



# TP-SC48-60-MPPT

## DATA SHEET

### MPPT Solar Charge Controller

#### Features

- MPPT Temperature Compensated Charging
- Fully Automatic Operation
- LCD Displays: Battery Volts, Battery Temp, Battery Level, Load Current and Solar Current
- Autoranging 12/24/36/48V Battery Arrays
- Multimode Load Operation – 5 selectable modes
- Soft Start Load Output to Power High Capacitive Loads
- Automatic 30day Battery Equalization
- Conformal Coated Electronics for Environmental Protection
- TVS lightning protection, Industrial Temperature Range
- Low self consumption <1W

#### Applications

- Remote Power Systems
- Solar Lighting
- Solar Power Applications

#### Description

The Tycon Solar™ TP-SC48-60-MPPT solar controllers are MPPT (Maximum Power Point Tracking) temperature compensated battery charging controllers. The 9ft battery temperature probe cable is included. The controllers are auto-ranging to accommodate 12V, 24V, 36V and 48V battery systems. There is a separate battery voltage input so that the controller can get very accurate readings of battery voltage. This removes voltage fluctuations seen because of large currents going through the battery cables.

They are designed to charge Flooded, AGM, GEL or Lithium batteries. They also have a USER setting for customizable battery charge settings. They have an integral LCD display that shows Battery Voltage, Battery Capacity, Charging Capacity, Battery Temperature, Load Current and Solar Current.

There is an RS232 interface to connect to the Tycon #TP-SC-BT1 Bluetooth adapter (not included). Using this configuration and the available Android or IOS mobile app, the solar controller can be monitored and controlled from a distance. There is also an RS485 port which allows sync of multiple controllers connected in parallel. A 36in RS485 interface cable is included.

They have multiple load operating modes which can be set through the buttons on the controller.

The load output has a soft start feature so it can smoothly and reliably power up high capacitance loads up to 20A. There is a convenient On/Off button to disconnect load power when the unit is operated in the default mode (15).

They have full electronic protections for short circuit, reverse current, over-power, over-voltage, over-charge, over-discharge and over-temperature. The built-in over-discharge protection and low self consumption ensures the battery is not over-discharged, which greatly



Load mode	Mode characters	Description
Standard light control mode	Light+On	The solar panel voltage is lower than the light control on voltage, and after a preset time delay , the controller will switch on the load; The solar panel voltage is higher than the light control off voltage, and after a preset time delay , the controller will switch off the load.
Light control + time control mode 1 to 14H	Light+01H ... Light+14H	The solar panel voltage is lower than the light control on voltage, and after a time delay, the controller will switch on the load. From this point on, the load will work for a preset period of time (1 to 14 hours) before being switched off.
Manual mode	Manual	In this mode, whether it's day or night, users can press and hold the "▶" key to switch on or off the load; this mode is often used in some special occasions or during commissioning. This is default setting.
Debugging mode	Debug	As long as the solar panel voltage is lower than the light control on voltage, the controller will immediately switch on the load; As soon as the solar panel voltage gets higher than the light control off voltage, the controller will immediately switch off the load. This mode is usually used during system installation and commissioning.
Normal on mode	Normal On	This mode is suitable for applications requiring 24-hour operation, and after being switched on, the load keeps outputting in this mode.

increases the life of the batteries. All protections are auto-recovery.

The units are protected against lightning strikes with TVS diode protection. They operate over a wide industrial temperature range. Electronics are conformal coated for environmental protection.

An automatic battery equalization charge automatically engages once every 30days (Programmable). The equalization charge helps to balance the batteries in an array and reduce the possibility of battery sulfation.

Connections are via 6 screw terminals for wire size up to 7AWG. The controllers are internally fused for protection, but we recommend always using an external 60A fuse between the controller and the battery. There are four screw holes for wall mounting. In addition, there are two DIN Rail brackets for DIN Rail mounting included.

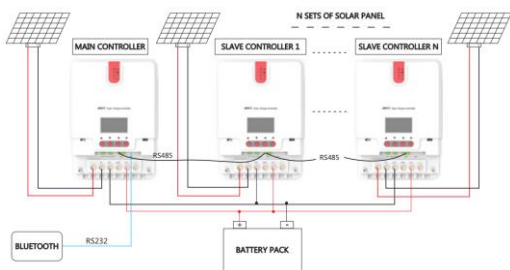
## Specifications

TP-SC48-60-MPPT	
<b>Rated Battery Voltage</b>	12/24/36/48V (Auto-Detect), 70V Max
<b>Rated Solar Current</b>	60A Max
<b>Max Solar Panel Size</b>	12V Battery = 800W 24V Battery = 1600W 36V Battery = 2400W 48V Battery = 3200W
<b>Rated Load Current</b>	20A Max
<b>Maximum Capacitive Load</b>	10,000uF
<b>Max Solar Input Voltage</b>	150V (25C) ; 145V (-25C)
<b>Max Power Point Range</b>	+2VDC to 120VDC Battery Volts
<b>Conversion Efficiency</b>	98% Typ
<b>MPPT Tracking Efficiency</b>	>99%
<b>Communication Port</b>	RS232 (for TP-SC-BT1 only) RS485 (for controller sync)
<b>Self-Consumption</b>	< 1W
<b>Temperature Compensation</b>	-3.0mV/°C/Cell
<b>Max Wire Size</b>	7 AWG
<b>Voltage / Current Accuracy</b>	+/-2%
<b>Environmental Protection</b>	IP32
<b>Certifications</b>	CE, RoHS
<b>Operating Temp</b>	-35°C to 55°C (-31°F to 131°F)
<b>Dimensions</b>	285x205x93mm (11x8x3.7")
<b>Weight</b>	3.6Kg (8lb)
<b>Warranty</b>	3 years

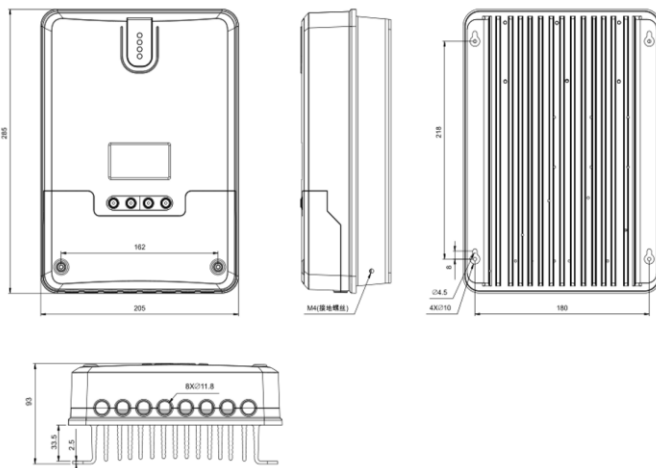
## Battery Charging Parameters (12V)

(for 24V x 2, for 36V x 3, for 48V x 4)

Voltage to set Battery type	Sealed lead-acid battery (SLD)	Gel lead-acid battery (GEL)	Open lead-acid battery (FLD)	Li battery (LI)	User (USE) (self-customized)
Over-voltage cut-off voltage	16.0V	16.0V	16.0V	—	9 to 17V
Equalizing voltage	14.6V	—	14.8V	—	9 to 17V
Boost voltage	14.4V	14.2V	14.6V	14.4V	9 to 17V
Floating charging voltage	13.8V	13.8V	13.8V	—	9 to 17V
Boost return voltage	13.2V	13.2V	13.2V	—	9 to 17V
Low-voltage cut-off return voltage	12.6V	12.6V	12.6V	12.6V	9 to 17V
Under-voltage warning voltage	12.0V	12.0V	12.0V	—	9 to 17V
Low-voltage cut-off voltage	11.1V	11.1V	11.1V	11.1V	9 to 17V
Discharging limit voltage	10.6V	10.6V	10.6V	—	9 to 17V
Over-discharge time delay	5s	5s	5s	—	1 to 30s
Equalizing charging duration	120 minutes	—	120 minutes	—	0 to 600 minutes
Equalizing charging interval	30 days	0 days	30 days	—	0 to 250D (0 means the equalizing charging function is disabled)
Boost charging duration	120 minutes	120 minutes	120 minutes	—	10 to 600 minutes



Parallel Controller Operation



## System Ordering:

**TP-SC48-60-MPPT** 12/24/36/48V 60A MPPT Temperature Compensated Solar Charge Controller

For further information contact:

[Tyconsystems.com](http://Tyconsystems.com)

