



PQM II

POWER QUALITY METER

Cross reference to Rockwell
Part # PP3659

Power Quality and Energy Cost Management

KEY BENEFITS

- Power quality metering with waveform capture and historical data logging
- Easy to program and use with keypad and large illuminated 40 character display
- Multiple communication ports for integration with DCS and SCADA systems
- Supports DNP 3.0 and Modbus protocols
- Digital and analog I/Os for control and alarms
- Voltage disturbance recording capability for electrical sag and swell events.

APPLICATIONS

- Metering of distribution feeders, transformers, generators, capacitor banks and motors
- Commercial, industrial, utility
- Medium and low voltage systems
- Flexible control for demand load shedding, power factor, etc.

FEATURES

Monitoring and Metering

- 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: A W var VA
- Harmonic analysis through 63rd with THD and TIF
- Event recorder - 150 events
- Waveform capture
- Data logger -98,000 events
- Voltage Disturbance Recorder (VDR) -500 events

Communications

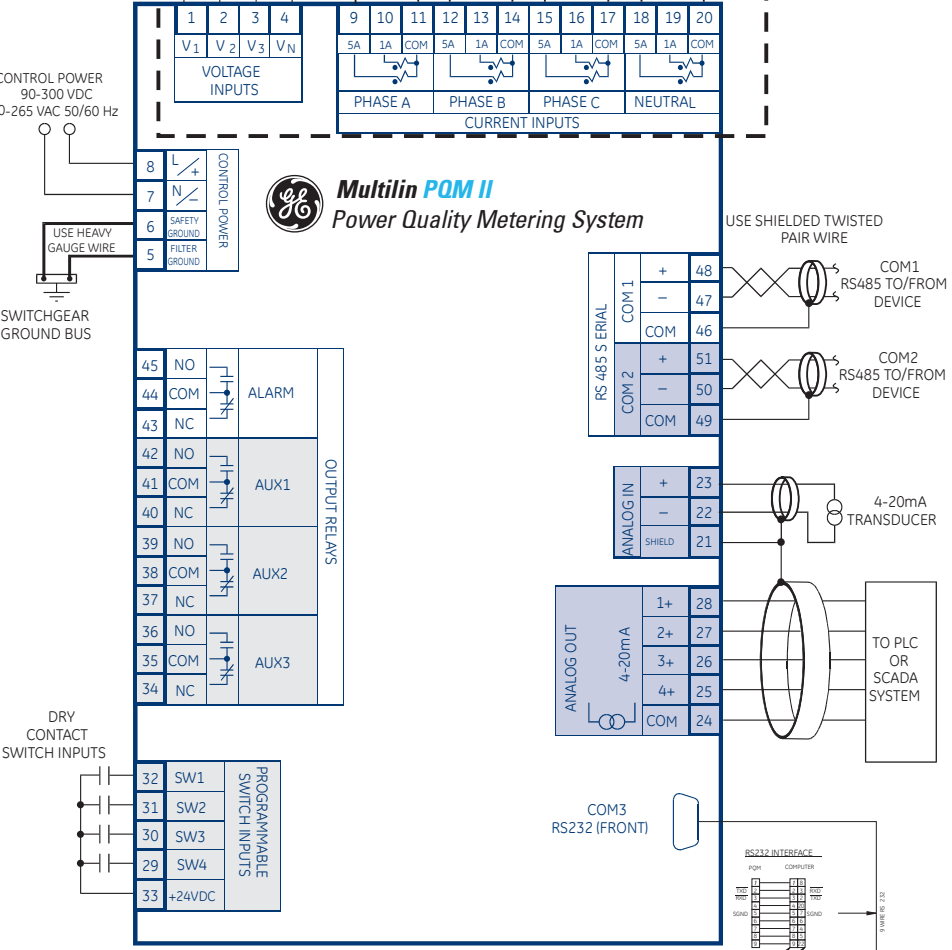
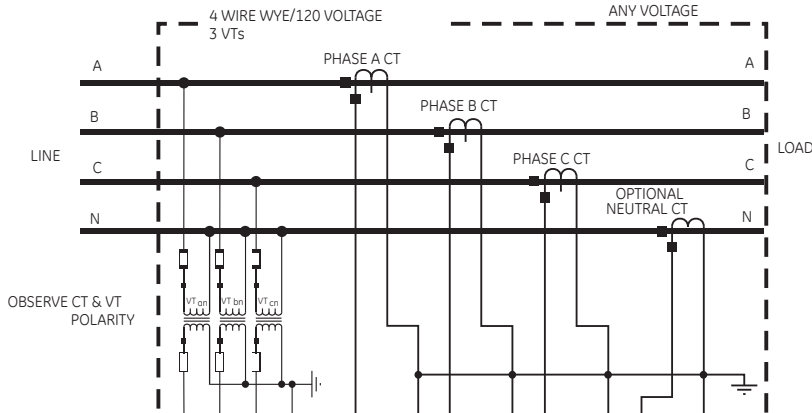
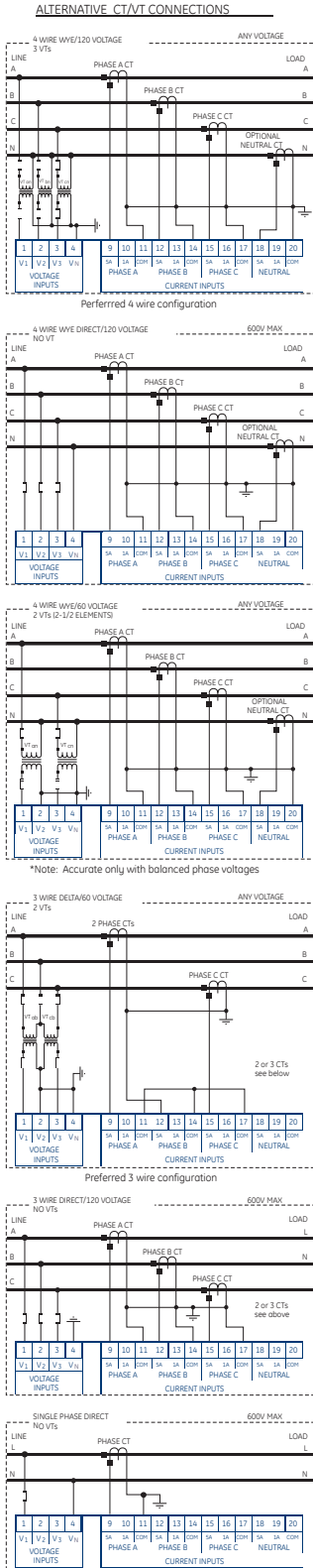
- Front RS232 serial port (1,200 to 19,200 bps)
- Two rear RS485 serial ports with ModBus and DNP 3.0 protocol
- Ethernet connectivity provided by MultiNet
- EnerVista™ software is provided for setup and monitoring functions
- External dial-in modem capabilities

Protection & Control

- Load shedding
- Power factor control
- Pulse input totalizing

Typical Wiring

Digital Metering



- NOTES:
- Relay contact state shown with control power not applied.

CAUTION: USE HIRC FUSES FOR VT PRIMARY TO ENSURE ADEQUATE INTERRUPTING CAPACITY.

- Transducer Option
- Control Option

Technical Specifications

MONITORING

UNDERVOLTAGE MONITORING

Required voltage: 20 V applied
Pickup level: 0.50 - 0.99 in steps of 0.01 x VT
Dropout level: 103% of pickup
Time delay: 0.5 - 600.0 in steps of 0.5 sec
Phases: Any one/any two/all three (programmable) phases have to go below pickup to operate
Per voltage input
Level accuracy: Per voltage input
Timing accuracy: -0/+1 sec

OVERVOLTAGE MONITORING

Pickup level: 1.01 - 1.25 in steps of 0.01 x VT
Dropout level: 97% of pickup
Time delay: 0.5 - 600.0 in steps of 0.5 sec
Phases: Any one/any two/all three (programmable) phases have to exceed pickup to operate
Per voltage input
Level accuracy: Per voltage input
Timing accuracy: -0/+1 sec

UNDERFREQUENCY MONITORING

Required voltage: 20 V applied
Pickup level: 20 - 70.00 in steps of 0.01 Hz
Dropout level: Pickup -0.03 Hz
Time delay: 0.1 - 10.0 in steps of 0.1 sec
Level accuracy: ±0.02 Hz
Timing accuracy: ±3 cycles

OVERFREQUENCY MONITORING

Required voltage: 20 V applied
Pickup level: 20 - 70.00 in steps of 0.01 Hz
Dropout level: Pickup -0.03 Hz
Time delay: 0.1 - 10.0 in steps of 0.1 sec
Level accuracy: ±0.02 Hz
Timing accuracy: ±3 cycles

POWER FACTOR MONITORING

Required voltage: 20 V applied
Pickup level: 0.50 lag - 0.50 lead in steps of 0.01
Dropout level: 0.50 lag - 0.50 lead in steps of 0.01
Time delay: 0.5 - 600.0 in steps of 0.5 sec
Timing accuracy: -0/+1 sec

SAMPLING MODES

	SAMPLES/	INPUTS SAMPLED	DURATION
	CYCLE	AT A TIME	(CYCLES)
Metered values	64	ALL	2
Trace memory	16	ALL	continuous
Harmonic spectrum	256	1	1

DEMAND MONITORING

Measured values: Phase A/B/C/N current (A)
 3f real power (kW)
 3f reactive power (kvar)
 3f apparent power (kVA)
Measurement type: Thermal exponential
 90% response time
 (programmable):
 5 - 60 min, steps of 1 min
 Block interval/rolling demand time in interval
 (programmable): 5 - 60 min, steps of 1 min
Pickup level:
 A: 10 - 7,500 in steps of 1
 kW: 0.1 - 6,500.0 in steps of 0.1
 kvar: 0.1 - 6,500.0 in steps of 0.1
 kVA: 0.1 - 6,500.0 in steps of 0.1

METERING

MEASURED VALUES

PARAMETER	ACCURACY (% of full scale)	RESOLUTION	RANGE
Voltage	±0.2%	1 VOLT	20% of VT - 100% of VT
Current	±0.2%	1 A	1% of CT - 150% of CT
Voltage unbalance	±1%	0.1%	0 - 100.0%
Current unbalance	±1%	0.1%	0 - 100.0%
kW	±0.4%	0.01 kW	0 - 999,999.99 kW
kvar	±0.4%	0.01 kvar	0 - 999,999.99 kvar
kVA	±0.4%	0.01 kVA	0 - 999,999.99 kVA
kWh	±0.4%	1 kWh	2 ³² kWh
kvarh	±0.4%	1 kvarh	2 ³² kvarh
kVAh	±0.4%	1 kVAh	2 ³² kVAh
Power factor	1%	0.01	±0.0 - 1.0
Frequency	0.02 Hz	0.01 Hz	20.00 - 70.00 Hz
kw demand	±0.4%	0.1 kw	999,999.99 kw
kvar demand	±0.4%	0.1 kvar	999,999.99 kvar
kva demand	±0.4%	0.1 kva	999,999.99 kva
Amps demand	±0.2%	1 A	0 - 7,500 A
Amps THD	±2.0%	0.1%	0.0 - 100.0%
Volts THD	±2.0%	0.1%	0.0 - 100.0%
Crest factor	±0.4%	-	1 - 9.99

INPUTS

AC CURRENT

Conversion: True RMS, 64 samples/cycle
CT input: 1 A and 5 A secondary
Burden: 0.2 VA
Overload: 20 x CT for 1 sec
 100 x CT for 0.2 sec
 150% of CT
Full scale: up to 32nd harmonic
Frequency: ±0.2% of full scale, true RMS
Accuracy:

AC VOLTAGE

Conversion: True RMS, 64 samples/cycle
VT pri/sec: Direct or 120 - 72,000 : 69 - 240
 20 - 600 VAC
Input range: 150/600 VAC autoscaled
Full scale: <0.1 VA
Burden: up to 32nd harmonic
Frequency: ±0.2% of full scale, true RMS
Accuracy:

SWITCH INPUTS

Type: Dry contact
Resistance: 1,000 Ω max ON resistance
Voltage: 24 VDC @ 2 mA
Duration: 100 ms minimum

ANALOG INPUT

Range: 4 - 20 mA
Accuracy: ±1% of full scale
Relay output: Programmable 4 - 20 mA
Internal burden resistance: 250 Ω

PULSE INPUT

Max inputs: 4
Min pulse width: 150 ms
Min off time: 200 ms

COMMUNICATIONS

COM1/COM2 type: RS485 2-wire, half duplex, isolated
COM3 type: RS232, 9PIN
Baud rate: 1,200 - 19,200 bps
Protocol: ModBus® RTU and DNP 3.0 level 2
Functions: Read/write setpoints
 Read actual values
 Execute commands

POWER SUPPLY

CONTROL POWER

Input: 90 - 300 VDC
 70 - 265 VAC 50/60 Hz
Power: 10 VA nominal, 20 VA maximum
Holdup: 100 ms typical @ 120 VAC/VDC

ENVIRONMENTAL

Operating Temperature: -10C to +60C
Humidity: operating up to 95% (non condensing) @ 55C
Pollution Degree: 2
Ingress Protection: IP40 (front), IP20 (back)

PACKAGING

Shipping box: 8 1/2" L x 6" H x 6" D
 (215 mm x 152 mm x 152 mm)
 5 lbs (2.3 kg)
Ship weight: 5 lbs (2.3 kg)
NOTE: LCD contrast impaired below -20° C

OUTPUTS

ANALOG OUTPUTS

Accuracy: ±1% of full scale reading

	OUTPUT	
	0 - 1 mA (F1 Option)	4 - 20 mA (T20 Option)
Max load	2400 Ω	600 Ω
Max output	1.1 mA	21 mA

Isolation: ± 36 VDC isolated, active source

OUTPUT RELAYS

Voltage	Make/Carry Continuous	Make/Carry 0.2 SEC	Break
Resistive 30 VDC	5	30	5
Resistive 125 VDC	5	30	0.5
Resistive 250 VDC	5	30	0.3
Inductive 30 VDC	5	30	5
Inductive 125 VDC	5	30	0.25
(Vr = 7ms) 250 VDC	5	30	0.15
Resistive 120 VAC	5	30	5
Resistive 250 VAC	5	30	5
Inductive 120 VAC	5	30	5
PF = 0.4 250 VAC	5	30	5
Configuration	FORM C NO/NC		
Contact material	SILVER ALLOY		

PULSE OUTPUT

Parameters: +ve kWh, -ve kWh, +ve kvarh,
 -ve kvarh, kWh
Interval: 1 - 65000 in steps of 1
Pulse width: 100 - 2000 ms in steps of 10 ms
Min pulse interval: 500 ms

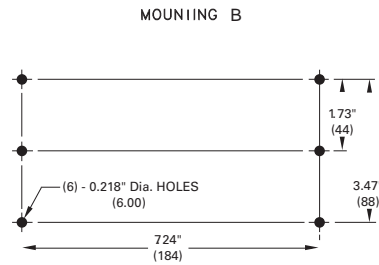
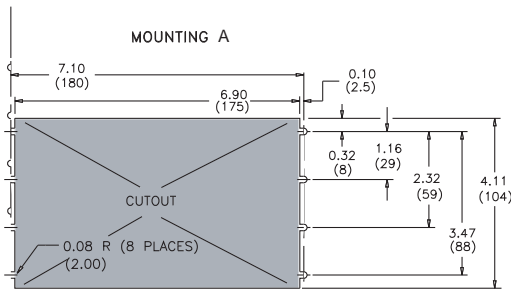
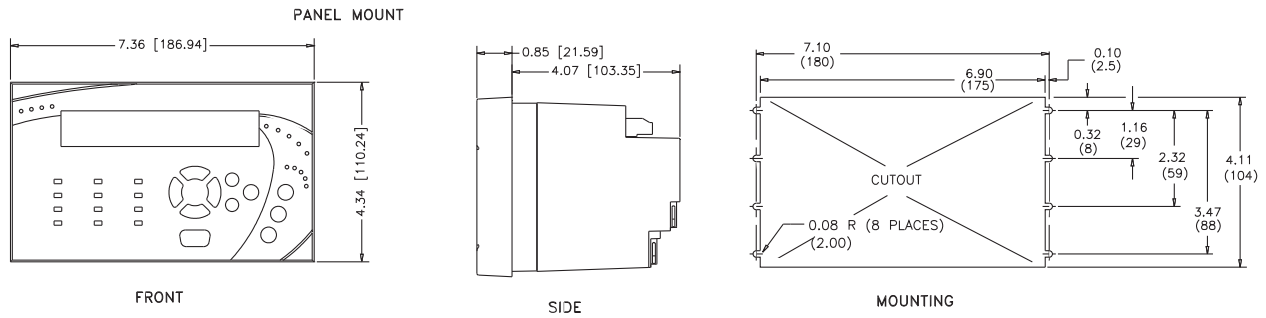
TYPE TESTS

Dielectric voltage withstand: EN60255-5
Impulse voltage withstand: EN60255-5
Insulation resistance: EN60255-5
Damped Oscillator: IEC61000-4-18 / IEC60255-22-1
Electrostatic Discharge: EN61000-4-2 / IEC60255-22-2
RF immunity: EN61000-4-3 / IEC60255-22-3
Fast Transient Disturbance: EN61000-4-4 / IEC60255-22-4
Surge Immunity: EN61000-4-5 / IEC60255-22-5
Conducted RF Immunity: EN61000-4-6 / IEC60255-22-6
Radiated & Conducted Emissions: CISPR11 / CISPR22 / IEC60255-25
Sinusoidal Vibration: IEC60255-21-1
Shock & Bump: IEC60255-21-2
Power magnetic Immunity: IEC61000-4-8
Pulse Magnetic Immunity: IEC61000-4-9
Voltage Dip & interruption: IEC61000-4-11
Ingress Protection: IEC60529
Environmental (Cold): IEC60068-2-1
Environmental (Dry heat): IEC60068-2-2
Relative Humidity Cyclic: IEC60068-2-30
EFT: IEEE / ANSI C37.90.1

APPROVALS

ISO: Manufactured to an ISO9001 registered program
cULus e83849 NKCR/7: UL508, UL1053, C22.2 No 14
CE: EN60255-5, EN61000-6-2

PQM II Dimensions



Ordering

PQM II	*	*	*	Description
PQM II				Basic unit with display, all current/voltage/power measurements, 1-RS485 comm port, 1 RS232 comm port
T20				Transducer option; 4 isolated analog outputs 0 – 20 mA and 4 – 20 mA, assignable to all measured parameters, 4 – 20 mA analog input, 2nd RS485 comm port
T1				Transducer option; 4 isolated analog outputs 0 – 1 mA, assignable to all measured parameters, 4 – 20 mA analog input, 2nd RS485 comm 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)

Modifications:

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

Control Power:

90 – 300 VDC/70 – 265 VAC standard
20 – 60 VDC/20 – 48 VAC (MOD 501)

Accessories for the PQM II:

Multilink Ethernet Switch	ML1600-HI-A2-A2
Multinet	Multinet-FE
Viewpoint Monitoring	VP-1

Visit www.GEMultilin.com/PQM II to:



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