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EPEVER LS-LPLW Charge Controller and LED Driver

Thank you for selecting the LS LPLW series solar charge controller with built in LED driver. Please read this manual carefully before using the product and pay attention to the safety information.
Do not install this product in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments.

Solar Charge Controller
—with built-in LED Driver

Overview

The LS LPLW series controller combines the solar charge controller and LED constant current driver in one unit. It is ideal for solar LED lighting, especially for LED lamp applications requiring dimmer function. The advanced pulse width modulation charging methods enable system charging and discharging to obtain the most radical optimization. Reduce cost and increase the system’s flexibility. The features are listed below:

- Apply to lead-acid battery and lithium battery
- Lithium battery self-activating function
- Lithium battery low-temperature protection function
- Intelligent power mode with 365-day lighting control technology

- Load power limitation function
- Maximum output efficiency of 96%
- Digital constant current control and the control accuracy of no more than 30mA
- Multiple load control modes
- Load test function for detecting the system
- Adjustable light ON delay time (minimum 10s)
- Intense penetration and long communication distance with 2.4G technology
- Low power consumption control function of 2.4G wireless communication
- Ultra-low power consumption in transporting
- Password verification when setting parameters
- Set parameters via the APP, RC11, and FC02
- Extensive electronic protections

Product Features

❶	Temperature Sensor	❺	Battery Positive and Negative Wires
❷	Charging Status LED indicator	❻	Load Positive and Negative Wires
❸	Battery Status LED indicator	❼	2.4G wireless communication

❹	PV Positive and Negative Wires	❽	Mounting hole size

Wiring

Reference for Serial connection of LED

System Voltage	Serial connection	Min. Output Voltage	Max. Output Voltage
12V	5 18 LED	15V	60V
4V	10 18 LED	30V	60V

WARNING

Risk of electric shock! The output voltage is higher than the human safety voltage because of the built-in boost LED driver.

The load or controller is damaged if the LED connection number is wrong.

CAUTION

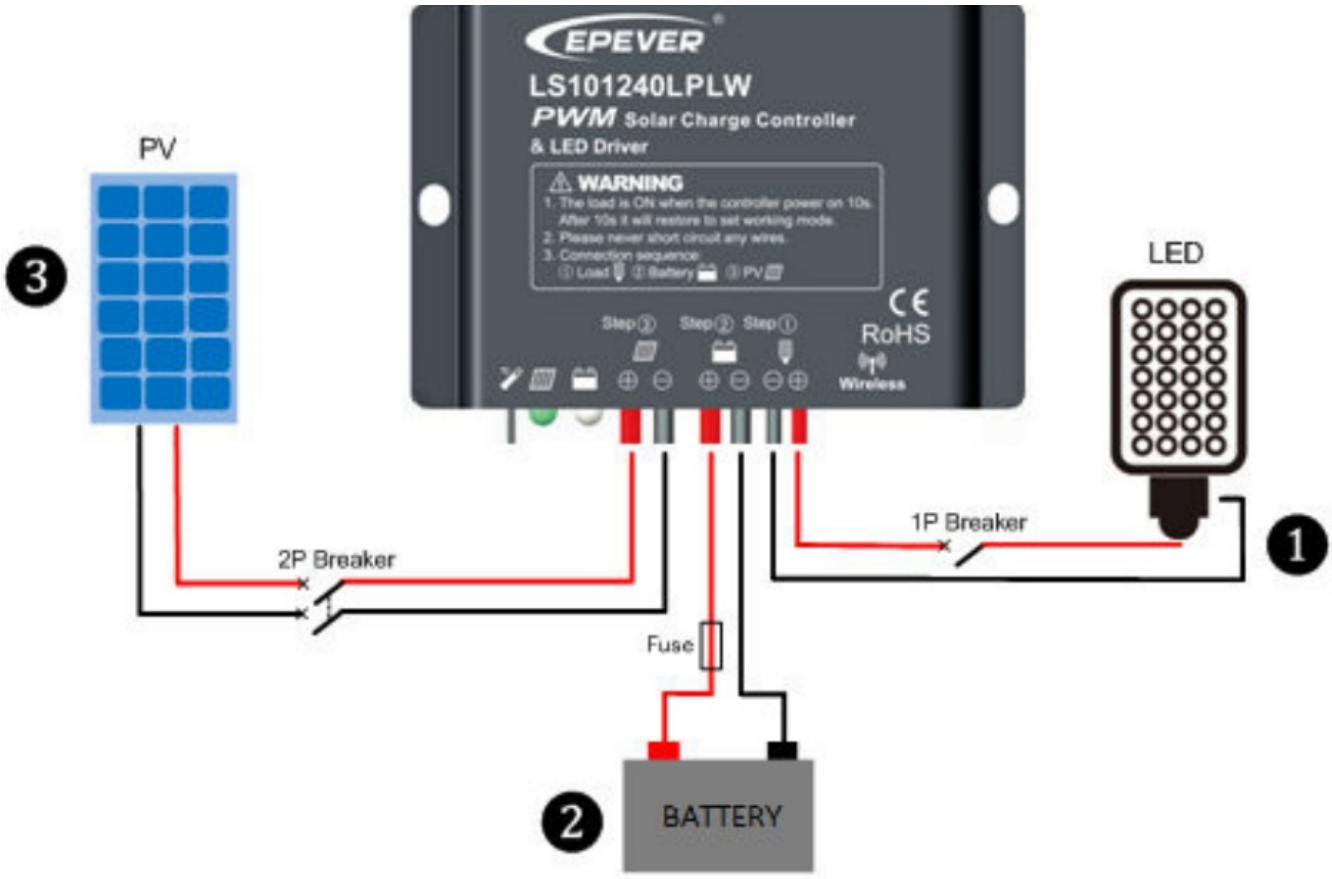
The above LED (1W, 3.3V) is calculated. If the user uses the unconventional LED, the actual LED voltage must be less than the Max. Load Output Voltage.

Connection Order

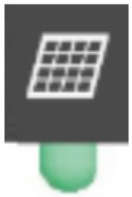
1. Connect components to the charge controller in the sequence 1 > 2 > 3 , as shown above, and pay much attention to the “+” and “-.” Please don’t connect the fast-acting fuse or breaker during the installation. When disconnecting the system, the order is reversed.
2. Check that the battery LED indicator is ON when you power the controller; otherwise, please refer to chapter 8.
3. Connect a fast-acting fuse in series through battery positive (+) in the circuit. The fast-acting fuse must be 1.25 to 2 times the rated current. The installed distance is within 150mm.

Load self-test function

The load is ON when the controller is powered on for 10 seconds. After 10 seconds, it restores to set working mode.



LED Indicators

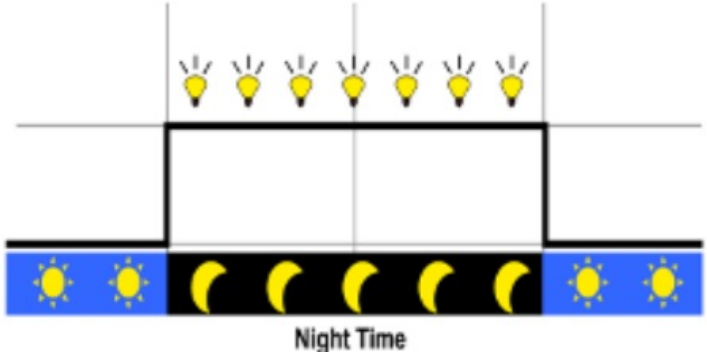
Indicator	Color	Status	Instruction
	Green	On Solid	PV connection normal but low voltage (irradiance) from PV, no charging
	Green	Slowly Flashing(1Hz)	In charging
	Green	Fast Flashing(4Hz)	PV reverse polarity

	Green	OFF	No PV voltage(night time) or PV connection problem
	Green	On Solid	Normal
	Green	Slowly Flashing(1Hz)	Full
	Green	Fast Flashing(4Hz)	Overvoltage
	Orange	On Solid	Under voltage
	Red	On Solid	Over-discharged
	Red	Slowly Flashing(1Hz)	Battery Overheating
The charging indicator (green) and battery indicator (orange) flash twice.			Set parameters successfully
The charging indicator (green) and battery indicator (orange) flash fast at the same time.			System voltage error★

★When selecting a lithium battery, the controller cannot automatically recognize the system voltage

Load Working Mode

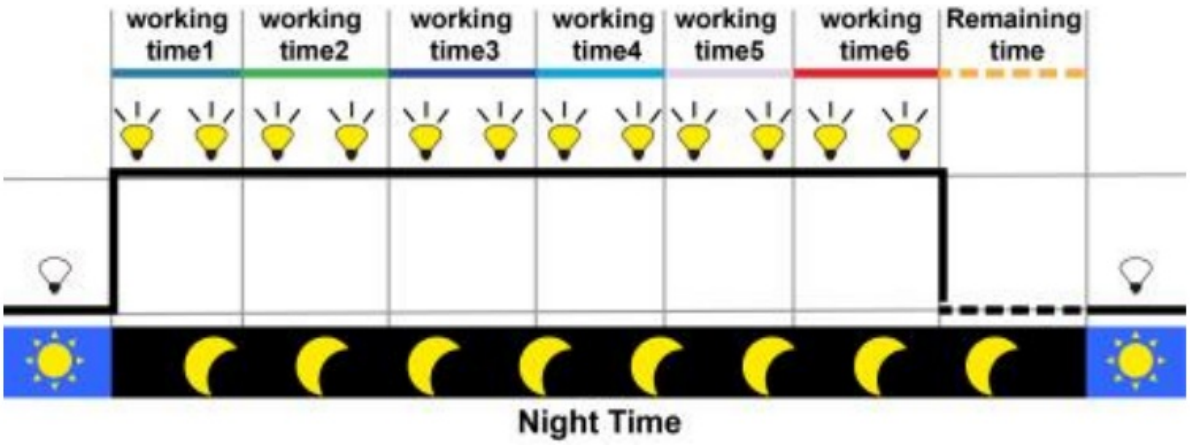
1. Manual Mode
2. Light ON/OFF (default)



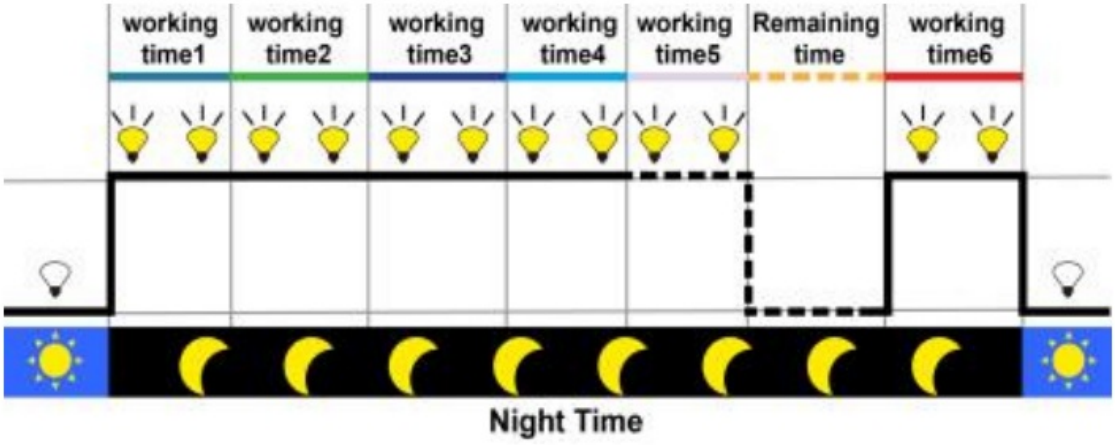
Turn-On voltage (Adjustable): 5V(12Vsystem), delay10min. Turn-Off voltage (Adjustable): 6V(12Vsystem), delay10min. Note: 24V system voltage×2

3. Light ON + Timer

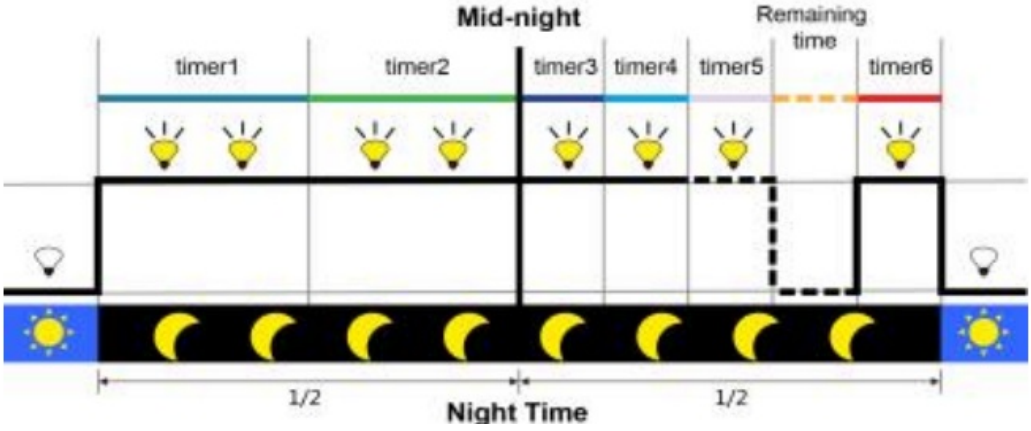
Light ON + Timer1



Light ON + Timer2



Light ON + Timer3



Item	Default※		Range
	Mode1	Mode2/3	

LED Rated Current	**0.35A**		0-2.6A(LS101240LPLW) 0-2.0A(LS102460LPLW) 0-4.0A(LS2024120/101260LPLW)
Timer1 LED Rated Current Percentage	**2H** **100%**	**1H** **100%**	00:00—23:59H 0—100%
Timer2 LED Rated Current Percentage	**2H** **80%**	**1H** **50%**	00:00—23:59H 0—100%
Timer3 LED Rated Current Percentage	**2H** **50%**	**0H** **0%**	00:00—23:59H 0—100%
Timer4/5 LED Rated Current Percentage	**0H** **0%**	**0H** **0%**	00:00—23:59H 0—100%

Timer6	**0H**	**2H**	00:00—23:59H
LED Rated Current Percentage	**0%**	**100%**	0—100%

The default value can be changed according to the user’s requirement.

Time Control

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

Intelligent Power Reduction Mode

When the battery voltage goes lower than the “Reduce Power Start Voltage (adjustable),” the intelligent power reduction mode is enabled. The LED output current is automatically reduced linearly with the battery’s voltage drop. When the battery voltage goes lower than the “Reduce Power End Voltage (adjustable),” the LED output current is 2% of the rated load current. The minimum percentage can be set to 1%. Also, when the battery voltage exceeds “Reduce Power Start Voltage,” the controller exits the intelligent power reduction mode.

CAUTION

- In Light ON/OFF and Light ON/Timer mode, the load is turned on after a 1- minute delay, and the delay time can be set.
- The controller’s real-time clock is an analog clock, valid at power-on and invalid after power-off. When using the time mode, the clock needs to be calibrated by handheld devices. Do not power off the controller after calibration.

Setting Operation

There are two methods to check and set the controller’s parameters:

1. **2.4G Remote Controller—RC11**
   This method can realize one-key setting operation which is suitable for bulk quantity products setting or applied in the projects.
2. **Super Parameter Programmer—FC02**
   NOTE: Please refer to the user manual of handheld device.

Protection

Protection	Conditions	Status
PV Reverse Polarity	When the battery is correctly connecting, the PV can be reversed.	The controller is not damaged
Battery Reverse Polarity	The battery can be reversed when the PV is not connected, or the connection is reversed. **WARNING: Controller is damaged when the PV connection is correct, but the battery connection is reversed!**	
Battery Over Voltage	The battery voltage reaches the OVD	Stop charging
Battery Over Discharge	The battery voltage reaches the LVD	Stop discharging
Battery Overheating	The temperature sensor is higher than 65℃	Output is OFF
	The temperature sensor is less than 55℃	Output is ON
Lithium battery Low Temperature★	The temperature sensor is less than the low-temperature value	Stop charging or discharge
	The temperature sensor is higher than the low-temperature value	Begin charging or discharge

Load Short Circuit	Load current ≥2.5 times rated current First short circuit, the output is OFF for 5s. Second short circuit, the output is OFF for 10s. Third short circuit, the output is OFF for 15s. Fourth short circuit, the output is OFF for 20s. Fifth short circuit, the output is OFF for 25s. Sixth short circuit, the output is always 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≥68V First open circuit, the output is OFF for 5s. Second open circuit, the output is OFF for 10s. Third open circuit, the output is OFF for 15s. Fourth open circuit, the output is OFF for 20s. Fifth open circuit, the output is OFF for 25s. Sixth open circuit, the output is OFF for 5s. Seventh open circuit, the output is OFF for 5s.	Output is OFF (Cycle to perform)

★ If selecting a lithium battery, the low-temperature value(LTV) must be set according to the specification; otherwise, the lithium battery is damaged.

Protection

	Possible reasons	**Troubleshooting**
Charging LED indicator off during the day time 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 the battery voltage with a multimeter. 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; ② Change the controller; ③Change the battery
Battery LED indicator red	Battery over ① discharged	The load works when the battery voltage is restored to or above the low voltage reconnect voltage.
Battery Status LED red indicator flashing	Battery Overheating	The controller automatically stops working. When the temperature is below 50 ºC, the controller resumes working.
All the LED indicator flashing(battery red indicator flashing)	System voltage error	Check whether the battery voltage matches the controller's working voltage. Please change to a suitable

		battery or reset the working voltage
	①Unreliable wiring, the	①Check the connecting cables
Power on normally, and the load is off	connection fails. ②The loading mode is wrong ③The controller does	②Check the load mode and parameter ③The voltage of the LED-light source is not in the output voltage

	not match the LED light. ④Output short circuit	range of the controller ④Check the connecting cables and LED light source
The dimming	The controller does not match the LED light so urce. This product is a step-up current	①Replace the LED light ②Reduce the rated system voltage a nd replace the product model
function is invalid	control; if the input voltage is lower than th e rated voltage, it is	For example, switch the 24V system to a 12V system, and replace the cor responding controller.
	not working.	

① When the battery is over-discharged, the battery indicator is red. The load keeps off before the voltage exceeds the low voltage reconnect voltage (LVR). To judge whether the system is normal, measure the battery voltage to confirm whether it is more than LVRV. If not, restart the controller to detect the load.

WARNING

The LVRV can be set, but it must be done carefully to avoid damaging the battery if the LVRV is set too low.

Technical Specifications

Item	**LS101240LPLW**	**LS101260LPLW**	**LS102460LPLW**	**LS2024120LPLW**
Nominal system voltage	12VDC	12VDC	12/24VDC◆ or Auto	
Rated charge current	10A	10A	10A	20A

Max. PV open circuit voltage		30V		50V	
Battery input voltage range		9 16V		9 32V	
Max. output power		40W/12V	60W/12V	30W/12V 60W/24V	60W/12V 120W/24V
Max. output current		2.6A	4.0A	2.0A	4.0A
Output voltage range		(Max. Battery Voltage +2V) 60V			
Load open circuit voltage		60V			
Maximum output efficiency		96%			
Output current control accuracy		≤30mA			
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			
	Reduce Power Start Voltage ▼	Sealed/Gel/Flooded:12.2V; User:9-17V			
	Reduce Power End Voltage ▼	Sealed/Gel/Flooded:12.0V; 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):14.5V; Li-NiCoMn(3s):12.5V; User:9-17V
	Reduce Power Start Voltage ▼	LiFePO4(4s):12.8V; Li-NiCoMn(3s):12.2V; User:9-17V
	Reduce Power End Voltage ▼	LiFePO4(4s):12.0V; Li-NiCoMn(3s):10.5V; User:9-17V
	Low Voltage Reconnect Voltage▼	LiFePO4(4s):12.8V; Li-NiCoMn(3s):10.5V; User:9-17V
	Low Voltage Disconnect Voltage▼	LiFePO4(4s):11.1V; Li-NiCoMn(3s):9.3V; User:9-17V
Self-consumption		≤19mA(12V); ≤35mA(24V)
Charge Circuit Voltage Drop		≤0.17V

Communication way	2.4G			
Communication distance	≤20m			
Work environment temperature	-40℃ +55℃			
Enclosure	IP68(1.5m,72h)			
Dimension (LxWxH) (mm)	87x60x22.8	87x67x24.8	87x63x24.8	108.5x88x25.6
Mounting size(mm)	80	80	80	100.5
Mounting hole size(mm)	Φ4	Φ4	Φ4	Φ5
Power cable(AWG/mm^2)	PV/BAT:14/2.5 LOAD:18/1.0			PV/BAT:12/4.0 LOAD:18/1.0
Net weight	0.17kg	0.20kg	0.20kg	0.40kg

- When selecting a lithium battery, the controller cannot automatically recognize the nominal system voltage and has no temperature compensation.
- The parameters are the 12V system at 25 ºC, double the values in the 24V system.

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 exceeds the rated value of the controller.
- The controller’s working temperature exceeds the limit working temperature.
- The user disassembly or attempted to repair the controller without permission.
- The controller is damaged due to natural elements such as lighting.
- The controller is damaged during transportation or shipment.

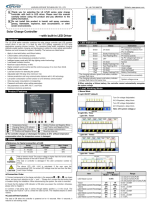
Any changes without prior notice!

Version number V2.3

FAQ

- **Q: What should I do if the battery LED indicator is not ON when I power the controller?**
  A: If the battery LED indicator is not ON, please refer to chapter 8 of the manual for troubleshooting steps.
- **Q: What is the recommended distance for installing the fast-acting fuse in the circuit?**
  A: The fast-acting fuse must be within 150mm from the battery positive (+) terminal.

Documents / Resources

	EPEVER LS-LPLW Charge Controller and LED Driver [pdf] Instruction Manual LS-LPLW, LS-LPLW Charge Controller and LED Driver, Charge Controller and LED Driver, Controller and LED Driver, LED Driver, Driver

References

- User Manual

EPEVER

Charge Controller and LED Driver, Controller and LED Driver, driver, EPEVER, LED Driver, LS-LPLW, LS-LPLW Charge Controller and LED Driver

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