

**User Manual for the Bioenno Power Solar Controller
for 48V LiFePO4 Batteries (30A Max)**

Model SC4830SYD



User Manual
For Use with LiFePo4 (Lithium Iron Phosphate) Batteries Only

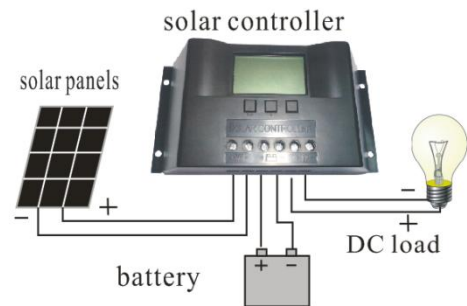
Thank you for purchasing the Bioenno Power Solar Controller, Model SC-4830SYD.

Product Introduction

The Bioenno Power Solar Controller, Model SC-4830SYD, is intended for use with 48V LiFePO₄ (lithium iron phosphate) batteries. Your LiFePO₄ battery must have a built-in Protection Circuit Module (PCM) that provides balancing of the internal cells, protection against overcurrent, undervoltage (overdischarge), and overcharging. It is not advised that you connect this controller directly to LiFePO₄ cells, by themselves. You will need to know the parameters of the LiFePO₄ batteries you intend to use with the unit. The unit includes an LCD display with simple button operation, with various status displays. It is important to note that this unit must have 3 parameters programmed prior to use including: (1) Value for the "Low Voltage Disconnection" voltage [the voltage of the battery at which the controller will disconnect power to the load, to avoid over-discharging the battery, otherwise known as the "cut-off" voltage], (2) Value for the "Low Voltage Reconnection" voltage [the voltage of the battery at which the controller should re-activate the electrical load] , and (3) Value for the "High Voltage Disconnection" voltage [the voltage of the battery at which the controller should cutoff the charging circuit, to avoid overcharging the battery]. Please follow the instructions below.

Installation

- 1) Make sure to use the proper gauge of cable to allow for up to 30 Amps through the controller. Please avoid placing the controller in a damp/dusty area or near any flammable or corrosive materials.
- 2) Install the controller into a fixed vertical plane.
- 3) As shown on the right, connect the (1) Load, (2) LiFePo₄ battery and (3) Solar Panel to the controller in exactly this order (1) Load first, (2) LiFePo₄ battery second, and (3) Solar Panel third.



Operation

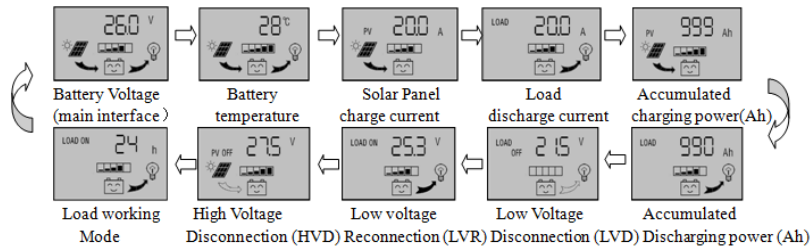
Description of LCD graphic symbols

	Controller has stopped providing power to the load (not filled up-arrow)
	Controller has stopped providing power to the battery (not filled down-arrow)
	Controller is delivering power to the load (filled up-arrow)
	Controller is charging the battery (filled down-arrow)
	Load
	The system is working correctly (smiley face)
	The system is not working correctly (frown face)
	Solar Panel
	Load sensor control
	Battery charge capacity display
	Load timer display
	Battery

Description of Button Functions

Set Button

The Set Button allows you to cycle through all the display screens on the LCD controller. This includes the battery voltage, battery temperature (if applicable and using a temperature sensor), the solar panel charge current, the load discharge current, the accumulated charge capacity (Ah), the accumulated discharging capacity (Ah), set point for the low voltage disconnection (LVD), set point for the low voltage reconnection (LVR), set point for the high voltage disconnection (HVD), and the load working mode.



Display Screens That Can be Obtained by Pushing the Set Button

Plus (+) Button

The plus button is used to increase the value for each parameter. Also, to restore factory defaults, hold down the plus button for 5 seconds.

Minus (-) Button

The minus button is used to decrease the value for each parameter. Also, in the main interface setting (also known as the Battery Voltage) setting, push this button to turn on the load.

Viewing and Setting the Parameters

When the controller is powered on, the default screen will be the “battery voltage” screen. This is also known as the “main interface screen”. By pushing the Set button, it is possible to cycle through all the screens. By holding down the Set button for more than 5 seconds, the parameters values start flashing. Set the values and then push Set again to store the values.

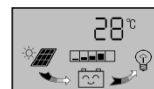
Battery Voltage (Main Interface) Screen

In this screen, the charge status, discharge status, approximate battery capacity, and battery voltage is displayed. In this screen, push the minus (-) button to turn on and off the load. Note, that turning the load on and off is only possible in the battery voltage (main interface) screen.



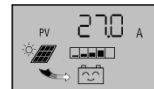
Temperature Screen

The ambient temperature of the controller is shown. The value can be used for temperature compensation for the low voltage disconnect function. The temperature sensor must be attached.



Solar Panel Charging Screen

The charge current from the solar panel is shown in this screen.



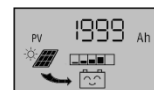
Load Discharge Current Screen

The load current from the battery to the load is shown in this screen



Accumulated Charging Capacity by Solar Panel to the Battery Screen

This screen shows the estimated capacity delivered by the solar panel to the battery. To reset, hold the Set button for 5 seconds. This is an estimate only.



Capacity that was Delivered by the Battery to the Load

This screen shows the estimated capacity delivered by the battery to the load. To reset, hold the Set button for 5 seconds. This is an estimate only.



Setting/Storing the Low Voltage Disconnection (LVD) voltage value

This screen is very important to setting the low voltage disconnection (LVD) voltage value. When the battery voltage is lower than this low voltage disconnection voltage, the controller will cut the load circuit to prevent the battery from over-discharge. Set this value to match your LiFePO4 battery's "cut-off" voltage value. To set this value, hold the Set button for 5 seconds and the parameter value will start flashing. Use the + and – buttons to set the value. Then hold the Set Button for 5 seconds to store the value.



Setting/Storing the Low Voltage Reconnection (LVR) voltage value

This screen is very important to setting the low voltage reconnection (LVR) voltage value. When the battery voltage is restored to a value that is higher than the LVR voltage, the controller will re-activate/re-connect the load circuit. To set this value, hold the Set button for 5 seconds and the parameter value will start flashing. Use the + and – buttons to set the value. Then hold the Set Button for 5 seconds to store the value.



Setting/Storing the High Voltage Disconnection (HVD) voltage value

This screen is very important to setting the high voltage reconnection (HVD) voltage value. When the battery voltage reaches the HVD voltage, the controller will cut off the charging circuit to prevent over-charging the battery. When the load circuit. To set this value, hold the Set button for 5 seconds and the parameter value will start flashing. Use the + and – buttons to set the value. Then hold the Set Button for 5 seconds to store the value.



"Load Working Mode" Screen

This screen allows the user to set a timer for turning the load on after dark (for a solar street light application) and then turning off the load at dawn. Set the value to "24h" to have the load always on. Set the value to "0h" to turn the load power after dark, and turn off the load after dawn. Set the value from "1h" to "23h" to turn the load on after dark, and shut off the load after 1h, 2h, 3h, etc. Use the + and – buttons to set the value. Then hold the Set Button for 5 seconds to store the value.



Faults/Errors

LVD Protection Screen

This screen shows that the battery is below the LVD protection voltage. Charge the battery until the battery reaches the LVR voltage. The controller will then resume to provide power to the load.



Overload Protection

This screen shows that the load is consuming too much power. Reduce the power of the load and press the minus (-) button to resume power to the load.



Short Circuit Protection

This screen shows that there is a short circuit at the load. Check the load. Resolve the problem with the load and press the minus (-) button resume power to the load.



Solar Panel Fault

If the solar panel icon is flashing, check for an open circuit between the solar panel and the controller. Resolve.

Technical Data

Voltage	48VDC
Rated Current	30A
Maximum Open Circuit Solar Panel Voltage	<100 VDC
Low Voltage Disconnect (LVD) Voltage	42.8VDC (programmable)
Low Voltage Reconnection (LVR) Voltage	50.0VDC (programmable)
Operating Temperature	-10 deg C to 60 deg C
Dimensions	188 mm x 90 mm x 48 mm