

## PV MONITOR

**Disclaimer & Warning:**

1. Thank you for choosing our products! Before using this product, please read this manual carefully. It includes important information and advice on installation, use, troubleshooting, etc., and please keep this manual in a safe place.
2. The warranty does not cover failure of the product due to accidental damage, unauthorised repair, improper storage and use.

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## I. Product Overview

This product is a photovoltaic power generation monitor, used to monitor the output of photovoltaic array. You can view the output voltage, current, power and historical power generation of PV in real time via mobile phone APP, and support manual operation or APP to control the output switch of PV. It is suitable for all solar power generation application scenarios.

## II. Product Features

### 2.1 Product features

- (1) [Independent Acquisition] Independently acquires the working data of the PV array without relying on the data acquisition function of the controller or other products.
- (2) [Sampling accuracy] The error in current and voltage detection error is less than  $\pm 1\%$ .
- (3) [Safety protection] With anti-reverse connection, high voltage, PV output overcurrent protection and other functions.
- (4) [Wireless transmission] With Bluetooth communication function, it can meet the wireless information transmission.
- (5) [Practical and Convenient] Support connecting mobile phone APP or display terminal [the display terminal is a display of our company that can receive the monitoring data of this product], and you can control the output switch of the PV through mobile phone APP/display terminal.
- (6) [Long record] Connecting to the mobile app/display terminal allows you to view the monthly/yearly PV power generation statistics records.
- (7) [Convenient Installation] With compact size and lugs on both sides reserved for fixing screw holes, it is also easy to install in any home or caravan environment.

## 2.2 Basic Technical Parameters

Models	ECO-PVM-1
PV Monitor	
Product Size (L*W*H)	169 * 100 * 49mm
Open-circuit voltage range for photovoltaics	23 - 150 V
Current monitoring range	0 - 50 A
Voltage monitoring range	8 - 150 V
Max. output power	4200 W
Operating power consumption	3.2 W
Voltage error	< ±1%
Current error	< ±1%
Operating Temperature Range	- 20 ~ 65 ℃
Weight	400 g/ 0.88lbs

## III. Usage method

### 3.1 Packing list

Table 3-1 PV Monitoring Module Packing List

NO.	Name	Number	Unit	Remark
1	Photovoltaic monitoring module	1	pcs	
2	Plastic Expansion Pipe	4	pcs	M 6* 30 (mm)
3	Phillips self-tapping screws	4	pcs	M 4 * 30 (mm)
4	Manual	1		

### 3.2 Product description



Product Function Indication Diagram

NO.	Name	Function	Clarification
1	Power Button	On/off	
2	Power/Fault Indicator	Indicates on/off, fault status	Green light-Power normal Off-Power off Red light-working abnormally
3	PV Output Indicator	Indicates PV output on/off	Green light-Output Off-Disconnect
4	Bluetooth Mode Switch	Switch the APP connection or display terminal connection	
5	Bluetooth Indicator	Displays the current Bluetooth mode and its connection status	Blue light flashing- No connection on APP connection mode Blue light always on - Successfully connected on APP connection mode
6	Installation Hole	For mounting and fixing products	
7	PV Input Port	For connecting photovoltaic arrays	
8	PV Output Port	For connecting to solar charge controllers	

### 3.3 Assembly steps

#### 1. Mounting the product

① Determine where the product is to be mounted first and mark the exact location of the screws.

Note: There is a high voltage inside the product, please make sure that children cannot touch the product.

② After punching holes at the marked screw locations, clean the sand particles inside .

Note: The depth of the hole should be greater than the length of the plastic expansion pipe so that the expansion pipe can be fully inserted into the wall.

③ Insert the M 6 \* 30 plastic expansion pipe into the hole first, and then hammer it into the wall until it is level with the wall surface.

Note: When you use the hammer, don't hit the plastic expansion pipe too hard resulting in damaging it.

④ From the front, use M 4 \* 30 Phillips self-tapping screws to go through the installation holes of the product, and then use a screwdriver to screw them into the plastic expansion pipes.



## 2.Connecting PV

Connect the PV extension cable to the PV input port connector of the product. Be careful not to reverse the positive and negative terminals, and make sure the open-circuit output voltage of the PV array is below 150V.

Please make sure that the PV extension cable and the PV array are disconnected when connecting to prevent electric shock and other dangerous accidents.



## 3.Connecting to the solar charge controller

Connect the PV output port of the product to the photovoltaic input port of the PV Charge Controller or the All-in-one Hybrid Inverter through the photovoltaic wiring harness.



## 4. Complete installation

After ensuring that the product is connected and installed correctly, connect the PV extension cable to the total positive and total negative terminals of the PV array output and press the power button of this product to switch on the power. At this time, the power/fault light is always on green.

### 3.4 Usage Instructions

#### 3.4.1 Steps for use

1. Install the mobile phone software

You can search and install eco-worthy in Apple App Store and Google App Store, or directly scan the QR code below to download the APP. With it, you do not need to log in to the account to use the Bluetooth connection function. And our product does not support the use of WiFi connection.



2. Select the corresponding Bluetooth connection mode

Make sure the Bluetooth of this product is in the APP connection mode. At this time, the Bluetooth indicator of this product is blue. If the indicator is not blue, you need to long press the Bluetooth mode switch button of this product for 2s to switch the mode.

3. Connection and Pairing

Before pairing, make sure the Bluetooth of your mobile phone is on, and put your mobile phone in a position within 3m from the product without any obstruction.

Click the + sign in the upper right corner of the device page of the mobile phone APP to add a device, and select the corresponding product number (ECO-WORTHY BW04\_xxxx) in the device list.

After this product is successfully connected to APP, the APP device page will prompt successful connection and the Bluetooth indicator on the product will change from a blue flashing state to a blue constant light state. Click the corresponding battery icon on the APP device page to view the monitored data of the product.

After successfully connecting to the APP, if the product disconnected, the mobile phone will automatically search for the product in the vicinity within 10 seconds to try to re-establish the connection. If re-establishing the connection fails, the APP page will indicate that the product is offline and jump back to the device page. When the mobile phone is near the product again, Bluetooth will connect automatically if you click the corresponding battery icon on the APP device page.

If you want to delete the information of this product on the APP, you can long press the corresponding PV icon on the APP device page, and then select delete. For detailed operation, you can scan the QR code below to get the APP operation manual.



### 3.4.2 APP Page Introduction

#### 1.Home Page

This page shows monitoring data such as Total generation, Daily generation, PV voltage, output current, output power, etc.The overcurrent protection threshold setting and restart can be found when we click "More Details"

1.1 PV output switch: used to switch off or on the PV output.

1.2 Overcurrent Protection Threshold: Click this parameter option to set the maximum current value allowed for PV output, enter a value in the range of 0-50.0A, and click OK, that is, to complete the customized parameter setting for the maximum overcurrent value.

1.3 Restart: After triggering some warnings, the product cannot close the warning automatically after the problem is solved, and you can click this option to reboot the device and close the warning.

## 2. History Page

This page views the PV monthly/yearly power generation statistics records through bar charts.

## 3. Fault Page

This page is used to indicate the warning or fault that is currently occurring:

Monitoring of warnings/faults Details	Device Failures
	Overcurrent Protection
	Overload Protections

3.1 Device failure: It refers to the failure of the internal switching device of this product, i.e. it can't turn off the PV output switch and lose the protection function, but other functions can still work normally.

3.2 Overcurrent protection: When the product monitors the PV output current exceeding the set maximum overcurrent value for more than 5s, overcurrent protection will be triggered, i.e. the PV output switch will be switched off and the PV output indicator light will go out. To recover, you need to go to > 'Home page' or press the Power Button to restart the device.

3.3 Overload protection: When the product monitors that the PV output power exceeds 4200W, overload protection will be triggered, i.e. the PV output switch will be switched off and the PV output indicator light will go out. To recover, go to > 'Home page' or press the Power Button to restart the device.

### 3.4.3 Precautions for use

1. Ensure that the working temperature of this product is -20 - 65 °C and keep it in a dry environment.
2. Be careful not to exceed the voltage and current range of the product, which may damage the product.
3. Do not connect the PV output connector of this product directly to the battery, which will cause the battery to reverse charge the PV array.
4. Make sure the input and output positive and negative poles are correctly connected, otherwise the product will not work and may even be damaged.
5. Be careful not to lose all the items in the packing list - accessories, manuals, etc.

6. If there is any abnormality during the use of the product, please contact our after-sales service personnel immediately.
7. Non-professionals please install the product under the guidance of the manual, and please do not touch the exposed part of the product wiring directly with your hands to prevent electric shock.
8. In order to ensure safety, please install the product in a position where children cannot touch it.
9. This product is not waterproof, please keep it away from rainwater for installation and use.

#### IV. Anomaly analysis and troubleshooting programme

Overview of the issue	Abnormal Phenomenon	Reason	Remedy
The product cannot be switched on normally	After connecting to the power supply, the power/fault light of this product is off	The product is not properly connected, the connection harness is damaged, or the product power button is not switched on	Check or replace the connecting harness to ensure that the product is wired correctly, and switch on the power button on the product
		The input voltage of the photovoltaic is not within the operating range of this product	Check if the PV array specifications are within the operating range of the product
		Current PV input power is relatively low	Increase power supply output
Unable to connect to the product using the mobile app	The Product Bluetooth indicator shows green	Current Bluetooth is connected display terminal mode	Long press the Bluetooth mode switching key of this product for 2s for mode switching
	Product Bluetooth indicator shows blue, but cannot connect to the product	Current Bluetooth signal is unstable.	Bring your mobile phone close to the product before connecting it to the operation
	After clicking the corresponding product icon on the APP device page, a connection failure prompt pops up instantly	APP loading failure	Close the app from the background and enter again
	Product's PV output light is off	Current PV input power is relatively low	Increase power output

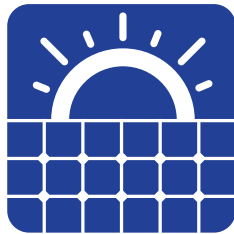
Overview of the issue	Abnormal Phenomenon	Reason	Remedy
The Mobile app cannot control PV output switch	The Product's power/fault light shows red	The Current product is faulty	Connect to the mobile app to view fault information and troubleshoot problems
	APP performs control operations abnormally slowly and prompts operation failure after a period of time	Current Bluetooth signal instability	Bring your mobile phone close to the product before operating the controls
Inaccurate historical data recording	Loss of historical data	If the product has not been powered up for a long time, the power stored inside will not be able to maintain the calculation of time	Please turn on the power regularly to charge to avoid the product internal capacitor power exhaustion.
Unable to view product monitoring content using mobile app	Prolonged inability to access device page or appear white screen	APP loading failure	Close the app from the background and enter again

## V. After-sales contact information

Official website address: [www.eco-sources.cn](http://www.eco-sources.cn)

After-sales service email: [customer.service@eco-worthy.com](mailto:customer.service@eco-worthy.com)

## VI. Appendix



**ECO-WORTHY**



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## FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.