

LS-EU Series

— **Solar Charge Controller**

USER

MANUAL

LandStar

LS-EU Series

— Solar Charge Controller



Nominal System Voltage	LS0512EU/LS1012EU	12VDC
	LS1024EU/LS2024EU	12/24VDC
Maximum PV Input Voltage	LS0512EU/LS1012EU	30V
	LS1024EU/LS2024EU	50V
Nominal Charge/Discharge Current	LS0512EU	5A
	LS1012EU/LS1024EU	10A
	LS2024EU	20A
USB Output	ALL	5VDC/1.2A

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1 Important Safety Information

- Read all of the instructions and cautions in the manual before beginning installation.
- There are no user serviceable parts inside the controller. Do not disassemble or attempt to repair it.
- Install external fuses/breakers as required.
- Disconnect the solar module and fuse/breakers near to battery before installing or adjusting the controller.
- Do not allow water to enter the controller.
- Confirm that power connections are tightened to avoid excessive heating from loose connection.

2 General Information

LS-EU series solar charge controller, with beautiful, economic, practical, simple and easy to use, etc. It has various unique functions:

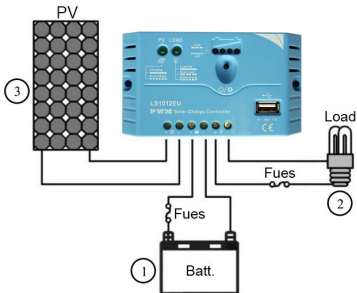
- It can be judged battery voltage intuitively with Battery indicator.
- High efficient Series PWM charging, increase the battery lifetime and improve the solar system performance.
- Use MOSFET as electronic switch, without any mechanical switch
- LED indicators indicate battery voltage state.
- Adopt temperature compensation, correct the charging and discharging parameters automatically and improve the battery lifetime.
- Electronic protection: over charging, over discharging, overload, and short circuit.
- Reverse protection for battery.
- The USB will provide 5VDC that can charge for electronic equipment.

3 Installation Instructions

3.1 Mounting

- Read through the entire installation section first before beginning installation.
- Be very careful when working with batteries. Wear eye protection. Have fresh water available to wash and clean any contact with battery acid.
- Use insulated tools and avoid placing metal objects near the batteries.
- Explosive battery gasses may be present during charging. Be certain there is sufficient ventilation to release the gasses.
- Avoid direct sunlight and do not install in locations where water can enter the controller.
- Loose power connections and/or corroded wires may result in resistive connections that melt wire insulation, burn surrounding materials, or even cause fire. Ensure tight connections and use cable clamps to secure cables and prevent them from swaying in mobile applications.
- Use with Gel, Sealed or Flooded batteries only.
- Battery connection may be wired to one battery or a bank of batteries. The following instructions refer to a singular battery, but it is implied that the battery connection can be made to either one battery or a group of batteries in a battery bank.
- Select the system cables according to $3.5\text{A}/\text{mm}^2$ current density.

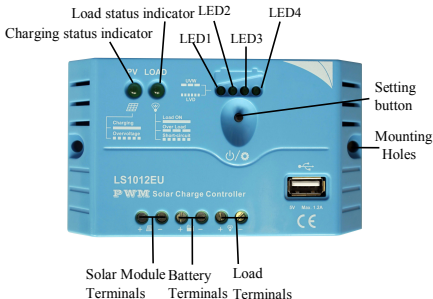
3.2 Wiring



1. Connect components to the charge controller in the sequence as shown in above picture and pay much attention to the “+” and “-”. Always power the battery First.
2. After power the battery, check the battery indicator on the controller, it will be green. If it's not green, please refer to chapter 5.
3. The load should be DC applicant with the same rated voltage as battery's. Controller offers power to loads through the battery voltage.

4 Operation

4.1 LED Indicators



• Charging and load status indicator

Table 4-1

Indicator	Indicator Status	System Status	Note
Charging status indicator	On	Charging	Normal
	Fast Flashing	over voltage	refer to section 5
load status indicator	On	ON	When the load amp is 1.25times of rated current for 60 seconds, or the load amp is 1.5 times of
	OFF	OFF	
	Slowly Flashing	Overload	

			rated current for 5 seconds
	Fast Flashing	Short Circuit	refer to section 5

●**Battery status indicator(LED1、LED2、LED3、LED4)**

Battery LED indicator(The parameters in the table below is for 12VDC system at 25°C, for 24VDC system ,the parameters is doubled)

Table 4-2

LED1	LED2	LED3	LED4	Battery Status
Slowly Flashing	×	×	×	Under voltage
Fast Flashing	×	×	×	Over discharged
Battery LED indicator status during voltage is up				
○	○	×	×	>12.8V
○	○	○	×	>13.4V
○	○	○	○	>14.1V
Battery LED indicator status during voltage is down				
○	○	○	×	<13.4V
○	○	×	×	<12.8V
○	×	×	×	<12.4V

“○”LED indicates on

“×”LED indicates off

4.2 Setting Operation

• Load Work Mode Setting

When the controller is powered on, press the setting button to control the load output. Press the button once, the ON/OFF status will be changed corresponding. The USB Output is ON only when the Load Work Mode is at ON status, otherwise, it is OFF.

• Battery Type Setting

Press the setting button for more than 5 seconds, battery indicator LED1, LED2, LED3 will be flashing correspondingly. Then press the setting button to choose Sealed, Gel, and Flooded battery type, when you finish choosing, stop pressing the button, the setting is finished till the digital tube stop flashing. The parameters indicated are shown below:

Battery type selection

Table4-4

LED1	LED2	LED3	Battery type
○	×	×	Sealed lead acid battery
○	○	×	Gel battery
○	○	○	Flooded battery

“○”LED indicator on

“×”LED indicator off

5 Protection and Troubleshooting

5.1 Protection

·Load Overload

If the load current exceeds the maximum load current rating(exceeds 1.25 times of rated current), the controller will disconnect the load with a short delay. Overloading must be cleared up through reapply power or pressing the setting button.

·Load Short Circuit

Fully protected against load wiring short-circuit(exceeds 2 times of rated current) automatically. After one automatic load reconnect attempt, the fault must be cleared by reapply power or pressing the setting button.

·Battery Reverse Polarity

Fully protection against battery reverse polarity, no damage to the controller will result. Correct the mistake of wiring to resume normal operation.

·Damaged Local Temperature Sensor

If the temperature sensor short-circuited or damaged, the controller will be charging or discharging at the default temperature 25°C to prevent the battery damaged from overcharging or over discharged.

·High Voltage Transients

PV is protected against high voltage transients. In lightning prone areas, additional external suppression is recommended.

5.2 Troubleshooting

Trouble Shooting

Table 5-1

Faults	Possible reasons	Troubleshooting
Charging LED indicator off during daytime when sunshine falls on PV modules properly.	PV array disconnection	Check that PV and battery wire connections are correct and tight.
charging LED indicator fast flashing	Battery voltage higher than over voltage disconnect voltage(OVD)	Check if battery voltage over high. Disconnect the solar module
Battery LED1 indicator SLOWLY FLASHING	Battery under voltage	When load output is normal, LED status will return to ON automatically when fully charged.

Battery LED1 indicator FAST FLASHING.	Battery over discharged	When the controller cut off the output automatically, LED status will return to ON automatically when fully charged.
Load LED indicator SLOWLY FLASHING	Over load	Please reduce the load and press the button once, the controller will resume to work after 3s
Load LED indicator FAST FLASHING	Short circuit	when the first short-circuit occurs, the controller will automatically resume to work after 10s; when a second short-circuit occurs, press the button, the controller will resume to work after 3s
No LED indicator	battery voltage lower than 6V	Measure battery voltage with multimeter. Min.6V can start up the controller
No charging status LED indicator with normal connection	input voltage of solar module lower than battery voltage	Measure the input voltage of solar module, the input voltage must be higher than battery voltage

6 Technical specifications

Electrical Parameters

Table 7-1

Description	Type	Parameter
Nominal System Voltage	LS0512EU/LS1012EU	12VDC
	LS1024EU/LS2024EU	12/24VDC
Max.batt.Volt.to the controller	LS0512EU/LS1012EU	16V
	LS1024EU/LS2024EU	32V
Rated Battery Current	LS0512EU	5A
	LS1012EU/LS1024EU	10A
	LS2024EU	20A
Charge Circuit Voltage Drop	ALL	≤0.26V
Discharge Circuit Voltage Drop	ALL	≤0.15V
Self-consumption	ALL	≤6mA

Temperature Compensation Coefficient

Table7-2

Description	Parameter
Temperature Compensation Coefficient(TEMPCO)*	-5mV/°C/2V (ref)

* **Compensation of equalize, boost, float and low voltage disconnect voltage**

Environmental parameters

Table 7-3

Environmental parameters	Parameter
Working temperature	-35°C ~ +55°C
Storage temperature	-35°C ~ +80°C
Humidity	≤95% N.C.

Enclosure	IP30
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Mechanical Parameters

Table 7-4

Type	LS0512EU	LS1012EU
Overall Dimension	109.7(4.32)x65.5(2.58)x 20.8(0.82)mm(inches)	120.3(4.74)x67(2.64)x 21.8(0.86)mm(inches)
Mounting dimension	100.9(3.97)mm(inches)	111.5(4.39)mm(inches)
Mounting hole size	Φ4.5	Φ4.5
Terminal	2.5mm ²	4mm ²
Weight	95g	103g

Mechanical Parameters

Table 7-5

Type	LS1024EU	LS2024EU
Overall Dimension	120.3(4.74)x67(2.64)x 21.8(0.86)mm(inches)	148(5.83)x85.6(3.37)x 34.8(1.37)mm(inches)
Mounting dimension	111.5(4.39)mm(inches)	138(5.43)mm(inches)
Mounting hole size	Φ4.5	Φ4.5
Terminal	4mm ²	6mm ²
Weight	102g	/

Final interpretation right of the manual belongs to our company.

Any changes without prior notice!

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