Shark 270 Switchboard Meter Quickstart Guide

CAUTION! Installation of the Shark® 270 meter must be performed only by qualified personnel who follow standard safety precautions during all procedures. Those personnel should have appropriate training and experience with high voltage devices. Appropriate safety gloves, safety glasses and protective clothing are recommended.

During normal operation of the Shark® meter, dangerous voltages flow through many parts of the unit, including: Terminals and any connected CTs (Current Transformers) and PTs (Potential Transformers), all I/O Modules and their circuits. All Primary and Secondary circuits can, at times, produce lethal voltages and currents. **Avoid contact with any current-carrying surfaces.**

Do not use the meter or any I/O device for primary protection or in an energy-limiting capacity. The meter can only be used as secondary protection.

IMPORTANT! Refer to your meter's User Manual for additional safety warnings before performing installation, wiring, or maintenance of your meter. See the link to the manual, below.

NOTE: This Quickstart Guide gives basic installation, wiring, and programming instructions.For additional meter operation and programming information, refer to your meter's *User Manual* and the *Communicator PQA® and MeterManagerPQA® Software User Manual* on EIG's website:

User Manual:
https://www.electroind.com/products/shark-270-swb3-switchboard-case/
From the webpage, click Technical Documents>User Manual.

Software Manual:

https://www.electroind.com/products/communicatorpqa-software-application-5/
From the webpage, click Technical Documents>User Manual.

CommunicatorPQA® Setup Software:

https://www.electroind.com/products/communicatorpqa-software-application-5/
From the webpage, click Download ComPQA Pro. To get a Professional license for the software, email sales@electroind.com or call 516-334-0870.

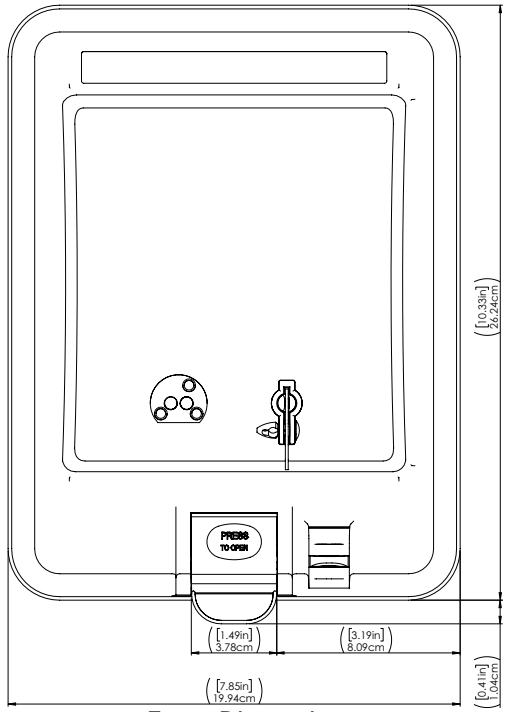
All EIG's metering and software products' literature can be accessed from:
https://www.electroind.com/all-products/

For software and metering integration, EIG's Technical Support Engineers are available on an hourly or daily basis to help with typical commissioning assistance, which includes:

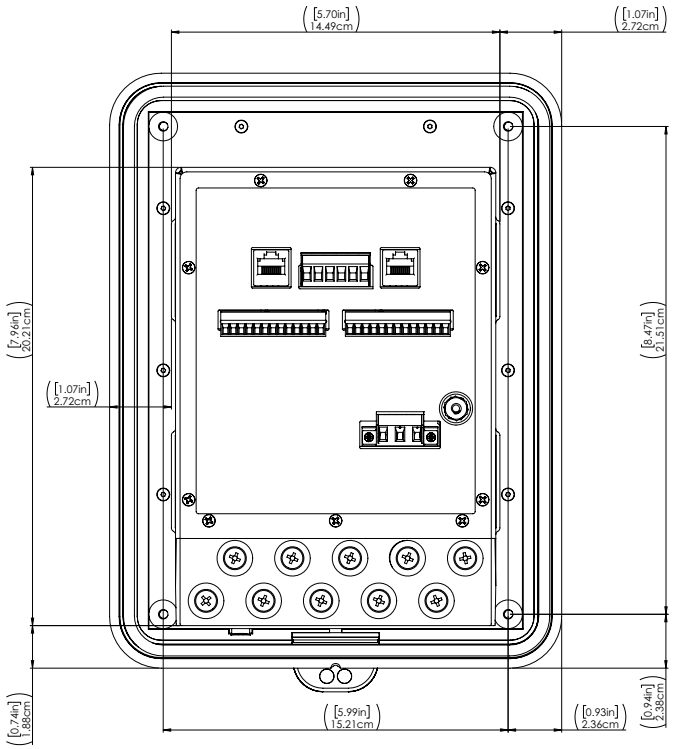
- Verifying meter installation and wiring.
- Verifying proper system integration.
- Working with 3rd parties to ensure cross compatibility.
- Advising users on best practices for optimal implementation.

You can reach Technical Support from 8 a.m. to 8 p.m. EST, Monday-Friday, at 516-334-0870.

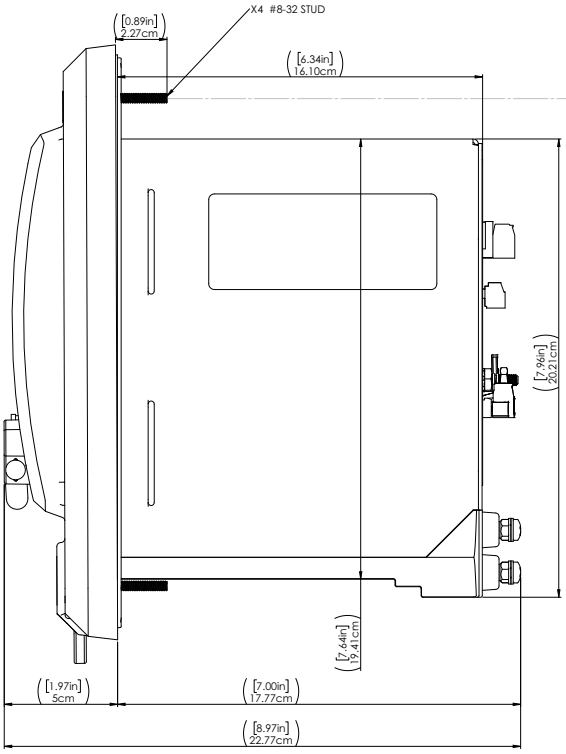
Hardware Installation:



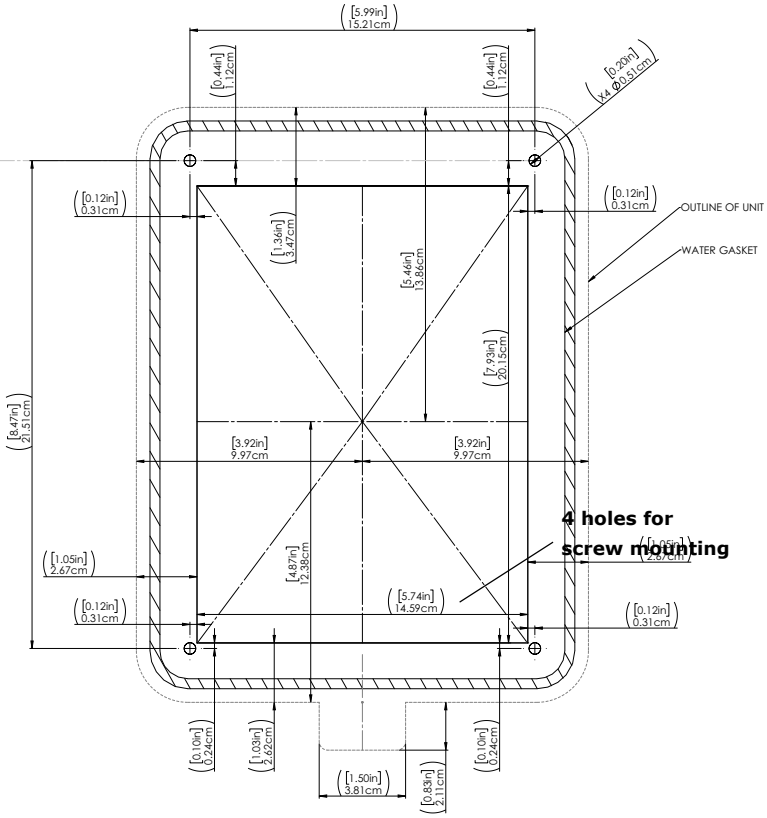
Front Dimensions



Back Dimensions



Side Dimensions



Cutout Dimensions

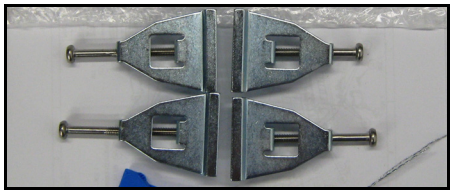
To install the meter:

The switchboard case meter fits into a standard panel cutout (see cut-out dimensions on previous page). The installation procedure you use depends on whether you are replacing an existing installation or performing a new installation. The hardware (mounting clips and screws; studs, washers, and nuts) are in plastic bags shipped with the meter.

For Retrofit to existing GE S1 case installations, follow the procedure, below.

For new installations, follow the procedure on the next page.

RETROFIT HARDWARE

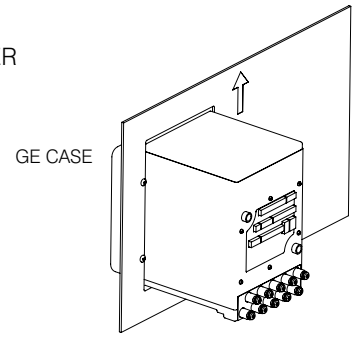


FOR EXISTING/RETROFIT INSTALLATIONS:

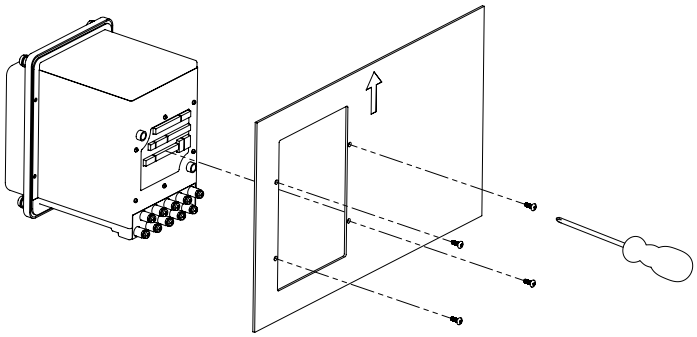
TOOLS NEEDED

#2 PHILIPS SCREWDRIVER

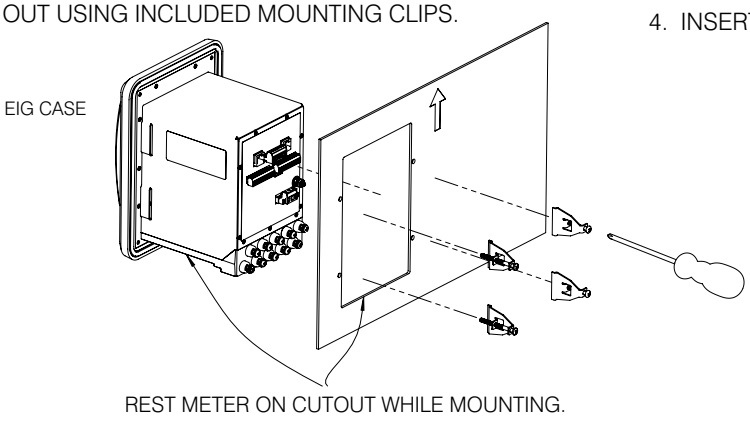
1. LOCATE UNIT TO BE CHANGED.



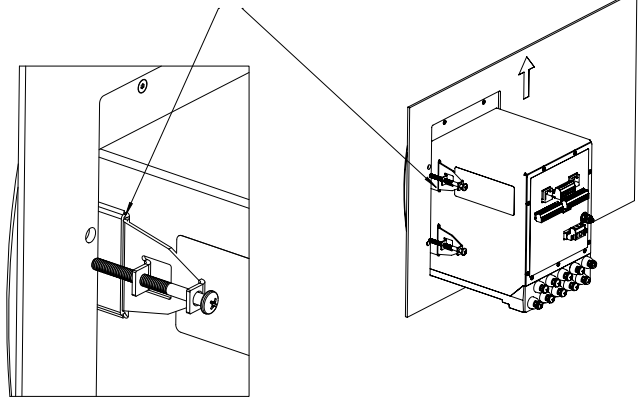
2. REMOVE 4 SCREWS HOLDING CASE TO PANEL.



3. INSERT AND INSTALL SHARK 270 SWB3 UNIT INTO PANEL CUT OUT USING INCLUDED MOUNTING CLIPS.



4. INSERT MOUNTING CLIPS INTO SIDE SLOTS.

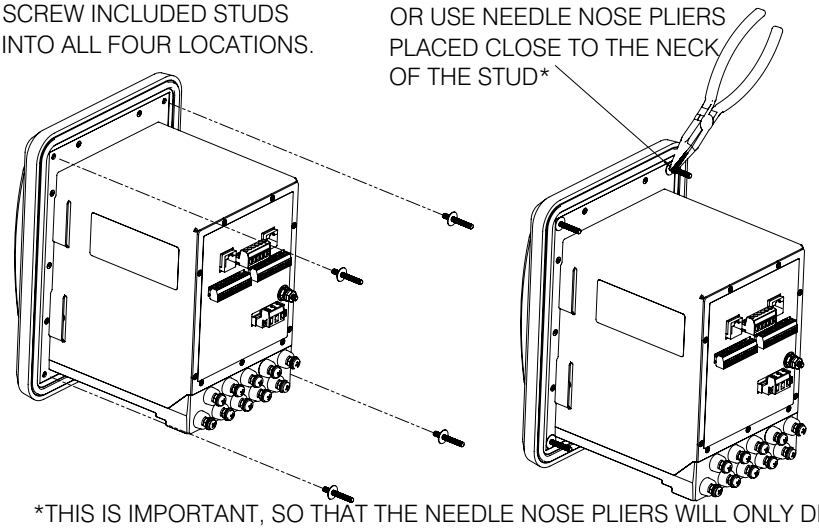


FOR NEW INSTALLATIONS:

NEW INSTALLATION HARDWARE

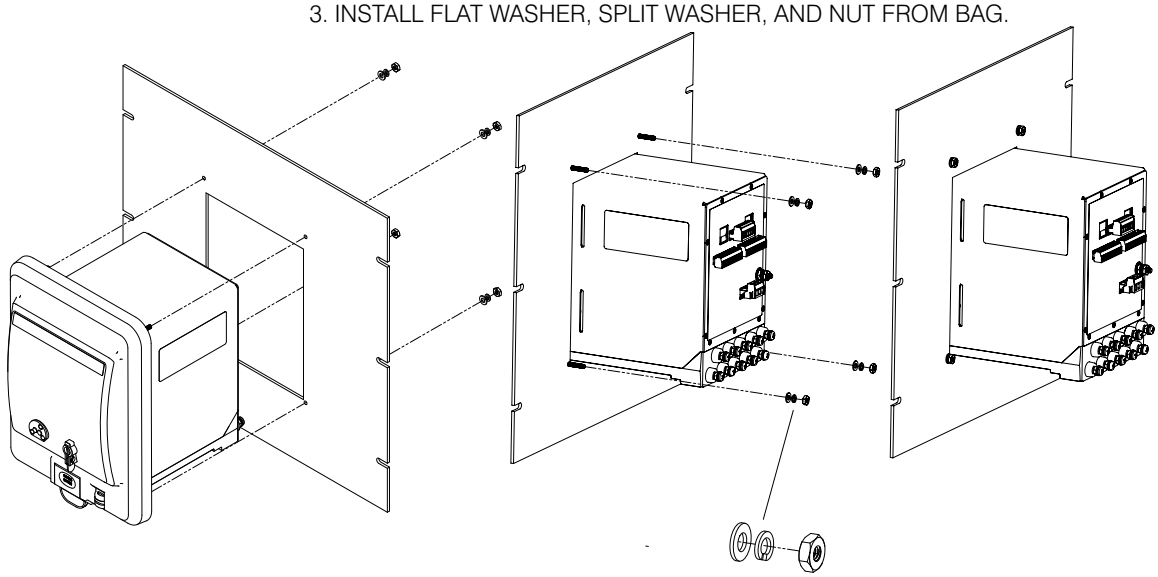
1. SCREW INCLUDED STUDS INTO ALL FOUR LOCATIONS.

2. TIGHTEN THE STUD FINGER TIGHT OR USE NEEDLE NOSE PLIERS PLACED CLOSE TO THE NECK OF THE STUD*



*THIS IS IMPORTANT, SO THAT THE NEEDLE NOSE PLIERS WILL ONLY DEFORM THE ENDING THREADS, WHICH WILL BE IN THE PANEL, RATHER THAN THE THREADS NEEDED FOR THE LOCKING NUT.

3. INSTALL FLAT WASHER, SPLIT WASHER, AND NUT FROM BAG.

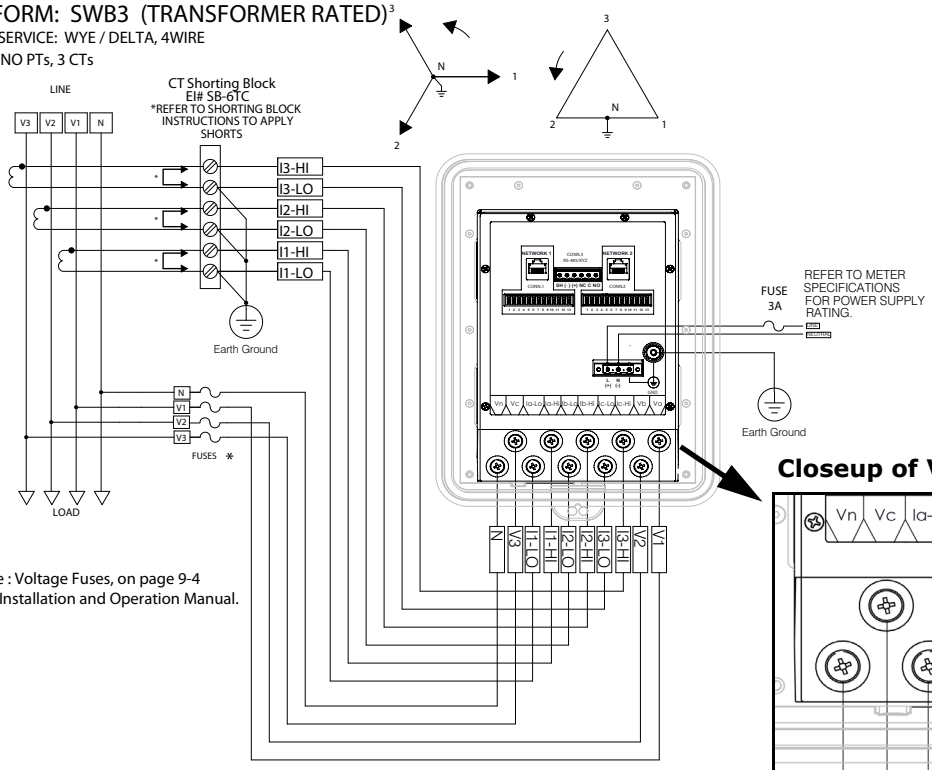


NOTE: Alternatively, you can use the mounting brackets for new installations.

Electrical Installation:

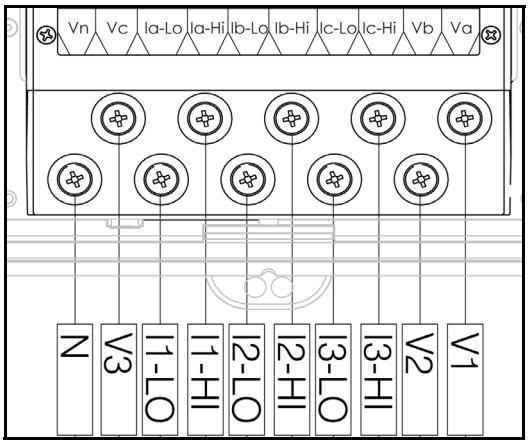
NOTE: Following are some of the possible wiring configurations. See the *Shark® 270 Meter User Manual* for additional configurations (see page QS-1).

FORM: SWB3 (TRANSFORMER RATED)[3]
SERVICE: WYE / DELTA, 4WIRE
NO PTs, 3 CTs

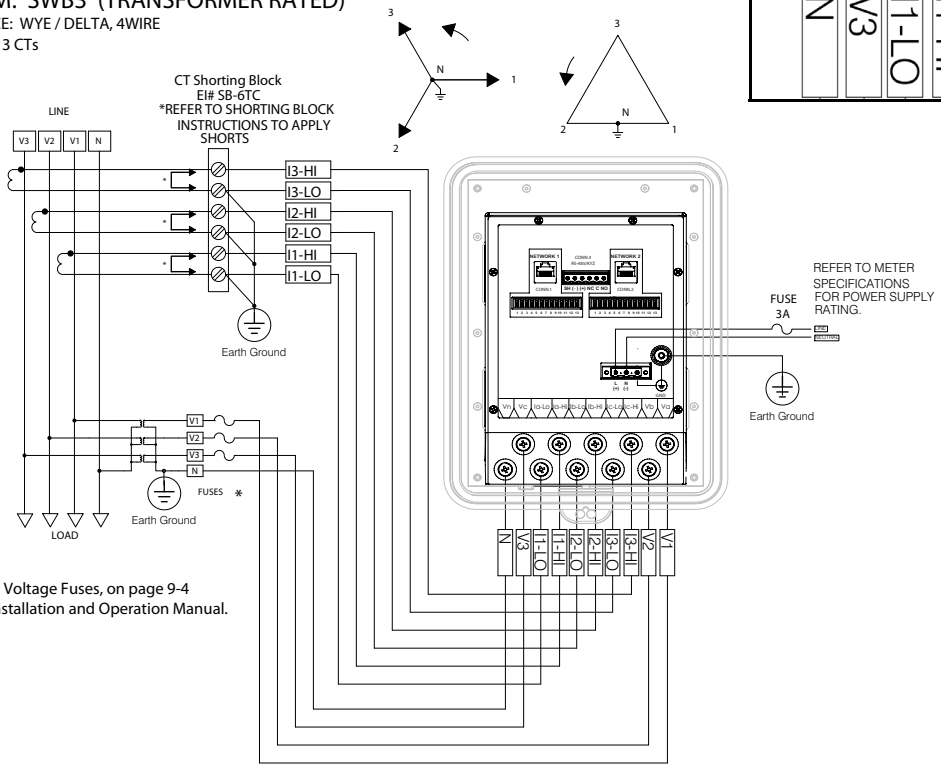


* For ratings, see : Voltage Fuses, on page 9-4 of the meter's Installation and Operation Manual.

Closeup of Voltage and Current Inputs

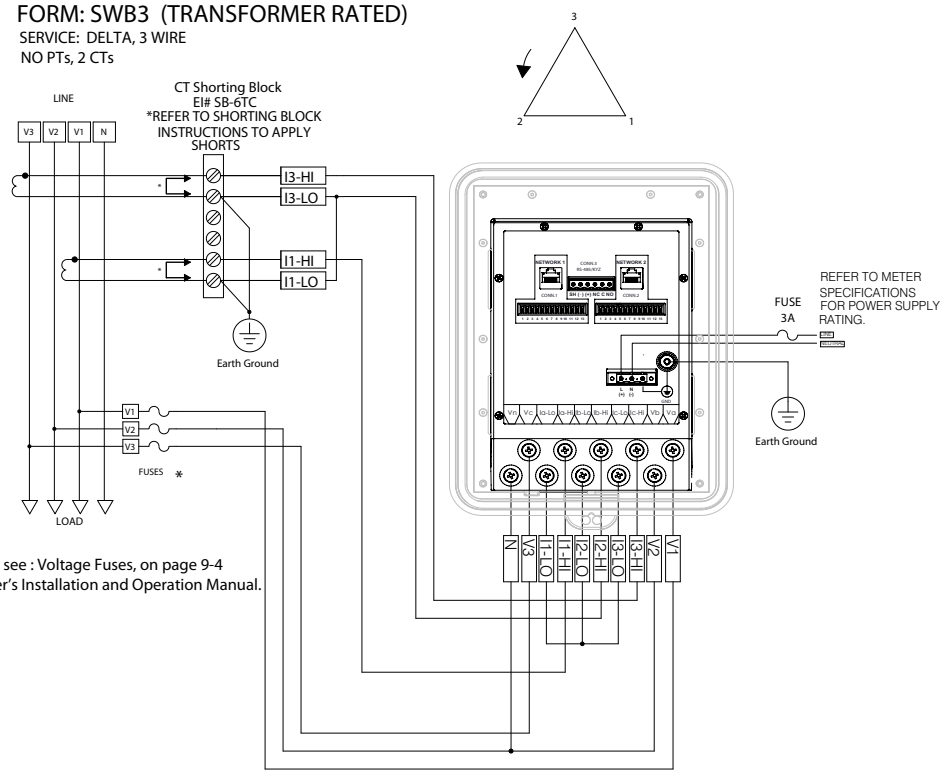


FORM: SWB3 (TRANSFORMER RATED)
SERVICE: WYE / DELTA, 4WIRE
3 PTs, 3 CTs



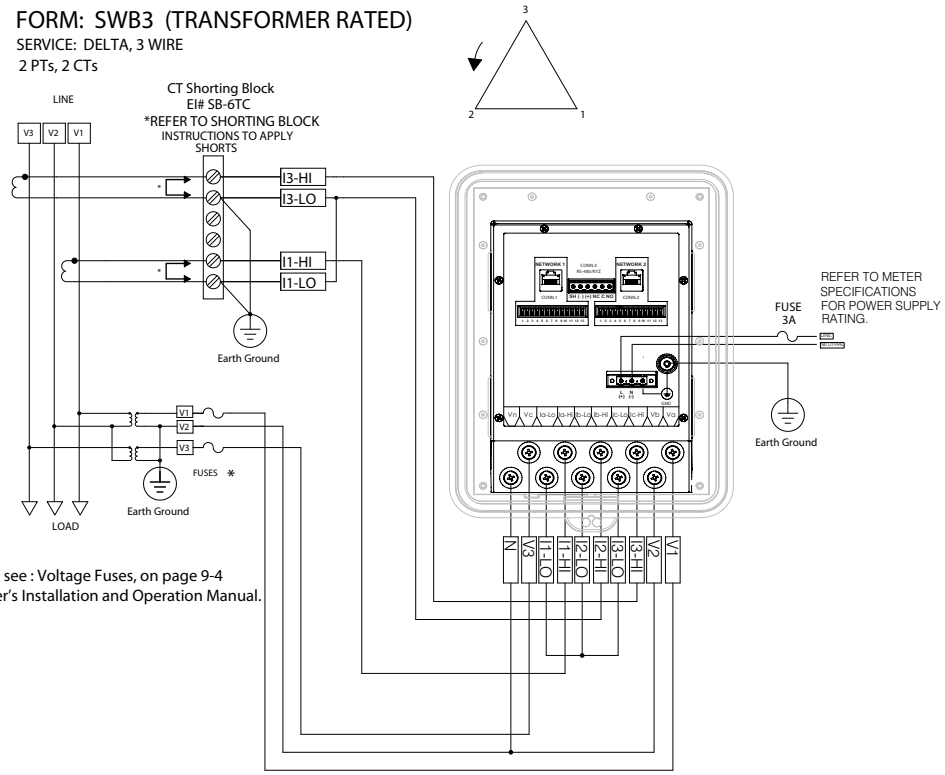
* For ratings, see : Voltage Fuses, on page 9-4 of the meter's Installation and Operation Manual.

FORM: SWB3 (TRANSFORMER RATED)
SERVICE: DELTA, 3 WIRE
NO PTs, 2 CTs



* For ratings, see : Voltage Fuses, on page 9-4
of the meter's Installation and Operation Manual.

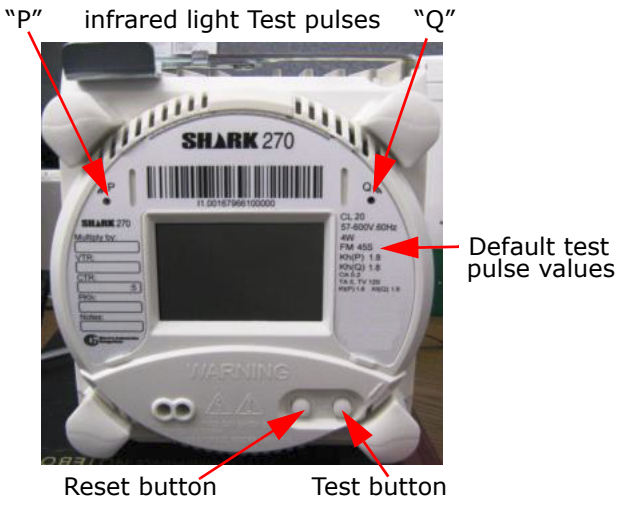
FORM: SWB3 (TRANSFORMER RATED)
SERVICE: DELTA, 3 WIRE
2 PTs, 2 CTs



*For ratings, see : Voltage Fuses, on page 9-4
of the meter's Installation and Operation Manual.

Testing:
The Shark® 270 meter has two infrared light ports for pulse-based accuracy testing.

- The port labeled "P" produces Wh pulse outputs.
- The port labeled "Q" produces VARh pulse outputs.
- The associated constant values are Kh and Kt.



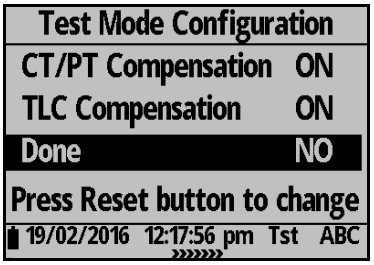
1. Open the switchboard cover by lifting the bottom latch (you may have to break the seal); remove the bezel.

2. To enter Test Mode, press the Test button.The test pulses are fixed as shown in the table below.

Test Pulse	Wye		Delta	
	Class 2	Class 20	Class 2	Class 20
1 - Wh pulse (P light port)	0.18	1.8	0.12	1.2
2 - VARh pulse (Q light port)	0.18	1.8	0.12	1.2

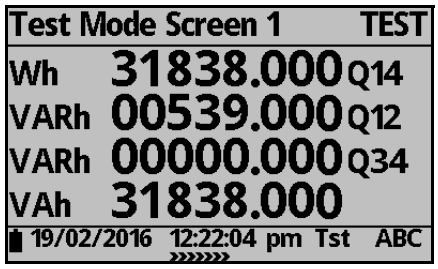
They are also shown on the meter's label, under the form type.

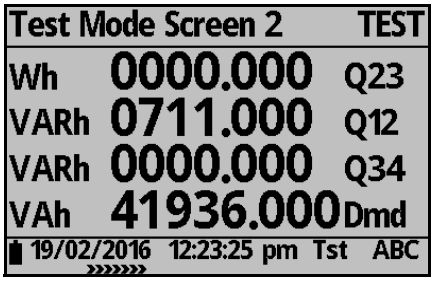
3. When you press the Test button, you first see the Test Mode Configuration LCD display screen. This screen lets you enable (ON) or disable (OFF) CT/PT and TLC compensation during testing. Click the Reset button to change ON to OFF, or vice versa; click the Test button to move to the next setting. When you have finished making your settings, click the Reset button to change NO to YES next to DONE.



4. Press the Test button again to begin testing. There are four Test Mode screens, which display accumulated real, reactive and apparent energy as well as Block Demand for real power. Advance through the Test Mode screens by pressing the Test button.

5. The table below shows the available screens, the data displayed on them, and the pulse source for each screen. Sample screens are shown on the right.





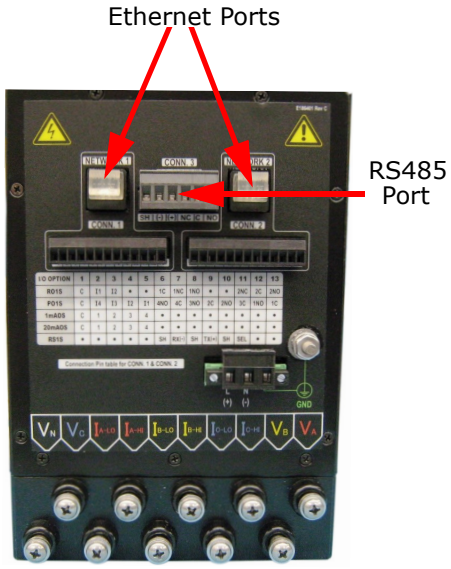
Screen	Parameters	Pulse 1 Source	Pulse 2 Source
1	Wh (Q1+Q4), VARh (Q1+Q2), VARh (Q3+Q4), VAh	Wh (Q1+Q4)	VARh (Q1+Q2) or (Q3+Q4)
2	Wh (Q2+Q3), VARh (Q1+Q2), VARh (Q3+Q4), VAh	Wh (Q2+Q3)	VARh (Q1+Q2) or (Q3+Q4)
3	W (Q1+Q4)Demand, VAR (Q1+Q2) Demand, VAR (Q3+Q4) Demand, VA Demand	Wh (Q1+Q4)	VARh (Q1+Q2) or (Q3+Q4)
4	W (Q2+Q3) Demand, VAR (Q1+Q2) Demand, VAR (Q3+Q4) Demand, VA Demand	Wh (Q2+Q3)	VARh (Q1+Q2) or (Q3+Q4)

6. Use a comparator to compare the test pulses to the Energy standard to test the meter accuracy.

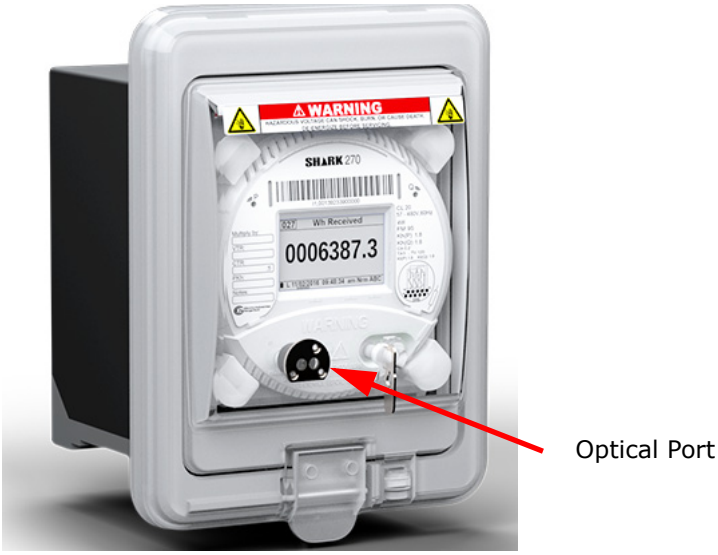
7. To exit Test Mode, press the Test Mode Button for more than three seconds. The meter returns to Normal Mode. Replace the switchboard cover and seal, if applicable.

Meter Communication Connection

To program the meter, you need to connect to it via the CommunicatorPQA® application.Depending on your meter configuration, you will connect through one of these ports: RS485 serial, RJ45 Ethernet, or Optical port.



Back of Switchboard Case



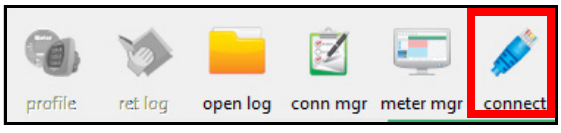
Front of Switchboard Case

Accessing the Communication Ports

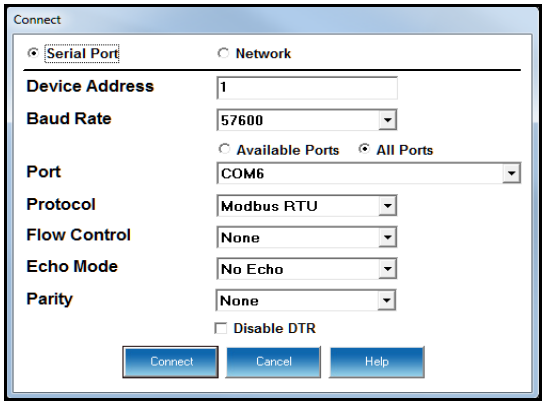
RS485 Serial Port
Use an RS485 cable to connect between the meter and the PC on which you are running CommunicatorPQA® software. You can use EIG's RS485 to USB cable E205301:
https://electroind.com/product/rs485-to-usb-communication-converter/
RJ45 Ethernet Port
Use an Ethernet cable to connect between the meter and the PC on which you are running CommunicatorPQA® software. You can use EIG's RS485 to USB cable E159343:
https://electroind.com/product/rj45-to-usb-communication-converter/
Optical Port
Use an Optical port reader to communicate between the meter and the PC on which you are running CommunicatorPQA® software. You can use EIG's Optical port to USB or RS485 cable, A9U or B10U:
https://electroind.com/product/ansi-optical-probe/

Programming the Meter through CommunicatorPQA® Software (see page QS-1 for download link)

1. From the CommunicatorPQA® software's Main screen, click the Connect icon in the Icon Bar.
2. From the CommunicatorPQA® software's Main screen, click the Connect icon in the Icon Bar.

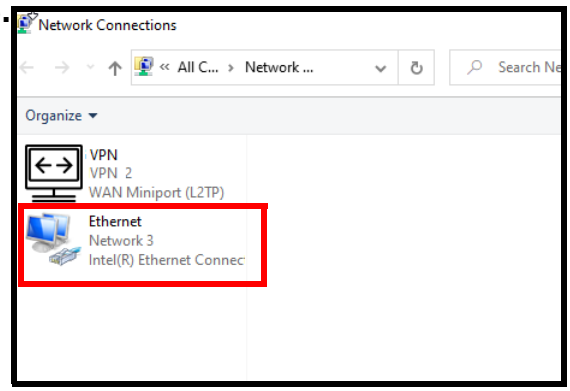


- If you are connecting through a serial port (RS485 or Optical port):
  a. Click the Serial Port button.
  b. Enter device address.
  c. Select baud rate (default for both ports is 57600), communication port you are using, protocol (default for RS485 is Modbus RTU and for the Optical port is Modbus ASCII), and parity (for RS485 - the default is None). You can leave the other fields as they are.
  d. Click Connnect.

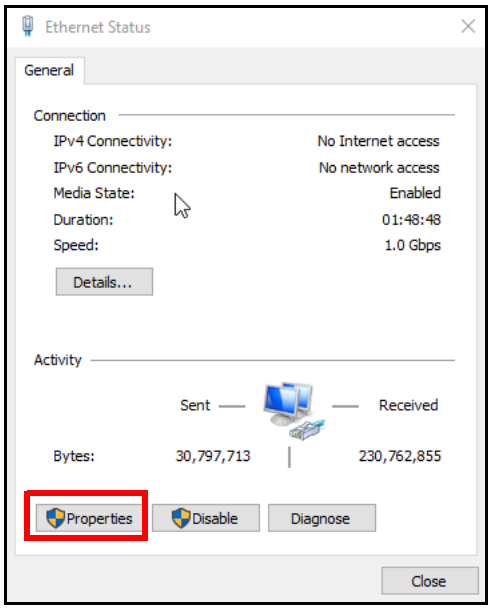


- If you are connecting through an Ethernet port, you must change your PC's Ethernet Adapter's properties before you can connect:
  a. Locate your Ethernet Adapter (Settings>Network and Internet>Change Adapter Options).
  b. Right-click on the connection you want to use.
  c. Click the Properties button.
  d. Click on Internet Protocol Version 4 (TCP/IPv4) and click the Properties button.

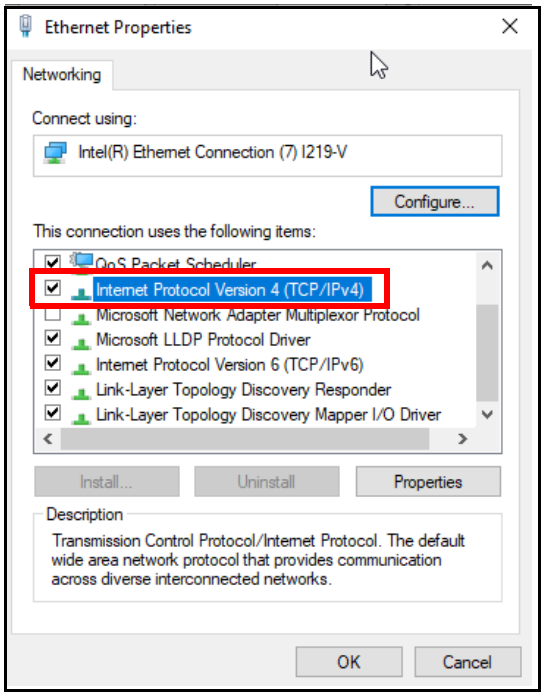
b.



c.



d.

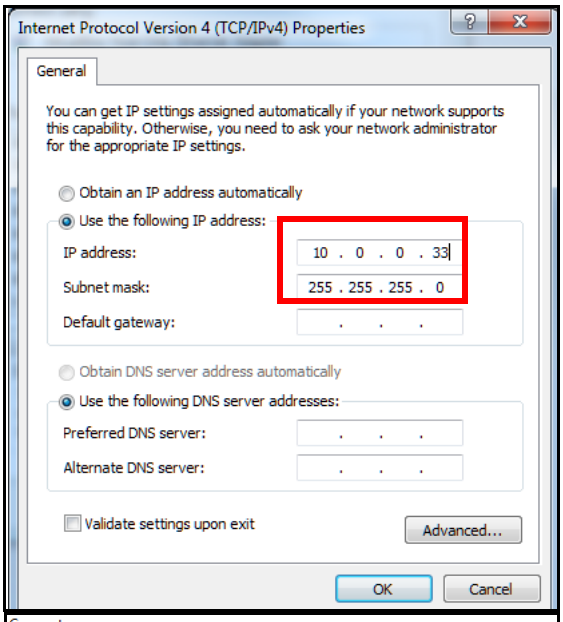


e. Click Use the following IP address and enter 10.0.0._ - the last number can be anything from 2 to 254 - in the IP address and 255.255.255.0 in the Subnet Mask.

f. Click OK.

g. Close the Ethernet Adapter and Properties windows.

e.



h. Click the Network button.

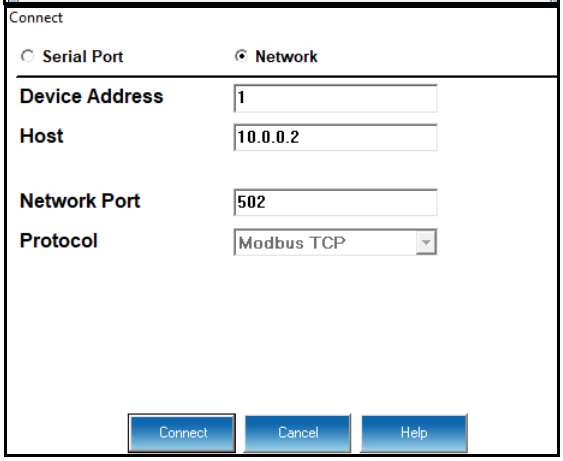
i. Enter device address.

j. Enter the meter's default IP address: **10.0.0.2**

k. Enter the meter's IP address Network port (the default is 502).

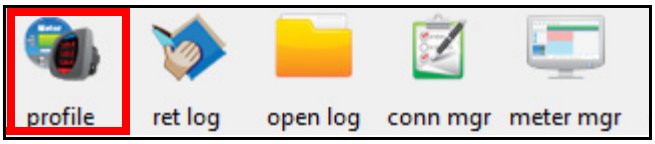
l. Network protocol is Modbus TCP.

m. Click Connect.
NOTE: You can change the meter's IP address once you are connected. See the instructions for Communications settings, beginning on page QS-11.



4. The Device Status screen opens, displaying information about the meter.

5. Click OK to close the Device Status screen, and then click the Profile icon in the Icon Bar.



6. The meter's Device Profile screen opens, giving you access to the programmable settings for the meter.

Program CT, PT Ratios

1. The first Device Profile screen is the CT, PT Ratios and System Hookup settings screen.Click General Settings>CT, PT Ratios and System Hookup from the left side of the Device Profile screen to access this screen from another settings screen.

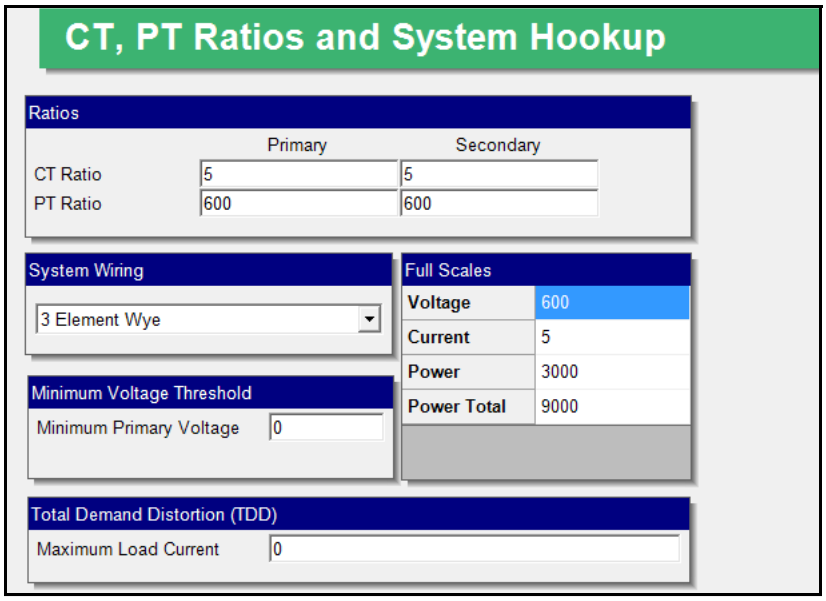
2. Enter CT Ratios Primary (1-65535). The Secondary is display only.

3. Enter PT Ratios Primary (1-99999999) and Secondary (1-65535) voltage.

Example CT Setting:
200/5 Amps: set the Primary current value as 200.00.

Example PT Settings:
14400/120 Volts: set the Primary voltage value as 14400.00; set the Secondary voltage as 120.00.

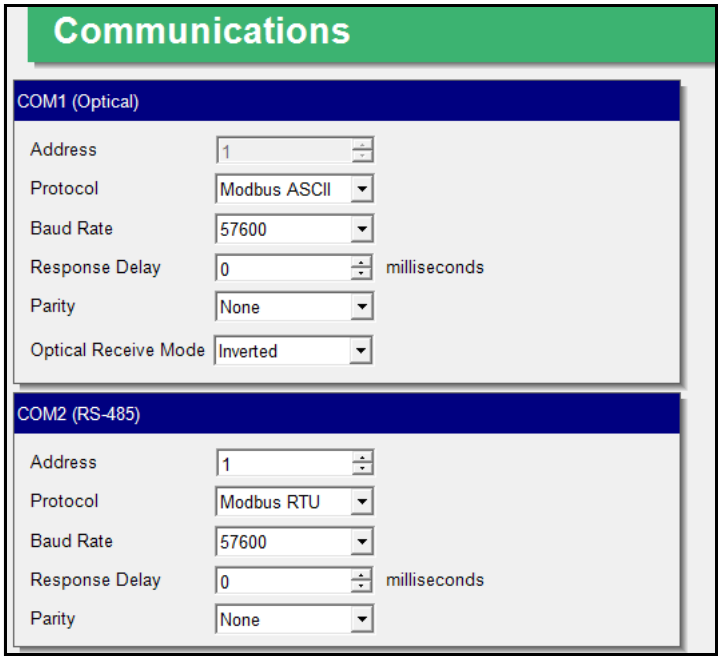
See Chapter 26 in the software manual for an explanation of the other settings in this screen.



Program Communications Setting

1. Click General Settings>Communications from the left side of the Device Profile screen.

2. The settings shown here for the Optical port (Com 1) and the RS485 port (Com 2) are the default settings. Change the settings, if necessary, for your system.



Program Meter Time

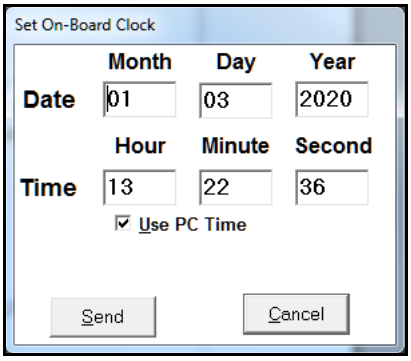
The meter is preset to United States Eastern time. To change the meter time:

1. From the Main screen's Title bar, Click Tools>Set Device Time.

2. You can either enter the time in the Time fields or click Use PC Time to match the meter time with the PC time.

3. Click Send.

NOTE: The meter offers multiple Time Synchronization methods. See Chapter 26, Section 26.1.2 in the software manual (see page QS-1 for the download link; alternatively, you can click Help>Contents from the Main screen to open the manual) for instructions on setting up Time Sync for the meter.



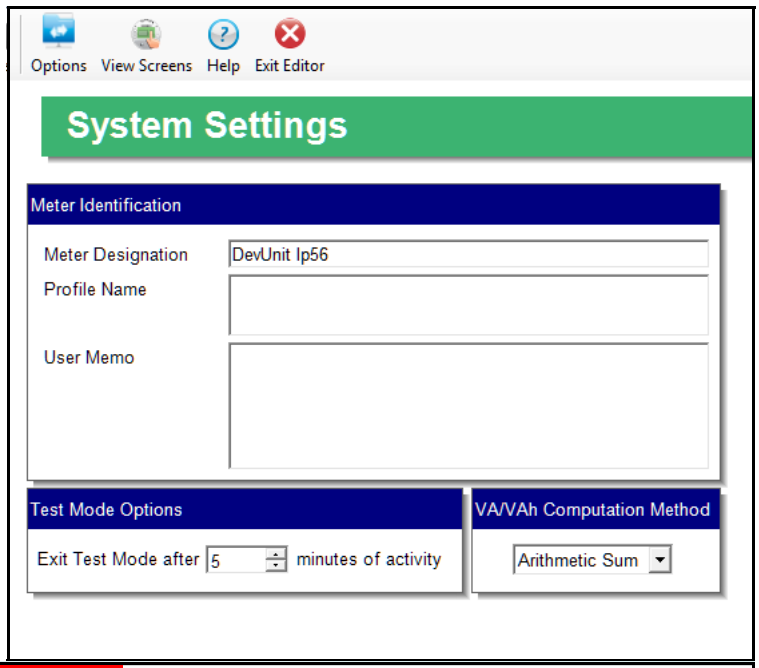
Program Meter Name

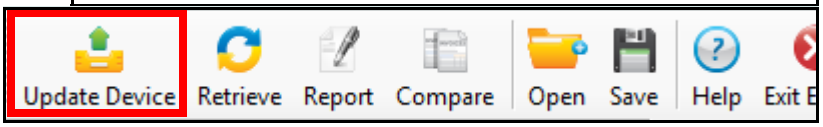
The meter's name is used in database files and report titles.
To give the meter a unique name:

1. From the meter's Device Profile screen, click General Settings>System Settings.

2. Enter a name for the meter in the Meter Designation field.

See Chapter 26 in the software manual for an explanation of the other settings in this screen.





IMPORTANT! When you have made changes to the meter's Device Profile, click Update Device at the top of the Device Profile screen, to send the new settings to the meter. The meter will reboot and then you can reconnect to it. If you changed the IP address, make sure to use the new address in the Network Connect screen. You may also need to reset the Ethernet Adapter to match the new IP address. Follow the steps outlined on pages QS-9 - QS-10.

NOTE: For additional meter operation and programming information, refer to the *Shark® 270 Meter User Manual* and the *Communicator PQA®* and *MeterManagerPQA® Software User Manual* on the EIG website - see page QS-1 for download links. You can also view the software manual by clicking the Help button on a settings screen, or by selecting Help>Contents from the top of the CommunicatorPQA® software's Main screen.