

PVM1010 Inverter Data Monitoring Module

Installation Manual

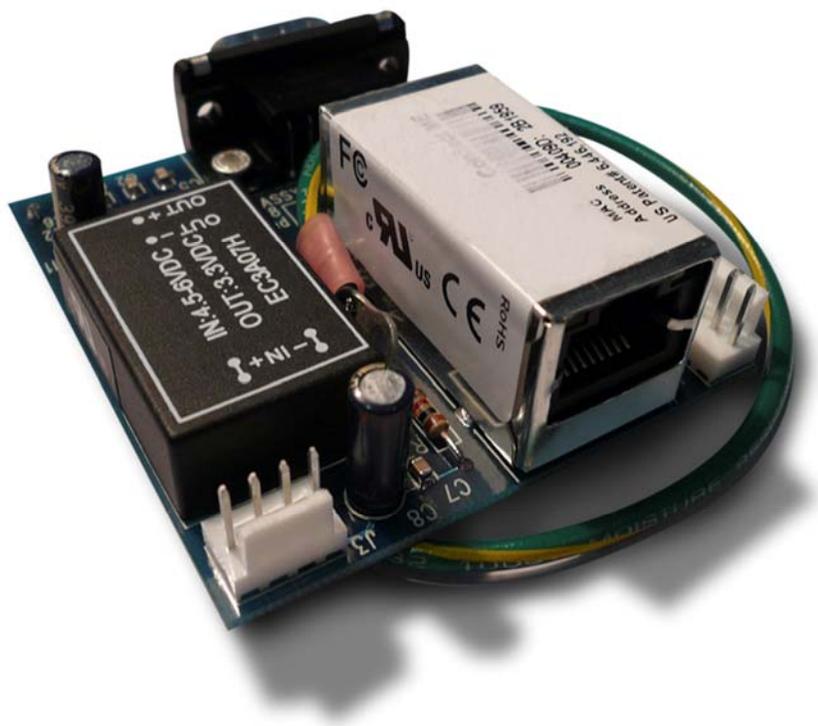


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IMPORTANT SAFETY INSTRUCTIONS

Please read all safety warnings and instructions before beginning the installation of the Inverter PVM1010 Data Monitoring Module.

This product has been engineered and manufactured to ensure your personal safety. Improper use may result in potential electrical shock or burns. Please read and follow all instructions for installation, use and servicing of this product.

PLEASE NOTE:

The PVM1010 Module should only be installed by a licensed electrician or qualified solar electric installer. Do not attempt to install this device if you have not been properly trained. If you have any questions, please contact your solar installer or PV Powered Tech Support at **541-312-3832**.

SAVE THESE INSTRUCTIONS:

This manual contains important and required instructions for installing the PVM1010 Module. This *Installation Manual* and other important documents are also available on the www.mypvpower.com website **Support** page.

CAUTION:

Before connecting the PVM1010 Module to the PV Powered Inverter, make sure that both AC and DC power to the inverter are turned OFF. After turning OFF the power, wait 5 full minutes before removing the front cover from the Inverter.

1 INTRODUCTION

The PVM1010 Data Monitoring Module is a data acquisition and communications interface accessory that you can add to PV Powered inverters. When installed, this module can provide PV system performance data three ways:

1. The recommended way to use the PVM1010 Data Monitoring Module is to subscribe to the standard monitoring service on the *mypvpower.com* website, which lets you track the PV system and inverter information online. This secure website is provided by PV Powered, and the Basic Web Monitoring Service is available free to all registered users.
2. For on-site monitoring that doesn't go through the website, users can access performance information directly from the PVM1010 circuit board using standard open UDP protocol from PV Powered.
3. Add remote, incentive-based performance monitoring and reporting programs for third parties.

NOTE: This *Installation Manual* is written primarily for the Basic Web Monitoring Service provided on the *mypvpower.com* website. For Options 2 and 3, contact PV Powered for special arrangements.

1.1 PVM1010 Features

Easy Installation

To add the PVM1010 Data Monitoring Module to a pre-installed inverter, qualified field service technicians simply follow the steps described in this manual. Installers plug the PVM1010 Module circuit board into the inverter and connect it to a broadband internet router with continuous internet access. LED blink codes and PV Powered technical support help installers troubleshoot the system before leaving the installation site.

Convenient Access to Inverter Data

The PVM1010 Module offers 24-7 remote access to inverter performance information. The inverter sends data to PV Powered's web server every 15 minutes. By entering a secure web-based login, users and installers can view and monitor near-real-time data for inverters.

User-Friendly Presentation

The PVM1010 *mypvpower.com* website displays inverter performance data in simple and understandable graphics, charts, and language. Information includes a summary of voltage and power output over various time ranges, historical energy produced and total energy production, as well as detailed energy data. For information on interpreting site data, refer to the online FAQs or the *PVM1010 Data Monitoring Module User's Guide*.

Integrated Support Tools

The PVM1010 *mypvpower.com* portal integrates a variety of support tools. The website includes an online Service Request Form – just click a link to request service for your PV Powered inverter or PVM1010 Data Monitoring Module. You also have quick access to online documentation, including frequently asked questions (FAQs) and answers available on the **Support** page.

Online Warranty Registration

The PVM1010 Data Monitoring Module lets installers and users register the warranty online, in just a few easy steps. This convenient process is a quick way to register installations without postponing or interrupting service.

1.2 Purpose of This Manual

This Installation Manual is designed to help qualified field technicians install the PVM1010 Data Monitoring Module printed circuit board (controller card), connect to the internet, validate that the PVM1010 Module is working, and troubleshoot any issues.

NOTE: To learn how to view and interpret PVM1010 inverter performance data, refer to the online *PVM1010 Data Monitoring Module User's Guide* located on the *mypvpower.com* website **Support** page.

1.3 Terms and Definitions

You will encounter the following acronyms and terminology in the PVM1010 documentation.

DHCP	Dynamic Host Configuration Protocol; a router that assigns IP addresses.
DNS	Dynamic Name Server; converts URL names to IP addresses.
CAT5	Category 5 networking cable; this is the basic 8-wire networking cable used for Ethernet.
RJ45	The plastic tips at the ends of the CAT5 cable.
IP Address	A unique address that certain electronic devices use to identify and communicate with each other on a computer network utilizing the Internet Protocol standard.
MAC Address	Media Access Control Address; a unique number identifier that is attached to most network adapters and acts like the adapter's name. Example: Network cards on two different computers have different names, or MAC addresses.
BPL	Broadband power-line converter

2 INSTALLATION REQUIREMENTS

Before you install the PVM1010 Data Monitoring Module, make sure you have the following items and systems ready.

2.1 PVM1010 Product Package

PV Powered provides a complete package for installing the PVM1010 Module on your PV Powered Inverter. This package includes the following parts:

- ◆ PVM1010 Data Monitoring Module device (printed circuit board)
- ◆ Power cable
- ◆ Cord grip
- ◆ Screws

Your product package also includes this *Installation Manual* and an *Installation Quick Start* card.

2.2 Inverters Supported by the PVM1010 Module

Make sure you have one or more PVM1010-supported inverters pre-installed and ready to accept the PVM1010 Data Monitoring Module device.

NOTE: If you purchased the PVM1010 Data Monitoring Module, PV Powered assumes that the installer or user already owns an installed PV Powered Inverter.

The PV Powered PVM1010 Module board is designed to work specifically with the following PV Powered inverter models:

- ◆ PVP5200
- ◆ PVP4800
- ◆ PVP4600
- ◆ PVP3500
- ◆ PVP2500

Though you can monitor more than one inverter through your PVM1010 Data Monitoring Module account, each inverter requires its own individual PVM1010 device. (Two inverters can't share the same PVM1010 circuit board.)

2.3 Tools and Materials Required for Installation

In addition to your PVM1010 product parts and an inverter, you need the following items to performing the installation:

- ◆ Linksys, Netgear, D-link, or other router
- ◆ Laptop – to verify communication to PVM1010 Data Monitoring Module
- ◆ Pre-made CAT5 cables – for connecting inverter to the internet
- ◆ CAT5 wire – to make additional cables on-site, if necessary
- ◆ RJ45 crimping tool
- ◆ RJ45 Connectors
- ◆ Phillips screwdriver
- ◆ Digital multimeter – used to test the PVM1010 device's voltage supply (optional)
- ◆ Cable tester – used to test CAT5 wires (recommend the Fluke networks MicroMapper)

These items are NOT provided by PV Powered in the PVM1010 product package. Installers are responsible for acquiring their own installation tools and materials.

3 INTERNET CONNECTION REQUIREMENTS

The PVM1010 Data Monitoring Module will not work until it's connected to the outside world through an "always ON" high-speed broadband connection, such as DSL or cable.

NOTE: The PVM1010 Module does not support modem connectivity.

Ethernet must be available at the inverter location. Customers are responsible for providing their own Ethernet connection based on the following specifications:

- ◆ DHCP-enabled broadband internet connection that is always ON. This can be cable internet, a DSL line, or an equivalent.
- ◆ Hard-wired, Ethernet-enabled connection available at the inverter location.
- ◆ Internet connected using one of the following preferred methods:

Hardwire an outdoor-rated CAT5 Ethernet cable between the Inverter (PVM1010 Module device) and the DHCP-enabled Internet connection.

If multiple PVM1010 Module-enabled inverters are commissioned to a single site, you can use an Ethernet hub located in an outdoor-rated enclosure to distribute Ethernet cables to the inverters. (Refer to the section titled *Supported Network Configurations*.)

- ◆ PC or laptop computer must be on-site with web access for registering the PVM1010 Module account and viewing PVM1010 Module data.

3.1 Prepare the Inverter-to-Ethernet Connection

Internet service must be set up properly at the installation site before you can activate the PVM1010 Data Monitoring Module. There are many ways to configure networks for accessing the internet, and these are dependent on the specific needs and configuration located at the user's home or business.

The PVM1010 Module only supports **hard-wired solutions** to the inverter. It does NOT support wireless configurations. Technology changes quickly, and PV Powered can't provide expertise on every potential wireless router or service option.

NOTE: Though the physical connection from the inverter to Ethernet is a simple wiring task, some complex networks might require a system administrator to add the inverter and the PVM1010 Module.

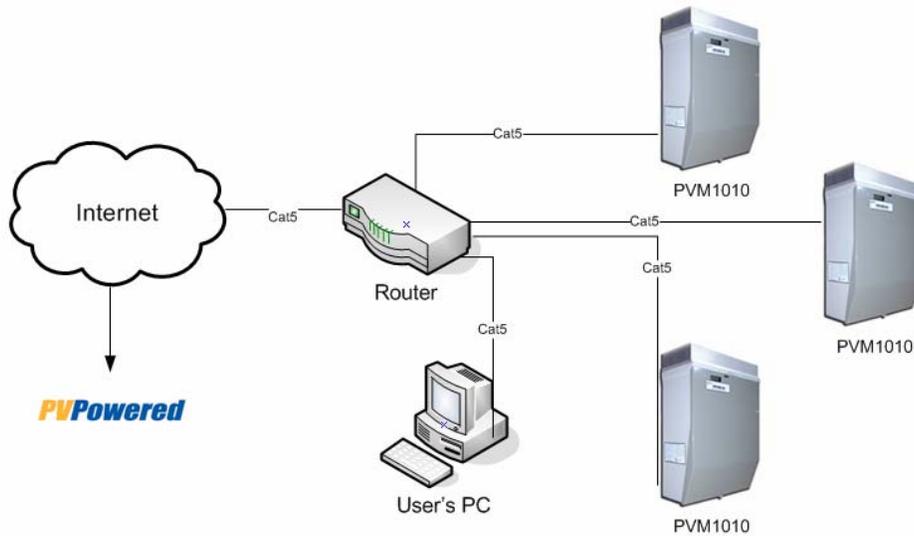
3.1.1 Supported Network Configurations

To connect Ethernet to the inverter, extend a CAT5 cable directly from a router out to the inverter location.

For multiple inverters, hook up a cable from each inverter to a switch/hub and then to the router.

Standard Wired Configuration

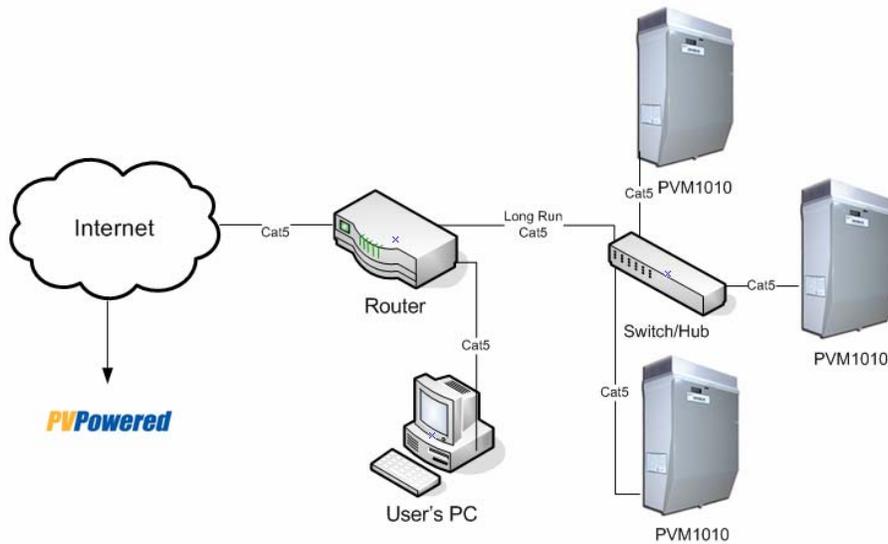
The Standard Wired configuration provides a very simple solution for networking PVM1010 Modules. This method is NOT the best choice when the inverters are located far from the router and you must run cables over a long distance.



Standard Wired Configuration

Switch/Hub Setup

The Switch/Hub setup is common when you need to make a long run between the inverters and the router. In this configuration, a hub is used to consolidate all PVM1010 Module traffic onto a single wire. The single wire is used to cover the long distance (up to 300 feet) to the router.

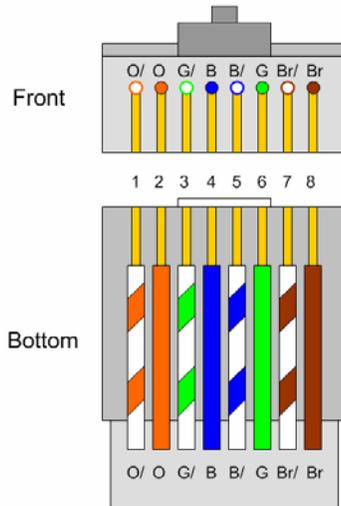


Switch/Hub Wired Configuration

3.1.2 Making a CAT5 Wire

For many networking situations, you must make a new CAT5 wire to complete the job. To do this, you need: the specialized crimping tool, RJ45 heads (connectors), and CAT5 wire.

1. Crimp the wires in the configuration illustrated below:



IMPORTANT: This wiring configuration complies with T-568B standards, and it's the only one that the PVM1010 Module supports.

OTHER WIRING CONFIGURATIONS DO NOT WORK.

RJ45 Wiring Schematic

RJ45 PIN	Strand Color		Signal Description
1	Orange/White	O/	TX+
2	Orange	O	TX-
3	Green/White	G/	RX+
4	Blue	B	
5	Blue/White	B/	
6	Green	G	RX-
7	Brown/White	Br/	
8	Brown	B	

2. After you make the wire, use a cable tester to ensure that your new cable wire works properly.
 - ◆ To obtain maximum noise immunity, wire the cable according to the standards described in this manual.
 - ◆ The cable tester does not test wire order. **You must complete the steps for installing the PVM1010 Module (*Install the PVM1010 Module* section) BEFORE you can verify that data is successfully communicating over the cables.**

4 INSTALL THE PVM1010 MODULE

Once you verify that internet is operational at the installation site, make sure you have all of the necessary equipment to physically hook up the PVM1010 Module.

NOTE: You must complete the following steps before you can verify that the PVM1010 Module communicates over the internet. The *Troubleshooting* section of this manual will help you identify and fix potential connectivity problems.

4.1 Install the PVM1010 Circuit Board

1. Turn OFF AC and DC power to the inverter. Wait 5 minutes before continuing.

CAUTION: Hazardous Voltage! Turn OFF the power and wait 5 minutes before removing the front cover.

2. Remove the front cover of the inverter.
3. Attach the Ground Cable from the PVM1010 device to the lower left corner screw on the power board. (The wire is green with a yellow stripe and has a ring lug on the end.) See *Figure 1*.

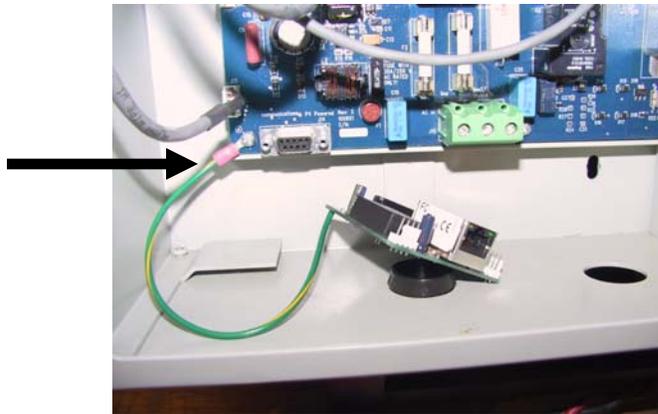


Figure 1

4. Insert the PVM1010 printed circuit board's DB-9 connector into the J14 connector (labeled RS232) of the inverter power board (*Figure 2*).

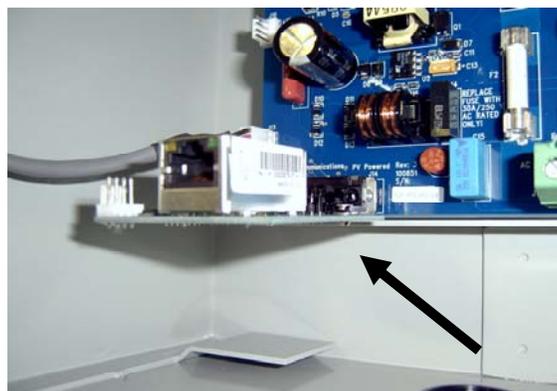


Figure 2

5. Use the two 4-40-type screws (provided in the product package) to secure the PVM1010 circuit board to the inverter (Figure 3).

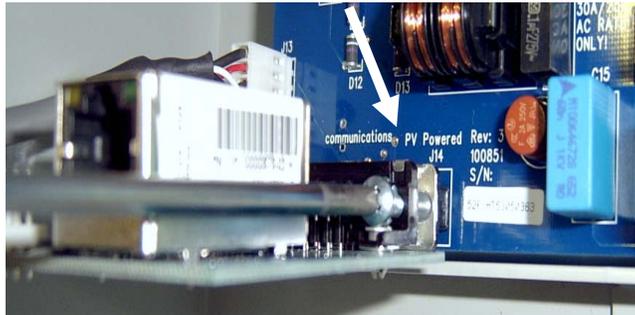


Figure 3

6. Plug the power cable (provided in the product package) into the J10 connector of the inverter power board (Figure 4).

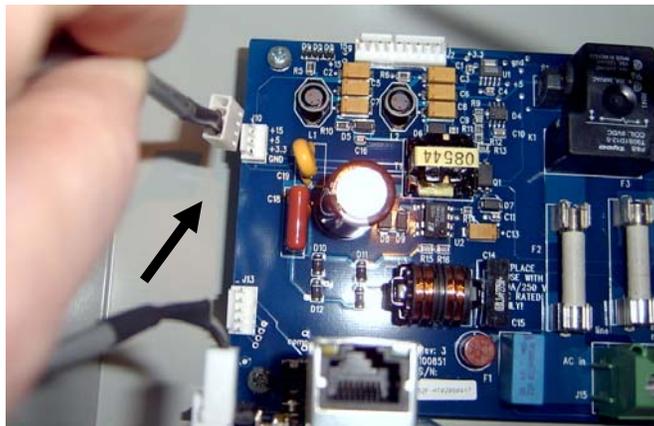


Figure 4

7. Plug the other end of the power cable into the J3 connector of the PVM1010 circuit board (Figure 5).

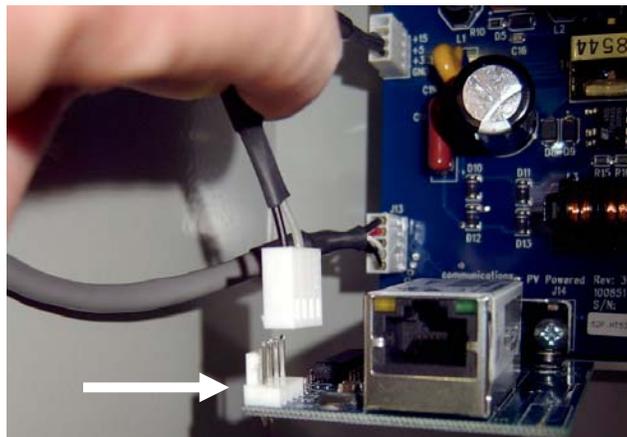


Figure 5

4.2 Connect Ethernet

1. Insert the Cord Grip (provided in the product package and shown in *Figure 6*) into one of the knock-outs located in the bottom left side of the inverter.



Figure 6

2. Route an Ethernet cable through the Cord Grip in the bottom of the inverter, and plug the end of the cable into the PVM1010 RJ-45 port (*Figure 7*).
3. After you attach the Ethernet cable to the PVM1010 circuit board, tighten the grommet on the Cord Grip.



Figure 7

4. Connect the other (free) end of the Ethernet cable to an Ethernet router, switch, or hub with access to high-speed internet.

The PVM1010 Data Monitoring Module expects to communicate with a DHCP server to acquire its IP configuration. It does not work with a static IP address.

CONGRATULATIONS! The PVM1010 Data Monitoring Module is now installed and hooked up to the inverter and the internet.

5 POST-INSTALLATION CHECKLIST

Use the following checklist to test the PVM1010 Module installation and connections.

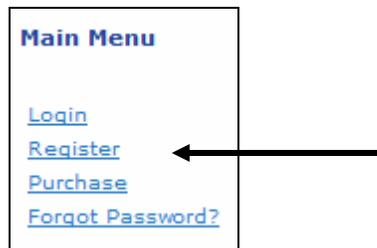
<input type="checkbox"/>	1. Turn ON (re-start) the AC and DC power to the inverter.
<input type="checkbox"/>	2. Wait two to three minutes.
<input type="checkbox"/>	3. Observe the LED lights on the PVM1010 Module circuit board. They are located next to the Ethernet port.
<input type="checkbox"/>	<p>The Amber LED light should display continuously (solid ON).</p> <p>If the amber light does not illuminate, there is a problem with the cables. Check the cables and make sure all routers and switches are ON.</p>
<input type="checkbox"/>	The Green LED light should flash intermittently when data is transmitting.
<input type="checkbox"/>	The Blue LED Troubleshooting light should display continuously (solid ON). It should begin to display approximately 45 seconds after you re-start power to the inverter. This light is located between the reset button and the six-pin connector.
	<p>NOTE: If the Blue light is blinking, or if any of the lights do not display properly, refer to the <i>Troubleshooting</i> section of this manual.</p>
<input type="checkbox"/>	<p>4. Before you complete the installation, write down the inverter's serial number. You'll need this number to Register the PVM1010.</p> <p>_____</p>
<input type="checkbox"/>	5. Re-attach the front cover to the inverter.
<input type="checkbox"/>	<p>6. Data begins to display on the website within two to three minutes after the PVM1010 Module is powered up.</p> <p>After you Register the PVM1010 (instructions in the next section), access the mypvpower.com website and verify that inverter monitoring data displays.</p>

6 REGISTER THE PVM1010 MODULE

Now that the PVM1010 Data Monitoring Module is installed and hooked up to Ethernet, you can register the PVM1010 on the *mypvpower.com* website.

NOTE: We recommend that the field technician (installer) and the end-user (customer) perform the Registration steps together. Both the installer and the user will have the required url and password for future access to PVM1010 monitoring data.

1. Open your internet browser and type www.mypvpower.com in the address line.
2. If you are a first time user; follow the directions below to register your PVM1010 Data Monitoring Module. Otherwise, you can log in directly.
3. From www.mypvpower.com, click **Register** on the left hand menu:



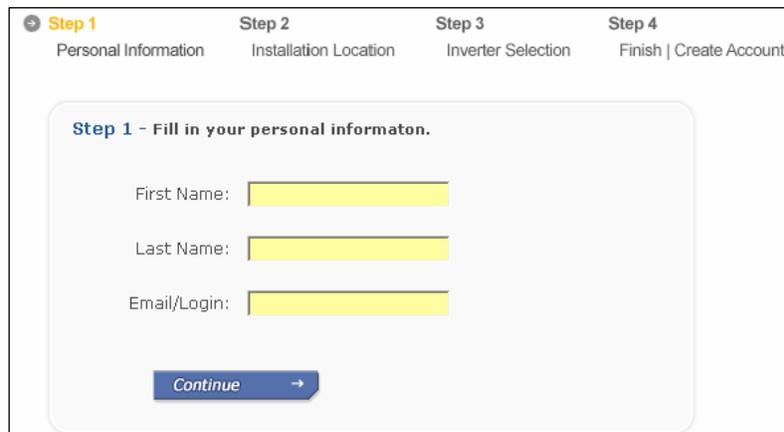
NOTE: The Register link also displays in other places.

4. **Step 1** displays on the first page of the registration wizard.

The wizard asks for your personal information, including your first name, last name, and your email address. The email address will be your future Login.

NOTE: If you forget your password, PV Powered support will send your new password to this address.

Complete the information and click **Continue**.

A screenshot of a registration wizard. At the top, there are four steps: "Step 1" (highlighted in orange), "Step 2", "Step 3", and "Step 4". Below the steps are labels: "Personal Information", "Installation Location", "Inverter Selection", and "Finish | Create Account". The main content area is titled "Step 1 - Fill in your personal informaton." (note the typo). It contains three input fields: "First Name:", "Last Name:", and "Email/Login:". Each field has a yellow highlight. At the bottom of the form is a blue button labeled "Continue" with a right-pointing arrow.

5. **Step 2** asks for the location of the inverter and the name of the Installer.

Complete all of the required field information. Click **Back** if you want to correct information in Step 1, or click **Continue** to Step 3.

The screenshot shows a multi-step registration process. At the top, there are four steps: Step 1 (Personal Information), Step 2 (Installation Location), Step 3 (Inverter Selection), and Step 4 (Finish | Create Account). Step 2 is currently active. The main heading for Step 2 is "Step 2 - Tell us where your inverter is installed." Below this heading are several input fields: "Street", "City", "State", "Zip", and "Phone", each with a yellow highlight. Below these is a "Time Zone:" dropdown menu with "Los Angeles" selected. At the bottom is an "Installer:" text input field with a circular arrow icon to its right, indicating auto-completion.

The **Installer** field auto-completes when you start typing. If your installer is not in the auto-completing list, finish entering your installer’s name manually.

6. **Step 3** asks for the serial number(s) on your inverter(s).

Click **Add Another Inverter** to enter multiple inverters at once. You can also add a nickname for each inverter to make it easy to identify. Example: *Back Yard*

Complete this information and click **Continue**.

The screenshot shows Step 3 of the registration process. The heading is "Step 3 - Which inverter(s) did you purchase?". Below the heading is a note: "Serial # is a required field. Your serial number should begin with 'PV', 'SP', or '280XV' followed by a series of digits." There are two input fields: "Inverter Serial #" and "Nickname". Below the "Inverter Serial #" field is a blue link that says "Add Another Inverter". At the bottom of the form are two buttons: "Back" with a left arrow and "Continue" with a right arrow.

7. **Step 4** asks you to review the information you entered. If anything is incorrect, click on the underlined heading to change the data.

8. The system asks if you want to set up a mypvpower.com account, or if you just want to Register your inverters.

Click **Yes, I want a MyPVPower Account**.

9. **Step 5** asks you to set up a **Password** for your MyPVPower account.

The password is case-sensitive and must be five or more digits long. When you log in, remember that this password is case-sensitive and you must always enter it the same way.

10. After you complete all the steps, log into your account using your email address (for the Login) and your **Password**.

Now you can view the inverter monitoring data on the www.mypvpower.com website.

NOTE: For more information on how to view PVM1010 Module data and set up accounts, refer to the *PVM1010 Data Monitoring Module User's Guide*.

CONGRATULATIONS! The PVM1010 Data Monitoring Module is now registered and ready for you to start monitoring this inverter's performance data.

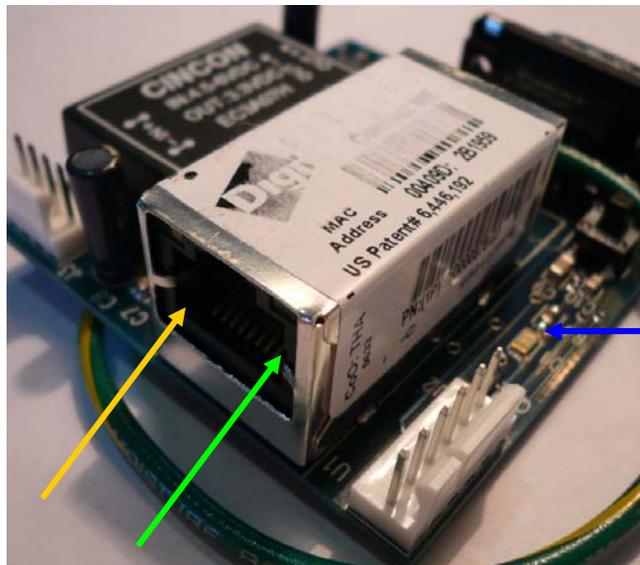
If you have any problems, please refer to the *Troubleshooting* section of this manual.

7 TROUBLESHOOTING

If connected properly, the PVM1010 Data Monitoring Module works well in most situations. However, you might encounter some issues with the network.

One or more of the following indicators might communicate a problem with the PVM1010 Data Monitoring Module system:

- ◆ The Blue LED Light on the PVM1010 device is blinking.
- ◆ The Amber light on the PVM1010 is NOT continuously ON.
- ◆ The Green light on the PVM1010 is continuously ON for an extended period of time (instead of flickering intermittently during transmissions).
- ◆ The *mypvpower.com* website does not display inverter data.



Indicator Lights

The Amber and Green lights are located on the front of the PVM1010, and the Blue LED light is on the side next to the D1 connector.

7.1 PVM1010 Blue LED Blink Codes

The PVM1010 device displays a Blue LED light that is used exclusively for installation troubleshooting. This is your primary troubleshooting tool.

The Blue LED blink codes are designed to help you track down the problem, or point of failure, and correct it. If the Blue LED is not ON continuously (solid on), something is wrong and the Blue LED light issues "blink codes":

1. When there's a problem, the LED initially displays three blinks in a row, followed by a long pause.
2. Start interpreting the Blink Codes after the pause (when the blue LED is OFF).

- ◆ The exception is the Router Connection Fault blink code, which does not pause. It continues to blink rapidly until the device re-establishes communication with the router.

7.2 Possible Issues

The following table displays symptoms and their possible causes and solutions. Though many of the symptoms and causes overlap, this will provide a helpful starting place for identifying and resolving problems.

Web-Related Issues

1. Symptoms	Possible Causes and Conditions
All lights are normal, but there are no posts to the server.	Account Registration problem. The serial number on the inverter doesn't match the serial number entered during user/account registration.
Possible Solutions: <ul style="list-style-type: none"> ◆ Download hot fix and reset the PVM1010 device. ◆ Check the account serial number (on the Account Options tab on the mypvpower.com website) and make sure it matches the inverter's serial number. 	
2. Symptoms	Possible Causes and Conditions
Inverter stops reporting data. (There is no data for several days.)	Internet connection problem. No power to the inverter. Bad connection between the PVM1010 and the nearest hub/router.
Possible Solutions: <ul style="list-style-type: none"> ◆ Verify that the internet connection works – is it up and running? ◆ Verify that the inverter power is ON. A red or green light is on next to the display. ◆ If the internet connection is okay, see if anything changed when data stopped reporting. ◆ Open the cover to the inverter – are any lights illuminated next to the Ethernet port on the PVM1010? ◆ If the Amber light is not ON, the connection or cable between the PVM1010 and the nearest hub/router is bad. ◆ Check for Blink Codes and use them to track down potential issues. 	
3. Symptoms	Possible Causes and Conditions
Data display issue on website: <ul style="list-style-type: none"> ◆ No data displays on the website. ◆ The data is older than 15 minutes. ◆ Spotty data or breaks in the energy graphs. 	The network is not standard. It's a wireless bridge or BPL. The connection to the ISP is not consistent. The PVM1010 device was unable to communicate with the website at the time the post was supposed to occur.
Possible Solutions: <ul style="list-style-type: none"> ◆ Make sure the network is powered ON. ◆ Change the network over to a more reliable, wired setup. ◆ Try swapping components to test internet connectivity; use a different laptop or other portable device. ◆ Replace the networking equipment if the router or cable/DSL modem is bad. 	

4. Symptoms	Possible Causes and Conditions
Data issues on website: <ul style="list-style-type: none"> ◆ Flat line or "0" for the data. ◆ Data packets are being sent and the time is updating, but the data displays network drop-outs. ◆ BLINK CODES: Short, Long, Short 	Serial connection between the PVM1010 and the inverter is bad or not seated properly. NOTE: It is rare for the serial connection to be bad.
Possible Solutions: <ul style="list-style-type: none"> ◆ Check the serial port connection in the PVM1010. Make sure the communication harness J13 connector is properly seated into the power board. 	
5. Symptoms	Possible Causes and Conditions
Can't log into mypvpower.com.	Incorrect login and password.
Possible Solutions: <ul style="list-style-type: none"> ◆ Verify that you're using the correct login and password. ◆ Close all web browser windows and try again. ◆ Click Forgot Password and use a temporary Password to login (sent to your email/Login address). 	

LED Lights / Indicators

6. Symptoms	Possible Causes and Conditions
BLINK CODE: Short Blinks (rapid with no pause between) <ul style="list-style-type: none"> ◆ Data does not display on the website. ◆ PVM1010 does not display as a device when you log into the router. (The MAC Address doesn't show up in the DHCP Table.) 	Router Connection Failure: <ul style="list-style-type: none"> ◆ A CAT5 cable is not crimped to standards. (See <i>Making A CAT5 Wire</i> section of this Manual.) ◆ The DHCP server is incompatible. ◆ General network problems.
Possible Solutions: <ul style="list-style-type: none"> ◆ Verify that all cables are crimped to standards, in the proper order. ◆ Check the router. Verify that the home router has a standard DHCP running on it. ◆ Make sure the router is turned on. ◆ Verify that the PVM1010 has DNS access. 	
7. Symptoms	Possible Causes and Conditions
BLINK CODE: Long, Short, Short <ul style="list-style-type: none"> ◆ PVM1010 can't find the internet address mypvpower.com. 	DNS Server Communication Error: <ul style="list-style-type: none"> ◆ Networking setup problem somewhere in the chain (with the ISP, DNS server, etc.). ◆ NOTE: #8 (Website Connection Error) can be the underlying cause.
Possible Solutions: <ul style="list-style-type: none"> ◆ The system will probably recover and resolve the issue itself – not serious. Wait 24 hours; if the problem persists, there is a network connectivity issue. ◆ Make sure the PVM1010 can access a DNS, and reboot the system. 	

8. Symptoms	Possible Causes and Conditions
BLINK CODE: Short, Short, Long ♦ PVM1010 can't connect to mypvpower.com.	Website Connection Error: ♦ Networking setup problem somewhere in the chain (ISP, DNS server, etc.). ♦ This can be the underlying cause of #7 (DSN Server Communication Error).
Possible Solutions: ♦ Make sure the PVM1010 can access a DNS. ♦ Use a different laptop and connect to the Ethernet cable at the inverter to test access to mypvpower.com. If it works, the connection is okay. ♦ If necessary, check and replace equipment in the network.	
9. Symptoms	Possible Causes and Conditions
BLINK CODE: Short, Long, Short ♦ Flat line or "0" for the data. ♦ Data packets are being sent and the time is updated, but the data displays network dropouts.	Serial Connection Error: ♦ Serial connection between the PVM1010 and the inverter is bad or not seated properly. ♦ NOTE: This is a rare condition. Same as #4 under <i>Web-Related Issues</i> .
Possible Solutions: ♦ Check the serial port connection in the PVM1010. Make sure the communication harness J13 connector is properly seated into the power board.	
10. Symptoms	Possible Causes and Conditions
BLINK CODE: Long, Long, Short	System Booting – Firmware is starting up.
11. Symptoms	Possible Causes and Conditions
No lights on the PVM1010 circuit board.	There is no power connected to the PVM1010 device.
Possible Solutions: ♦ Verify that the PVM1010 circuit board has power. ♦ Test the cable. ♦ If power cycles and the lights still don't display, the unit is dead or there is a problem with the +5V power.	
12. Symptoms	Possible Causes and Conditions
Amber and Green lights are both ON for an extended period of time.	The PVM1010 firmware is corrupted.
Possible Solutions: Send the PVM1010 device back to PV Powered.	

7.3 PV Powered Support

For networking issues, please contact customer support for your specific router vendor (Netgear, Linksys, etc.) or internet provider.

If you can't locate or fix the issue, please contact PV Powered Customer Support at **541-312-3832**.

8 LIMITED WARRANTY

PV Powered, Inc. provides a limited warranty for your residential or commercial inverter and optional data monitoring module for defects caused by material or manufacturing flaws. The inverter and the data monitoring module must be installed and maintained by a qualified technician in order for the warranty to be valid.

8.1 Term of Coverage

The warranty period for the inverter is ten years, and the warranty on the data monitoring module is one year, each beginning on the date of purchase by the original end user.

8.2 Coverage

PV Powered will, at its option, repair or replace the defective component(s) free of charge, provided that you notify PV Powered of the defect during the warranty period, have a dated proof of purchase, and PV Powered determines that the defect is covered by the limited warranty set forth above. PV Powered reserves the right to inspect the defective component(s) and determine if the defect is due to material or manufacturing flaws. PV Powered also reserves the right to charge a fee for service time expended if the defect is not due to material or manufacturing flaw or is not for some other reason subject to this limited warranty.

PV Powered will, at its option, use new and/or reconditioned parts in performing warranty repair and in building replacement products. PV Powered reserves the right to use parts or products of original or improved design in the repair or replacement. If PV Powered repairs or replaces a product, its warranty continues for the remaining portion of the original warranty period or 90 days from the date of the return shipment to the customer, whichever period expires later. All replaced products and all parts removed from repaired products become the property of PV Powered.

For defects covered by this limited warranty, PV Powered will provide, at no additional cost to the customer, both parts and labor necessary to repair the product, and return shipment to the customer via a PV Powered selected, non-expedited, surface freight carrier within the United States and Canada.

8.3 What is Not Covered

PV Powered does not warrant its products from any and all defects or damage caused by:

- ◆ Normal wear and tear
- ◆ Shipping or transportation damages
- ◆ Improper installation
- ◆ Improper maintenance
- ◆ Excessive voltage or current conditions from the electrical grid or PV panels.
- ◆ Exposure to unsuitable environmental conditions (including but not limited to damage due to lightning strikes, storm, fire, flood, etc.)
- ◆ Unauthorized or abnormal use, repair, modification, or operation

- ◆ Negligence or accidents
- ◆ Material or workmanship not provided by PV Powered or its authorized service centers

This warranty also does not cover costs related to the removal, installation, or troubleshooting of your electrical systems.

8.4 Disclaimer and Limitation of Liability

EXCEPT FOR THIS EXPRESS LIMITED WARRANTY, PV POWERED EXPRESSLY EXCLUDES ALL WARRANTIES WITH RESPECT TO THE INVERTER AND DATA MONITORING MODULE, EXPRESS AND IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTY OF MERCHANTABILITY, THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES THAT MAY HAVE ARISEN FROM COURSE OF DEALING OR USAGE OF TRADE.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, PV POWERED'S AGGREGATE MONETARY LIABILITY TO THE CUSTOMER FOR ANY REASON AND FOR ANY AND ALL CAUSES OF ACTION, WHETHER IN CONTRACT, TORT OR OTHERWISE, WILL NOT EXCEED THE AMOUNT PAID TO PV POWERED FOR THE INVERTER OR DATA MONITORING DEVICE. PV POWERED WILL NOT BE LIABLE TO YOU UNDER ANY CAUSE OF ACTION, WHETHER IN CONTRACT, TORT OR OTHERWISE, FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES, EVEN IF PV POWERED HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE ORIGINAL PRICE FOR THE INVERTER AND DATA MONITORING MODULE AND PV POWERED'S OBLIGATIONS UNDER THIS EXPRESS LIMITED WARRANTY ARE CONSIDERATION FOR LIMITING PV POWERED'S LIABILITY.

IF THIS PRODUCT IS A CONSUMER PRODUCT, FEDERAL LAW DOES NOT ALLOW AN EXCLUSION OF IMPLIED WARRANTIES. TO THE EXTENT YOU ARE ENTITLED TO IMPLIED WARRANTIES UNDER FEDERAL LAW, TO THE EXTENT PERMITTED BY APPLICABLE LAW THEY ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. SOME STATES AND PROVINCES DO NOT ALLOW LIMITATIONS OR EXCLUSIONS ON IMPLIED WARRANTIES OR ON THE DURATION OF AN IMPLIED WARRANTY OR ON THE LIMITATION OR EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION(S) OR EXCLUSION(S) MAY NOT APPLY TO YOU. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE OR PROVINCE TO PROVINCE.

8.5 Arbitration

IN THE EVENT OF A DISPUTE BETWEEN PV POWERED AND ANY PURCHASER COVERED UNDER THIS WARRANTY, TO THE MAXIMUM EXTENT ALLOWED BY LAW, THE PURCHASER AGREES TO RESOLVE ANY AND ALL SUCH DISPUTES USING BINDING ARBITRATION IN ACCORDANCE WITH THE RULES AND PROCEDURES OF THE ARBITRATION SERVICE OF PORTLAND, INC., AND JUDGMENT UPON AWARD RENDERED PURSUANT TO SUCH ARBITRATION SHALL BE BINDING ON THE PARTIES. THE LOCATION FOR ANY ARBITRATION HEARINGS SHALL BE BEND, OREGON. THE PRICE FOR THE INVERTER OR PVM1010 DEVICE AND PV POWERED'S OBLIGATIONS UNDER THIS EXPRESS LIMITED WARRANTY ARE CONSIDERATION FOR THIS BINDING ARBITRATION PROVISION.

8.6 Miscellaneous Provisions

This limited warranty will be governed and interpreted exclusively in accordance with the laws of the state of Oregon, without reference to provisions concerning conflicts of laws. If any provision of this limited warranty is found by any court or arbitrator to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will not be affected thereby. This limited warranty constitutes the entire contract between the parties concerning the subject matter of this warranty and supersedes all marketing brochures and other expectations, understandings, communications, representations and agreements, whether verbal or written, between the parties.