Shark® 270 Socket 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 Installation and Operation 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 *Installation and Operation Manual* and the *Communicator PQA™, MeterManagerPQA™, and EnergyPQA.com™ Software User Manual* on EIG's website:

User Manual:
https://www.electroind.com/products/shark-270-revenue-energy-meter/
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.

Mechanical Installation:

The Shark® 270 Socket meter is designed to mount into a standard meter socket, so this meter can fit in any base that can accept that meter form. The socket form is listed on the meter's front label (see picture on the right).

1. Examine the label to verify that the meter you are installing is the correct form factor and service type.

2. Make sure that the socket and meter current class ratings are compatible.

3. Make sure that all communication and auxiliary power wiring is accessible in case disconnection is required for any reason.

4. Make sure that any communications wiring from the back of the meter is fed through the appropriate openings in your socket to allow for clean connections with external devices. Refer to the meter's Installation and Operation manual for wiring connections to the I/O modules and related information. The manual is on the EIG website (see page QS-1 for the download link).
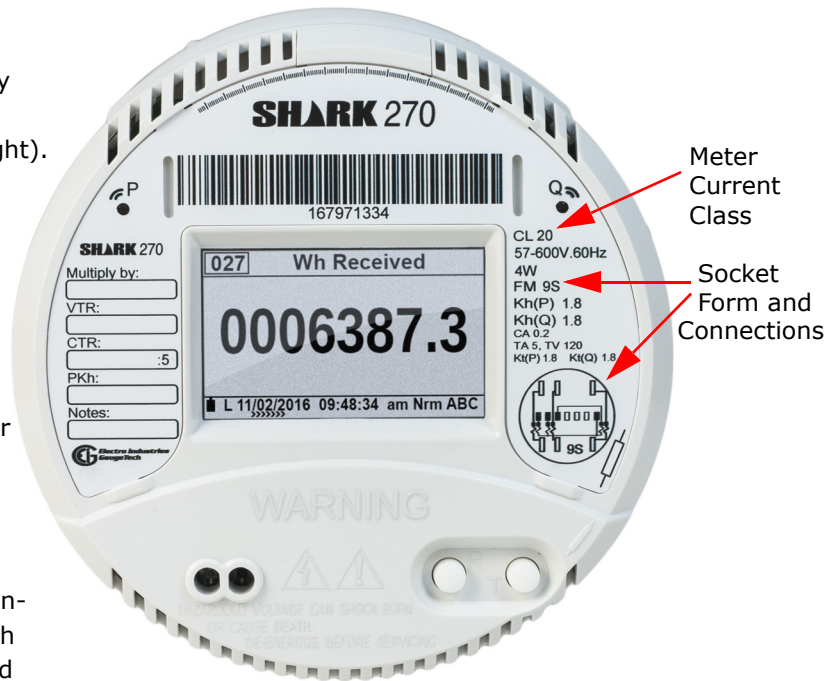
The possible socket forms for the Shark® 270 meter are: 9S, 36S, 45S, and 9A.

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. To enter Test Mode, remove the clear cover by turning it counter-clockwise, and press the Test button, located under the cover.

2. The test pulses are fixed as shown in the table below.
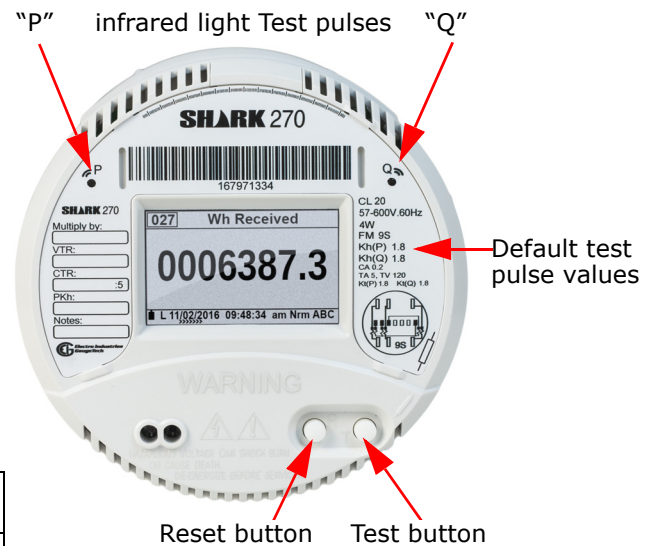
Test Pulse	Wye		Delta	
	Class 2	Class 20	Class 2	Class 20
1 - Wh pulse (P light port)	0.18	1.8	0.12	1.2
2 - VARh pulse (Q light port)	0.18	1.8	0.12	1.2

Test Mode Configuration

CT/PT Compensation	ON
TLC Compensation	ON
Done	NO

Press Reset button to change

19/02/2016 12:17:56 pm Tst ABC

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

4. 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.

5. 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.

6. 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.

Test Mode Screen 1   TEST

Wh	31838.000	Q14
VARh	00539.000	Q12
VARh	00000.000	Q34
VAh	31838.000	

19/02/2016 12:22:04 pm Tst ABC

| 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)

Test Mode Screen 2   TEST

|		
Wh	0000.000	Q23
VARh	0711.000	Q12
VARh	0000.000	Q34
VAh	41936.000	Dmd

19/02/2016 12:23:25 pm Tst ABC

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

8. To exit Test Mode, press the Test Mode Button for more than three seconds. The meter returns to Normal Mode. Replace the meter cover.

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

FORM: 9S (TRANSFORMER RATED)
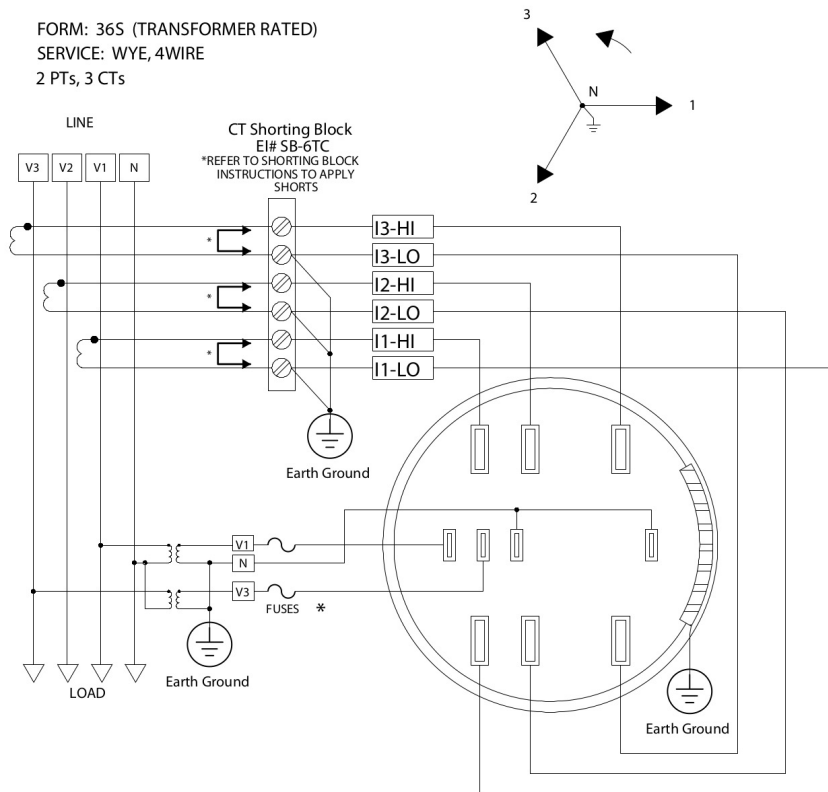SERVICE: WYE / DELTA, 4WIRE
3 PTs, 3 CTs
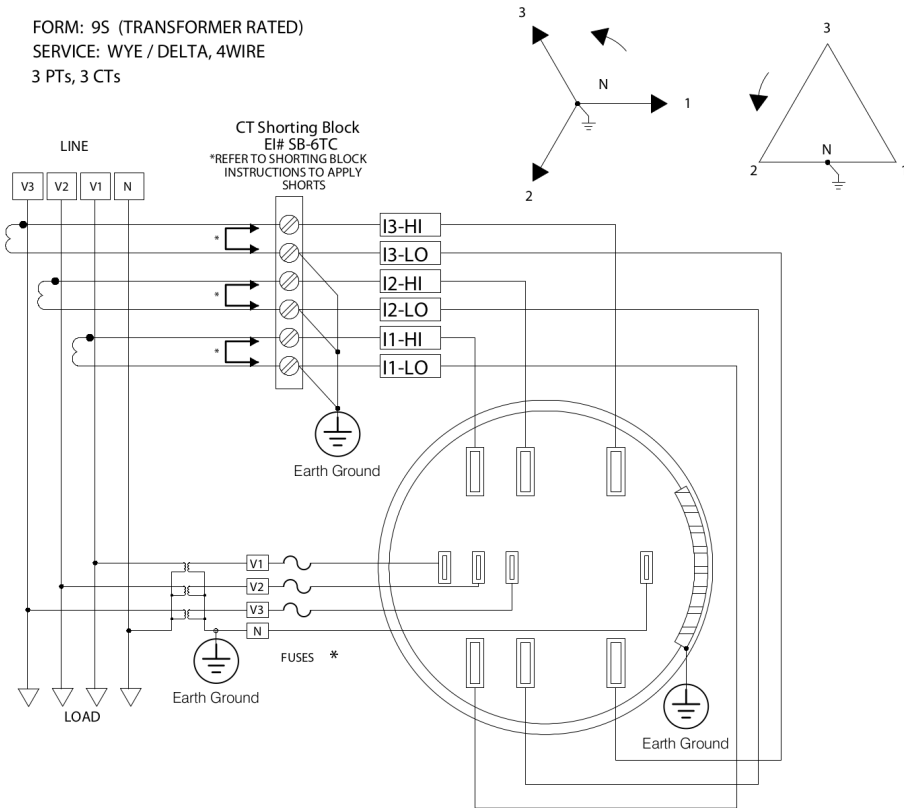
FORM: 9S (TRANSFORMER RATED)
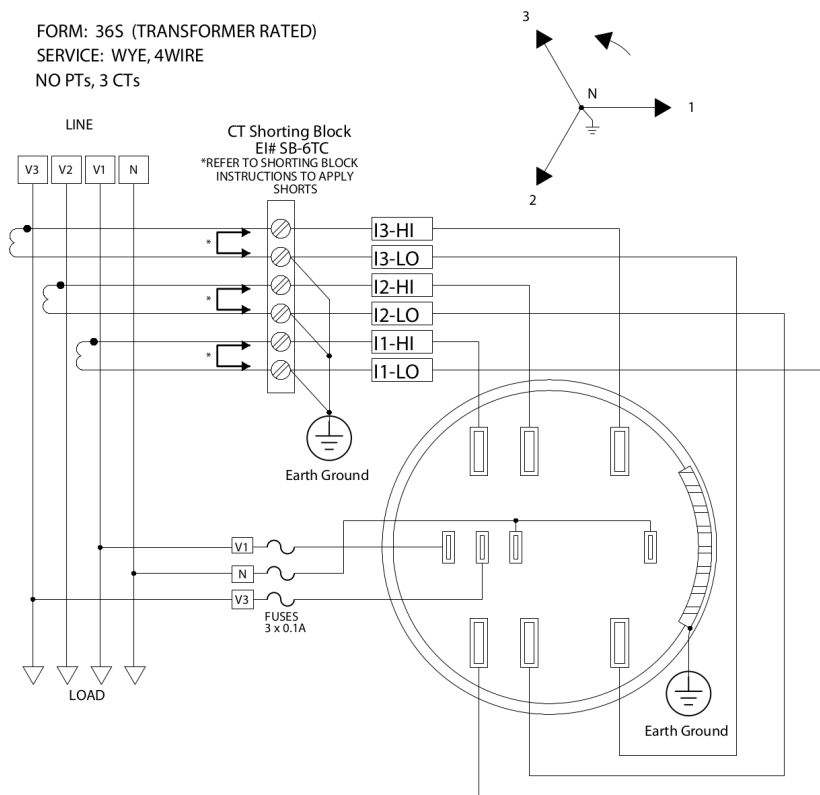SERVICE: DELTA, 3 WIRE
NO PTs, 2 CTs
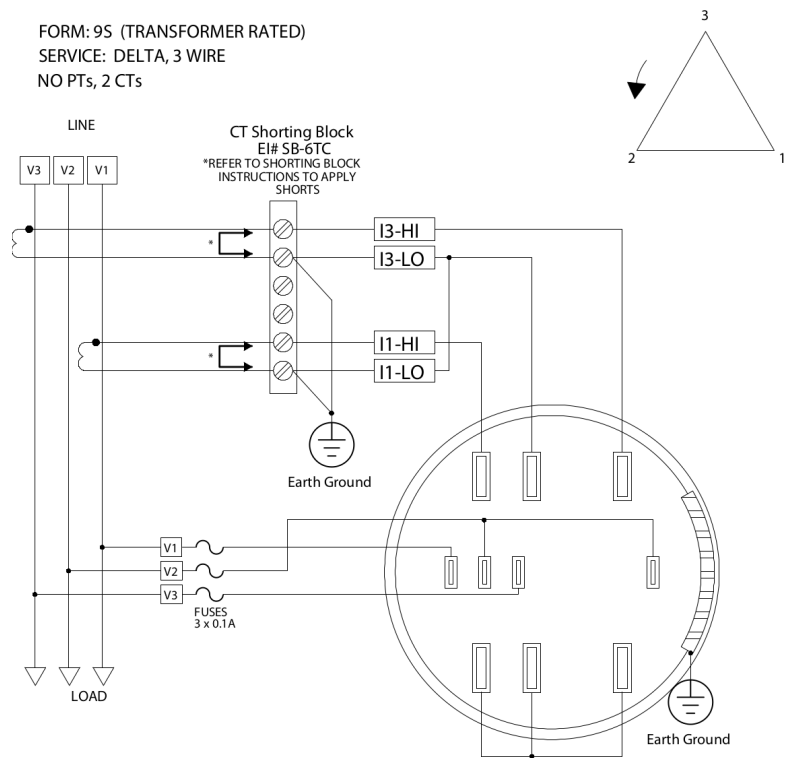
* For Fuse ratings, see Section 9.4: Voltage Fuses, in the meter's User Manual.

FORM: 36S (TRANSFORMER RATED)
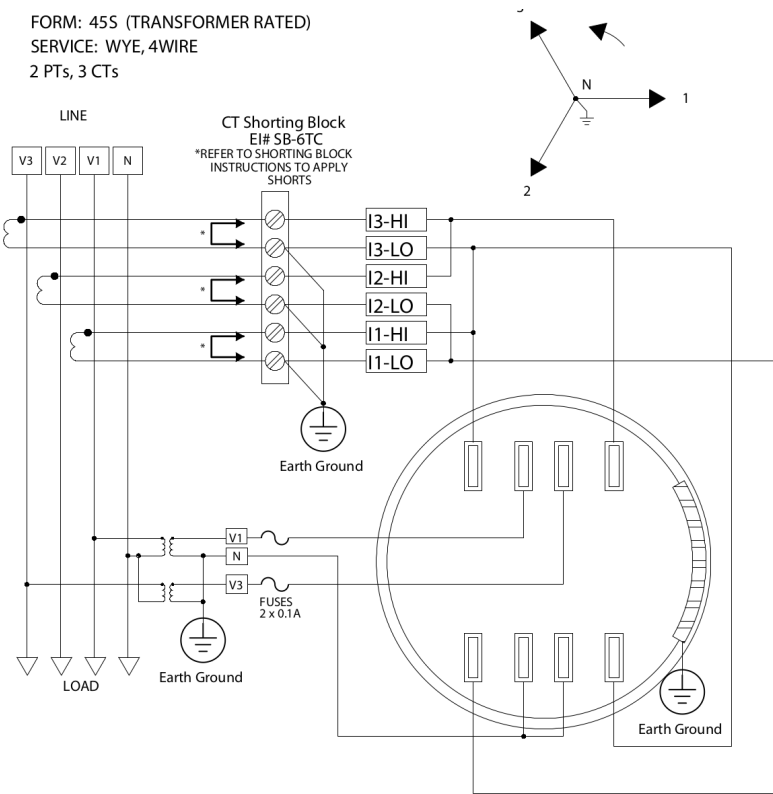SERVICE: WYE, 4WIRE
2 PTs, 3 CTs

LINE

V3 V2 V1 N

CT Shorting Block
EI# SB-6TC
*REFER TO SHORTING BLOCK
INSTRUCTIONS TO APPLY
SHORTS

3

N   1

2

I3-HI
I3-LO
I2-HI
I2-LO
I1-HI
I1-LO

Earth Ground

V1
N
V3   FUSES *

LOAD   Earth Ground

Earth Ground

FORM: 36S (TRANSFORMER RATED)
SERVICE: WYE, 4WIRE
NO PTs, 3 CTs

LINE

V3 V2 V1 N

CT Shorting Block
EI# SB-6TC
*REFER TO SHORTING BLOCK
INSTRUCTIONS TO APPLY
SHORTS

3

N   1

2

I3-HI
I3-LO
I2-HI
I2-LO
I1-HI
I1-LO
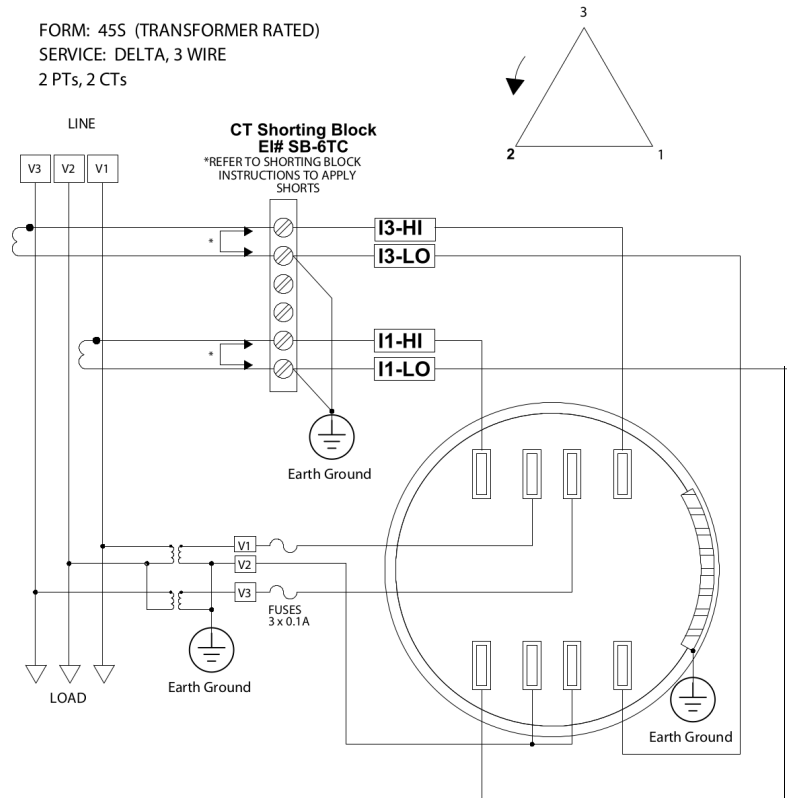
Earth Ground

V1
N
V3   FUSES
3 x 0.1A

LOAD

Earth Ground

* For Fuse ratings, see Section 9.4: Voltage Fuses, in the meter's User Manual.

FORM: 45S (TRANSFORMER RATED)
SERVICE: WYE, 4WIRE
2 PTs, 3 CTs

LINE

CT Shorting Block
EI# SB-6TC
*REFER TO SHORTING BLOCK
INSTRUCTIONS TO APPLY
SHORTS

| V3 | V2 | V1 | N |

N
1
2

I3-HI
I3-LO
I2-HI
I2-LO
I1-HI
I1-LO

Earth Ground

V1
N
V3
FUSES
2 x 0.1A

LOAD   Earth Ground

Earth Ground

FORM: 45S (TRANSFORMER RATED)
SERVICE: DELTA, 3 WIRE
2 PTs, 2 CTs

3

LINE

CT Shorting Block
EI# SB-6TC
*REFER TO SHORTING BLOCK
INSTRUCTIONS TO APPLY
SHORTS

| V3 | V2 | V1 |

2   1

I3-HI
I3-LO

I1-HI
I1-LO

Earth Ground

V1
V2
V3
FUSES
3 x 0.1A

LOAD   Earth Ground

Earth Ground

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.
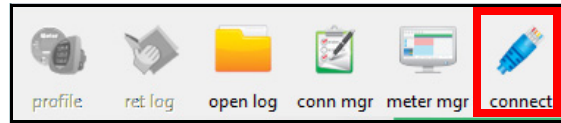
   - If you are connecting through a serial port (RS485 or Optical port), use either a cable or an optical port reader to communicate from the meter to your PC and click the Serial Port radio button.
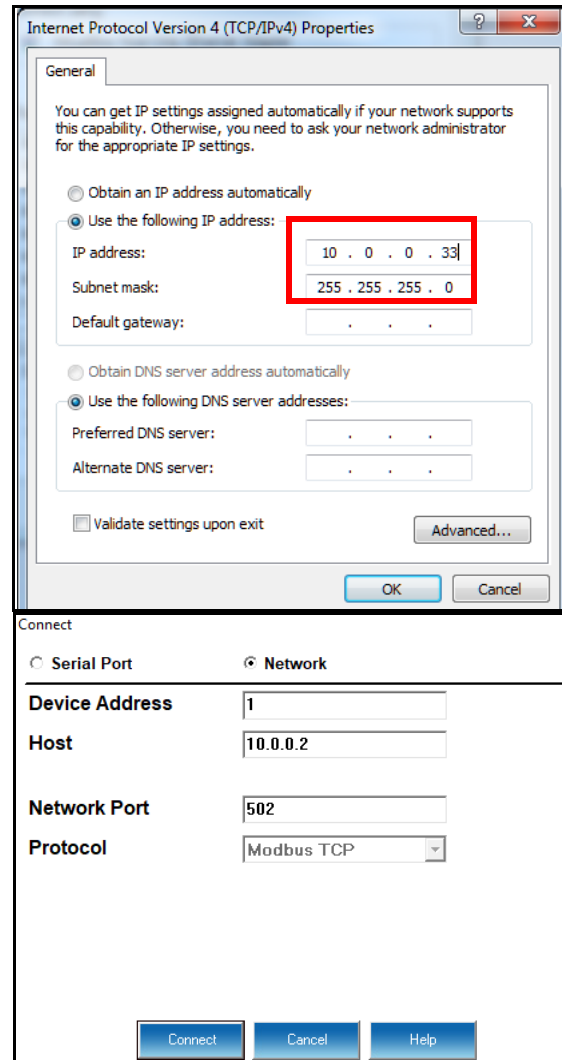   a. Enter device address.
      b. Select baud rate (default for both ports is 57600), communication port you are using, protocol (default for RS485 is Modbus RTU and for the Optical port is Modbus ASCII), and parity (for RS485 - the default is None). You can leave the other fields as they are.
      c. Click Connnect.
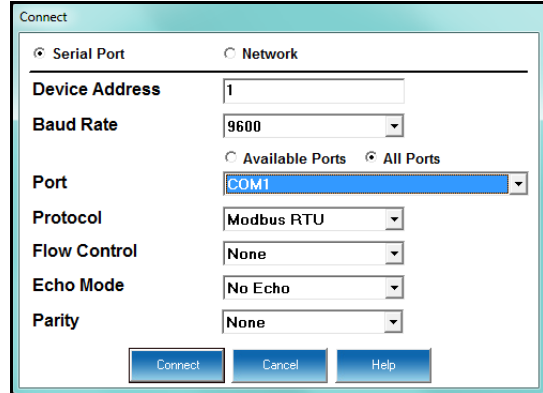
- If you are connecting through an Ethernet port, you must change your PC's Ethernet Adapter's properties before you can connect:
      a. Locate your Ethernet Adapter (Settings>Network and Internet>Change Adapter Options).
      b. Right-click on the connection you want to use.
      c. Click the Properties button.
      d. Click on Internet Protocol Version 4 (TCP/IPv4) and click the Properties button.

b.

c.

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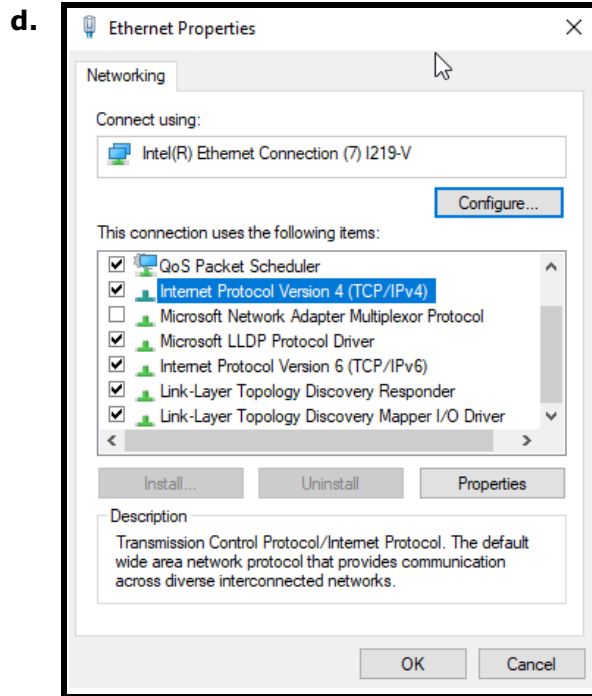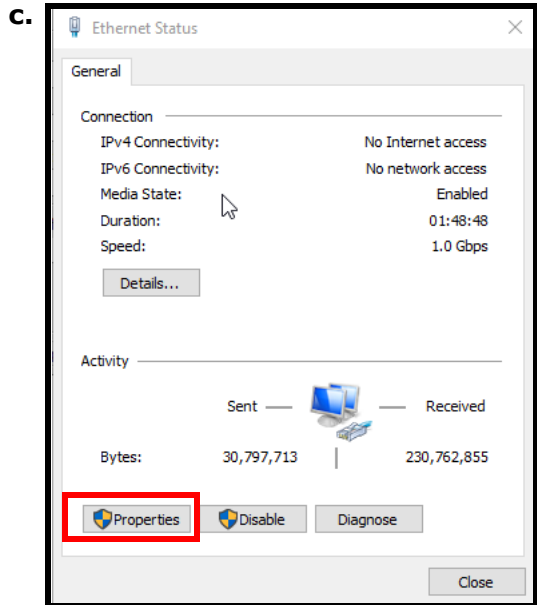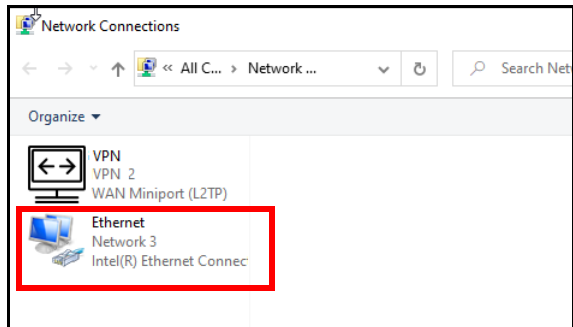
e. Click Use the following IP address and enter 10.0.0._ - the last number can be anything from 2 to 254 - in the IP address and 255.255.255.0 in the Subnet Mask.

f. Click OK.

g. Close the Ethernet Adapter and Properties windows.

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 Communi-cations settings, beginning on page QS-10.
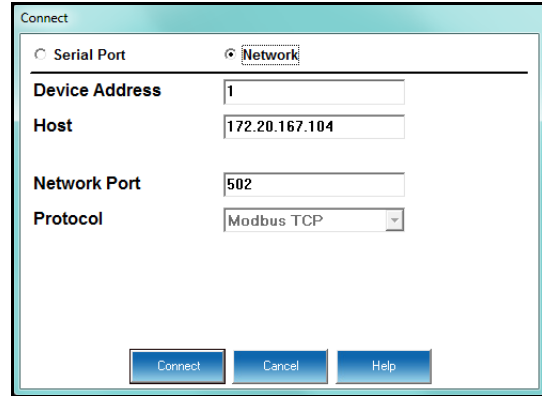
4. The Device Status screen opens, displaying information about the meter.

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.
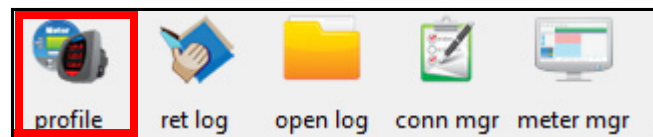
Program CT, PT Ratios

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.

- If you are connecting through an Ethernet port, click the Network radio button.
  a. Enter device address.
  b. Enter the meter's IP address Network port (the default is 502).
  c. Network protocol is Modbus TCP.
  d. Click Connect.

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

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

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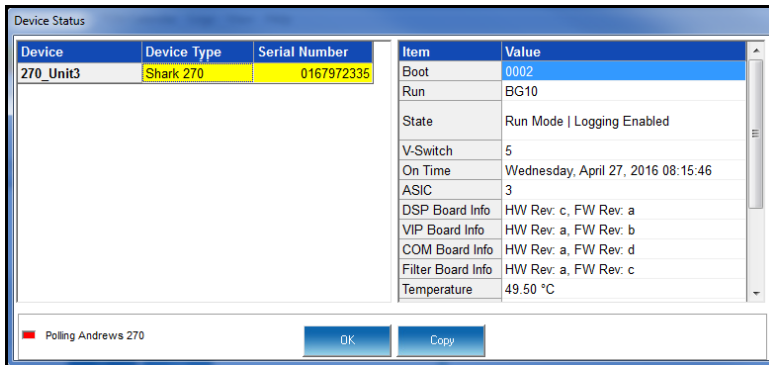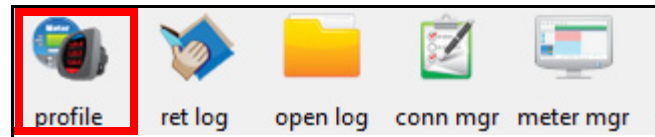

NOTE: To connect via USB virtual serial port from a PC, connect the RS485 to USB cable, part number E159343, to the meter's RS485 port's jack. See the picture on the next page.

RJ45 plug goes to RS485 port's jack

USB connector goes to PC's USB port
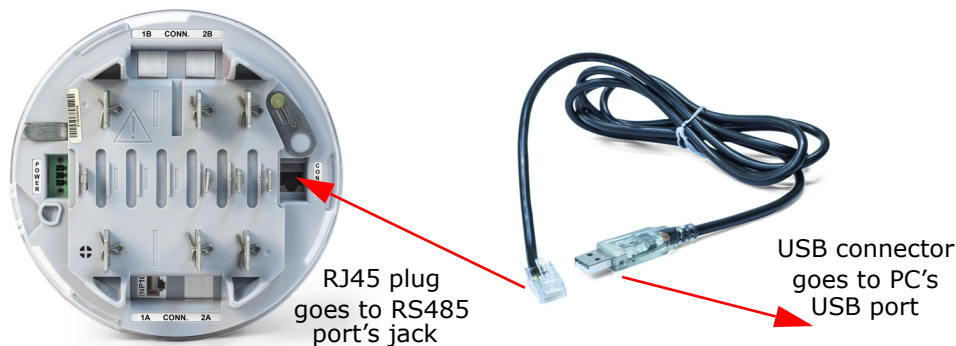
Program CT, PT Ratios

1. Click General Settings>CT, PT
   Ratios and System Hookup
   from the left side of the Device
   Profile screen.

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

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

      Example CT Setting:
      200/5 Amps: set the Pri-
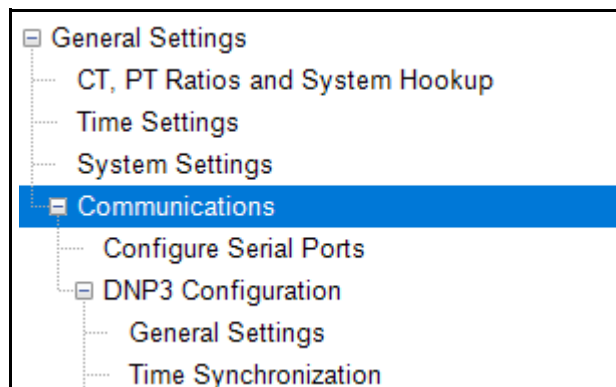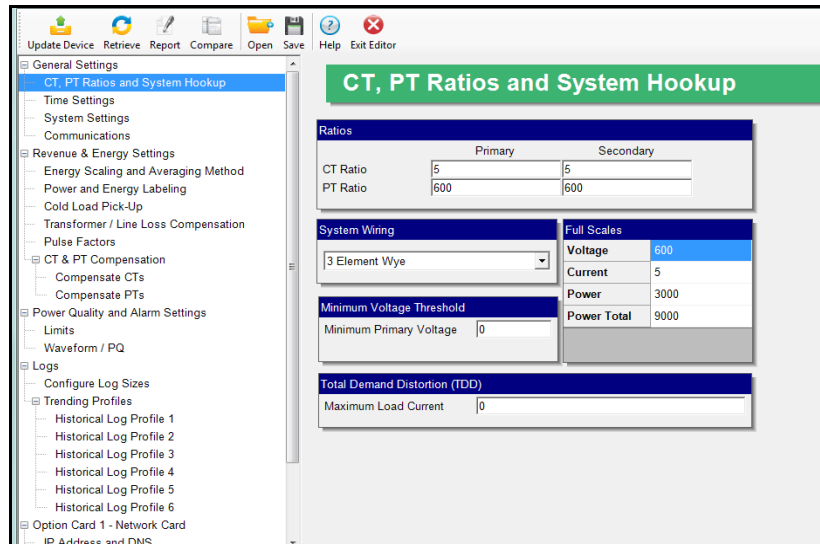   mary current value as
      200.00.

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.

Communications

COM1 (Optical)

Address	1
Protocol	Modbus RTU
Baud Rate	9600
Response Delay	0 milliseconds
Parity	None
Optical Receive Mode	Inverted

COM2 (RS-485)

Address	1
Protocol	Modbus RTU
Baud Rate	57600
Response Delay	0 milliseconds
Parity	None

Program Meter Time: The meter is preset to 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 set the time using your PC's time.

3. Click Send.

Set Device On-Board Clock

	Month	Day	Year
Date	06	19	2020

	Hour	Minute	Second
Time	16	20	18

☑ Use PC Time

Send   Cancel

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.
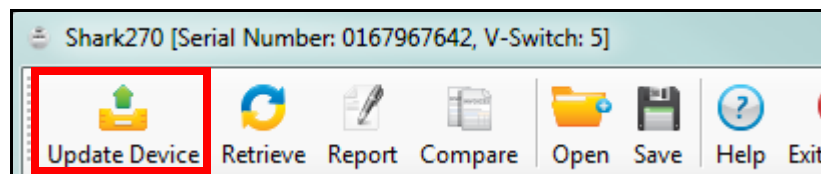
Program Meter Name:

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

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

⊟ General Settings
     CT, PT Ratios and System Hookup
     Time 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.

System Settings

Meter Identification

Meter Designation   270-3

Profile Name

User Memo

Test Mode Options

Exit Test Mode after 5 [ ] minutes of inactivity

VA/VAh Computation Method

Vector Sum

IMPORTANT! When you have made changes to the meter's Device Profile, click Update Device to send the new settings to the meter.

Shark270 [Serial Number: 0167967642, V-Switch: 5]

Update Device   Retrieve   Report   Compare   Open   Save   Help   Exit

NOTES:

- For additional meter operation and programming information, refer to the *Shark® 270 Meter Installation and Operation Manual* and the *CommunicatorPQA™, MeterManagerPQA™, and EnergyPQA.com™ Software User Manual* on the EIG website (see page QS-1 for the 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 Communicator PQA™ software's Main screen.

- If your meter came installed with the 4GLTE cellular modem option, see Chapter 14 of the *Shark® 270 Meter Installation and Operation Manual* for commissioning and operation instructions for it.

⚠ If your meter was ordered with the MC (Measurement Canada) option, it will come with Security enabled. The default username and password are both admin.