



## Bulletin 1400

### Power Monitoring Products

- Analysis and Capture
- Archival
- Control of Outputs and Communications
- Monitoring Capabilities for Energy Cost Allocation

## Bulletin 1402

### Line Synchronization Module

- Synchronization
- Anti-motoring
- Load Sharing
- Power Monitoring

## TABLE OF CONTENTS

Description	Page	Description	Page
<b>Product Selection</b>		<b>Specifications</b>	
Bulletin 1400 Power Monitoring Products . . . . .	<a href="#">6-2</a>	Bulletin 1400 Power Monitoring Products . . . . .	<a href="#">6-3</a>
Bulletin 1402 Line Synchronization Module . . . . .	<a href="#">6-2</a>	Bulletin 1402 Line Synchronization Synchronization Module . . . . .	<a href="#">6-4</a>
<b>Accessories</b>		<b>Approximate Dimensions</b>	
Bulletin 1400 Power Monitoring Products . . . . .	<a href="#">6-2</a>	Bulletin 1400 Power Monitoring Products . . . . .	<a href="#">6-5</a>
		Bulletin 1402 Line Synchronization Synchronization Module . . . . .	<a href="#">6-6</a>

### Description

**Bulletin 1400** – Bulletin 1400 Powermonitor modules are 16 bit microprocessor-based digital instruments used for integrating the measured and calculated power parameters of industrial, commercial, and utility power systems in automation systems.

The capabilities of its on-board microprocessor and an advanced field-configurable communication interface allows the unit to be used as either a stand-alone power monitor and control device or as one element in a large energy monitoring network.

#### Conformity to Standards:

IP54  
CSA C22.2 No. 14  
ANSI/IEEE C37.90.1-1989  
NEMA 12  
UL 508

#### Approvals:

CSA Certified  
UL Listed

### Description

**Bulletin 1402** – Bulletin 1402 Line Synchronization Module (LSM) provides an integrated power generation control solution. The LSM design reduces the complexity of conventional technology, increases generator control performance, and provides an easily integrated automation platform for both retrofit and new power facilities.

#### Conformity to Standards:

CSA C22.2 No. 14  
CSA C22.2 No. 213 Class I, Div. 2  
UL 508

#### Approvals:

CSA Certified  
UL Listed

PLC is a registered trademark of Allen-Bradley Company, Inc.  
ControlView is a trademark of Allen-Bradley Company, Inc.



#### Your order must include:

- Cat. No. of module and/or communication card selected.
- If required, Cat. No. of converter, software, or communications module.


Bulletin 1400/1402  
**Power Quality Products**

**Product Selection**

**Power Monitoring Products**

Type of Device	Measured Current A Full Scale	Measured Voltage		Power Supply	Cat. No.	*
		L-N	L-L			
 Powermonitor Block Module Cat. No. 1400-PB11A	1	120V	208V	85 - 240V AC or 110 - 300V DC	1400-PB11A	
				20 - 60V DC	1400-PB11B	
		277V	480V	85 - 240V AC or 110 - 300V DC	1400-PB12A	
				20 - 60V DC	1400-PB12B	
		347V	600V	85 - 240V AC or 110 - 300V DC	1400-PB13A	
				20 - 60V DC	1400-PB13B	
	5	120V	208V	85 - 240V AC or 110 - 300V DC	1400-PB51A	
				20 - 60V DC	1400-PB51B	
		277V	480V	85 - 240V AC or 110 - 300V DC	1400-PB52A	
				20 - 60V DC	1400-PB52B	
		347V	600V	85 - 240V AC or 110 - 300V DC	1400-PB53A	
				20 - 60V DC	1400-PB53B	
 Powermonitor Display Module Cat. No. 1400-PD11A	1	120V	208V	85 - 240V AC or 110 - 300V DC	1400-PD11A	
				20 - 60V DC	1400-PD11B	
		277V	480V	85 - 240V AC or 110 - 300V DC	1400-PD12A	
				20 - 60V DC	1400-PD12B	
		347V	600V	85 - 240V AC or 110 - 300V DC	1400-PD13A	
				20 - 60V DC	1400-PD13B	
	5	120V	208V	85 - 240V AC or 110 - 300V DC	1400-PD51A	
				20 - 60V DC	1400-PD51B	
		277V	480V	85 - 240V AC or 110 - 300V DC	1400-PD52A	
				20 - 60V DC	1400-PD52B	
		347V	600V	85 - 240V AC or 110 - 300V DC	1400-PD53A	
				20 - 60V DC	1400-PD53B	

**Line Synchronization Module**

	Description	Cat. No.	*
	<b>Line Synchronization Module -</b> Power Source: PLC® Backplane 1.1A @ 5V DC Measured Parameters: Voltage 120V AC Input Impedance: 728 kOhm Current: 0 - 5A AC Burden: 0.02 VA	1402-LS51	

**Accessories**

**Power Monitoring Products**

Description	Cat. No.	*
Communication Card for Display Module	1400-DCU	
Communication Card for Block Module	1400-BCU	
Communication Converter (RS-232/RS-485)	1400-CC	
Local Display Powermonitor Software	1400-SP	
ControlView™ Power Monitoring Software	6190-PMO	
Modem Cable Adapter	1400-MCA	

## Specifications

### Powermonitor Display and Block Module

#### Accuracy, Resolution, Ranges

Parameter	Accuracy	Resolution	Range
Volts (V1, V2, V3)	0.2%	0.1%	0–1,000,000 ②
Amps (I1, I2, I3)	0.2%	0.1%	0–30,000
Neutral Current (I4)	0.2%	0.1%	0–9,999
kW	0.4%	0.1%	0–1,000,000 ③
kVAR	0.4%	0.1%	0–1,000,000 ③
kVA	0.4%	0.1%	0–1,000,000 ③
Power Factor	1.0%	1.0%	1.0 to ± 0.6
Frequency	0.2 Hz	0.1 Hz ①	40 to 450 Hz
kW Demand	0.4%	0.1%	0–1,000,000
kVA Demand	0.4%	0.1%	0–1,000,000
kWH (-F, -R)	0.4%	1 kWH	0–1,000,000,000 ③
kVARH (-F, -R)	0.4%	1 kVARH	0–1,000,000,000 ③
V <sub>aux</sub> (1V AC scale)	0.25%	0.1%	0–1,000,000
IOUT	2.0%	1.0%	0–20mA
Waveform Capture	2.0%	0.1%	N/A

- ① 1 Hz resolution at 400 Hz range
- ② Reads in kV for voltages over 9,999
- ③ Reads in MVA, MW, MVAR for readings over 9,999

#### Input and Output Ratings

Voltage Inputs:	120V <sub>L-N</sub> /208V <sub>L-L</sub>	Nominal full scale input (+15%, -75%) Overload withstand: 2500V AC for 1 second Input impedance: 2 Megohm
	277V <sub>L-N</sub> /480V <sub>L-L</sub>	Nominal full scale input (+15%, -75%) Overload withstand: 2500V AC for 1 second Input impedance: 2 Megohm
	347V <sub>L-N</sub> /600V <sub>L-L</sub>	Nominal full scale input (+15%, -75%) Overload withstand: 2500V AC for 1 second Input impedance: 2 Megohm
Current Inputs:	5 Amps	AC ONLY nominal full scale input, Overload withstand: 15 amps continuous, 300 amps for 1 second Input impedance: 0.002 ohm, Burden: 0.05 VA
	1 Amp	AC ONLY nominal full scale input, Overload withstand: 15 amps continuous, 300 amps for 1 second Input impedance: 0.002 ohm, Burden: 0.05 VA
Status Inputs:	> 20V AC/V DC = active, < 6V AC/V DC = inactive, Minimum Pulse Width: 40 ms Input impedance: 49.2 kOhm, 277V AC/V DC maximum	
Control Relays Contact Ratings: (SPDT)	Resistive:	10A, 277V AC/30V DC
	Inductive:	240V AC, 3400 VA inrush, 360 VA sealed
Power Supply:	AC/DC	85V to 264V AC/0.2 Amps/ 47 to 440 Hz or 110 to 300V DC/0.2 Amps
	DC (optional)	20V to 60V DC @ 10W
Auxiliary Voltage Input (V <sub>AUX</sub> ):	1.0V AC/V DC nominal full scale input (1.25V AC/V DC maximum) Overload withstand: 120V continuous, 1000V for 1 second Input impedance: 10 kOhm	
Auxiliary Current Output (I <sub>OUT</sub> )	0 to 20mA output into 250 Ohm maximum load	
Terminal Strip:	1.35 N·m (12 lb-in) torque	
Maximum Wire:	4mm <sup>2</sup> (12 AWG), 75°C (167°F) CU wire only	
Operating Temperature:	0°C to 50°C (32°F to 122°F) ambient air temperature range	
Storage Temperature:	-30°C to +70°C (-22°F to 158°F)	
Humidity:	5 to 95 percent, non-condensing	

**Bulletin 1400/1402**  
**Power Quality Products**

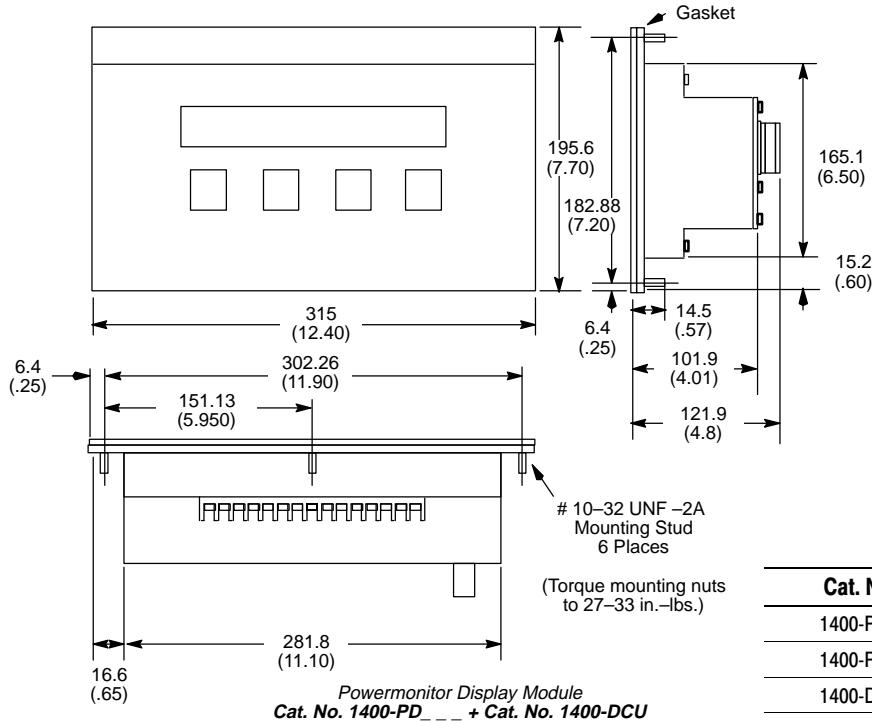
**Specifications, Continued**

**Line Synchronization Module**

<b>Inputs</b>	
Current	0 to 5A RMS Cont., 200A RMS 1 Second
Frequency	47 to 63 Hz (steady-state)
Dielectric Withstand Voltage	2500V RMS
Burden	0.0025 VA
Voltage	120V RMS (339 Vpk-pk) Maximum Peak
Input Impedance/Burden	728 kOhm/0.02 VA
<b>Synchronization Window</b> Independent Upper and Lower Thresholds	
Voltage	0.05% steps
Frequency	0.01 Hz steps
Phase	1 degree steps
<b>Isolated Load Sharing Input/Output</b>	
Max Common Mode Voltage	240V AC
Continuous Voltage	2 to 4V DC
Input Impedance	45 kOhm
<b>Back Plane Power Requirements</b>	1.1A at 5V DC
<b>Environmental</b>	
Operating Temperature	0°C to +60°C (32°F to + 140°F)
Storage Temperature	+40°C to +100°C (+104°F to +212°F)
Humidity	5% to 95%, non-condensing
<b>Update Rate</b>	
Alternate Error Parameters Table – 100 milliseconds	
Monitoring Parameters Tables 200 milliseconds (Synchronization Inactive) 2 seconds (Synchronization Active)	
<b>Accuracy @ 25°C (77°F)</b>	
Current Measurement = ±0.2% of Full Scale (Full Scale = 1.4 x CT Primary)	
Voltage Measurement = ±0.2% of Full Scale (Full Scale = 1.25 x PT Primary)	
Frequency Measurement = ±0.05 Hz (Within the 47 to 63 Range)	
Slip Frequency = ±0.05 Hz (Within the 47 to 63 Range)	
Power, Power Factor, VA = ±0.4% of Full Scale Power Consumption (Full Scale = 1.75 x CT Primary x PT Primary)	

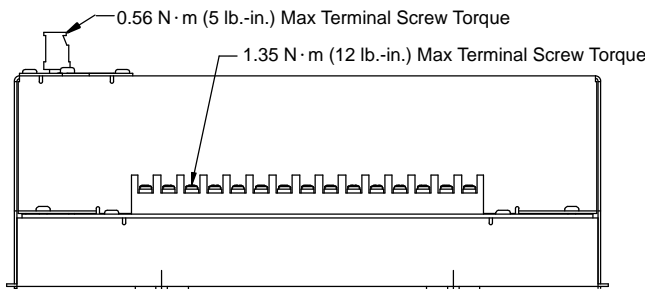
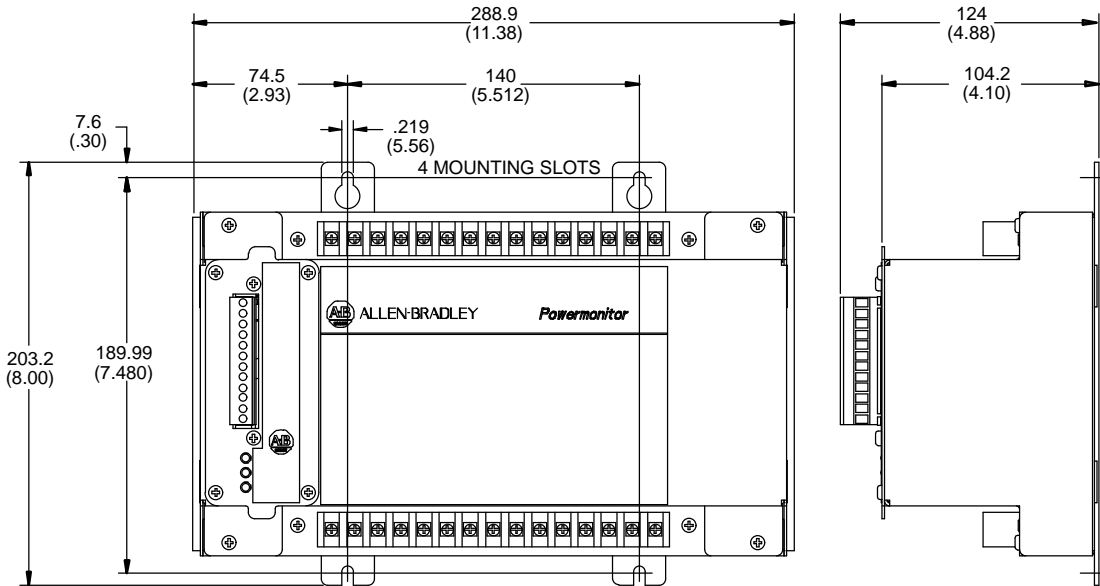
### Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



# 10-32 UNF -2A  
Mounting Stud  
6 Places  
(Torque mounting nuts  
to 27-33 in.-lbs.)

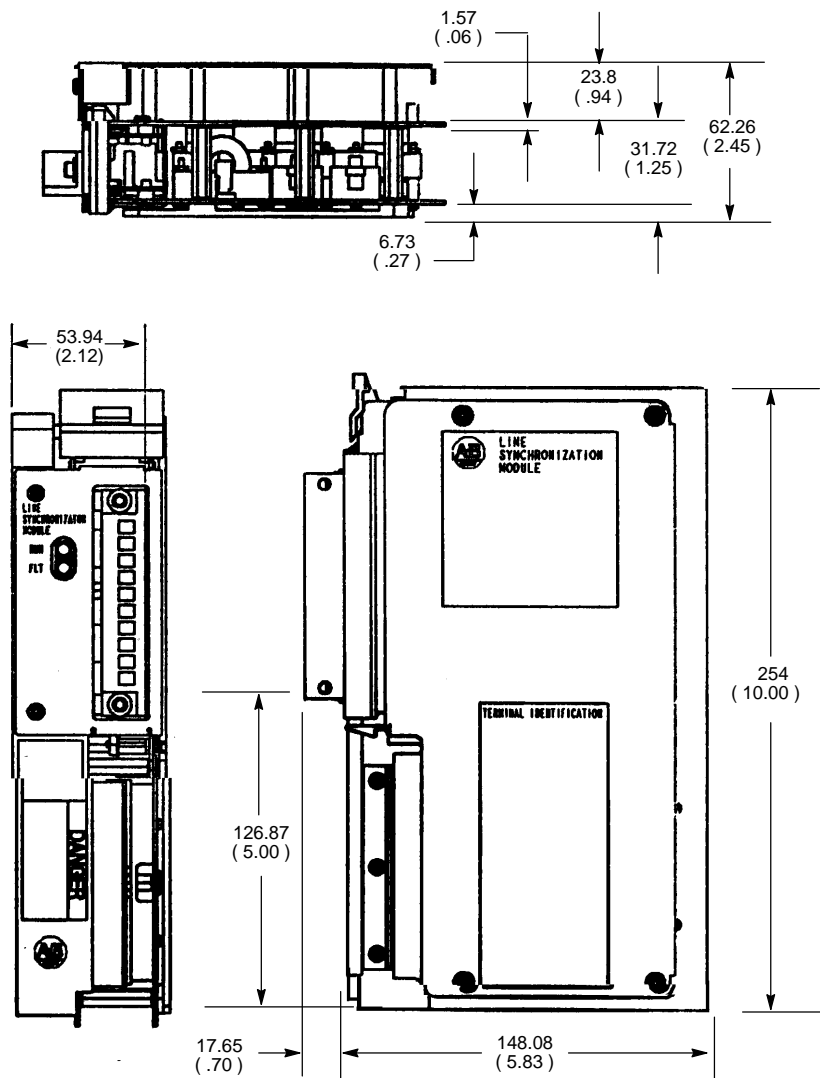
Cat. No.	Approx. Ship. Wts.
1400-PD	3.2 kg (7.1 lbs)
1400-PB	2.5 kg (5.6 lbs)
1400-DCU	0.18 kg (0.4 lbs)
1400-BCU	0.18 kg (0.4 lbs)



**Powermonitor Power Block Module**  
Cat. No. 1400-PB\_ \_ \_ + Cat. No. 1400-BCU

Approximate Dimensions, Continued

Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.  
Approximate shipping weight is 2.72kg (6.0 lbs.)



Line Synchronization Module  
Cat. No. 1402-LS51