

Thank you for selecting the IR Sensor Solar Charge controller & LED Driver. Please read this manual carefully before using the product and pay attention to the safety information.

LS-LPLIR Series IR Sensor Solar charge controller & LED Driver

1. Overview

The IR Sensor Solar Charge controller & LED Driver combines the solar charge controller and LED constant current driver into one unit which is ideal for solar LED Lighting, especially for the application for LED lamp which requires dimmer function. The advanced pulse width modulation charging methods enables the system charging and discharging management to obtain the most radical optimization. In addition, the external infrared induction module, with the aid of pyroelectric infrared induction, can output different power in man-available/man-unavailable state, provide humanized street lamp control, and reduce the energy consumption of battery in man-unavailable state.

Key features:

- Apply to lead-acid battery and lithium battery
- Lithium battery self-activating function
- Lithium battery low temperature protection function
- Pyroelectric infrared induction function
- Load power limitation function
- Maximum output efficiency of 96%
- Digital precision constant current control and the control accuracy are less than $\pm 2\%$
- Discharging power calculation and real-time energy statistics recording function
- Multiple load control modes
- The induction rated current percentage and induction time in load-6 period can be set.
- Load test function for detecting the system
- Extensive electronic protections
- Without any button, parameter setting via RC-10 and FC-01 with IR function.

2. Product Features



①	Temperature Sensor	⑤	Battery Positive and Negative Wires
②	Charging Status LED indicator	⑥	Load Positive and Negative Wires
③	Battery Status LED indicator	⑦	IR Sensor Com. interface
④	PV Positive and Negative Wires	⑧	IR Sensor Com. Module

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

3. Wiring

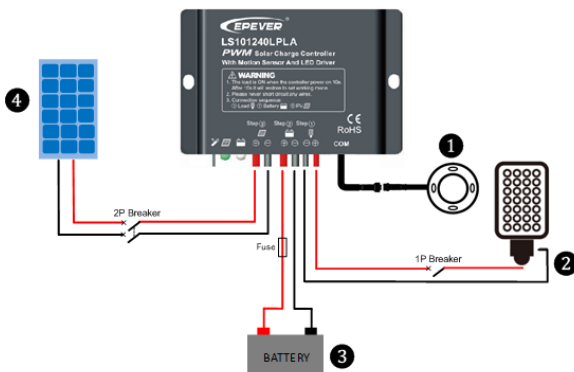
● Reference for Serial connection of LED

System Voltage	Serial connection	Min. Output Voltage	Max. Output Voltage
12V	5~18 LED	15V	60V
24V	10~18 LED	30V	60V

NOTE: The above one LED (1W, 3.3V) is calculated. If the user uses the unconventional LED, The actual LED voltage must less than the Max. Load Output Voltage.

WARNING: DO NOT electric shock! The product built-in boost LED driver, the output voltage is higher than the human safety voltage.

WARNING: If the LED connection number is wrong, the load or controller is damaged.



● 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 on the breaker during the installation. When disconnecting the system, the order will be reversed.
- 2) After power on the controller, check the battery LED indicator on the controller, it will be on solid green. Otherwise please refer to chapter 8.
- 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

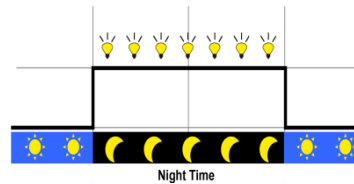
The load is ON when the controller power on 10seconds. After 10 seconds it will restore to set working mode.

4. LED Indicators

Indicator	Color	Status	Instruction
	Green	On Solid	PV connection normal but low voltage(irradiance) from PV, no charging
	Green	Slowly Flashing(1Hz)	In charging
	Green	OFF	No PV voltage(night time) or PV connection problem
	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
All indicators	Green and orange	Flashing two times	Set parameters successfully

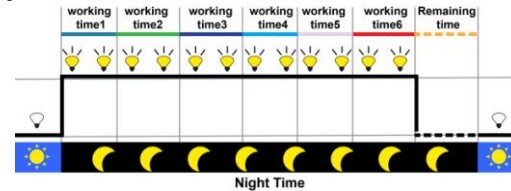
5. Load Working Mode

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

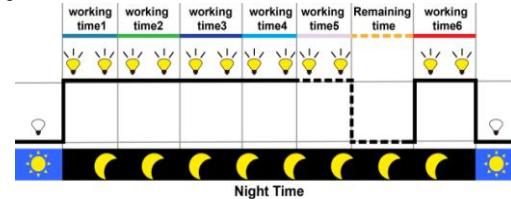


- 3) Light ON + Timer

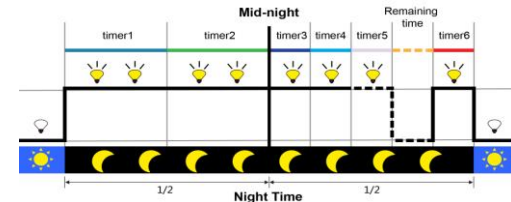
Light ON + Timer1



Light ON + Timer2



Light ON + Timer3



- 4) Time Control

Control the load on/off time through setting real-time clock.

- 5) Intelligent Power Mode

When the battery voltage is lower than "Under Warning Recover Voltage (UWRV adjustable)", the intelligent power mode is enabled; at this time, the LED current percentage will be automatically reduced in linear with the voltage drop of battery. When the battery voltage is lower than "Under Warning Recover Voltage (UWRV adjustable)", a minimum LED current percentage (default 2%, adjustable) will be output. In addition, when the battery voltage is higher than UWRV, the controller will exit the intelligent power mode.

NOTE: The load is ON when the controller power on 1seconds. After 1 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.

6. Setting Operation



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

- 1) IR Remote Controller—RC-10
- 2) Super Parameter Programmer—FC-01

This method can realize one-key setting operation which is suitable for bulk quantity products setting or applied in the projects.

NOTE: Please refer to the user manual of handheld device.



7. Protection

Protection	Conditions	Status
PV Reverse Polarity	When the battery is correct connecting, the PV can be reversed.	The controller is not damage
Battery Reverse Polarity	When the PV is not connecting, the battery can be reversed.	
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°C	Output is OFF
	Temperature sensor is less than 55°C	Output is ON
Libattery Low Temperature★	Temperature sensor is less than the low temperature value(LTV)	Stop charging or discharge
	Temperature sensor is higher than the low temperature value(LTV)	Begin charging or discharge
Load Short Circuit	Load current ≥ 2.5 times rated current One short circuit, the output is OFF 5s; Two short circuit, the output is OFF 10s; Three short circuit, the output is OFF 15s; Four short circuit, the output is OFF 20s; Five short circuit, the output is OFF 25s; Six short circuit, the output is OFF	Output is OFF Clear the fault: Restart the controller or wait for one night-day cycle (night time>3 hours).
Load Open Circuit(Load over voltage)	Max. load voltage $\geq 68V$ One open circuit, the output is OFF 5s; Two open t circuit, the output is OFF 10s; Three open circuit, the output is OFF 15s; Four open circuit, the output is OFF 20s; Five open circuit, the output is OFF 25s; Six open circuit, the output is OFF5s; Seven open circuit, the output is OFF5s	Output is OFF (Cycle to perform)



★**Warning:** If selecting a lithium battery, it must be set low temperature value(LTV) according to the charging/ discharging temperature of lithium battery; otherwise, the lithium battery will be damaged.

8. Troubleshooting

Faults	Possible reasons	Troubleshooting
Charging LED indicator off during daytime when sunshine falls on PV modules properly	PV array disconnection	Confirm that PV and battery wire connections are correct and tight
No LED indicator	Min.9V can start up the controller.	Measure battery voltage with multi-meter. Min.9V can start up the controller.
Battery LED indicator green Fast Flashing	Battery over voltage	①Disconnect the solar array and measure the battery voltage whether is too high; ②Change the controller; ③ Change the battery
Battery LED indicator red	Battery over discharged ^①	When the battery voltage is restored to or above setpoint (low voltage reconnect voltage), the load work
Battery Status LED indicator red flashing	Battery Overheating	The controller will automatically stop working. When the temperature is below 50 °C, the controller will resume to work.
All the LED indicator flashing(battery red indicator flashing)	System voltage error	Check whether the battery voltage match with the controller working voltage. Please change to a suitable battery or reset the working voltage
Powering on normally, the load is off	①The connecting wires are error or virtual connection ②Load mode is wrong ③The controller does not match with the LED light. ④Output short circuit	①Check the connecting cables ②Check the load mode and parameter ③The voltage of LED light source is not in the output voltage range of controller ④Check the connecting cables and LED light source
The dimming function is invalid	The controller does not match with the LED light source. This product is a step-up current control, If input voltage is lower than the rated voltage, it is not working.	①Replace the LED light ②Reduce system rated voltage grade and replace the product model For example 24V system change to 12V system, and replace the corresponding controller.

①When the battery is over discharged, the battery indicator will be red and the load will be off all the time before the voltage is more than the Low Voltage Reconnect Voltage (LVRV). In order to judge the system is normal or not, firstly measuring the battery voltage whether is more than LVRV, if not, restarting the controller to detect the load whether it is normal.

Note: The LVRV can be set, but it must pay more attention that it maybe damages the

battery if the LVRV is too low.

9. Technical Specifications

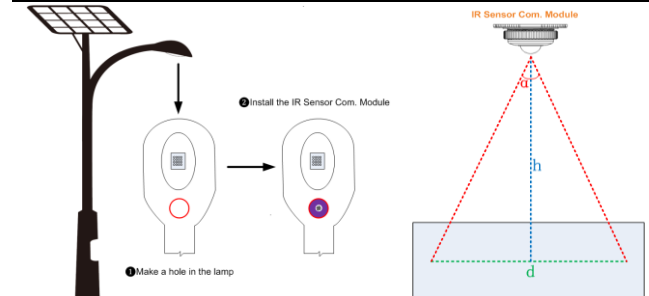
Item	Models	LS101240LPLA	LS102460LPLA
Nominal system voltage		12VDC	12/24VDC◆
Rated charge current		10A	
Max. PV open circuit voltage		30V	50V
Battery input voltage range		9~16V	9~32V
Max. output power		40W	30W/12V; 60W/24V
Max. output Current		2.6A	2.0A
Output voltage range		(Max. Battery Voltage +2V)~60V	
Load open circuit voltage		60V	
Maximum output efficiency		96%	
Output current control accuracy		$\leq 2\%$	
Battery Type★		Lead-acid battery: Sealed(default)/Gel/Flooded/User Lithium battery: LiFePO4/Li-NiCoMn/User	
Lead-acid battery	Equalization Voltage▼	Sealed:14.6V; Flooded:14.8V; User:9-17V	
	Boost Voltage▼	Sealed:14.4V; Gel:14.2V; Flooded:14.6V; User:9-17V	
	Float Voltage▼	Sealed/Gel/Flooded: 13.8V; User: 9-17V	
	Low Voltage Reconnect Voltage▼	Sealed/Gel/Flooded: 12.6V; User: 9-17V	
	Low Voltage Disconnect Voltage▼	Sealed/Gel/Flooded: 11.1V; User: 9-17V	
Lithium battery	Boost Voltage▼	LiFePO4(4s):14.4V/Li-NiCoMn(3s):12.4V/User:9-17V	
	Float Voltage▼	LiFePO4(4s):13.6V/Li-NiCoMn(3s):11.8V/User:9-17V	
	Low Voltage Reconnect Voltage▼	LiFePO4(4s):12.4V/Li-NiCoMn(3s):10.4V/User:9-17V	
	Low Voltage Disconnect Voltage▼	LiFePO4(4s):11.0V/Li-NiCoMn(3s):9.2V/User:9-17V	
Self-consumption		$\leq 19mA(12V); \leq 21mA(24V)$	
Charge Circuit Voltage Drop		$\leq 0.17V$	
Com. way		IR	
Working environment temperature		$-40^{\circ}C \sim +55^{\circ}C$	
Enclosure		IP68(1.5m,72h)	
Overall dimension		87x58x22.8mm	87x63x24.8mm
Mounting dimension		80mm	
Mounting hole size		Φ4mm	
Power cable		PV/BAT:14AWG/2.5mm ² ; LOAD: 18AWG/1.0mm ²	
Net weight		0.18kg	0.21kg

◆**The controller is not recognize system voltage and no temperature compensation when the battery connect the lithium battery.**

★**DO NOT connect the PV array when change the lithium battery type via the phone APP or PC software.**

▼**The parameters are 12V system at 25 °C, please double the values in 24V system.**

10. IR Sensor Com. Module



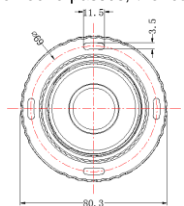
Description of actual application:

When the load mode "Light ON + Timer2" is selected, the module has LED rated current percentage of 6 periods, and the induction power percentage and induction time can be set.

For example: the "LED rated current percentage" of period 3 may be set to 50%, the "induction power percentage" may be set to 100%, and the induction time is 10s. When no one passes, the load output current percentage is 50%, when someone passes, the load output current percentage is 100%, and the duration is 10s.

Technical Specification

Model	IR Sensor Com. Module
Induction angle α	60°
Vertical induction distance	6m
Horizontal induction distance	7m
Enclosure	IP34
Module diameter	Φ 80.3mm
Module install diameter	Φ 51.5mm



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! V1.0