

Thank you for selecting the LandStar GPLI series solar charge controller with built-in LED driver of a step-down voltage control. Please read this manual carefully before using the product and pay attention to the safety information.

LandStar GPLI series solar charge controller

—With built in LED driver of step-down voltage

1. Safety Information

- Read all of the instructions in the manual before installation.
- DO NOT disassemble or attempt to repair the controller.
- Install external fuse or breaker as required.
- Do disconnect the solar module and fuse/ breakers near to battery before installing or moving the controller.
- Power connections must remain tight to avoid excessive heating from a loose connection.
- Only charge batteries that comply with the parameters of controller.
- Battery connection may be wired to one battery or a bank of batteries.

2. Overview

Thank you for selecting the LandStar GPLI series step-down voltage control solar charge controller with built in LED driver. It combines solar charge controller and LED constant current driver into one unit which is ideal for solar LED lighting, especially when dimmer function is needed. Full waterproof and IR communication design, it has the feature of high efficiency, high control accuracy and dimmer function. The product is dedicated in LED indoor and outdoor lighting application condition, such as road lighting, landscape lighting and billboard lighting etc.

Product Features:

- Maximum output efficiency of 96%
- Without any button, parameter setting via Mobile APP and RC-01 with IR function
- Flexible dimmer function, 0~100% can be adjusted
- Multiple load control modes, LED rated current and current percentage can be set.
- Load test function for detecting the system, the controller power on, the load is ON.
- Aluminum housing for better cooling
- Fully encapsulated PCB, IP68 protection (1.5 meters, 72h)
- Long lifespan design

3. Product Features



Figure 1 Product Feature

① Mounting hole size	⑥ Battery Positive and Negative Wires
② Charging Status LED indicator	⑦ Load Positive and Negative Wires
③ Battery Status LED indicator	⑧ Infrared LED
④ Temperature Sensor*	⑨ Infrared Receiver Module
⑤ PV Positive and Negative Wires	

*Temperature sensor is short circuit or open circuit, the controller will charge or discharge battery for 25°C and no temperature compensation

4. Wiring

• Reference for Serial connection of LED

System Voltage	Serial connection	Max. Load Output Voltage
12V	1~3 LED	Min. $V_{BAT} - 0.5V$ (LS102480GPLI)
24V	1~6 LED	Min. $V_{BAT} - 1V$ (LS2024100GPLI)



NOTE: The above one LED (1W, 3V) are calculated. If the user uses the unconventional LED, The actual LED voltage must less than the Max. Load Output Voltage.

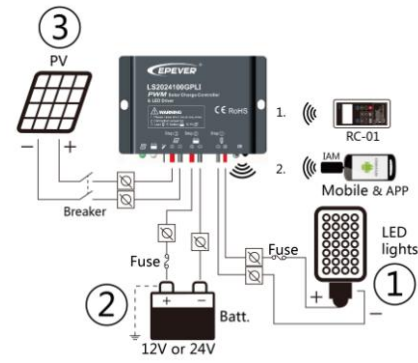


Figure 2 Wiring

• Connection Order

1) Connect components to the charge controller in the sequence as shown above and pay much attention to the “+” and “-”. Please don’t insert the fuse or turn off the breaker during the installation. When disconnecting the system, the order will be reserved.

2) After power on the controller, check battery LED indicator (the LCD on). Otherwise please refer to chapter 9.

3) Connecting a fuse in series through battery positive (+) in the circuit and the battery circuit fuse must be 1.25 to 2 times to the rated current. The installed distance is within 150mm.

• Load self-test function

The load is ON when the controller power on 10seconds. After 10 seconds it will restore to set working mode.

5. LED Indicators

Indicator	Color	Status	Instruction
	Green	On Solid	PV connection normal but low voltage(irradiance) from PV, no charging
	Green	OFF	No PV voltage(night time) or PV connection problem
	Green	Slowly Flashing(1Hz)	In charging
	Green	On Solid	Normal
	Green	Slowly Flashing(1Hz)	Full
	Green	Fast Flashing(4Hz)	Over voltage
	Orange	On Solid	Under voltage
	Red	On Solid	Over discharged
	Red	Slowly Flashing(1Hz)	Battery Overheating
Charging (green) and battery indicator (red) flashing simultaneously			System voltage error

6. Setting Operation



RC-01 Mobile & APP

There are two methods that it can realize controller work mode and parameters through IR function:

1) Infrared Communication Remoter—RC-01

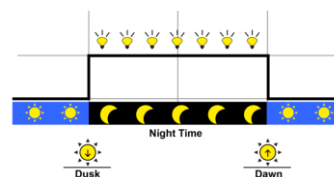
Set parameters of three timer, the LED rated current percentage and battery type, etc.

2) Ir-Android-Micro—IAM, Mobile and APP.

APP software can be downloaded from the website of <http://www.epsolarpv.com>.

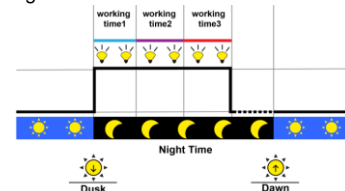
7. Load Working Mode

- 1) Manual Mode
- 2) Light ON/OFF (Default)

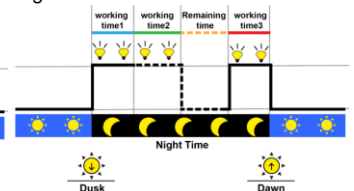


3) Light + ON Timer

Light + ON Timer1



Light + ON Timer2



Item	Default		Range
	Mode1	Mode2	
LED Rated Current	0.35A		LS102480GPLI:0-4A(12V/24V)
			LS2024100GPLI:0-5A(12V/24V)
Time1 LED Rated Current Percentage	2H 100%	1H 100%	00:00—23:59H 0—100%
Time2 LED Rated Current Percentage	2H 80%	1H 50%	00:00—23:59H 0—100%
Time3 LED Rated Current Percentage	2H 50%	2H 100%	00:00—23:59H 0—100%

4) Real-time Control

Control the load ON/OFF time through setting real-time clock.

5) Battery under voltage control

When the battery under voltage, the controller will reduce the LED rated current percentage for charging automatically. Return to normal mode when recovery from under voltage.



NOTE: The load is ON when the controller power on 10seconds. After 10 seconds it will restore to set working mode.



NOTE: In the mode of Light ON/OFF and Light ON/Timer, the Load is turned on after 10Min. delay, the delay time can be set.

8. Protection

Protection	Conditions	Status
PV Reverse Polarity①	Battery straight polarity and PV reverse polarity	The controller is not damage
Battery Reverse Polarity②	LED lights straight polarity and battery reverse polarity	
Battery Over Voltage	The battery voltage reaches to the OVD	Stop charging
Battery Over Discharge	The battery voltage reaches to the LVD	stop discharging
Battery Overheating	Temperature sensor is higher than 65℃	Output is OFF
	Temperature sensor is less than 55℃	Output is ON
Load Short Circuit (5 times reconnect load)	Load current ≥4 times rated current	Output is OFF
	Clear the fault: Restart the controller or wait for one night-day cycle (night time>3 hours).	Output is ON



①**WARNING:** The controller will be damaged when battery reverse polarity and PV reverse polarity!



②**WARNING:** The controller will be damaged when battery reverse polarity and PV straight polarity!

9. Troubleshooting

Faults	Possible reasons	Troubleshooting
Charging LED indicator(or LCD) off during daytime when sunshine falls on solar modules properly	PV array disconnection	Confirm that PV and battery wire connections are correct and tight
Wire connection is correct, the controller is not working	Battery voltage maybe less than 8V	Measure battery voltage with the multi-meter. Min.8V can start up the controller
Battery LED indicator green fast flashing	Battery over voltage	Check if battery voltage is higher than OVD, and disconnect the PV
Battery LED indicator red color	Battery over discharged	When the battery voltage is restored to or above LVR point (low voltage reconnect voltage), the load will recover
Battery LED indicator red slowly flashing	Battery Overheating	The controller will automatically turn the system off. But while the temperature decline to be below 55℃, the controller will resume.
Powering on normally, the LED is off	①The connecting wires are error or virtually connected ②Load mode is not appropriate.③This controller does not match with the LED light.④Output short circuit.	①Check the connecting cable. ② Check the load's mode and parameters.③The voltage of LED light is not within the output voltage range of controller.④Check the connecting cables and LED light.
The dimming function is invalid	The controller does not match with the LED light source.	This product is a step-down voltage control. If input voltage is higher than the Load output voltage, it is not working. Replace the LED light.

10. Technical Specifications

Item	LS102480GPLI	LS2024100GPLI
Nominal system voltage	12/24VDC Auto	
Rated charge current	10A	20A

Max. PV open circuit voltage	50V	
Battery input voltage range	8V~32V	
Max. output power	40W/12V,80W/24V	50W/12V,100W/24V
Max. output current	4A/12V, 24V	5A/12V,24V
Max. output voltage	Min. V _{BAT} -0.5V	Min. V _{BAT} -1V
Max. output efficiency	96%	
Output current control accuracy	≤50mA	
Battery Type	Sealed / Gel / Flooded / User	
Communication	IR	
Communication distance	≤6m	
Communication angle	≤15°	
Self-consumption	≤16mA(12V); ≤20mA (24V)	
Charge Circuit Voltage Drop	≤0.16V	
Temperature compensation coefficient	-3mV/°C/2V	
Working environment temperature	-35℃~+55℃	
Enclosure	IP68(1.5m, 72h)	
Overall dimension	107x68x20mm	108.5x88x25.6mm
Mounting dimension	100mm	100.5mm
Mounting hole size	Φ4	Φ5
Power cable	PV/BAT:14AWG(2.5mm ²) LOAD: 18AWG(1.0mm ²)	PV/BAT:12AWG(4.0mm ²) LOAD: 18AWG(1.0mm ²)
Net weight	0.25kg	0.39kg

Battery Voltage Control Parameters

Below parameters are in 12V system at 25℃, please double the values in 24V system

Battery Type	Sealed	Gel	Flooded	User
Over Voltage Disconnect Voltage	16.0V	16.0V	16.0V	9~17V
Charging Limit Voltage	15.0V	15.0V	15.0V	9~17V
Over Voltage Reconnect Voltage	15.0V	15.0V	15.0V	9~17V
Equalize Charging Voltage	14.6V	—	14.8V	9~17V
Boost Charging Voltage	14.4V	14.2V	14.6V	9~17V
Float Charging Voltage	13.8V	13.8V	13.8V	9~17V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V	9~17V
Low Voltage Reconnect Voltage	12.6V	12.6V	12.6V	9~17V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V	9~17V
Under Voltage Warning Voltage	12.0V	12.0V	12.0V	9~17V
Low Voltage Disconnect Voltage	11.1V	11.1V	11.1V	9~17V
Discharging Limit Voltage	10.6V	10.6V	10.6V	9~17V
Equalize Duration	120 min.	—	120 min.	0~180 min.
Boost Duration	120 min.	120 min.	120 min.	10~180 min.

NOTE:1) The default battery type is Sealed, For Sealed, Gel, Flooded battery type, the voltage point is fixed, unable to be modified. The adjusting range of equalize duration is 0 to180min and boost duration is 10 to180min.

2) User type is the user defined battery type. The default value is the same as sealed type. When modify it, please follow the below logistic relation:

- Over Voltage Disconnect Voltage > Charging Limit Voltage ≥ Equalize Charging Voltage ≥ Boost Charging Voltage ≥ Float Charging Voltage > Boost Reconnect Charging Voltage.
- Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage.
- Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage ≥ Discharging Limit Voltage.
- Under Voltage Warning Reconnect Voltage > Under Voltage Warning Voltage ≥ Discharging Limit Voltage.
- Boost Reconnect Charging voltage > Low Voltage Disconnect Voltage.

11. Disclaimer

This warranty does not apply under the following conditions:

- Damage from improper use or use in an unsuitable environment.
- PV or load current, voltage or power exceeding the rated value of controller.
- The controller is working temperature exceed the limit working environment temperature.
- User disassembly or attempted repair the controller without permission.
- The controller is damaged due to natural elements such as lightning.
- The controller is damaged during transportation and shipment.

Any changes without prior notice! Version number: V1.0