

TRISTAR 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.



30, 45 or 60 amps at up to 150 volts open circuit. 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
	46.4 Vmin		47.2 Vmin
Today	Solar	Day: -1	Solar
	58.9 Amax		56.8 Amax
Today	Solar	Day: -1	Solar
	107.2 Vmax		105.5 Vmax

TECHNICAL SPECIFICATIONS

Electrical

	TS-MPPT-30	TS-MPPT-45	TS-MPPT-60
• Maximum Battery Current	30 amps	45 amps	60 amps
• Nominal Maximum Operating Power*			
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
• Maximum PV 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

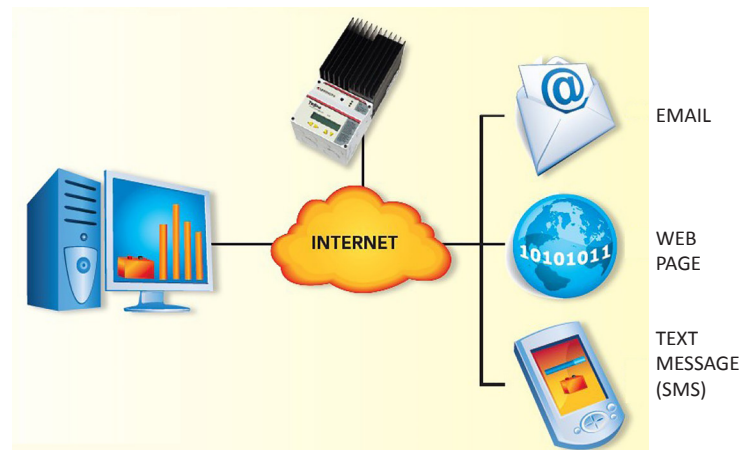
Note: Remote Temperature Sensor is included.

Mechanical

• Dimensions	29.1 x 13.0 x 14.2 cm 11.4 x 5.1 x 5.6 in
• Weight	4.2 kg / 9.2 lbs
• Maximum Wire Size	35 mm ² / 2 AWG
• Conduit knockouts	M20; ½, 1, 1 ¼ in
• Enclosure	Type 1 (indoor and vented) IP20

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 and RoHS Compliant
- ETL Listed (UL1741)
- cETL (CSA C22.2 No. 107.1-01)
- FCC Class B Part 15 Compliant
- U.S. National Electrical Code (NEC) 690.5 Compliant
- Manufactured in a certified ISO 9001 facility