Technical Bulletin #100202

Issued: 3/24/00
Revised: 10/30/03

Affected Products: Solar Boost 50, Solar Boost 3048 and Solar Boost 6024H

Purpose: Multi-controller use for large systems

Systems requiring greater current capability than that provided by a single Solar Boost 50, 3048 or 6024H controller can use multiple controllers to charge a single battery bank. The output of each controller is simply wired in parallel and connected to the battery in a manner similar to a single controller. However, the PV array feeding multiple controllers must be broken down into sub-arrays with each sub-array separately wired to each Solar Boost controller.

➢ **CAUTION:** The PV inputs, both Positive and Negative, of a multi-controller system must not be connected in parallel to a single large PV array or MPPT will not function properly. Additionally, parallel PV input connection of multiple units will adversely affect operation of the current limit function and may damage the unit. Damage caused by parallel PV inputs is not covered under the limited warranty.

For large battery banks being charged by a multi-controller system, each controller operates independently. Either two stage or three stage charge, or a combination can be used. Note that if temperature compensation is used, each controller must have its own SensorLug™ battery temperature sensor. Additionally, each controller must use it's own remote display panel if remote display is required.

Best charging performance is obtained by using three stage charge, and a single "external current shunt" for full charge determination as described in the Solar Boost operators manual. Each controller is set for three stage charge mode. Float Charge voltage for each controller would be set approximately the same. Acceptance Charge voltage and Float Transition Current would be set in a staged manner so that the controllers sequentially switch from acceptance to float as the battery reaches full charge. For example, assume there are three controllers charging a 2000 amp-hour battery. This would produce a desired Float Transition Current setpoint of 20 amps using the 1.0 amps per 100 amp-hours of capacity guideline. Controllers 1, 2 and 3 would be set for Float Transition Current and Acceptance/Float Charge voltages as shown in the table below. *Note that the controller with the highest Float Transition Current has the lowest Acceptance Charge Voltage setpoint. This is because a Solar Boost controller will not switch to Float unless the battery reaches and is held at that unit's desired Acceptance Charge voltage setpoint*. To simplify charge voltage calibration, consider use of the Charge Voltage Calibration tool described in Tech. Bulletin 100209.

TYPICAL MULTI-CONTROLLER SETUP
FOR LEAD-ACID 2000AH / THREE STAGE CHARGE

CONTROLLER NUMBER	ACCEPTANCE CHARGE SETPOINT	FLOAT CHARGE SETPOINT	FLOAT TRANSITION CURRENT SETPOINT
1	14.1V / 28.2V	13.3V / 26.6V	30A
2	14.2V / 28.4V	13.3V / 26.6V	25A
3	14.3V / 28.6V	13.3V / 26.6V	20A (final full charge value)

When the battery is at a low state of charge, each controller delivers maximum available charge current. As the battery reaches full charge, controller 1 switches to float first, then controller 2, and finally controller 3.