Power metering and monitoring with Modbus RTU

The PM3 is the perfect solution for main, branch circuit and standalone monitoring/metering applications. With information at your fingertips, you can meter, monitor and communicate phase current and voltage with calculated power and energy.

The PM3 is versatile, as it connects to the load side of a molded-case circuit breaker (MCCB) and communicates easily to a local network or the Internet through Eaton Power Xpert® Gateways (PXGs). Cost of ownership is reduced through ease of installation. The PM3 is your ideal MCCB metering solution.

Benefits

- Communicates electrical system data and circuit breaker status
- Meets ANSI C12.1 revenue grade standard with a current and voltage accuracy of 0.5% of reading
- Calculates power and energy to an accuracy of 1.0% of reading
- Configurable with thermal-magnetic or electronic trip units
- Suitable for reverse-feed applications
- Easy to install

PM3 benefits when combined with 310+ electronic trip unit

- Alarming: high load and ground fault
- Zone selective interlocking
- Arcflash Reduction Maintenance System™
- Cause-of-trip localized information through Digiview and TRIP-LED
- Modbus®/INCOM™ communications
- HMI connectivity through PXG
- Current and voltage metering to 0.5% of reading
- Power and energy monitoring to 1.0% of reading
- Reduces cost of ownership

Functions

- Communications via Modbus and Eaton's INCOM protocol; compatible with Eaton's PXG for Web page and Ethernet capabilities
- Works in 240 Vac PM3, 480 Vac and 600 Vac applications
  - 480 Vac PM3 has internal power supply to power electronics (INCOM only)
  - 600 Vac PM3 requires 24 Vdc auxiliary power
- Seamlessly integrates with thermal-magnetic or electronic trip units

Product selection

	Catalog Number	
Frame	480V	600V
Modbus		
FD	—	PM3FM
JG	—	PM3JM
KD and LG	—	PM3LM
INCOM		
FD	PM3FI480	PM3FI600
JG	PM3JI480	PM3JI600
KD and LG	PM3LI480	PM3LI600

Metered parameters

- I_A, I_B, I_C
- V_{AB}, V_{BC}, V_{CA}, V_{an}, V_{bn}, V_{cn}
- Apparent Energy, Forward Real Energy, Reverse Real Energy, Net Real Energy, Lagging Reactive Energy, Leading Reactive Energy, Net Reactive Energy
- Apparent Power A, B, C; Apparent Power Total; Reactive Power A, B, C; Reactive Power Total; Real Power A, B, C; Real Power Total
- Frequency, Apparent Power Factor, Apparent PFA, Apparent PFB, Apparent PFC

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PM3 power monitoring and communications module technical specifications for Modbus RTU

Current Inputs

Pickup current	0.3A rms
Maximum reported current	FD/JG 250A rms KD/LD 630A rms
Accuracy	0.5% of reading

Voltage Inputs

Range	Line-to-neutral 30–366 Vac Line-to-line 52–635 Vac
Supported systems	Three-element wye, three-element wye + neutral Two-element delta, four-wire delta systems
Input impedance	996 kiloohm/phase
Burden per phase	0.36 VA/phase max. at 600V; 0.014 VA at 120V
Phase voltage connections	Internal via screw terminal to busbar. For wye system, a neutral is required to be connected to the PM3 on the right Phoenix connector.
Neutral connection	If neutral is not available, the meter will calculate a virtual neutral based on the phase-to-phase rms voltage. The system voltage must be balanced for this to be accurate.

Frequency

Frequency	50/60 Hz
Accuracy	±0.1 Hz
Resolution	0.1 Hz

Power and Energy

Accuracy	1% of reading (ANSI C12.1)

Isolation

All inputs and outputs are galvanically isolated to 2500V

Environmental Ratings

Operating temperature	−20°C to +50°C
Storage temperature	−20°C to +50°C
Operating humidity	5 to 95% RH noncondensing

Sensing Method

Voltage, current	True rms
Sampling rate	13.02K samples per second

Update Rate

Watts, VAR and VA	1.03 sec at 60 Hz
All other parameters	1.07 sec at 60 Hz

Power Supply (External)

DC voltage	18–30 Vdc
Maximum current	30.0 mA at 24 Vdc
Burden	0.72W

Standard Communication Format

Connection type	Three-wire RS-485 (A, B, common)	
Com port baud rate	9600 or 19,200 bauds	Default: 19,200 bauds
Modbus address range	01–247	
Data format	Selectable (8, N, 1 | 8, N, 2 | 8, Even, 1 | 8, Odd, 1)	Default: 8, N, 2
Protocol	Modbus RTU	
Internal termination resistor selectable ON or OFF	Via DIP switch	Default: Enabled

Dimensions and weights

Breaker Type	Weight in Lbs (kg)	Basic Unit in Inches (mm) (W x L x H)	Shipping Container Dimensions in Inches (mm)
FD	1.26 (0.57)	4.13 x 5.00 x 3.39 (104.90 x 127.00 x 86.11)	8.00 x 5.13 x 5.50 (203.20 x 130.30 x 139.70)
JG	1.60 (0.73)	4.13 x 5.00 x 3.39 (104.90 x 127.00 x 86.11)	8.00 x 5.13 x 5.50 (203.20 x 130.30 x 139.70)
KD/LG	2.25 (1.02)	5.48 x 3.70 x 4.062 (139.19 x 93.98 x 103.17)	6.25 x 8.25 x 7.00 (158.75 x 209.55 x 177.80)

Standards and certifications

UL® 489, Annex J
IEC 61000-4-2—ESD
IEC 61000-4-4—EFT
IEC 61000-4-5—SURGE
IEC 61000-4-6—EMC
ANSI C12.1 (1% accuracy)
UL/cUL®/CE

F·T·N

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