

1. Battery Type Select Switch

(Page 4, Section 2.7 - Battery Type Select)

A rotary switch has replaced the Battery Type Select Pin used on the previous version of the ProStar. The rotary switch provides a third battery regulation voltage (nominally 13.90Vdc@25°C) for gel type batteries as well as the capability to hold the selected battery type through power down. The battery type is selected by rotating the switch to the appropriate position. The controller will acknowledge the change in battery type by flashing the three Battery State of Charge indicators. The ProStar will take up to three minutes to adjust the regulation voltage to the new setting. If the controller is not in regulation, the only indications available to the user are the switch position and the confirmation flashes of the battery SOC indicators.

Rotary Switch Position	Battery Type	Nominal Regulation Voltage	Number of Flashes
1	Gel	13.90	1
2	Sealed	14.10	2
3	Flooded	14.35	3
4	Error	----	Continuous

A fourth, unused position exists on the switch, which if selected will cause the Battery State of Charge indicators to flash continuously. This is an error condition and should be corrected by turning the switch to a valid position.

The Battery Type Select Indicator LED has been removed from the new ProStar. The selected battery type is indicated by the position of the arrow located on the top of the switch.

2. Remote Probe

An optional remote temperature probe can be used with the ProStar to provide a more accurate indication of the battery bank temperature. The probe should be used in installations where the batteries are in a different thermal environment (regularly more than 10°C hotter or colder) than the ProStar.

The remote probe is connected to the ProStar using the three position terminal block located on the back side of the controller. The probe is wired to the ProStar using the following wiring order:

Left Screw	Red Wire	Probe power
Middle Screw	Black Wire	Probe Ground
Right Screw	White Wire	Probe Signal/Control

Refer to the Remote Probe installation manual for wiring diagram and correct installation procedure.

If the Remote Probe is damaged or disconnected during operation, the ProStar will use the on board temperature sensor to calculate the correct the temperature compensated regulation voltage.

3. LED indicators

(Page 4, Section 3.0 - Indicators)

The ProStar utilizes 4 LED (light emitting diode) indicators to provide controller and system status information. These are described in the following table.

Indicator	Color	Description
Charging	Green	ON: PV array power available and charging battery OFF: PV array power is off (night mode)
Battery Status	Green	FLASH: Controller in PWM mode, battery at full charge. Controller is regulating battery voltage.
Battery Status	Green	ON: Battery near full charge
Battery Status	Yellow:	ON: Battery at middle capacity NOTE: This does not indicate a problem
Battery Status	Red:	FLASH: Battery at Low charge NOTE: This indicates a low battery condition
Battery Status	Red:	ON: Load has been disconnected
<u>Battery Status LED's</u>		
Green / Yellow / Red		One Cycle <i>ProStar Start-Up Sequence</i>
Yellow / Red		Alternately Flashing <i>Normal operation</i>
Green + Red / Yellow		Alternately Flashing <i>Over Temperature Condition, PV array will be disconnected first, if no effect on controller temperature, the load will also be disconnected</i>
Green / Red		Alternately Flashing <i>Load Short Circuit / Load Over Current</i>
Green + Yellow + Red		One Flash <i>Load disconnected (PV will continue to charge batteries)</i>
Green + Yellow + Red		Two Flashes <i>High voltage disconnect</i>
Green + Yellow + Red		Three Flashes <i>PV will be disconnected first, if no effect on battery voltage, the load will also be disconnected</i>
Green + Yellow + Red		Flashing continuously (more than 3 times) <i>Gel battery selected</i>
		<i>Sealed battery selected</i>
		<i>Flooded battery selected</i>
		<i>Battery type select error. Move battery type selector to a valid position.</i>

4. PV Short Circuit Protection

The ProStar is protected against short circuits that may occur on the PV array input wires. If a short circuit on the PV array occurs, the ProStar will stop charging the battery and immediately disconnect the PV array, protecting the ProStar from damage. Once the short circuit is removed, the ProStar will resume charging the battery if enough energy is available from the PV array.

5. Load Short Circuit and Over Current Protection

The ProStar is protected against short circuits and over current conditions that may occur at the load terminals. If a short circuit occurs on the load terminals or somewhere in the load circuit supplied by the ProStar, the controller will immediately shut off the load and display a load short circuit indication (the Green and Red LED's flashing alternately with the Yellow LED). If the short circuit was a transient condition, the ProStar will restart the load and resume normal operation. The ProStar will attempt to restart the load three times, each attempt occurs at five-second intervals. If after three attempts, the short circuit is not cleared, the ProStar will stop trying to connect the load and will indicate a short circuit condition. To reset the ProStar, it will be necessary to restart the controller by disconnecting and then reconnecting the ProStar to the battery terminals. The ProStar will continue to charge the batteries while in short circuit mode if sufficient energy is available from the PV array.

6. Grounding hole in heat sink

A #10-32 self tapping screw is provided to attach a ground wire to the ProStar metal heat sink in accordance with the National Electrical Code (NEC) Article 690-43. A #10 copper wire should be fastened between the ground screw on the ProStar heat sink and a solid earth ground.

For more information on proper system grounding please refer to the NEC Articles 250 and 690.

7. Miscellaneous

Temperature Sensor: The temperature sensor is located in the middle of the ProStar faceplate. The sensor provides temperature information to calculate the correct the temperature compensated regulation voltage. The temperature compensation is non-adjustable. Do not attempt to turn the temperature sensor, as damage to the controller will result.