



SOLAR TRACKER III CONTROLLER OWNER'S MANUAL

For All Models

**Including: S10A12, S20A12, S40A12, S80A12
and S10A24, S20A24, S40A24, S80A24
and S10A24, S20A24, S40A24, S80A24**



Available at <http://www.teslachargers.com>

Read First Before Operating Controller

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**WATCH THE VIDEO DEMONSTRATION OF THE
TESLA SOLAR TRACKER**

<https://www.youtube.com/watch?v=56YEFcDZn-0>

Learn more at <http://teslachargers.com>

About This Manual

Thank you for selecting the Solar Tracker III solar controller. This third generation Solar Tracker III adds new features and protections using highly advanced technology. Energenx's patented charging algorithm has also been further optimized for longer battery life and improved system performance.

Many functions of the Solar Tracker III are unique. Although the Solar Tracker III is very simple to use, please take the time to read this operator's manual and become familiar with the controller.

"Always Put Safety First"

- Be very careful when working with batteries. Wear eye protection and have fresh water available to wash and clean any contact with battery acid.
- Charge only lead-acid batteries that are properly sized for the system.
- Explosive battery gasses can be present during charging. Be certain there is enough ventilation to release the gasses.
- Use insulated tools and avoid metal objects near the batteries.
- Carefully read the battery manuals and other equipment manuals before installing the solar system. Observe ALL precautions when working with batteries and power electronics.
- Fuses or DC disconnects may be required in the system. These protective devices are not part of the Solar Tracker III controller.

- Avoid large voltage drops in the battery wires. Use the Battery Sense connection for best battery charging and system performance.
- Do not allow water to enter the controller.
- Install the controller in a horizontal position with adequate space for ventilation.
- Ensure that the system is properly grounded.
- **SAVE** these instructions for future reference.

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1.0 QUICK START INSTRUCTIONS

This section provides a brief overview of how to get started using the Solar Tracker III controller. However, please review the entire manual to ensure best performance and years of trouble-free service.

1. Mount the Solar Tracker III to a horizontal surface. Allow space above and below the controller for air flow.
2. Make sure the Solar and Load currents will not exceed the ratings of the Solar Tracker III version being installed.
3. Before connecting your batteries or solar panel be sure that all circuit breakers or switches on the Solar Tracker III are in the OFF position.
4. Connect the Battery first. Torque all the Solar Trackers terminals tightly, but do not exceed 35 in-lb.
5. Connect the Solar. With sunlight, the **BLUE** charging LED will light.
6. For 12 or 24 volt systems only.
7. Observe the LEDs to confirm normal operation.
8. It is recommended that the system be properly grounded.

1.1 LED INDICATORS

The 3 LEDs in the upper label indicate system status and various functions. These functions are described below.

SOLAR TRACKING (LED 2 – BLUE)

ON: battery charging during sunlight (always on during sunlight).

OFF: normal during night.

CHARGING (LED 1 – RED)

ON: battery charging during sunlight (always on during sunlight).

OFF: normal during night.

BATTERY STATUS (LED 3 – GREEN)

GREEN: ON indicates battery is at or near full charge and in a desulfating mode (self regulating).

1.2 GENERAL INSTALLATION NOTES

- The Solar Tracker III uses only the finest materials and fasteners, a durable powdercoating to protect from harsh conditions. However, for acceptable service life extreme temperatures and marine environments should be avoided.

- The Solar Tracker III prevents reverse current leakage at night, so a blocking diode is not required in the system.

- The Solar Tracker III is designed to regulate ONLY solar (photovoltaic) power. Do not connect it to any other type of power generator. Do not attempt to regulate a wind turbine. However, other power sources can be connected directly to the battery.

- The connector terminals will accept a maximum wire size of AWG #6 /16 mm²(solid/multistrand) or AWG #8 / 10 mm² (fine strand). Use a 7/16" insulated wrench, and torque tightly up to 35 in-lb.

• *Ratings*

Confirm that the solar array and loads will not exceed the current rating of the Solar Tracker III version being installed.

1.3 Solar Tracker III CHARGING METHOD

The Solar Tracker III uses 4 stages of charging for rapid, efficient and safe battery charging. These are listed below:

1. Recharging with 100% of available solar energy.
2. Constant-voltage regulation to prevent heating and excessive battery gassing.
3. Patented pulse charging to restore full battery capacity.
4. Float: After battery is fully recharged, Solar Tracker III reduces to a float or desulfating charge as indicated by the **GREEN** LED, this brings uneven cells into balance and extends the battery life.

1.4 TROUBLESHOOTING

The Solar Tracker III is assembled with automated equipment, tested with computers, and is protected from faults. It is usually worthwhile to troubleshoot the entire solar system for faults, since the Solar Tracker III will generally not be the cause of a problem. Most problems will be caused by wiring connections, batteries unable to hold a charge, or faulty loads.

CAUTIONS:

1. Troubleshooting should be done by qualified personnel.
2. A battery can cause serious damage if shorted.
3. There are no user serviceable parts, fuses or circuit breakers inside the Solar Tracker III.
4. Observe all normal precautions when working with energized circuitry.

BATTERY IS NOT CHARGING

- Check the **BLUE** charging LED above the Solar input. With sunlight on the solar array, this LED should be on.
- Check that all wire connections in the system are correct and tight. Check the polarity (+/–) of the connections.
- Measure the solar array open-circuit voltage (disconnected from the controller) and confirm it is normal. If the array voltage is low or zero, repair the fault in the array.
- Confirm that the load is not drawing more energy than the solar array can provide.
- If the BATTERY terminals are corroded, there may be excessive voltage drops between the Solar Tracker III and the battery. This is a common cause of undercharging batteries.
- Check the condition of the battery. Determine if the battery voltage falls at night with no load. If the battery is unable to maintain its voltage, it may be failing.
- Measure the solar input voltage (during daytime) and battery voltage at the Solar Tracker III terminals. If the voltages at the terminals are the same (within about 0.5 volts), the solar array is charging the battery.

If the solar voltage is close to open-circuit (about 20V), and the battery voltage is low, the controller is not charging the battery and may be defective.

- Check that the load is connected and turned on. Confirm that no fuses or circuit breakers in the system are tripped (there are fuses or circuit breakers in the front or back of the Solar Tracker III).
- Check all connections to the load, and battery connections. Make sure voltage drops in the system are not too high (a voltage drop to the load will reduce the voltage at the load).
- Check the LED indications on the Solar Tracker III. If no status LED is on, the solar array may have been disconnected.

SERVICING your Solar Tracker III

If for any reason this equipment stops working properly, contact the manufacturer immediately at:

Energenx, Inc.
Phone:
www.energenx.com

There are **NO USER SERVICEABLE PARTS** inside your Solar Tracker III. Any attempt to open the unit, repair it yourself, or have it repaired by a third party, voids the Limited Warranty and offer of Free Service and repair by the manufacturer.

1 Year Limited Warranty on all parts and service.