PWRM20-01: IoT Energy Monitoring Module

High-accuracy, Rugged, *Instrument Class*®, Energy Monitoring Module

DESCRIPTION

The PWRM20-01 energy monitoring module is an IoT universal, high-accuracy, compact, self-powered, electrical energy measurement device that interfaces to three-phase and single-phase systems. Specifically designed for industrial and commercial heavy-duty new and retrofit applications, the module provides a wide range of highly accurate power and energy measurement values over an operating temperature range of –40°C to +85°C.

The DIN-rail mounted enclosures have pluggable terminal blocks for connecting to phase voltages and phase currents which simplifies setup and maintenance, and the small format requires little space in control cabinets. The PWRM20-01 module interfaces to phase voltages of 85–525VAC, 50/60Hz, and is self-powered from any of the lines. Higher voltages can be interfaced to with the use of voltage transformers (VT) and appropriate scaling factors in the module.

Phase current inputs have an industry-standard range of 0.333VAC full-scale. An external shunt, current transformer, or Rogowski Coil is required to measure currents directly or non-contact.

The PWRM20-01 module measures and reports a wide range of electrical energy parameters.

Real-time data from the module is accessed via an Ethernet TCP/IP port using the HTTP API and a standard web browser on a host computer, smartphone, or tablet. Data logging is user-configurable and once parameters and ranges are selected, the data is automatically downloaded and stored.

FEATURES

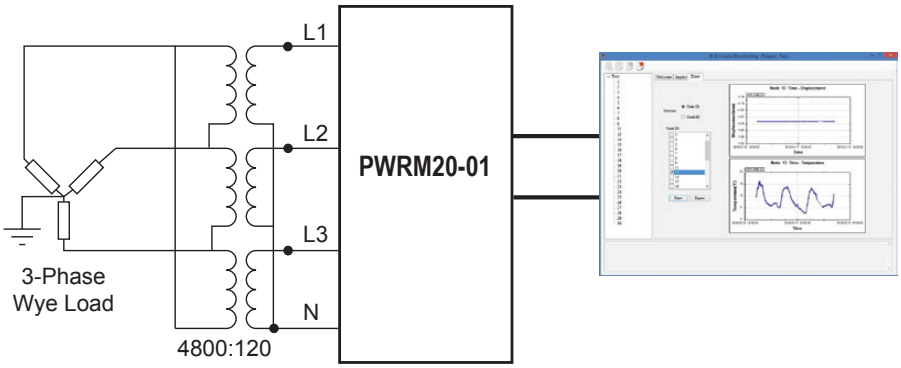
- RMS Voltages and Currents
- Phase Angles
- Line Periods
- Instantaneous Total Active Power
- Instantaneous Total Apparent Power
- Fundamental Active Power
- Power Factors
- Total Active Energy
- Fundamental Active Energy
- Fundamental Reactive Energy
- Total Apparent Energy
- Harmonics
- Power Quality
  - Over-voltage
  - Over-current
  - Sag

BENEFITS

- Power Quality Measurement
- Energy Consumption Monitoring
- Machine Health Monitoring
- Powerful Data Analysis
- User-friendly and Feature-rich IoT Module
- Withstands Harsh Environments
- High-level Noise Immunity

APPLICATIONS

- Energy Metering Systems
- Power Quality Monitoring
- Solar Monitoring
- Process Monitoring
- Health of Machine
- Predictive Maintenance
- Retrofit Applications in Energy Distribution and Industry



A PT with secondary Line-to-Neutal voltage of 120VAC and a step-down ratio of 4800:120 = 40 is used to connect the PWRM10-01 or PWRM20-01 to a utility voltage of 4800VAC. 120VAC is compatible with both modules.

Example shown, for more connectivity options, see PWRM User Manual MA1068

PWRM20-01 Block Diagram

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Electrical Specifications Typical* at T_A = +25°C

Module	PWRM20-01
Phase Voltage Range	85-525VAC
Phase Frequency	50/60Hz Input
Dimensions (h)(w)(d)	4.24" x 0.89" x 4.48" (107.7mm x 22.6mm x 113.7mm)
Material	Polyamide
Mounting	DIN-rail
Weight	0.4lb (0.18kg)
Electrical System	
Voltage Measurement (Direct Connection or VT)	Single-phase (2-wire) Two-phase (3-wire) Three-phase Wye (3-wire) Three-phase Delta (3-wire) Three-phase Wye (4-wire) Three-phase Delta (4-wire)
Current Measurement	Shunt, CT, or Rogowski Coil
Measured Parameters and Accuracy	
RMS Voltage	±0.1% of Full-scale Range
RMS Current	±0.1% of Full-scale Range
Active Power	±0.2%
Apparent Power	±0.2%
Reactive Power	±0.2%
Power Factor	±0.2%
Frequency Range	45 – 65Hz
Active Energy	±0.25%
Apparent Energy	±0.25%
Fundamental Active and Reactive Energy	±0.25%
Phase Angles	±0.1%
Line Periods	±0.1%
Measurement Bandwidth	
RMS Voltage and Current (–3dB)	3.3kHz
Total Active Energy (–3dB)	3.3kHz
Fundamental Reactive Energy (–3dB)	3.3kHz
Harmonic (–3dB)	3.3kHz (2.8kHz No Attenuation Pass Band)
Temperature Drift	
	±100ppm/°C
Events	
	Over-voltage, Over-current, Sag
Security	
	Password for Access Control
Data Logging	
	Configurable; Automatic Download and Storage
Communications Interface	
Connectivity Type	Ethernet, TCP/IP
IP Configuration	DHCP, Static IP
Port	Selectable (Default 80)
Number of Simultaneous Connections	6
Protocol	HTTP API
Power Supply	
Source	Self-powered from Any Line
Wide Range Power Supply	85-525VAC
Power Consumption	1.7W
Frequency	50 / 60Hz
Environmental	
Operating Temperature	–40°C to +85°C
Storage Temperature	–40°C to +85°C
Relative Humidity	0 to 95%, Non-Condensing
Compliance and Conformity	
Emissions, EN61000-6-4	ISM Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM Group 1
RF	Performance A ± 2% Span Error
ESD, EFT	Performance B
Certifications & Approvals	Heavy Industrial CE

NOTES:
* Contact factory for maximum values.

ATTENTION

Read, understand, and follow all instructions in the Quick Start Guide and Hardware User Manual, including all warnings, cautions, and precautions before installing and using.

PWRM20-01 module literature and software is available for download from the PWRM10-01 Software & User Download Center.

MA1069 PWRM10-01 & PWRM20-01 Quick Start Guide

MA1068 PWRM10-01 & PWRM20-01 Hardware User Manual

MA1067 PWRM10-01 & PWRM20-01 HTTP API User Manual

Ordering Information

Model	Description
PWRM20-01	85-525VAC, 50/60Hz Input

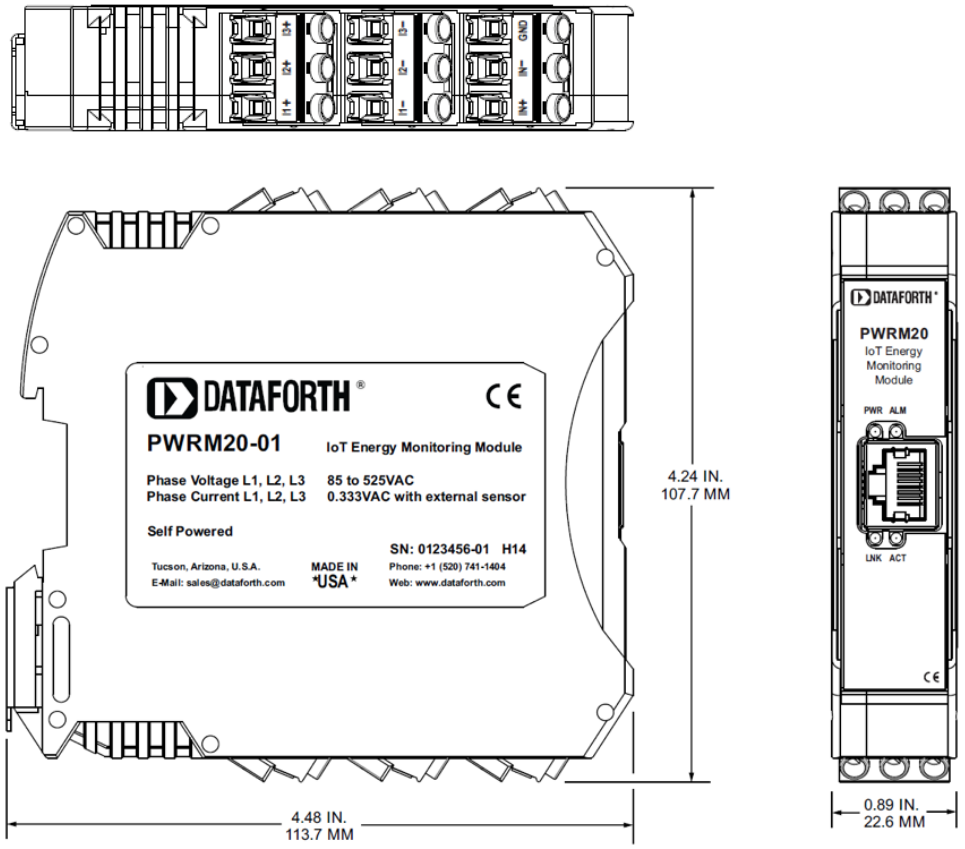
CAUTION – RISK OF ELECTRICAL SHOCK

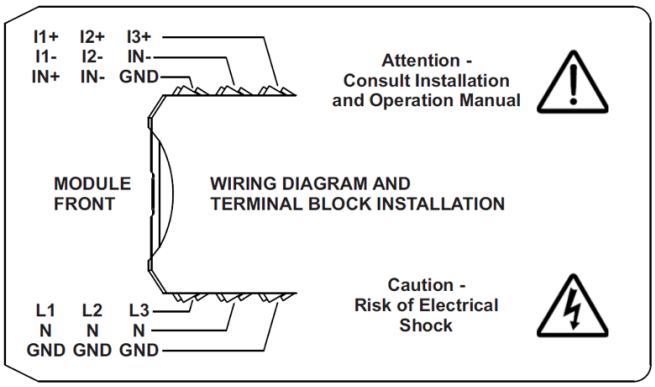
When installing and operating the PWRM20-01 module, there is a potential for shock hazard from dangerous high-voltage. Ensure systems are de-energized before installing or removing the terminal blocks.

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Module Dimensions and Pinouts





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