

# PWRM20-01: IoT Energy Monitoring Module

High-Accuracy, Rugged, Instrument Class®, Energy Monitoring Module

## DESCRIPTION

The Energy Monitoring Module PWRM20-01 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 0VAC to 0.333VAC. An external shunt, current transformer, or Rogowski Coil is required to measure currents directly or non-contact.



Figure 1: PWRM20-01 Module

## FEATURES

The PWRM20-01 module measures and reports a wide range of electrical energy parameters which include, but are not limited to:

- |                                      |                               |
|--------------------------------------|-------------------------------|
| • RMS Voltages and Currents          | • Total Active Energy         |
| • Phase Angles                       | • Fundamental Active Energy   |
| • Line Periods                       | • Fundamental Reactive Energy |
| • Instantaneous Total Active Power   | • Total Apparent Energy       |
| • Instantaneous Total Apparent Power | • Harmonics                   |
| • Fundamental Active Power           | • Power Quality               |
| • Power Factors                      | - Over-Voltage                |
|                                      | - Over-Current                |
|                                      | - Sag                         |

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.

## BENEFITS

Measuring power quality, monitoring energy consumption, determining machine health, and performing other powerful data analysis turn into simple and easy operations with this user friendly and feature rich IoT energy monitoring module.

## APPLICATIONS

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

The PWRM20-01 module is designed for installation in harsh industrial environments and has a high-level of noise immunity.

## Ordering Information

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

**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 [PWRM20-01 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](#)

**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 product.

**Electrical Specifications** Typical\* at  $T_A = +25^\circ\text{C}$ 

<b>Module</b>	<b>PWRM20-01</b>	<b>Temperature Drift</b>
Phase Voltage Range	85 – 525VAC	$\pm 100\text{ppm}/^\circ\text{C}$
Phase Frequency	50/60Hz Input	
Dimensions (h)(w)(d)	4.01" x 0.89" x 5.04" 102mm x 22.6mm x 128mm	
Material	Polyamide	
Mounting	DIN Rail	
Weight	0.3lb (0.14kg)	
<b>Electrical System</b>		<b>Data Logging</b>
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)	Configurable; Automatic Download and Storage
Current Measurement	Shunt, CT, or Rogowski Coil	
<b>Measured Parameters and Accuracy</b>		<b>Communications Interface</b>
RMS Voltage	$\pm 0.1\%$ of Full-Scale Range	Connectivity Type
RMS Current	$\pm 0.1\%$ of Full-Scale Range	IP Configuration
Active Power	$\pm 0.2\%$	Port
Apparent Power	$\pm 0.2\%$	Number of Simultaneous Connections
Reactive Power	$\pm 0.2\%$	Protocol
Power Factor	$\pm 0.2\%$	
Frequency Range	45 – 65Hz	<b>Power Supply</b>
Active Energy	$\pm 0.25\%$	Source
Apparent Energy	$\pm 0.25\%$	Wide Range Power Supply
Fundamental Active & Reactive Energy	$\pm 0.25\%$	Power Consumption
Phase Angles	$\pm 0.1\%$	Frequency
Line Periods	$\pm 0.1\%$	
<b>Measurement Bandwidth</b>		<b>Environmental</b>
RMS Voltage & Current (-3dB)	3.3kHz	Operating Temperature
Total Active Energy (-3dB)	3.3kHz	Storage Temperature
Fundamental Reactive Energy (-3dB)	3.3kHz	Relative Humidity
Harmonic (-3dB)	3.3kHz (2.8kHz No Attenuation Pass Band)	
		<b>Compliance and Conformity</b>
		<b>Emissions, EN61000-6-4</b>
		Radiated, Conducted
		ISM Group 1
		Class A
		<b>Immunity EN61000-6-2</b>
		RF
		ESD, EFT
		ISM Group 1
		Performance A $\pm 2\%$ Span Error
		Performance B
		Heavy Industrial CE
		<b>Certifications &amp; Approvals</b>

NOTES: \* Contact factory for maximum values.