

# User Manual of MPPT Solar Charge Controller

50A/60A

Maximum PV Voltage (Voc): DC150V



**Important safety instructions (Please keep this handbook for future reference. Please read all instructions and precautions in the manual carefully before installation.)**

This manual contains all the safety, installation and operation instructions of this series solar charge controller (hereinafter referred to as "controller"):

- Install the controller in a well ventilated place. The controller's case temperature may be very high during operation. Please don't touch the metal shell directly to prevent burns.
- It is recommended to connect fuse or circuit breakers to the input, load and battery terminals to prevent electric shock hazard during use.
- After installation, check all wiring connections are secure, so as to avoid the danger of heat build-up caused by virtual connection.
- If the controller does not display properly when first use, please cut off the fuse or circuit breaker immediately and check whether the wiring connection is correct or not.
- If the solar system needs to connect the inverter, please connect the inverter directly to the battery, instead of the load terminal of the controller.
- Don't disconnect the battery when the controller is charging. Otherwise, it may damage the DC load.

## Operation fault codes description

Code	Description	Code	Description	Code	Description
001	Battery over-voltage	010	Battery over-temperature	100	Trigger over-voltage protection
002	PV over-voltage	020	Internal over-temperature	200	Command mode
004	Overcharging	040	PV under-voltage	400	Battery system unrecognized
008	Over-discharging	080	Battery under-voltage		

Table 1

## System Voltage and Battery Types

1)The controller identifies the system voltage according to the battery voltage at start-up. And the controller will re-identify the system voltage after power-off and restart. Please confirm the system voltage displayed in controller is consistent with the actual voltage. Otherwise, need to recheck the battery pack voltage.

**Note:** Please refer to Table 9 for the battery system detailed system identification voltage.

2)The controller has set 3 kinds of conventional battery charging parameters (Table 2). To charge other types of batteries, please select "USE", then set up by PC software or APP. The controller can identify 12V/24V/36V/48V ONLY.

Battery type	Constant voltage = C * N (V)	Floating voltage = F * N (V)	1. C = Constant charging parameter. (9 ≤ F < C ≤ 15) 2. F = Floating charging parameter. (9 ≤ F < C ≤ 15) 3. N = Series number of battery. (1 ≤ N ≤ 4) [e.g. N=2, battery system is 24V] 4. Example: If battery system is 48V, then N=4; If battery pack's saturation voltage is 58.4V, then C=58.4/N=14.6V.
Flooded (FLD)	14.6 * N	13.8 * N	
Sealed (SEL)	14.4 * N	13.8 * N	
Gel (GEL)	14.2 * N	13.8 * N	
User (USE)	C * N	F * N	

Table 2 (The MPPT controller can not wake up lithium ion battery.)

## Strip Indicator Instruction

The controller panel has bar indicator light, user can judge the controller current working status according to the color and flash rule of the light. (Yellow - PV input, Red - Fault, Blue - Charging, Green - DC load)

Strip Indicator Light	Controller Status
Only Yellow flashing	PV input under-voltage, DC load closed
Only Red flashing	Fault mode, DC load closed
Interval flashing between Yellow and Green	PV input under-voltage, DC load turn on
Interval flashing between Red and Green	Fault mode, DC load turn on
Only Blue flashing	Charging mode, DC load closed
Interval flashing between Blue and Green	Charging mode, DC load turn on

Table 3

## 1. Characteristics

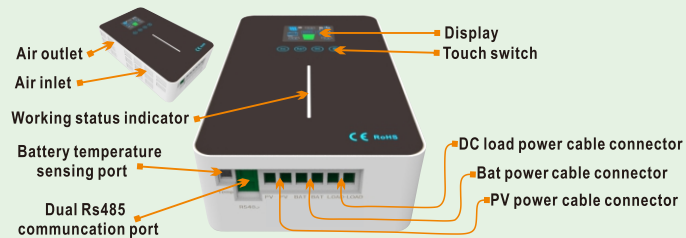


Figure 1

Please keep this handbook in case of need  
(Revision date: 201901)

## 2. Product List

Product	Description	Quantity
Installation accessories package	MPPT controller	1 unit
	Mounting backboard	1 pcs
	Temperature sensing cable	1 pcs
	M4 screws (for mounting backboard)	4 pcs
Information pack	plastic expansion particles	4 pcs
	User manual	1 pcs
Optional	Screwdriver	1 pcs
	RS485-USB cable	1 pcs
	External WIFI communication module	1 unit

Table 4 (If there are any parts missing, please contact dealer.)

## 3. Installation Instructions. (Please refer to the illustration at the end of the manual)

### 4. Serial connection(string) of PV modules

The Table 5 is the number(N) of PV modules in series, for reference only.

System Voltage	Voc * N = PV <sub>input</sub> < DC150V											
	Voc<23V		Voc<31V		Voc<34V		Voc<38V		Voc<46V		Voc<62V	
	Max.	Best	Max.	Best	Max.	Best	Max.	Best	Max.	Best	Max.	Best
12V	6	2	4	1	4	1	3	1	3	1	2	1
24V	6	3	4	2	4	2	3	2	3	2	2	1
36V	6	4	4	3	4	3	3	3	3	2	2	1
48V	6	5	4	4	4	3	3	3	3	2	2	2

Table 5

## 5. DC Load Output Voltage and Max. Discharge Current

The controller has DC LOAD output function, and its output voltage range is the same as battery pack. For example, if the battery's voltage is 48.6V, the instant DC output voltage is 48.6V, too. It can continue power supply in rated DC load current. When the load current is greater than the rated value and less than 120% of the rated value, the DC load will be disconnected in about 5 minutes. When the DC load current is greater than 120% of rated value, the DC load will be disconnected immediately.

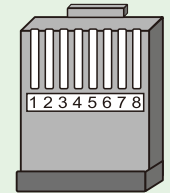
## 6. Communication port description

The communication port of the controller is compatible with RS485-USB communication cable for real-time monitoring by PC software and Wi-Fi module to have remote cloud monitoring by APP.

The communication port is a standard 8 pin RJ45 interface, and the pins are defined as follows (Table 6):

PIN	Function
1	RS485-A
2	RS485-B
3	Dry contact
4	Dry contact
5	GND
6	GND
7	+5V(Non-Isolated)
8	+5V(Non-Isolated)

Table 6



(Figure 2)

(Note: The pin definition is applicable to our related products ONLY!)

When the Load output is off due to the triggering protection mechanism, the dry contact output interface is ON (low impedance). Otherwise, it is OFF (high impedance).

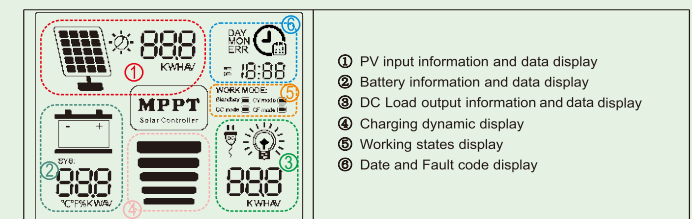
The controller has dual RS485 communication ports. It can be used for parallel connection.

If need to monitor multiple controllers centrally, please set the device address order (1-254) of the controllers accordingly. For example, 5 controllers in parallel connection and monitor centrally, set controllers' address order as 1, 2, 3, 4, 5.

If want to monitor the multiple controllers in Master-Slave communication, set the host device address to 255. For example, 5 controllers in parallel connection, just need to set the MASTER controller address order as 255.

## 7. Operation

### 7.1 LCD display area description



- ① PV input information and data display
- ② Battery information and data display
- ③ DC Load output information and data display
- ④ Charging dynamic display
- ⑤ Working states display
- ⑥ Date and Fault code display

7.2 Button Operation: (Fourbuttons: PV/select . BAT/up, DC/down . S) (Table 7)

Original State (State 1)	Function	Description
Original State (State 1)	PV/select	Touch to <b>read</b> the information of <b>PV Voltage / PV Current / PV Power</b>
	BAT/up	Touch to <b>read</b> the information of <b>BAT Voltage / Charging Current / Charging Power</b>
	DC/down	Touch to <b>read</b> the information of <b>Load Voltage / Load Current / Load Power</b>
	S	Touch to jump to the next state (State 2)
State 2	PV/select	Touch to <b>read</b> the information of <b>Daily / Monthly Power Generation</b>
	BAT/up	Touch to <b>read</b> the information of <b>System Voltage / Battery Percentage</b>
	DC/down	Touch to <b>read</b> the information of <b>Daily / Monthly Electricity Consumption</b>
	S	Touch to jump to the next state (State 3)
State 3	PV/select	Touch to <b>set</b> Battery Type / Temperature Display Unit / Device Address
	BAT/up	Touch to <b>select</b> in sequence or increase the flashing parameter
	DC/down	Touch to <b>select</b> in backward sequence or reduce the flashing parameter
	S	Touch to jump to the next state (State 4)
State 4	PV/select	Touch to jump to original state (State 1)
	BAT/up	Touch to <b>select</b> Load output modes in sequence
	DC/down	Touch to <b>select</b> Load output mode in backward sequence
	S	Touch to jump to original state (State 1)

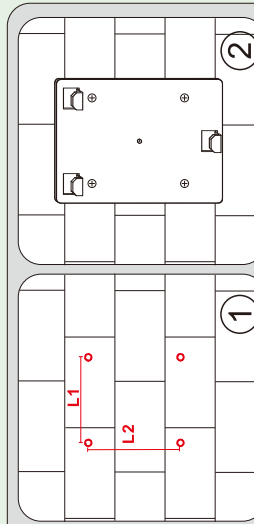
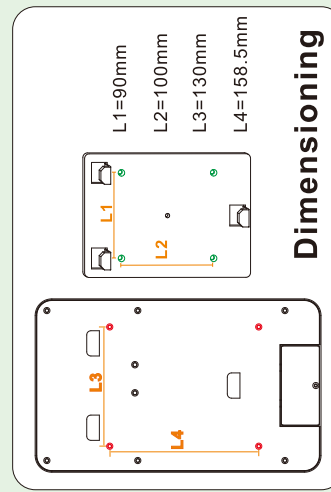
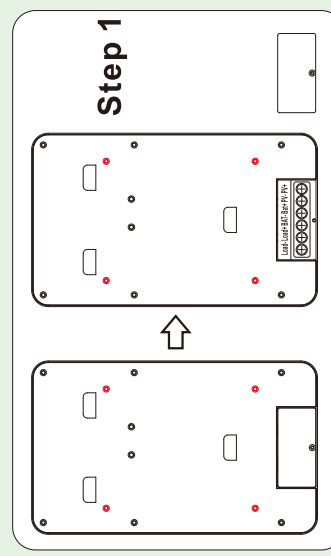
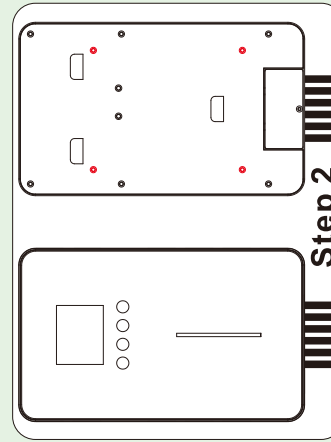
Note: In order to avoid failures and damages, please reset parameters when the controller stops charging.

8. Common fault and trouble shooting. (Table 8)

Common Problems	Possible Reasons	Solution
Controller cannot start up, screen can not be on	Battery positive and negative reverse connected	Check the wiring sequence of power line connector plug and reconnect in the right order
Controller not charging, PV voltage undetectable	PV Input positive and negative reverse connected	Check the wiring sequence of power line connector plug and reconnect in the right order
Charging and standby keeps circulating	Number of solar panels is too less in series and PV voltage is low It may occur in cloudy weather or in early morning and at dusk	PV Vmpp voltage must be greater than Vbat. Please refer to the proposed series-parallel scheme (Table 5) Normal phenomenon
	Unreasonable configuration of solar panels	Based on sufficient power, please refer to the proposed series-parallel scheme (Table 5)
Controller is on and PV voltage is normal, but not charging	The controller can not recognize battery system voltage (The "System" in LCD flashes)	Check whether battery voltage in LCD is in the range of controller system recognition
The battery is in a low energy state or emptying for a long time	Solar panels number are too less to generate enough energy	Increase solar panels quantity
	Battery capacity is too small to Store enough energy	Increase battery capacity

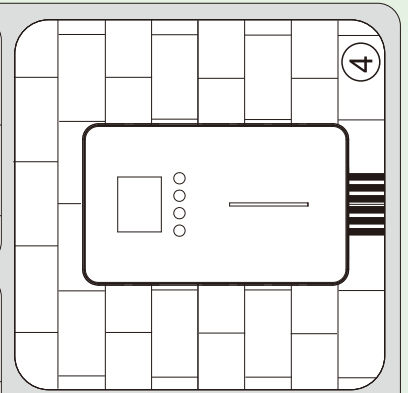
9. Parameters

Series		50A	60A	
Product category	MPPT efficiency	≥ 99.5%		
	Standby power	0.5W-1.2W		
	Heat-dissipating method	Fan-Cooling		
	System recognition voltage range	12V system	DC9V-DC15V	
		24V system	DC18V-DC30V	
36V system		DC32V-DC40V		
48V system		DC42V-DC60V		
Input Characteristics	Max. PV input voltage(Voc)	DC150V		
	Start the charge voltage point	Battery voltage + 3V		
	Low input voltage protection point	Battery voltage + 2V		
	Over voltage protection / Recovery point	DC150V / DC145V		
	Rated PV Power	12V system	650W	780W
		24V system	1300W	1560W
		36V system	1950W	2340W
48V system		2600W	3120W	
Charge Characteristics	Selectable battery types(Default Gel battery)	Sealed(SEL), Gel(GEL), Flooded(FLD), User-defined(USE)		
	Charge rated current	50A	60A	
	Temperature compensation	-3mV/°C/2V (default)		
	Charge method	3-Stage: constant current(fast charging)-constant voltage-floating charge		
	Output voltage stability accuracy	±0.2V		
LOAD Characteristics	Load voltage	Same as battery voltage.		
	Load rated current	30A		
	Load control mode	On/Off mode, PV voltage control mode, Dual-time control mode, PV + Time control mode		
	Low voltage protection	10.5V (default), 11V (restored), settable		
Display & Communication	Setup mode	PC software / APP / Controller		
	Display mode	High-definition LCD segment code backlight display		
Other Parameters	Communication mode	Dual RJ45 port / RS485 / support PC software monitoring / support WiFi module for APP cloud monitoring / support centralized parallel monitoring		
	Protect function	Input-output over / under voltage protection, Prevention of connection reverse protection, temperature protection, battery shedding protection etc.		
	Operating ambient temperature	-20°C ~ +50°C		
	Storage temperature	-40°C ~ +75°C		
	IP(Ingress protection)	IP21		
	Altitude	0-3000m		
	Max. Connection size	28mm <sup>2</sup>		
	Recommended breaker	≥100A		
	Net weight (kg) / Gross weight (kg)	2.15/3.05		
	Product size(mm)/ Packing size(mm)	305*185*72/412*271*146		



**Second Installation Method:**  
This is suitable for thick wall installation.  
① Drill four φ6mm holes on the wall according to the size of L1/L2 and insert plastic expansion particles.  
② Align the holes of mounting backboard to the holes in the wall, fix it with M4 screws.

**First Installation Method:**  
This is suitable for thin wall installation. Drill four φ4mm holes on the wall according to the size of L3/L4, and then fix the controller with four suitable length of M4 screws from the back of the wall.



③ Make sure that the controller which connected with the cable in step 2 is aligned with the hanging board on the wall, and then the controller is fixed on the hanging board.  
④ Ensure that the fixing between the controller and the hanging plate is firm.

