

# PQM II Retrofits

## Replace PQM, MPM, and MTM Plus meters with the PQM II Power Quality Meter

The PQM II Power Quality Meter further improves upon the metering, recording and communications functionality of the earlier generation devices including the PQM Power Quality Meter (discontinued 2013), MPM Motor Protection Meters (discontinued 2013) and MTM Plus Meter Transducer Module (discontinued 1998).

The PQM II is an ideal choice when continuous monitoring of a three-phase system is required. It provides metering for critical asset and system parameters such as current, voltage, real and reactive power, energy use, cost of power, power factor and frequency. Furthermore, programmable set points and 4 assignable output relays provide control functionality for specific applications. This includes alarms for over/under current or voltage, unbalance, demand based load shedding, and capacitor power factor correction control. More complex control is available using the 4 switch inputs that can be used for status indications such as breaker open/closed, flow information etc.

### Key Benefits

- Increased metering recording functionality including Voltage Disturbance Recorder (VDR) to monitor voltage dips (voltage sags) and voltage spikes (voltage swells) with capacity for 500 sag/swell events.
- Alarm trigger from any assignable output
- Easy integration to DCS or SCADA systems with standard Modbus and DNP 3.0 Communications Protocol
- Compatible with GE MultiNet Serial to Ethernet Converter
- Versatile mounting options for easy installation
- Easy to use keypad and large illuminated display
- Flash upgradable for future requirements

### Applications

- Commercial, Industrial and Utility Power Quality Applications for medium and low voltage systems
- Metering and asset monitoring of distribution feeders, transformers, generators, capacitor banks and motors
- Specialized control applications for demand load shedding, power factor, etc.
- Monitoring of assets in challenging Industrial environments



## Monitoring & Metering

- Current and Voltage measurements (Ia Ib Ic In, Va Vb Vc Vab Vbc Vca)
- V I unbalance
- True PF Crest and K factor
- Hz, W, VAR, VA
- Wh, VARh, Vah, W cost
- Demand: W VAR VA
- Power Factor- Disturbance recording and waveform capture
- Harmonic analysis through 63rd with THD and TIF
- Event Recorder – up to 150 events
- Data Logger – up to 98,000 events
- Voltage Disturbance Recorder (VDR) – up to 500 events

## Communications

- Front RS232 serial port
- Two rear RS485 serial ports with Modbus and DNP 3.0 protocol
- Ethernet connectivity via MultiNet
- Software based setup and monitoring with Enervista™

## Protection & Control

- Unbalance: A, V, W, Var, VA, Varh, Wh, PF, Hz
- Demand: A, W, Var, VA
- Load shedding
- Power factor control
- Pulse input totalizing
- Capacitor Bank Switching



## Feature Comparison MTM Plus, MPM, PQM, PQM II

FEATURE	MTM PLUS	MPM	PQM	PQM II
<b>REAL TIME READINGS</b>				
Current – RMS - Per Phase Current	•	•	•	•
Current – Phasors		•	•	•
Current – Ground			•	•
Current – Neutral	•	•	•	•
Voltage – RMS - L-L	•	•	•	•
Voltage – RMS - L-N	•	•	•	•
Voltage – RMS - 3 Phase		•	•	•
Voltage – Phasor		•	•	•
Frequency	•	•	•	•
Power Factor - Per Phase			•	•
Power Factor - 3 Phase	•	•	•	•
Real Power - Single Phase			•	•
Real Power - 3 Phase	•	•	•	•
Reactive Power - Single Phase			•	•
Reactive Power - 3 Phase	•	•	•	•
Apparent Power - Single Phase			•	•
Apparent Power - 3 Phase	•	•	•	•
<b>DEMAND READINGS</b>				
Demand Current - Per Phase	•		•	•
Maximum Demand Current	•			•
Demand Real Power - 3 Phase	•	•	•	•
Demand Real Power - Peak	•		•	•
Demand Reactive Power - 3 Phase	•	•	•	•
Demand Reactive Power - Peak	•		•	•
Demand Apparent Power - 3 Phase		•	•	•
Demand Apparent Power - Peak	•		•	•
<b>ENERGY READINGS</b>				
Accumulated Energy - Real	•	•	•	•
Accumulated Energy - Reactive	•	•	•	•
Accumulated Energy - Apparent	•	•	•	•
Bidirectional Readings	•		•	•
Incremental Energy			•	•
Energy Cost - Accumulated			•	•
Energy Cost - Per Day			•	•
Programmable Energy Tariffs			•	•
<b>INPUTS/OUTPUTS</b>				
KYZ Outputs			4	4
User Programmable Digital Inputs	2		4	4
User Programmable Digital Outputs			3	3
Fix Outputs	1	1	1	1
Pulse Inputs	1		4	4
<b>POWER ANALYSIS VALUES</b>				
Crest Factor (per phase)			•	•
THD Factor - Current Per Phase	•		•	•
Fundamental Voltage - per Phase	•		•	•
Fundamental Current - per Phase	•		•	•
Fundamental Real Power - per Phase			•	•
Fundamental Reactive Power - per Phase			•	•

FEATURE	MTM PLUS	MPM	PQM	PQM II
Unbalance Current	•		•	•
Min./Max. Current per Phase - Date/Time Stamped			•	•
Unbalance Voltage	•		•	•
Min./Max. Voltage L-N - Date/Time Stamped			•	•
Min./Max. Voltage L-L - Date/Time Stamped			•	•
Min./Max. Real Pwr. 3 - Phase - Date/Time Stamped			•	•
Min./Max. Reactive Pwr. 3 - Phase - Date/Time Stamped			•	•
Min./Max. Apparent Pwr. 3 - Phase - Date/Time Stamped			•	•
Min./Max. Pwr Fac. 3 - Phase - Date/Time Stamped			•	•
Min./Max. Real Pwr. 1 - Phase - Date/Time Stamped			•	•
Min./Max. Reactive Pwr. 1 - Phase - Date/Time Stamped			•	•
Min./Max. Apparent Pwr. 1 - Phase - Date/Time Stamped			•	•
Min./Max. Pwr Fac. 1 - Phase - Date/Time Stamped			•	•
Min./Max. Frequency - Date/Time Stamped			•	•
Phase Rotation Detection	•	•	•	•
<b>POWER QUALITY</b>				
Current THD	•		•	•
Voltage THD	•		•	•
Sag & Swell				•
Voltage Disturbance Recorder				•
Number of Sag & Swell Events				500
Voltage Flicker			•	•
Min./Max. THD Voltage - L-N - Date/Time Stamped			•	•
Min./Max. THD Voltage - L-L - Date/Time Stamped			•	•
Min./Max. THD Current - Phase - Date/Time Stamped			•	•
Metering Sampling Rate	16		64	64
Harmonic Analysis (on user-defined cycle)			256	256
Oscillography - Cycles			36	36
Oscillography - Sampling Rate			36	36
Trace Memory Trigger			16	16
Voltage Disturbance Recorder (samples per half-cycle)				8
Waveform Capture (two cycles)			64	64
Datalog Events (samples per cycle)			64	64
<b>ALARMING</b>				
Setpoint Driven Alarms	•		•	•
Custom Alarms with Priority Levels			•	•
High Speed (100 ms)			•	•
Multiple Level Alarming			•	•
Disturbance (1/2) Cycle				•

Note: The Enervista PQMII Setup software can convert settings files for PQM Meters using firmware version 3.6x or newer.

For further details on the PQM II Power Quality Meter, visit GE Multilin's web site at [www.GEMultilin.com](http://www.GEMultilin.com) where you can download the PQM II brochure with complete order codes, the PQM II instruction manual, and details about EnerVista suite of setup and monitoring software tools.

## Ordering the PQM II Power Quality Meter

For the full benefits of upgrading to the PQM II, the order code PQMII-T20-C-A is recommended.

### PQM II Options

Note: PQM order code options are the same as for PQM II, with additional features included in the PQM II meter.

**T20:** Transducer option; 4 isolated analog outputs 0 – 20 mA and 4 – 20 mA, 4 – 20 mA analog input, 2nd RS485 port

**T1:** Transducer option; 4 isolated analog outputs 0 – 1 mA, 4 – 20 mA analog input, 2nd RS485 port

**C:** Control option; 3 additional programmable output relays (total of 4), 4-programmable switch inputs

**A:** Power analysis option; harmonic analysis, triggered trace memory waveform capture, event record, data logger, voltage disturbance recorder (VDR)

**Control Power:** Standard: 90 – 300 VDC/70 – 265 VAC

### Modifications:

- MOD 501: 20 – 60 VDC/20 – 48 VAC
- MOD 504: Removable terminal blocks
- MOD 525: Harsh Environments Conformal Coating

### MPM Options

The MPM can be replaced by PQMII-T1 or PQMII-T20, however, we recommend PQMII-T20-C-A. For low control power, MOD 501 is available.

**MPM:** Basic unit, all current/voltage/power measurements, 1 x 269/269 Plus Comm port, Fail-safe Form C Output Relay

**LO:** 20 – 60 VDC, 20 – 48 VAC 50/60 Hz

**HI:** 90 – 300 VDC, 70 – 265 VAC 50/60 Hz

**A1:** Four 0 – 1 mA analog outputs

**A20:** Four 4 – 20 mA analog outputs

### MTM Plus Options

If required, a PQM II mounting plate is available in order to replace an MTM Plus meter.

**120:** 90 – 140 VAC

**240:** 200 – 260 VAC

**S:** Separate Power

**P:** PT Power

**A01:** 0 – 1 mA

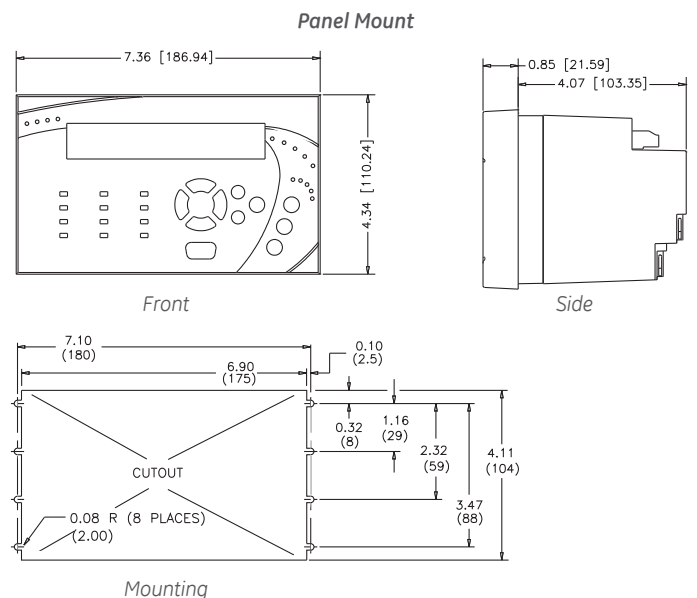
**A20:** 4 – 20 mA

FEATURE	MTM PLUS	MPM	PQM	PQM II
<b>REAL TIME READINGS</b>				
Other Features				
Downloadable Firmware			•	•
Remote Display Option			•	
Setpoint-controlled alarm & data logging			•	•
Analog Inputs			4	4
Analog Outputs	4	4	8	8
Event Recorder - Number of Events			40	150
Time Stamp Resolution (ms)			1	1
Min./Max. Average Log			•	•
Power Analysis Oscillography - Cycles			1	1
Oscillography - Sampling Rate			256	256
Data Logger			•	•
Display			•	•
Key Pad	•		•	•
<b>SPECIFICATIONS</b>				
VL-L/VN-N 600/347	240	300	600	600
Control Voltage Range DC		300	300	300
Control Voltage Range AC	140	265	265	265
Current Inputs Range	10	15	15	15
<b>COMMUNICATIONS</b>				
Interface Program	•		•	•
RS232 Port			•	•
RS485 Port	•	•	•	•
Time Synchronization - Comms Clock Sync			•	•
ModBus Protocol	•		•	•
User-defined ModBus Memory Map			•	•
DNP3 Protocol			•	•

For a feature comparison of all available GE Multilin meters, visit our meter selector at: [www.gegridsolutions.com/multilin/selector](http://www.gegridsolutions.com/multilin/selector)

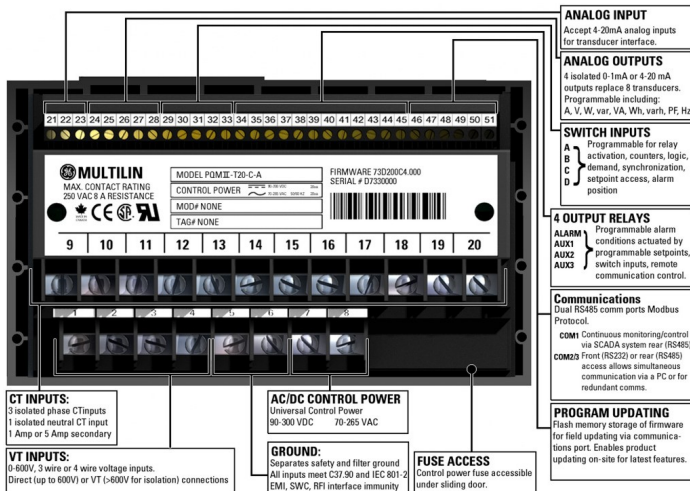
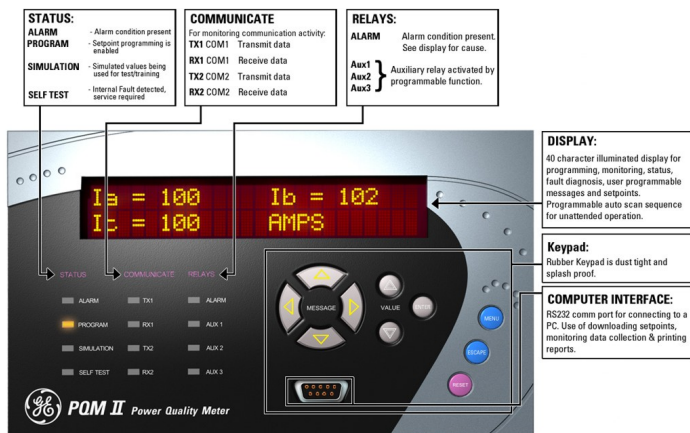
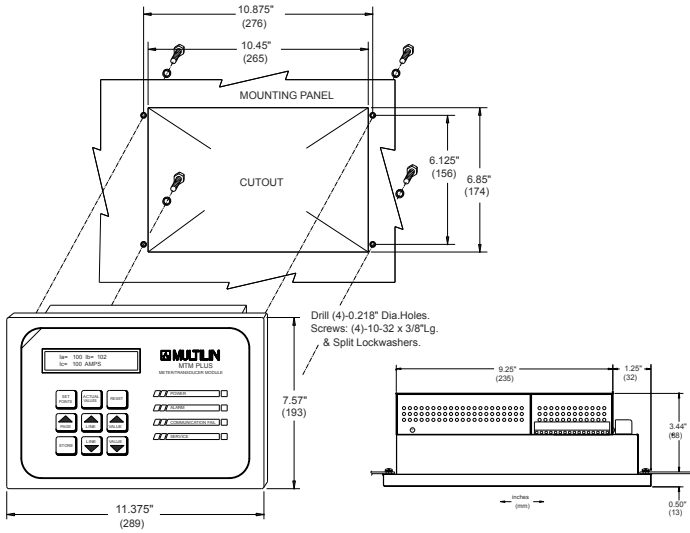
## MPM/PQM/PQM II Dimensions & Mounting

For ease of replacement, dimensions and mounting remain the same for the PQM II as for the PQM and MPM meters.



## MTM Plus Dimensions & Mounting

Note that the MTM Plus does not have the same dimensions as the PQM II. If required, a PQM II mounting plate is available to replace an MTM Plus meter. Otherwise, panel modifications may be required during retrofit.



## MPM/PQM/PQM II Terminal Mappings

MTM PLUS	MPM	TERMINAL DESCRIPTION	PQM/PQM II
2	1	Voltage Terminal - Phase A	1
3,4	2	Voltage Terminal - Phase B	2
5	3	Voltage Terminal - Phase C	3
35	4	Voltage Terminal - Neutral	4
	5	Filter Ground	5
1	6	Safety Ground	6
	7	Live Terminal - Control Power	7
	8	Neutral Terminal - Control Power	8
7	9	Phase A - 5 Amps - Current Terminal	9
8	10	Phase A - 1 Amp - Current Terminal	10
6	11	Phase A - Common Terminal	11
10	12	Phase B - 5 Amps - Current Terminal	12
11	13	Phase B - 1 Amp - Current Terminal	13
9	14	Phase B - Common Terminal	14
13	15	Phase C - 5 Amps - Current Terminal	15
14	16	Phase C - 1 Amp - Current Terminal	16
12	17	Phase C - Common Terminal	17
		Neutral - 5 Amps - Current Terminal	18
		Neutral - 1 Amp - Current Terminal	19
		Neutral - Common Terminal	20
26	21	Anlogue Input - Shield	21
		Anlogue Input - Negative	22
		Anlogue Input - Positive	23
19, 21, 23, 25	24	Anlogue Output - Common	24
24	25	Anlogue Output - 04	25
22	26	Anlogue Output - 03	26
20	27	Anlogue Output - 02	27
18	28	Anlogue Output - 01	28
		Switch Input - 04	29
		Switch Input - 03	30
33	31	Switch Input - 02	31
31	32	Switch Input - 01	32
32, 34	33	Switch Input - +24 V DC	33
		Normally Closed Contact of Aux3 Output Relay	34
		Common Leg of Aux3 Output Relay	35
		Normally Opened Contact of Aux3 Output Relay	36
		Normally Closed Contact of Aux2 Output Relay	37
		Common Leg of Aux2 Output Relay	38
		Normally Opened Contact of Aux2 Output Relay	39
		Normally Closed Contact of Aux1 Output Relay	40
26		Common Leg of Aux1 Output Relay	41
30		Normally Opened Contact of Aux1 Output Relay	42
27		Normally Closed Contact of Alarm Output Relay	43
28	44	Common Leg of Alarm Output Relay	44
29	45	Normally Opened Contact of Alarm Output Relay	45
17	46	RS-485 - Comm Port - 1 - Common Terminal	46
16	47	RS-485 - Comm Port - 1 - Negative Terminal	47
15	48	RS-485 - Comm Port - 1 - Positive Terminal	48
		RS-485 - Comm Port - 2 - Common Terminal	49
		RS-485 - Comm Port - 2 - Negative Terminal	50
		RS-485 - Comm Port - 2 - Positive Terminal	51

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