

# MidNite Solar Classic Installation Manual



**This Manual covers models Classic 150, 200 and 250**

The MidNite Solar Classic charge controller conforms to ***UL 1741, Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Second Edition, May 7, 1999 with revisions through January 28, 2010 CAN/CSA C22.2 No. 107.1: 2001/09/01 Ed: 3 (R2006)***

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MidNite Solar's Classic charge controller User's Manual

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## MIDNITE SOLAR CHARGE CONTROLLER INSTALLATION GUIDELINES AND SAFETY INSTRUCTIONS

This product is intended to be installed as part of a permanently grounded electrical system as shown in the system configuration sections. The following important restrictions apply *unless superseded by local or national codes*:

- The System's DC Negative conductor should not be bonded to ground anywhere. The Classic does this with its internal Ground Fault Protection. The battery negative and ground are not bonded together directly but are connected together by the GFP device when it is on. All negative conductor connections must be kept separate from the grounding conductor connections.
- With the exception of certain telecom applications, the Charge Controller should *never* be positive grounded.
- The Charge Controller equipment ground is marked with this symbol: 
- If damaged or malfunctioning, the Charge Controller should only be disassembled and repaired by a qualified service center. Please contact your renewable energy dealer/installer for assistance. Incorrect reassembly risks malfunction, electric shock or fire.
- The Charge Controller is designed for indoor installation or installation inside a weatherproof enclosure. It must not be exposed to rain and should be installed out of direct sunlight.

For routine, user-approved maintenance:

- Turn off all circuit breakers, including those to the solar modules, and related electrical connections before performing any maintenance.

### Standards and Requirements

All installations must comply with national and local electrical codes; professional installation is recommended. NEC requires ground protection for all residential PV installations

### DC and Battery-Related Installation Requirements:

All DC cables must meet local and national codes.

Shut off all DC breakers before connecting any wiring.

Torque all the Charge Controller's wire lugs and ground terminals to the specs found on page **XX**.

Copper wiring must be rated at 75° C or higher.

Keep cables close together (e.g., using a tie-wrap) as much as possible.

Ensure both cables pass through the same knockout and conduit to allow the inductive currents to cancel.

DC battery over-current protection must be used as part of the installation.

Breakers between the battery and the Classic must meet UL489 standards.

Breakers between the DC source and the Classic must meet UL1077 standards.



**WARNING** Warnings identify conditions or practices that could result in personal injury or loss of life.



**CAUTION** Cautions identify conditions or practices that could result in damage to the unit or other equipment.

Design the battery enclosure to prevent accumulation of hydrogen gas at the top of the enclosure. Vent the battery compartment from the highest point to the outside. A sloped lid can also be used to direct the flow of hydrogen to the vent opening.



**CAUTION** - To reduce risk of injury, charge only deep-cycle lead acid, lead antimony, lead calcium, gel cell or absorbed glass mat type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage. Never charge a frozen battery.

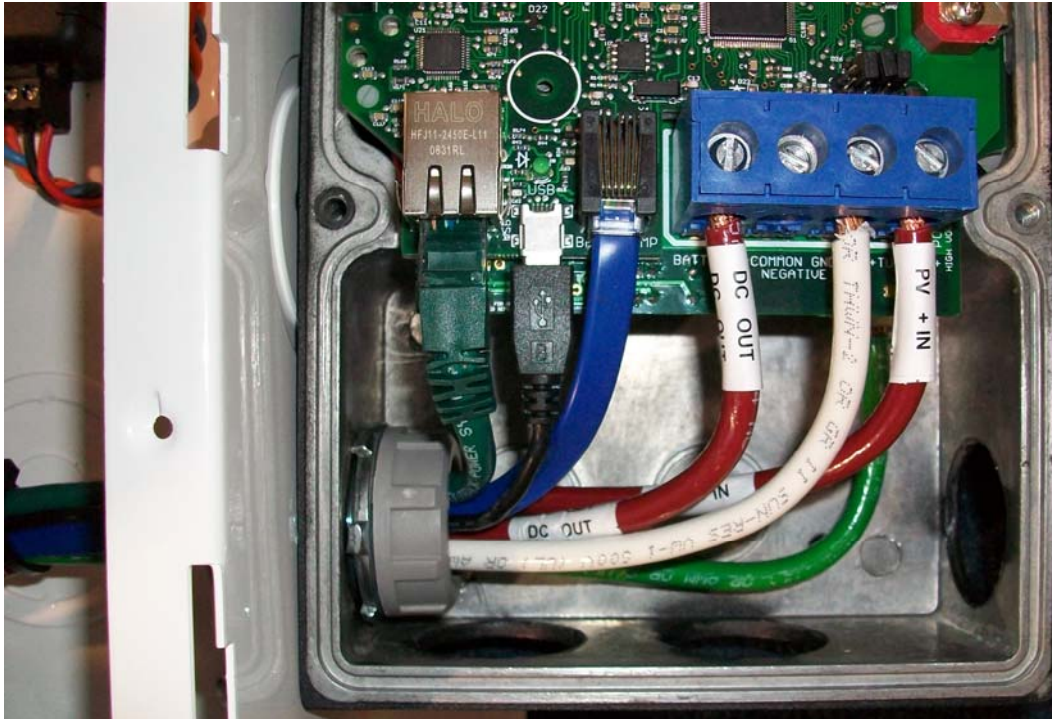


**WARNING: PERSONAL PRECAUTIONS DURING INSTALLATION**  
**WARNING BATTERIES PRESENT RISK OF**  
**ELECTRICAL SHOCK, BURN FROM HIGH SHORTCIRCUIT CURRENT, FIRE OR**  
**EXPLOSION FROM VENTED GASES. FOLLOW PROPER PRECAUTIONS.**

- Someone should be within range of your voice to come to your aid if needed.
- Keep plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- Wear complete eye protection. Avoid touching eyes while working near batteries. Wash your hands with soap and warm water when done.
- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters an eye, flood the eye with running cool water at once for at least 15 minutes and get medical attention immediately following.
- Baking soda neutralizes lead acid battery electrolyte. Keep a supply on hand in the area of the batteries.
- NEVER smoke or allow a spark or flame in vicinity of a battery or generator.
- Be cautious to reduce the risk of dropping a metal tool onto batteries. It could short the batteries or other electrical parts that can result in fire or explosion.
- Never wear metal items such as rings, bracelets, necklaces, and watches when working with a battery or other electrical current. A battery can produce a short circuit current high enough to weld a ring or the like to metal, causing severe burns

## Installation

The Classic was designed to be mounted onto the MidNite Epanel as shown in Figure 3.0. The Classic is designed to be used in a fixed installation inside mounted vertically in a dry environment. The Epanel comes with a charge controller (CC) mounting bracket and screws as well as a 1 inch chase nipple, 3 lock nuts and 2 insulating bushings. Refer to the Epanel instructions for mounting the bracket.

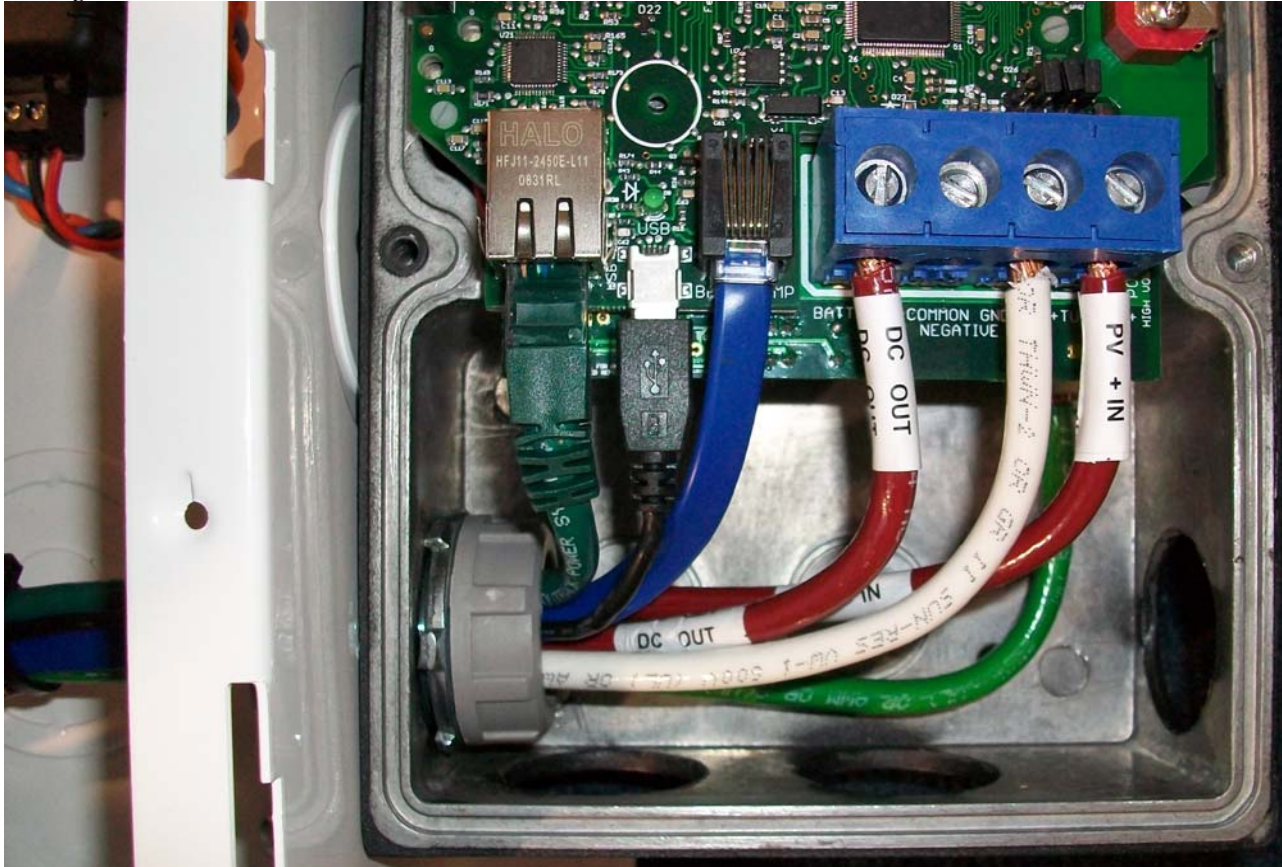


Begin by starting the cc mounting screw in the bracket and then install the chase nipple with 2 lock nuts. Now set the Classic onto the single mounting screw and over the chase nipple. Then install the



third lock nut onto the chase nipple and the 2 insulating bushings. Finish by tightening the screw in the cc mounting bracket. Refer to Figure 3.1

*Figure 3.1*



## Sealed or Vented

The Classic ships with the parts to convert it to a sealed unit. If you live in a dusty or salt air environment you may wish to seal the Classic. To seal the Classic install the solid plastic knock out covers into any unused knock outs and snap the upper vent cover onto the Classic as seen in the photo below. Note that the Classic will be slightly derated (puts out less power) by sealing it. Refer to the owner's manual for the specifications of the Classic in the sealed mode. Refer to Figure 3.2 and 3.3

*Figure 3.2*



*Figure 3.3*



Vented hole cover

Sealed hole cover



# Wiring

The Classic wiring is broken down into 3 main parts -- DC wiring, Classic communication cabling and Home network cabling. All wiring in the Classic will conform to the NEC and be appropriately protected by the correct size and type of over current protection. The breaker between the Classic and the battery must comply with UL489. All MNEPV and MNEDC breakers comply with this requirement. The breaker between the Classic and the dc input source must comply with UL 1077 or UL489. Please follow all common battery safety guidelines and de-energize all circuits before installing or maintaining the Classic. The Classic has built in ground fault protection. Refer to the owner's manual for the procedure to disable this feature. When using this feature there shall be no external connection between DC negative and Ground because the Classic does this for you.

## DC Wiring:

The Classic has 2 common neutral (negative) terminals. Therefore, only one neutral conductor is required to run from the Epanel and terminate on either (or both) common neutral terminal. The Positive DC source wire goes to the PV+ Turbine+ screw. The Positive Battery DC wire goes to battery + terminal. Torque the terminal screws to the specs in the table below

**Up to #10 AWG torque to 25-35 inch pounds.**  
**#8 AWG torque to 30-40 inch pounds.**  
**#6 AWG and above, torque to 40-50 inch pounds.**

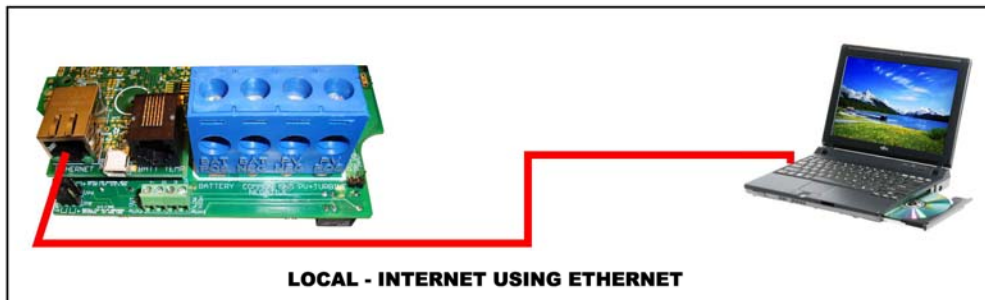
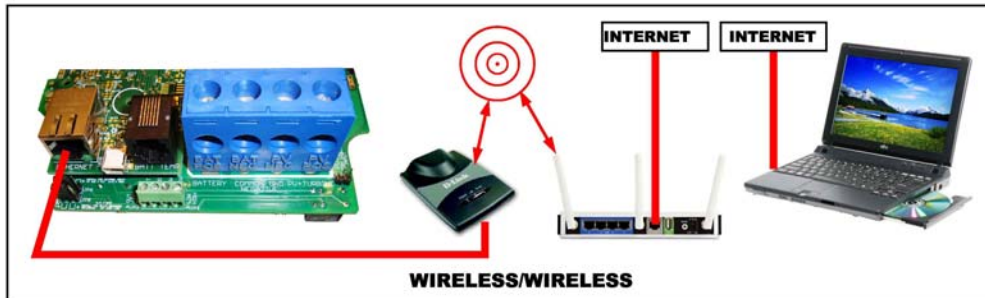
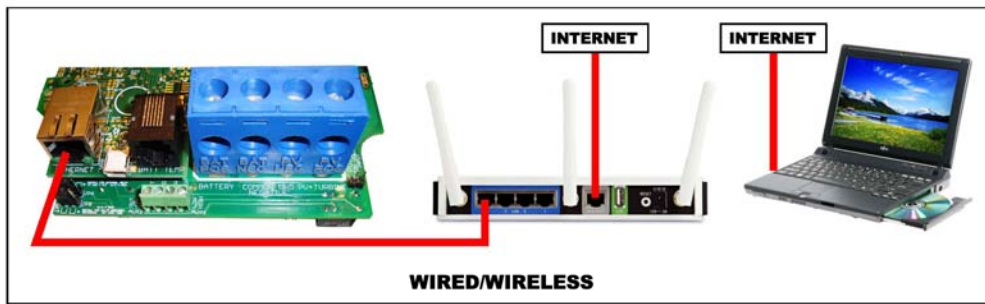
The Ground conductor connects to the ground lug that can be found in the wiring compartment marked with this symbol



## Classic Communication Cabling:

The Classic comes with a Battery temperature sensor which plugs into the jack beside the Terminal block labeled “Battery Temp”. Refer to the picture below. Route the cable through the Epanel into the battery box. Pick a battery in the middle of the bank and about half way up the side of the battery thoroughly clean a spot off on the case. Then remove the protective tape from the sensor and adhere the temperature sensor to the battery. Some manufacturers use a double wall case on the battery. For mounting a temp sensor to them please refer to the battery manufacturer's recommended procedure.

The Classic will use a network cable to communicate with other Classic's or other MidNite products. This cable is a standard 6 conductor phone cable and simply plugs into the jack on the Classic labeled slave and then plugs into the master jack on the second device. There is a plastic clamp located on the circuit board for routing the network cables over the usb jack so they stay tied in out of the way. Refer to Figure 3.4 for detailed network cable routing instructions refer to network cable section in the owner's manual.



## Home Networking Cabling:

The Classic has the ability to communicate over the internet. To take full advantage of all it has to offer you will need to connect it into the Computer Network in your house. To the left of the DC terminal strip there is a jack labeled “Ethernet”. Simply plug a standard cat5 cable into the Classic and route it to the Router and plug it into any unused port. Refer to Figure 3.4 for other Internet Connections that are supported such as a Wi-Fi bridge please refer to the owner’s manual.

*Figure 3.4*



## Installing the Front Cover

To install the front cover of the Classic, plug the cable from the display into the jack labeled remote. Then carefully tuck the cable around through the board and slide the cover on being careful not to pinch any wires in the process. Install the 4 Phillips screws and tighten them to 16 inch pounds. Refer to Figure 3.4

Figure 3.4



## Initial Power up

After the installation is complete you will need to power up the Classic. Then just follow the setup wizard on the screen. The setup wizard will walk you through everything you need to setup. If you have any questions on the setup wizard refer to the owner's manual.