

USER MANUAL

LiFePO4 Battery



Applicable model	
51.2V/314AH	With screen
	Without screen
48V/314AH	With screen
	Without screen

Catalogue

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I. Introduction

This product is designed and developed for household lithium iron phosphate battery energy storage.

Specifically for the home energy storage market, this product integrates miniaturization, lightweight, intelligent, long life and other design features, simple and beautiful appearance, quality safety and reliability, has been widely used in the global home energy storage market.

(1) The battery uses lithium iron phosphate (LiFePO₄) material, which has good safety performance and long cycle life;

(2) The battery system adopts high-performance BMS battery management module, which has multiple protection functions such as overcharge, overdischarge, overcurrent and temperature, so as to realize good communication between the battery system and the host;

(3) Automatic charge and discharge management, the monitoring unit automatically measures the battery charge and discharge current, and manages the float charging and cyclic charging of the battery;

(4) Battery control technology is effectively combined with computer to monitor and control various parameters and states in real time;

(5) Flexible configuration: multiple battery modules are connected in parallel to meet the requirements of high power consumption;

(6) Adopt self-cooling mode to make the whole system operate with low noise.

2. Reference standards and specifications

GB/T 8897.4-2008 Primary battery Part 4: Safety tips for lithium batteries

QB/T 2502-2000 General Technical Conditions for Lithium ion batteries

GB/T 36276-2018 National standard for lithium ion batteries for electric energy storage

IEC 62619-2017 Safety requirements for industrial lithium-ion batteries and lithium-ion battery packs containing alkaline or other non-acid electrolytes.

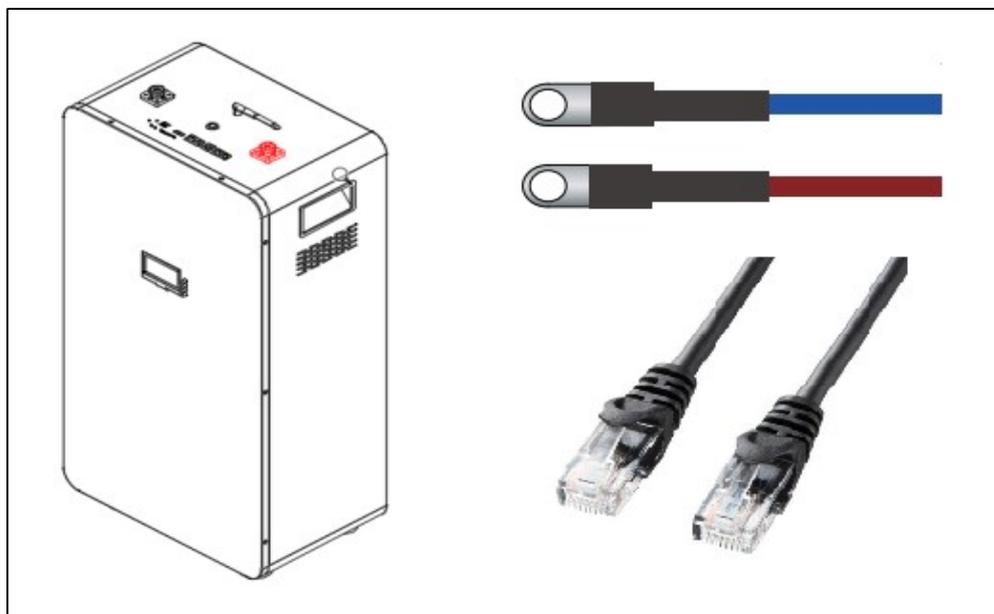
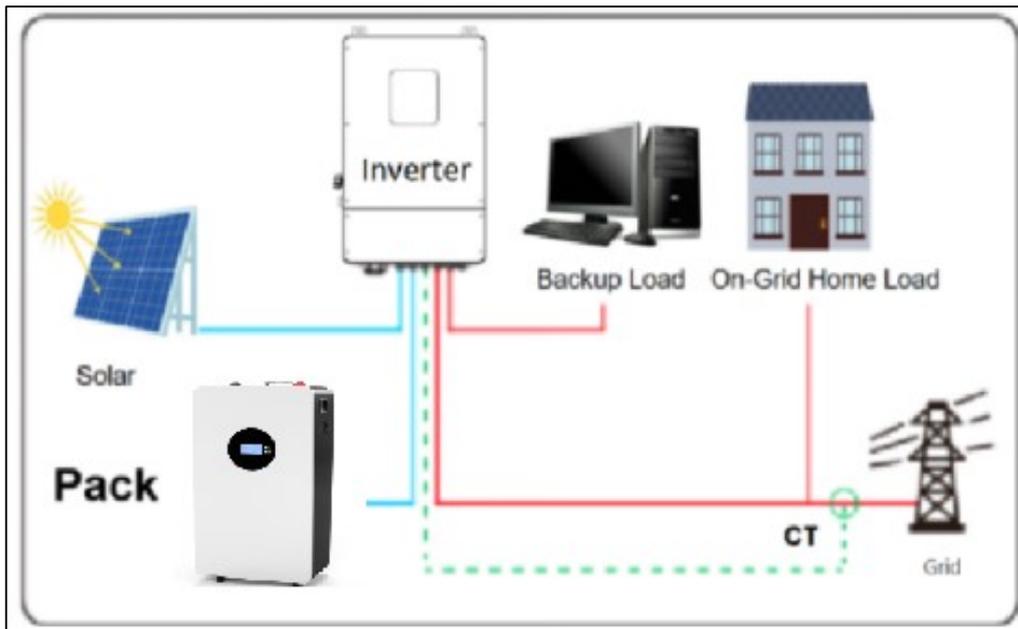
GB/T 36276-2018 Lithium ion battery for electric energy storage

GB/T 34131-2023 Battery management system for electric energy storage

GB/T 16935.1-2008 Insulation coordination of equipment for low-voltage systems-Part 1: Principles and requirements

3. Connection diagram

This product is mainly used with inverters, photovoltaic (PV) and related accessories to build a residential energy storage system that stores the electricity generated by photovoltaic power generation in connected batteries, converts the DC (DC) generated by photovoltaic power generation into AC, and provides it to the home grid.



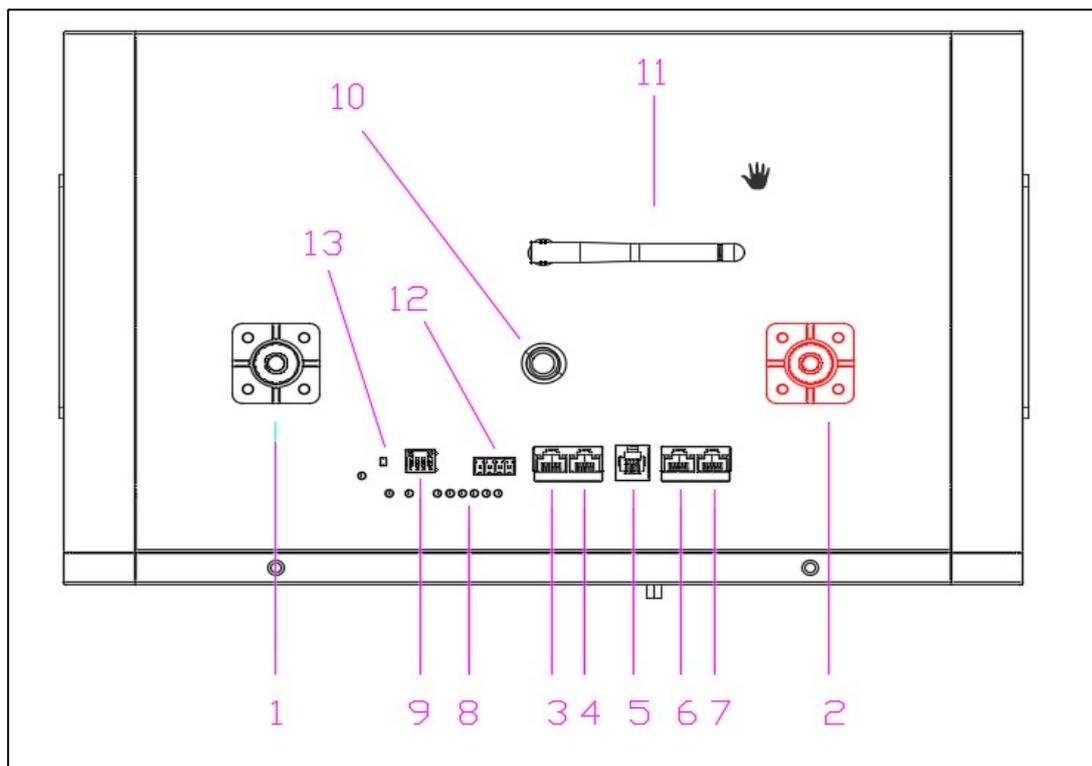
Battery wiring accessories (Battery wiring accessories+Power cable)

4. Battery Electrical wiring

4.1 Electrical Characteristics

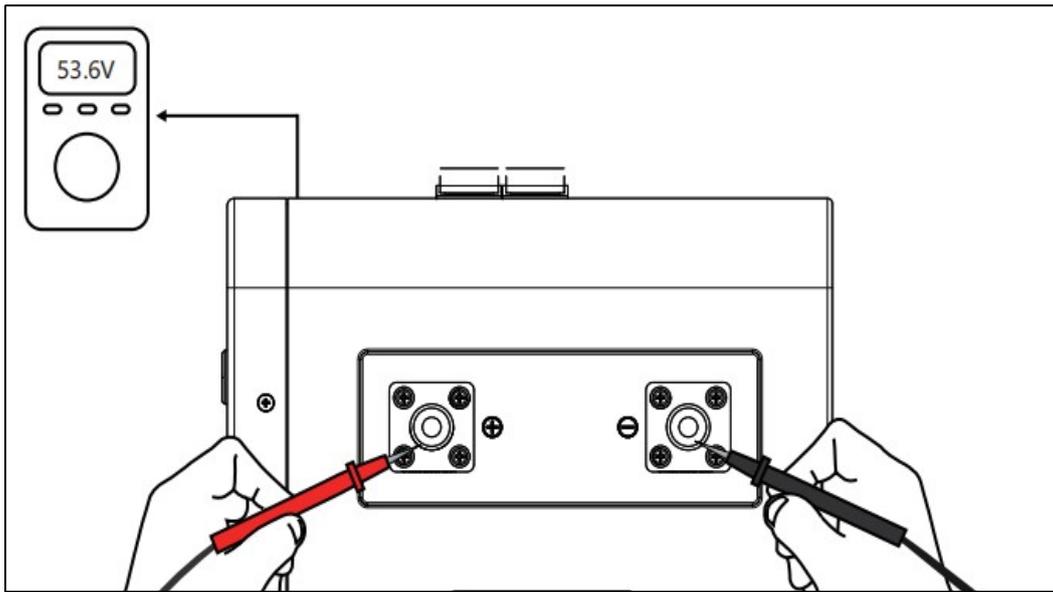
Rated Voltage (VDC)	48V	51.2V
Rated Capacity(Ah)	314	314
Cell	1P15S	1P16S
Energy Storage(kWh)	15KWH	16KWH
Cycle Life	6000 cycles @,0.5C	
Charge/Discharge Standard		
Charge Voltage(VDC)	54	57.6
Under Voltage Protection(VDC)	42	44.8
Recommend Charge Current(A)	≤150	
Recommend Discharge Current(A)	≤150	
Max.Discharge Current(A)	200	
Environment		
Charge Temperature	-20°C to 55°C	
Discharge Temperature	-35°C to 60°C	
Storage Temperature	-20°C to 50°C	
Relative Humidity	0%~90%,No Condensation	
Mechanical		
Protection Grade	IP20	
Install Altitude	≤3000m	
Cell	LiFePO4	
Case Material	Metal	
InstallLocation	Indoor	
Product Dimension LxWxH(mm)	740*395*250mm	
Net Weight (Kg)	105	112
Communication		
Protocol (Optional)	RS485/RS232	

4.2 Battery wiring guide



project	name	function
1	Battery negative pole	Connect the inverter
2	Battery Positive	Connect the inverter
3	RS485	Connected to PC or Inverter
4	CAN 1	Connected to PC or Inverter
5	RS-232	Connected to PC
6	RS485-IN (ADD)	Battery parallel connection method
7	RS485-OUT (ADD)	Battery parallel connection method
8	Indicator light	SOC
9	Automatic dialing code	dial
10	switch	Power supply
11	WIFI/Bluetooth	Connect
12	Dry contact	Switches to control the external equipment, such as generators, etc.
13	RST	reset

4.3 Voltage detection

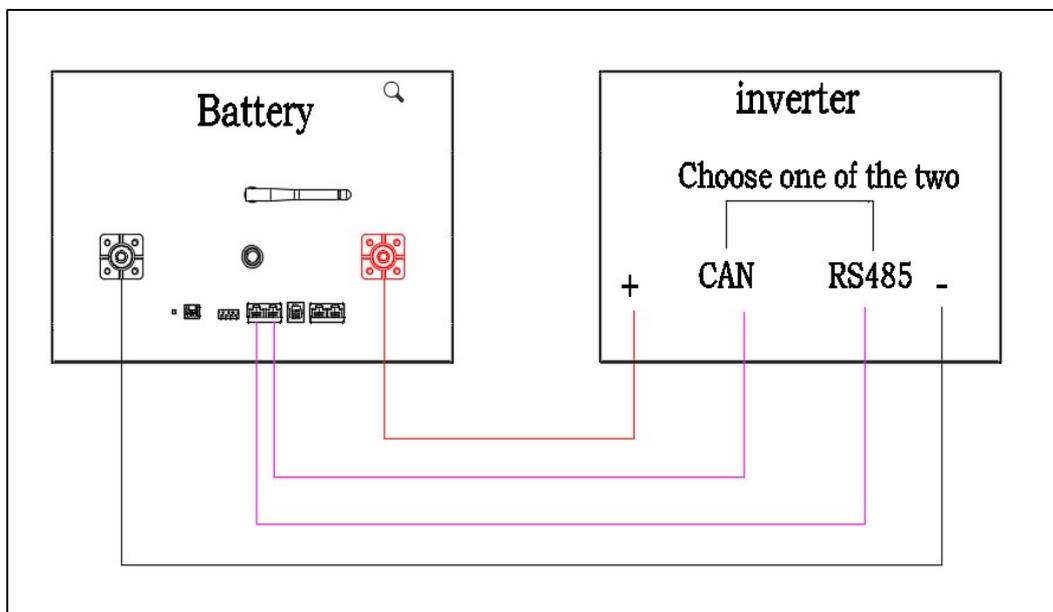


Check if the voltage is normal,

48V corresponds to the voltage range of 42V to 54V;

51.2V corresponds to a voltage range of 44.8V to 57.6V

4.4 Single battery connected to the inverter

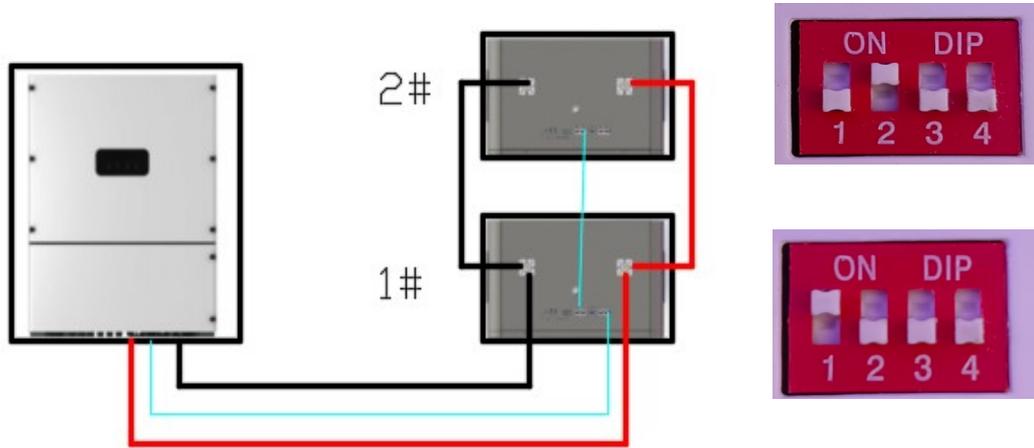


The communication connection between the battery and the inverter is completed through the RS485 or CAN interface on the battery.

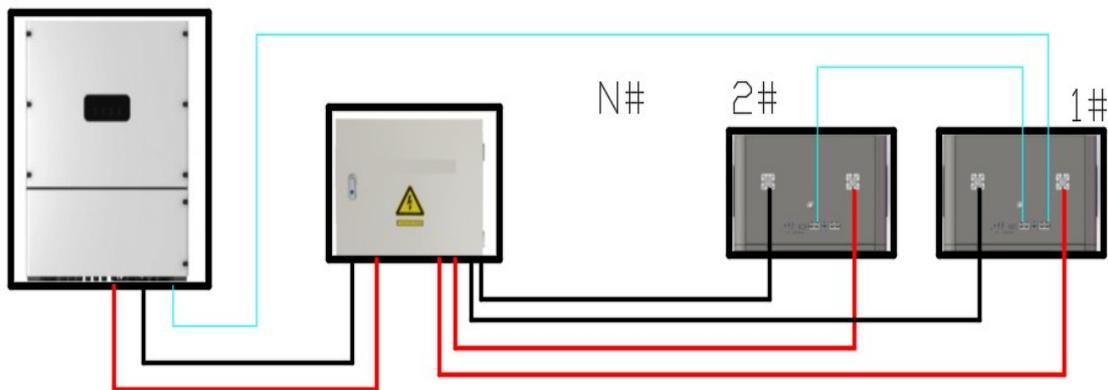
CAN or RS485 Choose one of the two.

4.5 Multiple batteries are connected to the inverter.

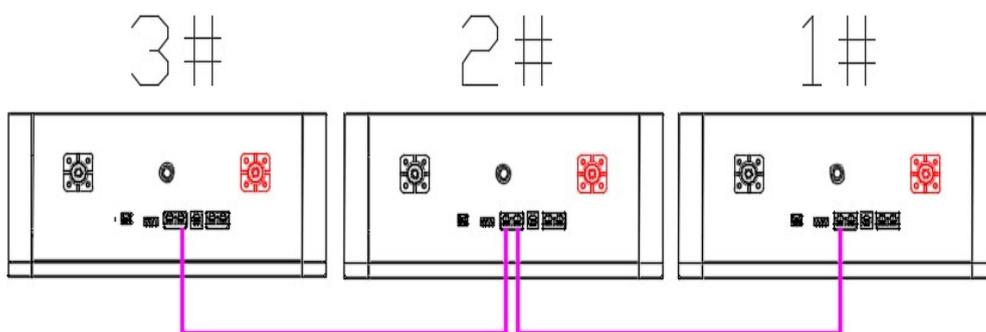
Charge / Discharge Current(A) $\leq 150A$,



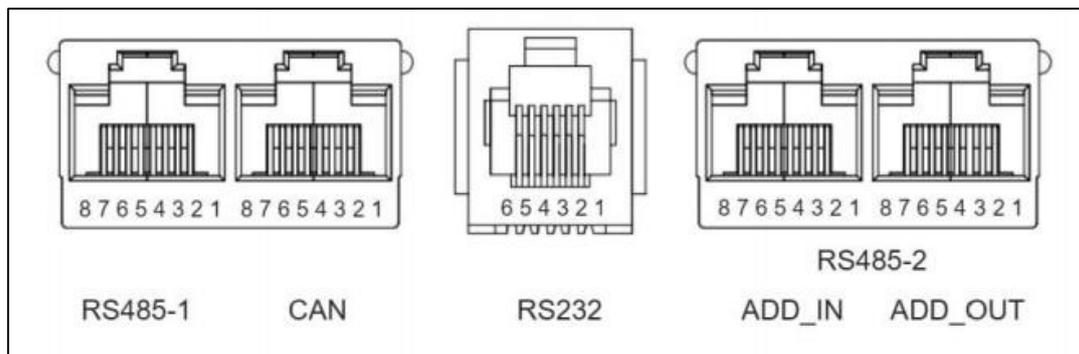
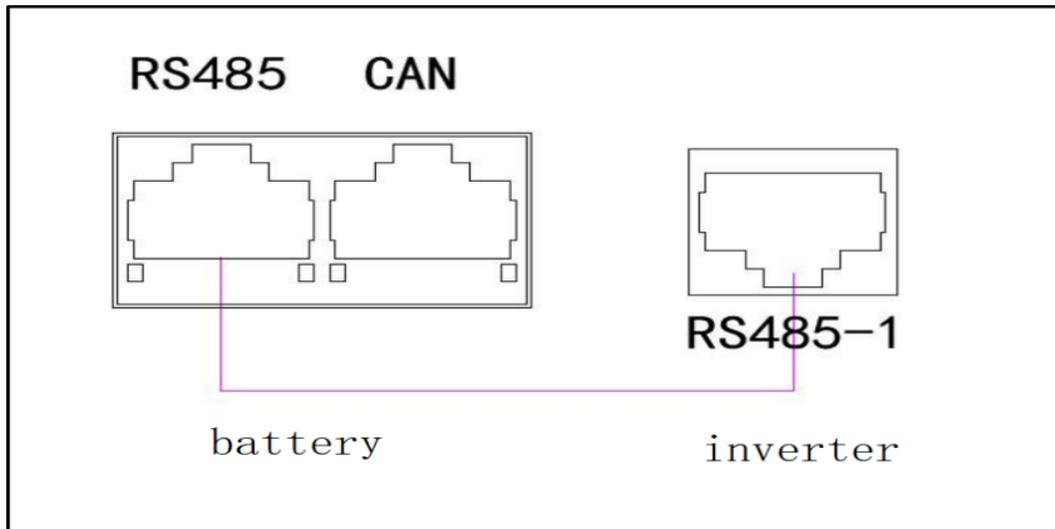
Charge / Discharge Current(A) $\geq 150A$, Battery collection



Battery parallel connection method; RS485-IN/OUT (ADD);



4.6 Communication between the battery and the inverter



Connector	RS485-1		CAN1		RS323		RS485-2 * 2	
Function	Connected		Connected		Connected PC		Parallel communication	
波特率	9600		500K		9600		19200	
Pin specification	PIN	Description	PIN	Description	PIN	Description	PIN	Description
	1、8	RS485-B1	1、8	NC	1、2、6	NC	1、8	RS485-B2
	2、7	RS485-A1	2、7	NC	3	232TX	2、7	RS485-A2
	4	NC	4	CANH1	4	232RX	4、5	NC
	5	NC	5	CANL1	5	GND	3	IN(L)/OUT(R)
	3、6	GND	3、6	GND			6	GND

4.7 Parallel DIP switch settings

When Batteries are used in parallel, the addresses can be set through the dip switch on the BMS to distinguish different Batteries. It is necessary to avoid setting the addresses to be the same. The definition of the dip switch for the BMS can be referred to the following table. In the parallel mode, the default dip switch address of 1 is the host.

Address	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON



BAT-1



BAT-2



BAT-3



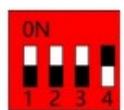
BAT-4



BAT-5



BAT-6



BAT-7



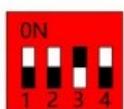
BAT-8



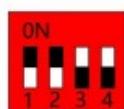
BAT-9



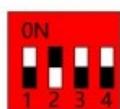
BAT-10



BAT-11



BAT-12



BAT-13



BAT-14



BAT-15

5.DisplayControl

Battery data can be viewed and communication protocols can be selected through the display screen.



Name	Definition
Pack Info	This page allows you to view voltage, current, temperature, and other data.
Pack Status	This page allows you to view the protection status, protection times, and protection flags.
Pack Para	This page can set some protection parameters and is currently not open.
Pack Set	This page allows you to set the host RS485 protocol or CAN protocol for BMS.

Home Page	Itemized	
		Vol: Battery module voltage Cur: Charging (+) /Discharging (-) Current

<pre>--Vol: 52.76V --Cur: 0.00A ->Capacity >> --Temp >></pre>	<pre>RSOC: 62.00% ReMain:125.0AH FCC: 200.0AH Cyc:0002</pre>	<p>Capacity: RSOC:Rest of state of capacity. Remain:Remaining capacity of battery pack. FCC:Full battery capacity. Cyc:Cycle times.</p>
<pre>--Vol: 52.76V --Cur: 0.00A --Capacity >> ->Temp >></pre>	<pre>NTC1: 31.9°C NTC2: 32.0°C NTC3: 31.5°C NTC4: 31.8°C AirTemp: 33.3°C PCBTemp: 35.2°C</pre>	<p>Temp: Display the temperature of all BMS probes.</p>
<pre>->CellInfo >></pre>	<pre>V1: 3295mV V2: 3297mV V3: 3295mV V4: 3296mV</pre>	<p>CellInfo: Check the voltage per section, in mV.</p>
<pre>--PackInfo >> ->PackStatus >> --PackPara >> --PackSet >></pre>	<pre>--Status:Standby ->Pro_Count >> --Pro_Status >> Mos: C-ON/D-ON OVP :00004 UVP :00002 POVP:00001 PUVP:00001</pre>	<p>OVP: Over Voltage Protection(single cell) UVP: Under Voltage Protection(single cell) POVP: Pack Over Voltage Protection PUVP: Pack Under Voltage Protection COTP: Charge Over Temperature Protection CUTP: Charge Under Temperature Protection DOTP: Discharge Over Temperature Protection</p>

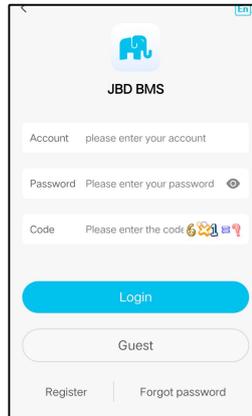
<pre>--PackInfo >> --PackStatus >> ->PackPara >> --PackSet >></pre>	<pre>This content is not settable V32</pre>	<p>not open.</p>
<pre>--PackInfo >> --PackStatus >> --PackPara >> ->PackSet >></pre> <pre>->RS485 >> --CANBus >></pre>	<pre>RS485-PYLON RS485-GROWATT RS485-Voltronic RS485-LXP</pre> <pre>RS485-DEYE RS485-INVT RS485-SRNE RS485-HNJD</pre> <pre>RS485-SVC RS485-OLU_VMII RS485-SAKO RS485-Index12</pre>	<p>PYLON GROWATT Voltronic LXP DEYE INVT SRNE HNJD SVC OLU VMII SAKO</p>
<pre>--RS485 >> ->CANBus >></pre>	<pre>Can-Pylon Can-VicTron Can-Goodwe Can-Growatt</pre> <pre>Can-LXP Can-DEYE Can-SOFAR Can-GINLONG</pre> <pre>Can-SMA Can-MUST Can-OLU_VMII Can-Index12</pre>	<p>Pylon Victeron Goodwe Growatt LXP DEYE SOFAR GINLONG SMA MUST OLU VMII</p>

6.WiFi/Bluetooth

Bluetooth Function Introduction: The communication module connects to the protection board via a UART interface. By using a mobile app to connect to the corresponding Bluetooth broadcast of the communication module, once the Bluetooth connection is successful, you can view and configure the real-time information of the protection board and perform related OTA operations.

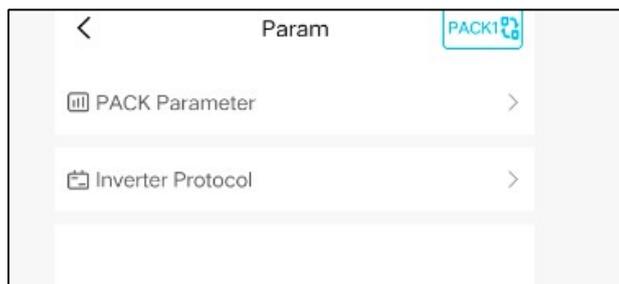
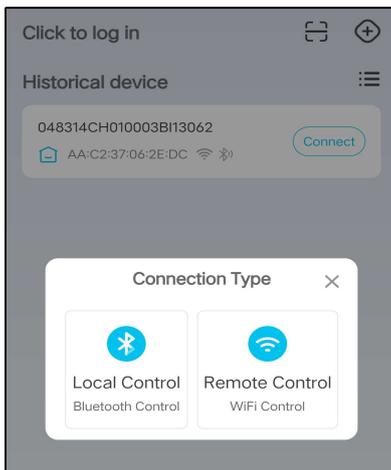
The communication module connects to the protection board through the UART interface and is used to configure the Wi-Fi account and password information. The module connects to the local Wi-Fi network.

The image below is the QR code for downloading the app,

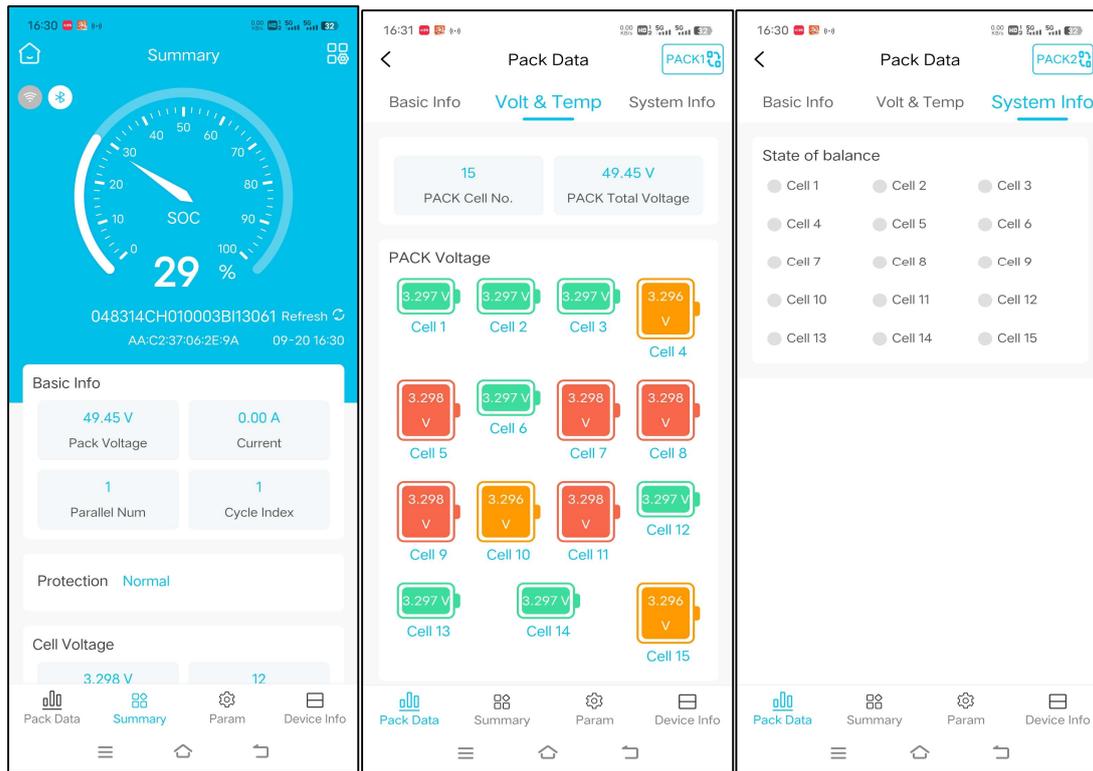


Bluetooth usage configuration method:

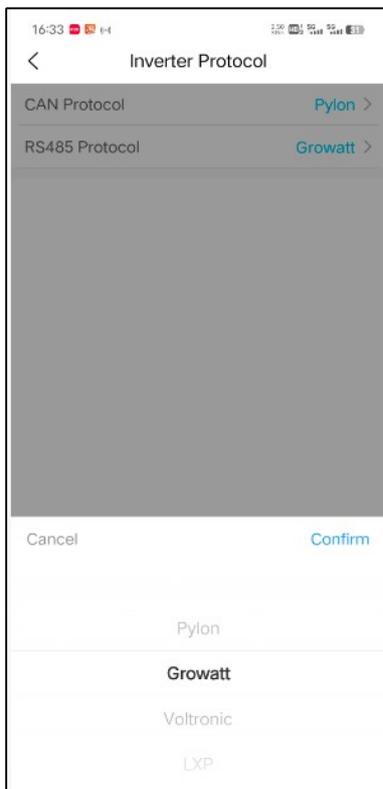
Open the bms_cloud_client app on your phone, and click 'Add' at the top right corner of the homepage.



View battery information



This page allows you to set the host RS485 protocol or CAN protocol for BMS.



Without a screen, you can use the app to change the communication protocol.

7. Installation Instructions

7.1 LED flashing indication

Flash mode	ON	OFF
Blinking 1	0.25S	3.75S
Blinking 2	0.5S	0.5S
Blinking 3	0.5S	1.5S

7.2 Buzzer Action Explanation

During a fault, it will beep for 0.25 seconds every 1 second.

During protection, it will beep for 0.25 seconds every 2 seconds (except for over voltage protection).

When an alarm occurs, it will beep for 0.25 seconds every 3 seconds (except for over voltage alarms).

The buzzer function can be enabled or disabled via the host computer. The factory default setting is to disable it.

7.3 Reset Button Instructions

When the BMS is in a dormant state, press the button (for 3 to 6 seconds) and then release it. The protection board is activated and the LED indicator lights will light up sequentially starting from "RUN" after a 0.5-second delay.

When the BMS is in the activated state, press the button (for 3 to 6 seconds) and then release it. The protection board will enter a dormant state, and the LED indicator lights will light up sequentially from the lowest power level light after a 0.5-second delay.

When the BMS is in the activated state, press the button (for 6 to 10 seconds) and then release it. The protection board will be reset and all the LED lights will light up simultaneously for 1.5 seconds.

After the BMS is reset, the parameters and functions set through the upper computer will still be retained. If it is necessary to restore to the initial parameters, this can be achieved by using the "Restore Default Values" function on the upper computer. However, the relevant operation records and stored data will remain unchanged (such as battery capacity, cycle count, protection records, etc.)

7.4 Hibernation and Awakening

Hibernation

When any of the following conditions is met, the system enters the low-power mode:

1. Single unit or overall over-discharge protection remains unaltered within 30 seconds.
2. Press the reset button (for 3 to 6 seconds), then release the button.
3. The minimum single-cell voltage is lower than the sleep voltage, and the duration reaches the sleep delay time (while meeting the conditions of no communication, no protection, no equalization, and no current).
4. Standby time exceeds 24 hours (without communication, without charging or discharging, and without grid).
5. Force shutdown through the host computer software.

Before entering sleep mode, make sure that the input terminal is not connected to any external voltage; otherwise, the device will not be able to enter the low-power mode.

Awakening

When the system is in low-power mode, if any of the following conditions are met, the system will exit the low-power mode and enter the normal operation mode:

1. Connect the charger. The output voltage of the charger should be greater than 48V.
2. Press the reset button (for 3 to 6 seconds), then release the button.
3. Through RS232 socket active.

8: Attention

8.1 Label Description

To ensure the safety of users when using this product, this manual provides relevant identification information and uses appropriate symbols to alert users. It is recommended that users carefully read the list of symbols used in this manual.

	Potential low risk: If not avoided, it may cause mild or moderate damage.
	High risk: If not avoided, it may result in serious injury or death.
	Before starting to operate the battery, the battery terminals must be disconnected.
	If the battery falls or gets crushed, it may explode and/or be severely damaged.
	If exposed to open flames or other extreme heat sources, the battery may explode.
	Grounding: For the safety of the operator, the system must be properly grounded.
	This side should be facing upwards.
	Handle with care to avoid damage.
	Keep dry.
	Please keep the battery out of the reach of children.
	Don't short-circuit.
	Do not connect the positive and negative terminals in reverse.

8.2 Installation tools

					
hummer driver	Drill Driver	Multimeter	Ammeter	Level gauge	Hammer
					
Screwdriver+	Screwdriver-	Tape measure	Electrical tape	Protective gloves	Goggles
					
Utility knife	Wire nippers	Wire crimper	Pen	Spanner	Pliers

8.3 Installation environment

- 1.The battery works best within the temperature range of 20 to 40 degrees Celsius.
2. Avoid installing in environments with direct high temperatures and exposure to rain.
- 3.Avoid installing it in environments close to high-temperature heat sources or low-temperature cold sources.
4. Avoid installing in areas where the environmental temperature fluctuates greatly.
- 5.Avoid installing in environments with strong interference.
6. Avoid installing it in a place where children can access it.
7. Avoid installing it in areas prone to water accumulation.
8. It is prohibited to place flammable or explosive items around the equipment.

Warnings

The battery is not a part that can be repaired by the user. If any abnormal phenomenon occurs, please contact the after-sales department for maintenance.

If you disassemble the battery without permission, you will not enjoy the guarantees policy, which may cause the battery to heat up, smoke, catch fire or explode.

1. Charging environment:

1) Use charging equipment that matches the battery parameters, and do not use equipment with mismatched voltage for charging. Continuous charging current: 0.2 CA~0.5CA is the best charging current.

2) Charge the battery at ambient temperature 0°C~45°C, ensure that there is no flammable material around and good ventilation.

3) Charging time description: the battery charging time is not more than 12 hours, overcharging will affect the battery life and there are safety risks.

4) The battery capacity rises quickly at the beginning of charging, but slowly at the end. This is a normal phenomenon set for charging safety.

5) When charging in winter, if the outdoor temperature is lower than -20°C, the battery will stop charging, which is normal. Please charge the battery in a suitable ambient temperature. Ensure charging effectiveness.

6) During the charging process, the surface of the battery pack chassis will have a temperature rise phenomenon, which is normal. Please use it at ease and avoid contact with children.

2. Storage environment:

1) Due to the internal resistance of lithium battery itself, the battery will have a certain self-discharge, and the power will decrease after a period of time.

2) Please store the battery in an environment temperature of -10°C ~ 45°C, do not store the battery where the ambient temperature is higher than 50°C, it may cause battery overheating, fire or functional failure, and shorten the service life.

3) When the battery pack is not used for a long time, please carry out regular maintenance and charging, otherwise it may lead to complete depletion of battery power, resulting in irrecoverable damage.

4) The most suitable storage capacity of the battery is 30%. If the storage capacity is less than 10% or more than 50% for a long time, the irreversible capacity degradation of the battery will occur.

5) The safety storage technical standard of lithium battery self-discharge protection is as follows:

When not used for a long time, the lithium battery is connected to the power supply equipment, and the safety period can be reached 3 months, otherwise there may be a battery feed problem that cannot be repaired.

If not used for a long time, the battery power should not be less than 30%. It should be stored separately and the safe period should not exceed 6 months. Otherwise, there will be a risk of battery feed and an irreparable problem.

6) Avoid storing the battery in a place where there is a risk of falling, so as to avoid uncontrollable damage to the battery, resulting in leakage, heating, smoking, fire or explosion.

7) The use of strong static electricity and strong magnetic field is prohibited, otherwise it is easy to damage the battery safety protection device and bring safety risks.

The above improper use of the battery caused by under voltage and abnormal feed is not within the responsibility of the manufacturer.

3. Usage:

1) When wiring, be sure to confirm that the positive and negative poles of the lithium battery and the polarity of the power supply equipment connection line are correct.

2) When the battery is used for the first time, the storage capacity of the battery is less than 30% due to transportation reasons.

3) In the later use, please keep the battery capacity not less than 10%, and charge in time to extend the cycle life of the battery.

4) In normal use, long time and high rate discharge should be reduced as far as possible, and the battery life can be extended according to the battery manual.

5) Connecting the two ends of a battery to any conductor will cause an external short circuit, and different types of batteries may have different consequences. For example, batteries cannot

Do not use for leakage, explosion, etc. Do not put the battery in a damp environment, nor mix it with conductors, such as putting both keys and batteries in the pocket at the same time, both of which may cause short circuit.

8.4 Serious warning

Avoid using batteries in the rain or when being rinsed, and avoid soaking batteries in water. Internal short circuits, lithium batteries have the risk of explosion and fire, and can cause permanent failure of the battery.

X. Precautions

To prevent leakage, abnormal heating, fire, performance degradation and explosion accidents, please use the battery correctly according to the following instructions. The company is not responsible for accidents caused by failure to operate according to the instructions.

- 1) Do not shake violently, hold and place the battery gently!
- 2) Do not immerse the battery and its accessories in water or other liquids, pay attention to moisture protection!
- 3) Avoid short circuit between positive and negative terminals of battery pack!
- 4) Do not disassemble the battery. Disassembling the battery may lead to internal short circuit, decomposition of internal materials, fire, explosion and other accidents, in addition, disassembling the battery may also lead to electrolyte leakage.

Leakage; if the electrolyte splashes on the skin, eyes or other body parts, rinse with water immediately and seek medical attention immediately!

- 5) It is strictly prohibited to put used batteries into fire, otherwise it will cause dangerous accidents such as explosion!
- 6) The battery has abnormal phenomena such as damage, deformation, electrolyte leakage or odor

If the battery is found to have abnormal phenomena, do not use it again, and should be sent to the manufacturer's authorized agency or relevant agency for proper treatment. In addition, the leaked electrolyte should be far away from the fire source to avoid explosion!

- 7) Battery replacement. The battery should be replaced by the battery supplier, and users are not allowed to replace it without authorization!
- 8) Do not disassemble the battery pack and charger without permission. The company will not be responsible for any loss caused by this!
- 9) Do not mix batteries of different capacity, model and variety!
- 10) Before use, the product must be correctly grounded to ensure your safety!