

## Solar Charging System Controller Quick Start Guide

**INCLUDES:** Charge controller; Remote Temperature Sensor (RTS); SD card inside SD card holder; (1) one-meter MS-CAN Cable; (3) ferrite cores; mounting template; (4)-#10 mounting screws

Use following URL to register Morningstar GenStar MPPT:  
<https://www.morningstarcorp.com/product-registration>



**Contact Information:**  
[www.morningstarcorp.com](http://www.morningstarcorp.com)  
Phone: 1-215-321-4457

### OPTIONAL ACCESSORIES:

See product manuals at [www.morningstarcorp.com/support/library/](http://www.morningstarcorp.com/support/library/)

#### ReadyRelay (RB-Relay-1)

The ReadyRelay is an expansion block that adds AC or DC relay dry contact hardware functionality and firmware control and logic to the Morningstar GenStar MPPT charge controller.

#### ReadyShunt (RB-Shunt-1)

The ReadyShunt is an expansion block designed to display measured branch currents, count Amp-hours for those branches, and allow net maximum charge current into a battery, but not exceeding the battery's maximum charging rate.

#### ReadyBMS (RB-BMS-1)

The ReadyBMS provides simple visibility of battery performance, hands-free settings and optimized battery control. Through the ReadyBMS, the GenStar MPPT will report any data variable contained in the battery BMS.

| SPECIFICATIONS:                           | GS-MPPT-60      | GS-MPPT-80      | GS-MPPT-100     |
|---|-----------------|-----------------|-----------------|
| Nominal Battery Voltage                   | 12-24-48V       | 12-24-48V       | 12-24-48V       |
| Maximum PV Open-circuit Voltage           | 200V            | 200V            | 200V            |
| Nominal Maximum Output Power              | 800-1600-3200W  | 1075-2150-4300W | 1350-2700-5400W |
| Maximum Recommended PV Input <sup>1</sup> | 1200-2400-4800W | 1600-3200-6400W | 2000-4000-8000W |
| Max. Battery Charging Current             | 60A             | 80A             | 100A            |
| Rated Load Current                        | 30A             | 30A             | 30A             |

<sup>1</sup> 150% of Nominal Maximum Output Power

### WIRE SIZE RANGES and TORQUE REQUIREMENTS

| Connection Point                | Wire Size                                | Max. Torque          |
|---------------------------------|--|----------------------|
| Power Terminals                 | #8-1/0 AWG (8.4 - 53.4 mm <sup>2</sup> ) | 100 in-lb (11.3 N-m) |
| Load Terminals                  | #14-6 AWG (2.1 - 13.3 mm <sup>2</sup> )  | 35 in-lb (4.0 N-m)   |
| Equipment Grounding Terminal    | #14-#2 AWG (2.1 - 33.6 mm <sup>2</sup> ) | 50 in-lb (5.6 N-m)   |
| Battery Voltage Sense Terminals | #24-16 AWG (0.2 - 1.3 mm <sup>2</sup> )  | 5 in-lb (0.56 N-m)   |
| Remote Temperature Sensor       | INCLUDED                                 | 5 in-lb (0.56 N-m)   |

### INSTALLATION SAFETY:

**WARNING: Shock Hazard**  
Verify that the solar, load and battery breakers and/or disconnects remain open (disconnected) until after all of the system wiring has been completed.

**WARNING: Risk Of Electrical Shock. NO POWER OR ACCESSORY**

TERMINALS ARE ELECTRICALLY ISOLATED FROM DC INPUT, AND MAY BE ENERGIZED WITH HAZARDOUS SOLAR VOLTAGE. UNDER CERTAIN FAULT CONDITIONS, BATTERY COULD BECOME OVER-CHARGED. TEST BETWEEN ALL TERMINALS AND GROUND BEFORE TOUCHING.

**WARNING: Equipment Damage or Risk of Explosion**

Never install the GenStar MPPT in an enclosure with vented/flooded batteries. Battery fumes are flammable and will corrode and destroy the GenStar MPPT circuits.

**CAUTION: Equipment Damage Power UP Sequence** - refer to manual's LED Indications Section for full details:

1. Connect Battery/Battery Bank.
2. Connect Solar.

#### Power DOWN Sequence:

1. Disconnect Solar.
2. Disconnect Battery/Battery Bank.

**CAUTION: Equipment Damage**  
Ensure sufficient ventilation - see clearance illustration on p. 3 - and do not install in a sealed enclosure. Improper ventilation will result in over-heating and a decreased product lifetime.

### IMPORTANT SAFETY INFORMATION:

**WARNING: Shock Hazard**  
The Morningstar GenStar MPPT must be installed by a qualified technician in accordance with the electrical regulations of the installation location.

**WARNING: Shock Hazard**  
This unit is not provided with a GFDI device. This charge controller must be used with an external GFDI device as required by Article 690 of the U.S. National Electrical Code and depending on the installation location.

**CAUTION:** This guide must be used with the full product manual that includes important information. Read the GenStar product manual for all specifications, safety, regulatory and warranty information, and for all required instructions, installation procedures, configuration, and operation details.

### FULL MANUAL INSTRUCTIONS:

SCAN →



#### TOOLS REQUIRED:

5/32" Allen Wrench

#2

3/32" (2.4 mm)



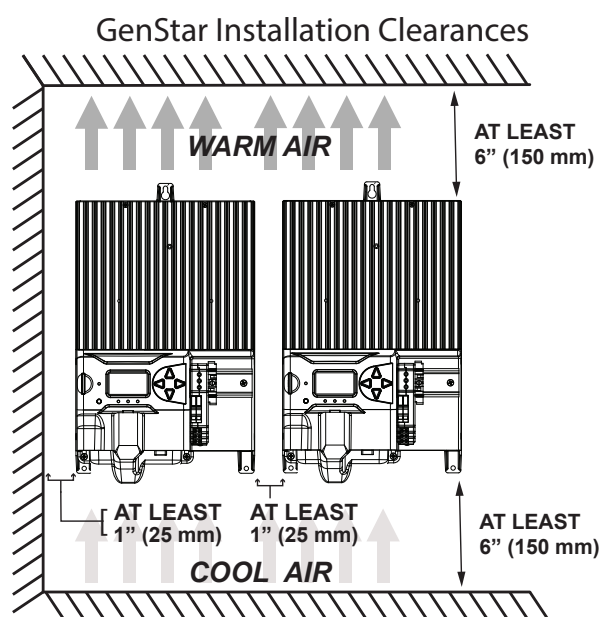
1/8" (3 mm) bit

### MOUNTING:

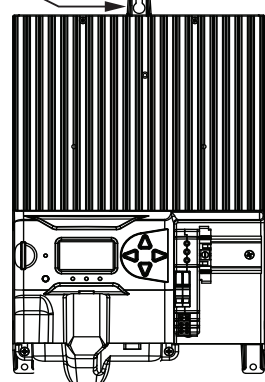


Choose an indoor mounting location, with no exposure to sun or water. When mounting, allow for proper air flow, as seen in upper-right illustration.

**Use only panhead screws.** Use mounting template to mark, and drill (3)-1/8 in. screw hole locations. Drive top screw head to 1/4 in. from flush with wall. Hang keyhole slot on hanging screw head - see lower-right illustration. Drive top screw head and (2) lower screw heads flush with mounting brackets.



Insert and pull down

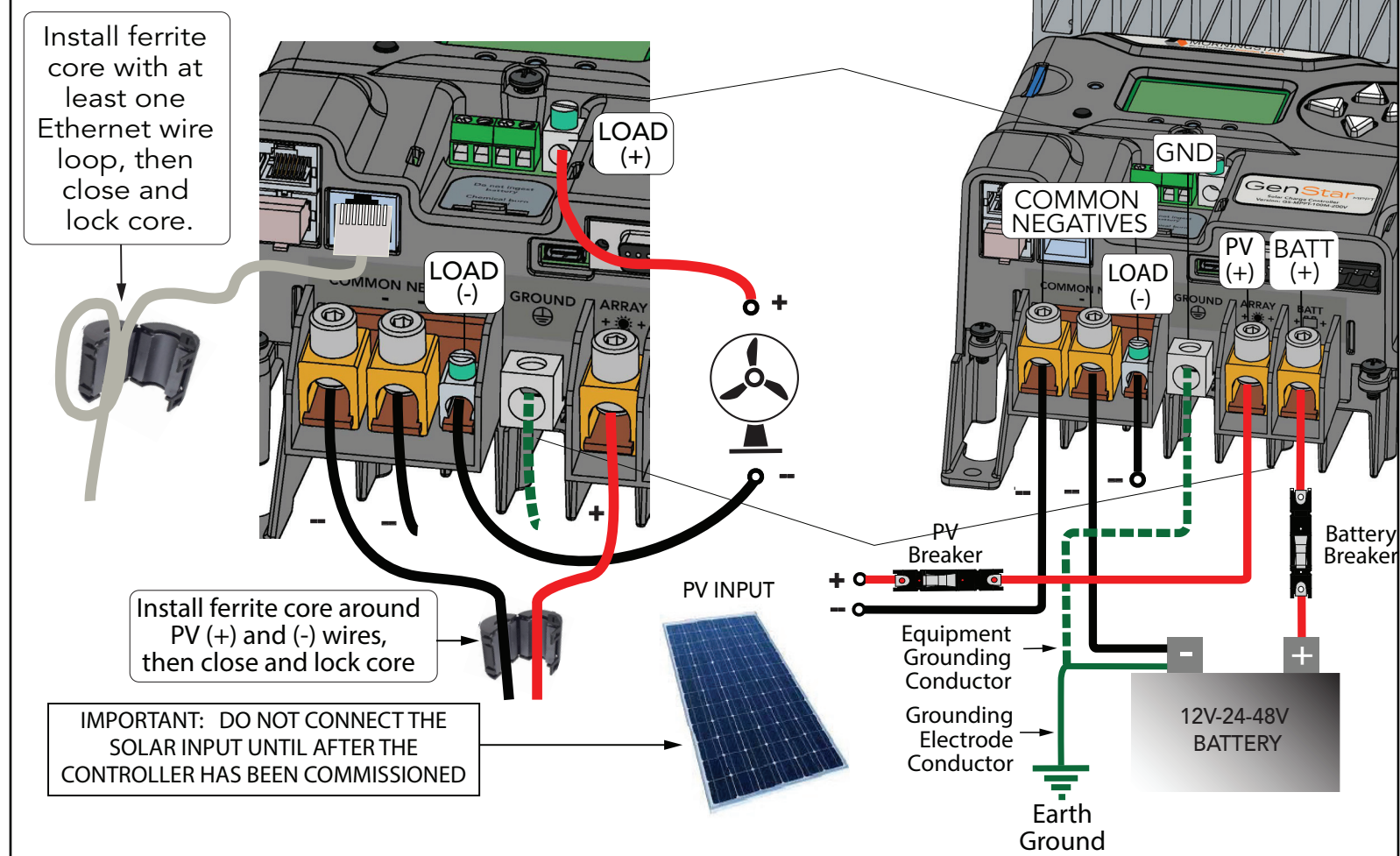


### WIRING SCHEMATIC -

see accessory wiring details on p. 5 - reverse

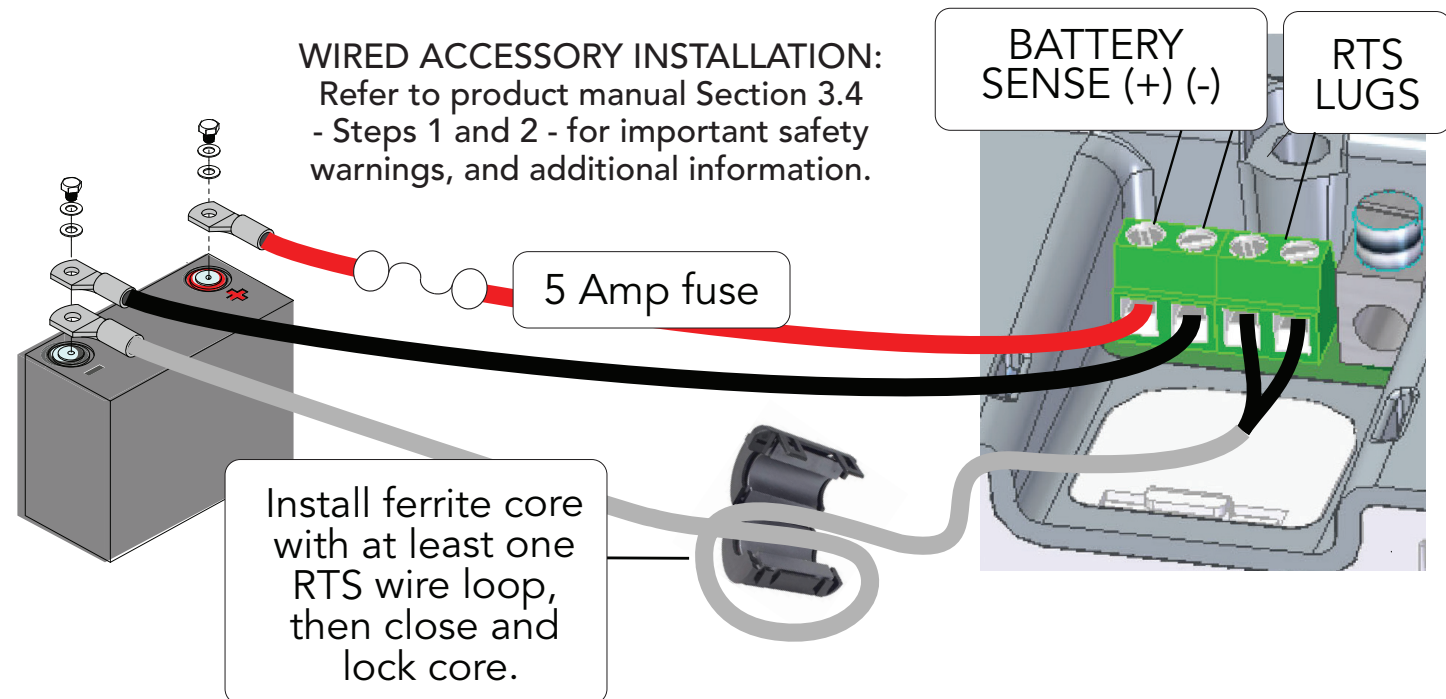
**LEGEND**  
— POSITIVE CONDUCTOR  
— NEGATIVE CONDUCTOR

**NOTE:** Actual wire routing and connection hardware components may vary.





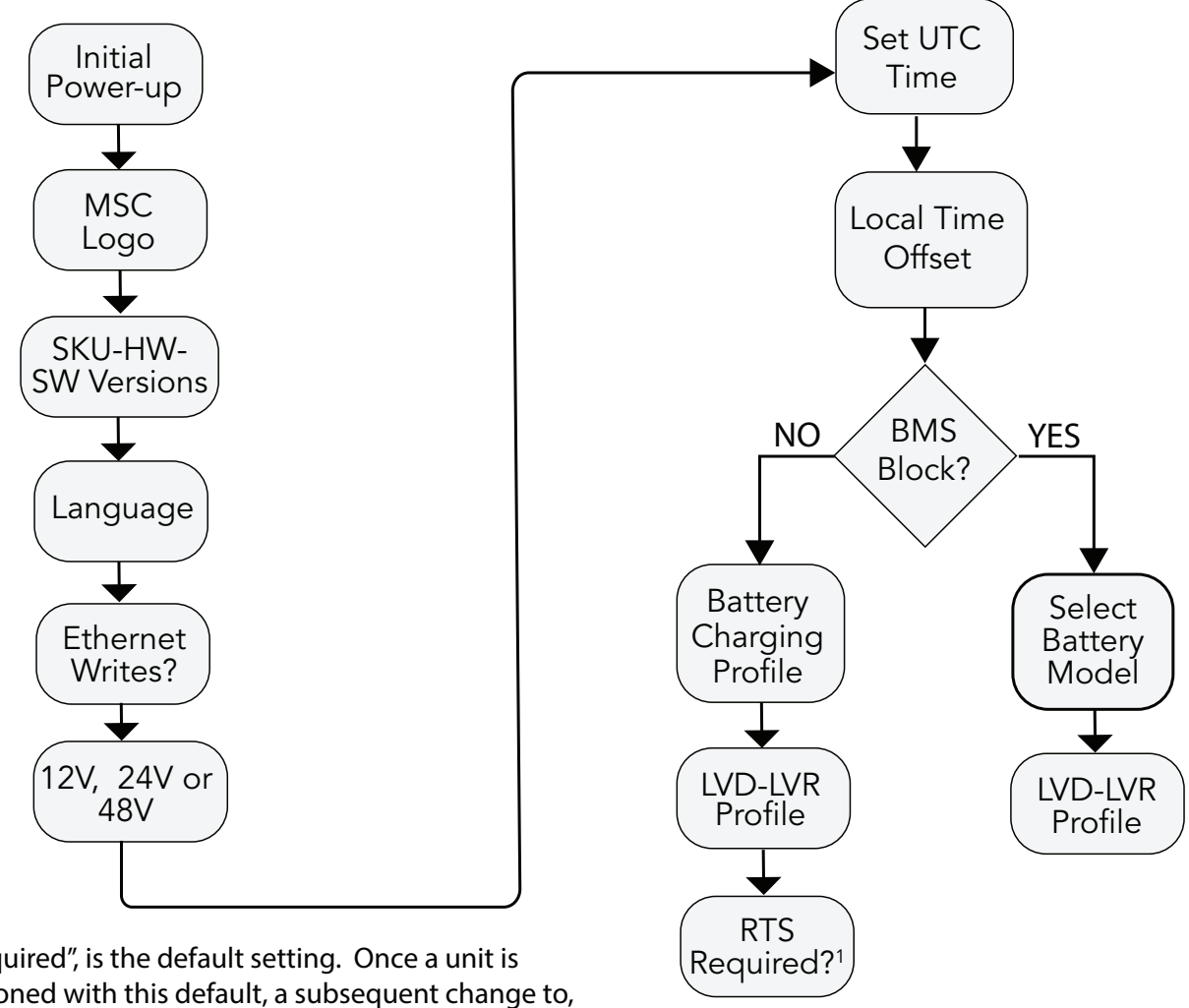
**CAUTION:** When installing the GenStar MPPT, refer to product manual Section 3.1 - General Installation Notes - and all mandatory Section 3.3 Overcurrent Protection Devices and 3.4 Wiring ratings, specifications, warnings and cautions.



**COMMISSIONING:**

Commissioning requires the user to enter and confirm important settings required for basic operation. Connect the battery to initiate the commissioning procedure, and then follow the meter prompts. Do not connect the solar input until after the controller has been commissioned.

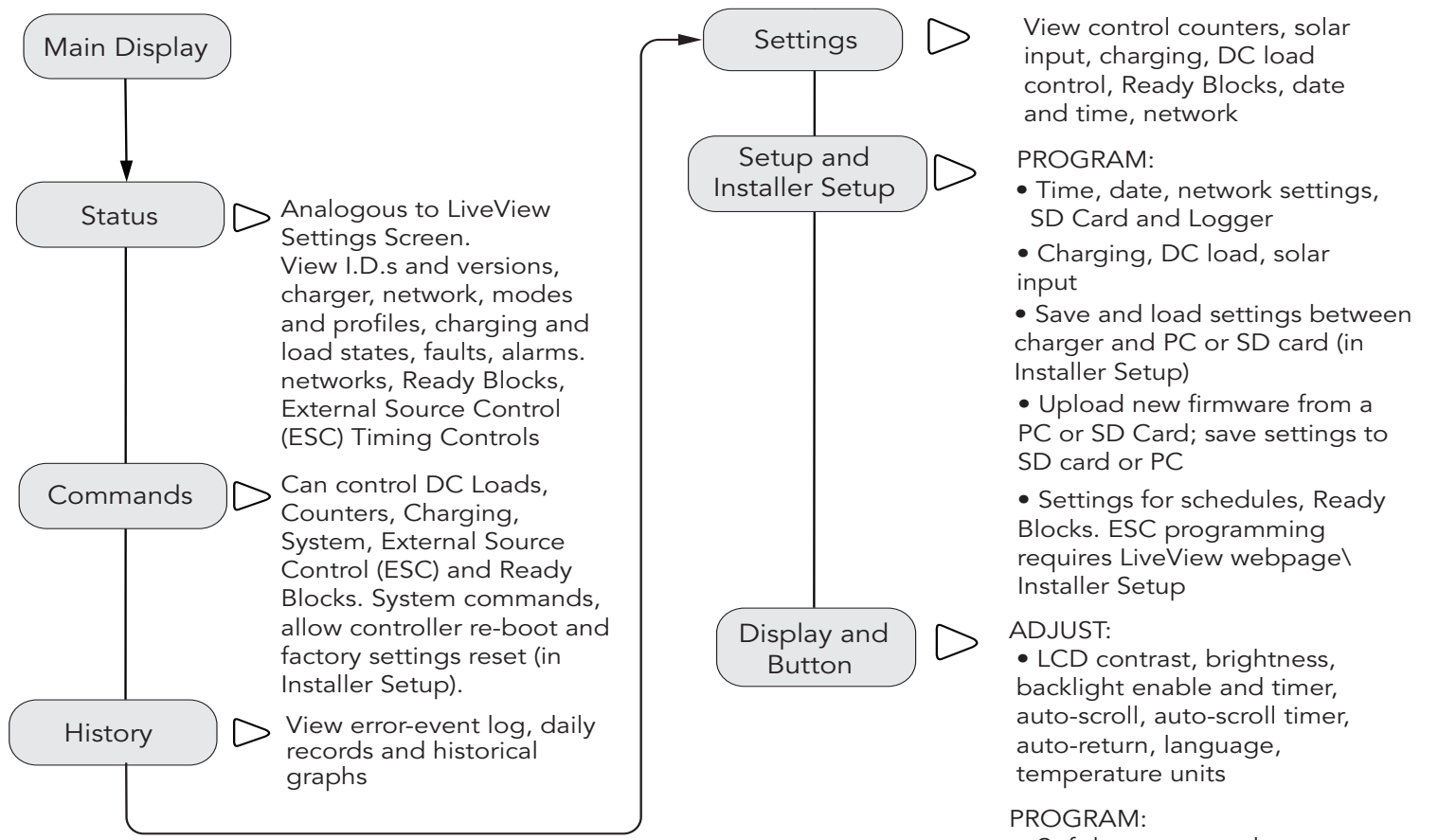
The commissioning flowchart - p. 6 - illustrates the selectable options required to prepare the GenStar-MPPT for operation or further programming. After commissioning, ① disconnect and then reconnect the battery to re-start the unit, ② connect the solar input. When powering down, ③ disconnect the solar input, ④ disconnect the battery.



<sup>1</sup> "RTS Required", is the default setting. Once a unit is commissioned with this default, a subsequent change to, "RTS not required", necessitates that the unit be re-commissioned via a Factory Reset using the local meter - Installer Setup\Commands\Factory Reset. Also see RTS Start-up and Run-time Behavior Tables in the Commissioning Section of the full manual.

**CONFIGURATION:**

All settings - excluding factory reset - can be configured using Morningstar LiveView web pages - see the main LiveView web page for locations and screens. The product manual configuration sections describe all settings details in terms of LiveView screens, and many settings are also accessible within the Setup-Installer Setup on-board meter menus shown below and in Section 4 of product manual.



**BATTERY CHARGING PRESETS and LVD-LVR PROFILES**

| Battery Type-Preset               | Absorption Voltage | Float Voltage | Equalization Voltage | Absorption Time | Equalization Time | Equalization Timeout |
|-----------------------------------|--------------------|---------------|----------------------|-----------------|-------------------|----------------------|
|                                   | Volts              | Volts         | Volts                | Minutes         | Minutes           | Minutes              |
| 1 - Sealed                        | 14.10              | 13.70         | Disabled             | 150             | Disabled          | Disabled             |
| 2 - Sealed                        | 14.30              | 13.70         | 14.6 <sup>1</sup>    | 150             | 60                | 120                  |
| 3 - Sealed / Flooded              | 14.50              | 13.60         | 15.0 <sup>1</sup>    | 180             | 60                | 120                  |
| 4 - Sealed / Flooded              | 14.60              | 13.50         | 15.2 <sup>1</sup>    | 180             | 120               | 180                  |
| 5 - Sealed / Flooded              | 14.80              | 13.50         | 15.4 <sup>1</sup>    | 180             | 120               | 180                  |
| 6 - LiFePO4 - Low <sup>2</sup>    | 13.60              | 13.50         | Disabled             | 180             | Disabled          | Disabled             |
| 7 - LiFePO4 - Medium <sup>2</sup> | 13.90              | 13.50         | Disabled             | 20              | Disabled          | Disabled             |
| 8 - LiFePO4 High <sup>2</sup>     | 14.20              | 13.50         | Disabled             | 15              | Disabled          | Disabled             |

**CHARGING PRESET NOTES:**

<sup>1</sup> For Presets 2-5, an equalization charging stage can be initiated manually using the Start Equalization Command from the local meter or LiveView. Auto equalization can only be set up using custom settings.

<sup>2</sup> CAUTION: LiFePO4 settings are for 4, 8 and 16-cell LiFePO4 batteries only.

• Preset temperature compensation co-efficient for sealed or flooded batteries = -30 Millivolts / °C / 12V -- temp. comp. is disabled for LiFePO4 presets.

• All settings, including charging stage voltages and timing, can be custom programmed using the local meter or LiveView. LiveView includes additional advanced custom programming options.

• CAUTION: Equipment Damage

Do not equalize sealed batteries with preset or custom settings unless recommended by the battery manufacturer. To prevent the possibility of unintended equalization, use custom settings to disable all equalization.

• CAUTION: Settings may not be compatible with all models of these battery types.

• All voltage setting values are for 12V systems. Multiply values by two (2) for 24 Volt batteries, or by four (4) for 48 Volt systems.

**See full manual for complete details on charging settings operation.**

**LVD-LVR PROFILES**

| Load Control Type-Preset | LVD   | LVR   |
|--------------------------|-------|-------|
|                          | Volts | Volts |
| 1 - Lead Acid            | 11.10 | 12.60 |
| 2 - Lead Acid            | 11.50 | 12.80 |
| 3 - Lead Acid            | 11.70 | 12.90 |
| 4 - Lead Acid            | 12.00 | 13.20 |
| 5 - LiFePO4              | 12.50 | 13.15 |
| 6 - LiFePO4              | 12.70 | 13.25 |
| 7 - LiFePO4              | 12.85 | 13.30 |