

SHARK[®] 50

Multifunction Electrical Switchboard Meter



Shark[®] 50 Meter



Features

- 0.5% Class Accuracy - Built-in Test Pulse to Verify Accuracy
- Measures Voltage, Current, Power, Frequency, Energy, Etc.
- Meets Both Revenue Metering Accuracy and Environmental Standards
- Optional RS485 with Modbus Protocol
- Large, Bright Red, Easy-to-Read LED Display
- % of Load Bar for Analog Meter Perception
- Fits Both ANSI and DIN Cutouts
- Great for Retrofit and New Applications
- Uses Minimal Panel Space and Depth

Applications

- Commercial Metering
- Industrial Metering
- Power Generation
- Campus Metering
- Submetering
- Indication Meter Replacement

Introduction

Electro Industries' Shark[®] 50 meter is a high-quality, affordable 0.5% class electrical switchboard panel meter. Designed for easy installation into electrical panels and switchgear, it is ideal for both new metering applications and as a simple replacement for existing analog or older electrical meters. Its bright red, three-line, built-in LED display makes meter readings easily viewable. In addition, the display has an anti-dither algorithm to improve reading stability. Its high-speed DSP technology and high-resolution A/D conversion provide stable and reliable measurements. And you can easily verify its energy accuracy using the meter's built-in test pulse.

The Economical Meter for the OEM

Superior Accuracy

Meter Accuracy by Measured Parameters		
Parameters	Accuracy %	Accuracy Input Range
Voltage L-N	0.2% of reading ²	(69 to 480) V
Voltage L-L	0.4% of reading	(120 to 600) V
Current Phase	0.2% of reading ¹	(0.15 to 5) A
Current Neutral (calculated)	2.0% of Full Scale ¹	(0.15 to 5) A @ (45 to 65) Hz
Total Watts	0.5% of reading ^{1,2}	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Total Wh	0.5% of reading ^{1,2}	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Total VAR	1.0% of reading ^{1,2}	(0.15 to 5) A @ (69 to 480) V @ +/- (0 to 0.8) lag/lead PF
Total VARh	1.0% of reading ^{1,2}	(0.15 to 5) A @ (69 to 480) V @ +/- (0 to 0.8) lag/lead PF
Total	1.0% of reading ^{1,2}	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Total VAh	1.0% of reading ^{1,2}	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Power Factor	1.0% of reading ^{1,2}	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Frequency	+/- 0.01 Hz	(45 to 65) Hz
Load Bar	+/- 1 segment ¹	(0.005 to 6) A

Note: ¹For 2.5 element programmed units, degrade accuracy by an additional 0.5% of reading. ²For unbalanced voltage inputs where at least one crosses the 150 V auto-scale threshold, degrade accuracy by additional 0.4%.

Communication and Pulse Output

- Optional RS485 port offers Modbus communication and baud rates from 9,600 to 57, 600. (485P Option)
- RS485 option includes a fixed energy pulse mapped to positive energy.

Easy to Install and Use

- Simple faceplate programming
- Set up through PC
- Phasor diagram showing wiring status
- Auto scroll of meter readings (programmable)
- Analog style % of load bar
- Shallow panel depth
- Color coordinated voltage and current inputs

Virtual Upgrade Switches

The Shark[®] 50 meter is equipped with EIG's exclusive V-Switch™ technology. This allows you to upgrade and add features, even after the meter is installed.

Note: You must purchase the Com port option to upgrade V-Switch™ keys (see the ordering guide on the last page).

Available V-Switch™ Keys:

- V1 – Voltage and Current Meter (Default)
- V2 – V, A, kW, kVAR, PF, kVA, Freq
- V3 – V, A, kW, kVAR, PF, kVA, Freq, kWh, kVAh, kVARh

Rugged and Safe Voltage and Current Inputs

The Shark[®] 50 meter is designed for harsh electrical applications in both high voltage and low voltage power systems. This feature is especially important in power generation, utility substation, and critical user applications. This meter's structural and electrical design was developed based on the recommendations and approval of many of our utility customers.

High Isolation Universal Voltage Inputs

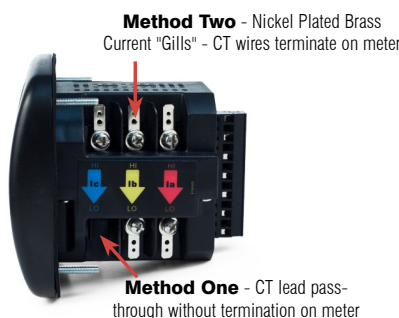
- Voltage inputs allow measurement of up to 416 volts line to neutral and 721 volts line to line.
- One unit will perform to specification on 69 volt, 120 volt, 230 volt, 277 volt, and 347 volt power systems.

Short Circuit Safe Current Inputs - Current inputs use a unique dual input method:

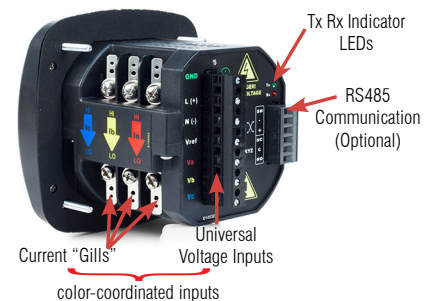
- **Method One** – CT Lead Pass Through: The CT lead passes directly through the meter without any physical termination on the meter. This ensures that the meter cannot be a point of failure on the CT circuit. This method is preferable to utility users when sharing relay class CTs. No burden is added to the secondary CT circuit.
- **Method Two** – Current "Gills": The meter also provides ultra-rugged termination pass-through bars that allow the CT leads to be terminated on the meter. The Shark[®] meter's stud-based design ensures that your CTs will not open in a fault condition.



Front View

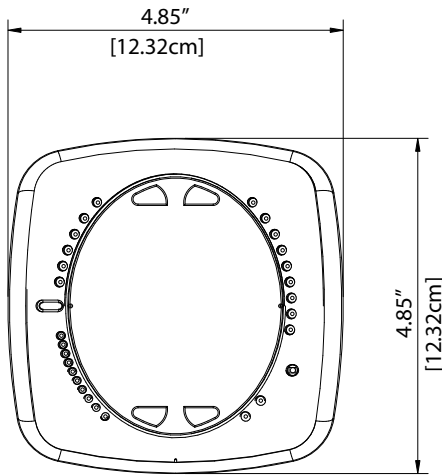


Side View

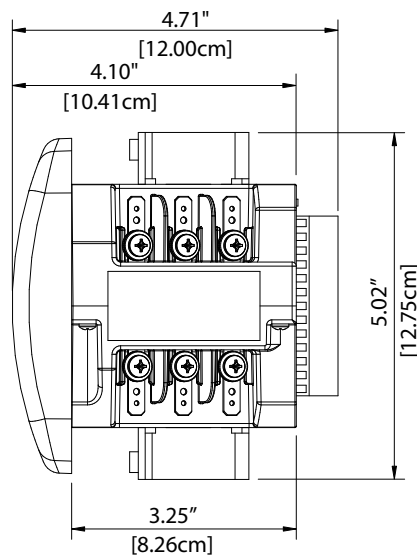


Rear View

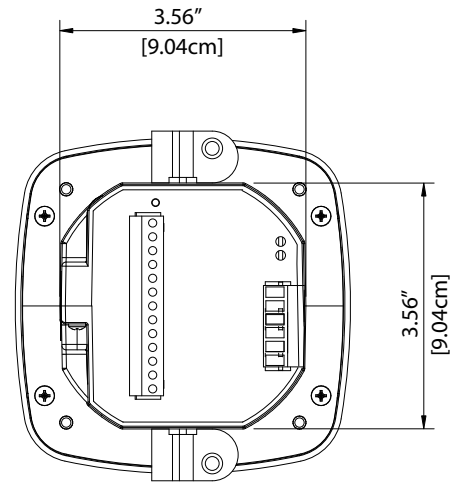
Dimensional Drawings



Front View

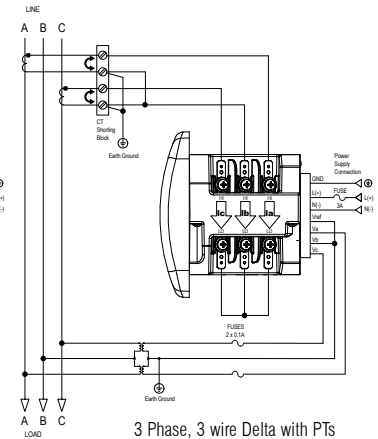
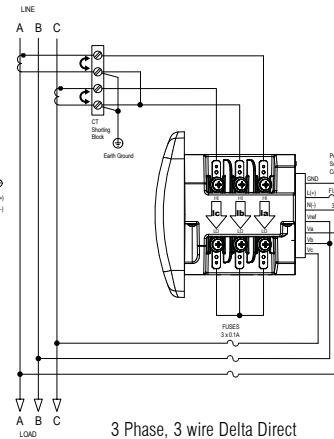
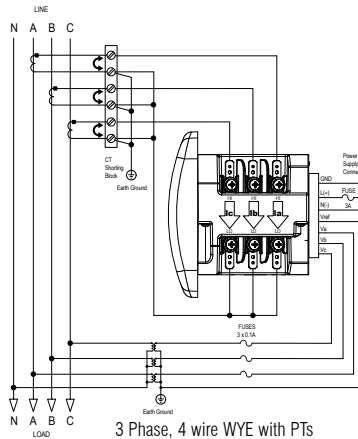
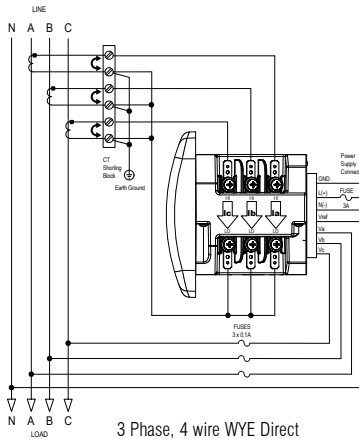


Side View



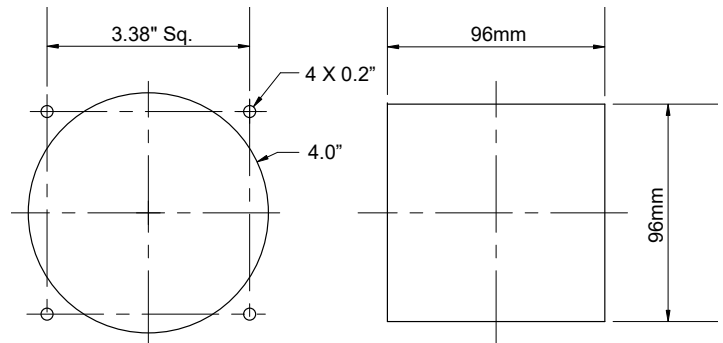
Rear View

Wiring Diagrams



Shark® 50 Meter ANSI and DIN Mounting

The unit mounts directly in an ANSI C39.41 (4" round form) or an IEC 96 mm DIN square form. This is perfect both for new installations and for existing panels. In new installations, simply use DIN or ANSI punches. For existing panels, pull out old analog meters and replace them with the Shark® 50 meter. The meter uses standard voltage and current inputs so that CT and PT wiring does not need to be replaced.



ANSI Mounting

DIN Mounting

- Perfect for switchgear panel direct retrofit.
- Uses minimal panel space.
- Mounts in only 4" panel depth.

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: 0.014 VA/Phase at 120 Volts
- Input Wire Gauge Max (AWG 12 / 2.5 mm2)

Current Inputs:

- Class 10: (0.005 to 10) A, 5 A CT Nominal Secondary, 10 A Maximum
- Fault Current Withstand (For 23 °C, 3 Phase Balanced WYE or Delta load): 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
- 0.1% of Nominal
- 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: NEMA 12 (Water Resistant) Gasket Included
- Protection: IP30 - Meter Front/Back

Sensing Method:

- RMS
- Sampling at 400+ Samples per Cycle on All Channels Measured Readings Simultaneously

Update Rate:

- All Parameters Up to 1 Second

Power Supply:

- (90 to 265) Volts AC

Communication Format (optional):

- RS485 Port (Through Back Plate)
- Com Port Baud Rate: (9,600 to 57,600)
- Com Port Address: 0-247
- 8 Bit, No Parity
- Modbus RTU, ASCII

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 (10ms)
- Off State Leakage Current @ 350 V DC: 1 mA

Dimensions and Shipping:

- Weight: 2 lbs
- Basic Unit: (H4.85 x W4.85 x L4.25) in.

- Mounts in Either 96 mm Square DIN or ANSI C39.1 4" Round Cutouts

- Shipping Container Dimensions: 6" Cube

Meter Accuracy:

- See Page 2

Compliance:

- ANSI C12.20-2010 Accuracy, Class 0.5 CL
- IEC 62053-22 Accuracy, Class 0.5S *
- 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 2 Directive)
- REACH Compliant
- Certified to UL 61010-1 and CSA C22.2 No. 61010-1, UL File: E250818

* Third party lab tested

Ordering Information - All fields must be filled in to create a valid part number.

Model	V-Switch™ Pack	COM	Mounting
Option Numbers:	-	-	-
Example:	Shark50	60	X
Shark50	V1 Voltage/Current	X No Com	X ANSI Mounting
	V2 Above with Power and Frequency	485P RS485+KYZ Pulse	DIN DIN Mounting Brackets
	V3 Above with Energy Counters		

Accessories		Compliance Documents	
Communication Converters		Certificate of Calibration, Part#: CCaI	This provides Certificate of Calibration with NIST traceable Test Data.
Unicom 2500	RS485 to RS232 Converter		
Unicom 2500-F	RS485 to RS232 to Fiber Optic Converter		
Software			
COMPQA5P1Y		Communicator PQA® 5.0 Configuration Software-Single-Computer License (One site)	
ENERGYPQA-1Year		Cloud-based Energy Management Solution	

Ordering Instructions

Email or fax part number above, plus quantity, to the address below. Lead times are typically stock to 2 weeks. Call toll-free **1-877-EIMETER** to speak to a sales engineer with any technical questions.



Shark® 50 web page



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