victron energy BlueSolar PWM Charge Controller – LCD – USB User Manual

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Contents

IMPORTANT

Always connect the batteries first.

- Use for 12V battery system only 12V (36 cells) solar panel array.

- Use for 24V battery system only 24V (72 cells) solar panel array.
- Use for 48V battery system only 2x24V (72 cells) solar panel array in series.

General Information

The BlueSolar Charge Controller series uses Pulse Width Modulation (PWM) charge voltage control combined with a multistage charge control algorithm.

Features

- Three stage battery charging [bulk – absorption – float]
- Battery type: Lead-ACID and LiFePO4 (with internal BMS)
- Protected against over current.
- Protected against short circuit.
- Protected against reverse polarity connection of the solar panels and/or\ battery.
- Low voltage load disconnect.
- Temperature protection.

Installation

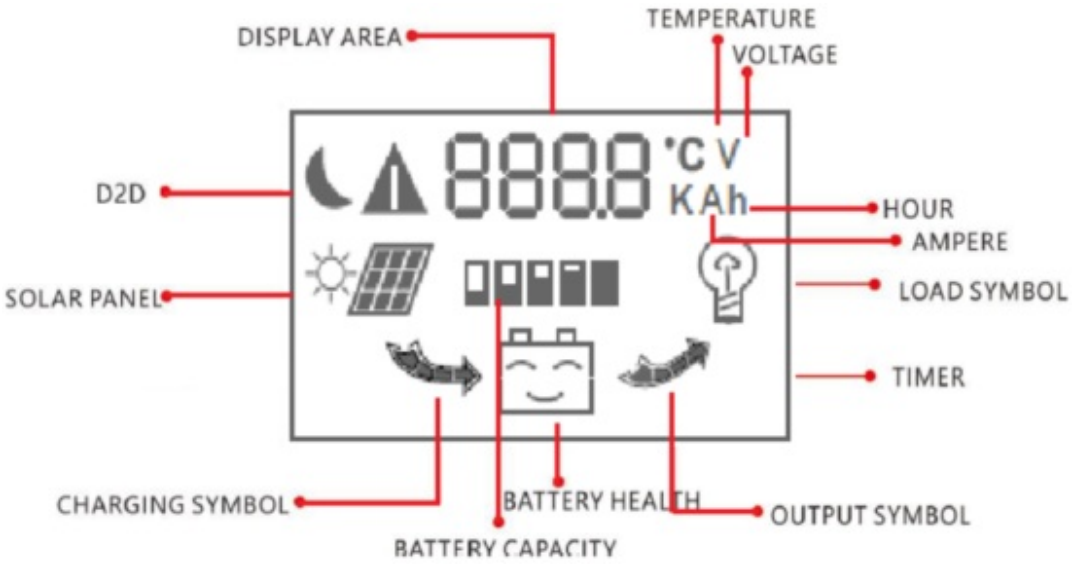
Important note: Always connect the batteries first.

1. **Connect the battery to the charge regulator – plus and minus.**
2. **Connect the solar module to the regulator – plus and minus.**
3. **Connect the load to the charge regulator – plus and minus.**

The reverse order applies when deinstalling!
An improper sequence order can damage the BlueSolar Charge Controller!

1. Make sure your battery is charged for the BlueSolar Charge Controller to recognize the battery type before first installation.
2. The battery cable should be as short as possible to minimize losses.
3. The BlueSolar Charge Controller is only suitable for lead-acid, and LiFePO4 batteries.
4. The BlueSolar Charge Controller is only suitable for regulating solar modules.
   Never connect another charging source to the charge BlueSolar Charge Controller.

LCD DISPLAY and SETTINGS



MENU switch between different display, or to enter/exit setting by long press.

UP press to change the settings when in setting mode.

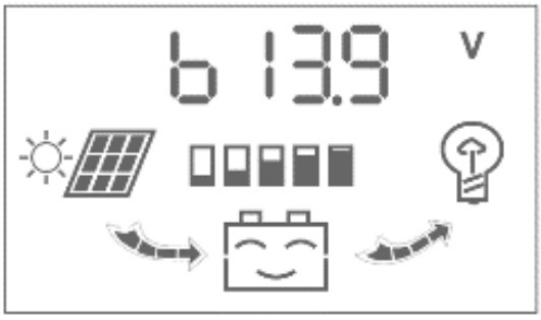
DOWN: press to change the settings when Load on/off button when in H mode.

Monitoring & Settings

Values between [ ] are for 24V battery settings. Bolt are the 48V settings.

Boot Display. After connecting the batteries, you see the type of charger and the measured battery voltage.
1230= BlueSolar Charge Controller – LCD – USB 12V|30A
2430= BlueSolar Charge Controller – LCD – USB 24V|30A
4810= BlueSolar Charge Controller – LCD – USB 48V|10A
4820= BlueSolar Charge Controller – LCD – USB 48V|20A
4830= BlueSolar Charge Controller – LCD – USB 48V|30A

Press MENU to enter next display



Main display. It shows battery voltage, battery capacity, charging and discharging status.

Press MENU to enter next display.

Change Settings Main display. press on the MENU key for several seconds until the numbers flash, you are in:

Battery type setting.
See table below.
The factory setting is b01

	Battery type	Battery voltage	Absorbtion voltage	Float voltage	Low voltage disconnect factory setting	Low voltage disconnect range	Low voltage reconnect factory setting	Low voltage reconnect range
b01	LEAD-ACID [AGM]	12.0V [24V] **48V**	14.4V [28.8V] **57.6V**	13.7V [27.4V] **54.8V**	11.2V [22.4V] **44.8V**	10.5V-12.0V in steps of 0.1V	12.6V [25.2V] **50.4V**	12.0V-13.5V in steps of 0.1V
b02	LEAD-ACID [Gel]	12.0V [24V] **48V**	**14.2V** [28.4V] **56.8V**	13.7V [27.4V] **54.8V**	11.2V [22.4V] **44.8V**	10.5V-12.0V in steps of 0.1V	12.6V [25.2V] **50.4V**	12.0V-13.5V in steps of 0.1V
b03	LEAD-ACID [Wet]	12.0V [24V] **48V**	14.6V [29.2V] **58.4V**	13.7V [27.4V] **54.8V**	11.2V [22.4V] **44.8V**	10.5V-12.0V in steps of 0.1V	12.6V [25.2V] **50.4V**	12.0V-13.5V in steps of 0.1V
b04*	12V LiFePO4	12.8V	14.2V	13.35V	11.2V	10.5V-12.0V in steps of 0.1V	12.6V	12.0V-13.5V in steps of 0.1V
b05*	24V LiFePO4	25.6V	28.4V	26.7V	22.4V	21.0V-24.0V in steps of 0.1V	25.2V	24.0V-27.0V in steps of 0.1V

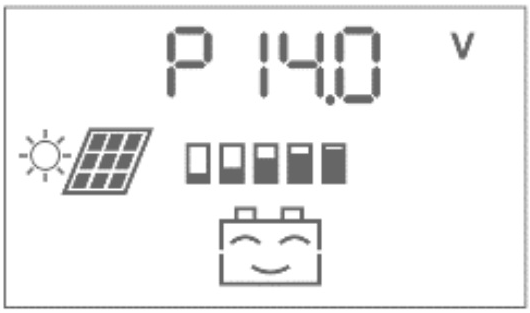
- The controllers do not have a remote on/off input. Therefore use LiFePO4 batteries with integrated BMS only (such as the Victron SuperPack batteries) NA for 48V

press on the MENU key again and you are in:

Low voltage disconnect
The factory setting is 11.2V [22.4V] 44.8V

press on the MENU key again and you are in:

Low voltage reconnect
The factory setting is 12.6V [25.2V] 50.4V



Solar Voltage display. It shows Solar Panel voltage, battery capacity status.

Press MENU to enter next display.

Charge current display. It shows solar to battery current and charge status.

Press MENU to enter next display.

Load working mode.
The factory setting is 24H

Press MENU to enter next display

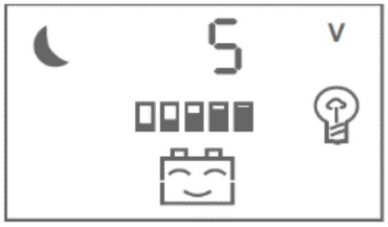
Change Settings in the Load working mode display.

Press on the MENU key for several seconds until the numbers flash, you are in setting mode for the:

Load working mode setting.
See table below.

H	The load can switch on and off by the Load on/off switch.
L	Load D2D. The load will switch on at sunset and switch off at sunrise.
L01-L23	The load output will switch on after sunset and switch off after 1-23 hours.
24H	The BlueSolar Charge Controller will continuously supply power to your load.

Press on the MENU key again and you go to:
(Note: the Phoenix VE.Direct inverters can be controlled by connecting to the left side connection of the remote control to the load output)



Load Setting: trigger value
(Solar Panel Voltage)When the work mode is L01-
L23 the charge Controller will measure the solar panel voltage to decide whether its day or night to switch load on or off. The higher this value is the earlier it switches on the load output.
The factory setting is 4/8V/16V

L01-L23 trigger delay value
(Seconds)
When the charge Controller measures a solar panel voltage lower this value it will delay for 10s and measure again to make sure night falls. The factory setting is 10sec

Press on the MENU key again and you go to:

Short-circuit protection setting.
Some inductive or capacitive consumer will trigger the shortcircuit protection during start up. Therefore the SCprotection can be disabled manually. Sc.F=OFF, Sc.n=ON. The default is ON.
The factory setting is Sc.n.

Load current display. It shows load current and battery capacity.

Press MENU to enter next display.

USB Voltage display. It shows the USB voltage
5V (2A max)

Press MENU to enter next display.

Controller temperature display. If the controller overheats it will automatic shut down and wait for the temperature to drop to normal level and then it will start again.

Press Press MENU to enter Main display

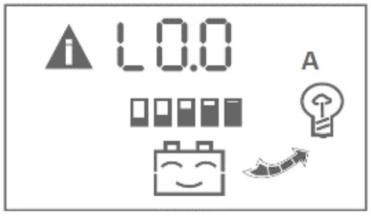
Alarms

High temperature

Temp <85°C, controller works normally.
When temp ≥ 85°C, controller will adopt first protection phase:

1. Controller will lower the PV input current, in order to lower the controller temp; but Load works normally. There is no alarm on LCD display.
   When temp is >90°C, controller will adopt second protection phase:
2. Controller will cut off PV input current. Load output cut off. A high temp alarm icon will show on LCD to notice user.
   When temp down under 82°C, the controller will again turn on PV input and Load output. Alarm icon disappears.

Low voltage.
Empty battery symbol flashing means the battery is discharged lower than the LVD voltage. The charge Controller has disabled the output. User should charge the battery until it is up to LVR Low voltage re-connect voltage and then BlueSolar Charge Controller will recover the output status.



Short-circuit protection.
This display means a short-circuit protection occurs. The controller will switch off the output and wait for 30s and then try to recover again. User should check and remove the trouble in time.

Over-current protection.
This display means an output over-current occurs. The controller will switch off the output and wait for 30s and then try to recover again. User should check and remove the trouble in time.
Shut down after 60s in case of 110%-130% load.
Shut down after 5s in case of 130%-160% load.

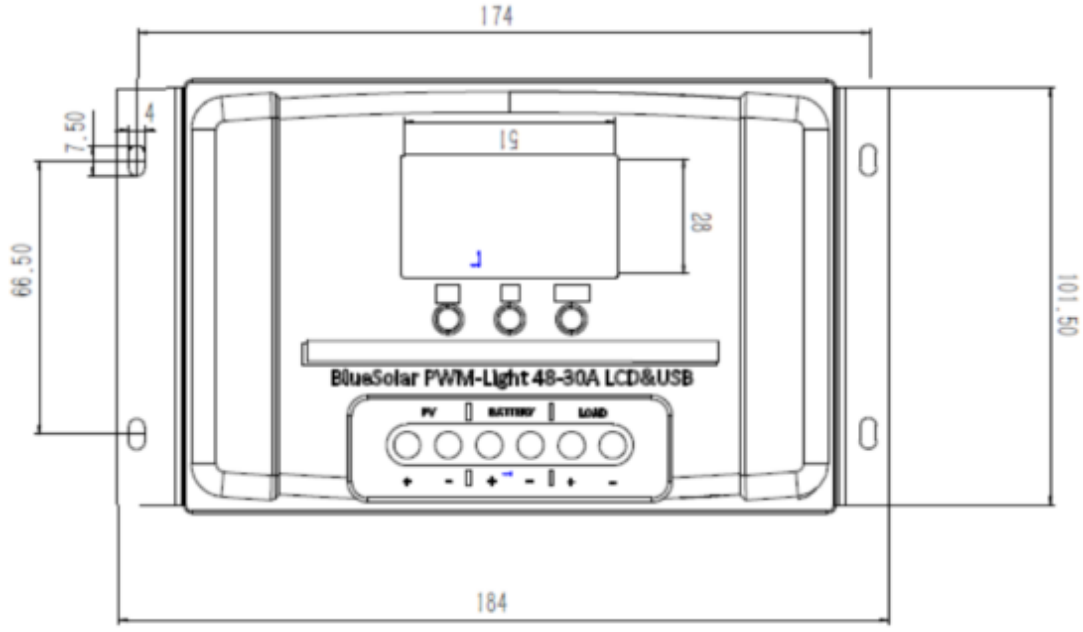
Specifications

BlueSolar Charge Controller	**12V/24V|30A**		**48V|10A**	**48V|20A**	**48V|30A**
Battery Voltage	12/24V Auto Select		48V		
Charge & Load Current	30A		10A	20A	30A
Charge mode	PWM, Time and Lighting Control				
Automatic load disconnect	Yes				
Maximum solar voltage	55V		100V		
Solar voltage range	15-28V	30-55V	60-100V		
Self-consumption	<15mA				
Protections	Reverse polarity connection of the solar panels. Reverse polarity connection o f the battery. Low voltage disconnect. 110%-130% load: Shuts down after 60sec. 130%-160% load: Shuts down after 5sec. Short circuit: immediate shut down. Over-temperature protection.				
Solar Panel					

Recommended solar panel array	36cell	72cell	2x72cell in series or 4x36cell in series		
Max Solar Input Power	360W	720W	480W	960W	1440W
USB outputs					
Voltage	5V				
Current	2A (total from 2 USB outputs)				
Default settings					
Absorption charge (b01)[1]	14.4V	28.8V	57.6V		
Float charge (b01)[1]	13.7V	27.4V	54.8V		
Load disconnect (b01)[1]	11.2V	22.4V	44.8V		
Load reconnect (b01)[1]	12.6V	25.2V	50.4V		
Enclosure					
Terminal size	16mm² / AWG6				

Weight	300gr
Dimension (h x w x d)	101.50×184.00×47.10 mm
Mounting	Vertical wall mount Indoor only
Humidity (non condensing)	Max. 95%
Operating temperature	-35°C to +60°C (full load)
Cooling	Natural convection
Protection class	IP20
Standards	
Safety	EN60335-1, IEC62109-1
EMC	EN61000-6-1, EN61000-6-3

Mechanical drawing



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Documents / Resources

	victron energy BlueSolar PWM Charge Controller - LCD - USB [pdf] User Manual BlueSolar PWM Charge Controller LCD - USB, BlueSolar, PWM Charge Controller

References

- Victron Energy