Battery Monitoring System

User Manual

Installation Tutorial

App: Pro BMS

1. INSTRUCTIONS FOR USE

1. Please read the "User Manual" and "Installation Tutorial" carefully before installing the device to avoid fire or damage to the device due to incorrect wiring.
2. Do not use a damaged device. Before using the device, check whether it has any malfunctions, abnormal sounds, or serious damage.
3. Do not operate this equipment in an environment containing explosive gases, vapors, or dust.
4. Be careful when using metal tools near batteries. Improper handling may cause the positive (+) and negative (-) terminals of the battery to come into contact with each other, resulting in a short circuit or even explosion.
5. To use the device's "protection function" , you need to purchase an additional relay. If the device is not connected to a relay, the "protection function" will not work.

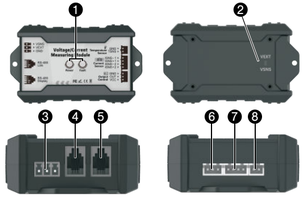
2. MAIN FUNCTIONS

1. Applicable to all single cells or battery packs with voltage of 0~120V, including lead-acid batteries, lithium batteries, nickel-metal hydride batteries and solar cells.
2. Real-time monitoring of battery or battery pack power, remaining capacity, charge/discharge voltage, charge/discharge current, charge/discharge temperature, charge/discharge time, charge/discharge power, cumulative charge energy and cumulative discharge capacity.

3. Supports multiple protection functions such as overvoltage, undervoltage, overcurrent, overpower, overtemperature, undertemperature and low battery. The protection function requires an external relay to work properly.
4. Intelligent patented algorithm solves cumulative errors. The device will actively build a long-term model of battery voltage, current, power and capacity, and automatically calibrate the cumulative error through the model database.
5. Supports up to 30 days of history storage, and the history will not be lost when the device is powered off.
6. Supports Android and iPhone applications. Through the application, you can obtain real-time data, historical data and charts of the equipment.
7. Provides device communication protocol, It supports up to 99 devices communicating simultaneously, and obtains original data of the device through RS-485 interface to meet the needs of secondary development.

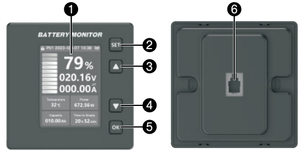
3. PRODUCT INFORMATION

Host



1. Indicator Light
2. Power Switch
3. Power Supply Interface
4. RS-485 Communication Interface
5. Display Interface
6. Relay Control Interface
7. Current Sensor Interface
8. Temperature Sensor Interface

Display

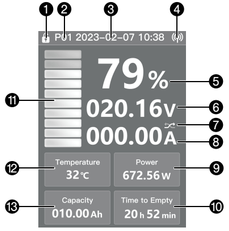


1. Display Screen
2. Set Key
3. Up Key
4. Down Key
5. Ok Key
6. Connecting Port

Current Sensor

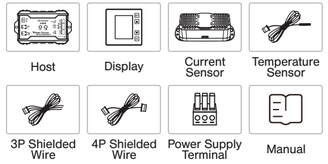
1. Current Sensor Interface

Display Information



1. Key lock state
2. Address of device
3. Date
4. Communication Signal
5. SoC
6. Measured Voltage
7. Direction of Current
8. Measured Current
9. Power
10. Estimated Use/Fill Time
11. SoC Level Graph
12. External Temperature
13. Capacity

Packing List



4. APP INSTALLATION

(Fig 1) (Fig 2)

1. Scan the QR code of the product and download the app. (Fig 1)
2. For Android phones, go to "Google Play", and for iPhones, go to "App Store". Search for "Pro BMS" to download the app. (Fig 2)

5. TECHNICAL PARAMETERS

Specifications	200A	400A	600A
Work Voltage Range	10~120V		
Voltage Measurement Range (External Power Supply)	0~120V		
Voltage Measurement Range (Self-Powered)	10~120V		
Voltage Measurement Accuracy	±0.4%		
Voltage Resolution	0.01V		
Current Sampling Method	Shunt		
Current Measurement Range	0~200A	0~400A	0~600A
Current Measurement Accuracy	±0.4%		
Current Resolution	0.01A		
Temperature Measurement Range	-20℃~120℃ (-4℉~248℉)		
Power Measurement Range	0~24KW	0~48KW	0~72KW
Power	About 0.4W		
Communicate Mode	Bluetooth 5.3、RS-485		
Bluetooth Communication Distance	Barrier-free access up to 10 meters		
RS-485 Communication Address	Device address P01~P99 Can communicate with up to 99 devices simultaneously		

6. FAQ AND SOLUTION

- **Phenomenon 1:**

After the host is powered on, the indicator light on the front of the host does not light up?

- **Solution:**

This situation is usually caused by incorrect wiring of the host power supply interface.

① The "power switch" is in the "VSNS" position. Please check whether the "GND" of the host power supply interface is connected to the negative pole (-) of the battery to be tested, whether the "VSNS" is connected to the positive pole (+) of the battery to be tested, and ensure that the voltage of the battery to be tested is within the range of 10~120V. "VEXT" can be left unconnected.

② The "power switch" is in the "VEXT" position.Please check whether the "GND" of the host power supply interface is connected to the negative pole (-) of the external power supply, whether "VEXT" is connected to the positive pole (+) of the external power supply, and make sure that the external power supply voltage is within the range of 10~120V. Check whether "VSNS" is connected to the positive pole (+) of the battery to be tested, and make sure that the voltage of the battery to be tested is within the range of 0~120V.

- **Phenomenon 2:**

The current direction displayed on the app is opposite to the actual charging and discharging status?

- **Solution:**

This is because the "BATT-" terminal and the "LOAD-" terminal on the current sensor are connected reversely. The correct connection method is that the "BATT-" terminal needs to be connected to the negative pole (-) of the battery through a wire, and the "LOAD-" terminal needs to be connected to the negative pole (-) of the load.

- **Phenomenon 3:**

There is no current in the current sensor, but the app shows there is current?

- **Solution:**

You can turn off all loads or disconnect the terminals at both ends of the current sensor to ensure that there is no current in the current sensor; then perform zero current calibration in the app. After calibration, the current in the app will be displayed as 0.

- **Phenomenon 4:**

After the battery is fully charged, the battery leve displayed in the app is not 100%?

- **Solution:**

There are three situations that may cause the battery to not be fully charged.

① Check whether the battery capacity setting is correct.

② For the first use, you need to make sure the battery is fully charged and manually calibrate the battery to 100% in the app.

③ Check whether the battery full charge voltage, tail current and full charge detection time parameters are correct.

- **Phenomenon 5:**

The screen is still black after power on, without any display.

- **Solution:**

① Check whether the power wiring and the wiring between the display board and the motherboard are connected.

② After the above check, restart the meter.

③ If the product still cannot be used normally, please contact the supplier.

- **Phenomenon 6:**

The screen is too dark to see clearly.

- **Solution:**

Check whether the brightness setting value of the LCD screen is too small, press the "**SET**" key to enter the system setting interface, and then press the "▲" and "▼" key to make the cursor on the brightness of the working screen press the "**OK**" key, and then adjust the brightness of the LCD screen to the appropriate state through the "▲" and "▼" keys.

Phenomenon 7:

- The communication between the display and the host is interrupted, and the red " **X** " is displayed in the upper right corner.

- **Solution:**

There are three situations that may cause the battery to not be fully charged.

① Check the communication line.

② Check the communication address of the host is consistent with the communication address of the display .

③ If the mobile phone firmware upgrade is aborted or interrupted, the firmware can be upgraded again.

7. FCC STATEMENT

Federal Communications Commission (FCC) Statement.

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.

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.

Warning: Changes or modifications made to this device not expressly approved by **Shenzhen Foxwell Technology Co., Ltd.** may void the FCC authorization to operate this device.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

RF exposure statement: This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The device is installed and operated without restriction.