

# INSTRUCTION MANUAL

-----For solar charge controller

-----EPRC10-EC series



## **RATINGS (12VDC or 12/24VDC Auto)**

EPRC10-EC 12VDC or 12/24VDC Auto, 10Amp

**NOTES:** For use with solar panels only, for use with sealed battery in 12V or 24V systems

## **TECHNICAL INFORMATION**

	<b>12V</b>	<b>24V</b>
Rated solar input:	<b>10A</b>	<b>10A</b>
Rated load:	<b>10A</b>	<b>10A</b>
25% Current overload:	<b>1 min.</b>	<b>1 min.</b>
Load disconnect:	<b>11.1V</b>	<b>22.2V</b>
Load reconnect:	<b>12.6V</b>	<b>25.20V</b>
Equalization voltage(60 minutes):	<b>14.8V</b>	<b>29.6V</b>
Boost voltage(60 minutes):	<b>14.4V</b>	<b>28.8V</b>
Float voltage:	<b>13.7V</b>	<b>27.4V</b>
Temp Comp.(mV/°C):	<b>-30mV</b>	<b>-60mV</b>
Terminals:	<b>For wire sizes to 2.5mm<sup>2</sup></b>	
Temperature:	<b>-35°C ~ +55°C</b>	

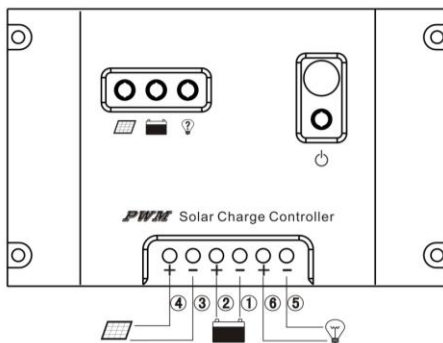
## **QUICK START INSTRUCTIONS**

This section provides a brief overview of how to get started using the controller. However, please review the entire manual to ensure best performance and years of trouble-free service.

1. Mount the controller to a vertical surface. Allow space above and below the controller for air flow.
2. Make sure the PV and load currents will not exceed the ratings of the controller being installed.
3. It is important to connect the battery first. We recommend that connections be made in order from 1 to 6 as per the diagram below.

**Note: carefully check before making each connection to be certain the polarity is correct.**

**We strongly recommend connecting a fuse in the battery+ line near the battery. The fuse rating should be 1.5 times the controller current rating.**



4. Connect the **BATTERY** first. Make sure bare wires do not touch the metal case of the controller.

5. Connect the **SOLAR**(PV array) next. The green LED indicator will light if sunlight is present.
6. Connect the **LIGHT** last. To verify system operation, read the next section and put the system in Mode 6. or 7. which will allow On / Off control via the switch.



## **LIGHTING CONTROL OPTIONS**

1. The ON / OFF switch has two functions. To turn the load on and off momentarily press the switch. To use it for setting options, press for 5 seconds to advance through the 16 work modes described below.
2. The controller requires 10 minutes of continuous transition values before it starts to work. These constraints avoid false transitions due to lighting or dark storm clouds.
3. The list below describes each of the modes:

**Please note that the last 8 modes will have the point after the number lit.**

Number 0	Dusk-to-Dawn, light is on all night
Number 1	Light is turned on after sundown for 1 hour
Number 2	Light is turned on after sundown for 2 hours
Number 3	Light is turned on after sundown for 3 hours
Number 4	Light is turned on after sundown for 4 hours
Number 5	Light is turned on after sundown for 5 hours
Number 6	Light is turned on after sundown for 6 hours
Number 7	Light is turned on after sundown for 7 hours
Number 0.	Light is turned on after sundown for 8 hours
Number 1.	Light is turned on after sundown for 9 hours
Number 2.	Light is turned on after sundown for 10 hours

Number 3.	Light is turned on after sundown for 11 hours
Number 4.	Light is turned on after sundown for 12 hours
Number 5.	Light is turned on after sundown for 13 hours
Number 6.	Light remains turned off, on/off mode
Number 7.	Test mode, light on after it detects no light, light off after it detects light

## **LED INDICATOR**



Green ON when solar is charging battery  
Green blink when the system over voltage



Green ON when battery level in the right range  
Green slowly flashing when battery level full  
Yellow ON when battery level low  
Red ON when loads cut off



Red ON when the output is on.  
Red slowly flashing when it is over load  
(The load amps is 1.25 times of rated current for 60 seconds, or the load amps is 1.5 times of rated current for 5 seconds)  
Red fast flashing when the load is short-circuit.

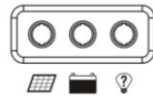
Please note:

The output will be cut off once there is either short circuit or over load. While short circuit occurs, disconnect the loads and check the error loads, then press the switch, the

load will be reconnected automatically after 3s. There is one automatic load reconnect attempts after 10s while first time short circuit. For more one time short circuit, users need press switch to reconnect loads.

While the over load occurs, disconnect some loads and press the switch, the load will be reconnect automatically after 3s.

## **TROUBLESHOOTING**



1. PV indicator is off when it is daytime
  - a. The green Charging LED should be on during day time.
  - b. Check that the proper battery type has been selected.
  - c. Check that all wire connections in the system are correct and tight. Check the polarity(+ and -) of the connections.
  - d. Disconnect the PV and measure the PV open-circuit voltage and confirm it is within normal limits. If the voltage is low or zero, check the connections at the PV array itself.
  - e. With PV connected, measure the PV voltage and the battery voltage at the controller terminals. If the voltage at the terminals is the same (within a few tenths of a Volt), the PV array is charging the battery. If the PV voltage is close to the open circuit voltage of the panels and the battery voltage is low, the controller is not charging the batteries and may be damaged.

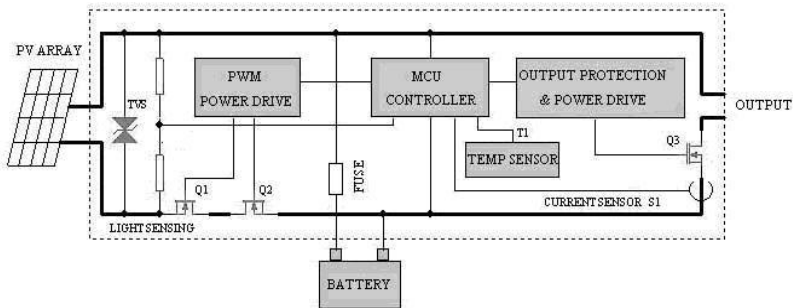
2. Charging LED indicator is blinking
  - a. First check the operating conditions to confirm that the voltage is higher than specifications. Consider the temperature compensation of the controller's PWM setpoint. If the temperature lower than 0°C the controller will regulate higher than 17V(17V is over voltage point).
  - b. Check that all wire connections in the system are correct and tight.
3. Problems with operation of load
  - a. If Load LED is fast flashing, there is a short circuit. Look for short circuit.
  - b. If Load LED is slow flashing, there is an overload condition. Check wiring to load, check connections. If you have multiple devices connected to the load, you may need to measure the current of each device to find defective device. Reduce the load, and press the switch button, the controller will turn on load after 30 seconds.
  - c. If load is not operating, check that the load is turned on. Check that no system fuses are defective. Check connections to the load, and other controller and battery connections. Make sure voltage drops in the system wires are not too high.

## **INSPECTION AND MAINTENANCE**

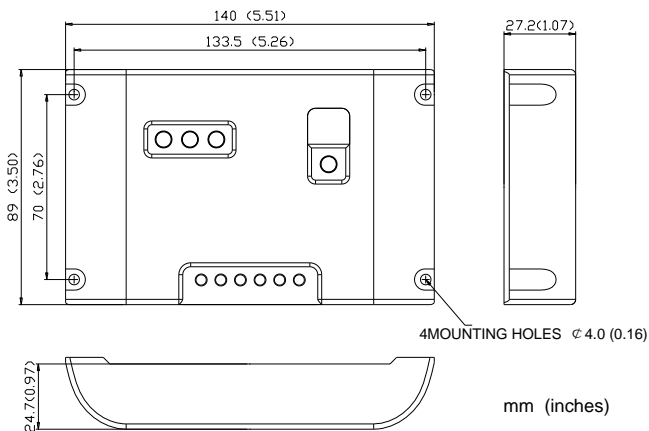
The following inspections and maintenance tasks are recommended at least once per year for best controller performance

1. Confirm that the current levels of the solar array and load do not exceed the controller ratings.
2. Tighten all the terminals. Inspect for loose, broken, or burnt wire connections. Be certain no loose strands of wire are touching other terminals.
3. Verify the lights are working. This can be tested by putting controller in mode 6. and using the button as an on/off switch.
4. Check that the controller is securely mounted in a clean environment. Inspect for dirt, insects and corrosion.
5. Check the air flow around the controller is not blocked.
6. Protect from sun and rain. Confirm that water is not collecting under the cover.
7. Check that the controller functions and LED indicators are correct for the system conditions at that time.
8. Make sure the PV array is clean and clear of debris and snow. Confirm the array is oriented correctly for the installation location.

# SYSTEM MAIN CIRCUIT DIAGRAM



# MECHANICAL



Version number: V2.0