

# SHARK® 100B

BACNET / IP COMMUNICATING MULTIFUNCTION POWER METER

BACnet / IP  
for Building Automation  
Systems



Shark® 100BT  
Transducer Only

Shark® 100B  
Power Meter/Transducer

## Features

- Multifunction Measurements of AC Voltage, Current, Power and Energy
- Industry Recognized Superior 0.2% Energy Class Accuracy
- BACnet / IP 100BaseT Ethernet Protocol
- Available in Meter or Transducer Version
- Highly Reliable Industrial Rated Design

## Applications

- LEED Projects
- Smart Buildings
- Commercial Energy Management
- HVAC Efficiency Monitoring
- Building Management Systems

## Introduction

Electro Industries introduces our industry leading revenue grade power meter with native BACnet / IP protocol. This meter is designed to integrate seamlessly into existing and new building management systems using the popular BACnet protocol. Available as either a meter or a transducer, the unit allows users to gather data on voltage, current, power and energy usage throughout a facility.

The Shark® 100B was designed to be the perfect device for “Green” initiatives, LEED certified projects, smart buildings and all kinds of

smart energy projects. The Shark® 100B’s metrology is industry recognized as superior, providing revenue testable 0.2% Energy accuracy with compliance to modern ANSI and IEC accuracy standards. The unit utilizes advanced DSP technology, high sampling rates and 24 bit analog to digital conversion to measure and analyze power accurately and reliably.

**Bi-Directional, Highly Accurate Energy Measurements Perfect for Alternative Energy**



# SHARK® 100B METER

## Shark® 100B with BACnet: the “Green” Choice

The Shark® 100B meter with BACnet / IP supports building energy management strategies, LEED certification and other Green Building initiatives. By letting you track energy use and power quality from wherever you are, the meter gives you the information you need to accurately identify cost-saving measures and respond to power quality problems when they arise.

The Shark® 100B meter’s readings can also be viewed and analyzed using CommunicatorPQA™ software which lets you program the meter and view real-time readings remotely.



BACnet Objects			
Volts A-N	VARh Net	Positive Watts, 3-Phase, Average Demand	Volts, A-N THD
Volts B-N	kVARh Net	Positive kWatts, 3-Phase, Average Demand	Volts, B-N THD
Volts C-N	Frequency	Positive VARS, 3-Phase, Average Demand	Volts, C-N THD
Volts A-B	Neutral	Positive kVARs, 3-Phase, Average Demand	Amps, A THD
Volts B-C	Current	Negative Watts, 3-Phase, Average Demand	Amps, B THD
Volts C-A	Whr Received	Negative kWatts, 3-Phase, Average Demand	Amps, C THD
Amps A	kWhr Received	Negative VARs, 3-Phase, Average Demand	
Amps B	Whr Delivered	Negative kVARs, 3-Phase, Average Demand	
Amps C	kWhr Delivered	Positive VARs, 3-Phase, Max Average Demand	
Total Watts	Whr Net	Positive kVARs, 3-Phase, Max Average Demand	
Total kWatts	kWhr Net	Negative Watts, 3-Phase, Max Average Demand	
Total VARs	Total Whr	Negative kWatts, 3-Phase, Max Average Demand	
Total kVARs	Total kWhr	Negative VARs, 3-Phase, Max Average Demand	
Total VA	Positive VARh	Negative kVARs, 3-Phase, Max Average Demand	
Total kVA	Positive kVARh	Positive Watts, 3-Phase, Max Average Demand	
Total PF	Negative VARh	Positive kWatts, 3-Phase, Max Average Demand	
Total VAh	Negative kVARh	VAs, 3-Phase, Average Demand	
Total kVAh		kVAs, 3-Phase, Average Demand	
Total VARh		VAs, 3-Phase, Max Average Demand	
Total kVARh			

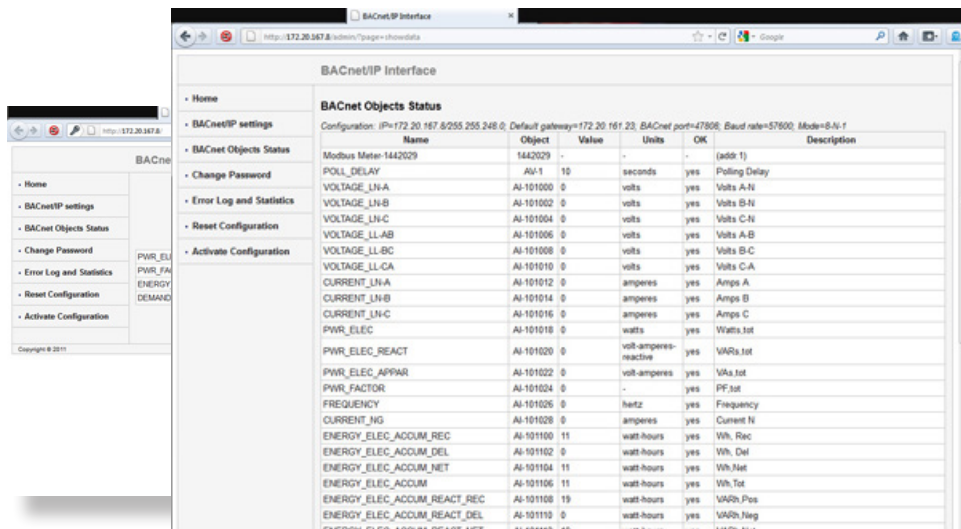
The 62 pre-defined objects in the Shark® 100B meter’s BACnet IP protocol

Measured Parameters	Accuracy % of Reading	Display Range
Voltage L-N	0.1%	0-9999 Scalable V or kV
Voltage L-L	0.1%	0-9999 V or kV Scalable
Current	0.1%	0-9999 A or kA
+/- Watts	0.2%	0-9999 Watts, kWatts, MWatts
+/- Wh	0.2%	5 to 8 Digits Programmable
+/- VARs	1.0%	0-9999 VARs, kVARs, MVARs
+/- VARh	1.0%	5 to 8 Digits Programmable
VA	1.0%	0-9999 VA, kVA, MVA
VAh	1.0%	5 to 8 Digits Programmable
PF	0.2%	+/- 0.2 to 1.0
Frequency	+/- 0.01 Hz	45 to 65 Hz
THD	5.0%	0 to 100%
Load Bar	1-120%	10 Digit Resolution Scalable

Note: Typical results are more accurate. Applies to 3 Element WYE and 2 Element Delta Connections. Add 0.1% of Full Scale plus 1 digit to Accuracy specs for 2.5 Element connections.

## Shark® 100B BACnet / IP Through the Web

The Shark® 100B meter’s BACnet / IP comes standard with a Web interface. Use the BACnet / IP Interface to remotely set up the BACnet / IP configuration and track energy usage through the Internet with any standard Web browser. You do not need to be on-site - you can check on your buildings from anywhere in the world! There is also a Modbus TCP Socket that can be used to simultaneously poll Modbus TCP through the same device.



**Traceable Watt-Hour Test Pulse for Accuracy Verification**

The Shark® 100B device is a traceable revenue meter. It contains a utility grade test pulse allowing power providers to verify and confirm that the meter is performing to its rated accuracy. This is an essential feature required of all billing grade meters.

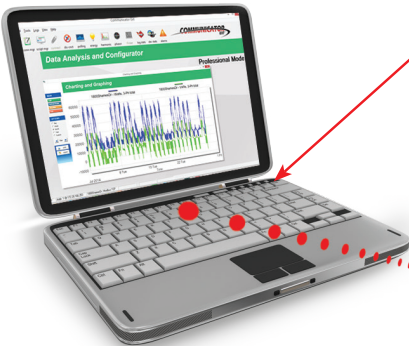
**Additional Features Include:**

- Utility Block and Rolling Average Demand
- Adjustable Demand Profiles
- Max and Min Available on Most Other Parameters
- Voltage Provides Instantaneous Max and Min for Surge and Sag Limits

**Front Mounted IrDA Communication**

Uniquely, the Shark® 100B meter also has an optical IrDA port, allowing the unit to be set up and programmed using a remote laptop PC without the need for a communication cable.

To configure the meter, just point at it with an IrDA-equipped PC.

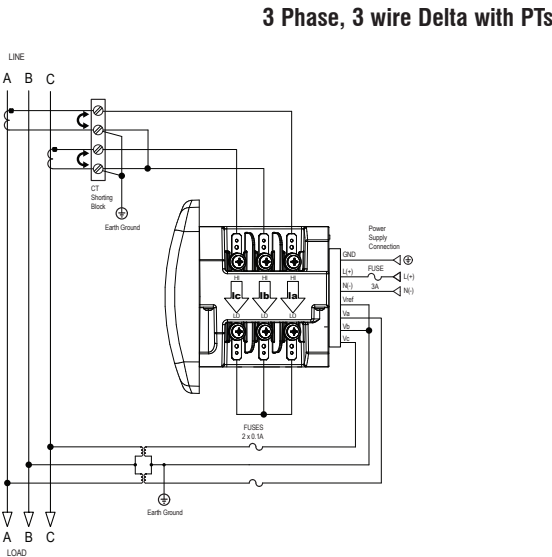
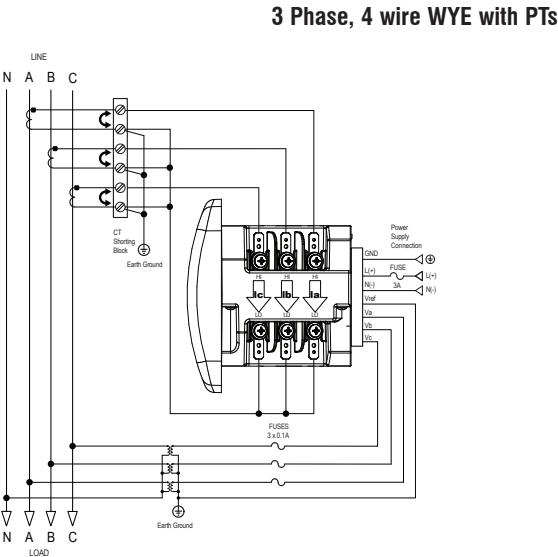
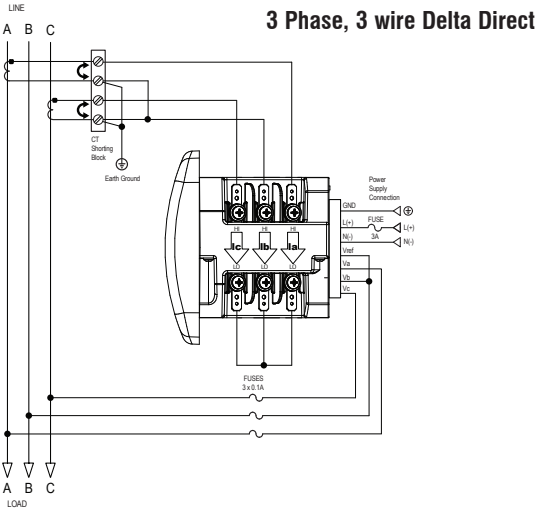
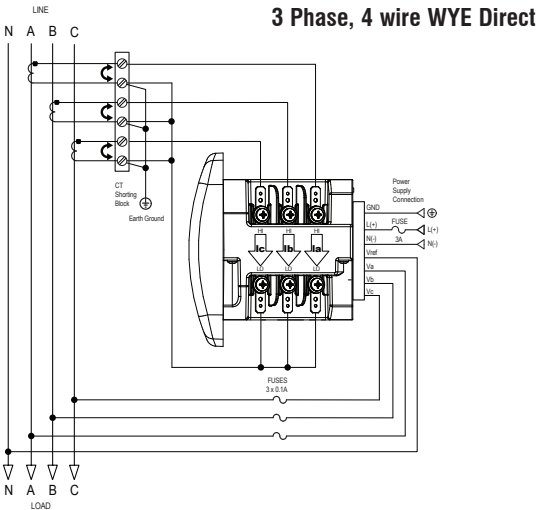


**Wireless IrDA Communication**

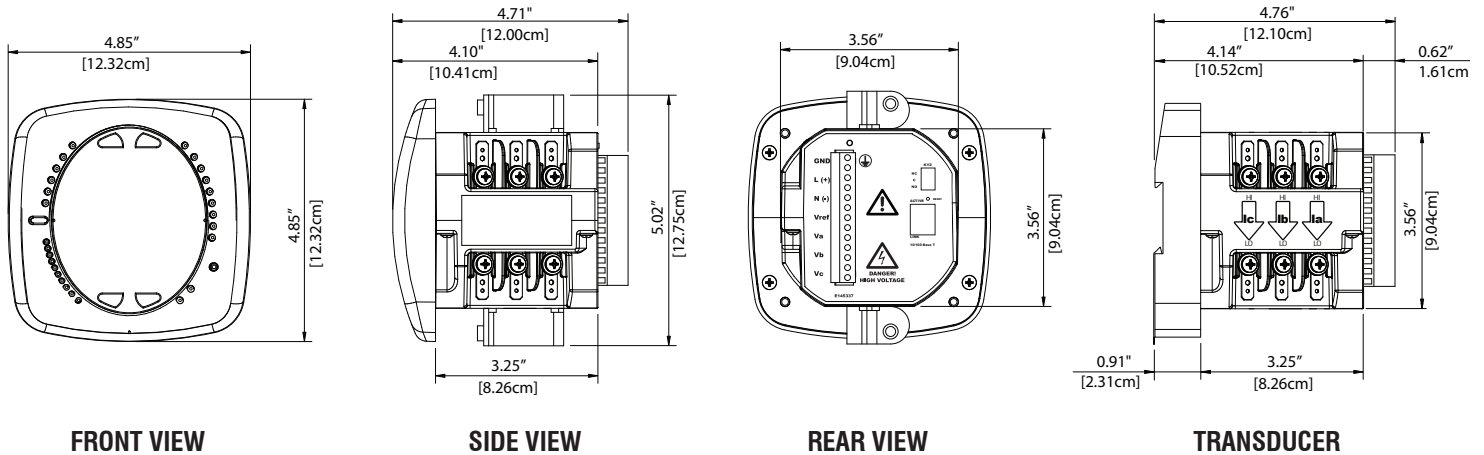


- BACnet / IP
- Modbus TCP
- HTTP Web Server

**Wiring Diagrams**



## Dimensional Drawings



## Specifications

### Voltage Inputs

- (20-416) Volts Line To Neutral, (20-721) Volts Line to Line
- Universal Voltage Input
- Input Withstand Capability – Meets IEEE C37.90.1 (Surge Withstand Capability)
- Programmable Voltage Range to Any PT ratio
- Supports: 3 Element WYE, 2.5 Element WYE, 2 Element Delta, 4 Wire Delta Systems
- Burden: 0.36 VA per phase Max at 600 V, 0.014 VA at 120 Volts
- Input wire gauge max (AWG 12 / 2.5 mm<sup>2</sup>)

### Current Inputs

- Class 10: (0 to 10) A, 5 A Nominal
- Class 2: (0 to 2) A, 1 A Nominal Secondary
- Fault Current Withstand (at 23 °C): 100 A for 10 Seconds, 300 A for 3 Seconds, 500 A for 1 Second

- Programmable Current to Any CT Ratio
- Burden 0.005 VA per phase Max at 11 A
- 5 mA Pickup Current
- Pass through wire gauge dimension: 0.177" / 4.5 mm
- Continuous current withstand: 20 A for screw terminated or pass through current connections

### Isolation

- All Inputs and Outputs are galvanically isolated to 2500 Volts AC.

### Environmental Rating

- Storage: (-20 to +70) °C
- Operating: (-20 to +70) °C
- Humidity: to 95% RH Non-Condensing
- Faceplate Rating: NEMA12 (Water Resistant)
- Mounting Gasket Included
- Protection: IP30 - Meter Front/Back, Optional DIN Rail Mounting

### Sensing Method

- RMS
- Sampling at 400+ Samples per Cycle on all channels measured readings simultaneously
- Harmonic THD (% of Total Harmonic Distortion)

### Update Rate

- Watts, VAR and VA-100 msec
- All other parameters-1 second

### Power Supply

- Option D2:
  - (90 to 265) V AC and (100 to 370) V DC Universal AC/DC Supply
- Option D:
  - (18-60) V DC
- Burden: 10 VA Max

### Communication Format

- 2 Com Ports (Back and Faceplate)
  - BACnet / IP Ethernet (Through Backplate)
  - IrDA (Through Faceplate)

- Modbus TCP
- Baud Rate: 57.6k baud

### KYZ Pulse

- Type Form A
- On Resistance: (23-35) Ohm
- Peak Voltage: 350 V DC
- Continuous Load Current: 120 mA
- Peak Load Current: 350 mA (10 ms)
- Off Stat Leakage Current @ 350 V DC: 1 mA
- Opto-Isolation: 3750 V (60 Hz, 1min)

### Dimensions and Shipping

- Weight: 2 lbs
- Basic Unit: (H4.85 x W4.85 x L4.25) in.
- Shark® 100B – mounts in 92 mm DIN and ANSI C39.1 4" round cutouts
- Shark® 100BT-DIN rail mounted transducer
- Shipping Container Dimensions: 6" cube

### Meter Accuracy

- See page 2

### Compliance:

- IEC 62053-22 (Class 0.2S)
- ANSI C12.20 (0.2 Accuracy Class)
- ANSI (IEEE) C37.90.1 Surge Withstand
- ANSI C62.41 (Burst)
- EN 61000-6-2 – Immunity for Industrial Environments: 2005
- EN 61000-6-4 – Emission Standards for Industrial Environments: 2007
- EN 61326-1 - EMC Requirements: 2006
- Certified to UL 61010-1 and CSA C22.2 No. 61010-1, UL File: E250818
- REACH Compliant
- RoHS Compliant

## Ordering Information: To order, please fill out ordering guide:

Model	Frequency	Current Class	Power Supply	Mounting (Shark100B Only)
Option Numbers:	-	-	-	-
Example: Shark100B	60	10	D2	X
Shark100B (Meter/Transducer)	50 50 Hz System	10 5 A Secondary	D2 (90-265) V AC or (100-370) V DC	X ANSI Mounting
Shark100BT (Transducer Only)	60 60 Hz System	2 1 A Secondary	D (18-60) V DC	DIN DIN Mounting Brackets (Euro Mounting)

## Additional Accessories

### Communication Converters

CAB6490 - USB to IrDA Adapter

### Compliance Documents

Certificate of Calibration, Part # CCal – This provides Certificate of Calibration with NIST traceable Test Data.

