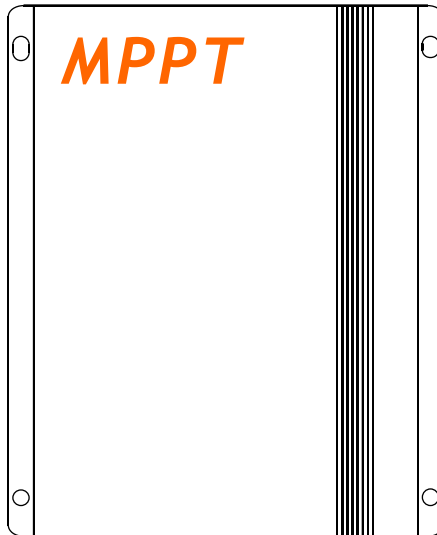


Smart-MPPT series MPPT Solar charge controller 12/24V, 10/15A, 130/200/400W



User Manual

Solar charge controller Smart-MPPT series User Manual

Dear Clients,

Thanks for selecting the **Smart-MPPT** series solar controller. Please take the time to read this user manual, this will help you to take advantage of controller's new features.

This manual gives important recommendations for installing, programming, using and so on. Read it carefully in your own interest please.

1.Description of Function

Smart-MPPT series intelligent MPPT solar controller is programmable and especially for solar light system. The charging efficiency is about 20% higher than the traditional PWM controller, which can make the cost of the whole system much lower.

It comes with a number of outstanding features, such as:

- Innovative Max Power Point Tracking(MPPT) technology, tracking efficiency >99.9%
- Full digital technology, high charge conversion efficiency up to 97%
- 12/24V system voltage automatic recognition
- 5 stages time can be adjusted
- Can read parameters and running status
- AGM, Liquid and GEL battery for selection
- External temperature sensor, automatic temperature compensation
- Four stages charge way: MPPT, boost, equalization, float
- Day/Night threshold can adjust automatically
- Remote Unit to configure, with LCD display
- IP67, Strong and durable aluminum case
- Full automatic electronic protect function

2.Safety Instruction and Waiver of Liability

2.1 Safety

①The solar charge controller may only be used in PV systems in accordance with this user manual and the specs of other module manufacturers. No energy source other than solar gen. may be connected to the solar charge controller.

②Batteries store a large amount of energy, never short circuit a bat. under all circumstances. We strongly recommend connecting a fuse directly to the battery to protect any short circuit at the bat. wiring.

③Batteries can produce flammable gases. Avoid making sparks, fire or any naked flame. Make sure that the bat. room is ventilated.

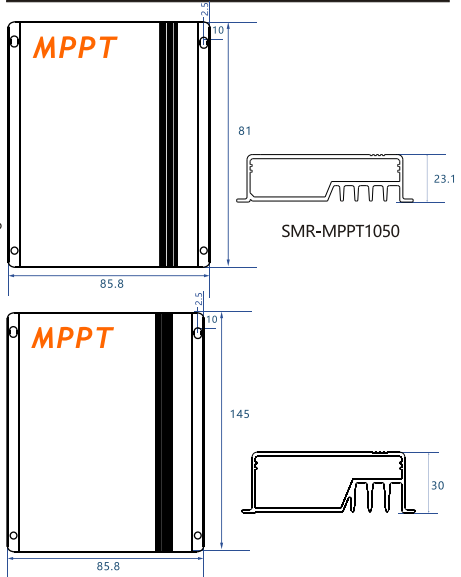
④Avoid touching or short circuiting wires or terminals. Be aware that the voltages on special terminals or wires can be as much as twice the battery voltage. Use isolated tools, stand on dry ground, and keep your hands dry.

⑤Keep children away from batteries and the charge controller.

2.2 Liability Exclusion

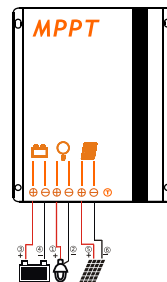
The manufacturer shall not be liable for damages, especially on the battery, caused by use other than as intended or as mentioned in this manual or if the recommendations of the battery manufacturer are neglected. The manufacturer shall not be liable if there has been service or repair carried out by any unauthorized person, unusual use, wrong

3.Dimensions



4.Installation

The following diagrams provide an overview of the connections and the proper order



1.As the chart, connect the load with the corresponding red(positive) and black(negative) cables firstly, then seal them with tape.

2.Connect battery with the corresponding red(positive) and black(negative) cables, Load will be on.

3.Connect panel with the corresponding red(positive) and black(negative) cables, the controller begins charging.

4.Confirm the LED display status, please refer to the **9.2Faults and Alarms** to identify the reason.


■ Make sure the wire length between battery and controller is as short as possible.

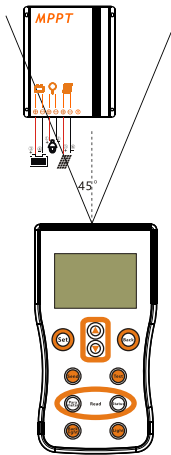
■ Recommended mini. Wire size: 2.5mm².

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5.Remote control, Default setting

When Smart-MPPT series controller is connected to the system, you can set the controller with S-Unit infrared remote controller, as showed below! Detailed setting operations, please read S-Unit User Manual.


 **Remark:** Be sure to set only one Smart-MPPT unit at a time.



5.1 Read the parameters

Press the "Parameter" key of the S-Unit to read the setting parameters of the controller.

Num	Name	Factory Default
1	Time1	24H
2	Dim1	100%
3	Time2	0H
4	Dim2	100%
5	Time3	0H
6	Dim3	100%
7	Time4	0H
8	Dim4	100%
9	Time5	0H
10	Dim5	100%
11	D/N Thr	8.0V
12	D/N Dly	0min
13	Load I	0.3A
14	Dim Auto	No
15	Battery	GEL
16	LVD	11.0V
17	LVR	12.0V

-  1.Dimming function, if you set 0%, the load will be off, otherwise the load will be on.
2.The setting data of "Load I" and "Dim Auto" is for "DC" series with LED driver built-in, does not work in this type controller.

5.2Read the running status

Press the "Status" key of the S-Unit to read the running status of the controller.

Num	Name	Name describe	Unit
	Status:	Charge	
1	Batt V	Battery voltage	V
2	Load I	Load current	A
3	Load V	Load voltage	V
4	PV V	PV voltage	V
5	PV I	PV current	A
6	Energy	Total generating capacity	AH
7	OD Times	Over discharge times	Times
8	FC Times	Fully charge times	Times
9	Day1-HV	A day ago highest voltage	V
10	Day1-LV	A day ago lowest voltage	V
11	Day2-HV	Two days ago highest voltage	V
12	Day2-LV	Two days ago lowest voltage	V
13	Day3-HV	Three days ago highest voltage	V
14	Day3-LV	Three days ago lowest voltage	V

5.3 Test function(Streetlight mode)

Press the "Test" key of S-Unit, the controller will turn on load for 30s. During daytime, the testing function can help users to verify correct installation or for system trouble shooting. 30s later the load will automatically turn off.

Note: Default "24H" mode, the test key is invalid.

6.Starting up the controller

6.1 Self Test

As soon as the controller is powered, it starts a self test routine. Then the display changes to normal operation.

6.2 System Voltage

The controller adjusts itself automatically to 12V or 24V system voltage. As soon as the battery start-up voltage is within 10V to 15V, the controller implies a 12V system, else if the battery voltage is within 20V to 30V, the controller implies a 24V system.

If the battery voltage is not within the normal operating rang(ca.10 to 15V or ca.20 to 30V) at start-up, please refer to 9.2Faults & Alarms.

Note: SMR-MPPT1050 is only suitable for 12V system.

6.3 Battery Type

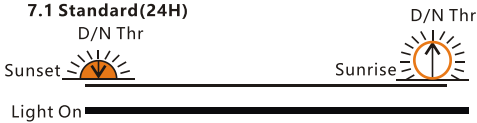
The controller applies to AGM, Liquid and Gel battery, the factory default setting is suitable for Gel battery.

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7. Output Function

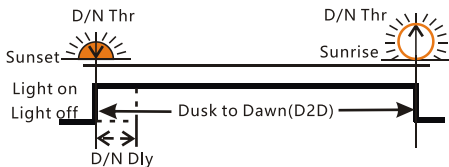
Smart-MPPT series controller with advanced light control function. The modes of lighting can be based on customer needs.

7.1 Standard(24H)



If "Time1" is set to "24H" and sent to the controller successfully, the controller's load will always be open.

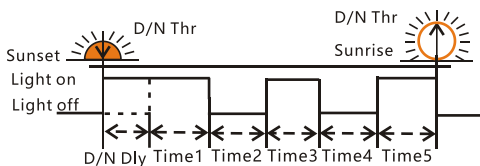
7.2 Dusk to Dawn (D2D)



If "Time1" is set to "D2D", the controller works in dusk to dawn mode.

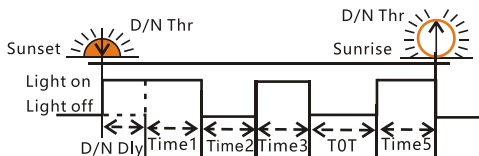
- 1. Smart-MPPT series controller is set to D2D mode, the corresponding dimming setting is still valid.
- 2. If "Time1" is set to D2D mode, "Time4" can not be set to TOT mode.

7.3 Five-stage Night Mode



You can set the Time 1-5 and Dim 1-5 with S-Unit.

7.4 TOT mode(can set the load on time before morning coming)



If "Time4" of the S-Unit is set to "TOT", this mode is TOT mode.

* If "Time4" is set to TOT mode, "Time1" can not set to D2D mode.

8.LVD, LVR, Threshold

8.1Low Voltage Disconnect

8.1.1 Battery capacity control

SOC1: 11.0~11.6V/22.0~23.2 V
SOC2: 11.1~11.7V/22.2~23.4 V
SOC3: 11.2~11.8V/22.4~23.6 V
SOC4: 11.4~11.9V/22.8~23.8 V
SOC5: 11.6~12.0V/23.2~24.0 V

8.1.2 Battery voltage control

Low Voltage Disconnect(LVD): 10.8~11.8V/21.6~23.6V.

8.2Low Voltage Reconnect(LVR)

Low voltage reconnect: 11.4~12.8V/22.4~25.6V.

If the controller goes into low voltage disconnect, it will restore only when the battery being recharged to the recovery voltage.

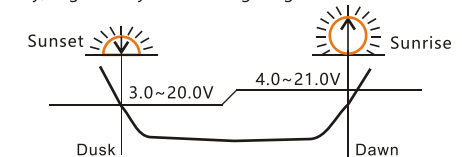
8.3 Day/Night Threshold, Day/Night Delay

The controller recognizes day and night based on the solar array open circuit voltage. This day/night threshold can be modified according to local light conditions and the solar array used.

Day/Night threshold setting range: 3.0~20.0V.

In the evening, when the solar array open circuit voltage reaches the setting day/night threshold, you can adjust the day/night delay time to make the load turn on a little later.

Day/Night delay time setting range: 0~30min.

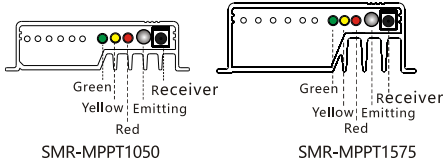


1. Day/Night threshold voltage of load disconnect is 1V higher than the setting data, means the load will disconnect when the solar voltage at 4.0~21.0V.

2. The controller has an automatic day/night threshold adjustment function. If the lowest voltage of solar array is higher than the setting day/night threshold, the load has no output in first night, 24 hours later the controller can automatically adjust the day/night threshold to meet the requirements of lighting at night.

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9.LED indications and Faults & Alarms



9.1LED Display Explanation

LED	Status	Function
Green LED	On	Solar panel is correctly connected, but not charged
	Fast flash(0.1/0.1s)	MPPT charging
	Flash(0.5s/0.5s)	Equal or Boost Charging
	Slow flash(0.5/2s)	Float Charging
Yellow LED	Off	Over voltage protection
	On	Battery is normal
	Slow flash(0.5/2s)	Battery voltage is low
Red LED	Fast flash(0.1/0.1s)	Low voltage protection
	Off	Work normal
	On	The output power is 0.
	Flash(0.5s/0.5s)	Over temperature
Red LED	Fast flash(0.1/0.1s)	Short circuit or Over current protection *

Detailed fault information can be read by S-Unit remote controller.

9.2Faults & Alarms

Fault	Status	Reason	Remedy
Loads are not powered	Low volt. protection	Battery capacity is low	Load will be reconnected when battery is recharged
	Overcurrent, short circuit protection	Loads are over current or short circuit	Switch off all loads, remove short circuit, load will be reconnected after 1 minute automatically
	Over temp. protection	Controller temp. is too high	Load reconnects after temp. reduces
High voltage at battery terminal	Over voltage protection	High battery voltage >15.5/31.0V	Check if other sources overcharge the battery. If not, controller is damaged.
		Battery wires or battery fuse damaged, battery has high resistance.	Check battery wires, fuse and battery.
Can't recognize system voltage	All LED fast flashing	Battery voltage is not in right range	Charge or discharge, make battery voltage in the right range
Battery is empty after a short time	Low voltage protection	Battery has low capacity	Change battery
Battery can't be charged	Green LED is on	PV panel fault or reverse connection	Check panels and connection wires

10.Safety Features

	Solar terminal	Battery terminal	Load terminal
Reverse polarity	Protected *1	Protected	Protected *1
Short circuit	Protected	Protected *2	Switches off immediately
Over current	—	—	Switches off with delay
Reverse Current	Protected	—	—
Over voltage	Max.55V *3	Max. 35V *4	—
Under voltage	—	—	Switches off
Over temp.	The controller cuts off the load if the temperature reaches the set value.		

*1.Controller can protect itself, but loads might be damaged.

*2.Battery must be protected by fuse, otherwise battery will be damaged.

*3.Please refer to "11.Technical Data" to get the max voltage of PV panel.

*4. Please refer to "11.Technical Data" to get the max voltage of battery.



Warning: The combination of different error conditions may cause damage to the controller. Always remove the error before you continue connecting the controller.

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11. Technical Data

	Item	SMR-MPPT1050	SMR-MPPT1575
Battery Parameters	System Voltage	12V	12V/24V automatical recognition
	Max Charging Current	10A	15A
	MPPT Charging Voltage	<14.5V@25°C	<14.5/29V@25°C
	Boost Voltage	14.5 @25°C	14.5/29V @25°C
	Equalization Voltage	14.8 @25°C (Liquid)	14.8/29.6V @25°C (Liquid)
	Float Voltage	13.7 @25°C	13.7/27.4V @25°C
	Low Volt. Disconnect	10.8~11.8V,SOC1~5	10.8~11.8V/21.6~23.6V; SOC1~5 (Programmable)
	Reconnect Voltage	11.4~12.8V	11.4~12.8V/22.8~25.6V (Programmable)
	Overcharge Protect	15.5V	15.5/31.0V
	Max volt on Bat. terminal	25V	35V
	Temp. Compensation	-4.17mV/K per cell (Boost, Equalization), -3.33mV/K per cell (Float)	
	Battery Type	Liquid, Gel, AGM (Programmable)	
Panel Parameters	Max volt on PV terminal	45V	55V *1
	Max input power	130W	200W/400W
	Dusk/Dawn detect volt.	3.0~8.0V	3.0~20.0V (Programmable)
	Day/Night delay time	0~30Min (Programmable)	
	MPPT tracking range	(Battery Voltage + 1.0V) ~Voc*0.9 *2	
Load	Output Current	10A	15A
System Parameters	Max tracking efficiency	>99.9%	
	Max charge conversion	96.0%	97.0%
	Self consumption	6mA	
	Dimensions(mm)	85.8 * 81 * 23.1	85.8 * 145 * 30
	Weight	260g	600g
	Ambient temperature	-35~+60°C	
	Ambient humidity	0~100%RH	
	Protection degree	IP67	
	Max Altitude	4000m	

*1.PV panel Voc can not exceed this value, otherwise it will damage the controller.

*2.Voc means the open circuit voltage of the solar panel.

*3.Around oblique line value separately on behalf of 12V and 24V system's value.