

Intelligent Solar Charge Controller User's Manual

Welcome

Thank you for purchasing the DBCSOLAR-40A Solar Charge Controller. Before operating your new product, please read these operating instructions carefully. They contain important information for safe use, installation and maintenance of the product.

Please keep this instruction manual for future reference. The manufacturer does not accept responsibility for any damages that may arise due to improper use. If you have any further questions regarding our products, please contact us at:

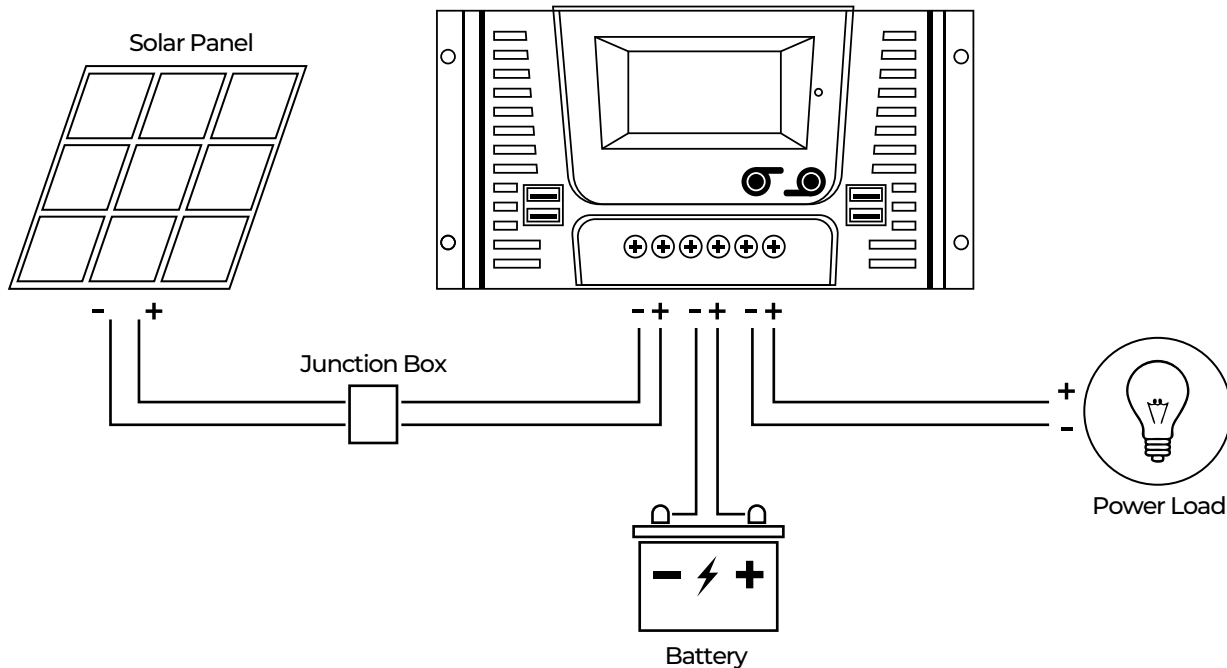
support@dbdrive.net

1. Product Features:

The DBCSOLAR - 40A Controller is a PWM charge controller with built in LCD that adopts the most advanced digital techniques. The multiple load control modes enable it to be widely used on solar off grid systems.

- System voltage of battery 12V/24V or 12V/24V/36V/48V automatic recognition.
- Intelligent 4 stages PWM charging: Bulk, Absorption, Equalize, Float
- LCD display with Back-lighting shows device's operating data and working conditions.
- Humanized simple button operation; Adjustable charge-discharge control parameters.
- Support more kinds of battery: Lead-acid battery (Sealed, Gel, Flooded) and Lithium battery (LiCoMnNiO₂, LiFePO₄).
- Multiple load control modes: 24Hours Working Control, Light Control, Light and Dual Time Control.
- Automatic temperature compensation and accumulated function of charge and discharge KWH.
- Double USB output 5V/2A.
- Perfect electronic protections.

2. System Connections



















2.1. Order of Connections

1. Connect the power controller to the battery.
2. Connect the load to the power controller.
3. Connect the solar panel to the power controller.

NOTE:

1. This series is a positive ground controller. Any positive connections to the solar panels, load or battery can be earth grounded.
2. The fuse should be installed as close to the battery as possible, the suggested distance is about 4 inches.
3. If the inverter or other load with large current requirements to start are installed in the system, please connect it with the battery, not the solar controller.
4. When disconnecting the system, the order will be reversed.

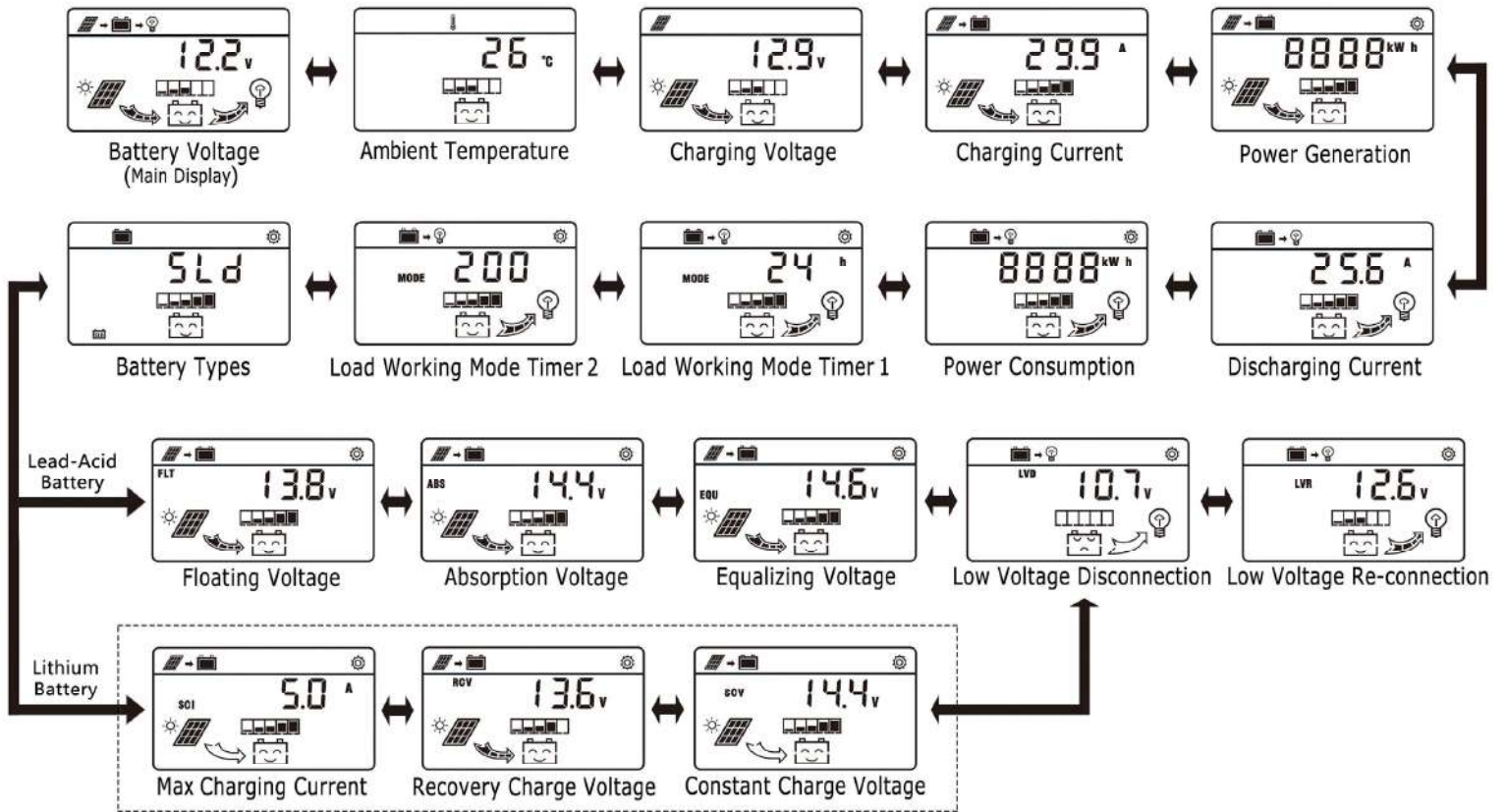
3. LCD System Icon Descriptions

Icon	Meaning	Icon	Meaning	Icon	Meaning
	Day		Data Relates to Charging	FLT	Float Charging
	Night		Data Relates to Discharging	ABS	Absorption Charging
	Charging		Data Relates to Temperature	EQU	Equalizing Charging
	No Charging		Data Adjustable	SCI	Max Charging Current
	Load On		Data not Adjustable	RCV	Recovery Charging Voltage
	Load Off		Sealed Battery	SCV	Constant Charging Voltage
	System Works Normally		GEL Battery	LVD	Low Voltage Disconnection Voltage
	System Works Abnormally		Flooded Battery	LVR	Low Voltage Re-connection Voltage

4. Button Functions

Modes	Operation
Browse Interface	Short press button “+” or “-”.
Load On/Off	When load in 24H working mode, short press button “-” in Main interface.
Parameter Setting	In the settable interface, long press button “+” into setting, and then short press “+” or “-” to set parameter, long press button “+” to save and exit. (Long press button “-” to cancel the parameter and back to last setting)
Factory Reset	Long Press button “+” 5s in the interface of Ambient Temperature.

5. Browse Interface



NOTE:

1. After the battery is connected, the LCD will go into the interface that automatically recognized the battery voltage level, 3 seconds later it will enter the main interface.
2. Equalizing charge will be after 90 times floating charge, or one charge in three months.
3. Default maximum charging current of lithium battery is 5A, but it can be adjusted by users within the rated current range.
4. Under the interface of accumulated KWH, long press button “+” to clear the value
5. When no operation for 30 seconds, the interface will return to the main menu and back-light will be turned off.

6. Battery Types

Icon	Battery Type
SLD	Sealed Battery (Default)
GEL	Gel Battery
FLD	Flooded Battery
USE1	Lead-Acid Battery (User-defined)
3.2-4	LiFePO4: 3.2V-4S /8S /12S /16S
3.2-5	LiFePO4: 3.2V-5S /10S /15S /20S
3.7-3	LiCoMnNiO2: 3.7V-3S /6S /9S /12S
3.7-4	LiCoMnNiO2: 3.7V-4S /8S /12S /16S
USE2	Lithium Battery (User-defined)

7. Battery Voltage Automatic Identification Range

Battery Types	Lead-Acid Battery	Lithium Battery			
		LiFePO4 3.2V-4	LiFePO4 3.2V-5	LiCoMnNiO2 3.7V-3	LiCoMnNiO2 3.7V-4
12V System	≤17.6V	≤18V	≤22.5V	≤15.9V	≤21.2V
24V System	≤29.9V	≤30.4V	≤38V	≤26.9V	≤35.8V
36V System	≤42.1V	≤42.8V	≤53.5V	≤37.8V	≤50.4V
48V System	>42.1V	>42.8V	>53.5V	>37.8V	>50.4V

6. Control Parameters of Lead-acid Battery

Lead-Acid Battery Types	SLD				GEL				FLD			
	12V	24V	36V	48V	12V	24V	36V	48V	12V	24V	36V	48V
Battery Voltage Level	12V	24V	36V	48V	12V	24V	36V	48V	12V	24V	36V	48V
Float Charging Voltage	13.8V	27.6V	41.4V	55.2V	13.8V	27.6V	41.4V	55.2V	13.8V	27.6V	41.4V	55.2V
Absorption Charging Voltage	14.4V	28.8V	43.2V	57.6V	14.2V	28.4V	42.6V	56.8V	14.6V	29.2V	43.8V	58.4V
Equalizing Charging Voltage	14.6V	29.2V	43.8V	58.4V	NO				14.8V	29.6V	44.4V	59.2V
Charging time of Absorption/Equalizing	2 Hours											

Lead-Acid Battery Types	SLD / GEL / FLD			
Battery Voltage Level	12V	24V	36V	48V
Low Voltage Disconnection	10.7V	21.4V	32.1V	42.8V
Low Voltage Re-connection	12.6V	25.2V	37.8V	50.4V
Load Over-Voltage Disconnection	16V	32V	48V	64V
Load Over-Voltage Re-connection	15.5V	31V	46.5V	62V

7. Control Parameters of Lithium Battery

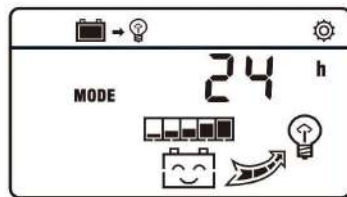
Lithium Battery Type	LiFePO4							
	3.2-4				3.2-5			
Icon	3.2-4				3.2-5			
Battery Serial Number	4S	8S	12S	16S	5S	10S	15S	20S
Recovery Charging Voltage	13.6V	27.2V	40.8V	54.4V	17V	34V	51V	68V
Constant Charging Voltage	14.4V	28.8V	43.2V	57.6V	18V	36V	54V	72V
Stop Charging Current	0.1A				0.1A			
Low Voltage Disconnection	11.2V	22.4V	33.6V	44.8V	14V	28V	42V	56V
Low Voltage Re-connection	12.8V	25.6V	38.4V	51.2V	16V	32V	48V	64V
Load Over-Voltage Disconnection	18.5V	37V	55.5V	74V	18.5V	37V	55.5V	74V
Load Over-Voltage Re-connection	18V	36V	54V	72V	18V	36V	54V	72V

8. Control Parameters of Lithium Battery

Lithium Battery Type	LiCoMnNiO2							
	3.7-3				3.7-4			
Icon	3S	6S	9S	12S	4S	8S	12S	16S
Recovery Charging Voltage	12V	24V	36V	48V	16V	32V	48V	64V
Constant Charging Voltage	12.6V	25.2V	37.8V	50.4V	16.8V	33.6V	50.4V	67.2V
Stop Charging Current	0.1A				0.1A			
Low Voltage Disconnection	9.9V	19.8V	29.7V	39.6V	13.2V	26.4V	39.6V	52.8V
Low Voltage Re-connection	11.1V	22.2V	33.3V	44.4V	14.8V	29.6V	44.4V	59.2V
Load Over-Voltage Disconnection	18.5V	37V	55.5V	74V	18.5V	37V	55.5V	74V
Load Over-Voltage Re-connection	18V	36V	54V	72V	18V	36V	54V	72V

9. Load Working Modes:

Under the load mode setting interface, long press button “+”, when Timer 1 or Timer 2 begin flashing, short press button “+” or “-” to set parameter, then long press button “+” to save and exit.



Load Working Mode Timer 1



Load Working Mode Timer 2

Icon	Load Working Mode Timer 1	Icon	Load Working Mode Timer 2
24h	Load 24 Hours working (Default).	200	Disable.
00h	Light Control: Load On since sunset, Load Off when sunrise.	200	Disable.
101~115	Load On for 1~15 hours since sunset.	200~215	Load On for 1~15 hours before sunrise.
-00h	Reversed Light Control: Load On since sunrise, Load Off when sunset.	200	Disable.

10. Protections

Solar Panel Reverse-Polarity

If the solar panel is connected with controller in reversed polarity, controller will not be damaged and will work as normal when correctly connected.

Battery Reverse-Polarity

If the battery is connected with the controller in reversed polarity(solar controller is not connected with solar pnel), controller will not be damaged and will work as normal when correctly connected.

Over-heating Proection

Once the internal temperature is detected to be higheer than a certain value by the controller, it will stop charging the battery. After the temperature drops, recharging the battery will automatically resume.

Battery Over-Current

Controller will stop charging when excess current is detected from the solar panel, and it will resume automatically after 2 minutes.

Load Over-load

The load will be turned off when the output current of the load exceeds its rated current for a while, and turned on automatically after 2 minutes.

Load Short-Circuit

Controller will be in protection state when the load is short circuited, and recharging will resume automatically after 2 minutes.

Battery Low-Voltage

Controller will turn off the load when the battery voltage is lower than the value preset for low-voltage disconnection. and turn on the load when the battery voltage reaches the value preset for low-voltage re-connection. The value for low-voltage disconnection and low-voltage re-connection can be set by users to a specific range.

Battery Over-Voltage

Controller will turn off the load when the battery voltage is higher than the value preset for over-voltage protection, and turn on the load when the battery voltage is 1V lower than the value preset for over-voltage protection.

Lightning Protection

The lightning protection function of the controller is limited and it is recommended to install devices for lighting protection on the input side to increase system reliability.

10. Troubleshooting

Error Code	Cause	Solution
E01	Battery Low-Voltage	Recharging the battery or change a new one.
E02	Load Over-Load	Check the loads connection or reduce the electric equipment.
E03	Load Short-Circuit	
E04	Load Over-Voltage	
E05	Solar Panel Over-Current	Check the power of solar panel or reduce the solar panel.

11. Technical Specifications

Max Current	10A/20A	30A/40A	50A/60A	80A
Battery Voltage	12V/24V Auto	12V/24V/36V/48V Auto		
Max PV Open Circuit Voltage	100V			
Self-consumption	≤30mA			
Loop Voltage Drop	≤0.3V			
USB Output	5V/2A *2			
Temperature Compensation	-4mV/°C/2V (25°C)			
Operating Temperature	-20°C~+50°C			
Protection Category	IP32			
Humidity	95%, no-condensing			
Terminals	8AWG/10mm ²	6AWG/16mm ²	4AWG/25mm ²	
Mounting Hole Size	137*52mm-Φ6mm	177*60mm-Φ5mm	190*104mm-Φ5mm	
Dimension	147*82*36mm	187*96*47mm	200*132*61mm	200*132*62mm
Weight	0.22KG	0.19KG	0.4KG	0.73KG