Measurement & Verification System
Single-Phase

Quick Start Guide

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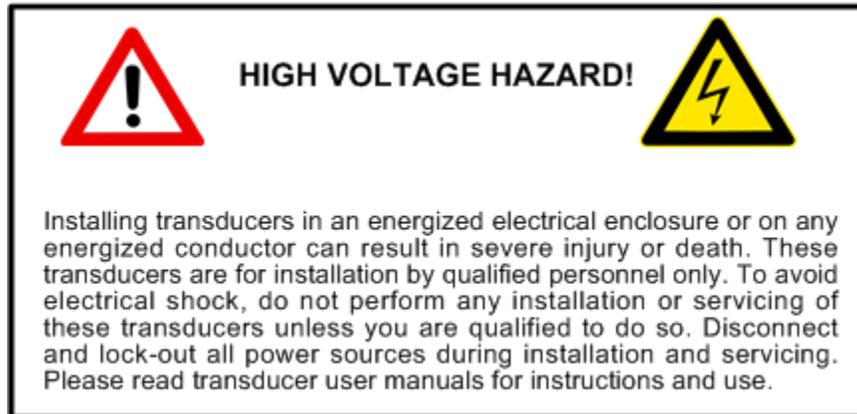
Installing transducers in an energized electrical enclosure or on any energized conductor can result in severe injury or death. These transducers are for installation by qualified personnel only. To avoid electrical shock, do not perform any installation or servicing of these transducers unless you are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

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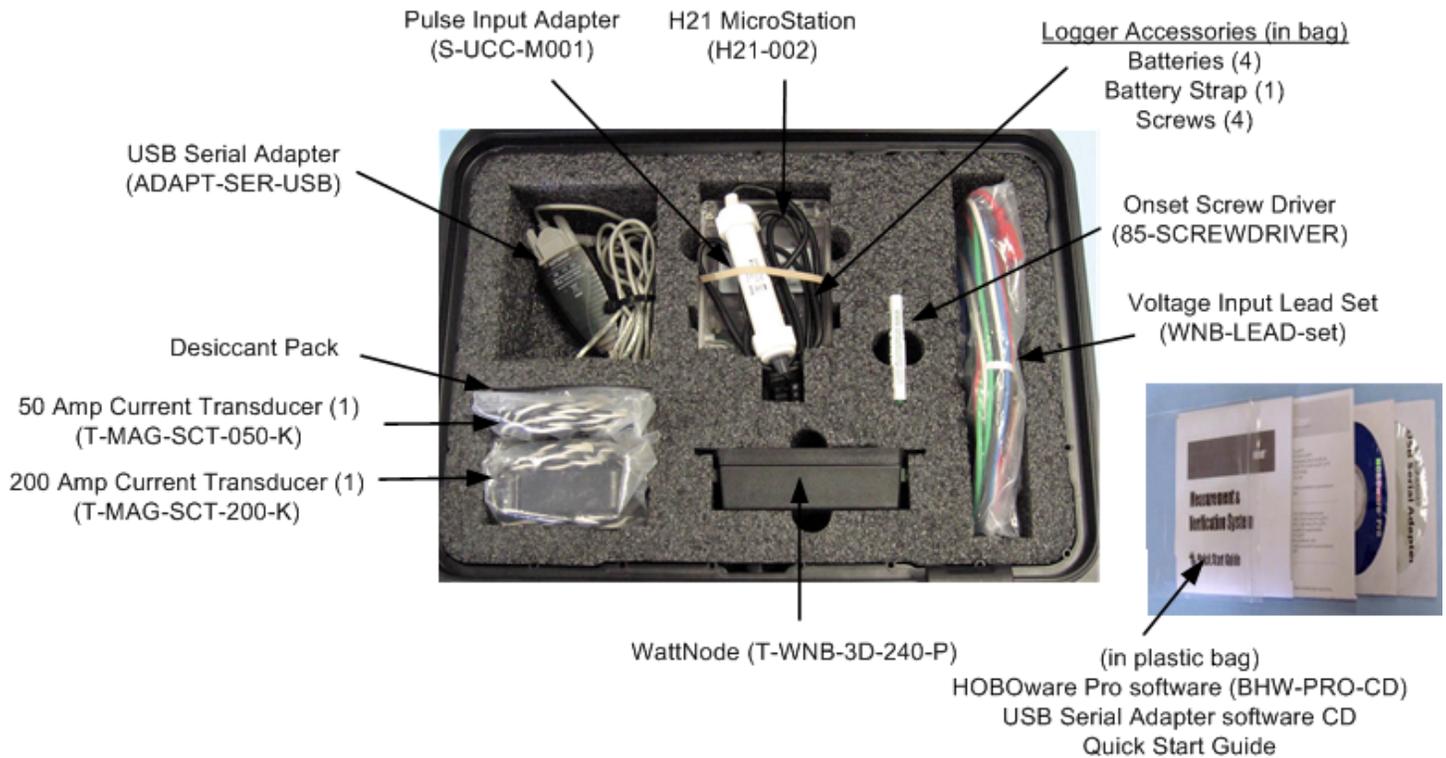
MAN-KIT-MV-1P

Doc # 13370-A

Introduction

The HOBO Measurement & Verification System measures 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 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 *
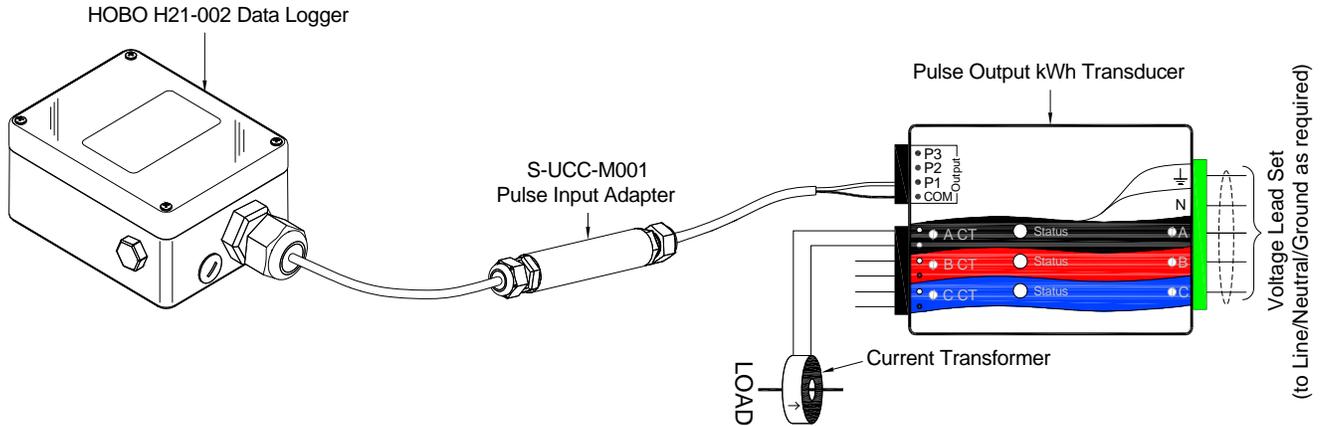
* Additional CT required.

Components

Pulse Input Adapter (S-UCC-M001)
H21 MicroStation (H21-002)
Logger Accessories (in bag) Batteries (4) Battery Strap (1) Screws (4)
USB Serial Adapter (ADAPT-SER-USB)
Onset Screw Driver (85-SCREWDRIVER)
Desiccant Pack
Voltage Input Lead Set (WNB-LEAD-set)
50 Amp Current Transducer (1) (T-MAG-SCT-050-K)
200 Amp Current Transducer (1) (T-MAG-SCT-200-K)
WattNode (T-WNB-3D-240-P)
(in plastic bag) HOBOware Pro software (BHW-PRO-CD) USB Serial Adapter software CD Quick Start Guide

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-1p

Example Configuration

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

HOBO H21-002 Data Logger

Pulse Output kWh Transducer

Voltage Lead Set (to Line/Neutral/Ground as required)

S-UCC-M001 Pulse Input Adapter

P3
P2
P1
COM

Output

A CT   Status   A
B CT   Status   B
C CT   Status   C

N

Current Transformer

LOAD

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

Connect Pulse Input Adapter

Connect Current Transducers

Continental Control Systems LLC
WATTNODE® PULSE
WNB-3D-240-P
208-240V~ 50-60Hz 4W
SN 35538   2009-06-24

P3
P2
P1
COM

Output

φA CT 0.333~   Status
φB CT 0.333~   Status
φC CT 0.333~   Status

φ-N 140V~
φ-φ 240V~
240V CAT III

N

φA
φB
φC

Continental Control Systems LLC

Functional ground. This terminal should be connected to earth ground if possible. It is not required for safety grounding, but the accuracy of the WattNode may be reduced if this terminal is not connected.

Neutral. This terminal should be connected to neutral if required by your service type.

Status LEDs. These are status LEDs used to verify and diagnose WattNode operation.

Connect Voltage Input Lead Set

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.

   Battery Strap
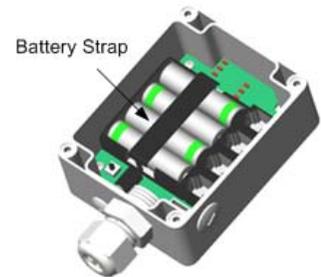
3. Connect H21 to a PC running HOBOware

   > **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.

   Data Access Port cover

   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).

   Cable plugged into Communications Port
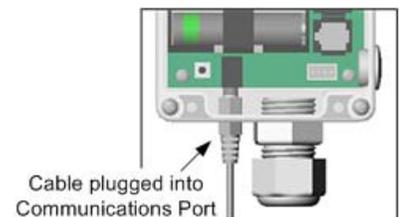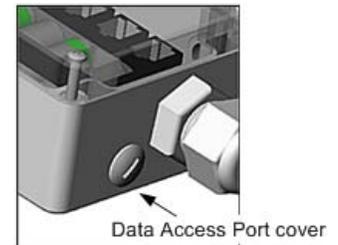
4. Connect Pulse Input Adapter to the Pulse Output Terminal Block on the WattNode.

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

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

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7. Set Launch Parameters.

   a. Open HOBOware Pro.

   b. Click the Launch ![icon] 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	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 *kWh Assistant Parameters below.*
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	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. To create a series that shows energy in kWh, check the **Energy** box. To create a series that shows average power in kWh, check the **Average Power** per interval box. To create a cost series, check the **Usage Cost** box and enter the cost per kWh.
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**.

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8. Disconnect the H21 from the computer.

9. Transport Measurement and Verification Kit to Site.

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10. At site, connect CTs to electrical panel

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

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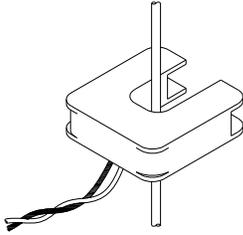
a. Remove the bar at the front of the CT.
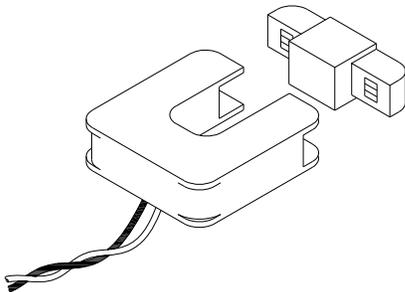
b. Place the CT around the individual wire carrying the phase to be monitored.

   IMPORTANT: Make sure that the top of the CT (with white label) is facing towards the energy supply.

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

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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 on page 12 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.

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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.

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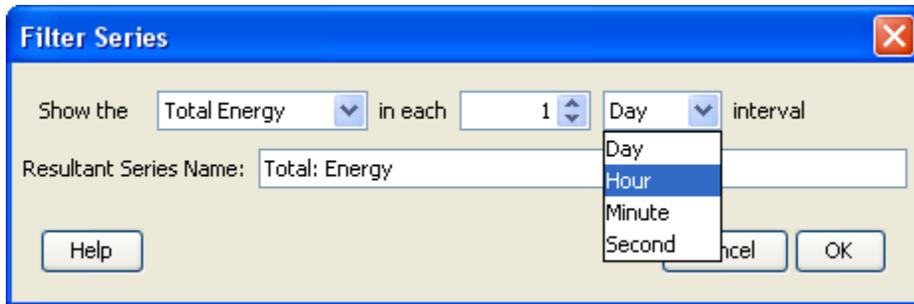
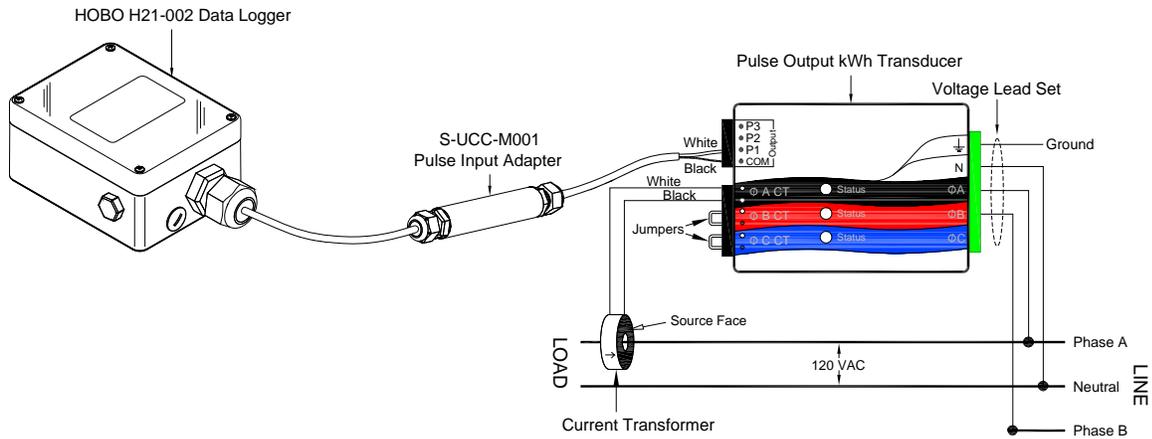The new series is added to the graph, the Details pane, and the Points pane.

Wiring Diagrams
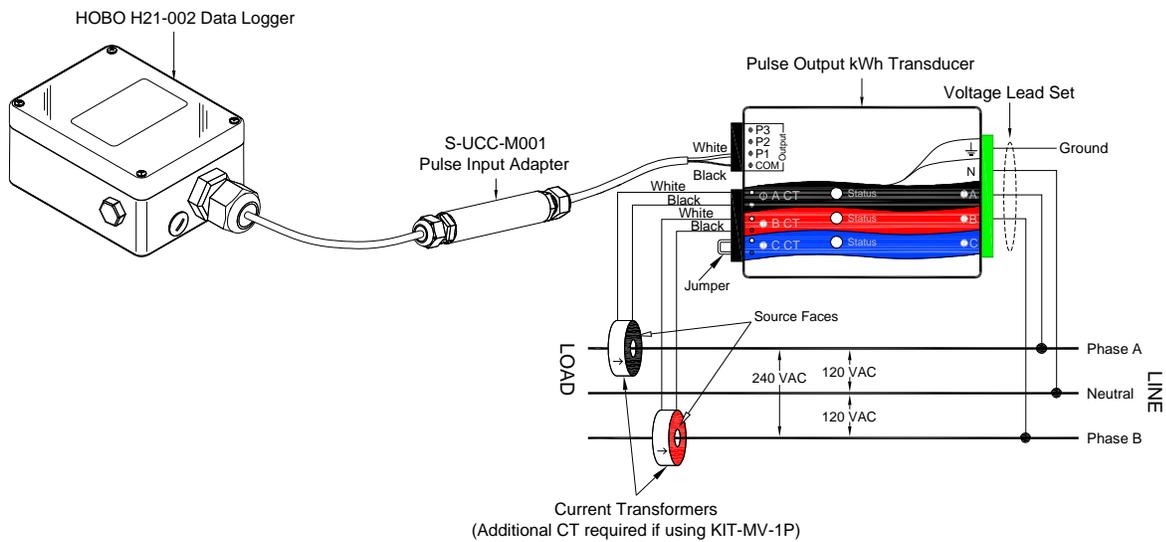
Single Phase

For single phase 120 volt applications, the red and blue leads are not used.
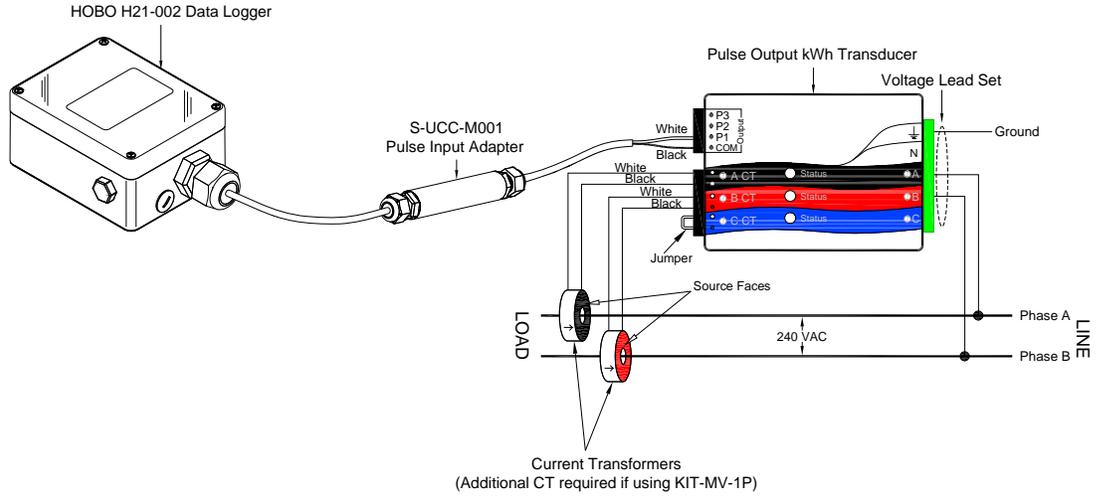
120 VAC Single-Phase Two-Wire with Neutral

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

Current Transformers
(Additional CT required if using KIT-MV-1P)

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