

# WATTSON®-MARK II

## **PRECISION ENERGY METER**

The WattsOn-Mark II Precision Energy Meter uses cutting-edge metering technology to provide unprecedented accuracy, resolution and metering performance for any electrical installation. WattsOn monitors each phase individually and incorporates the functions of single-phase, split-phase, and three-phase meters.

#### **FEATURES:**

- ♦ ANSI C12.1-2022 Class 0.1 Accuracy, Four-Quadrant
- ♦ California CSI PBI Eligible
- ♦ High-Resolution Power and Energy measurements
- Fast update (100ms) for all power readings
- Per phase instantaneous and accumulated data
- Ultra-High Dynamic Range simplifies CT options
- ♦ Compatible with mV, mA, 5A and Rogowski Coil Inputs
- ♦ Digital communication via RS-485 (Modbus/RTU or BACnet MS/TP)
- Customizable Modbus Register Map
- Compatible with common Solar Industry Modbus Specifications
- ♦ Alarm / Pulse Outputs
- ♦ DIN and wall-mount enclosure
- Optional Display with Datalogging and Real-Time Clock
- Optional Ethernet with Modbus/TCP, BACnet/IP or web server with user configurable POST capability





The WattsOn-Mark II Precision Energy Meter utilizes advanced metering technology to implement a multi-function power and energy meter into a small, cost-effective package. WattsOn-Mark II provides a unique solution for monitoring virtually any wiring installation including single phase, split phase and three phase loads. It accepts up to 600V (line-to-line) directly, without the need for potential transformers. It may be configured for use with industry standard 5A CTs, 333mV CTs, mA CTs (such as Elkor's line of "safe" mA split and solid core CTs) or Rogowski Coil flexible CTs.

The WattsOn-Mark II offers full four-quadrant metering. All parameters are metered and accumulated on a per-phase basis. Instantaneous power (W, VA, VAR) feature a high update rate (100ms), other parameters are updated every 500ms. The high sampling rate, true-RMS inputs may be used even with distorted waveforms, such as those generated by variable frequency drives and SCR loads, up to the 30th harmonic.

The meter provides comprehensive per phase data, including Volts, Amps, Real Power, Reactive Power, Apparent Power, Voltage Angle, Power Factor and Frequency, Quadrant, Import/Export/Net Wh/VAh and per Quadrant VARh.

All models include Ultra-High Resolution and Dynamic Range. This feature allows mA input meters to be user configured and no longer requires the CT model and ratio to be specified at the time of ordering, simplifying meter and CT selection. The wide dynamic range of the current inputs ensures high accuracy and resolution even at very low measurements. Precise CT ratios and phase compensation may be field programmed for ultimate accuracy. Additionally, the meter may be configured with individual CT ratios per-phase, allowing for metering asymmetrical loads such as individual building branch circuits.

Measurements are available via the RS-485 output port (Modbus/RTU or BACnet MS/TP). In addition, two solid-state relay outputs are provided and may be software configured for pulse, status or alarm triggers, on any measured parameter. An onboard graphic LCD display, real-time clock and data logging are available as an option.

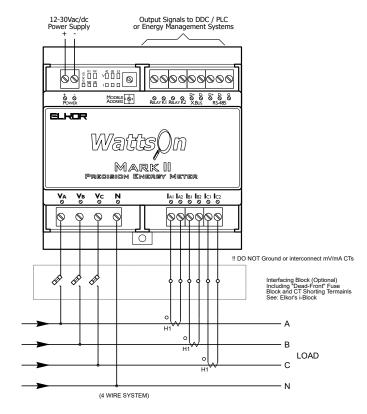
The meter may be optionally equipped with an integrated BACnet/IP gateway, or an ETnet (Ethernet module providing Modbus/TCP, web server, as well as HTTP post capability).



# WATTSON®-MARK II

SPECIFICATIONS:   INPUTS								
Power Supply   12-30 VDC or 24 VAC, < 2VA	SPECIFICATIONS:							
Power Supply   12-30 VDC or 24 VAC, < 2VA	INDITS							
Supported Wiring Types         Up to 347/600V Delta, Wye Single-phase installations up to 347V RMS split-phase (two phase) installations           Frequency         40-70 Hz nominal (30-300 Hz max)           Voltage         20Vac - 347Vac L-N (600Vac L-L), (450Vac L-N, 780V L-L absolute max.)           Current         -5A Model         -mA Model         -mV Model         -RC/-RCH Model (Rogowski Coils)           Input (10A max)         5A nominal (200mA)         333mV (Rogowski Coils)           Input Impedance         Voltage: AWG 30-12, (AWG 16-22 recommended) (Rogowski Coils)           Wire Size         Voltage: AWG 30-12, (AWG 16-22 recommended for 5A CTs)           Overload         20% continuous (voltage & current) maintaining full accuracy: 100% momentary current overload.           OUTPUTS           Modbus/RTU (-M1)         RS-485 2-wire, 9600 to 230400 baud           BACnet MS/TP (-M2)         RS-485 2-wire, 9600 to 115200 baud           Relay         2x Solid-State Relay Outputs (100 mA @ 50V max)           User Programmable for alarm, status or pulse output           Indicators         LED indication of: Voltage, Current, Power, Output relay state, Status, Communication           Display & Datalogging (-D1)         Back-lit Graphic LCD Display 128x32           Charmacy         Back-lit Graphic LCD Display 128x32           Wist on-board flash with battery backed RTC. Configurable to log any metering	Dower Supply							
Wiring Types				·	-			
Split-phase (two phase) installations			-	• •				
Voltage	willing Types		• .					
Voltage	Frequency							
Current         -5A Model         -mA Model         -mV Model         -RC/-RCH Model           Input Rating         5A nominal         200MA         (400mV max)         333mV         360mV/720mV           Input Rating         0.05Ω max         1.5Ω typ.         800kΩ min, 1.2MΩ typ.         600kΩ min, 600kΩ min, 1.2MΩ typ.           Input Impedance         Voltage: AWG 30-12, (AWG 16-22 recommended)         Current: AWG 24-12, (AWG 16-12-16 recommended for 5A CTs)           Overload         20% continuous (voltage & current) maintaining full accuracy. 100% momentary current overload.         0UTPUTS           Modbus/RTU (-M1)         RS-485 2-wire, 9600 to 230400 baud         BACnet MS/TP (-M2)         RS-485 2-wire, 9600 to 115200 baud           Expansion Bus         RS-485 2-wire, 9600 to 115200 baud         Expansion Bus         RS-485 2-wire, 9600 to 115200 baud           Relay         2x Solid-State Relay Outputs (100 mA @ 50V max)         User Programmable for alarm, status or pulse output           Indicators         LED indication of: Voltage, Current, Power, Output relay state, Status, Communication         Expansion Bus           Display & Datalogging (-DL)         Back-lit Graphic LCD Display 128x32         2MB on-board flash with battery backed RTC. Configurable to log any metering parameter           Ethernet/WiFi (-E4)         ETport—Ethernet & WiFi module (integrated) Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP pOST, SSL		, ,						
Input Rating   SA nominal (10A max)   (mA output CTs)   (400mV max)   (80gowski Coils)								
(10A max)	Current							
Input   Mode	Input Rating			200mA	333mV	360mV/720mV		
Impedance         L.2MΩ typ.           Wire Size         Voltage: AWG 30-12, (AWG 16-22 recommended)           Overload         20% continuous (voltage & current) maintaining full accuracy. 100% momentary current overload.           OUTPUTS           Modbus/RTU (-M1)         RS-485 2-wire, 9600 to 230400 baud           BACnet MS/TP (-M2)         RS-485 2-wire, 9600 to 115200 baud           Expansion Bus         RS-485 2-wire, 9600 to 1230400 baud           Relay         2x Solid-State Relay Outputs (100 mA @ 50V max)           User Programmable for alarm, status or pulse output           Indicators         LED indication of: Voltage, Current, Power, Output relay state, Status, Communication           Display & Datalogging (-DL)         Back-lif Graphic LCD Display 128x32           Vambor - Ethernet & WiFi module (integrated)         Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP poort, SL           Ethernet/WiFi (-E4)         ETport—Ethernet & WiFi module (integrated)           Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP poort, SL         ACCURACY           Standards         ANSI C12.1-2022 Class 0.1 Accuracy           Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-22, and IEC 62053-22, and IEC 62053-23 standards.           Current (A)         0.05% typ         0.19% max           Voltage, L-I (V)         0.19% typ         0.29% max		(10A max)		(mA output CTs)	(400mV max)	(Rogowski Coils)		
Wire Size Voltage: AWG 30-12, (AWG 16-22 recommended) Current: AWG 24-12, (AWG 12-16 recommended for 5A CTs)  Overload 20% continuous (voltage & current) maintaining full accuracy. 100% momentary current overload.  OUTPUTS  Modbus/RTU (-M1) RS-485 2-wire, 9600 to 230400 baud BACnet MS/TP (-M2) RS-485 2-wire, 9600 to 115200 baud Expansion Bus RS-485 2-wire, for accessory expansion  Relay 2x Solid-State Relay Outputs (100 mA @ 50V max) User Programmable for alarm, status or pulse output Indicators LED indication of: Voltage, Current, Power, Output relay state, Status, Communication  Display & Datalogging (- DL) Back-lit Graphic LCD Display 128x32 2MB on-board flash with battery backed RTC. Configurable to log any metering parameter  Ethernet/WiFi (-E4) ETport—Ethernet & WiFi module (integrated) Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP POST, SSI.  ACCURACY  Standards ANSI C12.1-2022 Class 0.1 Accuracy Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-23 standards.  Current (A) 0.05% typ 0.1% max  Voltage, L-N (V) 0.1% typ 0.2% max  Voltage, L-I (V) 0.1% typ 0.2% max  Frequency 0.1% max  Frequency	· -	0.05Ω max		1.5Ω typ.		600kΩ min.		
Current: AWG 24-12, (AWG 12-16 recommended for 5A CTs)  Overload  20% continuous (voltage & current) maintaining full accuracy. 100% momentary current overload.  **Tourner Course Cours	•			* * * * * * * * * * * * * * * * * * * *				
Now momentary current overload.   OUTPUTS	Wire Size					•		
Modbus/RTU (-M1)  BACnet MS/TP (-M2)  RS-485 2-wire, 9600 to 230400 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  Input Bandwidth  Expansion Bus  RS-485 2-wire, 9600 to 115200 baud  Expansion Bus  Relay  Undre (every 100ms) for instantaneous W, VA, VAR 2bt (every 500ms) for all other parameters  Michael Bus and	Overload	20% con	tinuc	· · · · · · · · · · · · · · · · · · ·				
Modbus/RTU (-M1)	, ,				load.			
Modbus/RTU (-M1)	OUTPUTS							
RS-485 2-wire, 9600 to 115200 baud	Modbus/RTU (-M1)		RS-4					
RS-485 2-wire, for accessory expansion   Relay			_					
User Programmable for alarm, status or pulse output								
LED indication of: Voltage, Current, Power, Output relay state, Status, Communication	Relay	•						
state, Status, Communication  Display & Datalogging (- DL)  Back-lit Graphic LCD Display 128x32  2MB on-board flash with battery backed RTC. Configurable to log any metering parameter  Ethernet/WiFi (-E4)  ETport—Ethernet & WiFi module (integrated) Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP POST, SSL  ACCURACY  Standards  ANSI C12.1-2022 Class 0.1 Accuracy Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-23 standards.  Current (A)  0.05% typ  0.1% max  Voltage, L-N (V)  0.1% typ  0.2% max  Power (W, VA, VAR) 0.1% typ  0.2% max  Power Factor  Frequency  10-1% typ  Data Update Frequency  10-16 (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions  4.2" x 4.3" x 2.4" W x L x H  Mass  0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature  40°C to +70°C  Humidity  10 to 90% non-condensing  COMPLIANCE  Safety  UL Listed (#E250395)  Isolation  3,500VAC (min) input-to-output								
Back-lit Graphic LCD Display 128x32   2MB on-board flash with battery backed RTC.   Configurable to log any metering parameter				9 ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '				
C-DL   2MB on-board flash with battery backed RTC. Configurable to log any metering parameter								
Configurable to log any metering parameter  Ethernet/WiFi (-E4)  ETport—Ethernet & WiFi module (integrated) Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP POST, SSL  ACCURACY  Standards  ANSI C12.1-2022 Class 0.1 Accuracy  Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-23 standards.  Current (A)  0.05% typ  0.1% max  Voltage, L-N (V)  0.1% typ  0.2% max  Power (W, VA, VAR)  Power (W, VA, VAR)  Power Factor  Frequency  10.1% typ  0.2% max  Frequency  10.1% typ  0.2% max  Frequency  10.1% typ  10.2% max  Frequency  10.1% typ  10.2% max  Frequency  10.1% typ  10.2% max  Frequency  10.1% typ  10.1% typ  10.2% max  Frequency  10.1% max  Frequency  10.1% max  Input Bandwidth  2 kHz  (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)  10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions  4.2" x 4.3" x 2.4" W x L x H  Mass  0.15 kg (-mA and -mV models)  0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount  3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature  40°C to +70°C  Storage Temperature  40°C to +70°C	(- DL) 2N			• • •				
Ethernet/WiFi (-E4)  ETport—Ethernet & WiFi module (integrated) Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP POST, SSL  ACCURACY  Standards  ANSI C12.1-2022 Class 0.1 Accuracy  Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-23 standards.  Current (A)  0.05% typ  0.1% max  Voltage, L-N (V)  0.1% typ  0.2% max  Voltage, L-L (V)  0.1% typ  0.2% max  Power (W, VA, VAR)  Energy  0.1% typ  0.2% max  Frequency  0.1% typ  0.2% max  Input Bandwidth  2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)  Data Update Frequency  10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions  4.2" x 4.3" x 2.4" W x L x H  Mass  0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature  -40°C to +70°C  Storage Temperature  -40°C to +70°C  Humidity  UL Listed (#E250395)  Isolation  3,500VAC (min) input-to-output				•				
Modbus/TCP, BACnet/IP, MQTT, Webserver, HTTP   POST, SSL								
POST, SSL				, , ,				
ANSI C12.1-2022 Class 0.1 Accuracy								
Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-23 standards.  Current (A)  0.05% typ  0.1% max  Voltage, L-N (V)  0.1% typ  0.2% max  Power (W, VA, VAR)  Energy  0.1% typ  0.2% max  Power Factor  0.2% max  Frequency  10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions  4.2" x 4.3" x 2.4" W x L x H  Mass  0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature  40°C to +70°C  Storage Temperature  40°C to +70°C  Humidity  10 to 90% non-condensing  COMPLIANCE  Safety  UL Listed (#E250395)  Isolation  3,500VAC (min) input-to-output								
IEC 62053-22, and IEC 62053-23 standards.	Standards			ANSI C12.1-2022 Class 0.1 Accuracy				
IEC 62053-22, and IEC 62053-23 standards.								
Current (A)         0.05% typ         0.1% max           Voltage, L-N (V)         0.1% typ         0.2% max           Voltage, L-L (V)         0.1% typ         0.2% max           Power (W, VA, VAR)         0.1% typ         0.2% max           Energy         0.1% typ         0.2% max           Power Factor         0.2% max           Frequency         0.01% max           Input Bandwidth         2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)           Data Update Frequency         10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters           MECHANICAL           Dimensions         4.2" x 4.3" x 2.4" W x L x H           Mass         0.15 kg (-mA and -mV models)           0.23 kg (-5A-DL model)           Mounting         DIN Rail Mount 3-point screw wall mount           ENVIRONMENTAL (Protected Installation)           Operating Temperature         -40°C to +70°C           Storage Temperature         -40°C to +70°C           Humidity         10 to 90% non-condensing           COMPLIANCE           Safety         UL Listed (#E250395)           Isolation				· · · · · · · · · · · · · · · · · · ·				
Voltage, L-N (V)         0.1% typ         0.2% max           Voltage, L-L (V)         0.1% typ         0.2% max           Power (W, VA, VAR)         0.1% typ         0.2% max           Energy         0.1% typ         0.2% max           Power Factor         0.2% max           Frequency         0.01% max           Input Bandwidth         2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)           Data Update Frequency         10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters           MECHANICAL           Dimensions         4.2" x 4.3" x 2.4" W x L x H           Mass         0.15 kg (-mA and -mV models)           0.23 kg (-5A-DL model)           Mounting         DIN Rail Mount 3-point screw wall mount           ENVIRONMENTAL (Protected Installation)           Operating Temperature         -40°C to +70°C           Storage Temperature         -40°C to +70°C           Humidity         10 to 90% non-condensing           COMPLIANCE           Safety         UL Listed (#E250395)           Isolation				i I				
Voltage, L-L (V)         0.1% typ         0.2% max           Power (W, VA, VAR)         0.1% typ         0.2% max           Energy         0.1% typ         0.2% max           Power Factor         0.2% max           Frequency         0.01% max           Input Bandwidth         2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)           Data Update Frequency         10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters           MECHANICAL           Dimensions         4.2" x 4.3" x 2.4" W x L x H           Mass         0.15 kg (-mA and -mV models)           0.23 kg (-5A-DL model)           Mounting         DIN Rail Mount 3-point screw wall mount           ENVIRONMENTAL (Protected Installation)           Operating Temperature         -40°C to +70°C           Storage Temperature         -40°C to +70°C           Humidity         10 to 90% non-condensing           COMPLIANCE           Safety         UL Listed (#E250395)           Isolation         3,500VAC (min) input-to-output				0.05% typ	)	0.1% max		
Power (W, VA, VAR) Energy  0.1% typ 0.2% max  Power Factor  0.2% max  Frequency 0.01% max  Input Bandwidth 2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)  Data Update Frequency 10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions 4.2" x 4.3" x 2.4" W x L x H  Mass 0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature 40°C to +70°C  Storage Temperature 40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395) Isolation 3,500VAC (min) input-to-output								
Energy 0.1% typ 0.2% max  Power Factor 0.2% max  Frequency 0.01% max  Input Bandwidth 2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)  Data Update Frequency 10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions 4.2" x 4.3" x 2.4" W x L x H  Mass 0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395)  Isolation 3,500VAC (min) input-to-output				0.1% typ				
Power Factor 0.2% max  Frequency 0.01% max  Input Bandwidth 2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)  Data Update Frequency 10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions 4.2" x 4.3" x 2.4" W x L x H  Mass 0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395)  Isolation 3,500VAC (min) input-to-output				0.1% typ		0.2% max		
Trequency	<u> </u>							
Input Bandwidth  2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)  Data Update Frequency 10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions 4.2" x 4.3" x 2.4" W x L x H  Mass 0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature 40°C to +70°C  Storage Temperature 40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395) Isolation 3,500VAC (min) input-to-output								
(33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)  Data Update Frequency  10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions  4.2" x 4.3" x 2.4" W x L x H  Mass  0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature  -40°C to +70°C  Storage Temperature  40°C to +70°C  Humidity  10 to 90% non-condensing  COMPLIANCE  Safety  UL Listed (#E250395)  Isolation  3,500VAC (min) input-to-output	•							
Data Update Frequency	input Bandwidth							
2Hz (every 500ms) for all other parameters  MECHANICAL  Dimensions 4.2" x 4.3" x 2.4" W x L x H  Mass 0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395)  Isolation 3,500VAC (min) input-to-output	Data Undata Fraguency							
MECHANICAL  Dimensions 4.2" x 4.3" x 2.4" W x L x H  Mass 0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395)  Isolation 3,500VAC (min) input-to-output	Data Opuate Frequency							
Dimensions  4.2" x 4.3" x 2.4" W x L x H  Mass  0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395) Isolation 3,500VAC (min) input-to-output								
Mass  0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395)  Isolation  3,500VAC (min) input-to-output	MECHANICAL							
0.23 kg (-5A-DL model)  Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395) Isolation 3,500VAC (min) input-to-output	Dimensions							
Mounting  DIN Rail Mount 3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature  -40°C to +70°C  Storage Temperature  -40°C to +70°C  Humidity  10 to 90% non-condensing  COMPLIANCE  Safety  UL Listed (#E250395)  Isolation  3,500VAC (min) input-to-output	Mass							
3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature				0.23 kg (-5A-DL model)				
3-point screw wall mount  ENVIRONMENTAL (Protected Installation)  Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395)  Isolation 3,500VAC (min) input-to-output	Mounting			DIN Rail Mount				
Operating Temperature -40°C to +70°C  Storage Temperature -40°C to +70°C  Humidity 10 to 90% non-condensing  COMPLIANCE  Safety UL Listed (#E250395)  Isolation 3,500VAC (min) input-to-output								
Storage Temperature	ENVIRONMENTAL (Protected Installation)							
Humidity	Operating Temperature -40°C to +70°C							
COMPLIANCE Safety UL Listed (#E250395) Isolation 3,500VAC (min) input-to-output		•		-40°C to +70°C				
COMPLIANCE Safety UL Listed (#E250395) Isolation 3,500VAC (min) input-to-output				10 to 90% non-condensing				
Isolation 3,500VAC (min) input-to-output								
	Safety							
Electromagnetic Emissions FCC part 15 Class B	Isolation			3,500VAC (min) in	put-to-output			

#### **TYPICAL WIRING:**



### MEASURED PARAMETERS (available via Modbus)

Voltage [V] (A, B, C, Avg, AB, AC, BC, Avg)
Current [A] (A, B, C, Avg)
Active Power [W] (A, B, C, Total) — Bi-directional
Apparent Power [VA] (A, B, C, Total)
Reactive Power [VAR] (A, B, C, Total) — Bi-directional
Power Factor (A, B, C, System) — Bi-directional
Active Quadrant (A, B, C, System)
Voltage Phase Angle [°] (AB, AC, BC)
Frequency [Hz]
Import/Export/Net Real Energy [Wh] (A, B, C, Total)
Import/Export/Net Apparent Energy [VAh] (A, B, C, Total)
Q1/Q2/Q3/Q4 Reactive Energy [VARh] (A, B, C, Total)
Total Demand Power (Sliding Window) [W]

All parameters are accessible as integer and floating point format.

### ORDERING INFORMATION

```
W2-[1]-[2]-[3]

[1] Specifies Model:
    M1 = RS-485 + 2 x Pulse (Modbus/RTU)
    M2 = RS-485 + 2 x Pulse (BACnet MS/TP)
    E4 = Ethernet & WiFi (ETport) + 2 x Pulse

[2] Specifies CT Input Type:

5A = Inputs for 5A CTs
    mA = Inputs for mA output CTs (up to 200mA)
    mV = Inputs for 333mV output CTs
    RC = Inputs for Rogowski Coil (up to 360mV)

[3] Specifies Display/Logging Module (optional):
    DL = Integrated Display AND Logging Module

Examples:

W2-M1-mA: RS-485, mA inputs, no logging or display
W2-E4-mA-DL: Ethernet/WiFi, mA inputs, Logging/Display module
```