**Remote Temperature Sensor (RTS)**
**Operator's Manual**

## WHEN TO USE

The RTS may be used with Morningstar's ProStar™ or TriStar™ solar controller. The RTS should not be used with any other controllers. Also note that the RTS may only be used with ProStar manufactured after May 2001 (bar code label: after 0122xx - year 2001 / week 22).

The ProStar has on-board temperature compensation, and the RTS provides more accurate compensation by measuring temperature at the battery. Use of the RTS is recommended whenever the temperature at the battery will be more than 5°C (9°F) different than the temperature at the controller.

The TriStar has no on-board temperature compensation, and the RTS will provide temperature compensated charging. Use of the RTS is recommended only for battery charging or diversion control modes (not for load control mode) and whenever the temperature of the battery varies more than 5°C (9°F) during the year.

## OPERATION

The RTS is encapsulated in epoxy inside a power lug housing for maximum protection from harsh environments. The RTS will correct for temperatures from -30°C (-22 °F) to +80°C (+176 °F). The RTS is also protected from lightning surges and short circuits.

As soon as the RTS is connected, the controller will begin to use the battery temperature for charge control. If the RTS should fail open or closed:

- The ProStar will automatically use the on-board temperature sensor for temperature corrections.
- The TriStar will stop charging battery (refer to the TriStar manual for more information).

For installation instructions, see the back of this page.

## TESTING

To confirm the RTS is working correctly for non-meter versions, a separate volt meter is required. With the PWM charging (green "Battery Status" LED is flashing), change the temperature of the remote sensor. If the RTS is heated (e.g. holding the sensor in your hand), the battery voltage at the battery terminals will decrease. If the RTS is cooled (e.g. putting the sensor on ice), the battery voltage will increase. These battery voltage changes occur slowly, and can take a few minutes to occur. A small change in battery temperature is all that is required to verify the RTS is working correctly.

For meter versions of the ProStar, simply run the self-test (see ProStar manual). For the TriStar with meter, you can test the RTS by simply scrolling the meter to the screen which should display temperature (see TriStar meter manual).

## EXTEND CABLE LENGTH

If the battery is located more than 10 meters (33 ft) from the controller, the RTS cable length can be extended up to 30 meters (100 ft.).

It is recommended that the original remote sensor cable be cut and the new cable soldered into the middle. Solder the spliced wire connections and tape or seal the bare wires.

The new cable extension should be a shielded, twisted pair cable. The new wires should be at least 0.34 $mm^2$ (22 AWG), and a larger size 1.0 $mm^2$ (18 AWG) is recommended for best performance.

## SPECIFICATIONS

- Power lug housing: 9.5 mm (3/8") screw hole
- 2-conductor copper cable with PVC jacket
- Cable rated UL CMR
- accuracy +/- 1.5°C (2.7°F)
- UL recognized component used with TriStar
- Passed CE test with Prostar and TriStar
- Sensor noise is filtered


1098 Washington Crossing Road, Washington Crossing, PA 19877 USA Tel 215-321-4457 Fax 215-321-4458
Email: info@morningstarcorp.com Website: www.morningstarcorp.com

## ProStar Temperature Sensor Installation Instructions:

**NOTE**: *The ProStar circuits are static sensitive. Be sure to touch a metallic grounded object to discharge built-up static charge on your body before touching the circuits.*

1. Remove the 4 Phillips screws in the corners of the heat sink and remove the plastic case.

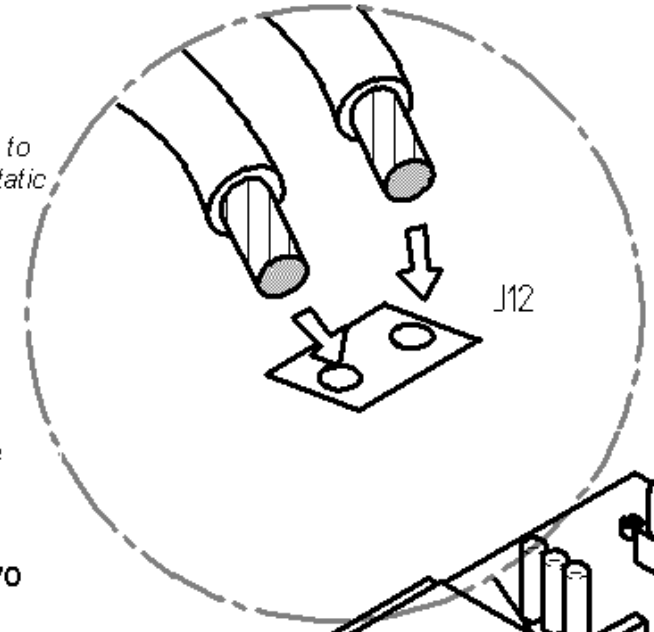
2. Pull about 3 inches(80mm) of the probe wire through the heat sink as shown.

3. Solder a sensor wire into each of the two holes at J12(see drawing). There is no polarity(+ or -), so either wire can go into either hole.

4. Carefully replace the plastic case. Make sure all 4 corners of the heat sink are flat against the case mounting posts. If the sensor wire interferes with the assembly, push or pull the wire slightly to clear the interference.

5. Replace the 4 case screws. **DO NOT** over-tighten the screws.

6. The battery temperature sensor terminal lug can be left in free air or secured directly to the battery terminal post. The terminal lug is electrically isolated.




## Tools:

Phillips screwdriver
Soldering Iron
(recommend 20 Watt, small tip: about 250ºC)