

MANUAL V2.0

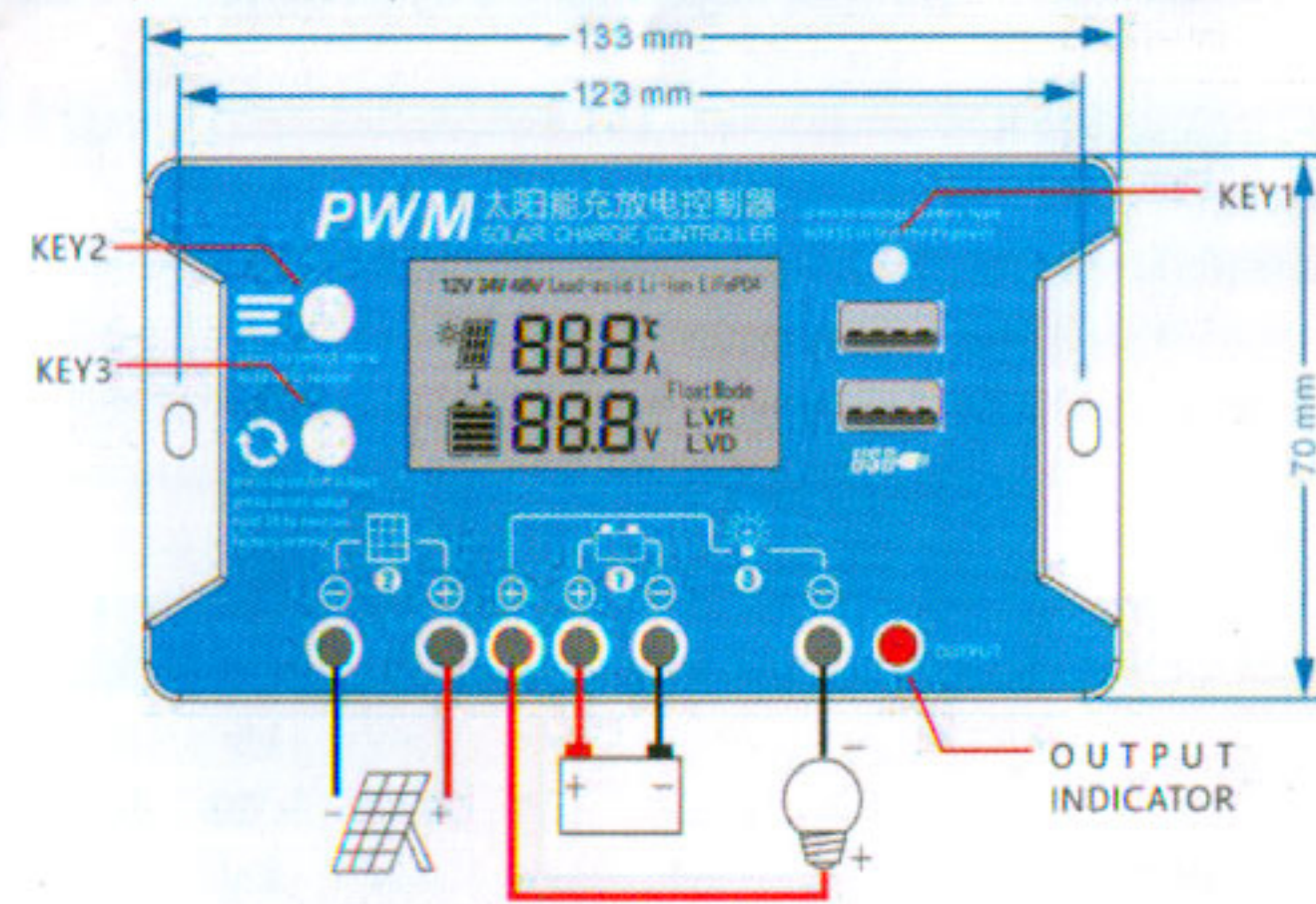
SAFETY INSTRUCTIONS

1. This controller is a 12V / 24V controller. When installing for the first time, make sure that the battery has enough voltage so that the controller can recognize the correct battery type.
2. Install the controller as close to the battery as possible to avoid voltage drop caused by too long wire, which will affect the normal voltage judgment.
3. This controller is applicable to 12 / 24V lead-acid battery, lithium-ion battery and lithium iron phosphate battery. Please pay attention to select the corresponding battery type in the menu. The wrong battery type may cause overcharge of the battery, which may lead to fire or explosion and other safety accidents.
4. This controller can only use PV as the charging source, do not use DC power as the charging source.
5. The controller will generate heat when running. Please pay attention to install the controller on a flat and well ventilated surface.
6. This product can not be used in series or parallel!
7. This product is not waterproof! Humid environment will corrode the circuit board, damage the controller and lose the warranty!
8. Do not install the product in the car, the temperature inside the car in summer will be as high as 70 °C or above, which will cause the controller to burn!

PRODUCT FEATURES

1. Adopt intelligent high-speed main control chip.
2. Large screen LCD display with adjustable charging and discharging parameters.
3. PWM charging management.
4. built-in reverse connection protection, over charge and over discharge protection, high temperature protection, over current / short circuit protection, all are self restoring without damage to the controller.
5. Dual MOS anti backflow circuit, low heat output.

SYSTEM CONNECTION



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 consumer to the charge regulator - plus and minus.

The reverse order applies when deinstalling!
An improper sequence order can damage the controller!

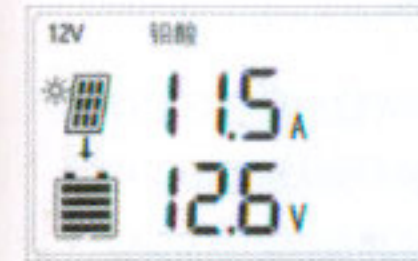
KEY FUNCTION

- KEY1** F1: click to switch the battery type.
F2: hold for 5S to test the PV panel (refer to the following text PV panel test).
- KEY2** F1: click to enter menu 1-10 in sequence.
F2: in the main interface, long press to restart the controller.
- KEY3** F1: in the main interface, click to manually control the load switch, long press can restore the factory settings and restart.
F2: in the interface 1-10, click to adjust the parameter value, long press to restore the default factory value.

F3: click to exit if an error happened.

DISPLAY/SETTING

1. After power on, click KEY2 to enter each interface to view parameter settings, as shown in the figure below.
2. In the settable interface, click KEY3 to adjust the value and save it automatically, or long press KEY3 to restore the factory default value.



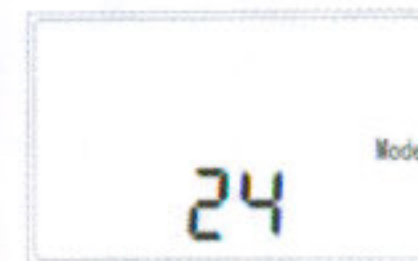
main interface

The main display interface can display the battery voltage, generating current, battery capacity, battery type, etc.



interface 1

Discharging ampere display.



interface 2

Load output timer control

- 【24】 -output turn on all the time.
 - 【00】 -output turn on only during Dusk to Dawn(D2D).
 - 【1~23】 -output turn on after sunset and turn off after 1~23H.
- Attn: no matter which is selected ,output will turn off when battery is in a LVD condition.



interface 3

controller's body temperature display,if the controller gets too hot during running ,it will automatic shut down and wait for the temperature to drop to normal level ,and then it will work again.



interface 4

Charge voltage setting
Different battery types have different maximum charging voltage. Consult your battery supplier for more information.
Default setting is recommended.



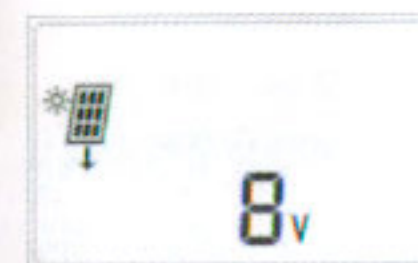
interface 5

Low voltage re-connect (LVR) setting
When a low voltage disconnect happens,the controller will wait until the voltage raise more then this voltage,then it will re-connect the load again.
Default setting is recommended.



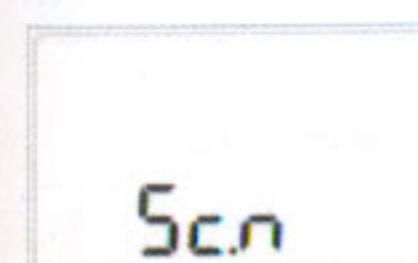
interface 6

Low voltage disconnect (LVD)setting.
When battery voltage is lower than this voltage,the controller will cut off the output automatically .
Default setting is recommended.



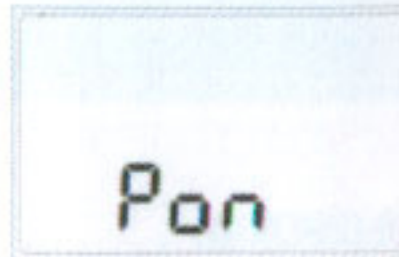
interface 7

D2D trigger value(solar panel voltage)
When the work mode is D2D or Timer,the controller will detect the solar panel voltage to decide whether its day or night,so to decide to enable load output or not.the higher this value is,the earlier it enables the load output.
Default setting is recommended.



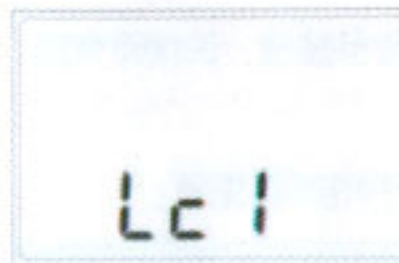
interface 8

Short-circuit protection setting.
Some inductive or capacitive consumer will trigger the short-circuit protection during start up,therefore,you can disable the SC-protection manually.
SC.F=OFF, SC.n=ON.the default is ON.
Default setting is recommended.



interface 9

PWM charging enable
PWM could generate noise and interference which will trigger a high voltage protection in a Li-Battery BMS system.Therefore,to avoid this happen,you can choose to disable the PWM charging.The controller will charge the battery until Setting voltage(Menu NO.4),then it will fully stop charging,when battery voltage drop ,it will re-charge again.
P.on=PWM ON, P.oF=PWM OFF.
Default setting is P.on.



interface 10

Output mode control.
Normally a LED light connected to the output terminal will work only after sunset,therefore,LC1 can be selected.But some load equipment requires to work only after sunrise,for example,a camera or a pump,therefore ,you can choose LC2.
LC1 and LC2 are logically opposite on D2D control.
If you have set a timer(1-23H)control,for example 16H,but in reality the night /day is only 12Hour.LC1/2 means output work only 12H(any sunset or sunrise will stop the countdown) ,but LC3/LC4 will work 16H(ignore any sunset or sunrise and countdown until setting hours). Default setting is LC1.

UNUSUAL DISPLAY

Battery low voltage warning .
To prevent damage of the battery, Output automatic disconnect when battery voltage drop below LVD voltage and automatic re-connect if raise above LVR voltage.
Press KEY3 to ignore for one time and force to work again.

Battery high voltage warning .
To prevent damage of the load equipment , Output automatic disconnect when battery voltage raise above HVD voltage and automatic re-connect if drop below HVR voltage.
Press KEY3 to ignore for one time and force to work again.

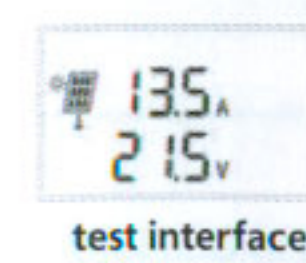
Output over current warning.
Load current exceed rated current,if it does not resume within 60 seconds,it will turn into E04 warning.
Press KEY3 to ignore for one time and force to work again.

Output short-circuit warning.
Output automatic disable when there is a short-circuit and will resume after 10 seconds.

High temperature warning .
when the temperature of the controller exceeds 80 °C , it will enter stand-by mode and stop charging or discharging until the temperature falls to 70 °C .
Press KEY3 to ignore for one time and force to work again.

PV over-voltage warning .
In order to protect the internal circuit,Charging automatic stop when PV voltage exceed 50V and automatic recover when voltage drop below 45V.(for 12V/24V system)

PV TEST



test interface

When the controller is not abnormal, after connecting the battery and PV, long press the KEY1 (more than 5 seconds), then the controller will display the open circuit voltage and the maximum working current of the PV. This value has a certain reference significance for detecting whether the PV power is false or declining. Note that the display value is also affected by ambient light, occlusion, installation angle, etc.

FAQ

Q:why the controller is not showing charging when I connect the solar panel?
A:please carefully check the solar panel wires are connected correctly,and there is no reverse.the PV voltage should be higher than the voltage of the battery,any sewage or shadow on the PV will cause the voltage drop,please use a 18V PV to charge a 12V battery under normal circumstances.

Q:why is my charging current very low?

A:use more solar panel and stronger sun light will increase the charging current,otherwise,using the wrong PV voltage or sewage and shadow on the PV will reduce the charging current.in addition,when the battery voltage is high it will enter float charging mode,also the charging current will become smaller.

Q:why my consumer is off?

It could be wrong working mode,like setting the work mode to D2D,but you are asking why my consumer is off during the daytime.or battery is not enough and a low-voltage disconnect has happened.or your consumer is broken,to check that ,you can directly connect your consumer to the battery to see if it is working,please carefully check the wires and so.

Q:the solar power stored is not enough to supply the consumer

A:if the power generated by the solar panel is less than the consumer used,the consumer will have to get the power from the battery storage.and day by day,it will cause a LVD finally at some moment,please use more solar panel and add more battery capacity to prevent cloudy or rainy day,or you can reduce the watt of the consumer or working time to balance the system.

Q:why my battery runs out of power very quickly after it is fully charged?

A:your battery could have been used for a very long time,and after few hundred of cycling, its dying,a dying battery will not have the capacity to keep the electricity.run a simple test like this,when your charge your battery ,the voltage raise very quickly ,and when you discharge it again,it drops very quickly,this means you should change your battery.

TECHNICAL PARAMETER

System Voltage	12V/24Vauto
Rated PV current	10~30A
Rated LOAD current	10A
MAX.PV input	<50V 1. For 12V battery, use 18V solar panel 1. For 24V battery, use 30-36V solar panel Do not use 30-36V solar panel to charge 12V battery!!
MAX.Wire size	15mm ² /6AWG
USB output	5V/2A total
Standby lost	<10mA@ 12V
Working temp.	-35~+60 °C
Size/Weight	133*70*21.5mm /150g
Mounting hole size	119.5mm

VOLTAGE PARAMETER

	12V	12V	12V	24V	24V	24V
Battery type	Lead acid	3s Li- ion	LiFePO 4	Lead acid	7s Li- ion	LiFePO 4
High voltage disconnect	16V	16V	16V	32V	32V	32V
High voltage re-disconnect	15V	15V	15V	30V	30V	30V
Float	13.7V	12.3V	14.0V	27.4V	28.7V	28V
Low voltage re-disconnect	12.0V	10.5V	12.0V	24.0V	24.5V	24.0V
Low voltage disconnect	10.7V	9.5V	11.2V	21.4V	22.1V	22.4V

*Product specifications are subject to change without prior notice.

WARRANTY

A The warranty period of this product is one year. If the product fails during the warranty period, it is a poor quality or manufacturing problem of components, the company provides free warranty and parts replacement.

B Product damage caused by the following reasons cannot be used normally and is not covered by the warranty.

1. Damage caused by use and installation not in accordance with the instructions,
 2. Product damage caused by human or accident.
 3. Any repair or modification not approved by the company or the seal sticker of the product is broken.
 4. Aging, bruise and scratch of product surface shell.
 5. Improper input voltage, high temperature, water inflow, mechanical damage, falling, serious oxidation or rust of products, etc.
- C After the expiration of the warranty period, users can still get the maintenance services provided by the company, but they need to pay the corresponding fees.