

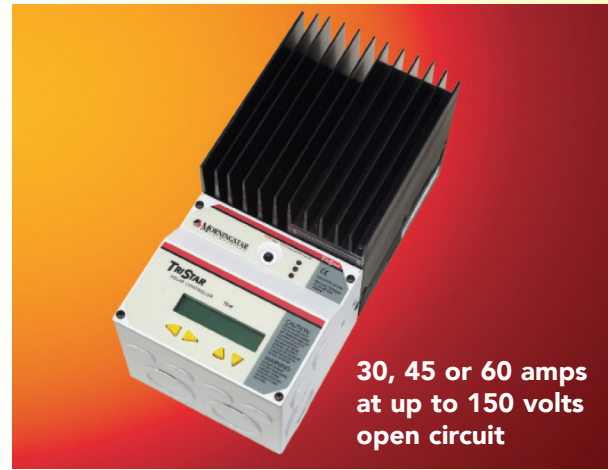


TRI STAR MPPT™

SOLAR CONTROLLER WITH MAXIMUM POWER POINT TRACKING

Morningstar's **TriStar MPPT** solar controller with TrakStar Technology™ is an advanced maximum power point tracking (MPPT) battery charger for off-grid photovoltaic (PV) systems up to 3kW. The controller provides the industry's highest peak efficiency of 99% and significantly less power loss compared to other MPPT controllers.

The TriStar MPPT features a smart tracking algorithm that maximizes the energy harvest from the PV by rapidly finding the solar array peak power point with extremely fast sweeping of the entire I-V curve. This product is the first PV controller to include on-board Ethernet for a fully web-enabled interface and includes up to 200 days of data logging.



Product shown with optional meter.

Key Features and Benefits

■ Maximizes Energy Harvest

Our TrakStar MPPT Technology features:

- Better peak power point tracking than other MPPT controllers
- Very fast sweeping of the entire I-V curve
- Recognition of multiple power points during shading or mixed PV arrays
- Excellent performance at sunrise and low solar insolation levels

■ Extremely High Reliability

- Robust thermal design and no cooling fans
- Parallel circuit design provides less stress and longer life for electronic components
- No mechanical relays
- Extensive electronic protections including PV short circuit protection
- Epoxy encapsulated inductors and conformally coated printed circuit boards

■ Very High Efficiency

- Peak efficiency of 99%
- Proprietary tracking algorithm minimizes power losses
- Low self-consumption
- Continuous operation at full power to 45°C without need to de-rate
- Selected electronic devices with higher ratings to minimize losses from heating

■ Extensive Networking and Communications Capabilities

Enables system monitoring, data logging and adjustability. Uses open standard MODBUS™ protocol and Morningstar's MS View software.

- Meterbus: communications between compatible Morningstar products
- Serial RS-232: connection to a personal computer
- EIA-485: communications between multiple devices on a bus
- Ethernet: fully web-enabled interface to a local network or internet; view from a web browser or send email/text messages.

■ Metering and Data Logging

- Optional TriStar meter and remote meter provides detailed operating data, alarms and faults
- Three LED's display system status
- Up to 200 days of data logging via meters or communications ports

System Status:

| | | |
|--------|-----|-------|
| 53.60V | 28C | 54.2A |
| 2867W | | MPPT |

Data Logging:

| | | | |
|-------|-----------|---------|-----------|
| Today | Batt | Day: -1 | Batt |
| | 46.4Vmin | | 47.2Vmin |
| Today | Solar | Day: -1 | Solar |
| | 58.9Amax | | 56.8Amax |
| Today | Solar | Day: -1 | Solar |
| | 107.2Vmax | | 105.5Vmax |

TECHNICAL SPECIFICATIONS

Electrical

| | TS-MPPT-30 | TS-MPPT-45 | TS-MPPT-60 |
|--------------------------------------|--------------------|------------|------------|
| • Maximum Battery Current | 30 amps | 45 amps | 60 amps |
| • Nominal Maximum Solar Input | 12 Volt 400 Watts | 600 Watts | 800 Watts |
| | 24 Volt 800 Watts | 1200 Watts | 1600 Watts |
| | 48 Volt 1600 Watts | 2400 Watts | 3200 Watts |

| | TS-MPPT-30, 45 and 60 |
|--|---------------------------|
| • Peak Efficiency | 99% |
| • Nominal System Voltage | 12, 24, 36 or 48 volts DC |
| • Max. Solar Open Circuit Voltage | 150 volts DC |
| • Battery Operating Voltage Range | 8-72 volts DC |
| • Maximum Self-consumption | 2.7 Watts |
| • Transient Surge Protection | 4500 Watts/port |

Electronic Protections

- **Solar:** Overload, Short Circuit, High Voltage
- **Battery:** High Voltage
- **High Temperature**
- **Lightning and Transient Surges**
- **Reverse Current at Night**

Battery Charging

- **Charging algorithm** 4-stage
- **Charging stages** Bulk, Absorption, Float, Equalize
- **Temperature Compensation**
 - Coefficient -5mV/°C/cell (25° ref)
 - Range -30°C to +80°C
 - Set points Absorption, Float, Equalize, HVD

Note: Remote Temperature Sensor is included.

Mechanical

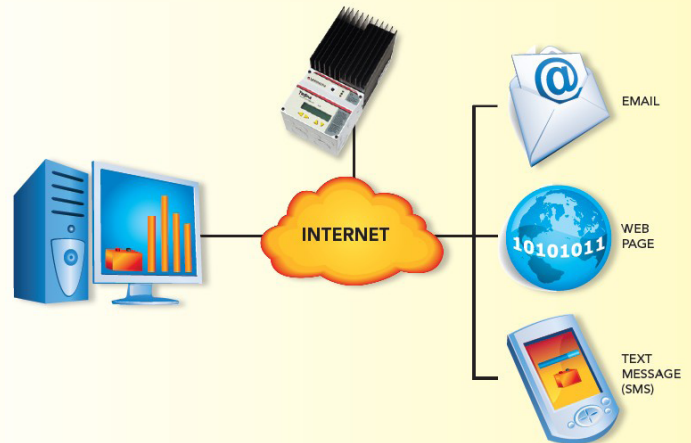
- **Dimensions** 29.1 x 13.0 x 14.2 cm
11.4 x 5.1 x 5.6 inch
- **Weight** 4.2 kg / 9.2 lbs.
- **Max. Wire Size** 35 mm² / 2 AWG
- **Conduit knockouts** M20; ½, 1, 1 ¼ inch
- **Enclosure** Type 1 (indoor and vented)
IP20

WARRANTY: Five year warranty period. Contact Morningstar or your authorized distributor for complete terms.

AUTHORIZED MORNINGSTAR DISTRIBUTOR:

Environmental

- **Ambient Temperature** -40°C to +45°C
- **Storage Temperature** -55°C to +100°C
- **Humidity** 100% non-condensing
- **Tropicalization** Epoxy encapsulation
Conformal coating
Marine rated terminals



Communication Ports

| | TS-MPPT-30 | TS-MPPT-45 | TS-MPPT-60 |
|-------------------|------------|------------|------------|
| • MeterBus | Yes | Yes | Yes |
| • RS-232 | Yes | Yes | Yes |
| • EIA-485 | No | No | Yes |
| • Ethernet | No | No | Yes |

Options

- **TriStar Meter-2 (TS-M-2)**
- **TriStar Remote Meter-2 (TS-RM-2)**
- **Meter Hub (HUB-1)**
- **Relay Driver (RD-1)**

Certifications

- **CE Compliant**
- **ETL Listed (UL1741)**
- **cETL (CSA C22.2 No. 107.1-01)**
- **FCC Class B Part 15 Compliant**
- **Complies with (NEC) U.S. National Electric Code**
- **RoHS Compliant**
- **Manufactured in a certified ISO 9001 facility**

