AIMS POWER™
www.aimscorp.net

User's Manual

SOLAR CHARGE CONTROLLER

SCC20APWM **SCC30APWM**

12V/24V 20A 30A

Your battery guard

※ Thank you for selecting the AIMS Power PWM solar charge controller.

Please read this manual carefully before using the product.

1.Overview

Experience the pinnacle of charging technology with our PWM Charge Controller. Designed with the most advanced digital technology, this controller ensures an intelligent charging process that optimizes battery life and enhances overall system performance.

- Molded red and black terminals distinguish plus and minus poles to help prevent reversing the polarity
- Controller works continuously at full load within the environment temperature range from -20 to 55 ℃
- 3-Stage intelligent PWM charging: Bulk, Boost and Float charging mode
- Supports 5 charging options: Sealed, Gel, AGM, Flooded and LiFePO4,Li(NiCoMn)O2 battery
- Easy to read LCD display provides real-time monitoring and easy access to system information
- Convenient USB port
- Intuitive button settings allow for easy programming
- DC load port
- Battery temperature compensation function
- Designed with multiple safety protections

2.Product Features

①	Temperature Sensor	⑤	USB Output Ports※
②	LCD	⑥	Load Terminals
③	Operation Button	⑦	Battery Terminals
④	Menu Button	⑧	PV Terminals

※ USB output port provides 5VDC/1A and has short circuit protection.

3.PWM Controller Charging Technology

Guidelines when sizing a solar charge controller

Solar Input power= Input voltage (V_{Mpp}) *input current (I_{PV})

Power into battery=Battery voltage (V_{Bat}) *battery current (I_{Bat})

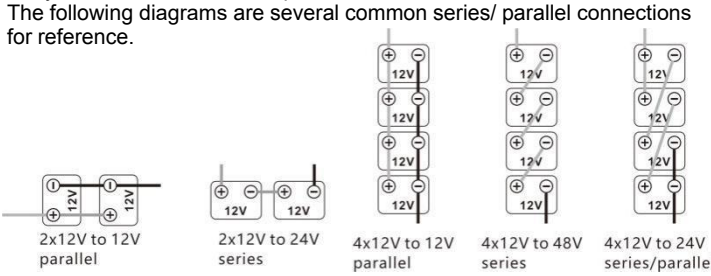
Battery Rated Voltage	PV Module							Controller Rated Voltage
	36 cell Voc < 23V			72 cell Voc < 46V		60 cell Voc < 38V		
	1S	2S	4S	1S	2S	1S	2S	
12V	√	—	—	—	—	—	—	12V
24V	×	√	—	√	—	√	—	24V

√: Match —:No match ×: No match, cannot charge.

⚠ “4S” means four solar panels are connected in series, and so on

Solar panel array and battery bank can change the voltage of the whole array and bank in series and parallel,

The following diagrams are several common series/ parallel connections for reference.



4.Wiring

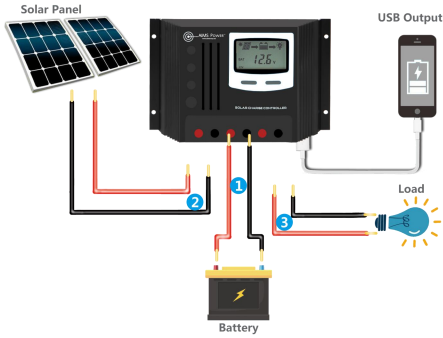
Step 1: Choose the installation site

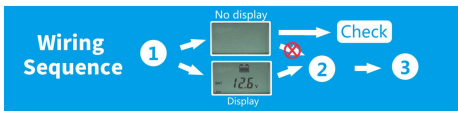
Do not install the controller in a location that is subject to direct sunlight, high temperature or where the unit can get wet. Make sure the ambient environment is well ventilated.

Step 2: Place the controller at a proper mounting surface, use a screw driver to fit screws in mounting hole and attach to surface.

⚠**CAUTION:** If the controller is to be installed in an enclosed box, it is important to ensure reliable heat dissipation through the box.

Step 3: Wiring





Connect the system in this order ❶ Battery first. Once the battery is connected, the LCD will turn on. If LCD is not on, stop connecting, and check whether the positive and negative poles are connected correctly. Only after the LCD in on can you continue to the next step. Always connect the battery first, this allows the controller to recognize the system voltage ❷ PV array ❸ Load. Disconnect the system in the reverse order ❸ ❷ ❶.

⚠**CAUTION: If an inverter is to be used in the system, connect the inverter directly to the battery, not to the load port of the controller. This will void the warranty if connected to the wrong port.**

The battery fuse should be installed as close to battery as possible. The suggested distance is within 6 inches.

The charge controller is a positive ground controller. Any positive connection of solar, load or battery should be earth grounded as required.

Add breakers or fuse to solar, battery, and load.

When the controller is in a normal charging state, disconnecting the battery may cause damage to the terminals. Do not disconnect unless PV is shut down and all other power sources are off.

5.Operation

6. Button

Mode	Note
Load ON/OFF	In load manual mode, it can turn the load On/Off via the “OPERATION” button(→)
Clear Fault	Press the “OPERATION” button(→)
Browsing Mode	Press the “MENU” button(←).
Setting Mode	Press the “MENU” button. and hold on 5s to enter the setting mode, Press the “OPERATION” button. to set the parameters, Press the “MENU” button. to confirm the setting parameters or no operation for 10s, it will exit the setting interface automatically.

6.1 Interface

(1) Status Description

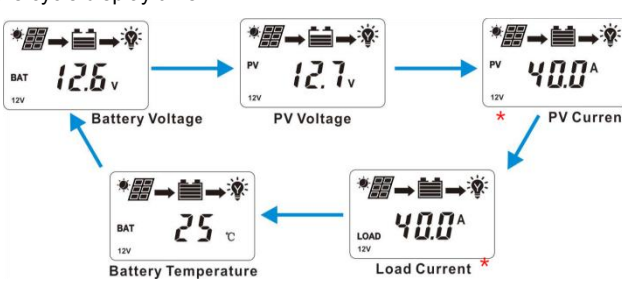
Item	Icon	Status
PV array		In daytime and PV connected correctly
		NO PV input:Maybe night or connecting is reversed
		No Charging
		In Float Charging Mode
		In Boost Charging Mode
	PV	PV Voltage, Current and Power
Battery		Battery Capacity Indicating
	12V24V48V	Current System Voltage
	BAT	Battery Voltage and Current
	BAT TYPE	Battery Type
Load		Load ON
		Load OFF
		Light and Time Control Mode
		Light Control Mode
	LOAD TYPE	Load Working Mode
	LOAD	Discharging Current and Work Status

(2) Fault Indication

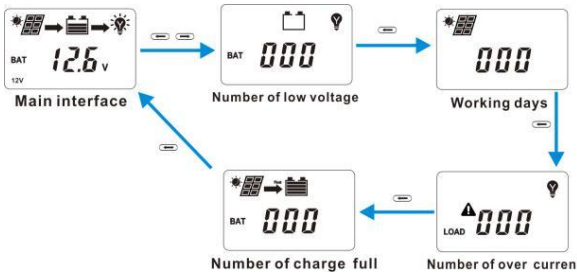
Status	Icon	Description
Battery over discharged		Battery level shows empty, battery frame blink, fault icon blink
Battery over voltage		Battery level shows full, battery frame blink, fault icon blink
Controller over temperature		Temp.Icon shows Temp. inside controller is higher than 75℃, temperature icon blink, fault icon blink
Load failure		Load overload ① ,Load short circuit
PV over voltage		It shows PV voltage is higher than rated PV open voltage.PV icon blink,fault icon blink

(3) Browse interface

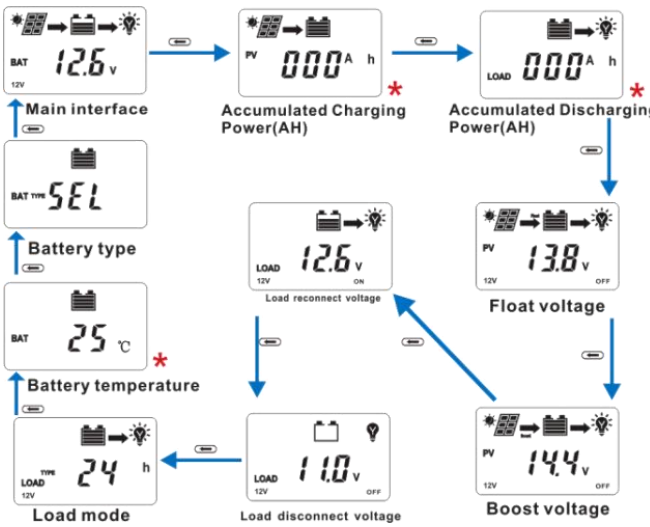
①If there is no operation within 20s in any interface or after powered on within 10s, the main interface will cycle to display the battery voltage, PV voltage, charging current, discharging current and battery temperature every 3s. Long press the “MENU” button (←) can speed up the cycle display time.



②At main interface(cycle display), long press menu and operation button at same time to enter working record status, it can show times of low voltage, working days, times of over current and times of full charging



③At main interface(cycle display), press the “MENU” button(←) and enter menu interface



6.2 Setting

(1) Clear the charging power and discharging power(AH)

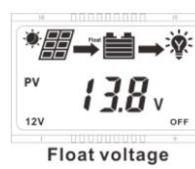
Operation:

Step 1: Press the “**OPERATION**” button and hold for 5s under the PV generated charging power interface and the value will be cleared.

Step 2: Press the “**OPERATION**” button and hold for 5s under the PV generated discharging power interface and the value will be cleared

(2) Float Voltage Setting

Operation:



Step 1: At main interface(cycle display),Press the “MENU” button to enter float voltage interface

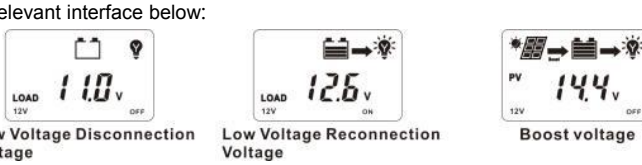
Step 2: Long press the “MENU” button(≥5S) until the value is flashing,then it enters the setting state.

Step 3: Press the “MENU” and “OPERATION” button to change the value

Step 4: After setting,Long press the “MENU” button(≥5S) to save the new setting.If there is no operation within 20s,the controller will enter the main interface and cycle to display automatically.

(3) Setting of boost voltage, low voltage reconnect voltage and low voltage disconnect voltage

Operation: At main interface(cycle display),Press the “MENU” button to enter the relevant interface below:



The operation method of setting is the same as float voltage setting,Please refer to the above”2)”

- **The following rules must be observed when modifying the parameter values in User**

Ⅰ.Charging Limit Voltage >Boost Charging Voltage >Float Charging Voltage > Boost Reconnect Charging Voltage.

Ⅱ.Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage(BMS+0.2V)

Ⅲ. Boost Reconnect Charging voltage > Low Voltage Reconnect

Voltage> Low Voltage Disconnect Voltage(BMS+0.2V)

- **Battery Voltage Control Parameters**

  Below parameters are in 12V system at 25 ºC, please double the values in 24V system

Battery Type	SEL 24V*2	GEL 24V*2	FLD 24V*2	LIF(LiFePO44S/12V 8S/24V*2)	LI3 (Li(NiCoMn)O2 3S/12V 6S/24V*2)
Over Voltage Disconnect	16.0V	16.0 V	16.0 V	16.0V	17.5 V
Charging Limited Voltage	15.0 V	15.0 V	15.0 V	14.8V	17.0 V
Over Voltage Reconnect	15.0 V	15.0 V	15.0 V	14.8V	17.0 V
Boost charge	14.4 V	14.2 V	14.6 V	14.6V	12.6V
Float charge	13.8 V	13.8 V	13.8 V	14.4V	12.4V
Boost Restart Voltage	12.6V	12.6V	12.6V	13.0V	11.5V
Low voltage reconnect	12.6V	12.6V	12.6V	12.6V	11.0V
Low voltage disconnect	11.0V	11.0V	11.0V	10.5V	9.2V

(4) Load Working Mode

The default working mode of the controller is 24 hours, which means that as long as the battery has enough energy, the controller can supply power to the load continuously.

Operation:

Step 1: At main interface(cycle display),press the “MENU” button to enter load mode interface.

Step 2: Long press the “MENU” button(≥5S) until the 24H is flashing, then it enters the setting state.

Step 3: Press the “MENU” and “OPERATION” button to change the value

Step 4: After setting,long press the “MENU” button(≥5S) to save the new setting. If there is no operation within 20s, the controller will enter the main interface and cycle to display automatically.

Hours	Light and Timer Control
24H	Load will always be on
1H	Load will be on for 1 hour after sunset
2H	Load will be on for 2 hours after sunset
3H~14H	Load will be on for 3 ~ 13 hours after sunset
14H~23H	Load will be on after sunset and be off before sunrise.

(5) Supported Battery type

Lead-acid battery	Sealed(default)/Gel/Flooded/User
Lithium battery	LiFePO4(LF4/12V;LF8/24V)
	Li(NiCoMn)O2 (LI3/12V;LI7/24V)

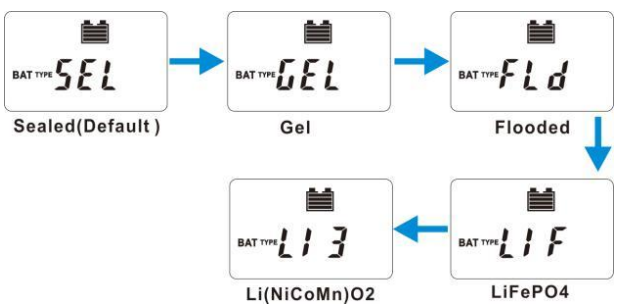
Setting the battery type via LCD

Step 1: At main interface(cycle display), press the “MENU” button to enter battery type mode interface.

Step 2: Long press the “MENU” button(≥5S) until the “SEL” is flashing, then it enters the setting state.

Step 3: Press the “MENU” and “OPERATION” button to confirm the battery type below:

Step 4: Long press the “MENU” button(≥5S) to save the new setting. If there is no operation within 20s, the controller will enter the main interface and cycle to display automatically.

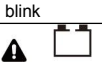


7. Protections, Troubleshooting and Maintenance

7.1 Protection

PV Short Circuit	When not in PV charging state, the controller will not be damaged in case of a short-circuiting in the PV array.
PV Reverse Polarity	When the polarity of the PV array is reversed, the controller may not be damaged and can continue to operate normally after the polarity is corrected.
Night Reverse Charging	Prevents the battery from discharging through the PV module at night.
Battery Reverse Polarity	Fully protected against battery reverse polarity; no damage will occur for the battery. Correct the wrong wiring to resume normal operation. **NOTE: Limited to the characteristic of lithium battery, when the PV connection is correct and battery connection reversed, the controller will be damaged.**
Battery Over Voltage	When the battery voltage reaches the over voltage disconnect voltage, it will automatically stop battery charging to prevent battery damage caused by over-charging.
Battery Over Discharge	When the battery voltage reaches the low voltage disconnect voltage, it will automatically stop battery discharging to prevent battery damage caused by over-discharging. (Any controller connected loads will be disconnected. Loads directly connected to the battery will not be affected and may continue to discharge the battery.)
Load Short Circuit	When the load is short circuited (The short circuit current is ≥ 2 times the rated controller load current), the controller will automatically cut off the output. The controller will reconnect the output automatically every 30s to judge whether the short circuit is relieved , it needs to be cleared by pressing the operation button or restarting the controller.
Load Overload	When the load is overloading (The overload current is ≥ 1.1 times the rated load current), the controller will automatically cut off the output. If the load reconnects automatically every 30s, it needs to be cleared by pressing the Load button restarting the controller or restarting the controller.
Controller Overheating	The controller is able to detect the temperature inside the controller. The controller stops working when its temperature exceeds 85 °C and restart to work when its temperature is below 65 °C.

7.2 Troubleshooting

Possible reasons	Faults	Troubleshooting
PV array disconnection	LCD display during daytime 	Confirm that PV wire connections are correct and tight.
Battery voltage is lower than 8V	Wire connection is correct, the controller is not working.	Please check the voltage of battery. At least 8V voltage to activate the controller.
Battery over voltage	 Battery level shows full, battery frame blink, fault icon blink	Check if battery voltage is higher than OVD(over voltage disconnect voltage), and disconnect the PV.
Battery over discharged	 Battery level shows empty ,battery frame n blink	When the battery voltage is restored to or above LVR(low voltage reconnect voltage), the load will recover
Load Overload	 1. The load is no output 2.Load and fault icon blink	①Reduce the number of electric equipment. ②Restart the controller.
Load Short Circuit		①Carefully check load connection, clear the fault. ②Restart the controller.

7.3 Maintenance

The following inspections and maintenance tasks are recommended at least two times per year for best performance.

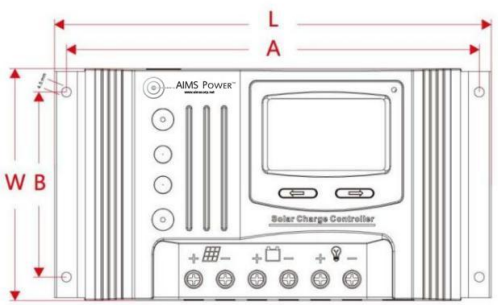
- Make sure controller is firmly installed in a clean and dry environment.
- Make sure there is no blocked air-flow around the controller. Clear up any dirt and fragments on radiator.
- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Confirm that all the terminals have no corrosion, insulation

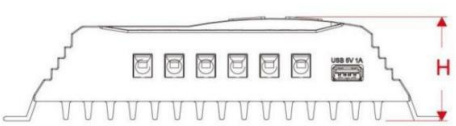
damaged,high temperature or burnt/discolored sign,tighten terminal screws to the suggested torque.

- Check for dirt, nesting insects and any foreign objects within the system.

8. Technical Specifications

Model	SCC20APWM	SCC30APWM
System Voltage	12V/24V	
PV Max Input Voltage	55V	
Self-consumption	<10mA	
Max Charging current	20A	30A
Max Discharging current	20A	30A
Battery Type	Sealed Lead /Gel/Flooded/LiFePO4/ Li(NiCoMn)O2/ User）	
LVD	11.0V ADJ 9V-12V:x2/24V	
LVR	12.6V ADJ 11V-13.5V:x2/24V	
Float Voltage	13.8V ADJ 13V-15V : x2/24V	
Boost Voltage	14.4V ADJ 13V-17V:x2/24 battery voltage less than 12.6v auto boost 2hrs	
Battery Over Voltage Protection	16.5V : x2/24V	
Reverse Connection Protection	Yes	
Load Over Current Protection	Yes, each 30s auto restart	
Controller Over V,C,T Protection	Yes	
Charging Type	PWM	
Temperature Consumption	-24 mV /°C for 12Vsystem ; x2/24V	
Working Temperature	-20°C -55°C	
Dimensions(L×W×H)	6.61" x 3.6"x 1.35"	8 " x 3.85"x 2 "
Weight	11oz	1 lb
Terminals	10mm²	16mm²
Mounting Holes	6.14"×2.44"	7.44"×2.44"





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1 Year Warranty from date of purchase.
Details regarding warranty can be found on our website.