

User Manual for the Bioenno Power Solar Controller – SC-122430T

For Use with LiFePO4 (Lithium Iron Phosphate) Batteries Only

Thank you for purchasing the **Bioenno Power** Solar Controller, Model SC-122430T



Instructions for Use

This 12V/24V, 30A solar controller can be used for charging LiFePO4 batteries.

It is very important NOT to exceed 30A MAX for the current when attaching the solar panel to this controller and also when attaching to the load. We recommend for testing to use a multi-meter, to measure the current flow, to the solar controller and to measure the load current to ensure you are not exceeding the limits.

Installation and Standard Operation

(Follow this order):

- 1.) Attach the battery to the battery terminal (middle terminal in above figure).
- 2.) Push the Yellow Button to show “L” first, then push the button to cycle to “8” (which turns off the controller to allow for connection of the solar panel and electrical load).
- 3.) Attach the solar panel to the solar panel input (left most terminals in above figure).
- 4.) Attach the load to the load terminal (right most terminals in above figure).
- 5.) Push the Yellow Button to show “L” first, then push the button to cycle to “7” (which keeps the solar controller always on)

OPERATION MODES

The unit uses a single button to cycle through several operation modes.

Automatic Street Lighting Mode (“L-Mode”)

Automatic Street Lighting Mode (“L-Mode”): If you are using the solar controller for a street light application, choose one of the L0 to L8 modes. If you want the controller on all the time (for other applications), see **L7 mode**.

L0: Light on at Dusk, Off at Dawn: Push the button to show “L” first, then push the button to cycle to “0”. This is the L0 mode which turns the load on at dusk and off at dawn.

L1: Same as L0.

L2: Light on at Dusk and Stay On 4 hours: Push the button to show “L” first, then push the button to cycle to “2”. This is the L2 mode. The unit switches the street light on at dusk and shuts off the street light 4 hours later.

L3: Light on at Dusk and Stay On 6 hours: Push the button to show “L” first, then push the button to cycle to “3”. This is the L3 mode. The unit switches the street light on at dusk and shuts off the street light 6 hours later.

L4: Light on at Dusk and Stay On 8 hours: Push the button to show “L” first, then push the button to cycle to “4”. This is the L4 mode. The unit switches the street light on at dusk and shuts off the street light 8 hours later.

L5: Light on at Dusk and Stay On 10 hours: Push the button to show “L” first, then push the button to cycle to “5”. This is the L5 mode. The unit switches the street light on at dusk and shuts off the street light 10 hours later.

L6: Light on at Dusk and stay On For 6 hours, and again 1 hour before dawn: Push the button to show “L” first, then push the button to cycle to “6”. This is the L6 mode. The unit switches the street light on at dusk and keeps the light on for 6 hours. Then the unit shuts of the street light. At one hour before dawn, the unit switches the street light on again. At dawn, the unit shuts of the street light.

L7: Solar Controller Always On: The solar controller always keeps the load on and also charges the battery using the solar panel and provides protection. Use this mode if you want the solar controller always operating.

L8: Solar Controller Always Off: The Solar Controller is off. (Used for assembling the system)

Manual Street Lighting Mode (“U-Mode”)

Manual Street Lighting Mode – Manually Setting the Voltage for the Transition at Dusk (“U-Mode”): You can manually set up the solar controller to the voltage from the solar panel that corresponds to dusk. To find the voltage, measure at time of dusk, the voltage from the solar panel, and set to the nearest corresponding voltage below.

- U0: Voltage from Solar Panel is 2.5V
- U1: Voltage from Solar Panel is 3.35V
- U2: Voltage from Solar Panel is 4.2V
- U3: Voltage from Solar Panel is 5.05V
- U4: Voltage from Solar Panel is 5.9V
- U5: Voltage from Solar Panel is 6.75V
- U6: Voltage from Solar Panel is 7.6V
- U7: Voltage from Solar Panel is 8.45V
- U8: Voltage from Solar Panel is 9.3V
- U9: Voltage from Solar Panel is 10.15V

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STATUS INDICATORS

The unit provides status indicators regarding operation. These status indicators are shown below.

Decimal Point OFF: **Battery Not Charging:** If the decimal point on the display is not showing, then the battery is not charging.

Decimal Point ON: **Battery Charging:** If the decimal point on the display is showing, then the battery is charging.

P0: **Low Battery Voltage:** The battery voltage is low and the solar controller's low voltage protection circuit has been engaged.

P1: **Low Remaining Charge on Battery:** The charge on the battery is low, but the solar controller is working normally.

P2: **Battery Full:** The charge on the battery is full and the solar controller is working correctly.

P3: **Overvoltage:** The battery voltage is high and the solar controller's over charge protection has been engaged.

E1: **Reverse Current or Short Circuit of Solar Panel:** The solar controller has detected a reverse current or short circuit in the solar panel. Check the solar panel.

E2: **High Charge Current:** The solar controller has detected a charge current to the battery that is too high (>30 Amps). Shut down the system. Check for any damage to the solar controller, battery, solar panel, and load.

E3: **Short Circuit of the Load:** The solar controller has detected a short circuit at the load. Check the load.

E4: **Over Load Current:** The solar controller has detected that the load is pulling too much current. Check the load.

E5: **Low Temperature:** The environmental temperature is below -35 deg C. The solar controller cannot operate below this temperature.

E6: **High Temperature:** The environmental temperature has exceeded 55 deg C. The solar controller cannot operate above this temperature.

Specifications

System Voltage	12V/24V
Solar Panel Input Voltage	0V to 25VDC (when using a 12V LiFePO4 Battery) 0V to 50VDC (when using a 24V LiFePO4 Battery)
Max Charging Current and Max Load Current	30A (peak)
Over Discharge Voltage (Low Discharge Voltage)	10.8V +/- 0.1V 21.6V +/- 0.2V
Over Discharge Recovery Voltage (Low Recovery Voltage)	12V +/- 0.1V 24V +/- 0.2V
Over Charge Voltage	14.6V +/- 0.1V 29.2 V +/- 0.2V
Over Charge Recovery Voltage (High Recovery Voltage)	13.6V +/- 0.1V 27.2 +/- 0.2V
Storage Battery Parameters <i>You must use this controller with Lithium Iron Phosphate Batteries. This controller cannot be used with Lead Acid or Lithium Polymer batteries.</i>	<p>Lithium Iron Phosphate Batteries (12V) Nominal Voltage: 12.8V Over Charge Voltage: 14.6V High recovery voltage: 13.6V Saturation Voltage: 12V to 13.6V Low Discharge Voltage: 10.8V Low Recover Voltage: 12V</p> <p>Lithium Iron Phosphate Batteries (24V) Nominal Voltage: 25.6V Over Charge Voltage: 29.2V High recovery voltage: 27.2V Saturation Voltage: 24V to 27.2V Low Discharge Voltage: 21.6V Low Recover Voltage: 24V</p>
Temperature Operation	-35 deg C to 55 deg C
Dimensions	7.375 in. x 3.75 in. x 1.625 in. (187 mm x 95 mm x 42 mm)
Weight	1 lb. (0.45 kg.)



Warranty (6 months)

Bioenno Power and Bioenno Tech LLC warrants only to the original purchaser of this product that this product is free of defects in material and workmanship for **6 months** from time of purchase as indicated on the receipt or invoice. This product will be replaced within the **6 month period** as long as the buyer contacts Bioenno Power and Bioenno Tech LLC within this time period (by telephone or email communication). This warranty does **NOT** cover damage to the product caused by abuse or neglect, modification by tampering with the product casing, failure to keep the battery properly charged or maintained, disposal in a fire, freezing, theft, overcharging, or other forms of damage. This warranty shall be in lieu of any other warranty, express or implied, including but not limited to, any implied warranty of merchantability or fitness for a particular purpose.