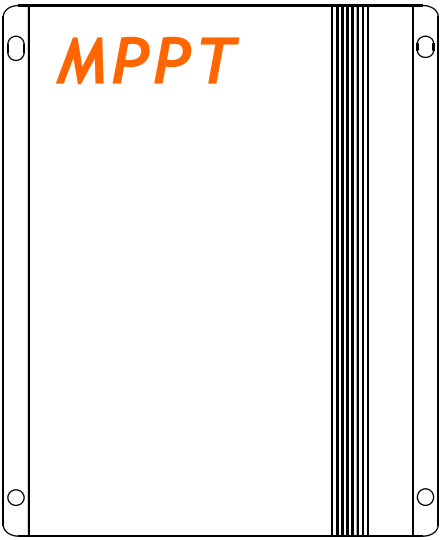
Lumiax
Magic your solar life

Smart-MPPT series
MPPT Solar charge controller



User Manual

User Manual_Smart-MPPT series_GJ
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 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%
- Full digital technology, high charge conversion efficiency up to 98%
- 12V/24V system voltage automatic recognition
- 5 stages time can be adjusted
- Can read parameters and running status
- 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.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 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.

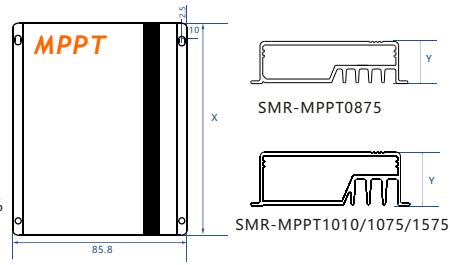
④Avoid touching or short circuiting wires or terminals. Be aware that the voltages on special terminals or wires can be as much as twice the battery voltage. Use isolated tools, stand on dry ground, and keep your hands dry.

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

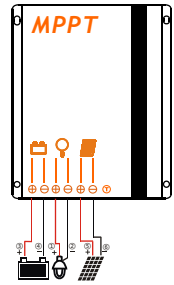
3.Dimensions



Model	X(mm)	Y(mm)
SMR-MPPT0875	81	23.1
SMR-MPPT1010/1075/1575	145	30

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 after 2-30s.

4.Confirm the LED display status: If the green LED is on or flashes and the red LED is off, it is normal;

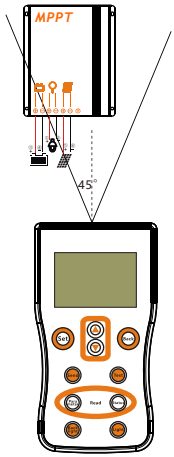
If the red LED is on or flashes, it means fault, please refer to the **9.2Faults and Alarms** to identify the reason.

- Make sure the wire length between battery and controller is as short as possible.
- Recommended mini. Wire size: 8/10A: 2.5mm²; 15A: 4mm².

5.Remote control, Default setting

When Smart-MPPT series controller is connected to the system, you can choose "DC 5-Stage" icon on the display of S-Unit infrared remote controller, as shown 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	11.2V
17	LVR	11.8V

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 affect the operation of 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 1min. During daytime, the testing function can help users to verify correct installation or for system trouble shooting. 1min 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 supplied with battery, 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 voltage at the time of start-up 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, a status display according to the section **9.2Faults & Alarms** occur.
Note: SMR-MPPT0875 is only suitable for 12V system.

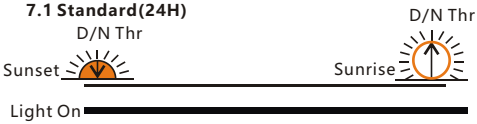
6.3 Battery Type

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

7. Output Function

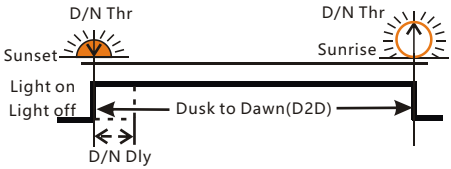
Smart-MPPT series controller with advanced light control function. The modes of lighting can be based on customer needs.

7.1 Standard(24H)



If "Time1" of "DC 5-Stage" is set to "24H" and sent to the controller successfully, the controller's load will always be open.

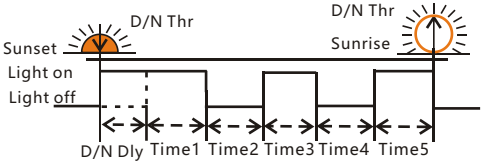
7.2 Dusk to Dawn (D2D)



If "Time1" of "DC 5-Stage" is set to "D2D" ,the controller works in dusk to dawn mode.

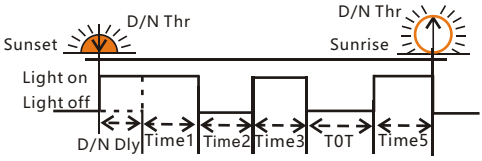
1.Smart-MPPT series controller is set to D2D mode, the corresponding dimming setting is still valid.
2. If "Time1" is set to D2D mode, "Time4" can not be set to T0T mode.

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

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)

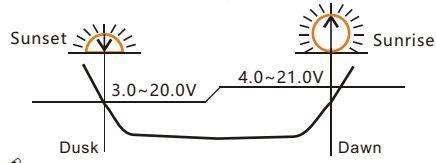
Low voltage reconnect: 11.4~12.8V/22.4~25.6V.

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

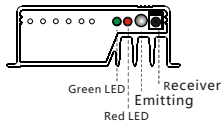
The controller recognizes day and night based on the solar array open circuit voltage. This day/night threshold can be modified according to local light conditions and the solar array used.
Day/Night threshold setting range: 3.0~20.0V.

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 should be set around 0.22 times of open circuit voltage.
2.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.
3.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	Slow flash(0.5s/2s)	Battery connected, Daytime detected
	Slow flash(1s/1s)	Float charging
	Flash(0.5s on/0.5s off)	Boost charging
	Fast flash(0.2s/0.5s)	Equalization charging
	Fast flash(0.1s/0.1s)	MPPT Charging
	On	Battery connected, night detected
Red LED	Off	No fault detected
	On	Low voltage protection
	Slow flash(1s/1s)	Overcurrent or short circuit protection
	Flashing(0.5s/0.5s)	Over temperature protection
	Fast flash(0.1s/0.1s)	Over voltage protection
Red Green	Both off	No connection to battery
	Both on 1s	Start up Self test

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	Green and Red 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.60V *3	Max. 40V *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.The PV panel voltage should not exceed 60V for a long time.
*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.

11.Technical Data

	Item	SMR-MPPT0875	SMR-MPPT1010	SMR-MPPT1075	SMR-MPPT1575
Battery Parameters	System Voltage	12V	12V/24V automatical recognization		
	Max Charging Current	8A	10A		15A
	MPPT Charging Voltage	<14.5V@25℃	<14.5/29V@25℃		
	Boost Voltage	14.5 @25℃	14.5/29V @25℃		
	Equalization Voltage	14.8 @25℃ (Liquid)	14.8/29.6V @25℃ (Liquid)		
	Float Voltage	13.7 @25℃	13.7/27.4V @25℃		
	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	40V	35V	
	Temp. Compensation	-4.17mV/K per cell (Boost, Equalization) , -3.33mV/K per cell (Float)			
	Battery Type	Liquid, Gel			
Panel Parameters	Max volt on PV terminal	60V	90V	60V	
	Max input power	100	130W/260W		200W/400W
	Dusk/Dawn detect volt.	3.0~20.0V (Programmable)			
	Day/Night delay time	0~30Min (Programmable)			
	MPPT tracking range	(Battery Voltage + 1.0V) ~Voc*0.9			
Load	Output Current	8A	10A		15A
System Parameters	Max tracking efficiency	>99.9%			
	Max charge conversion	96.0%	97.0%		
	Self consumption	6mA			
	Dimensions	85.8 x 81 x 23.1mm	85.8 x 145 x 30mm		
	Weight	260g	600g		
	Ambient temperature	-35~+60℃			
	Ambient humidity	0~100%RH			
	Protection degree	IP67			
	Max Altitude	4000m			

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