EPM 6000

POWER METER

High Accuracy Power and Energy Measurement

KEY BENEFITS

- High accuracy multifunction power meter
- Superior performance at competitive pricing
- Ultra compact, easy to install, program and use
- 0.2% class revenue certifiable energy and demand metering
- Total harmonic distortion (%THD)
- Fits both ANSI and DIN cutout
- Large 3 line .56" bright LED display for better visibility and longer life
- User programmable for different system voltages and current measurements
- Standard Modbus and DNP communications
- Optional Ethernet port for simplified integration into onto new or existing LAN infrastructures and multi-point connectivity.

APPLICATIONS

- Continuous metering of electrical loads such as generator panels, feeders, switchgear etc.
- Provides remote status when used with EnerVista suite of software
- Low and medium voltage applications
- Replaces multiple analog meters saving space and installation costs

FEATURES

Monitoring and Metering

- True RMS multifunction measurements including voltage, current, power, freq., energy, etc.
- Meets ANSI C12.20 (0.2%) and IEC 687 (0.2%) accuracy classes
- Future field upgradeable for added functionality without removing installed meter
- Load percentage graphical bar for instant load visualization

Communications

- RS485 Modbus and DNP 3.0 Protocol up to 57.6K Baud (Serial Option)
- Modbus TCP Protocol through 10/100BaseTX via RJ45 (Ethernet Option)
- 3 Line .56" Bright Red LED Display
- Front IrDA Port laptop communication
- Pulse output for accuracy testing and energy

Features

EPM 6000 is one of the industry's highest performance revenue grade panel meters. Based on the latest technology and an all-new platform, EPM 6000 has a superior cost to performance ratio and significantly outperforms other metering products many times its price.

Revenue Grade Certifiable with built-in Accuracy Verification

EPM 6000 is a traceable revenue class meter. It contains a utility grade test pulse allowing power providers to verify and confirm that the meter is performing to its rated accuracy. To be certified for revenue metering, power providers and utility companies need to know that the billing energy meter will perform to the stated accuracy. This features allows instant verification of accuracy by third parties as well as utilities for billing purposes.

The EPM 6000 excels in metering energy accurately exceeding ANSI C12.20 (0.2%) and IEC 687 (0.2%) energy measurement standards. The unit utilizes high speed DSP technology with high resolution A/D conversion to provide revenue certifiable accuracy for utility billing, substation metering, sub-metering and critical metering applications.

Measured Values

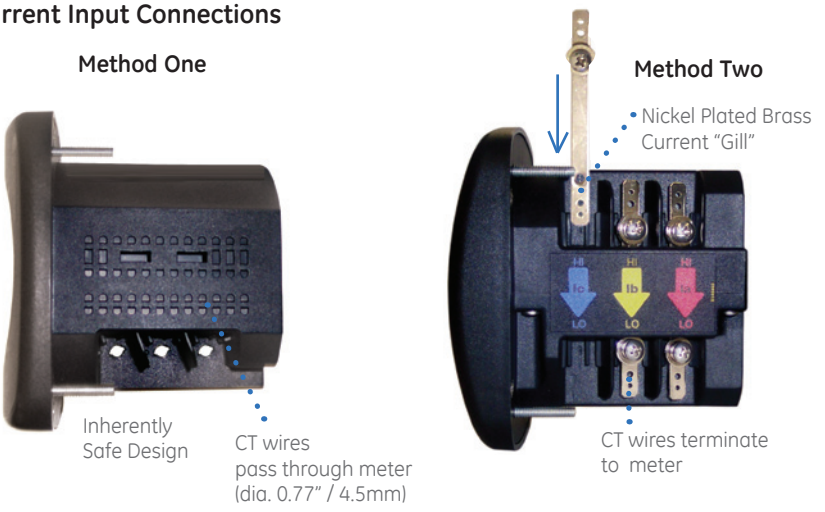
Standard EPM 6000 measures the following values:

Measured Values	Real -Time	Avg	Max	Min
Voltage L-N	■		■	■
Voltage L-L	■		■	■
Current Per Phase	■	■	■	■
Watts	■	■	■	■
VAr	■	■	■	■
VA	■	■	■	■
PF	■	■	■	■
+Watt-hr	■			
-Watt hr	■			
Watt-hr net	■			
+VAr-hr	■			
-VAr-hr	■			
VAr-hr net	■			
VA-hr	■			
Frequency	■		■	■
Voltage Angles	■			
Current Angles	■			
%THD	■		■	■
% of Load Bar	■			

Utility Peak Demand

The EPM 6000 provides user configurable fixed window or rolling window demand. KW, kVAR, kVA and PF are calculated using utility demand structures. All other parameters offer min and max capability over the user selectable averaging period. Voltage provides an instantaneous max and min reading displaying the highest surge and lowest sag seen by the meter.

Current Input Connections



Universal Voltage and Current Inputs

The meter allows voltage inputs measurements up to 416 Volts Line to Neutral and 721 Volts Line to Line. This ensures proper meter safety when wiring directly to high voltage systems. The unit will perform to specification on 69 Volt, 120 Volt, 230 Volt, 277 Volt and 347 Volt power systems.

Unique Current Input Connections

EPM 6000 meter uses a two current input wiring methods.

- Method One - CT pass through. Directly pass the CT through the meter without any physical termination on the meter. This insures that the meter cannot be a point of failure on the CT circuit. This is preferable to utility users when sharing relay class CTs. No Burden is added to the secondary CT circuit.
- Method Two - Current "Gills." The meter additionally provides ultra-rugged termination pass through bars allowing the CT leads to be terminated on the meter. This also eliminates any possible point of failure at the meter. This method is also a preferred technique for ensuring relay class CT integrity does not get compromised. No terminal blocks are required and this stud based design ensures that CTs will not open under a fault condition.

Communications

Through a built-in infra-red (IrDA) port, the meter can be programmed through a lap top computer without a physical wire connection to the meter, making programming or data download convenient and safe. Using standard high speed Modbus communications, the meter can also provide data to RTUs, PLCs and other control devices. When used with the EnerVista suite of software, the meter can be remotely monitored.

The EPM 6000 provides two independent communication ports with advanced features.

- IrDA port – Uniquely the unit has an optical IrDA port allowing the unit to be set up and programmed using a remote laptop without needing a communication cable. Just point at the meter with an IrDA equipped PC computer and configure it.

  The second port is factory selectable to be either a RS485 port or an Ethernet port with features as follows:

- RS485 Port – This port provides RS485 communication using Modbus ASCII or Modbus RTU or DNP 3.0 protocol. Baud rates are from 9600 to 57.6 kbaud

- Ethernet Port – This port provides connectivity via a 10/100BaseT RJ45 connection. Modbus TCP protocol is supported

Simultaneous Dual Communications Paths

Solid Construction with Mounting Versatility

The EPM 6000 has a rugged design for harsh environment. This is especially important in power generation, utility substation, and critical user applications. The structural and electrical design of this meter was developed based on the recommendations and approvals of many of our utility customers.

EPM 6000 can easily be mounted in a panel for generator monitoring, substation automation and more. The unique dual design combines ANSI and DIN mounting structure and allows easy installation for both new metering applications and retrofit of existing analog meters.

The unit mounts directly in an ANSI C39.1 (4" Round form) or an IEC 92 mm DIN square form.

Future Upgrade Packs

The EPM 6000 is equipped with a virtual firmware based switch that allows feature upgrades through communications even after installation. This allows you to optimize your metering investment. Begin with a standard meter and upgrade it to more functionality as new features are added, such as %THD Monitoring for identifying power quality problems and limit exceeded alarms for notification of out of limit conditions.

Simple Installation and Programming

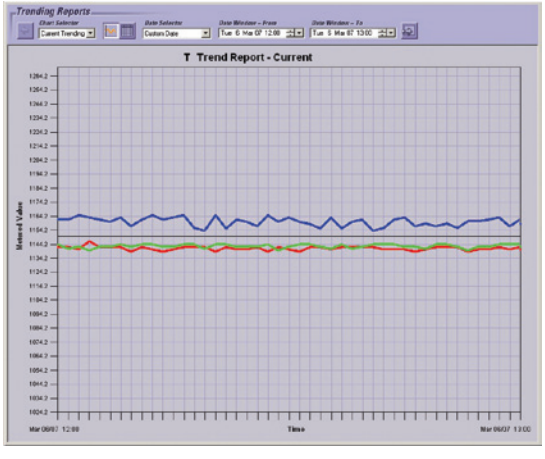
EPM 6000 is intuitive so that a new user can easily program and set-up the meter. The unit can be programmed using a PC or through a simple keypad interface. Additionally, using the PC, a technician or electrician can see a visual phasor diagram of the vectors ensuring that the CT and voltage polarities are correct. All wiring inputs are color coded with clear labeling to avoid cross wiring mistakes by installers. The meter has built in programmable auto scroll features to display multiple values without having to press keys.

EnerVista™ Software

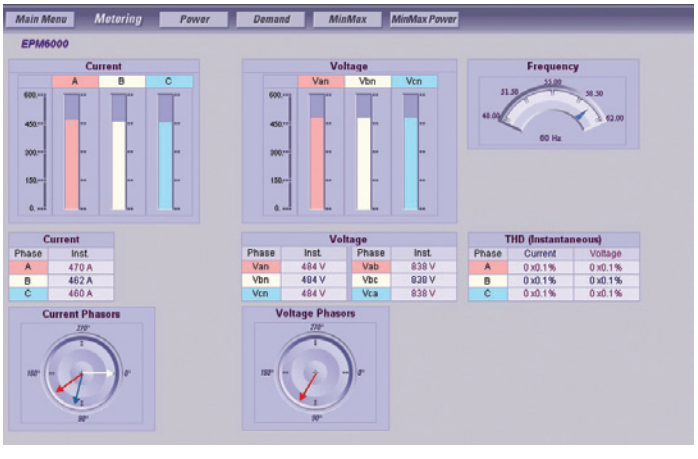
EnerVista Launchpad

EnerVista Launchpad is a powerful software package that provides users a platform to access all of the setup and support tools needed for configuring and maintaining GE's Multilin™ products.. Launchpad

EnerVista Viewpoint Monitoring Data Recording and Real-Time Status



Create graphical trending reports of usage overtime



Real-time metering values and phasors to verify device connection

allows configuration of devices in real-time by communicating using RS232, RS485, Ethernet, or modem connections.

Using Launchpad as the single interface to the setup and analysis software makes it simple to enter setpoints, read metered values, monitor status and evaluate power quality.

Included in Launchpad is a document archiving and management system that ensures critical documentation is up-to-date and available when needed by automatically checking for and downloading new versions of manuals, applications nates, specifications, and service bulletins.

Viewpoint Monitoring

Viewpoint Monitoring is a simple-to-use, full-featured monitoring and data recording software package for small systems. Viewpoint Monitoring provides a complete HMI package that instantly puts critical real-time device data on your PC through pre-configured graphical screens with the following functionality.

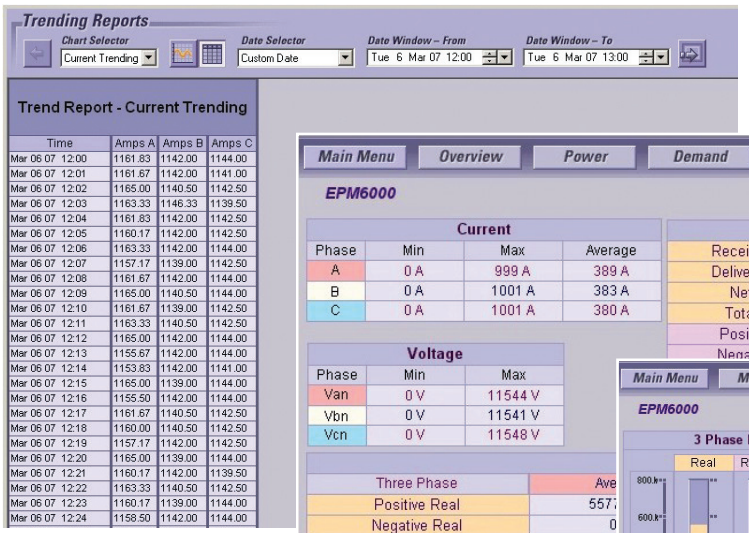
- Plug-&-Play Device Monitoring
- System Single-Line Monitoring & Control
- Annunciator Alarm Screens
- Trending Reports
- Automatic Event Retrieval
- Automatic Waveform Retrieval

EnerVista Integrator

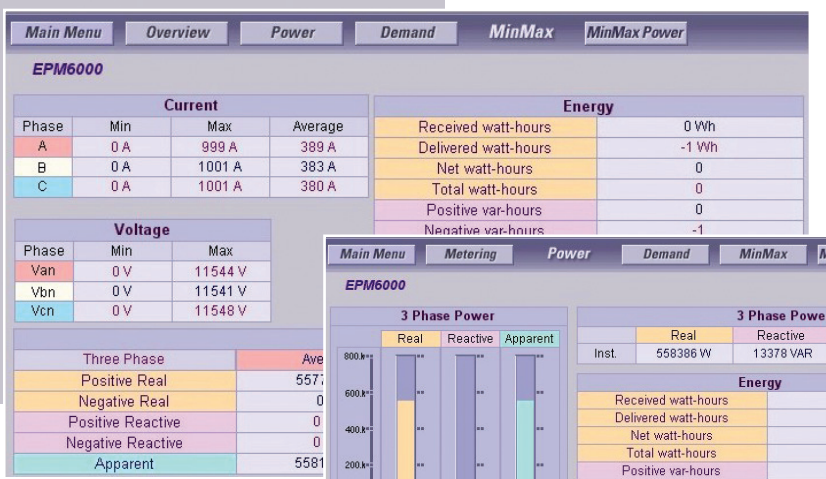
EnerVista Integrator is a toolkit that allows seamless integration of GE Multilin devices into new or existing automation systems by sending GE device data to HMI, DCS, and SCADA systems. Included in EnerVista Integrator is:

- OPC/DDE Server
- GE Multilin Drivers
- Automatic Event Retrieval
- Automatic Waveform Retrieval

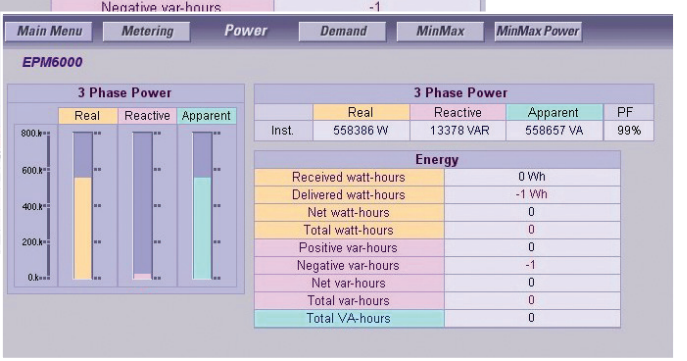
EnerVista Viewpoint Monitoring Data Recording and Real-Time Status



Create tabular trending reports of usage data

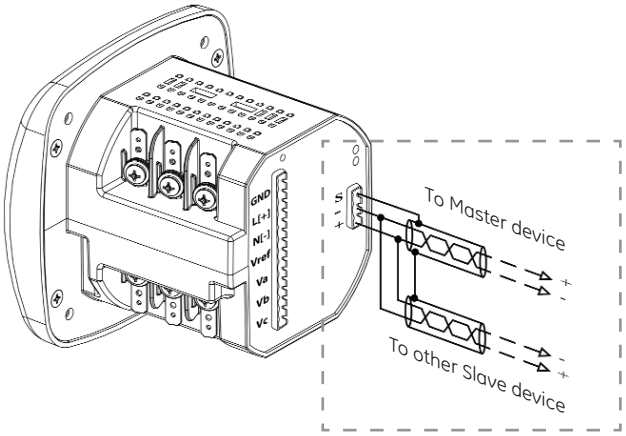


Historical minimum and maximum values to understand fluctuations on the network

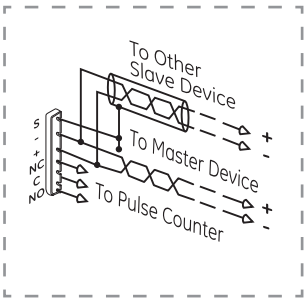


Real-time power values to instantly analyze system capacity

RS485 COM Port and Pulse Counter

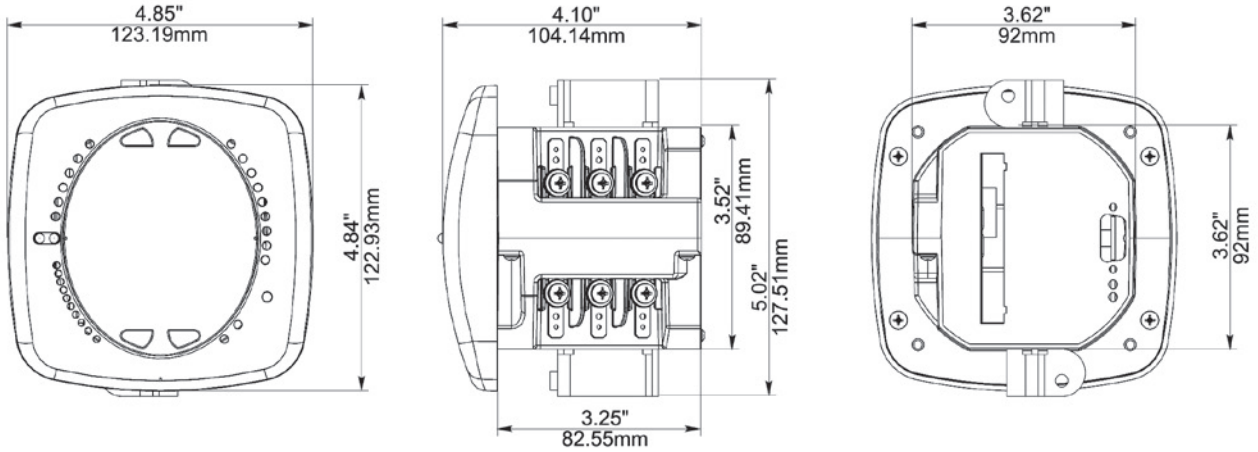


EPM6000 with RS485 Comm Port



EPM6000 THD Option with RS485 and KYZ pulse output

Dimensions and Mounting



User Interface

Technical Specifications

VOLTAGE INPUTS

Universal Voltage Input
- 0-416 Volts Line To Neutral, 0-721 Volts Line to Line
- Input withstand capability – Meets IEEE C37.90.1 (surge withstand Capability)
- Programmable voltage range to any PT ratio
- Supports: 3 element WYE, 2.5 element WYE, 2 Element Delta, 4 Wire Delta Systems
- Burden: 0.36VA per phase max at 600V, 0.014VA at 120 Volts
- Input wire gauge max (AWG 12 / 2.5mm2)

CURRENT INPUTS

- Class 10: 0 to 11 Amps Secondary / 5 Amps Nominal / 10Amps Max
- Class 2: 0 to 2 Amps Secondary / 1 Amp Nominal / 2 Amps max
- Fault Current Withstand: 100 Amps for 10 Seconds 300 Amps for 3 Seconds 500 Amps for 1 Second.
- Programmable Current to Any CT Ratio
- Burden 0.005VA per phase Max at 11Amps
- 5mA Pickup Current
- Frequency 50 Hz or 60 Hz+/- 3Hz above and below nominal range
- Pass through wire gauge dimension: 0.177" / 4.5mm

ISOLATION

- All Inputs and Outputs are galvanically isolated to 2500 Volts AC.

SENSING METHOD

- True RMS
- Sampling at 400+ Samples per Cycle on all channels measured readings simultaneously
- Harmonic % THD (% of total harmonic distoration)

UPDATE RATE

- Watts, VAr and VA-100msec
- All other parameters-1second

POWER SUPPLY

- Universal AC/DC Supply
  - 90 to 265 Volts AC and
  - 100 to 370 Volts DC.
- Optional 24 to 48 Volts DC Supply.

Burden: 10VA max.

COMMUNICATIONS

- 2 Com Ports: IrDA and either RS485 or Ethernet
- IrDA (Through Faceplate)
  - Protocol Modbus ASCII
  - Com Port Baud Rate: 56.7k
  - Address: 1
- RS485 Output (Back Plate)
  - Protocol Modbus RTU, Modbus ASCII or DNP 3.0
  - Com Port Baud Rate: 9600 to 57.6K
  - Com Port Address: 0-247
  - 8 Bit, No Parity
- Ethernet (Back Panel)
  - 10/100BaseT via RJ45 connector
  - Protocol Modbus TCP

METERING ACCURACY

Measured Parameters	Accuracy% of Reading	Display Range
Voltage L-N	0.1%	0-9999 Scalable V or kV
Voltage L-L	0.1%	0-9999 V or kV Scalable
Current	0.1%	0-9999 Amps or kAmps
+/- Watts	0.2%	0-9999 Watts, kWatts, MWatts
+/-Wh	0.2%	5 to 8 Digits Programmable
+/-VARs	0.2%	0-9999 VARs, kVARs, MVARs
+/-VARh	0.2%	5 to 8 Digits Programmable
VA	0.2%	0-9999 VA, kVA, MVA
VAh	0.2%	5 to 8 Digits Programmable
PF	0.2%	+/- 0.5 to 1.0
Frequency	0.01 Hz	45 to 65 Hz
%THD	5%	0-200%
%Load Bar	1-120%	10 Digit Resolution Scalable

PULSE OUTPUT

- Front panel Wh infared test pulse
- Back panel Wh pulse output

DIMENSIONS & SHIPPING

- Weight: 2 lbs
- Basic Unit: H4.85 x W4.82 x L4.25
- Mounts in 92mm DIN and ANSI C39.1 Round Cut-outs
- Shipping Container Dimensions: 6" cube

ENVIRONMENTAL

Storage: -20°C to +70°C
Operating: -20°C to +70°C
Humidity: to 95% RH Non-Condensing
Faceplate Rating: NEMA 12 (Water Resistant) Mounting Gasket Included

COMPLIANCE

- IEC 687 (0.2% Accuracy)
- ANSI C12.20 (0.2% Accuracy)
- ANSI (IEEE) C37.90.1 Surge Withstand
- ANSI C62.41 (Burst)
- IEC1000-4-2 – ESD
- IEC1000-4-3 – Radiated Immunity
- IEC 1000-4-4 – Fast Transient
- IEC 1000-4-5 – Surge Immunity

APPROVALS

ISO: Manufactured to an ISO9001 registered program
UL/cUL: Listed under E250818
CE: Conforms to European CE standards

Ordering

PL 6000	*	*	*	*	*	Description
						Standard unit with display, all current/voltage/power/frequency/energy counters measurement, % load bar, RS 485 and IRDA communication ports and one front test pulse output.
Hz	5					50 Hz AC frequency system
	6					60 Hz AC frequency system
Amps		5A				5 Amps
		1A				1 Amp
Pulse			0			No THD option
			THD			THD, Limit Alarms
Power Supply				LDC		24 to 48 V DC power supply to substitute standard AC/DC power supply
Communications					S	RS485 Communications Port (Modbus and DNP)
					E	Ethernet 10/100BaseT via RJ45 (Modbus TCP)

Example - PM 6000 for 60Hz system with 1 Amp secondary current with THD, Limit Alarms. PL600061ATHD

EPM 6000 is available without a display as the EPM 6000T. Please see the online store for ordering information.

Visit GEMultilin.com/EPM6000 to:

- View Guideform Specifications
- Download the instruction manual
- Review applications notes and support documents
- Buy a EPM 6000 online