

onset®

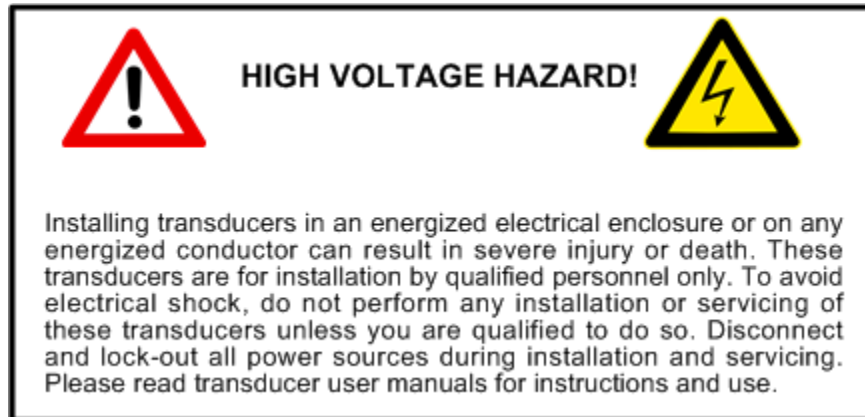
Measurement & Verification System

Three-Phase

 **Quick Start Guide**

HOBBO®

onsetcomp.com



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MAN-KIT-MV-3P

Doc # 13371-A

Introduction

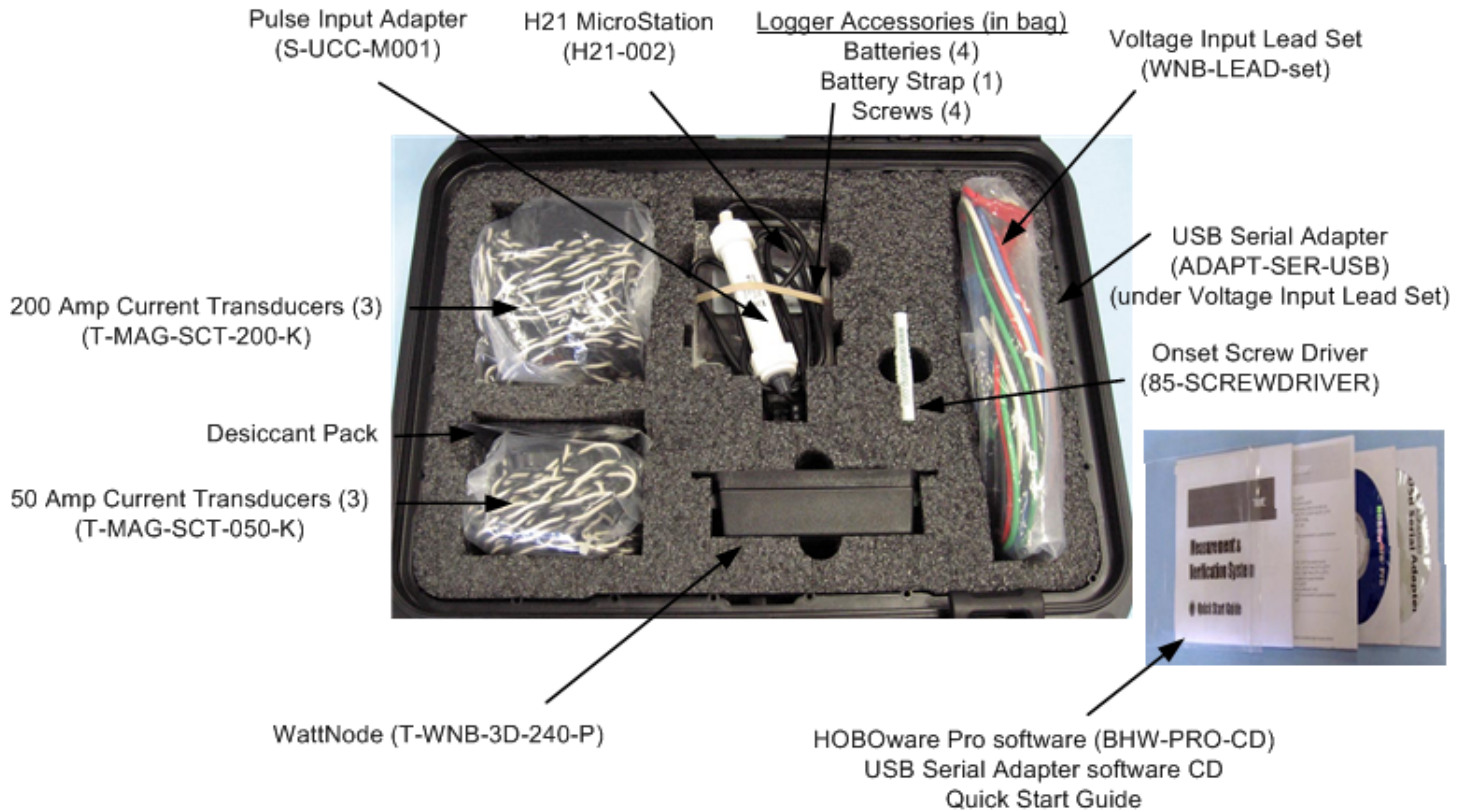
This HOB0 Measurement & Verification System can be used to measure AC voltages from (nominal) 120 to 140 phase to neutral and (nominal) 208 to 240 phase to phase. Electrical service types applicable are:

- 120 VAC/208-240 VAC Three-Phase Four-Wire Wye with Neutral
- 208-240 VAC Three-Phase Three-Wire Delta without Neutral

The system can also be used for the following Single-Phase service types by installing a jumper (refer to the Single-Phase Wiring Diagrams on page 13).

- 120 VAC Single-Phase Two-Wire with Neutral
- 120 VAC/240 VAC Single-Phase Three-Wire with Neutral
- 120-240 VAC Single-Phase Two-Wire without Neutral

Components



Related Documentation

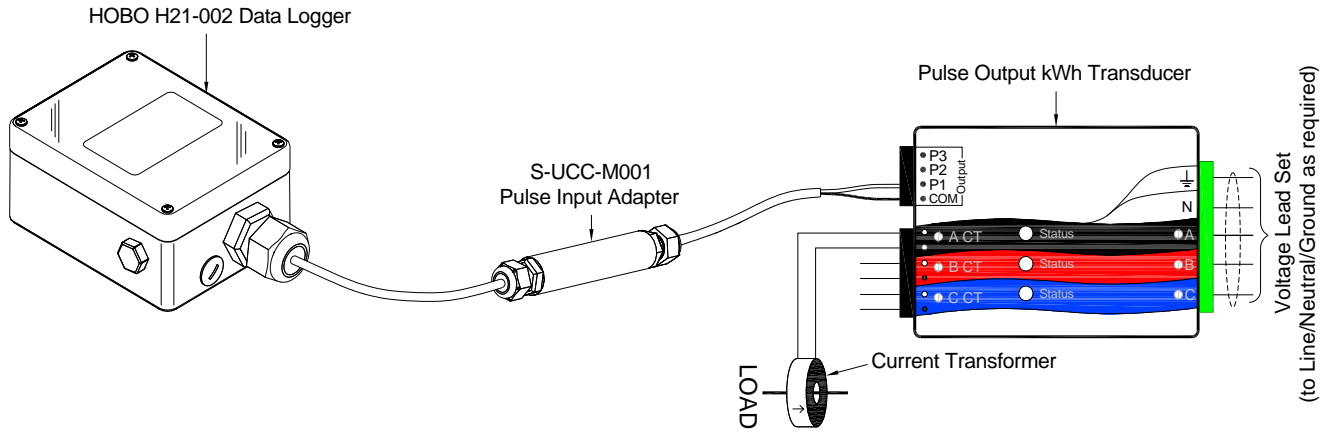
Documentation for the components in the Measurement & Verification System can be found at the Onset Web site:

<http://www.onsetcomp.com/products/kits/kit-mv-3p>

Example Configuration

The following diagram shows the connections between the system components in an example configuration.

See the Wiring Diagrams starting on page 12 for your specific service type.



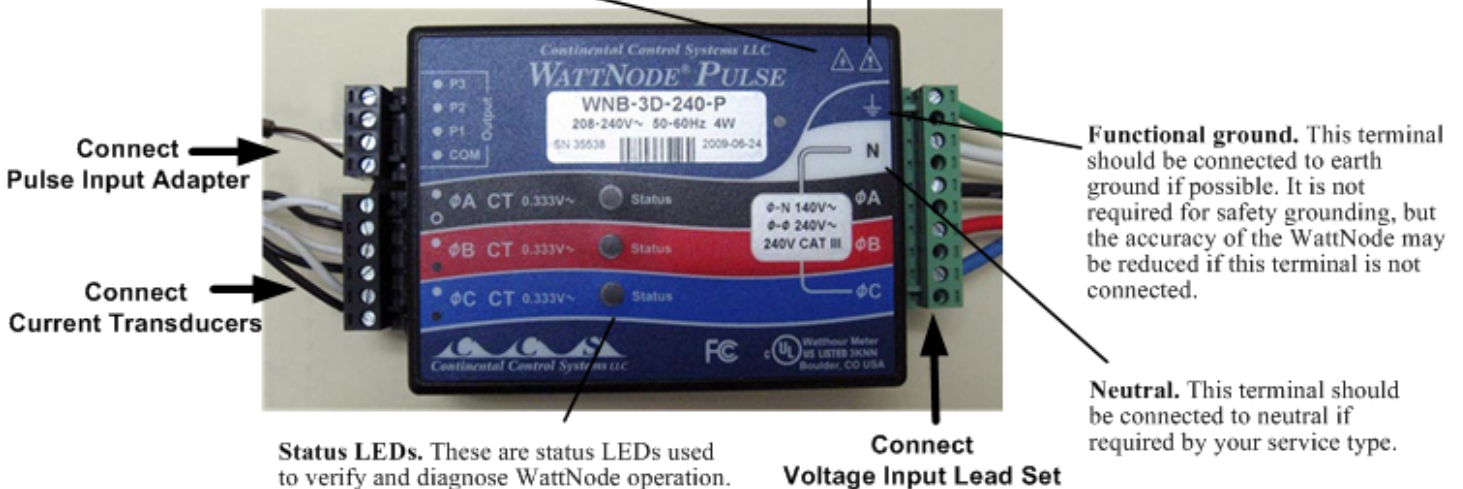
WattNode Description

The WattNode transducer provides bidirectional power measurements (positive and negative power). It can be used for conventional power and energy measurement as well as for net metering and PV applications. The WattNode transducer includes three LEDs—one per phase—for diagnostics and indication of power direction, low power factor, and correctly installed CTs.

Onset Part No.	Configuration / VAC	Output	WattNode Part No.
T-WNB-3D-240	Delta 208-240	Pulses representing kWh	WNB-3D-240-P

Attention - consult User's Guide. This symbol indicates that there can be danger when installing and operating the WattNode if the installation instructions are not followed correctly.

Caution, risk of electrical shock. This symbol indicates that there is a risk of electric shock when installing and operating the WattNode if the installation instructions are not followed correctly.



IMPORTANT: See the WattNode manual for all safety information and specifications.

http://www.ccontrolsys.com/downloads/Manual_WNB_Pulse.pdf

Setup Procedure

Follow this procedure to connect all of the system components, configure the logger, and start logging data.

Onset recommends that before you use the system in the field you connect all components and connect the logger to HOBOWare in the office to familiarize yourself with the hardware and software.

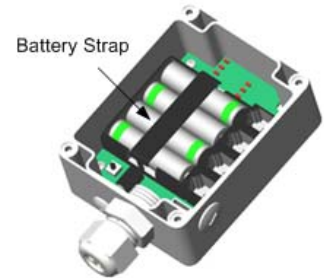
1. Unpack contents.

Remove all components from the case and then remove plastic from components if applicable.

2. Install batteries in the H21.

See the small plastic bag for parts: batteries, battery strap, screws.

- a. Remove the U21 cover.
- b. Install 4 AA alkaline or lithium batteries.
- c. Place the battery strap over the batteries.
- d. Replace the cover.
- e. Secure the cover with screws.

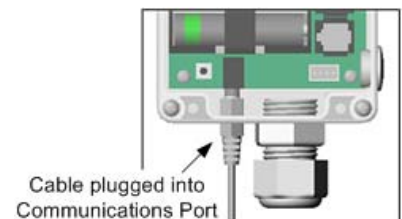
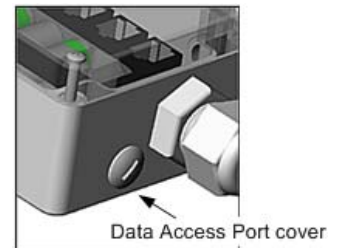


3. Connect H21 to a PC running HOBOWare

NOTE: If your computer does not have a serial port, you must use the USB Serial Adapter (included). **IMPORTANT:** Install the Keyspan software prior to plugging the adapter into the USB port.

For more information see the *Keyspan: USB Serial Adapter for Windows-v3.4 Manual*. You can find the manual on the Keyspan CD included with the kit, or at:
<http://www.onsetcomp.com/products/kits>

- a. Use a slotted screwdriver or small coin to unscrew the data access port cover.
- b. Insert the PC interface cable through the data access port and plug it into the communications port on the logger.
- c. Connect the other end of the cable to the computer (use Keyspan USB Serial Cable if your PC does not have a serial port).



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4. Connect Pulse Input Adapter to the Pulse Output Terminal Block on the WattNode.




-
5. Connect Current Transducer(s) to the CT Block on the WattNode.



-
6. Connect Voltage Input Lead Set to the Screw Terminal Block on the WattNode.



7. Set Launch Parameters.

- a. Open HOBOWare Pro.
- b. Click the Launch  icon on toolbar.
- c. Select *HOBO Micro Station Logger* from the Select Device window and click **OK**.

Set the following parameters in the Launch window:

Launch Parameter	Description
Description	Enter a description of the launch.
Battery type	Alkaline
Channels to Log	<ol style="list-style-type: none"> a. Verify that the S-UCC is connected. b. Add a descriptive label to each channel by selecting the channel and then selecting Set Location. c. To configure scaling, select the channel and then click Data Assistants, then select kWh Assistant. See <i>kWh Assistant Parameters below</i>.
Logging Interval	Default is 1 second. Change to a longer interval if required.
Sampling Interval	Sampling is not required for kWh.
Launch Options	Select when you want the logger to launch. See Launch Options below.

kWh Assistant Parameters

Use the kWh Assistant to convert kWh to average kW and energy cost.

From the Launch window, select the desired channel and then click the **Data Assist** button and then select the kWh Assistant. Enter values or selections in the kWh Assistant as shown below. When done click **Save Parameter Set**, then click **Done** to return to the Launch window. **NOTE:** All of your settings will be retained as default values the next time you access the kWh Assistant.

Field	Value
Select Data Series	If your readout will include multiple Counts series, choose the one you want to convert from the Pulse Series drop-down list. The labels you entered in the Set Location window will be displayed here.
Setup/Energy Transducer	Select WattNode and then select WNB-3D-240-P from the drop-down list.
Setup/Current Transformer	Select the CT Size, 50 or 200, depending on model.
Output Series	<p>In the Output Series panel, select one or more series you wish to create. For each series, you may keep the default Resultant Series Name, or enter a new one.</p> <p>To create a series that shows energy in kWh, check the Energy box.</p> <p>To create a series that shows average power in kWh, check the Average Power per interval box.</p> <p>To create a cost series, check the Usage Cost box and enter the cost per kWh.</p>
User Notes	Enter any User Notes concerning the series you are creating (optional).

Launch Options

- *Now*: Logging begins as soon as you click the Launch button. If you do not have at least one sensor attached, the logger will not launch.
- *At Interval*: Logging will begin at an exact interval (for example 9:00:00 rather than 8:47:00 when you choose a one-hour logging interval). The exact start time depends on the logging interval you choose.
- *Delayed*: Logging will begin at a date and time you specify.
- *Trigger*: Logging will not start until you press the button on the logger and hold it down, or perform some other action as described in the logger manual. If the logger has a light, the light will flash quickly when logging begins. This is not available for the U30 Station.
- *Save Settings*: Logging will not start, but the launch settings will be saved so that you do not have to re-enter them when you are ready to launch at a later time. The next time you view the Launch window for this logger, the settings you entered will still be in place.

d. Click **Launch**.



Note: If the Pre-Launch Warning window appears for the first launch, check **Don't show me this again** and then click **Launch Anyway**.

8. Disconnect the H21 from the computer.

9. Transport Measurement and Verification Kit to Site.

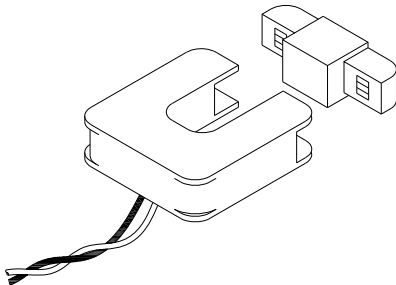
10. At site, connect CTs to electrical panel

See the Wiring Diagrams starting on page 12 for your specific service type.

HIGH VOLTAGE HAZARD!

Installing transducers in an energized electrical enclosure or on any energized conductor can result in severe injury or death. These transducers are for installation by qualified personnel only. To avoid electrical shock, do not perform any installation or servicing of these transducers unless you are qualified to do so. Disconnect and lock-out all power sources during installation and servicing. Please read transducer user manuals for instructions and use.

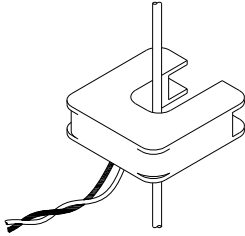
a. Remove the bar at the front of the CT.



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- b. Place the CT around the individual wire carrying the phase to be monitored.


IMPORTANT: Make sure that the top of the CT (indicated by red tape and white label) is facing towards the energy supply, and the blue tape on the bottom of the CT is facing away from the power supply.




- c. Replace the bar. Ensure that it is fully seated.

11. Connect Voltage Leads to Panel.

Attach applicable alligator clips to the appropriate locations in the electrical panel to make voltage phase connections. See the wiring diagram for your service type.



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12. Launch the H21 and Verify Operation



- a. Connect the H21 to a PC running HOBOWare.
- b. From the Main Menu select **Launch** and then click the Launch button to launch the logger. Wait a few minutes to allow the logger to record some measurements.
- c. From the Main Menu select **Status** and review the Status window to see that
- d. From the Main Menu select **Readout** and then click **Plot** to generate a graph of data. View the graph to see that data is being recorded accurately.

13. Unplug the H21 from the PC.

Your system is now recording measurements.

Retrieving and Analyzing Data

1. When you return to the site, connect the logger to a PC and verify that the logger has recorded the data that you require.
2. Once you are satisfied that you have the data you require, disconnect the Voltage Input Leads from the panel and then disconnect the CTs from the electrical panel.

HIGH VOLTAGE HAZARD!

Installing transducers in an energized electrical enclosure or on any energized conductor can result in severe injury or death. These transducers are for installation by qualified personnel only. To avoid electrical shock, do not perform any installation or servicing of these transducers unless you are qualified to do so. Disconnect and lock-out all power sources during installation and servicing. Please read transducer user manuals for instructions and use.

3. Disconnect all of the system components and store in the case.
4. Readout Logger

When you are back in your office, perform a readout to analyze the data. To retrieve data recorded by a logger, you must read out the logger. Reading out the logger copies data from the logger to your computer, allowing you to save the data in a datafile and view the plot.

- a. Connect the logger to the computer.
- b. Click the Readout icon on the toolbar, or choose **Readout** from the Device menu. If the logger is still logging, a message asks whether you want to stop the logger.

Tip: If you do not want to be prompted to stop the logger every time you read out a logging logger, go to **Preferences > General > Readout Time-Saving Options** and deselect the *Ask to stop logging before reading out a running logger* option.

Wait while the data is read out from the logger. During readout, the logger continues to record data unless you have stopped the logger or the logger is full.

- c. When HOBOWare prompts you to save the data, accept the default location and name, or enter a new name and click **Save**.

By default, the data is saved in the HOBOWare folder located in the My Documents directory with the following extensions: .dtf or .dsec

If you save the file to a different folder, HOBOWare will make that folder the new default.

5. Filter Series

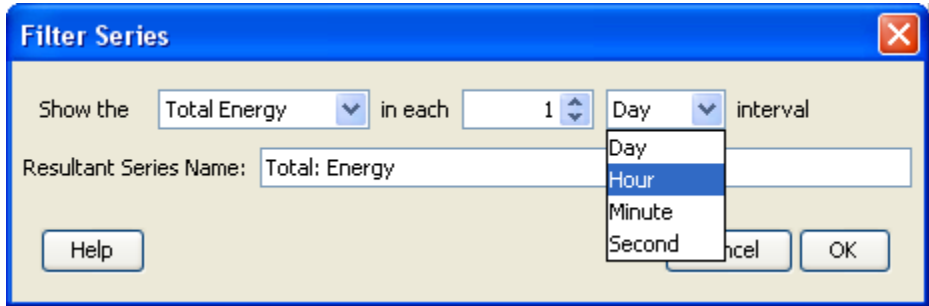
You can create a new series based on statistical analysis of an existing series over specified periods of time. **NOTE:** When you apply a filter, the graph rescales to accommodate all of the displayed data.

To filter a series:

- a. Click on the series and then from the Main Menu select **Edit > Filter Series**
- b. Choose the type of statistic to use for the filter:

For external event series, such as kWh, you can create a series showing a cumulative sum, or a count over a period of time.

- c. Specify the interval over which you want these values to be calculated.
- d. Enter a new **Resultant Series Name**, if desired.
- e. Click **OK**.

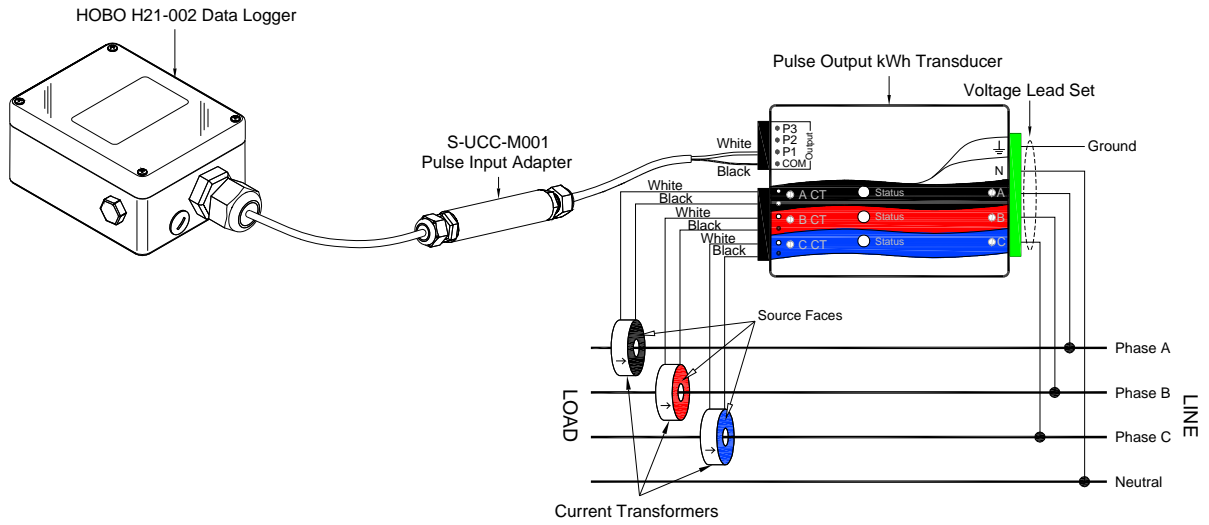


The new series is added to the graph, the Details pane, and the Points pane.

Wiring Diagrams

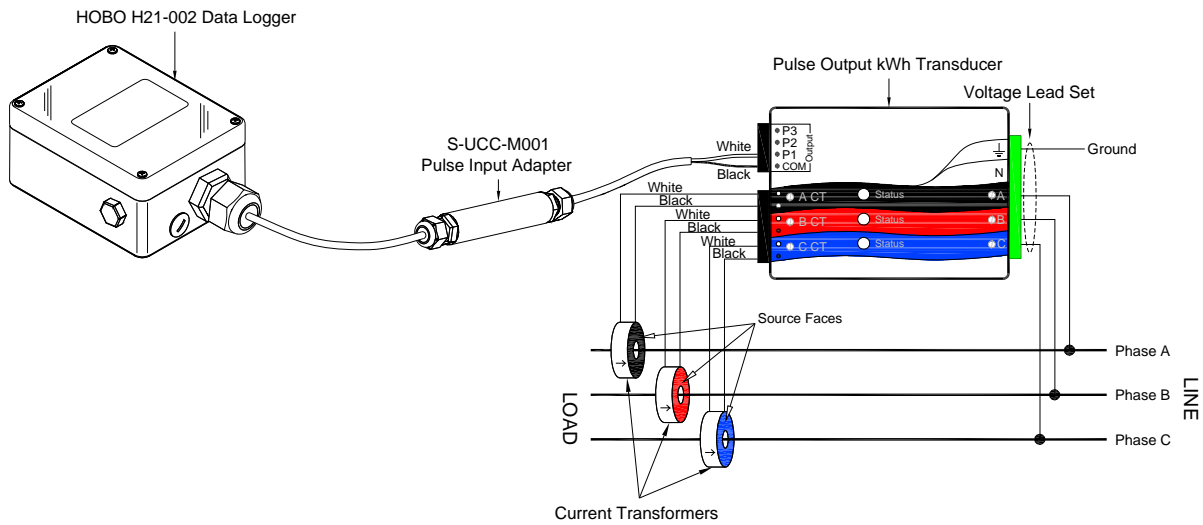
Three-Phase

120 VAC/208-240 VAC Three-Phase Four-Wire Wye with Neutral



In delta applications where there is no neutral connection, the white lead is not used.

208-240 VAC Three-Phase Three-Wire Delta without Neutral



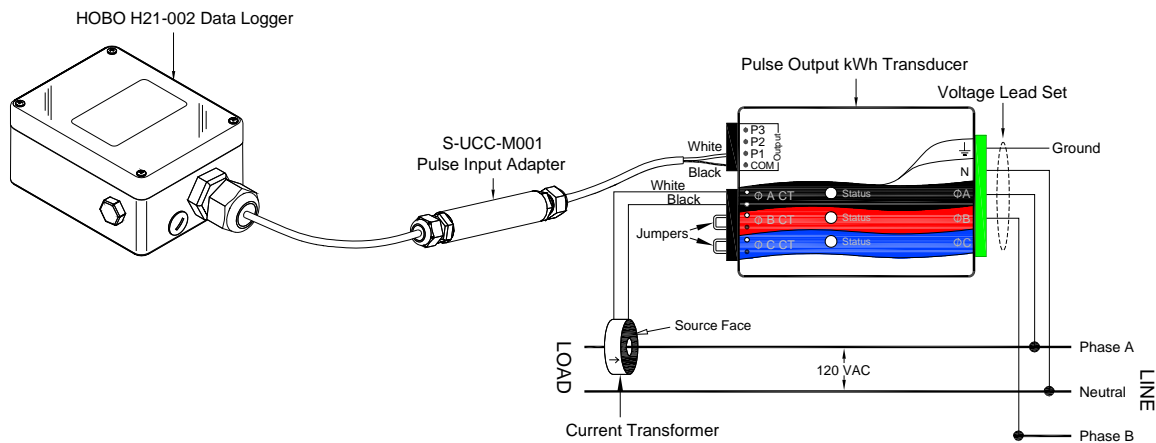
Single Phase

You can convert a three phase system to a single phase system by performing the following steps:

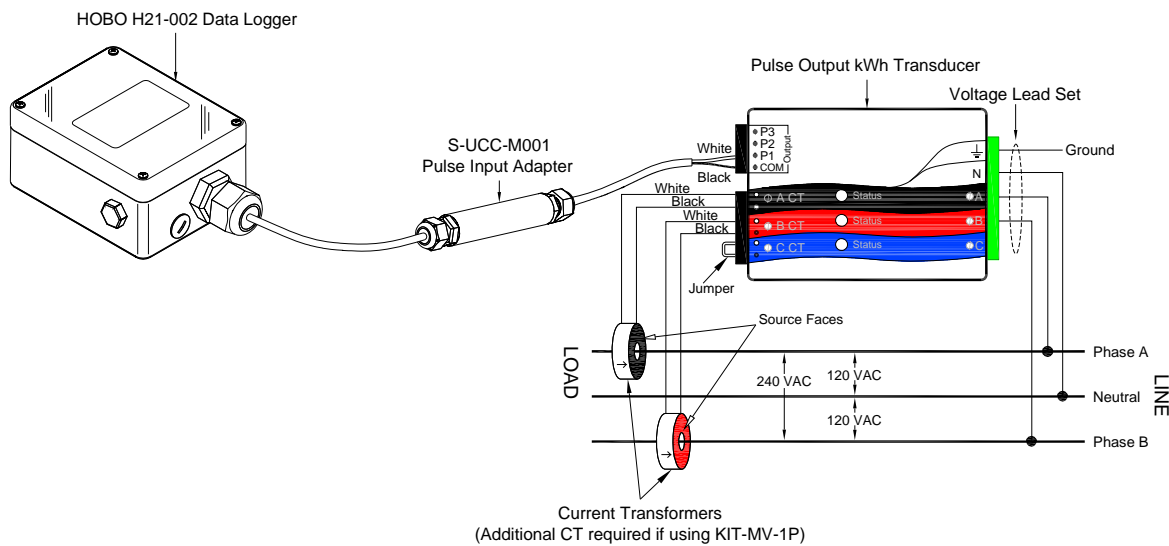
1. Add jumpers to unused CT ports. Refer to the appropriate Single-Phase Wiring Diagram.
2. Unplug the alligator clip on unused leads or disconnect the whole lead assembly disconnected from the main.

For single phase 120 volt applications, the red and blue leads are not used.

120 VAC Single-Phase Two-Wire with Neutral

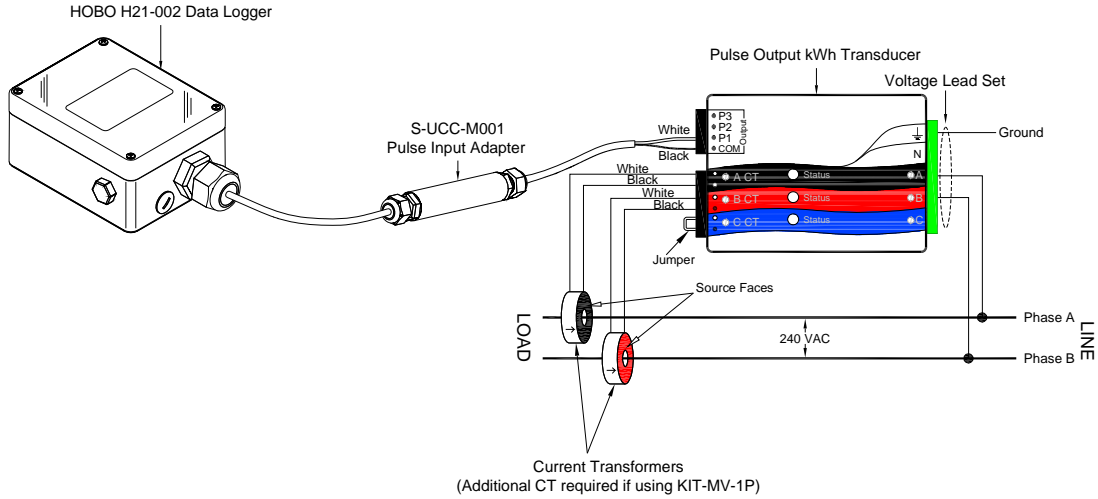


120 VAC/240 VAC Single-Phase Three-Wire with Neutral



For single phase 208/240 applications, the blue lead is not used.

208-240 VAC Single-Phase Two-Wire without Neutral



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