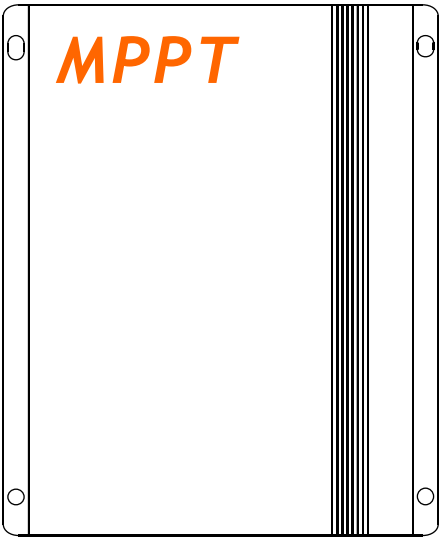
Lumiax
Magic your solar life

Smart-MPPT series
MPPT Solar charge controller
10/15/20A, 120~600W, Lithium



User Manual

User Manual_Smart-MPPT series_JH
CE, Rohs, ISO9001:2015
Subject to change without notice!

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 Li 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 97.5%
- 5 stages time can be adjusted
- Can read parameters and running status
- When BMS power off because of LVD, it can activate the system automatically
- Low temperature charging protection
- Charging target voltage and recovery voltage can be set
- 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.Safty 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 battery under any circumstances. We strongly recommend connecting a fuse directly on the battery wiring to protect against a short circuit.

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

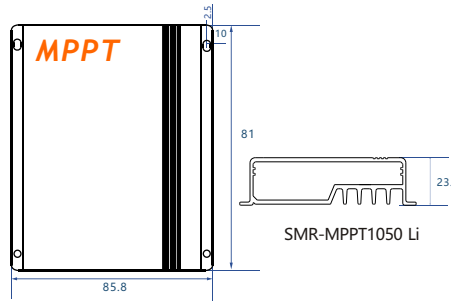
④Avoid touching or short circuiting wires or terminals. Be aware that the voltages on certain terminals or wires can be as much as twice the battery voltage. Use isolated tools, stand on dry ground, and keep your hands dry.

⑤Keep children away from batteries and the charge controller.

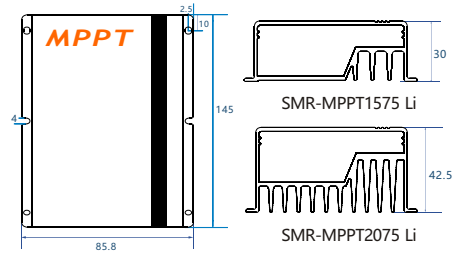
2.2 Liability Exclusion

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, incorrect setup, or bad system design.

3.Dimensions



SMR-MPPT1050 Li

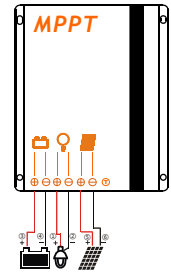


SMR-MPPT1575 Li

SMR-MPPT2075 Li

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 Wire size: 10A: 2.5mm²; 15/20A: 4mm².

5.Starting up the controller

5.1 Self Test

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

5.2 Battery Type

The controller is applied to Lithium rechargeable battery . The charging voltage target and charging voltage recovery can be set according to customer requirements.

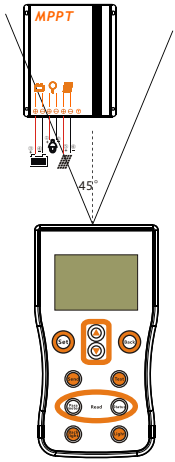
5.3 0℃ Charging Protection

"0℃ Chg" can be set to "Yes", "Slow" or " No" . When the controller detects that the ambient temperature is higher than 0℃, the charging function is normal. when the ambient temperature is low than 0℃, if the "0℃ Chg" is set to "Yes" , the charging function is normal, else if the "0℃ Chg" is set to "slow" , the max charging current is 20% of the rated current, else if the "0℃ Chg" is set to "No" , the controller does not charge the battery.
The user can select the appropriate charging method.

6.Remote control, Default setting

When Smart-MPPT Li 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 Li unit at a time.



5.1 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.

6.2 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	5.0V
12	D/N Dly	0min
13	Load I	0.3A
14	Dim Auto	No
15	Battery	LI
16	CVT	12.6V
17	CVR	12.4V
18	LVD	9.0V
19	LVR	9.8V

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.

6.3 Read the running status

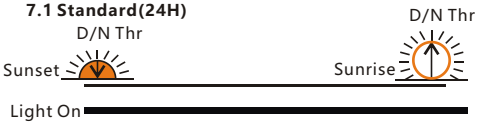
Press the "Status" key of the S-Unit to read the running status of the controller.

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

7. Streetlight Function

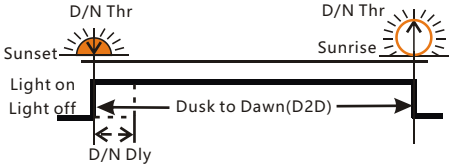
Smart-MPPT Li series controller with advanced light control function. The modes of lighting can be based on customer needs.

7.1 Standard(24H)



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

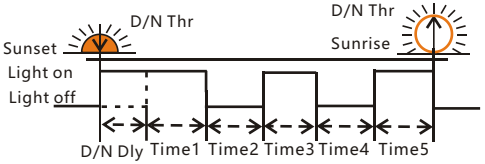
7.2 Dusk to Dawn (D2D)



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

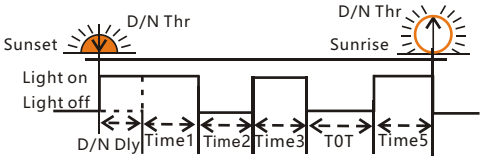
1.Smart-MPPT Li series controller is set to D2D mode, the corresponding dimming setting is still valid.
2. If "Time1" is set to D2D mode, "Time4" can not be set to T0T mode.

7.3 Five-stage Night Mode



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

7.4 T0T mode(can set the load on time before morning coming)



If "Time4" of the S-Unit is set to "T0T", this mode is T0T mode.

* If "Time4" is set to T0T mode, "Time1" can not set to D2D mode.

8.LVD, LVR, Threshold

8.1Low Voltage Disconnect(LVD)

Low Voltage Disconnect setting range: 9.0~30.0V

8.2Low Voltage Reconnect(LVR)

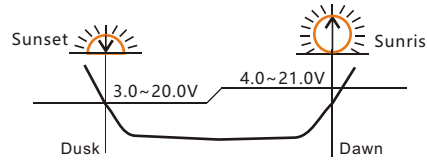
Low voltage reconnect setting range: 9.6~31.0V.

1.If the controller goes into low voltage disconnect, it will restore only when the battery is recharged to the recovery voltage.
2."LVR"should be higher than "LVD" by at least 0.6V.

8.3 Day/Night Threshold, Day/Night Delay

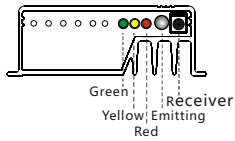
The controller recognizes day and night based on the solar array open circuit voltage. This day/night threshold can be modified according to local light conditions and the solar array used.
Day/Night threshold setting range: 3.0~20.0V.

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.

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
	Slow flash(0.5/2s)	Charging
Yellow LED	Off	Over voltage protection
	On	Battery is normal
	Slow flash(0.5/2s)	Battery voltage is low
	Fast flash(0.1/0.1s)	Low voltage protection
Red LED	Off	Work normal
	On	The load is off.
	Flash(0.5/0.5s)	Over temperature protection
	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 >("CVT" + 0.2V)	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.
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
Short circuit	Protected	Protected *1	Switches off immediately
Over current	——	——	Switches off with delay
Reverse Current	Protected	——	——
Over voltage	Max.55V *2	Max. 35V *3	——
Under voltage	——	——	Switches off
Over temp.	The controller cuts off the load if the temperature reaches the set value.		

*1.Battery must be protected by fuse, otherwise battery will be damaged.
*2.Please refer to "11.Technical Data" to get the max voltage of PV panel.
*3.Please refer to "11.Technical Data" to get the max voltage of battery terminal.

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

11.Technical Data

	Item	SMR-MPPT1050 Li	SMR-MPPT1575 Li	SMR-MPPT2075 Li
Battery Parame-ters	Max Charging Current	10A	15A	20A
	Charging voltage target	10.0~17.0V	10.0~32.0V(Programmable)	
	Charging voltage recovery	9.2~16.8V	9.2~31.8V(Programmable)	
	Low voltage disconnect	9.0~15.0V	9.0~30.0V(Programmable)	
	Low voltage reconnect	9.6~16.0V	9.6~31.0V(Programmable)	
	MPPT Charging Voltage	< Charging voltage target		
	Battery Type	Lithium		
	Max volt on Bat. Terminal	25V	35V	
Panel Parame-ters	Max volt on PV terminal	45V	55V***1**	
	Max input power	120W(3series) ~150W(4series)	50W * **#(3~8)** Eg: 150W(3 series) ~400W(8 series)	75W * **#(3~8)** ***2** Eg:225W(3Series) ~600W(8Series)
	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 ***3**		
Load	Output Current	10A	15A	20A
System Parame-ters	Max tracking efficiency	>99.9%		
	Max charge conversion	96.5%	97.5%	
	Self consumption	6mA		
	Dimensions(mm)	85.8 * 81 *23.1	85.8 * 145 * 30	85.8 * 145 * 42.5
	Weight	260g	600g	720g
	Ambient temperature	-35~+60℃		
	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.#(3~8) means the number of lithium battery series.**
***3.Voc means the open circuit voltage of the solar panel.**