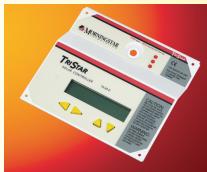


Product shown with optional meter.





# TRISTAR METER-2<sup>™</sup> TRISTAR REMOTE METER-2<sup>™</sup>

**DIGITAL DISPLAYS FOR TRISTAR CONTROLLERS** 

Morningstar's *TriStar Meter-2 (TS-M-2)* and *TriStar Remote Meter-2 (TS-RM-2)* are advanced digital meters that may be used with any TriStar<sup>™</sup> solar controller. These two meters are identical except that the TS-M-2 is mounted on the controller and the TS-RM-2 is flush mounted up to 30 meters (98.4 feet) away from the controller.

The TriStar meters are 2 x 16 character LCD's that display extensive system and controller information, logged data, bar graph metering as well as alarms and faults for easy troubleshooting. The information may be shown in English, French, German, Portuguese or Spanish languages.

In multi-controller systems the TS-M-2 and TS-RM-2 are networkable using Morningstar's MeterHub to allow individual controller data and aggregate system data to be displayed together on a single meter.

# **Key Features and Benefits**

# Easy to Install

- Uses standard 6 conductor RJ-11 connectors.
- TS-RM-2 fits a "double gang" electrical box and includes 30 meters (98.4 feet) of cable.
- Both data and meterbus power flow over a single cable.
- Network supports up to 15 devices and, optionally, more than one meter per system.

## Easy to Use

- Four directional pushbuttons for easy navigation of display screens.
- Backlighting to enhance readability.
- Meter may be added during initial controller installation, added as an upgrade anytime in the future or connected temporarily for troubleshooting and then using this same meter at other sites.

## Networking Capability

- Displays individual controller data from up to 14 TriStars with optional Morningstar Meterhubs.
- Aggregates system data to show total charge, load and battery charge/discharge state.
- Auto detects any device found on the network.

## **Technical Specifications**

## Electrical

Self consumption
 7.5 mA
 42.5 mA (backlight on)

### Mechanical

 TS-RM-2 mounting plate dimensions

• Plate material

 Meter weight TS-M-2

TS-RM-2
• Connector type

• TS-M-2 cable

• TS-RM-2 cable

• Cable temperature

0.23 kg / 0.5 lb 0.18 kg / 0.4 lb

powder coated steel

RJ-11 (6-pin)

0.13 m / 5 in - 6 conductor 30 m / 98.4 ft - 6 conductor

116 x 116 mm (4.56 x 4.56")

60°C rating

### Environmental

• Operating temperature

• LCD temp. rating

• Storage temperature

Humidity rating

Tropicalization

-40°C to +60°C

-20°C to +70°C

-55°C to +85°C

5 to 95 % (NC)

conformal coating on both sides of circuit board

#### Certifications

- CE Compliant
- RoHS Compliant
- ETL Recognized Component

#### Compatibility

• TS-45, TS-60, TS-MPPT-45, TS-MPPT-60

# DISPLAYS FOR TRISTAR METER-2™ & TRISTAR REMOTE METER-2™

| Operating Data Charge Control Control Diversion Charge Battery Voltage  V V V Reset Ah/kWh Counters V V Reset Ah/kWh Counters V V V Reset Ah/kWh Counters V V V Reset Ah/kWh Counters V V V V V V V V V V V V V V V V V V V  |
|--|
| Battery Voltage  |
| Solar Input Voltage  Charging Current  Load/Diversion Current  Load/Diversion Current  Battery Sense Voltage  V V Reset Min/Max Battery V V Load On/Off  Battery Sense Voltage  V V V Battery Min/Max Voltage  V V V Battery Sense Voltage  V V V Set Meter Display Language V V V Set Temperature Units (°C/°F) V V V Battery Temperature V V V Logged Data' Days of Daily Log Data Last 60 Days  Battery Voltage Min (Daily) V Battery Voltage Max (Daily) V Charge Ah (Daily) V Load Ah (Daily) V Battery Wh (Daily) Solar Vmax (Daily) Battery Wh (Daily) Time in Absorption (Daily) Time in Float (Daily) Time in Float (Daily) Time in Float (Daily)  Faults (Daily) V Alarms (Daily) V V V Alarms (Daily) V V V Alarms (Daily) V V V V Alarms (Daily) V V V V V V V V V V V V V V V V V V V  |
| Charging Current  Load/Diversion Current  Battery Sense Voltage  V V V C Equalize Start/Stop  Load On/Off  Battery Temperature  V V V C Reset Battery Service Reminder  V V V V C Reset Battery Service Reminder  V V V V V V C Reset Battery Service Reminder  V V V V V V V V V V V V V V V V V V V  |
| Battery Sense Voltage  |
| Battery Temperature  Battery Min/Max Voltage  Charging Watts  Load/Diversion Watts  Daily Charge Wh  Heatsink Temperature  Nominal System Voltage  Absorption Charge Voltage  Float Charge Voltage  Low Voltage Bottery Source Reminder  V  V  Set Meter Bus Address  V  Set Meter Display Language  V  V  Logged Data¹  Days of Daily Log Data  Battery Voltage Min (Daily)  V  Battery Type  Absorption Charge Voltage  Float Charge Voltage  V  Low Voltage Notage  V  Low Voltage Poltage  Low Voltage  V  Low Voltage Reconnect Value  Low Voltage Reconnect Value  Diagnostic Data  Ah Total/Since Last Reset  V  V  V  V  V  V  V  V  V  V  V  V  V   |
| Battery Min/Max Voltage  Charging Watts  Load/Diversion Watts  Daily Charge Wh  Heatsink Temperature  V  V  Logged Data¹  Days of Daily Log Data  Last 60 Days  Settings Data  Nominal System Voltage  W  Regulation Type  Absorption Charge Voltage  Float Charge Voltage  Float Charge Voltage  V  Load Ah (Daily)  Load Ah (Daily)  Float Charge Voltage  V  Low Voltage Reconnect Value  Low Voltage Reconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  V  V  V  V  V  V  V  V  V  V  V  V  V   |
| Charging Watts  Load/Diversion Watts  V  Set Meter Display Language  V  V  Set Temperature Units (°C/°F)  Logged Data¹  Days of Daily Log Data  Last 60 Days  Settings Data  Nominal System Voltage  Battery Type  Absorption Charge Voltage  Float Charge Voltage  Float Charge Voltage  V  V  V  Battery Wh (Daily)  Absorption Charge Voltage  Float Charge Voltage  V  V  Charge Ah (Daily)  Low Voltage Disconnect Value  Diagnostic Data  Ah Total/Since Last Reset  V  V  V  Alarms (Daily)  V  V  V  Alarms (Daily)  V  Total System Data (multiple controllers)   |
| Load/Diversion Watts  Daily Charge Wh  Heatsink Temperature  V V V Logged Data'  Nominal System Voltage  Battery Type  Regulation Type  Absorption Charge Voltage  Float Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  V V V Diagnostic Data  Ah Total/Since Last Reset  Ah Total/Since Last Reset  A V V V V Set Temperature Units (°C/°F)  V V V V V V V V V V V V V V V V V V V  |
| Daily Charge Wh  Heatsink Temperature  V  Logged Data¹ Days of Daily Log Data  Battery Voltage Min (Daily)  Regulation Type  Absorption Charge Voltage  Float Charge Voltage  Logged Data¹  Last 60 Days  Battery Voltage Min (Daily)  Charge Ah (Daily)  Load Ah (Daily)  Equalize Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  Float Charge Voltage  Ah Total/Since Last Reset  V  Alarms (Daily)  V  V  Alarms (Daily)  V  V  Alarms (Daily)  V  V  Alarms (Daily)  V  Total System Data (multiple controllers)   |
| Heatsink Temperature  V V V Battery Type  Battery Type  Absorption Charge Voltage  Float Charge Voltage  Logged Data'  Days of Daily Log Data  Battery Voltage Min (Daily)  Charge Ah (Daily)  Load Ah (Daily)  Battery Wh (Daily)  Battery Wh (Daily)  Charge Ah (Daily)  Solar Vmax (Daily)  Solar Vmax (Daily)  Time in Absorption (Daily)  Time in Float (Daily)  Time in Float (Daily)  Time in Float (Daily)  Time in Float (Daily)  Faults (Daily)  Faults (Daily)  Total System Data (multiple controllers)  |
| Settings Data Nominal System Voltage V V V Battery Type V Regulation Type V Absorption Charge Voltage V Float Charge Voltage V Low Voltage Disconnect Value Low Voltage Reconnect Value Charge Voltage Charge Voltage Charge Voltage Charge Voltage Charge Voltage Charge Voltage Charge Wh (Daily) Charge Ah (Dail |
| Settings Data Nominal System Voltage  Battery Voltage Min (Daily)  Battery Voltage Max (Daily)  Charge Ah (Daily)  Absorption Charge Voltage  Float Charge Voltage  Float Charge Voltage  Equalize Charge Voltage  Equalize Charge Voltage  Low Voltage Disconnect Value  Days Between Equalizations  Ah Total/Since Last Reset  W  Total System Data (multiple controllers)  Battery Voltage Min (Daily)  Charge Ah (Daily)  Load Ah (Daily)  Abattery Wh (Daily)  Solar Vmax (Daily)  Time in Float (Daily)  Time in Float (Daily)  Alarms (Daily)  Total System Data (multiple controllers)   |
| Battery Type  Regulation Type  Absorption Charge Voltage  Float Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  Ab Total/Since Last Reset  A Total/Since Last Reset  Total System Data (multiple controllers)  Battery Voltage Max (Daily)  Charge Ah (Daily)  Load Ah (Daily)  Battery Wh (Daily)  Solar Vmax (Daily)  Time in Absorption (Daily)  Time in Equalize (Daily)  Faults (Daily)  Total System Data (multiple controllers)   |
| Battery Type  Regulation Type  Absorption Charge Voltage  Float Charge Voltage  Float Charge Voltage  Float Charge Voltage  Equalize Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  Faults (Daily)  Time in Float (Daily)  Time in Float (Daily)  Time in Equalize (Daily)  Time in Equalize (Daily)  Time in Equalize (Daily)  Time in Equalize (Daily)  Faults (Daily)  Alarms (Daily)  V  Alarms (Daily)  Total System Data (multiple controllers)  |
| Regulation Type  Absorption Charge Voltage  Float Charge Voltage  Equalize Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  Diagnostic Data  Ah Total/Since Last Reset  Alarms (Daily)  Charge Ah (Daily)  Battery Wh (Daily)  Solar Vmax (Daily)  Time in Absorption (Daily)  Time in Float (Daily)  Time in Float (Daily)  V  Alarms (Daily)  Total System Data (multiple controllers)   |
| Absorption Charge Voltage  Float Charge Voltage  Equalize Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  Diagnostic Data  Ah Total/Since Last Reset  Alarms (Daily)  Load Ah (Daily)  Battery Wh (Daily)  Solar Vmax (Daily)  Time in Absorption (Daily)  Time in Float (Daily)  Time in Equalize (Daily)  Faults (Daily)  Alarms (Daily)  V  Total System Data (multiple controllers)   |
| Float Charge Voltage  Equalize Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  Diagnostic Data  Ah Total/Since Last Reset  Alarms (Daily)  Battery Wh (Daily)  Time in Absorption (Daily)  Time in Float (Daily)  Time in Equalize (Daily)  Faults (Daily)  Alarms (Daily)  V  Total System Data (multiple controllers)   |
| Equalize Charge Voltage  Low Voltage Disconnect Value  Low Voltage Reconnect Value  Time in Absorption (Daily)  Time in Float (Daily)  Time in Equalize (Daily)  Diagnostic Data  Ah Total/Since Last Reset  Alarms (Daily)  Total System Data (multiple controllers)  |
| Low Voltage Disconnect Value  Low Voltage Reconnect Value  Days Between Equalizations  Time in Float (Daily)  Time in Float (Daily)  Time in Equalize (Daily)  Faults (Daily)  V  Ah Total/Since Last Reset  Alarms (Daily)  Total System Data (multiple controllers)  |
| Low Voltage Reconnect Value  Days Between Equalizations  Time in Float (Daily)  Time in Equalize (Daily)  Time in Equalize (Daily)  Faults (Daily)  Ah Total/Since Last Reset  Alarms (Daily)  Wh Total/Since Last Reset  Total System Data (multiple controllers)   |
| Days Between Equalizations  Time in Float (Daily)  Time in Equalize (Daily)  Faults (Daily)  Faults (Daily)  Ah Total/Since Last Reset  Alarms (Daily)  Total System Data (multiple controllers)   |
| Diagnostic Data  Ah Total/Since Last Reset  W  Alarms (Daily)  Alarms (Daily)  Total System Data (multiple controllers)  |
| Ah Total/Since Last Reset  Alarms (Daily)  KWh Total/Since Last Reset  Total System Data (multiple controllers)  |
| kWh Total/Since Last Reset  Total System Data (multiple controllers)   |
| Total System Data (multiple controllers)   |
| Charge Current   |
| Load State Load Current  |
| Fault List   |
| Alarm List   |
| Days Since Last Equalization   Charging Nation  Charging Ah  |
| Days Since Last Battery Service   Charging Wh  Charging Wh   |
| Cumulative Hours of Service    Load Watts  |
| Controller Version V V V Load Ah   |
| Meter Version  |
| Mode of Operation  |

 $<sup>^{1}</sup>$ Logged data available on TriStars with software v13 or later.

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

**AUTHORIZED MORNINGSTAR DISTRIBUTOR:** 



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