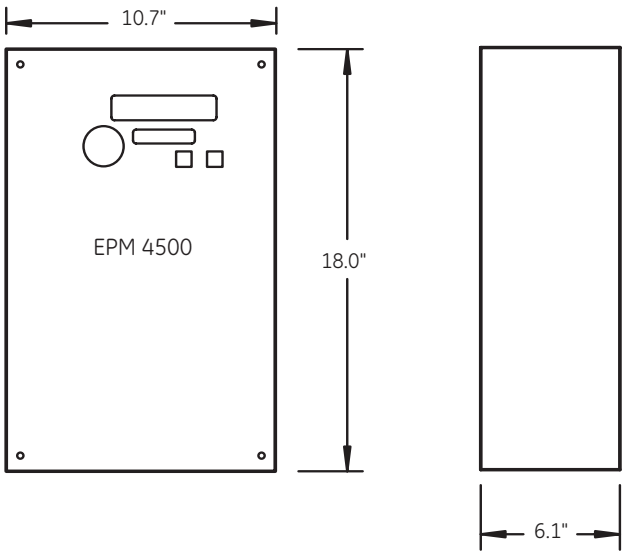
The Software is qualified for Windows XP Professional. It uses the Microsoft.Net Framework and MSDE. The system comes with MS Excel for reporting / billing and PcAnywhere for Remote Access Support. It is also web accessible.

Typical 3-Phase Commercial Wiring



Dimensions

EPM 4500 Enclosure Dimensions



EPM 4500 Specifications

Demand Monitoring

Consumption & Demand: kW & kWh
Interval Data & Peak

Demand Commercial	15-min block demand interval & peak demand with date & time stamp
Data Logging	120 days with kW & kWh Internal battery maintains time and current interval metering data during power outage only
Battery Backup	During power outage, long time lithium battery maintains time, logs, incoming pulses and stores the current time and interval data.
Demand Reset	Allows local reset of peak demand register

Control Power Supply

Input	120V Phase A to Neutral 277V phase A to Neutral 480V phase to phase (Internally powered through metered voltage no external source is required)
Frequency	50-60Hz
Operating Power:	2 Watts for 120V 5 Watts for 277V & 480V

Metering

Measured Values

Parameter	Real Time per Phase	Data Logging
Voltage	x	
Current	x	
kW	x	
kVAR	x	
kVA	x	
kWh		x
Power factor	x	
Frequency	x	
kW demand		x
Phase Angle	x	

Meter Accuracy

0.5 class accuracy
+ 0.5% @ unity and 50% power factor; 1-100% of full-scale
Meets revenue certifiable ANSI C12.1 accuracy standards

Liquid Crystal Display (LCD)

32-digit liquid crystal display (16 digit x 2 rows)
Data digit height: .31"
6 whole digit consumption register
Scrollable display
Push button scroll

Inputs

AC Current Inputs

CT input	50A-800A primary available
Secondary inputs	0.1A or 5A

AC Voltage Inputs

Metered voltage	120/208C Wye, 277/480V Wye, 480 or 600V Delta, 50-60Hz
Rated voltage	90% – 100%

Pulse Inputs

Inputs	Up to 38 Form A Pulse Inputs logged in programmable intervals also count during power outage
Min. wire gauge	20 AWG
Max. wire length	300 feet
Max rate	5 transitions/sec.
Min. pulse width:	100 ms.

Communications

Power Line Communications (PLC)
RS-485 Modbus (2-wire, half duplex, isolated) (optional)
IEC Front Optical Point of Access (POA) (optional)
Built-in Internal Modem (19.2K) (optional)

Environmental

Humidity	0 to 95% Relative Humidity (non-condensing)
Temperature	-20°C to + 60°C
Meter Dimensions	18"H x 9.8"W x 6"D
CT Dimensions:	Variable sizes (see drawings)

Packaging

Shipping Weight	1 meter assembly, 34 lbs. (total weight)

Type Tests

TVSS	ANSI C37.90.1-1989
Rated Voltage	90% to 110%

Approvals

ANSI	C12.1 and C12.16 accuracy
UL & cUL	Recognized under E204142
Industry Canada	MC#AE-1148

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www.geelectrical.com/oem

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