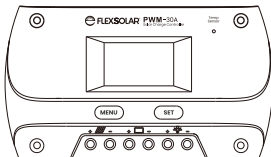

30A PWM SOLAR CHARGE CONTROLLER

INSTRUCTION MANUAL & WARRANTY

MODEL: PWM-30A
P/N: FLX-PWM-30A



30A PWM SOLAR CHARGE CONTROLLER

Thank you for purchasing this FLEXSOLAR® product. Before operating, please read these instructions carefully. This instruction manual contains information for safe use and maintenance of the product.

Please keep this instruction manual in a safe place for future reference.

The manufacturer does not accept responsibility for any damages due to not following these instructions.

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GENERAL

Please carefully read the following operation and safety instructions. Non-compliance with these instructions may void the product warranty.

This guide contains information regarding the operation and safe handling FLEXSOLAR® solar charge controller. All operations must be read and understood before attempting operation. If there are any questions, please contact your dealer or FLEXSOLAR® customer support for further information.

The user should conform to all safety precautions in the guide when using the solar charge controller. Before using a solar photovoltaic system (including cable, power station or other electric equipment), the user should be familiar with the mechanical and electrical requirements for photovoltaic systems. Keep this guide in a safe place for future reference.

PRODUCT OVERVIEW

30A PWM (FLX-PWM-30A)

Thank you for selecting FLEXSOLAR SOLAR CHARGE CONTROLLER. The controller is a PWM charge controller with a built-in LCD display that uses the most advanced digital technology. The multiple load control modes enable the controller to be widely used on solar home system, traffic signal, solar street light, solar garden lamp, etc.

The Features Are Listed Below:

- High quality components of ST (ST Microelectronics), ensures product's lifespan.
- Controller can work continuously at full load within the environment temperature range from -4°F to 131°F (-20°C to 55°C).
- 3-Stage intelligent PWM charging: Bulk, Boost and Float.
- Supports 3 charging options: flood, lead acid, GEL.
- LCD Display design, dynamically displaying device's operating data and working condition.
- USB design, the power supply charge for electronic equipment.
- With user-friendly button settings, operation is more comfortable and convenient.
- Multiple load control modes.
- Battery temperature compensation function.
- Built-in short-circuit protection, open-circuit protection, reverse protection and overload protection.

PRODUCT SPECIFICATIONS

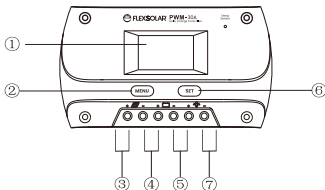


Figure 1 Characteristic

①	LCD	⑤	Load Terminals
②	MENU Button	⑥	SET Button
③	Solar Panel Terminals	⑦	USB Output Ports※
④	Battery Terminals		

※ USB Output port provide the power supply of 5V/2A and have the short circuit protection.

SAFETY INSTRUCTIONS

- Make sure your battery has enough voltage for the PWM to recognize the battery type before first installation.
- The battery cable should be as short as possible to minimize loss.
- The PWM is suitable for lead acid batteries (Flood, AGM, GEL) (please make sure the PWM is set for the right type of battery before usage). It is not suited for nickel metal hydride, or other types of batteries.
- The PWM is only suitable for regulating solar modules. Never connect any other charging source to the PWM.
- It is normal for the PWM to be hot when the PWM is at work. Please install the PWM on a flat and well-ventilated place.

TECHNICAL SPECIFICATIONS

Model	PWM-30A
P/N	FLX-PWM-30A
Max.charge Current	30A
System Voltage	(GCLT24**): 12/24V
Max. Input Voltage	(GCLT24**): 50V
Suitable Battery Type	Sealed、 GEL、 Flood
LVD	11.0V ADJ 9V...12V
LVR	12.6V ADJ 11V...13.5V
Float Voltage	13.8V ADJ 13V...15V
Boost Charging	14.4V
Battery Over Voltage Protection	16.5V
Temperature Compensation	-24mV/°C for 12V system
Points for Attention	Technical data for 12V battery system at 25°C twice in 24V system. fourfold in 48V system
Reverse Connection Protection	Yes
Load Over Current Protection	Yes, every two minutes restart once
Charge Type	PWM
Working Temperature	-4°F to 131°F (-20°C to 55°C)
Terminal Scale	28 – 10 AWG
Waterproof Grade	IP32
Size	6.4 x 3.7 x 1.5 INCH (162 x 95 x 39 MM)
Net Weight	0.68 LB (310 G)

NOTE:

- (1) Charging parameters may vary based on availability of sunlight on the solar panels.
- (2) Product specifications are subject to change without notice.
- (3) Bold italic typeface voltage *2,*4 while using 24/48 system.

TROUBLESHOOTING

Situation	Problem	Solution
Charge icon not on when sunny	Solar panel opened or reversed	Reconnect
Load icon off	Mode setting wrong	Set again
	Battery low	Recharge
Load icon slow flashing	Over load	Reduce load watt
Load icon fast flashing	Short circuit protection	Auto reconnect
Power off	Battery too low/ Reverse	Check battery/ Connection

BEFORE USING

WHAT'S IN THE BOX

Make sure you have **all** the following items included in the package. If any item is damaged or missing, contact your dealer.

- 1 x PWM Controller: 30A/(12/24V)
- 1 x User Manual

OPERATION

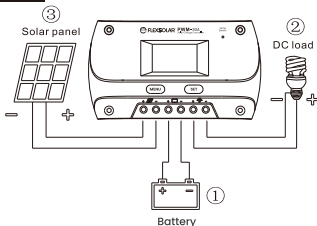


Figure 2 Connection Diagram

(1) Connect the components to the charge controller in the sequence as shown above and pay close attention to the “+” and “-” . When disconnecting the system, the order will be reversed.

(2) After power on the controller, check the LCD Display. If there's no display on the LCD screen, please go back to step (1). **Always connect the battery first, in order to allow the controller to recognize the system voltage.**

(3) This series is a positive ground controller. Any positive connections of solar, load or battery can be earth grounded as required.

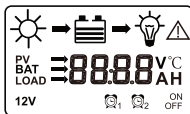
NOTE:

Please connect the inverter of the other load that has the large start current to the battery rather than to the controller, if the inverter or other load is necessary.








BUTTON FUNCTION

Mode	Remark
Load Switch	Press the SET button to switch the load
Error Clearing	Press SET button
Browsing Mode	Press MENU button
Setting Mode	Press and hold MENU button for 3 seconds and enter setting mode. Press MENU or SET button to set parameters, press and hold MENU button for 3 seconds to confirm modification; If no operation for 10s, it exits the interface automatically.

LCD DISPLAY



STATUS DESCRIPTION

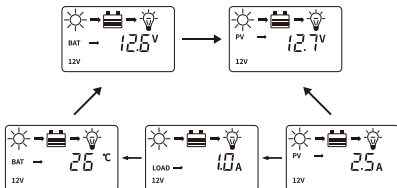
Item	Icon	Status
Solar Panel	 	No charging (30A)
Battery	 	Charging
Load		Battery Capacity
		Load ON
		Load OFF

MAIN INTERFACE

- The controller will have 1s initialization interface after it is electrified, then go into the main interface.



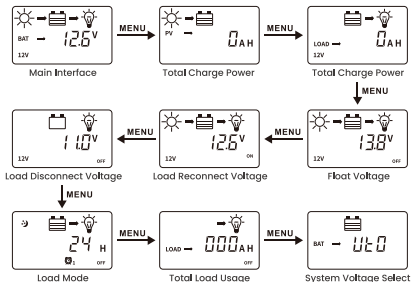
- If there is no operation at the main interface for 20s, the main interface will auto rotate among voltage of battery, voltage of solar panel and temperature of environment. Keep each interface in the 3s and long press.
- Press and hold the "SET" button for more than 5s, it will speed up auto rotation at main interface. Let go of the button and it will stop speed up.



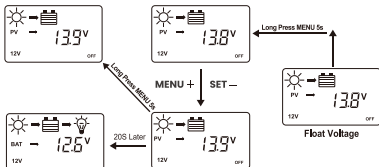
- Press "SET" button under main interface could open or close the load output.



- Press the "MENU" button to get into the next menu under the main interface.



(A) Float Voltage Set Up

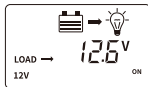


This parameter is High Voltage Disconnection (HVD) voltage. (Boost state voltage will increase 0.6V based on HVD) The controller will start PWM function at this point (HVD), limited voltage rising.

Press "MENU" button join in float voltage menu. Long press "MENU" button $\geq 5S$, The parameter on the interface will flash, this is the set up state. Let go of the button, press "MENU" button again could operate plus data, press "SET" button could operate minus data. After finishing the needed technical data, long press "MENU" button again $\geq 5S$, The parameter saves and is set up. If there is no operation, automatically go back to the main interface.

(B) Low Voltage Reconnection Voltage (LVR)

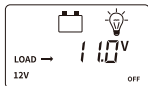
When the voltage of the battery is low the controller will stop offering power to the load. If the controller needs to be reconnected to the output, the voltage of battery must be higher than LVD voltage or press "SET" button forcing it to release. The procedure is same with (A).



Load Reconnect Voltage

(C) Low Voltage Disconnection Voltage

When the voltage of the battery is low, the load output will be cut off. When the controller detected the battery voltage was less than LVD point, the cut off function will be immediately working. At the same time the status of the controller is locked. Users have to charge the battery, when the battery voltage is higher than LVD voltage or press "SET" button forcing it to release. The load output will be back. The procedure is same with (A).



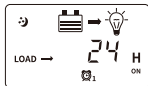
Load Disconnect Voltage

Above (A)、(B)、(C) three parameter default data was fully considered by designer according to the actual use. Generally, users don't need to adjust. If you must make the adjustment, please refer to the battery supplier's suggestion, or the battery will be damaged or irreparable destroyed.



(D) Load Working Mode Selection

The control default load working is 24 hours. When the load working time sheet is set to 24 hours, the load will keep working 24 hours in no fault status. When the load working time set to $\leq 23H$, it means the load start timer or sensor function. If the battery



Load Mode

capacity is enough, the load will be started at sunset. The load will work under timer setting hours or stop working till sunrise.

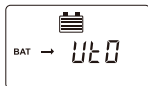
When the load joins into the timer or sensor mode, if the reset working time is more than actual night time, the load output will be closed at sunrise, although the working time has not reached the set hours. For example, the local actual night time is 10 hours, user resets the working time at night to 12 hours, but 10 hours later the output will be closed automatically, the balance hours will be back to zero. The load will be working with next sunset signal.



(E) System Voltage Select

This parameter is designed for customers wide range voltage requirement. The default display "UT0" system voltage 12/24V auto.

When battery voltage is more than 18V, the controller will automatically change to 24V system with 24V control data. When battery voltage is less than 18V, the controller will automatically change to a 12V system with 12V control data.



System Voltage Select

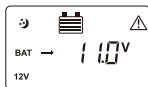
If the system voltage is set to "1", the controller will work under 12V version forever. The battery voltage is not valid. The reset data will be working after reconnection.

If the system voltage is set to "2", the controller will work under 24V version forever. The battery voltage is not valid. The reset data will be working after reconnection.

PROTECTION

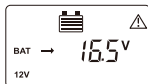
BATTERY LOW VOLTAGE PROTECTION (LVD)

When battery voltage is less than 11V, the LVD protection will be started. The output is cut off, at the same time the battery symbol and warning flash. Please increase charge current or increase charge time. When the battery voltage is over 12.6V, the LVD protection will be shut off. If the load output does not come back, press "SET" button to unlock at main interface.



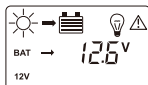
BATTERY OVER VOLTAGE DISCONNECTION (OVD)

When the voltage of the battery is more than 16.5V, the over voltage protection will be started. The load cut off, at the same time the load and warning symbol flash. When the voltage of battery was decreased to 15v, the protection will be released. The output of the load will be back.



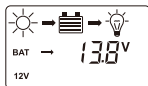
LOAD OVER CURRENT PROTECTION

When the load is short circuit or overload, the output cut off, at the same time the load symbol and warning flash. Please confirm if there is short circuit on the load terminal, decrease the power of the load. 30s later the controller will be auto restart with unlock, or press "SET" button force to unlock at main interface.



HIGH VOLTAGE DISCONNECTION PROTECTION (HVD)

When the battery is charged to 13.8V, the PWM function will be started, the charge symbol will be flashing, and the voltage of battery will be limited.



Protection	Conditions	Status
Solar Panel Reverse Polarity	When the battery is correctly connected, the solar panel connection is reversed	The controller is not damaged
Battery Reverse Polarity	When the solar panel is not connecting, the battery can be reversed	
Battery Over Voltage	The battery voltage reaches to the HVD	Stop charging and Stop discharging
Battery Over Discharge	The battery voltage reaches to the LVD	Stop discharging
Load Overload	The load current exceeds the rated current of controller	Output is OFF Clear the fault: Press the SET button or restart the controller

TROUBLESHOOTING

FAULTS	POSSIBLE REASONS	TROUBLESHOOTING
The LCD is off during daytime when sunshine shoots on solar panel properly	Solar panel disconnection	Confirm that solar panel wire connections are correct and tight
Wire connection is correct, LCD not display	(1) Battery voltage is lower than 9V (2) Solar panel voltage is less than battery voltage	(1) Please check the voltage of battery. At least 9V to activate the controller (2) Check the solar panel input voltage which should be higher than battery's
Interface E12	Battery over voltage	Check if the battery voltage is higher than OVD point (over voltage disconnect voltage), and disconnect the solar panel
Interface E11	Battery over discharged	When the battery voltage is restored to or above LVR point (Low Voltage Reconnection Voltage), the load will recover
Interface E13	Over load	Please reduce the number of electronic equipment or check loads connection carefully

WARRANTY STATEMENT

FLEXSOLAR® warrants to the original consumer purchaser that the FLEXSOLAR® product will be free from defects in workmanship and material under normal consumer use during the applicable warranty period identified in the "Warranty Period" section below, subject to the exclusions set forth below. This warranty statement sets forth FLEXSOLAR® total and exclusive warranty obligation. We will not assume, nor authorize any person to assume for us, any other liability in connection with the sale of our products.

WARRANTY PERIOD:

The warranty period is 24 months. In each case, the warranty period is measured starting on the date of purchase by the original consumer purchaser. The sales receipt from the first consumer purchase, or other reasonable documentary proof, is required in order to establish the start date of the warranty period.

REMEDY:

FLEXSOLAR® will repair or replace (at FLEXSOLAR® option) any FLEXSOLAR® product that fails to operate during the applicable warranty period due to defect in workmanship or material. If a valid claim is made during the applicable period, FLEXSOLAR®, at its option, will either (1) replace the product, (2) exchange the product with a product that is of equal value. A replacement product assumes the remaining warranty of the original product or 60 days from the date of replacement, whichever is greater. Customer is responsible for the return shipping costs.

LIMITED TO ORIGINAL CONSUMER BUYER:

The warranty on FLEXSOLAR® products is limited to the original consumer purchaser.

EXCLUSIONS:

FLEXSOLAR® warranty does not apply to (i) any product that is misused, abused, modified, damaged by accident, or used for anything other than normal consumer use as authorized in FLEXSOLAR® current product literature, or (ii) any product purchased through an online auction house.

HOW TO RECEIVE SERVICE:

To obtain warranty service, you must contact our customer service team. If our customer service team determines that further assistance is required, they will give you a Return Material Authorization ("RMA") number and will provide you with return instructions. You must properly package the product, clearly marking the RMA number on the package and including proof of your purchase date with the product. We will process your return and send your repaired or replacement product to you in continental North America.

EXCLUSIVE REMEDY; LIMITATION OF LIABILITY:

The foregoing provisions state FLEXSOLAR® entire liability, and your exclusive remedy, for any breach of warranty, express or implied.

IN NO EVENT WILL FLEXSOLAR® BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM ANY USE OR MALFUNCTION OF ANY FLEXSOLAR PRODUCT, OR FROM ANY BREACH OF WARRANTY, INCLUDING DAMAGE TO OTHER DEVICES. IN NO EVENT WILL FLEXSOLAR'S LIABILITY FOR ANY CLAIM, WHETHER IN CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR UNDER ANY OTHER THEORY OF LIABILITY, EXCEED THE AMOUNT PAID BY YOU FOR THE FLEXSOLAR® PRODUCT.

Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

UPC CODE:



SERIAL NUMBER:

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**WHERE THERE IS LIGHT
THERE IS ELECTRICITY**

30A PWM SOLAR CHARGE CONTROLLER

