# SHARK® 50B/100B

## BACnet Communicating Multifunction Power Meters



**Shark® 100B**
**Power Meter/Transducer**
The Shark® 100B also offers a Transducer only option.

**Shark® 50B**
**Power Meter/Transducer**

## Features

- Multifunction Measurements of Voltage, Current, Power and Energy

- Industry Recognized Superior 0.2% (100B)/0.5% (50B) Energy Class Accuracy

- BACnet/IP and Modbus TCP/IP Ethernet (100B); BACnet MS/TP Serial and Modbus TCP/IP Ethernet (50B)

- Available in Meter or Transducer Version (100BT)

- Highly Reliable Industrial Rated Design

## Introduction

Electro Industries introduces our industry-leading revenue grade power meter with native BACnet protocol. This meter is designed to integrate seamlessly into existing and new building management systems that use BACnet. Available as either a meter or a transducer (100BT), the unit allows you to gather data on voltage, current, power, and energy usage throughout a facility.

The Shark® 50B/100B was designed to be the perfect device for "green" initiatives, LEED certified projects, smart buildings, and other smart energy projects. The Shark® 50B/100B's metrology is industry recognized as superior, providing revenue testable

0.2% (100B)/5% (50B) 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.

## Applications

- LEED Projects

- Alternative Energy Monitoring

- Commercial Energy Management

- HVAC Efficiency Monitoring

- Building Management Systems

## *Bi-directional, Highly Accurate Energy Measurements Perfect for Alternative Energy*

**Electro Industries/GaugeTech™**

## Shark® 50B/100B with BACnet: the "Green" Choice

The Shark® 50B/100B meter with BACnet MS/TP or 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 meter's readings can also be viewed and analyzed using CommunicatorPQA® software, which lets you program the meter and view real time readings remotely.

### Additional Features Include:

- **100B:** BACnet/IP, Modbus TCP/IP, IrDA
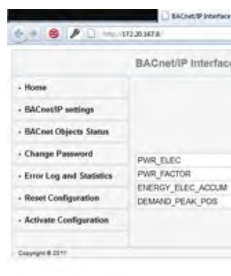- **50B:** BACnet MS/TP, Modbus TCP/IP

Both meters support an embedded web server.

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

Pre-defined objects in the Shark® meters' BACnet protocol. *These values are only for the 100B meter.

| Measured Parameters | Accuracy % of Reading | | Display Range |
|---|---|---|---|
| | 100B | 50B | |
| Voltage L-N | 0.1% | 0.2% | 0-9999 Scalable V or kV |
| Voltage L-L | 0.1% | 0.4% | 0-9999 V or kV Scalable |
| Current | 0.1% | 0.2% | 0-9999 A or kA |
| +/- Watts | 0.2% | 0.5% | 0-9999 Watts, kWatts, MWatts |
| +/- Wh | 0.2% | 0.5% | 5 to 8 Digits Programmable |
| +/- VARs | 1.0% | same | 0-9999 VARs, kVARs, MVARs |
| +/- VARh | 1.0% | same | 5 to 8 Digits Programmable |
| VA | 1.0% | same | 0-9999 VA, kVA, MVA |
| VAh | 1.0% | same | 5 to 8 Digits Programmable |
| PF | 0.2% | 1.0% | +/- 0.2 to 1.0 |
| Frequency | +/- 0.01 Hz | same | 45 to 65 Hz |
| THD | 5.0% | N/A | 0 to 100% |
| Load Bar | 1-120% | same | 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.
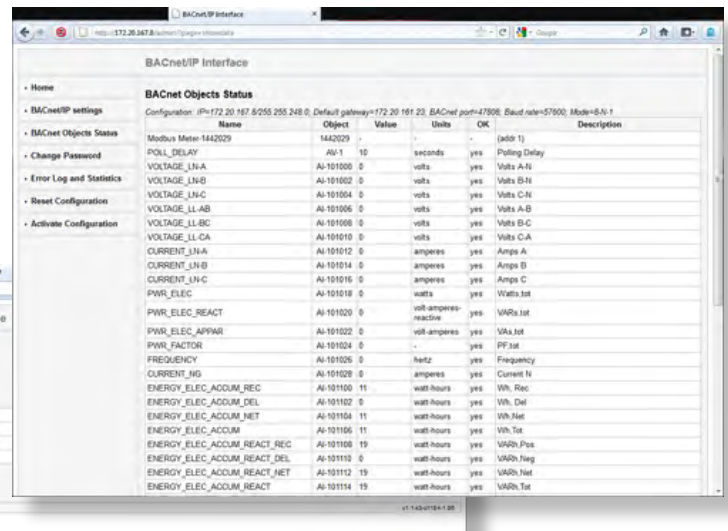
## Shark® 50B/100B BACnet Through the Web

The Shark® 50B/100B meter's BACnet comes standard with a web interface. Use the interface to remotely set up the BACnet 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/IP socket that can be used to simultaneously poll Modbus TCP/IP through the same device.
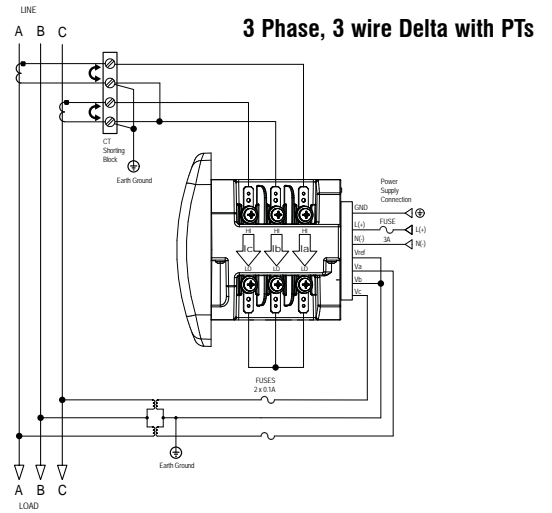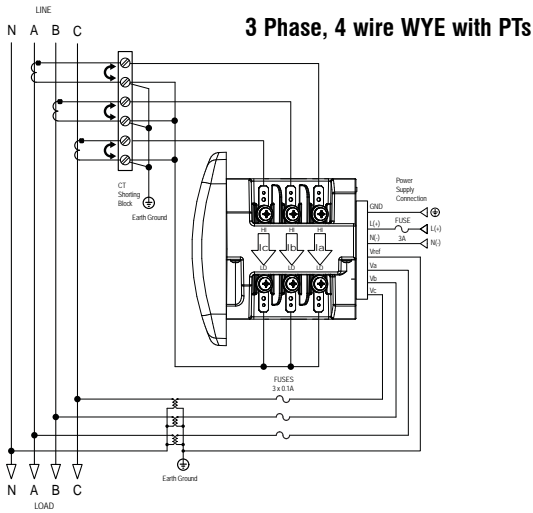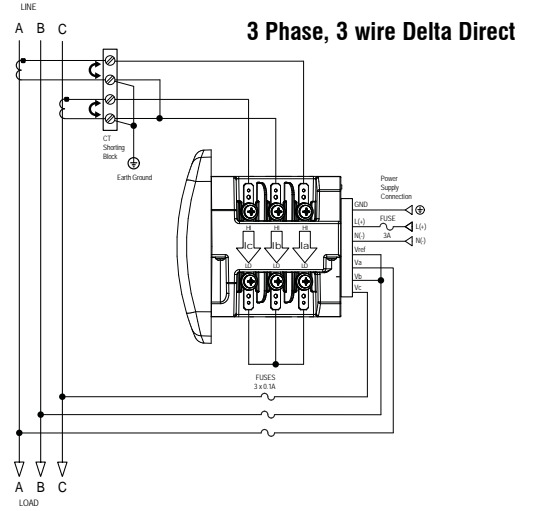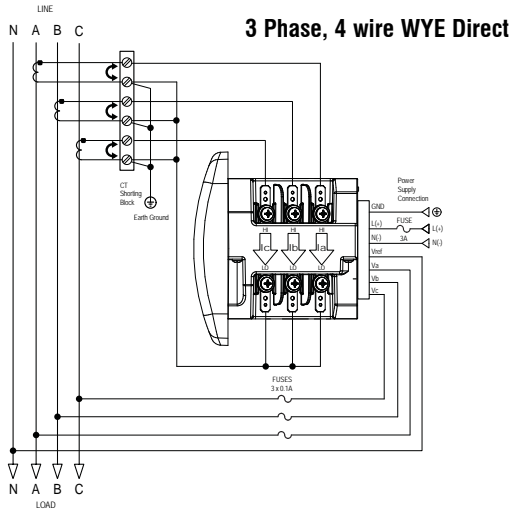
## Wiring Diagrams

**3 Phase, 4 wire WYE Direct**



**3 Phase, 3 wire Delta Direct**



**3 Phase, 4 wire WYE with PTs**



**3 Phase, 3 wire Delta with PTs**



## Dimensional Drawings



**Front View**

4.85″ [12.32cm]

4.85″ [12.32cm]

**Side View**

4.71" [12.00cm]

4.10" [10.41cm]

5.02″ [12.75cm]

3.25" [8.26cm]

**Rear View**

3.56″ [9.04cm]

3.56″ [9.04cm]

**Transducer**

4.76" [12.10cm]

4.14″ [10.52cm]

0.62″ 1.61cm

3.56″ [9.04cm]

0.91" [2.31cm]

3.25″ [8.26cm]
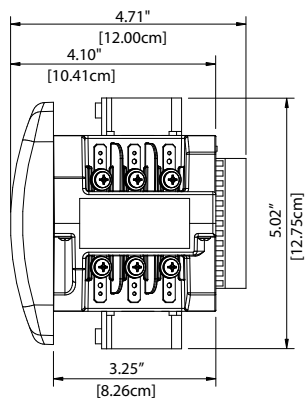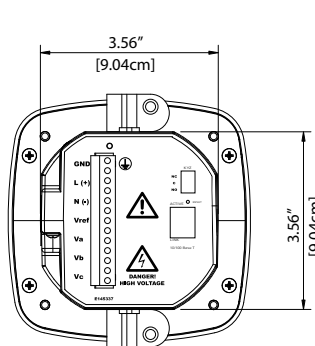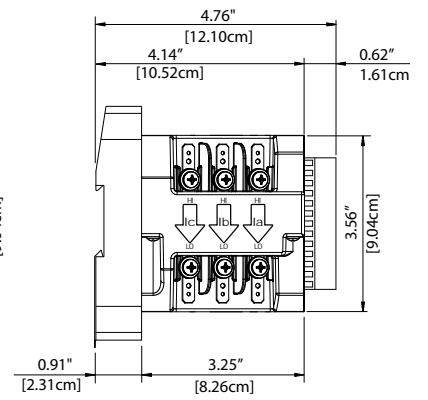
### Voltage Inputs

- Absolute Range: (20-416) Volts Line to Neutral, (0-721) 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 V
- Input wire gauge max (AWG 12 / 2.5 mm$^2$)

### Current Inputs

- Class 10: (0.005 to 10) A, 5 A Nominal CT Secondary
- Class 2: (0.001 to 2) A, 1A Nominal CT 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 V 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 - 100B)

### Update Rate

- Watts, VAR, and VA-100 ms (100B only)
- 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 (100B Only):

- (18-60) V DC

Burden: 10 VA Max

### Communication Format

- 2 Com Ports (Back and Faceplate)
- BACnet / IP (100B); BACnet MS/TP (50B)
- IrDA (through Faceplate)
- Modbus TCP/IP
- Baud Rate: 57.6k baud

### KYZ Pulse

- Type Form A

- On Resistance: (25-35) Ohm
- Peak Voltage: 350 V DC
- Continuous Load Current: 120 mA
- Peak Load Current: 350 mA (10 ms)
- Off State Leakage Current @ 350 V DC: 1 mA
- Opto-Isolation: 3750 V AC (60 Hz, 1min)

### Dimensions and Shipping

- Weight: 2 lbs
- Basic Unit: (H4.85 x W4.85 x L4.25) in.
- Shark® 50B/100B – mounts in 96 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:

- ANSI C12.20-2010 Accuracy, Class 0.2 CL - 100B; 0.5 CL - 50B
- IEC 62053-22 Accuracy, Class 0.2S-100B; 0.5S-50B *

- IEC 62053-23 Edition 1 Class 2
- CE (IEC 61000-6-2 & IEC 61000-6-4 & IEC 61326-1)*
  - IEC 61000-4-2 (Electrostatic Discharge)*
  - IEC 61000-4-3 (Radiated EM Immunity)*
  - IEC 61000-4-4 (EFT)*
  - IEC 61000-4-5 (Surge Immunity)*
  - IEC 61000-4-6 (Conducted Immunity)*
  - IEC 61000-4-8 (Magnetic Immunity)*
  - IEC 61000-4-11 (Voltage Variations Immunity)*
  - IEC/CISPR 11, Class A (Conducted, Radiated Emissions)*
- IEEE C37.90.1 (Surge Withstand)
- IEEE C62.41 (Surge Immunity)
- EU Directive 2011/65/EU (RoHS 3 Directive)
- REACH Compliant
- Certified to UL 61010-1 and CSA C22.2 No. 61010-1, UL File: E250818

* Third party lab tested

## 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 |
| | Shark 100B (Meter/Transducer) | 50 50 Hz System | 10 5 A Nominal CT Secondary | D2 (90-265) V AC or (100-370) V DC | X ANSI Mounting |
| | Shark 100BT (Transducer Only) | 60 60 Hz System | 2 1 A Nominal CT Secondary | D (18-60) V DC | DIN DIN Mounting Brackets (Euro Mounting) |

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

| | Model | Mounting |
|---|---|---|
| Option Numbers: | - | |
| Example: Shark 50B | - | X |
| | Shark 50B (Meter/Transducer) | X ANSI Mounting |
| | | DIN DIN Mounting Brackets (Euro Mounting) |

## Additional Accessories

### Communication Converters

CAB6490 - USB to IrDA Adapter (100B)

Contact for available CTs, shorting blocks, and fuses.

### Compliance Documents

Certificate of Calibration, Part # CCal - This provides Certificate of Calibration with NISTtraceable Test Data.