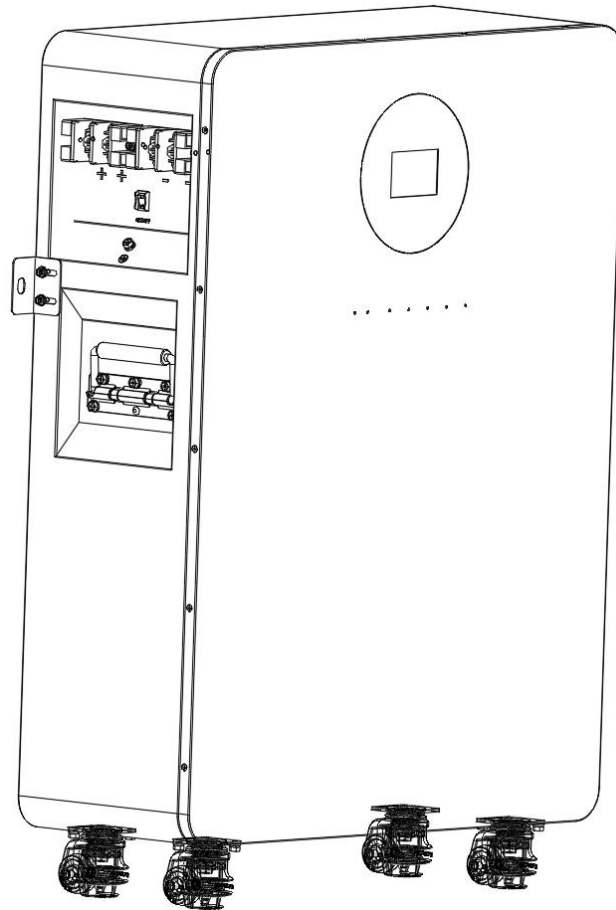


TR8500WX

BATTERY ENERGY STORAGE



User Manual

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1.Introduction

1.1 Introduction

The TR8500WX lithium iron phosphate battery system is a standard battery system unit. Customers can choose a certain quantity of TR8500WX according to their needs, and form a larger capacity battery pack in parallel to meet users' long-term power supply needs. The product is especially suitable for applications with high operating temperature, limited installation space and long service life.

1.2 Product Features

The TR8500WX battery system uses lithium iron phosphate as the battery anode material and is equipped with a high-performance BMS to effectively manage the battery cells. The system has the following characteristics:

- Meet European RoHS regulations, pass SGS certification, use the best non-toxic and pollution-free battery;
- The battery anode is made of lithium iron phosphate (LiFePO₄) material, which has good safety performance and long cycle life;
- Adopt high-performance BMS battery management mode, with over-discharge, over-charge over-current, temperature and other protection functions;
- With charge and discharge automatic management and single cell balance function;
- Intelligent BMS, equipped with Bluetooth +WIFI modules, features functions such as remote information query, remote control and remote parameter modification;
- Flexible configuration, multiple system units connected in parallel can extend the power supply time of the system;
- Self-cooling method, the whole system has extremely low noise;
- The battery has less self-discharge, and it can be recharged for up to 10 months during storage; no memory effect, shallow charging and discharging;
- Wide temperature working range, 20℃ ~ + 60℃, good cycle life and discharge performance at normal temperature;
- Small battery size and light weight.

1.3 Product Identification Definition

 Voltage of battery is higher than safety voltage, it's dangerous to touch.	 Read manual before operation.	 Please recycle the battery after serving.
 Operate carefully.	 Default battery can't be thrown to trash can.	 CE standards are met.

2.Specifications

2.1 Model number

Items	TR8500WX
Rated Voltage (V)	51.2
Nominal capacity (Ah)	314
Energy (kWh)	16.076

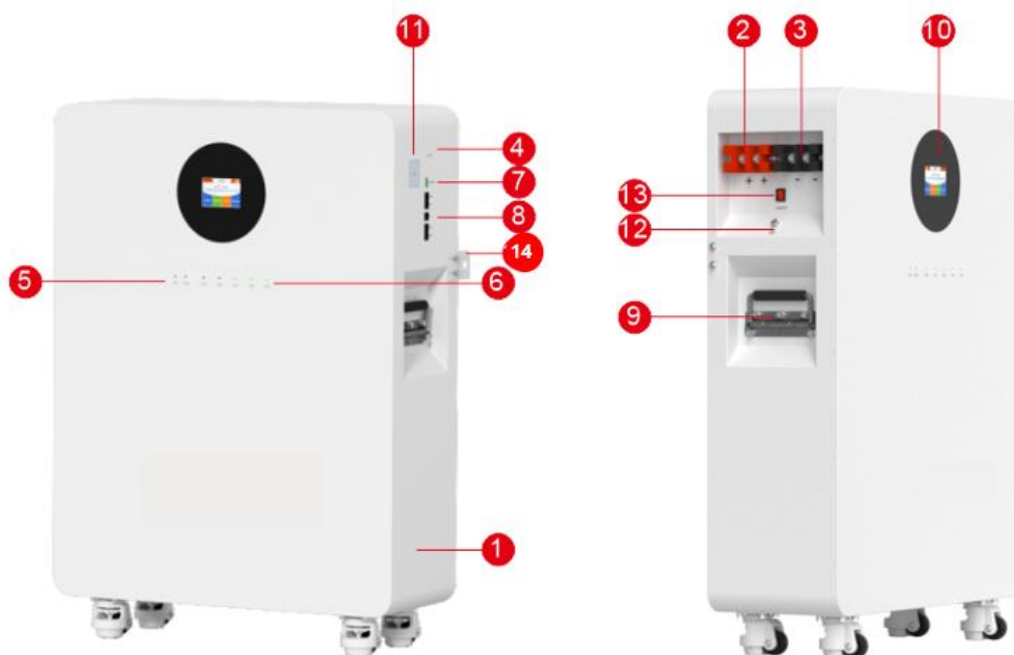
2.2 Performance parameter

Table 2-2: Performance parameter table

N O.	Items	Sub-Items	Parameters	Remark
			TR8500WX	
1	Charging	Single cell charging over-voltage protection	3.65V	Release below 3.34V
		Battery pack of charging over-voltage protection	58.4V	
2	Voltage	Single cell discharge low voltage protection	2.75V	Release above 3.0V
3	charge	Battery pack of discharge low voltage protection	44.8V	
4		Recommended continuous charge current	157A(Factory default Settings)	
5		Over-current alarm	162A	
6		Over-current Protection 1	167A	1s delay
7	Discharge	Recommended continuous discharge current	157A	
8		Over-current alarm	205A	
9		Over-current Protection 1	210A	1s delay
10		Over-current Protection 2	250A	500ms delay
11		Short circuit protection	Yes	350ms delay
12	Temperature	Charge and discharge temperature range	Discharge temperature range: -20~60°C	
13	Ambient	Charging temperature range	Charging temperature range: 0~55°C	
14	PCB	Operating temperature range	Below 85°C	

2.3 Interface Definition

Panel interface Configuration and Functions This section describes the functions of the interfaces on the front panel of the TR series.



- | | | |
|----------------------|----------------------|------------------------|
| ① Metal Case(SPCC) | ② Positive terminal | ③ Negative terminal |
| ④ RESET Button | ⑤ Run&Alarm Lighting | ⑥ SOC Display Lighting |
| ⑦ Dry Contact | ⑧ Communication Port | ⑨ Metal handle |
| ⑩ LCD Display screen | ⑪ WIFI/BT | ⑫ GND |
| ⑬ Switch | ⑭ Fixed bracket | |

Interface definition diagram

Fig. 2-3 Interface diagram

No.	Item	Function	Remark
1	Metal Case (SPCC)		
2	Positive Terminal	Battery external positive output port	
3	Negative Terminal	Battery external negative output port	
4	RESET Button	Emergency system reset to ensure system maintainability	Press for 1–3 seconds and release
5	RUN & ALM	Green LED is lighting during normal operation Red LED is lighting during abnormal operation	
6	SOC Display Lighting	Battery capacity display	

7	Dry Contact	Dry contact communication	Dry contact 1–PIN1 to PIN2: normally open, closed in fault protection; Dry contact 2–PIN3 to PIN4: normally open, low battery alarm closed.
8	Communication interface	RS485/CAN/COM0/COM1	COM0: Battery-to-battery parallel output communication line COM1: Battery-to-battery parallel input communication line RS485: to 485 port of the inverter CAN: to CAN port of the inverter
9	Metal Handle	Transport the battery box	During the handling process, prevent the battery from toppling over
10	LCD Display Screen	LCD Display Screen	LCD Display Screen
10	RS232	1. Monitor battery and parameter changes 2. Perform software upgrade.	Tools required: 1. 232 computer monitoring software 2. Upgrade software and upgrade program 3. Computer and USB to 232 communication line
11	WIFI/BT	WIFI/BT signal	Connect mobile APP
12	GND	Battery grounding point	Grounding of the battery box
13	On/Off Switch	Power switch.	OFF/ON Switch It must be "ON" when used. It must be "OFF" when closed.
14	Fixed bracket	Fixed bracket	After the battery is installed, lock the screws to fix the battery box

Note:

1. TR8500WX is not suitable for wall hanging due to their heavy weight, so they are placed on the floor.

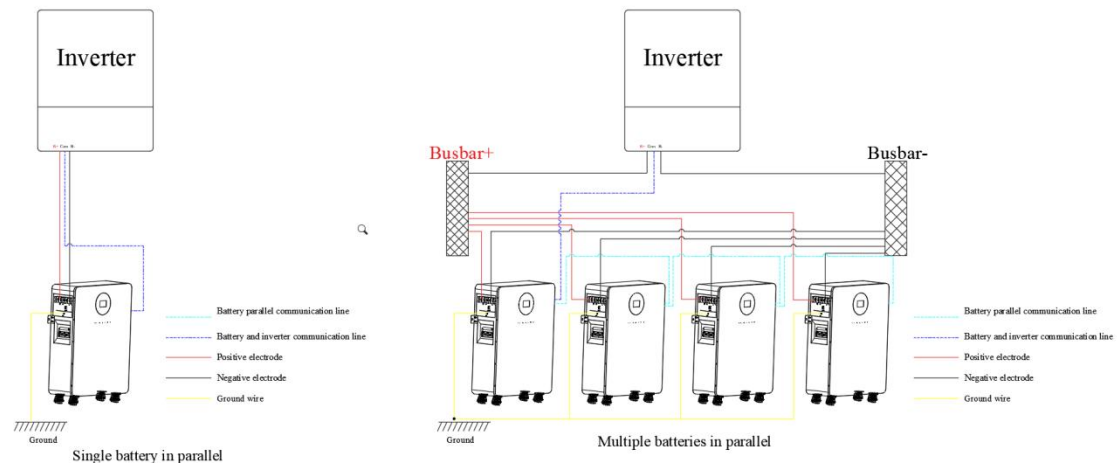
2.3.1 Easy &Fast Guideline for Installation Steps

2.3.1.1 Battery power-on and power-off operation instructions

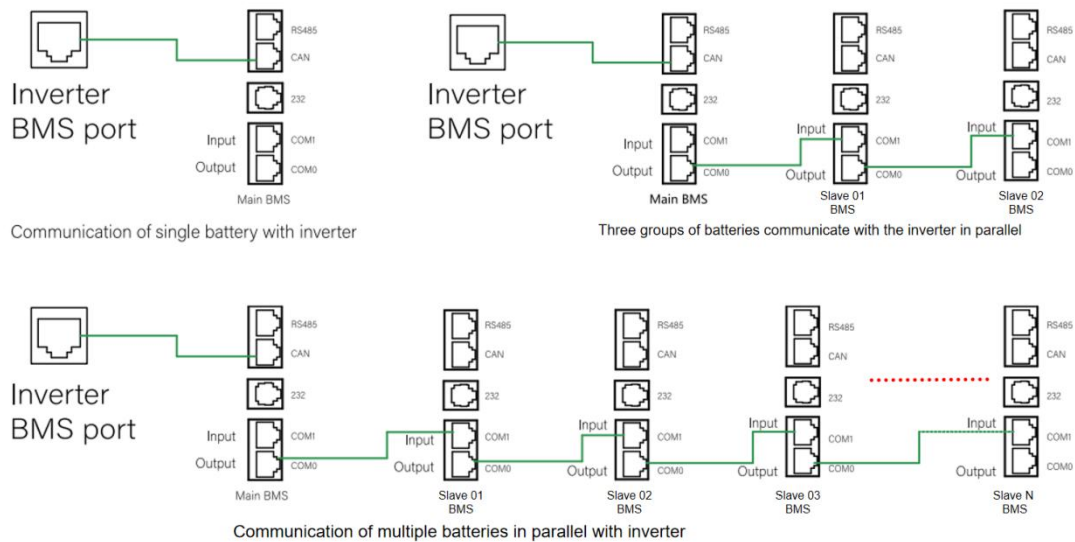
- Power-on: Place the "ON/OFF" switch to "ON", and the RUN indicator light will light up, indicating that the system is running.
- Power-off: Set the "ON/OFF" switch to "OFF". The RUN indicator light going off indicates that the system has stopped working.

2.3.1.2 Schematic diagram of battery and inverter connection:

- Schematic diagram of the power cord connection between the battery and the inverter.



● Schematic diagram of battery parallel communication line connection.



Remarks:

1. battery box parallel communication line connection mode.
2. If there are two or more batteries running in parallel, please choose a parallel bus bars to connect the power cord.

Note:

- Communication interfaces must be one-to-one. For the definition of battery 485 and CAN communication interfaces, see 2.3.7;
- For details about the inverter 485 and CAN communication ports, see the inverter operation manual. If the communication interfaces are inconsistent, the communication fails;
- Photovoltaic and AC input, load output wiring should comply with local safety regulations;
- The battery contains a variety of inverter protocols, the default protocol is Pylon (V3.5) protocol. Other corresponding inverter communication protocols can be

configured by connecting RS232 with BMS host computer. Alternatively, you can configure the communication protocol of the corresponding inverter under Protocol on the main screen of the display. Set the password to 123456. After the configuration is successful, power off the battery and restart it. After the communication protocol is modified, you must go to the Protocol page again to check whether the modification is successful. If the modification is not successful, modify it again and restart the BMS.

2.3.2 Indicator definition and description

Table 2-4: LED working status indication

status	Normal alarm/protection	RUN	ALM	power indicator light					explain
				L 5	L4	L3	L2	L1	
									
power off	Dormant	off	off	of f	off	off	off	off	All off
standby	Normal	F1	off	According to battery indicator					stand by
	Alert	F1	F3						Cell low
charge	Normal	on	off	According to battery indicator (Power indicator Maximum LED blink)					ALM does not blink when the overcharge alarm is generated/
	Alert	on	F3						
	overcharge protection	on	off	o n	on	on	on	on	If there is no mains supply, the indicator is in standby state
	Temperature/ove r current/fail-safe	off	on	of f	off	off	off	off	stop charging
discharg ing	Normal	F3	off	According to battery indicator					
	Alert	F3	F3						
	low-voltage protection	off	off	of f	off	off	off	off	stop charging
	Temperature/ove r current/short circuit/reverse/fa il-safe	off	on	of f	off	off	off	off	stop charging
lose efficacy		off	on	of f	off	off	off	off	Stop charging/discharging

Table 2-5 Capacity description

status	charge	discharging
--------	--------	-------------

Capacity indicator light		L5	L4	L3	L2	L1	L5	L4	L3	L2	L1
		●	●	●	●	●	●	●	●	●	●
Electric quantity	0-20%	off	off	off	off	F2	off	off	off	off	ON
	20-40%	off	off	off	F2	ON	off	off	off	ON	ON
	40-60%	off	off	F2	ON	ON	off	off	ON	ON	ON
	60-80%	off	F2	ON	ON	ON	off	ON	ON	ON	ON
	80-100%	F2	ON	ON	ON	ON	ON	ON	ON	ON	ON
Running lights ●		ON					flicker				

Table 2-6 Flash description

Flashing way	on	off	Remarks
Flashing 1	0.25S	3.75S	F1
Flashing 2	0.5S	0.5S	F2
Flashing 3	0.5S	1.5S	F3

Remarks:Flash 1 is short for F1;Flash 2 is short for F2;Flash 3 is short for F3.

Note:The alarm can be enabled or disabled through the host computer. The factory default is enabled.

2.3.3 Buzzer action description

When the fault occurs, every 1S will beep 0.25S;When protecting, every 2S will beep 0.25S (except for over voltage protection).When the alarm occurs, every 3S will beep 0.25S (except for over voltage alarm).The buzzer function can be enabled or disabled by the host computer, The factory default is disabled.

2.3.4 RESET Button description

When the BMS is in the dormant state, press the RESET button (3~6S) and release it, the protection board is activated, and the LED indicator lights up sequentially for 0.5 seconds from "RUN". When the BMS is in the activated state, press the RESET button (3~6S) and release it, the protection board will be dormant, and the LED indicator will turn on for 0.5 seconds starting from the lowest battery.When BMS is activated, press the RESET button (6~10S) and release, the protection board is reset, and the LED lights are all the same Lights for 1.5 seconds.

After the BMS is reset, the parameters and functions set by the host computer are still retained. If the original parameters need to be restored, they can be implemented by the "Restore default values" of the host computer, but the related operation records and stored data remain unchanged (such as power, cycle times, Protect records, etc.).

Note:

1. After resetting the BMS with RESET, the WIFI configuration will also be reset. We must take care of you for the WIFI configuration.
2. If the new battery fails to detect WIFI or Bluetooth signals, it can be reset using RESET. Then search for the Bluetooth signal, enter the APP via Bluetooth connection, click on "Parameter settings" at the bottom of the screen to enter the parameter Settings, find the distribution network "Entering distribution network mode", click on it, and enter the password "4321". Then the WIFI binding can be unbound. After WIFI is bound, other devices will not be able to search for Bluetooth and WIFI signals.

2.3.5 Sleep and wake

2.3.5.1 Sleep

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

- (1) Single or overall over-discharge protection has not been released within 60 seconds.
- (2) Press the RESET button(3~6S), and release the button.
- (3) The minimum cell voltage is lower than the sleep voltage, and the duration reaches the sleep delay time (at the same time, no communication, no protection, no balance, no current).
- (4) Standby time exceeds 24 hours (no communication, no charge and discharge, no mains).
- (5) Force shutdown by PC software.

Before entering hibernation, make sure that the input terminal is not connected to external voltage, otherwise it will not be able to enter the low power consumption mode.

2.3.5.2 Wake

When the system is in the low power consumption mode and meets any of the following conditions, the system will exit the low power consumption mode and enter the normal operation mode:

- Connect the charger, The output voltage of the charger must be greater than 51.2V.
- Press the RESET button (3~6S), and release the button.

Note:

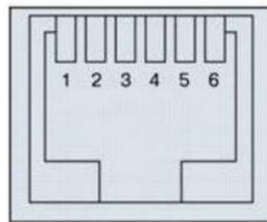
After single or overall, over-discharge protection, it enters low power consumption mode and wakes up at regular intervals every 4 hours to turn on charge and discharge mode. Can be charged, it will exit hibernation and enter normal charging. If it cannot be charged after 10consecutive automatic wake up, it will no longer to wake up.

When the system is defined as the end of charging, the recovery voltage is not reached after 2days of standby (standby time set value), and the charging is forcibly

resumed until the end of recharging.

2.3.6 RS232 communication

The BMS upper computer can communicate with the BMS through the RS232 interface of the battery pack to monitor various information of the battery, including battery voltage, current, temperature, status, battery production information, etc. The default baud rate is 9600bps.

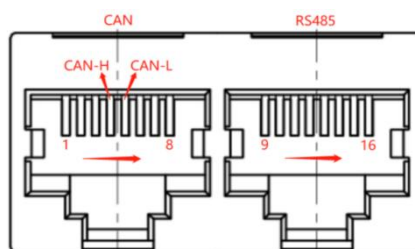


RS232- with 6P6C vertical RJ11 socket	
RJ11 PIN	Definition specification
1、 2、 6	NC
3	TX
4	RX
5	GND

2.3.7 RS485 And CAN Interface Definition

485 communication: The default baud rate is 9600bps. The interface function communicates with the inverter. When the battery is the main BMS, it can summarize the data of the slave machines and communicate with the inverter.

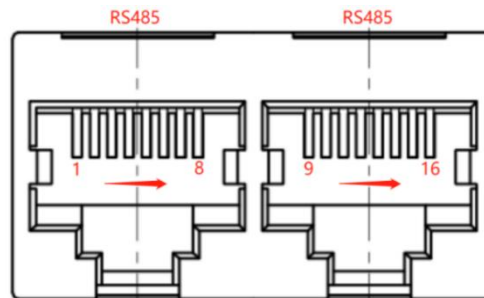
CAN communication: The default baud rate is 500K. The interface function communicates with the inverter. When the battery is the main BMS, it can summarize the slave machine data and communicate with the inverter.



CAN-- Using 8P8C vertical RJ45 socket		RS485- 8P8C vertical RJ45 socket	
RJ45 PIN	Definition specification	RJ45 PIN	Definition specification
1、 3、 6、 7、 8	NC	9、 16、	RS485-B1
4	CAN-H	10、 15	RS485-A1
5	CAN-L	11、 14	GND
2	GND	12、 13	NC

2.3.8 Definition of two RS485 parallel communication ports

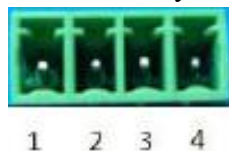
Multiple battery parallel communication ports, with a default baud rate of 9600bps. Through this port, multiple battery packs can communicate in parallel. COM0 is the communication output port and COM1 is the communication input port. When multiple groups are connected in parallel, refer to 2.3.1 "Schematic Diagram of Battery Parallel Communication Line Connection".



COM0- 8P8C vertical RJ45 socket		COM2- 8P8C vertical RJ45 socket	
RJ45 PIN	Definition specification	RJ45 PIN	Definition specification
1、8	RS485-B	9、16、	RS485-B
2、7	RS485-A	10、15	RS485-A
3、6	GND	11、14	GND
4	GND	13	UP_IN
5	DN_OP+	12	GND

2.3.9 DRY Interface Definition

BMS alarm faults and protection faults, dry node output signals.



Pin number	Pin definition	Remarks
1	NO	Normally open, closed during fault and protection./
2	NO	
3	NO	Normally open, low battery alarm closed./
4	NO	

2.4 Battery Management System (BMS)

2.4.1 Low Voltage Protection

Discharge low voltage protection:

When discharging, the voltage of any single cell is lower than the protection value, the over discharge protection will be started, the battery buzzer alarm. When the voltage of all cells is recovered to the range of released value, the protection is removed.

Charging Over Voltage Protection:

During charging, when the total voltage of battery pack or the voltage of any single cell reaches the protection value, the system stops charging. When the total voltage and the single voltage return to the released value range, the protection will be released.

2.4.2 Current Protection

Charging Over Current Protection:

When the charging current is more than the protection value, the battery buzzer will alarm and the system will stop charging. The protection will release after the system delays the rated time.

Discharging Over Current Protection:

When the discharge current is more than the protection value, the battery buzzer will alarm and the system will stop discharging. The protection will release after the system delays the rated time.

Note: The buzzer alarm setting can be manually turned on or off on the computer. The default is off.

2.4.3 Temperature Protection

Charge low/high temperature protection:

During charging, when the battery temperature exceeds the range of 0°C~+55°C, the system starts the charging temperature protection, stops charging, recovering to the rated return value and then the protection is released.

Discharge low/high temperature protection:

During charging, when the battery temperature exceeds the range of -20°C~+60°C, the system starts the charging temperature protection, stops charging, recovering to the rated return value and then the protection is released.

2.4.4 Other Protection

Short circuit protection:

When the battery system detects any external short circuit, the BMS short circuit protection will be triggered.

Release of Short Circuit Protection

When any of below conditions achieved, the protection will be released:

- (1) When charging starts;
- (2) When load has been removed;

Note: The max, discharge current of battery should be bigger than max working current required for load.

3.Installation and configuration

3.1 Installation&Preparation

Safety Regulation

Only the personnel who have received the electrical system training and fully mastered the electrical knowledge can install this system. Always follow the safety regulations listed below and local safety regulations during installation.

- All circuits with external voltage less than 48V connected to the power system must meet SELV requirements defined in IEC60950.
- If operating inside the cabinet, make sure that the power system is not active, The battery shall also be shut down.
- The cables shall be arranged reasonably and protected to avoid touching these cables when operating the power equipment.
- It is recommended to wear the following safety gear when dealing with the battery pack.



Insulated glove



Safety shoes



Safety goggles

3.1.1 Environment Requirement

Working Temperature:-20°C~+60°C

Storage Temperature:-10°C~+35°C

Relative Humidity:5%~85%RH

Altitude:<4000m

Working environment: there is no conductive dust and corrosive gas, and the following conditions are met:

- The installation site should be more than 1,000 meters away from the coastline and avoid the core area of high salt spray corrosion.
- The ground is flat and level.
- There are no in flammables and explosives in the accessories of the installation point.
- The ideal ambient temperature is 15°C~30°C .
- Keep away from dust and dirty areas.

Note: Before long-term storage, please charge the battery to 50% - 70% (SOC

50-70%, without charging and discharging current, the reference value of the maximum single cell voltage is 3.30-3.32V, and the reference value of the total voltage is 52.8V - 53.12V). Charge once every three months and cycle once every six months (discharge once and charge once).

3.1.2 Tools

The tools and meters that may be used in Table 3- 1:

Table 3-1 Tools

Name (Left Column)	Name (Right Column)
Screwdriver/Slotted screwdriver/Phillips screwdriver	Multimeter
Torque wrench	Clamp meter
Diagonal pliers	Insulation tape
Needle-nose pliers	thermometer
Wire cutter	Anti-static bracelet
Wire stripping pliers	Tie
Electric drill	Tape measure

Note: The battery is relatively heavy. During installation, other auxiliary tools can be used, including but not limited to trolleys, forklifts, etc.

3.1.3 Technical preparations

Electrical interface check Devices connected directly to the battery can be user equipment, power supplies, or other power devices.

- Confirming whether the user's photovoltaic power generation equipment, power supply or other power supply equipment has a direct current output interface, and measuring whether the output voltage of the direct current interface meets the voltage range requirements in “Table 2-2: Performance parameter table” .
- Confirm that the maximum charge and discharge current capacity of the DC interface of the user's photovoltaic power generation equipment, power supply or other power equipment should be greater than the maximum working current of the product used in the performance parameter table. The user's photovoltaic power generation equipment should have a current-limiting function to ensure the normal operation of the user's equipment.
- Please ensure that the maximum operating current of the device (inverter) connected to the battery is less than the maximum charging and discharging current shown in "Table 2-2: Performance Parameters Table".



Security check

It is strictly prohibited to place flammable, explosive and other dangerous materials next to the battery. Fire equipment should be available near the equipment, such as portable dry powder fire extinguishers. Where necessary, an automatic fire protection system should be provided.

3.1.4 Unpacking inspection

When the equipment arrives at the installation site, it must be loaded and unloaded in accordance with regulations to prevent sunlight and rain. Before unpacking, check the total number of pieces according to the shipping list attached to each packing box, and check whether the appearance of the packing box is intact.

3.1.5 Manual for Energy Storage

Handle with care during unpacking to protect the surface coating of objects.

When opening the packaging box, the installer should first read the technical documents and check the list, and check whether the items are complete and intact according to the configuration table and packing list. If the internal packaging is damaged, it must be checked and recorded. The packing list is as follows:

Table 3-2 List

No.	Picture	Name	Qty.	Remark
1		LiFePO4 Battery	1 pcs	
3		Plug	1 pcs	
4		Trestle	2pcs	
6		M8*90 Expansion screw bolt M5*10 Combination screws	2 pcs 4 pcs	

7		Power cables	2 pcs	Connect the inverter and the battery
8		Battery parallel communication network cable	1 pcs	Connect the communication between batteries
9		Category 6 network cable	1 pcs	Connect the inverter and the battery
10		User Manual Warranty card QC Pass Cert.	1 pcs 1 pcs 1 pcs	

Note: If there are any changes to the packaging list, the user manual will not be updated. The actual packaging list shall prevail.

3.1.6 Engineering coordination

Note the following before construction:

- **Installation space and load bearing.**

Make sure that there are sufficient fixed components to install the battery system, and to ensure that the battery mounting bracket or the cabinet be strong enough to bear the weight.

- **Project layout.**

Ensure the whole construction process of power equipment, batteries and other reasonable layout.

- **Wiring layout.**

Ensure that the wiring reasonable, orderly and consider the moisture-proof, corrosion prevention.

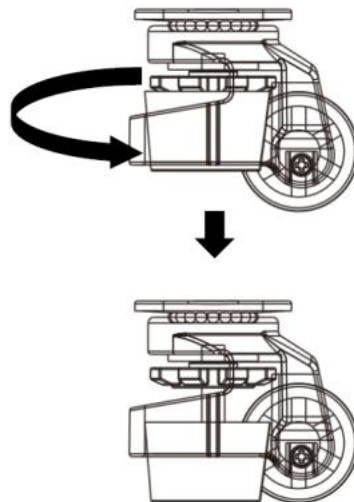
- The whole installation process should wear anti-static wristband.
- The installation site should be at least two or more peoples to operate
- Equipment and tools ready for installation.

⚠ CAUTIONS: Please ensure the installation site safe before installation.

3.1.7 Installation Steps

The steps for installing TR8500WX floor mounted batteries are as follows:

- Place the battery near the wall.
- Use fixing bolts to lock the battery to the wall.
- Lock the battery wheel.
- If two or more batteries are installed at the same time, add bus bars for the positive and negative terminals.



Step No.	Name	Definition
1	Turn off power supply	The system should be powered off, to ensure that there is no electric in installation process

2	Mechanical installation	1. Mounting lugs installation 2. Battery fixed installation
3	Electrical installation	1. Grounding cable 2. Power cable installation 3. Connecting equipment installation 4. Communication cable installation
4	Electrical commissioning	Power system commissioning

Step 1.interruption Of Power Supply

Before installation, please ensure the battery is powered off, at the same time, shutdown the equipment which need to connect to the battery.

Step 2. Machinery Installation

Select an installation mode based on the battery model.

Step 3. Electrical installation

Grounding cable:

The grounding cable end with screw press-fit fixation in the chassis rear grounding hole, the other end is connected to the frame (or cabinet) grounding copper bar, to ensure the stable connection.

Power cord installation:

If a single battery is used, the battery terminal is directly connected to the terminal of the device or the switching power supply.

If multiple batteries are connected in parallel, use a bus bar to connect the battery power cables in parallel. The length of the power cables from the parallel battery power cables to the bus bars must be the same.

Note:Parallel communication cable connection:

For details, see 2.3.1 Schematic diagram of battery parallel communication cable connection.

Step 4.Electrical commissioning

When these steps are completed, turn on switch to start the battery one by one, then boot on the whole power system complete the installation.

※Communication inspection and fault handling between BMS and inverter:

➤ A detection method for whether communication has been established between the BMS and the inverter

After the inverter is debugged, disconnect the communication line between the BMS and the inverter. Wait for about 1 minute and then determine whether the inverter reports a "BMS communication fault". If it reports a fault, after connecting

the communication line, the inverter communication fault disappears, indicating that the communication between the BMS and the inverter is normal.

If the communication line between the BMS and the inverter is disconnected and the inverter does not alarm, it indicates that the BMS and the inverter cannot communicate normally. Check the parameter Settings of the inverter.

➤ **The handling method for the inverter reporting "BMS communication error"**

If the inverter keeps reporting a BMS communication failure, check whether the inverter's communication interface definition matches the interface definition of the BMS communication line and whether the BMS communication protocol Settings match the inverter.

Treatment method:

1. Re-fabricate the communication lines that match the inverter and BMS interface definitions.
2. Set the communication protocol to match the inverter through the BMS upper computer or the APP.

 **CAUTIONS:** If you have any question about the installation, please stop and contact dealer technical support immediately. If the battery does not start or control panel ALM lights, please disconnect the power line inspection and reinstall the start. If still cannot solve, please contact dealer, avoid damage to equipment or cause accidents.

4.Using maintenance and troubleshooting

4.1 battery system use and operation instructions

After completing the electrical installation, turn on the battery system as follows:

1. Make preparations before starting the battery pack and then turn the "ON/OFF switch" to "ON", RUN light and SOC light will be on after self inspection.
2. If you need to turn off the battery, please place the "ON/OFF switch" in the "OFF" position, and the battery system will be turned off.



Pay attention :

After turn the switch "ON". If it is found that the battery status indicator on the front panel is on red continuously, please check 4.2 alarm description. If the fault cannot be eliminated, please contact the dealer in time.

1. Use a voltmeter to measure whether the two voltages at the battery access end of the circuit breaker are over 45V, and check whether the voltage polarity is consistent with the inverter input polarity. If the voltage output at the battery access end of the circuit breaker is over 45V, then the battery has started to work normally.
2. After confirming that the battery output voltage and polarity are correct, close the

circuit breaker and set the inverter power switch to "ON".

3. Check the working status of the inverter and the indicator light status of the battery. If everything is normal, it indicates that the connection between the battery and the inverter is complete. If the inverter alarms, please refer to the inverter manual to find out the cause or contact the dealer.

4.2 Alarm Description and Solution

In case of protection action or fault of the system, the alarm signal will be given through the working status indicator light of the front panel, and the specific alarm category can be queried through the network management system. If there are any abnormal faults affecting the output, such as voltage over-voltage, charging over-current, under voltage protection, temperature protection, etc., please handle according to Table 4-2.

Table 4-2 Main alarm and protection

State	Alarm category	Alarm indication	Solution
Charging state	Cell over voltage	ALM Red light is always on	Stop charging and find out the cause of the fault
	Charge over current	ALM Red light is always on	Stop charging and find out the cause of the fault
	Charging temperature alarm	ALM Red light is always on	Stop charging
Discharging state	Discharge over current alarm	ALM Red light is always on	Stop discharging and find out the cause of the fault
	Discharging temperature alarm	ALM Red light is always on	Stop discharging
	Total voltage under voltage alarm	ALM Red light is always on	Charge
	Cell Voltage Under-voltage alarm	ALM Red light is always on	Charge

4.3 Analysis and solution of common faults

Common faults and solutions are shown in table 4-3:

Table 4-3 Common faults and solutions

No.	Fault	Causal analysis	Solutions
1	When the ON/OFF switch is set to ON, the indicator light does not respond	1. Power switch is broken 2. Over-discharge of the battery 3. BMS is damaged.	1. Replace the power switch/ 2. Charge 3. Replace the BMS

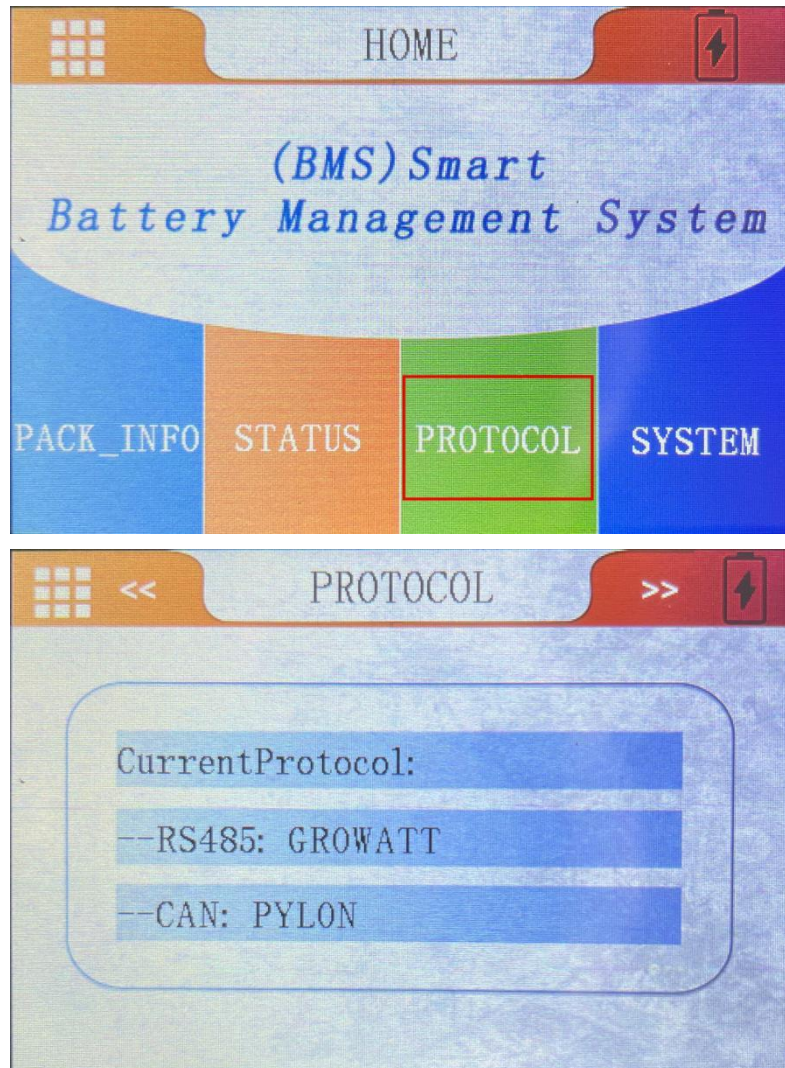
2	When the "ON/OFF" switch is set to ON, there is no DC output and the ALM light flashes	Battery data status is abnormal	Connect the mobile phone APP to the BMS Bluetooth or WIFI, read the fault and battery information, and select the corresponding solution through the BMS fault
3	DC power supply time is too short	1. Battery capacity attenuation 2. The consistency of the charge capacity carried by individual battery cells varies too much	Replace a battery
4	Battery cannot be fully charged	Charging voltage is too low	Adjust charging voltage to 57.6V
5	The moment the battery is connected to an external device and starts up, the ALM light of the battery flashes	1. Short circuit in power supply wiring 2. The starting current of the external device is too large	1. Turn off the battery, check the cause of the short circuit and solve it 2. Disconnect the device connection, start the battery alone, and confirm the battery status. If the battery status is normal, the external device is damaged 3. Use the device to charge the battery or wait for about one minute to make sure the alarm light returns to normal

In case of special technical difficulties or questions, please contact the seller in time.

Appendix:

Display configuration inverter communication protocol

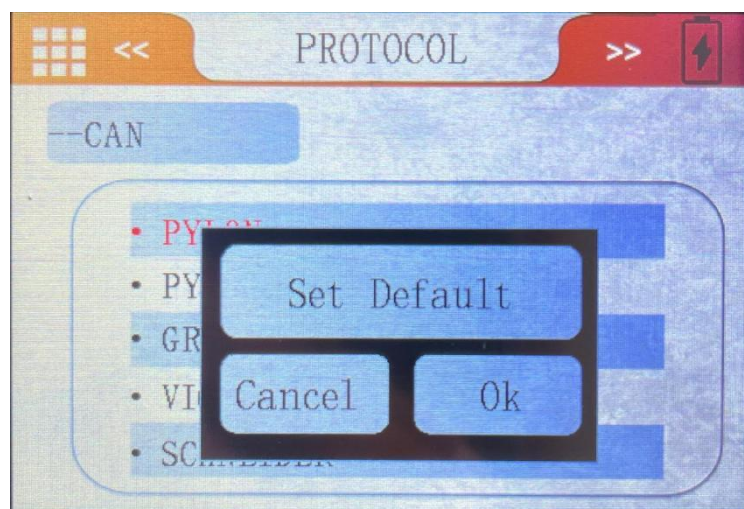
1. Turn on the battery switch and the display starts to work.
2. Tap "PROTOCOL" to enter the configuration screen.



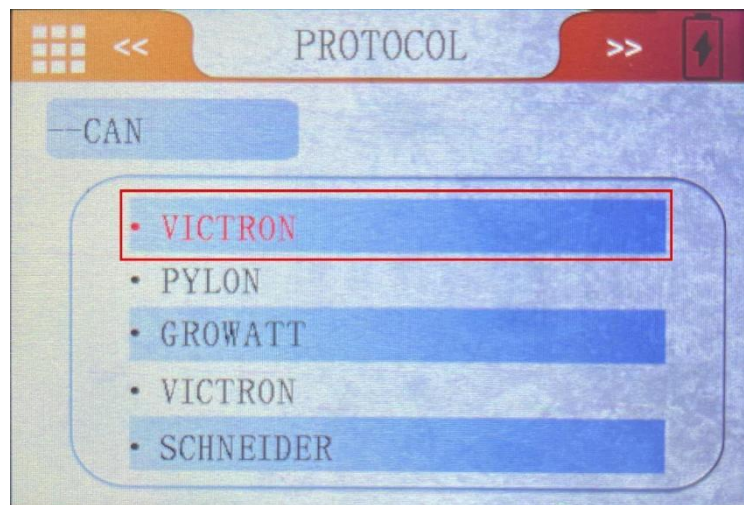
3. Configure the 485 or CAN communication protocol of the BMS according to the communication type of the inverter configuration.
4. Click the "CAN or RS485" area, click any protocol, and enter the password "123456".



5. Swipe up and down the interface with your finger, select the protocol to be configured, and click "OK".

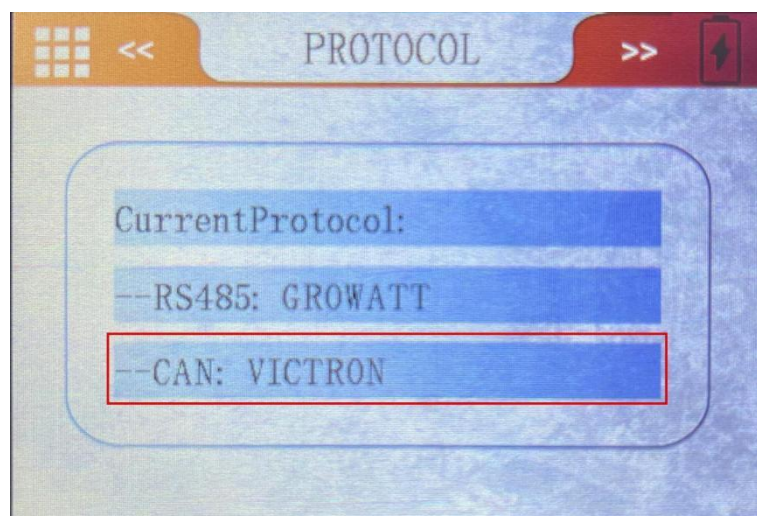


6. After the configuration is successful, check that the protocol to be configured is in red.



7. Turn off the battery switch and wait 3 to 5 seconds to restart the battery.

8. Tap "PROTOCOL" again to go to the configuration page. Check that the protocol is modified successfully.



9. The configuration is complete.

APP User Manual

5.Download and install

According to the mobile phone system, select the download link Android entrance Mobile phones that support GMS can download PACEEX App through Google Play Store, and Android phones that do not support GMS can install APK directly.

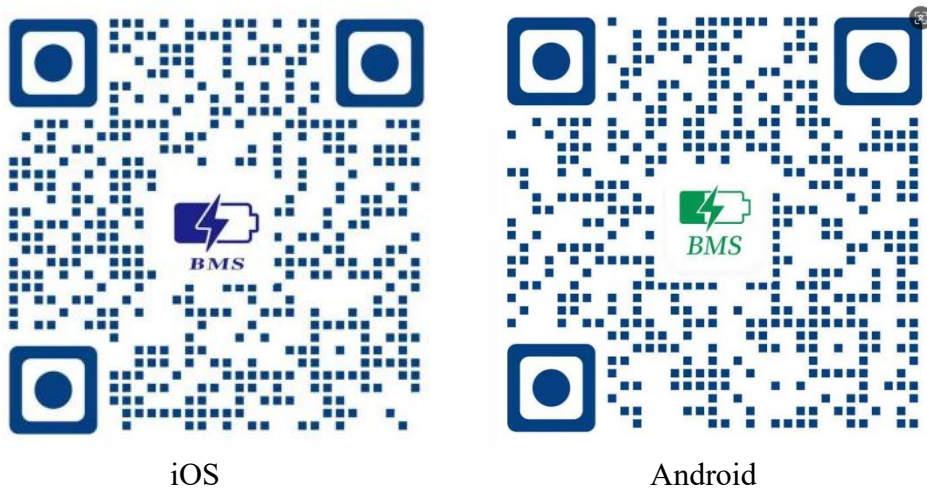
1.Android entrance:Search for PACEEX downloads in the App Store

<https://play.google.com/store/apps/details?id=com.paicheng.bms>

2.iOS entrance:Search for PACEEX downloads in the App Store

<https://apps.apple.com/cn/app/6461723294>

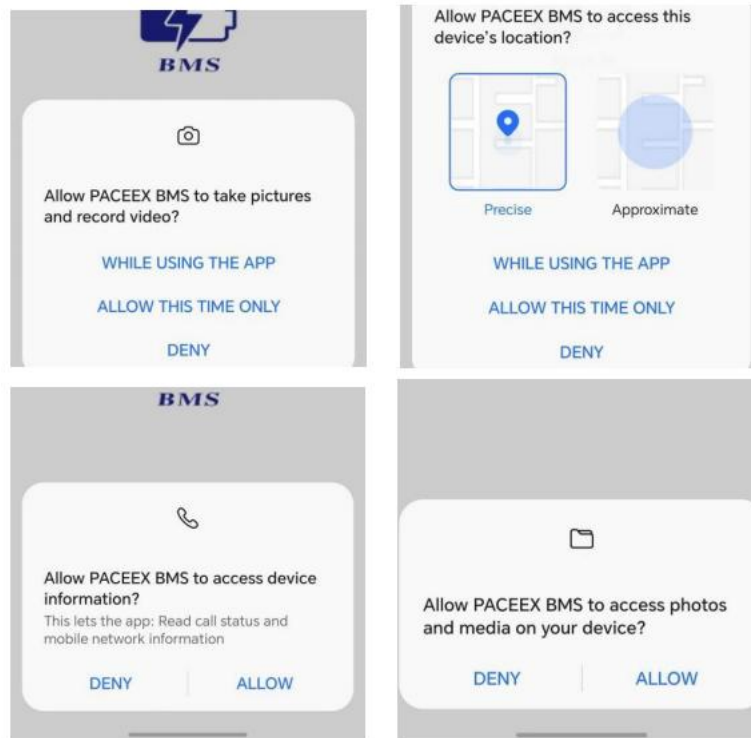
3.Download the APP by scanning the QR code



6.APP dynamic permission

Install the APP, click the start button and start smoothly. For the first start, you will request the user to confirm and authorize the following authority:

- Camera permission;
- Add WIFI devices in remote control Location permission:
- search for nearby Bluetooth devices in local control and identify current network information in remote control;
- Equipment status information detect the operation status of the equipment;
- Photos and audio: The code scanning interface in the remote control system can directly identify the local photo album;



Control method

Local control: BLE Bluetooth communication, directly search for the nearby Bluetooth signal, a pair of continuous connection, control devices, no account login, do not do binding records, that is, ready to use Remote control.

WiFi communication: which realizes the purpose of controlling the device rather than in the same geographical location. It requires account registration and login, records the binding between the account and the device, and requires distribution network operation.



Local Control(BLE)

When the device is in the distribution network state, click the Local control button, search for the device on the local control page, click Search for the device, and click Connect to enter the BMS data page, view the BMS information and modify parameters.



7.Telecontrol

7.1 Account registration and login

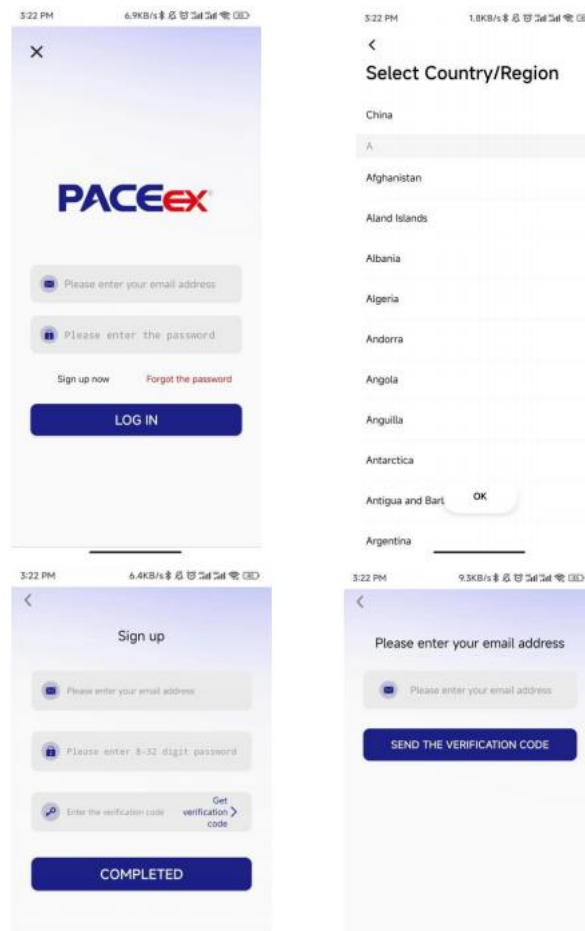
Registration: Create the new account by means of email account, password and verification code.

Note:

Please select the real country and region according to the actual situation, this is very important. Once selected and created successfully, the devices added through the account distribution network will automatically connect to the server node with the same account.

Login: Log in with the registered account number and password.

Forget your password: You can reset your password through your email number.



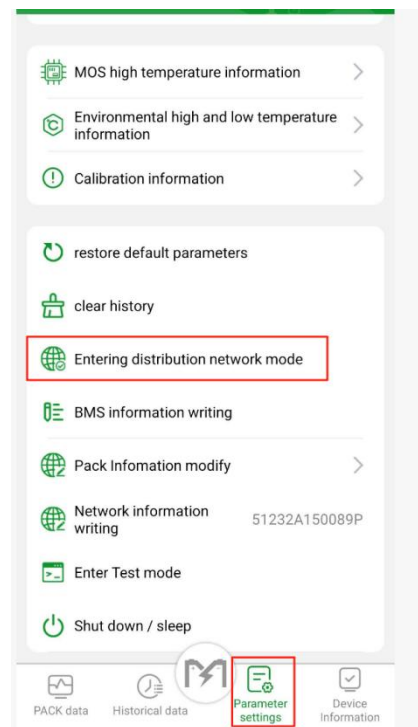
7.2 List of equipment

7.2.1 The WIFI module is put back in the factory

If the mobile phone APP fails to search for Bluetooth or WiFi signals, it indicates that the WIFI might be bound. The WIFI module needs to be restored to its factory

state through the following operations to discover the device.

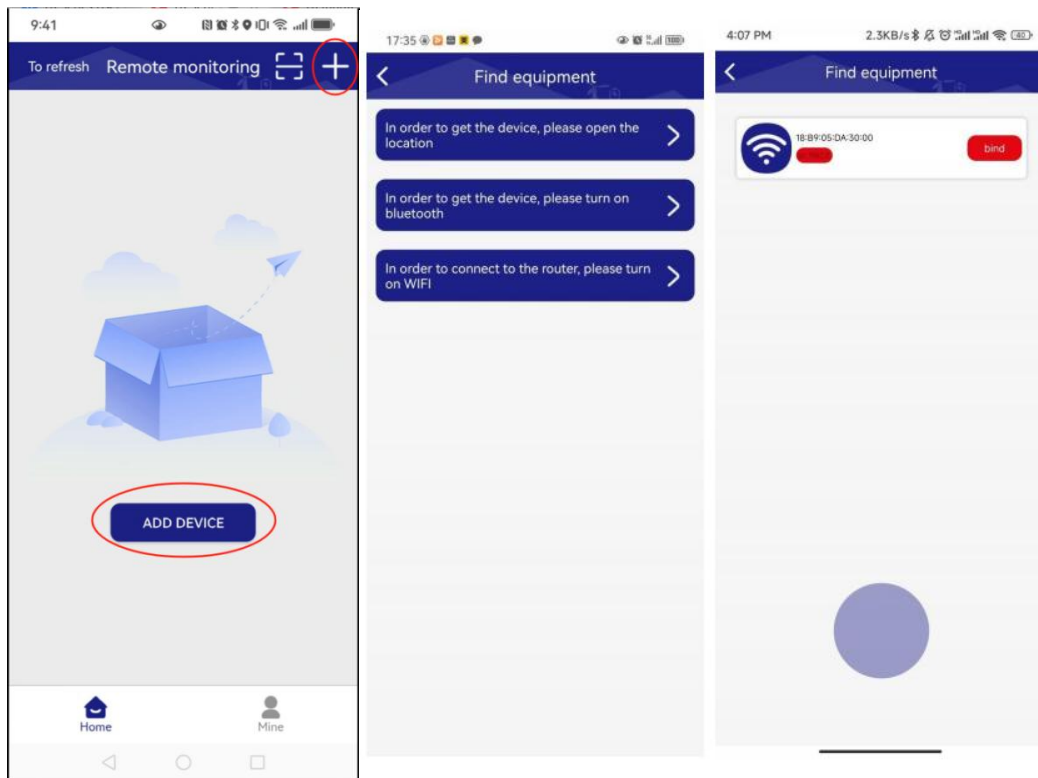
- Press and hold the reset button for 10 to 13 seconds. The specific operation of the LED light is as follows: Long press and hold the reset button, and the RUN light will run once.
- Search for the Bluetooth signal and connect to the APP.
- Enter the "Parameter Settings" interface.
- Click "Entering distribution network mode", enter the password "4321", and unbind the WIFI module.



Note: When installing the new machine, if the Wi-Fi signal distribution network cannot be searched, follow the unbinding method. Otherwise, it is not necessary.

7.2.2 Search for BMS WIFI signal

Click "Add Device" or "+" to enter the search page and search for the device.



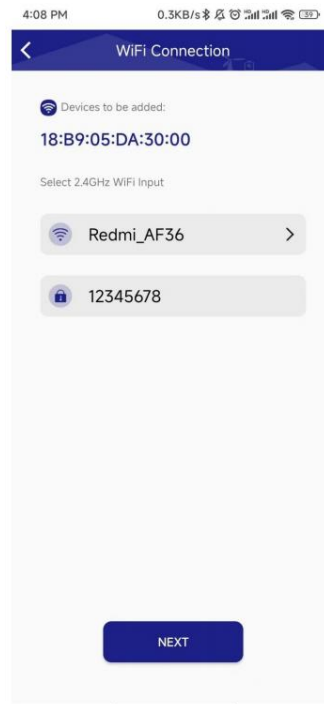
Note:

1. Scanning the WIFI QR code for network distribution function is temporarily unavailable.
2. This step requires the phone to open the "Bluetooth", "Positioning and "WiFi" functions, otherwise the search and subsequent distribution network operation cannot be completed.

7.2.3 Fill in the distribution network information

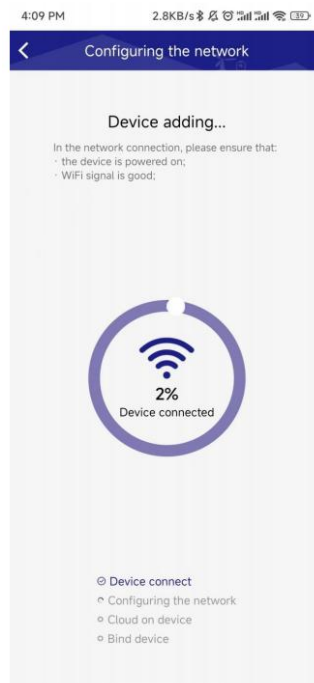
Click the device found in 5.3.2, jump to the distribution network information page, fill in the WiFi account and password of the device to be connected, or change the WiFi. After confirming that the password is correct, click "Next" to enter the distribution network waiting page.

Note: The mobile phone should be connected to the WiFi first, and the module only supports 2.4G WiFi, please identify it by yourself.



7.2.4 Execute distribution network operation

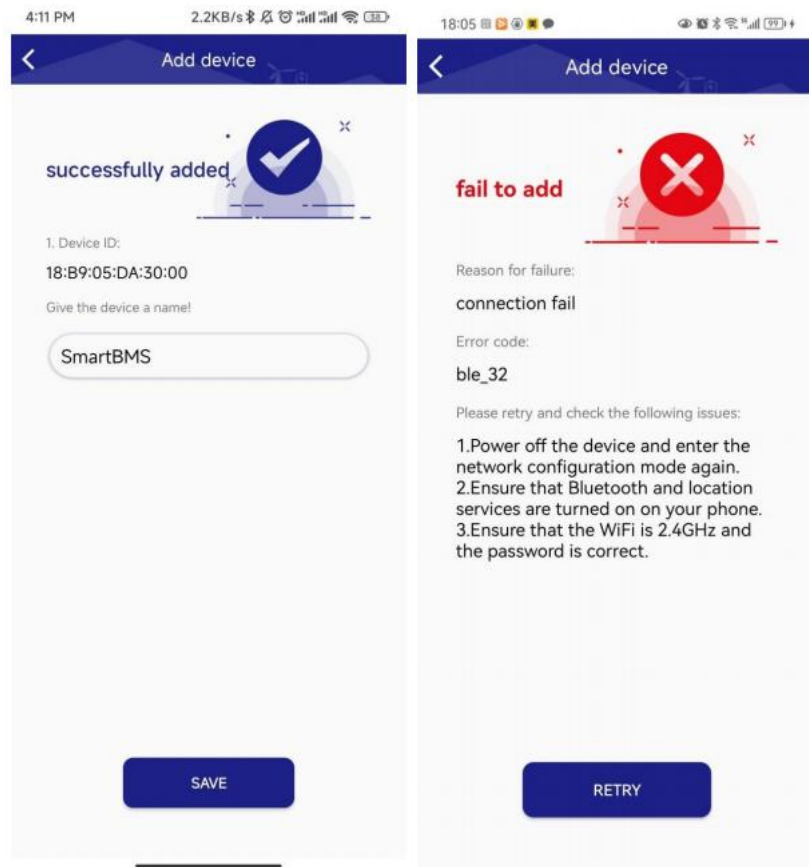
APP and device will automatically perform "Connect device", "Configure network", "device cloud" and "bind device" operations. Please wait patiently.



7.2.5 Distribution network results

When the distribution network is over, it will jump to the page, click Save to

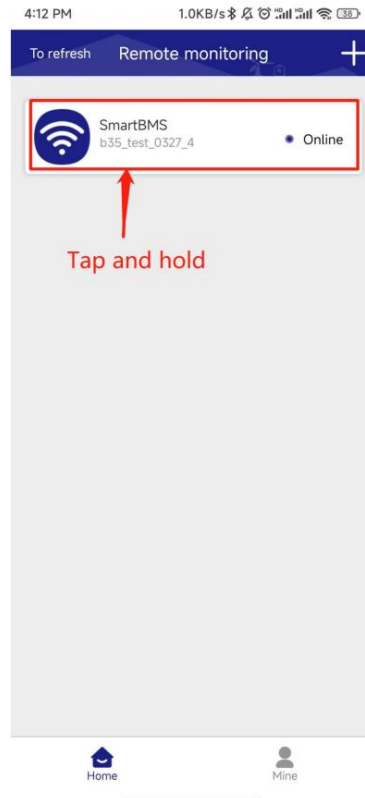
successfully add and automatically jump back to the device list page. If the network fails, please follow the prompts of the APP, and start from step 5. 3. 1 after inspection. If the network still fails for many times, please save the error page and contact the after-sales personnel!



7.3 Device editor

Long press the device item, and the edit menu will pop up at the bottom.

Rename: Modify device nickname to use Delete, unbinding with the device, the next use need to scan the code or add the network.



7.4 Device sharing

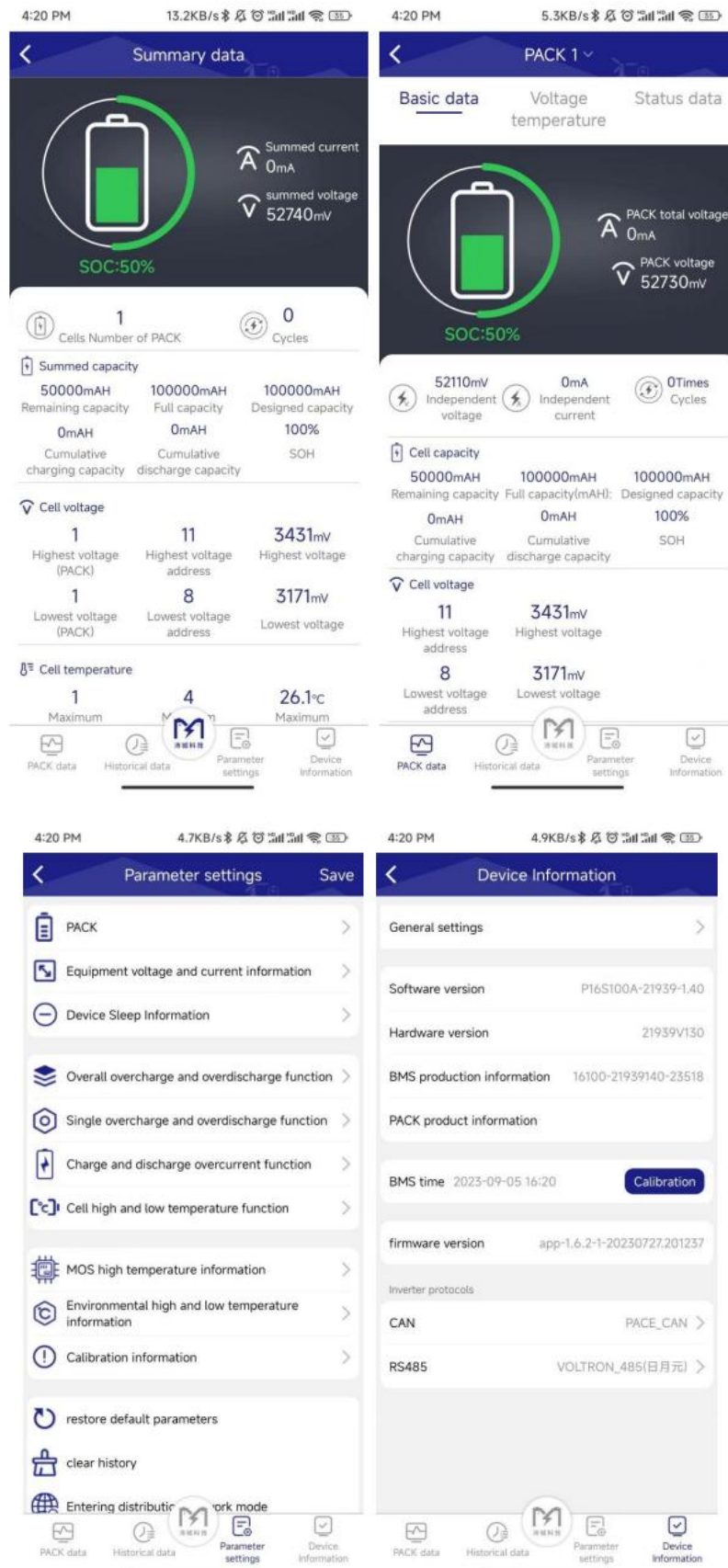
Long press the device item, when you are the device administrator (the first account bound to the first distribution network), the device can generate a QR code for other users to scan the code to add. Note: Non-administrators cannot share twice. The QR code generated each time can only be scanned once, and the time of scanning the code is limited (30 minutes).



7.5 Device control

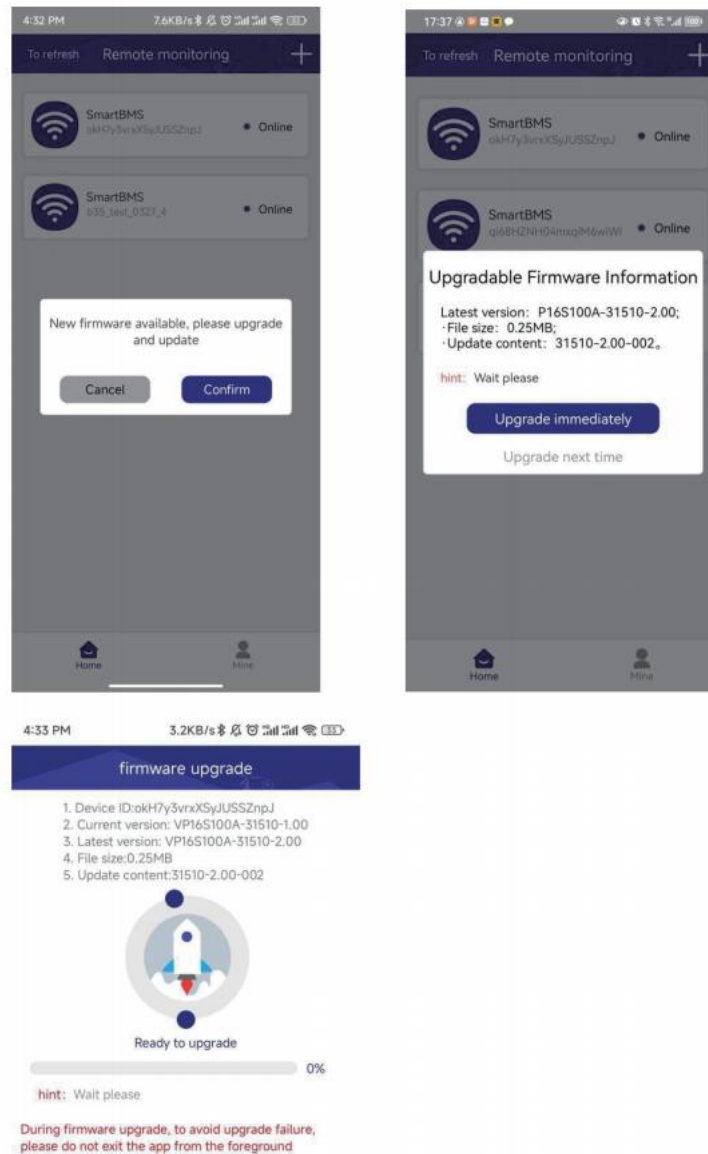
According to the functions supported by serial port protocol 0.0.9, except for the

protocol itself, the summary interface, basic data, voltage and temperature, state data, historical data, parameter setting, equipment information, general setting,etc.



7.6 OTA upgrade

When there is an updated version of firmware in the background, the APP clicks on a device to pop up the upgrade popup, click upgrade immediately, and the firmware will be upgraded. Click the next time to enter the device parameters display, Settings and other pages.



7.7 Account exit and logout

Account exit: after exit, you can switch to other accounts for login.

Account cancellation: Once cancelled, all the information and binding relationship of the account will be cleared, and you need to be re-registered next time.

