MORNINGSTAR corporation

TRISTAR MPPT™

SOLAR CONTROLLER WITH MAXIMUM POWER POINT TRACKING

45 or 60 amps at up to 150 volts open circuit

Product shown with optional meter.

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.

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

TRISTAR MPPT™ *SOLAR CONTROLLER*

TRAKSTAR™
MAXIMUM POWER POINT TRACKING

TECHNICAL SPECIFICATIONS

Electrical

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

TS-MPPT-45 and TS-MPPT-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
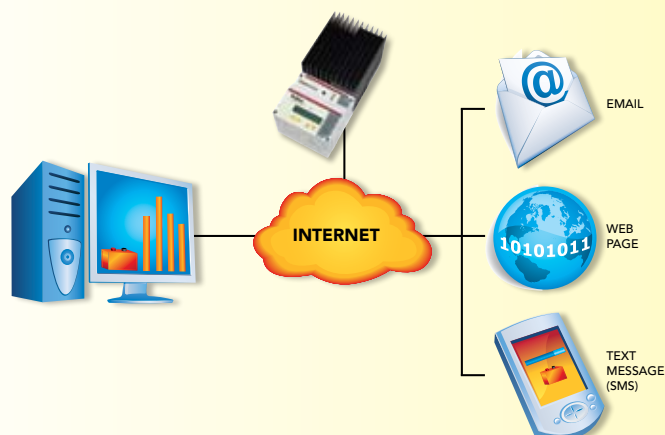 - Set points — Absorption, Float, Equalize, HVD
  - Note: Remote Temperature Sensor is included.

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

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

@ EMAIL

INTERNET

10101011 WEB PAGE

TEXT MESSAGE (SMS)

Communication Ports

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

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

AUTHORIZED MORNINGSTAR DISTRIBUTOR:

MORNINGSTAR
c o r p o r a t i o n

8 Pheasant Run
Newtown, PA 18940 USA
Tel: +1 215-321-4457   Fax: +1 215-321-4458
E-mail: info@morningstarcorp.com
Website: www.morningstarcorp.com

© 2010 MORNINGSTAR CORPORATION   PRINTED IN USA 224E-R3-9/10

CE   cETL us