

MULTILIN EPM 6000

High Accuracy Power & Energy Measurement

The Multilin™ EPM 6000 is one of the industry's highest performance revenue grade panel meters with superior cost to performance ratio that significantly outperforms other metering products many times its price.

In addition to its 0.2% (ANSI/IEC) accuracy the EPM 6000 also provides serial or Ethernet communications options as well as Modbus and DNP3.0 Protocol support for easy integration into new or existing systems that provide visualization of asset status.

The EPM 6000 is ideally suited for applications where uptime power monitoring is required as well power and energy measurement including revenue accuracy and harmonic distortion in panels, switchgear or in an enclosure for metering independent circuits. Its compact size which fits standard ANSI cutouts/DIN mounting can replace multiple analog meters to save space and installation costs.

Key Benefits

- Revenue class 0.2% accuracy energy and demand metering providing accurate and reliable data for energy management projects
- Easy-to-install with ANSI cutout or DIN mounting options reducing panel space requirements or a DIN mount transducer (EPM 6000T option) configuration for in cabinet installation
- Replaces multiple analog meters compact space and cost saving installation and easy to read, reliable, 3 line 0.56" bright LED display
- Reduced commissioning and maintenance efforts and costs with software based setup for user programmable system voltages and current measurements options
- Simplified integration into networks with optional Ethernet communications
- Meter Enclosure option provides new or supplements existing metering capabilities without costly downtime or engineering efforts

Applications

- Continuous metering and uptime monitoring of electrical loads such as in industrial switchgear and generator panels
- Local indication and remote metering through communications of asset uptime and energy management planning data
- Establish a baseline of energy consumption of specific areas in low and medium voltage applications



Monitoring & Metering

- Meets ANSI C12.20 (0.2%) and IEC 687 (0.2%) accuracy classes
- True RMS multi-function measurements including voltage, current, power, frequency, and energy
- Field upgradable for added functionality without removing installed meter
- Load percentage graphical bar for instant load visualization
- Samples at 400+ times per cycle and has 24-bit A/D conversion
- Total Harmonic Distortion (%THD)
- 3 Line 0.56" Bright Red LED Display
- Optional Transducer configuration without display (EPM 6000T)

Advanced Communications

- Modbus TCP Protocol through 10/100BaseTX via RJ45 (Ethernet Option)
- Modbus and DNP3.0 Protocol through 57.6K Baud RS485 port (Serial Option)
- Front IrDA Port for laptop communications
- Pulse output for accuracy testing and energy



Features

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

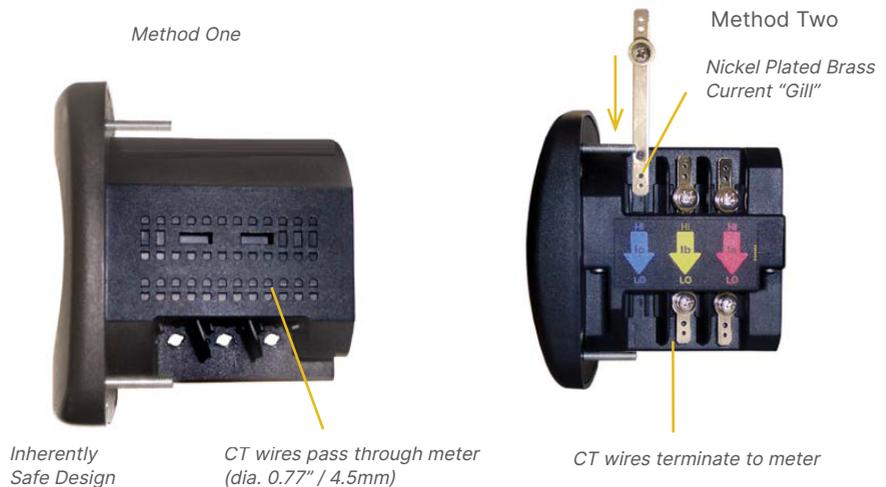
Standard EPM 6000 measures the following values:

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.

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	•			

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. 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

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.

EPM 6000T Transducer Option

The EPM 6000 is available in a transducer configuration (EPM6000T). Without a display and DIN rail mounted, the EPM 6000T is ideal for use in switchgear retrofit applications where access to the meter face and display is not necessary.

Simultaneous Dual Communications Paths



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.

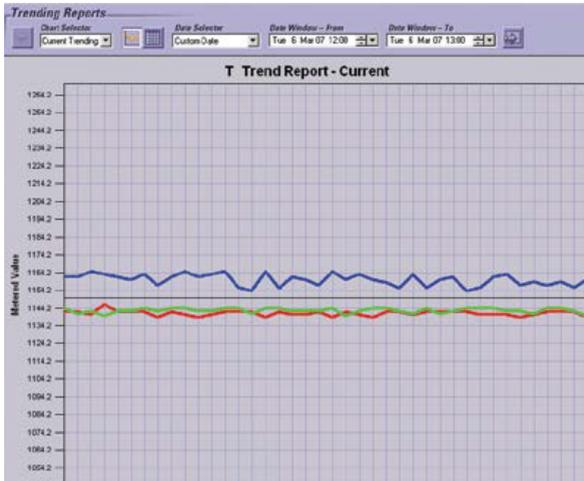
EnerVista™ Software

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 Vernova's Multilin™ products. Launchpad 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.

EnerVista Viewpoint Monitoring Data Recording and Real-Time Status



Create graphical trending reports of usage overtime

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 notes, 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



Real-time metering values and phasors to verify device connection

EnerVista Integrator

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

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

EnerVista Viewpoint Monitoring Data Recording and Real-Time Status

Trending Reports

Chart Selector: Current Trending | Date Selector: Custom Date | Date Window - From: Tue 6 Mar 07 12:00 | Date Window - To: Tue 6 Mar 07 13:00

Trend Report - Current Trending

Time	Amps A	Amps B	Amps C
Mar 06 07 12:00	1181.83	1142.00	1144.00
Mar 06 07 12:01	1181.87	1142.00	1141.00
Mar 06 07 12:02	1185.00	1140.50	1142.50
Mar 06 07 12:03	1183.33	1148.33	1139.50
Mar 06 07 12:04	1181.83	1142.00	1142.50
Mar 06 07 12:05	1180.17	1142.00	1142.50
Mar 06 07 12:06	1163.33	1142.00	1144.00
Mar 06 07 12:07	1157.17	1139.00	1142.50
Mar 06 07 12:08	1181.87	1142.00	1144.00
Mar 06 07 12:09	1165.00	1140.50	1144.00
Mar 06 07 12:10	1181.87	1139.00	1142.50
Mar 06 07 12:11	1183.33	1140.50	1142.50
Mar 06 07 12:12	1185.00	1142.00	1144.00
Mar 06 07 12:13	1155.67	1142.00	1144.00
Mar 06 07 12:14	1183.83	1142.00	1141.00
Mar 06 07 12:15	1165.00	1139.00	1144.00
Mar 06 07 12:16	1155.50	1142.00	1144.00
Mar 06 07 12:17	1181.87	1140.50	1142.50
Mar 06 07 12:18	1160.00	1140.50	1142.50
Mar 06 07 12:19	1157.17	1142.00	1142.50
Mar 06 07 12:20	1165.00	1139.00	1144.00
Mar 06 07 12:21	1180.17	1142.00	1139.50
Mar 06 07 12:22	1183.33	1140.50	1142.50
Mar 06 07 12:23	1180.17	1138.00	1144.00
Mar 06 07 12:24	1158.50	1142.00	1144.00

EPM6000

Current

Phase	Min	Max	Average
A	0 A	999 A	389 A
D	0 A	1001 A	383 A
C	0 A	1001 A	380 A

Voltage

Phase	Min	Max
Van	0 V	11544 V
Vbn	0 V	11541 V
Vcn	0 V	11548 V

Energy

Received watt-hours	0 Wh
Delivered watt-hours	-1 Wh
Net watt-hours	0
Total watt-hours	0
Positive var-hours	0
Negative var-hours	-1

3 Phase Power

Inst.	Real	Reactive	Apparent	PF
Inst.	558386 W	13378 VAR	558657 VA	99%

Energy

Received watt-hours	0 Wh
Delivered watt-hours	-1 Wh
Net watt-hours	0
Total watt-hours	0
Positive var-hours	0
Negative var-hours	-1
Net var-hours	0
Total var-hours	0
Total VA-hours	0

3 Phase Power

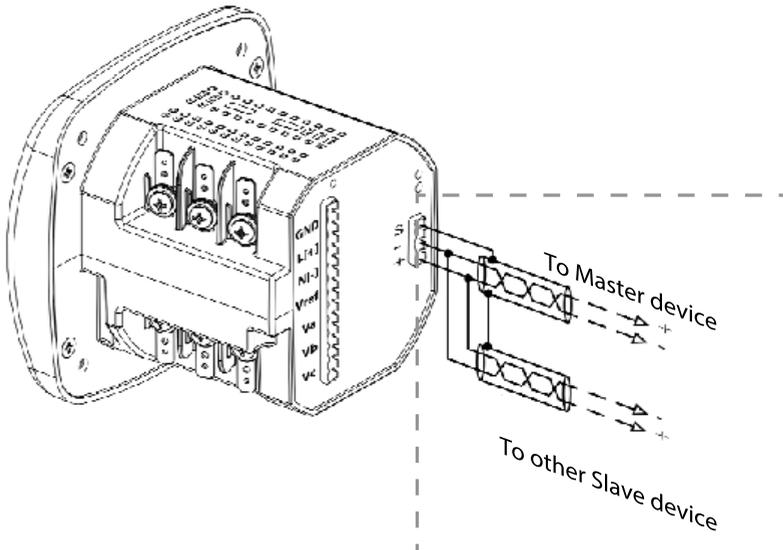
Three Phase	Av
Positive Real	557
Negative Real	0
Positive Reactive	0
Negative Reactive	0
Apparent	558

Create tabular trending reports of usage data

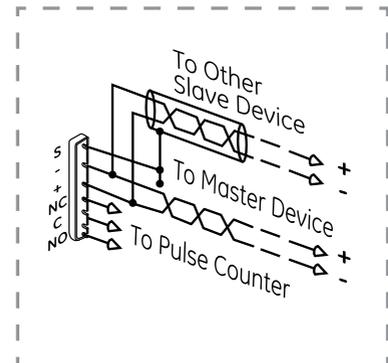
Historical minimum and maximum values to understand fluctuations on the network

Real-time power values to instantly analyze system capacity

RS485 COM Port and Pulse Counter

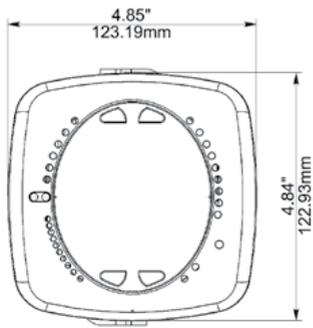


EPM6000 with RS485 Comm Port

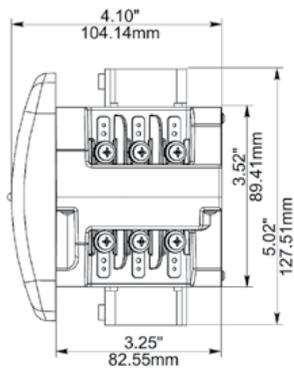


EPM6000 THD Option with RS485 and KYZ pulse output

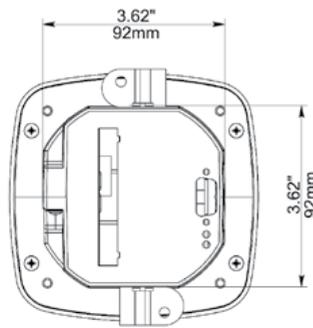
Dimensions and Mounting



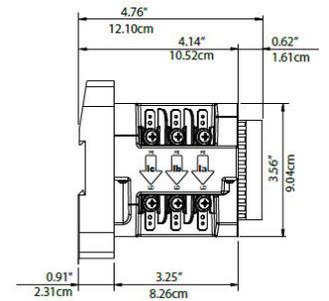
Front View



Side View



Rear View



Transducer

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 / 10 Amps 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 11 Amps
- 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 distortion)

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 infrared test pulse
Back panel Wh pulse output

DIMENSIONS & SHIPPING

Weight: 2 lbs
Basic Unit: H 4.85" x W 4.82" x L 4.25"
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)
EN/IEC 61000-4-2 Electrostatic Discharge (ESD)
EN/IEC 61000-4-3 Radiated Immunity
EN/IEC 61000-4-4 Electrical Fast Transient/Burst
EN/IEC 61000-4-5 Surge
EN/IEC 61000-4-6 Conducted
EN/IEC 61000-4-11 Voltage Dips and Interrupts

APPROVALS

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

Ordering

	PL6000	*	-	*	-	*	-	*	-	*	-	*	Description
Base type	PL6000												EPM 6000 with Multilin Meter Enclosure
Enclosure Option		ENC120 ENC277											NEMA1 Rated Indoor, Single Meter Enclosure, 120V NEMA1 Rated Indoor, Single Meter Enclosure, 277V
System Frequency				5 6									Frequency Option 50 Hz Frequency Option 60 Hz
Current Input						1A 5A							Current Input 1A Current Input 5A
THD								0 THD					No THD Option THD, Limits Alarms & One KYZ Pulse Output
Power Supply (Substitute LV PS)										- LDC			No LDC Low Voltage DC Power Supply to Substitute Standard AC/DC Power Supply
Ethernet Option													S Standard Serial Option E 10/100 RJ45 Ethernet Port

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

For more information, visit
governova.com/grid-solutions

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