User's Manual

Home Energy Storage Series

Edition V1.0

Introduction

Thanks for choosing $LiFePO_4$ battery, we will provide you with high-quality products and reliable after-sales service. In order to protect the safety of users and products, please carefully read the detailed information on the product's features, structure, operation standards, maintenance and troubleshooting, etc.

Special Statement

This manual cannot be used as the basic requirements of $LiFePO_4$ battery. This manual is subject to update without notice. No liability is accepted for any damages arising in this manual including, but not limited to, omissions, typographical errors, arithmetical or listing errors in this manual.

Liability Statement

will not bear any direct or indirect responsibility for battery damage or property loss caused by the following situations.

- Not authorized by, the battery system has been modified, refitted or replaced with parts.
- Non technicians change and clear the serial number of the battery system.
- Design and installation of the system composed of other equipment does not meet the standards, safety regulations and other relevant requirements.
- Equipment damage caused by failure to comply with the relevant requirements of the battery system user manual.
- Equipment damage caused by improper or misuse of the battery system.
- Equipment damage caused by insufficient ventilation of the battery system.
- Maintenance procedures regarding battery systems do not follow acceptable standards.
- Equipment damage caused by force majeure, such as earthquakes, storms, lightning, over-voltage, fire, etc.
- Equipment damage caused by any external factors.

Edition	Date	Records
V1.0	2024-06	First Edition

1. Safety Precaution

DANGER!

● Please keep Power Off before any operations to avoid danger. Strictly follow all safety precautions outlined in this manual and safety labels on the equipment during the operation.

● This manual applies to trained and knowledgeable technical professionals. The technical personnel has to be familiar with the product, local standards, and electric systems.

● Do not use the battery module if it is defective, broken, or damaged.

● Do not disassemble, modify, or replace any part of the battery module without official authorization from.

● Damaged battery may leak electrolyte. If the battery module leaks electrolyte, avoid contact with the leaking liquid or gas, and immediately contact the after-sales service center for help.

WARNING!

In case of accidental exposure to spilled substance, do the following:

● Breath in the leaked substance: Evacuate from the polluted area, and seek immediate medical assistance.

● Eye contact: Rinse your eyes for at least 15 minutes with clean water and seek immediate medical assistance.

● Skin contact:Thoroughly wash the touch area with soap and clean water, and seek immediate medical assistance.

● Ingestion: Induce vomiting, and seek immediate medical assistance.

● Do not move the battery system if it is connected with external battery modules. Please contact after-sales service if the battery shall be replaced or added.

CAUTION!

● Protect the battery system from damage during transportation and storage.

● Be careful and consider its weight when moving the battery.

● Do not hit, pull, drag, or step on the equipment, and do not place extraneous objects into any part of the battery system.

● The transportation must be carried out by trained professionals. All operations during the process have to be recorded.

● Keep the equipment stable to avoid dumping, which can result in equipment damage and personal injuries.

● Please make sure that the carbon dioxide extinguisher or Novac1230 or FM-200 is nearby.

● The fire cannot be put out by water or ABC dry powder extinguisher. Firefighters are required to wear full protective clothing and self-contained breathing apparatus.

● The battery may explode when the ambient temperature exceeds 150℃.

● Use proper tools and protection when installing and maintaining heavy equipment. Improper operation might cause personal injury.

● The insulation layer of the cables may be aging or broken due to high temperature. Place the cables at least 30mm away from the heating components or heat sources.

● Tie the cables of the same type together, and place cables of different types at least 30mm apart. Do not place the cables entangled or crossed.

2. Product Introduction

2.1 Product

● This document mainly introduces the product introduction, application, installation, debug, maintenance and technical parameters of the $LiFePO_4$ battery.

● The battery system can be used with leading brand solar inverters.

2.2 Symbol

Symbol	Description
	There is a potential hazard after battery is in operation. When operating please take precautions.
	There is high voltage when battery is running. When operating please ensure that it is powered off.
	The battery contains corrosive electrolyte. Please avoid contact with leaked electrolyte or volatile gas.
	Before operating the battery, please read the user manual carefully.
	Pay attention to personal protection during installation, operation and maintenance.

	Keep the battery away from open flames or sources of ignition.
	Keep the battery out of the reach of children.
	Can't leave battery as garbage disposal.
	Battery can be recycled.

3. Battery Introduction

3.1 Specification

Technical parameter	25.6V100AH	25.6V200AH
Available electricity	2.56Kwh	5.12Kwh
Rated capacity	100Ah	200Ah
Combination mode	8S1P	8S1P
BMS configuration	8S100A	8S200A
Rated voltage	25.6V	25.6V
Operating voltage range	20.8V~29.2V	20.8V~29.2V
Rated charge and discharge current	50A	100A
Peak current	100A Continue @130A 500ms	200A Continue @250A 500ms
Rated charging and discharging power	1.28Kw	2.56Kw
Peak power	2.56Kw Continue @3.328Kw 500ms	5.12Kw Continue @6.4Kw 500ms
Short-circuit current	0.225Ka@100us	0.427Ka@100us
Weight	28±3%Kg	40±3%Kg
Dimensions (L*W*H) mm	750*145*250mm 470*100*770mm	750*150*300mm 620*200*275mm 410*175*680mm

Technical parameter	48V100AH	48V200AH
Available electricity	4.8Kwh	9.6Kwh
Rated capacity	100Ah	200Ah
Combination mode	15S1P	15S1P
BMS configuration	15S100A	15S200A
Rated voltage	48V	48V
Operating voltage range	39V~54.75V	39V~54.75V
Rated charge and discharge current	50A	100A
Peak current	100A Continue @130A 500ms	200A Continue @250A 500ms
Rated charging and discharging power	2.4Kw	4.8Kw
Peak power	4.8Kw Continue @6.24Kw 500ms	9.6Kw Continue @12Kw 500ms
Short-circuit current	0.45Ka@100us	0.671Ka@100us
Weight	47±3%kg	75±3%kg
Dimensions (L*W*H) mm	425*145*660mm 470*100*770mm	440*140*835mm 410*240*640mm
Technical parameter	**51.2V100AH**	**51.2V200AH**
Available electricity	5.12Kwh	10.24Kwh
Rated capacity	100Ah	200Ah
Combination mode	16S1P	16S1P
BMS configuration	16S100A	16S200A
Rated voltage	51.2V	51.2V
Operating voltage range	41.6V~58.4V	41.6V~58.4V
Rated charge and discharge current	50A	100A
Peak current	100A Continue @130A 500ms	200A Continue @250A 500ms
Rated charging and discharging power	2.56Kw	5.12Kw
Peak power	5.12Kw Continue @6.656Kw 500ms	10.24Kw Continue @12.8Kw 500ms
Short-circuit current	0.377Ka@100us	0.6Ka@100us

Weight	45±3%kg	84±3%kg
Dimensions (L*W*H) mm	425*145*660mm 470*100*770mm	440*140*835mm 410*240*640mm 410*240*670mm 520*240*855mm
Technical parameter	**51.2V300AH**	**51.2V400AH**
Available electricity	15.36Kwh	20.48Kwh
Rated capacity	300Ah	400Ah
Combination mode	16S1P	16S2P
BMS configuration	16S200A	16S200A
Rated voltage	51.2V	51.2V
Operating voltage range	41.6V~58.4V	41.6V~58.4V
Rated charge and discharge current	150A	200A
Peak current	200A Continue @250A 500ms	200A Continue @250A 500ms
Rated charging and discharging power	7.68Kw	10.24Kw
Peak power	10.24Kw Continue @12.8Kw 500ms	10.24Kw Continue @12.8Kw 500ms
Short-circuit current	0.762Ka@100us	0.8Ka@100us
Weight	120±3%kg	170±3%kg
Dimensions (L*W*H) mm	720*260*580mm 500*355*755mm 770*260*655mm 650*240*855mm 500*240*980mm	585*280*1100mm 585*280*1120mm 520*270*1160mm
Technical parameter		
Cycle life	≥6000 Cycle，80%DOD，25°C	
Communication mode	CAN, RS485, RS232	
Parallel number	Recommend 6 in parallel (Max support 16 in parallel)	
Remote data	Bluetooth optional/Wifi	
Operating temperature	Charging:0°C~+50°C / Discharge:-20°C~+60°C	
Relative humidity	0~95%	

Storage temperature	<3 Months-10°C~25°C / <1 Year 0°C~25°C
Maximum working altitude	2000m
Class of protection	IP20
Supports inverter communication brands	SMA/Growatt/TBB/Deye/GOODWE/Huawei/ Schneider/Victon energy/SOFAR/INVT
Installation mode	Wall hanging/Floor mounting
Power cable outlet mode	Behind / Flank
Standards and certification	Transport UN38.3

*1：Test conditions, cell voltage 2.6V~3.65V, the new battery at +25±2°C 0.5C charging and discharging, available power may vary depending on the inverter;

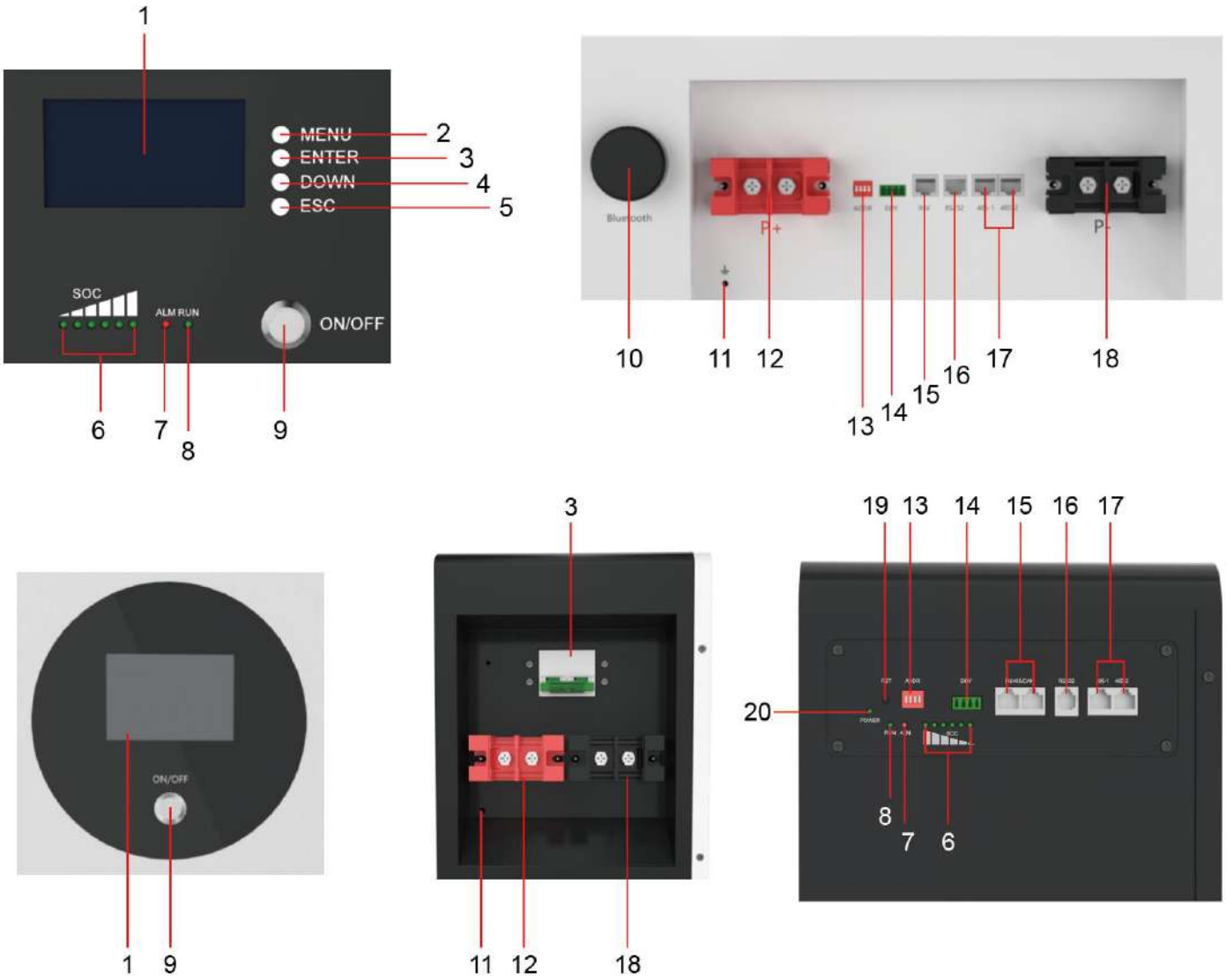
*2：Rated charge and discharge current and power will change due to temperature and SOC.

*3：Please contact customer service for details of different products.

3.2Label Introduction

Labels are for reference only. The actual labels prevail. The label contains the SN number, product type and model, product technical specifications, safety symbol, and product. The SN corresponds to the number of each Bluetooth device.

3.3 Description



Port Definition

Number	Component	Description
1	LED Display	Display battery information
2	Menu Button	Menu press to enter the sub-menu
3	Enter Button	Confirm key select to enter sub-option
4	Next Option	Move cursor key down move submenu or option
5	Exit/Return Button	Exit/back key to exit the mobile submenu or option
6	SOC Display Light	Display battery capacity status
7	Trouble Light	Red trouble light blinking

8	Operating Light	Green light ON
9	Button Switch	Press and hold the button for 3 to 5 seconds to power on or off
10	Bluetooth	Connect to the mobile APP to view battery data and modify the inverter protocol
11	PE	Battery connects the ground wire
12	Positive Electrode	Power transfer
13	Decoder Switch	The IP address is configured in parallel
14	Dry Contact	External signal
15	Inverter Communication Port	Communication transfer support RS485/CAN2.0
16	Reserved Communication Port	Communication transfer support RS232
17	Parallel Communication Port	Communication transfer support RS485
18	Negative Electrode	Power transfer
19	Reset key	Wake up BMS
20	ON/OFF Light	Flicker after startup
* The configuration varies according to the model, if problem is not solved, please contact after-sales in time.		

4. Storage & Package

4.1 Storage Environment

If the battery is not installed and used immediately, please confirm the storage environment meets the following conditions:

● The battery should be packed in the carton, and the carton needs to be sealed after placing desiccant in it;

● If the battery is not installed within 3 days after unpacking, it is recommended to store the battery in the carton;

● Storage SOC: 25~50%SOC, one charge-discharge cycle is required every 3 months of storage;

● Storage temperature range: storage at -20°C~40°C for no more than 1 month; storage at 0~35°C for no more than 1 year;

● Humidity range: 0~95% non-condensing. It cannot be installed when there is moisture condensation on the battery interface;

● The battery should be stored in a cool place out of direct sunlight;

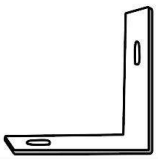
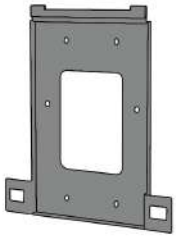
● Battery storage should be kept away from flammable, explosive and corrosive items;

● Battery is prohibited from raining.

4.2 Package

● Before unpacking the battery carton, please check whether the carton is damaged and check the battery model. If there is any abnormality, please do not open carton and contact the after-sales service center as soon as possible.

● After unpacking the battery carton, please check whether the product delivery is complete according to the packaging information. If there is any abnormality, please contact the after-sales service center as soon as possible.

			
Battery x1	User Manual x1	USB/RS485 to RJ45 x1	Hanging ear x2
		N	N
Wall Mounted Board x1	M10 Expansion Bolt x6	N	N

5. System Installation

5.1 Installation Environment

The battery system must be installed on a floor with sufficient bearing capacity and smoothness. If the ground does not have enough support and flatness, it needs to be guaranteed by other means (such as making foundations, adding load-bearing plates, etc.).

● The battery works best at a temperature of 20~40°C;

● Avoid installation in direct heat, rain environment;

● Avoid installation near high temperature heat source or low temperature cold source environment;

● Avoid installation in areas with extreme changes in ambient temperature;

● Avoid installation in strong interference environment;

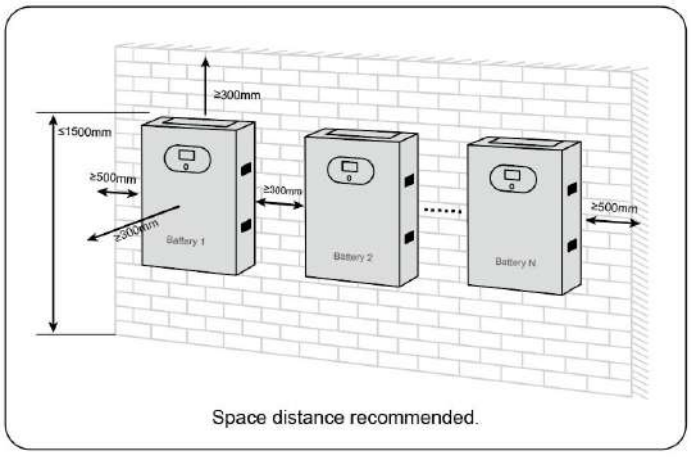
● Avoid installation in areas accessible to children;

● Avoid installation in areas prone to water accumulation;

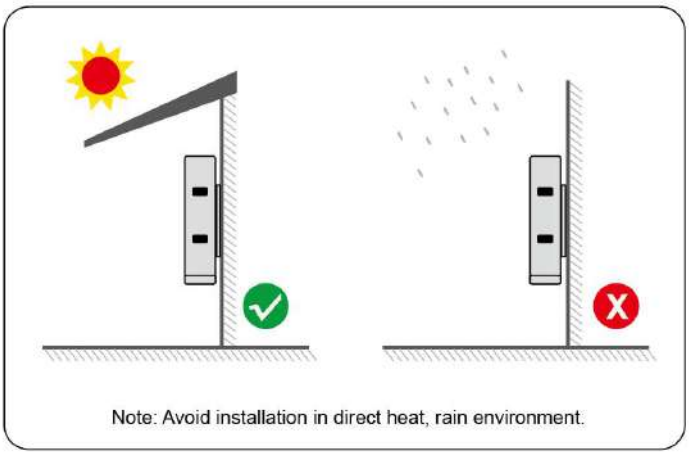
● Do not place flammable or explosive materials around the device.

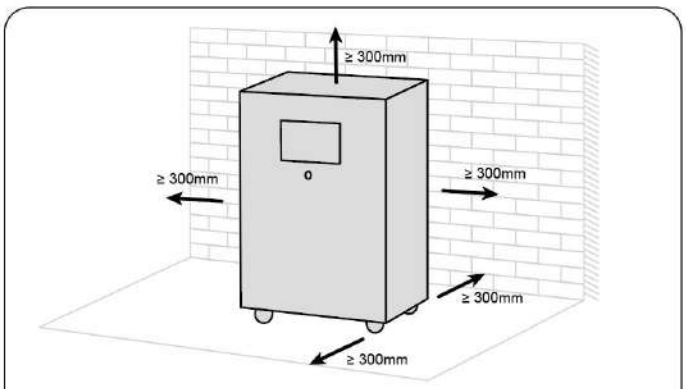
5.2 Space Requirement

Note: The left and right distance between the battery is the recommended distance, and the distance should be reduced as much as possible on the basis of operability.

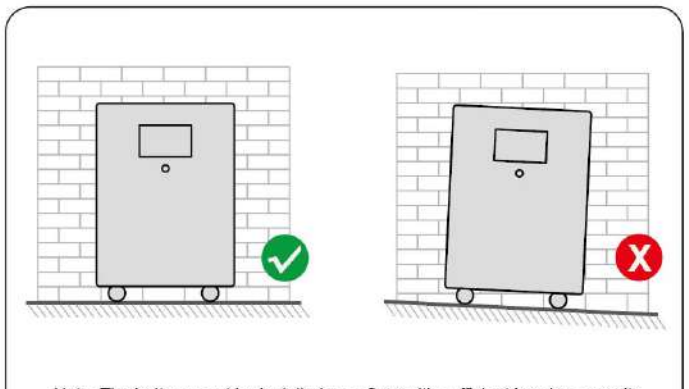


Space distance recommended.


Note: Avoid installation in direct heat, rain environment.



Note: The left and right distance between the battery is the recommended distance, and the distance should be reduced as much as possible on the basis of operability.


Note: The battery must be installed on a floor with sufficient bearing capacity and smoothness.

5.3 System Installation

5.3.1 Wall Mounted Installation

Note: The installation requires the cooperation of multiple people.

● Position the wall-mounted board as a template, and use a level to make the wall-mounted board parallel to the ground.

● Make the wall-mounted board close to the wall. Make sure it is secure, mark the hole location with a marker, and remove the wall hanging plate.

● Use a percussion drill to drill holes on the wall (diameter: 13mm, depth: 65mm).

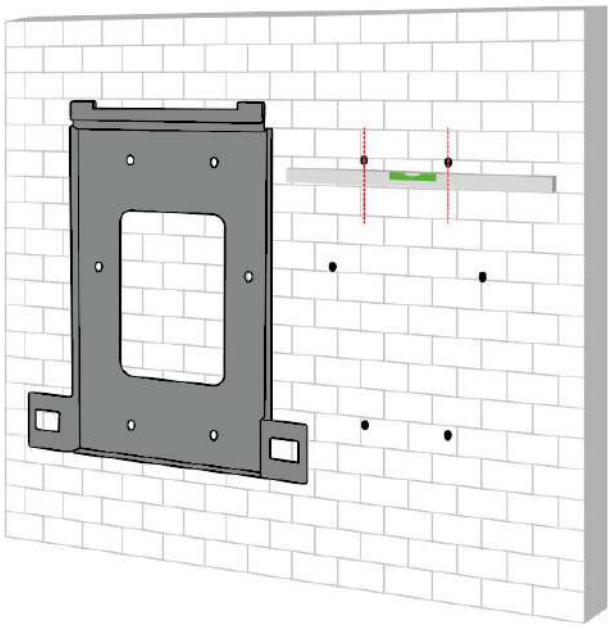
● Tighten M10 expansion bolts, torque requirement: 10N·m.

● Lift the battery parallel to the ground.

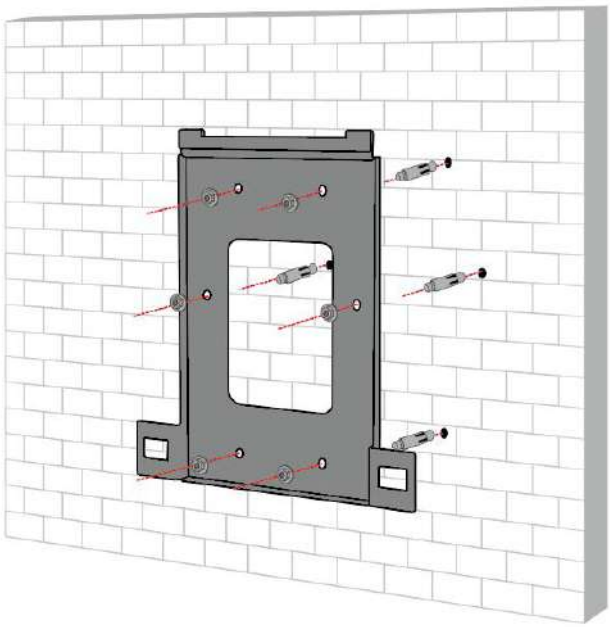
● Hang the top of the battery hanging plate into the wall hanging plate.

● Push the bottom of the battery into the slot.

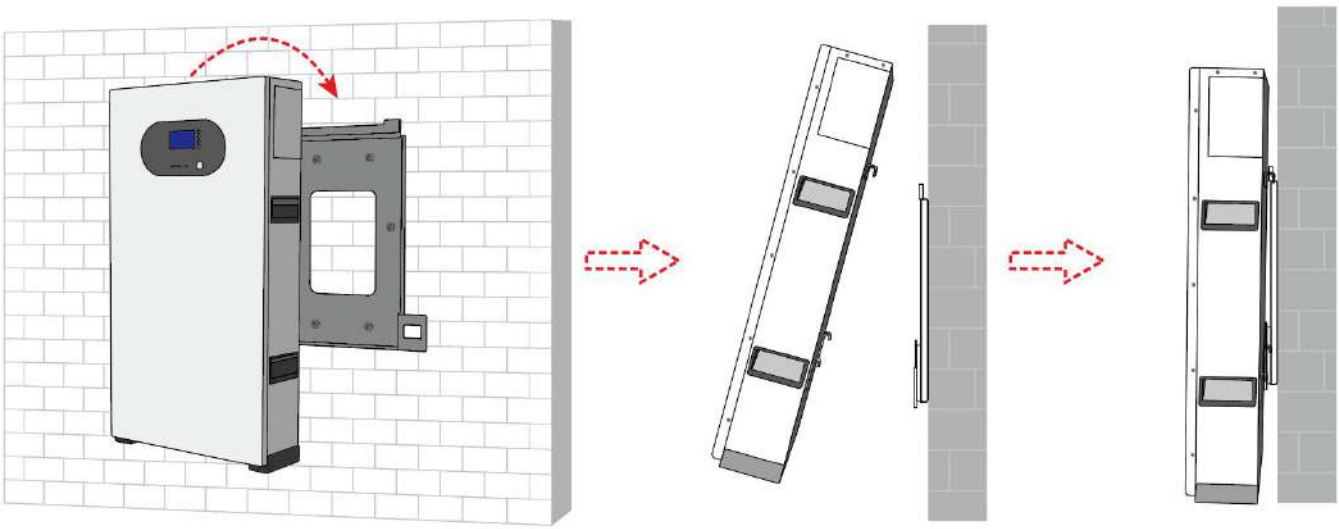
Horizontal measurement, drilling



Install expansion screws



Hanging battery



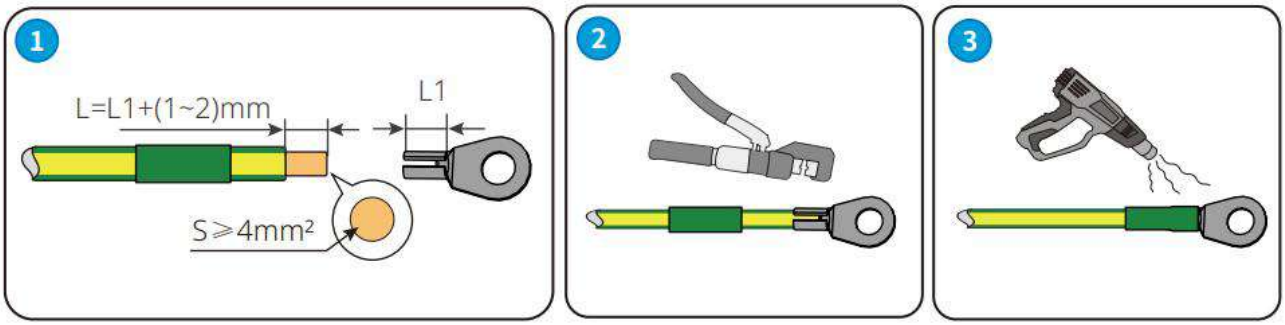
5.3.2 Ground Wire

● When installing equipment, the protective ground wire must be installed first; when removing equipment, the protective ground wire must be removed last.

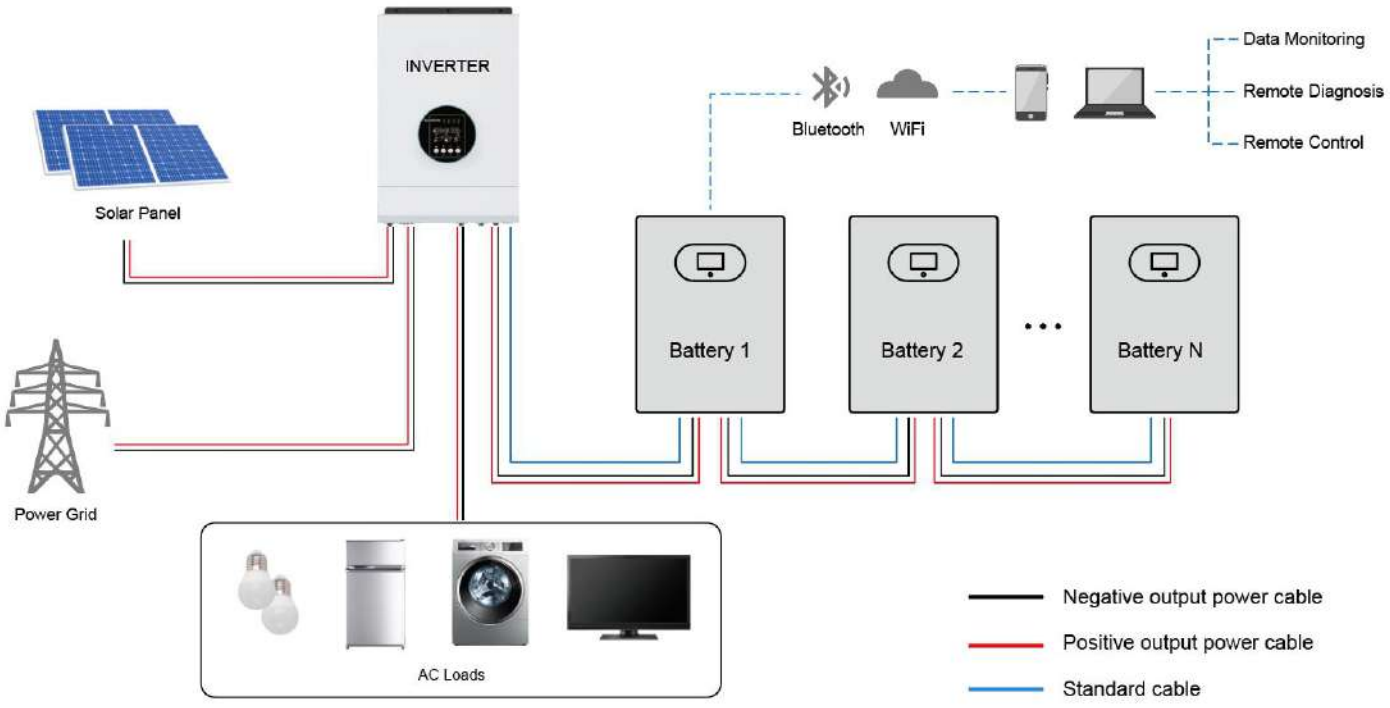
● The pulling force after crimping should be greater than 400N.

● Cross-sectional area of protective earth conductor: 6².

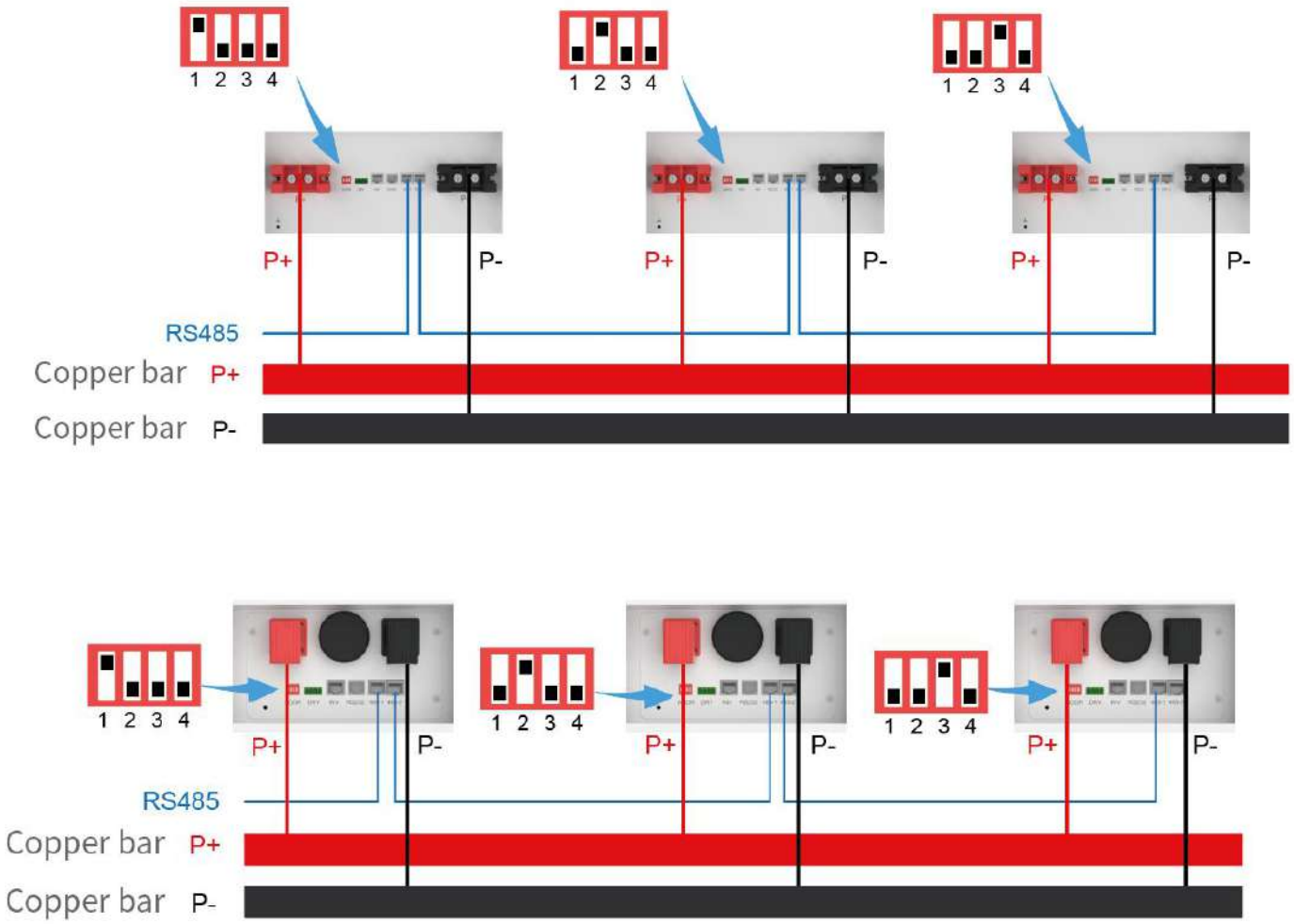
● The cables must meet the standards for outdoor use.



5.4 System Wiring



5.5 Parallel Wiring



Note: When used in parallel, it is necessary to keep the power line length as consistent as possible, so that the system will not have serious bias phenomenon during operation. In parallel, it is also necessary to set the address of each battery, as shown in the figure above.

6. System Operation

6.1 Check Before Power On

When powering on the battery system, ensure that the following items are checked to prevent system damage.

Item	Check the entry
1	The device is firmly installed, the installation position is convenient for operation and maintenance, the installation space is convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.

2	Protect the ground wire, power cable, communication cable, and terminal resistor are securely connected.
3	Cables are bundled according to cable routing requirements, properly distributed, and without damage.
4	The unused port is blocked.

6.2 Power On

Hold down the power button for 3 to 5 seconds. If the LED indicator blinks, the power-on is normal.

Key indicator light description

Key indicator light	State
Green light	standby, working, alarm
Red light	malfunction

6.3 LED Light Status Description

Table 1 working status description

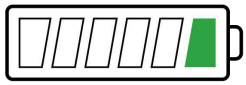
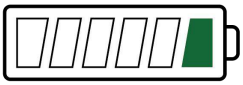
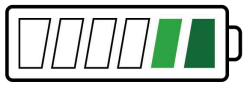
Battery with 8pcs LED lights, running lights (1pcs), fault lights (1pcs), SOC lights (6pcs).

State	Normal/Warning/Protection	ON/OFF	Operation	Malfunction	LED Power Indicator						Description
Standby	Dormancy	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All OFF

Standby	Normal	ON	Flash 1	OFF	Follow moudle capacity						Standby
	Warning	ON	Flash 1	Flash 3							Module at low voltage
Charge	Normal	ON	ON	OFF	Follow moudle capacity (Flash 2 at full capacity)						LED flash 2 at full capacity. Alarm doesn't flash at overcharge warning.
	Warning	ON	ON	Flash 3							
	Overcharge protection	ON	ON	OFF	ON	ON	ON	ON	ON	ON	If no grid supply, LED turn on standby.
	Temperature/ overcurrent/ disabled protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	ON	Flash 3	OFF	Follow moudle capacity						
	Warning	ON	Flash 3	Flash 3							
	under voltage protection	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
	Temperature/o vercurrent/ short circuit/ reverse/ disab led protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Disabled		OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging and discharging

Table2 SOC Indicator Description:

Flash is laurel-green, Always is bottle-green.

Charge SOC indication	Description	Discharge SOC indication	Description
	0~16.6%		0~16.6%
	16.6%~33.2%		16.6%~33.2%
	33.2%~49.8%		33.2%~49.8%
	49.8%~66.4%		49.8%~66.4%
	66.4%~83%		66.4%~83%
	83%~100%		83%~100%

7. Communication Specification

7.1 RS485 Communication

● The BMS can communicate with the upper computer through the RS485 interface to monitor the information such as battery voltage, current, temperature, and inverter protocol selection. The default baud rate is 9600bps.

7.2 CAN Communication

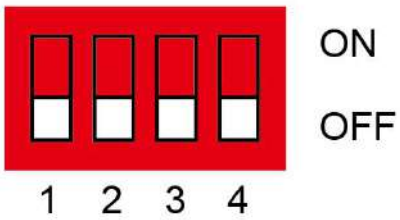
● CAN communication Can communicate with the inverter, thus extending the battery life, the default baud rate is 500K, the inverter as the host battery as the slave, you need to set the address 1 to 15 through ADD.

7.3 RS485 Communication

● The RS485 communication can communicate with the inverter to prolong the battery life. The default baud rate is 9600bps. If the inverter serves as the host battery and serves as the slave, you need to set addresses 1 to 15 through ADD.

7.4 DIP Address Setting

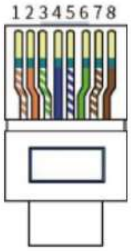
When packs are used in parallel, you can set the address to distinguish different PACK through the code switch on the BMS to avoid the same address setting. Please refer to the following table:



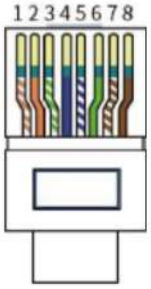
Address	Dial Switch				Description
	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	No Parellel Sing Rack
1	ON	OFF	OFF	OFF	Master Pack
2	OFF	ON	OFF	OFF	Slave-Pack1
3	ON	ON	OFF	OFF	Slave-Pack2
4	OFF	OFF	ON	OFF	Slave-Pack3
5	ON	OFF	ON	OFF	Slave-Pack4
6	OFF	ON	ON	OFF	Slave-Pack5
7	ON	ON	ON	OFF	Slave-Pack6
8	OFF	OFF	OFF	ON	Slave-Pack7
9	ON	OFF	OFF	ON	Slave-Pack8
10	OFF	ON	OFF	ON	Slave-Pack9
11	ON	ON	OFF	ON	Slave-Pack10
12	OFF	OFF	ON	ON	Slave-Pack11
13	ON	OFF	ON	ON	Slave-Pack12
14	OFF	ON	ON	ON	Slave-Pack13
15	ON	ON	ON	ON	Slave-Pack14

8. RJ45 Description

- Invert Inverter communication, RJ45 CAN, RS485 adopts (8P8C) vertical socket.
- Parallel communication, RJ45 RS4851, RS4852 adopts (8P8C) vertical socket.
- PC communication，RJ11 232, adopts (6P6C) vertical socket.

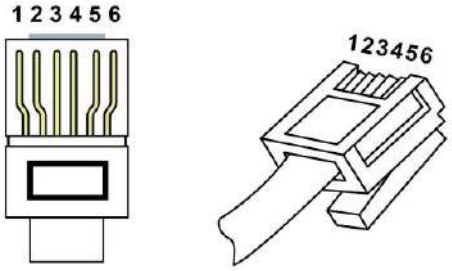


RS485 and CAN Interface Definition			
RS485（8P8C）		**CAN（8P8C）**	
RJ45 Pin	Instructions	RJ45 Pin	Instruction
1	485-B1	1	NC
2	485-A1	2	GND
3	GND	3	NC
4	NC	4	CAN-H
5	NC	5	CAN-L
6	GND	6	NC
7	485-A1	7	NC
8	485-B1	8	NC



Parallel Communication Interface Definition			
RS485-1（8P8C）		**RS485-2（8P8C）**	
RJ45 Pin	Instructions	RJ45 Pin	Instructions
1	485-B1	1	485-B1
2	485-A1	2	485-A1
3	GND	3	GND
4	NC	4	NC

5	NC	5	NC
6	GND	6	GND
7	485-A1	7	485-A1
8	485-B1	8	485-B1



PC communication	
RS485-1（6P6C）	
RJ11 Pin	Instructions
1	NC
2	NC
3	TX
4	RX
5	GND
6	NC

9. Operation Instructions Of Upper Computer

9.1 Requirements Of Software Running Environment

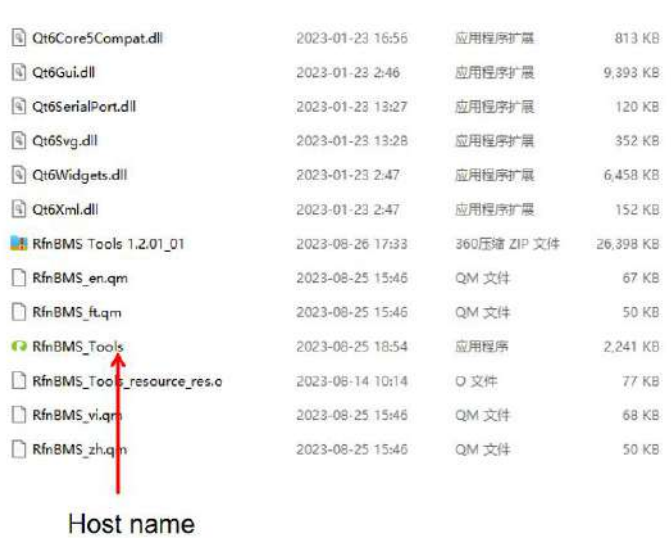
Hardware environment request: PC and compatible computers, CPU frequency > 1.5G, memory > 2G, hard disk > 500M, Computer supports USB2.0 interface.

Software environment request: WindowsXP, Windows7 32/64bit, Windows10, Windows11 are all compatible.

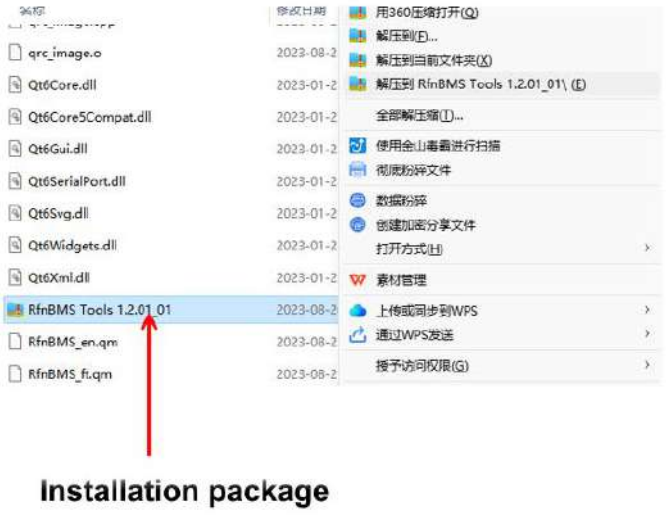
9.2 Installation Of Software

Extract the host computer software compressed package directly to the target folder of the computer to complete the software installation, as shown in Figure 9.2-1.

The name of the application RfnBMS_Tools found in the decompressed file is shown in Figure 9.2-2:



Pic 9.2-1



Pic 9.2-2

9.3 USB to 485 Drive Installation

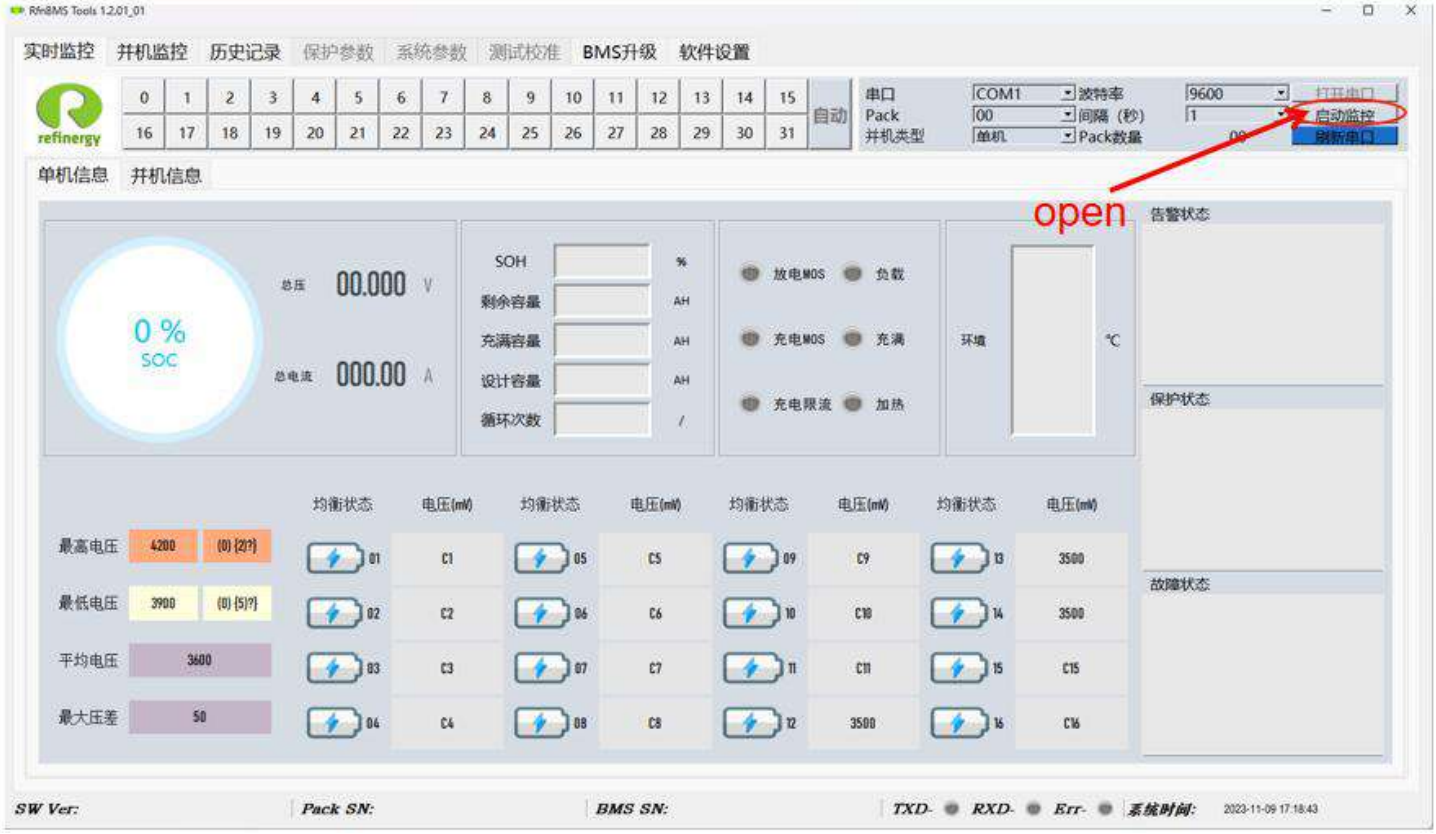
RfnBMS_Tools host computer software communicates with BMS through USB to 485 device. To connect the USB to 485 device, you need to install the driver software. Before installing the driver, you need to know the model number and install the correct driver software. After installation, insert the USB to 485 interface into the computer,and find the COM port corresponding to the USB to 485 in the computer ,as shown in Figure 9.3-1：

Pic 9.3-1

9.4 Connect To Host Computer

After the USB to 485 is connected to the BMS communication port, double-click the RfnBMS_Tools icon and click to open the serial port to start monitoring. As shown in Figure 9.4-1, the host computer automatically detects the serial port, select the corresponding serial port number and baud rate, and then click "Open Serial Port".

In stand-alone mode, other options can be left as default, and then click "Start Monitoring" to communicate with BMS. For parallel communication, select the "Parallel" type in the "Parallel Type", as shown below, and then click the "Start Monitoring" button.



Pic 9.4-1

9.5 Host Computer Connection Exception Handling

Check the following steps：

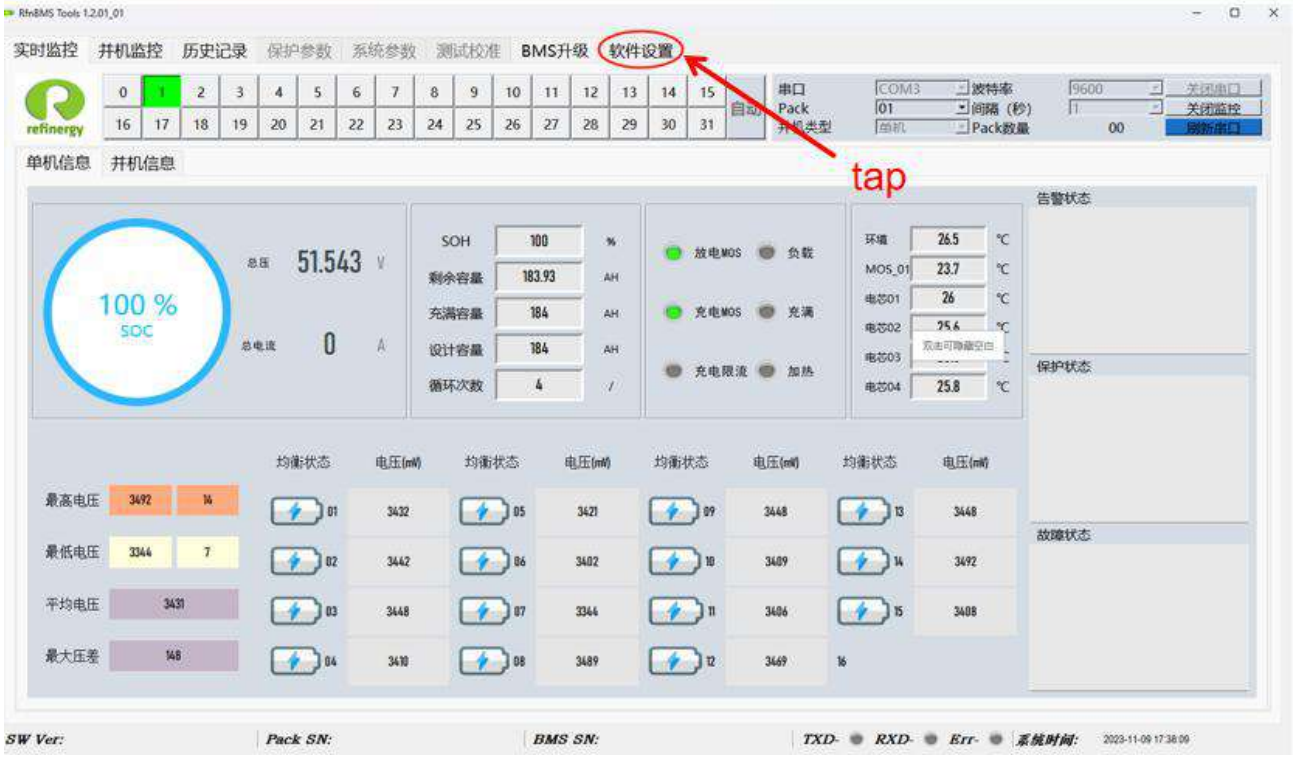
1. Computer: Check whether the driver is installed normally and whether the serial port is found;
2. [Note] For window system drivers of common serial port chips, please refer to the "UART_Driver" folder of the host computer software;
3. Is there any problem with the serial port tool (communication box);
4. Is there any problem with the connection between the serial port and the BMS? If the BMS is a communication split board, then you need to check whether the communication terminals on the communication split board and the BMS board are connected properly.
5. Has BMS started up? Or try changing a USB to 485 serial port.

9.6 Language Switch

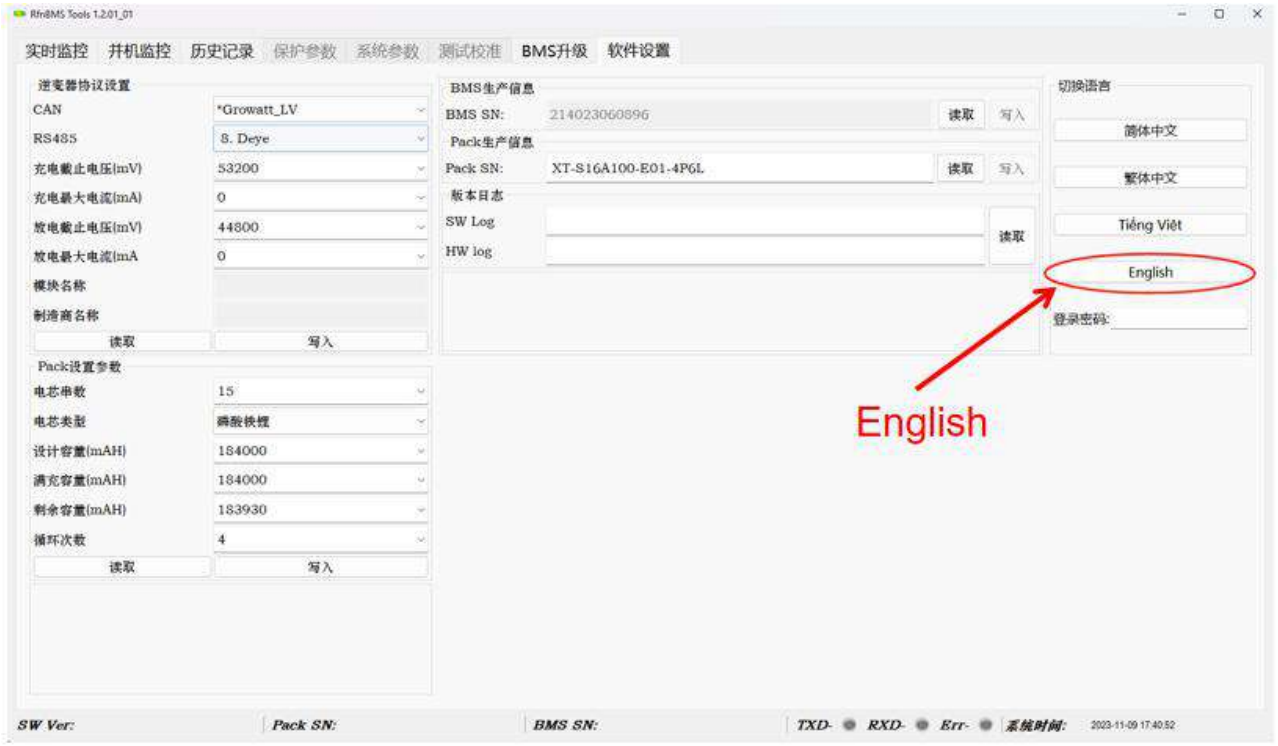
The language can be switched to Simplified Chinese, Traditional Chinese, Vietnamese, and English. The specific

operations are described as follows:

After the monitoring interface is opened, click the software setting interface and switch the language on the right side of the software setting interface, as shown in Figure 9.6-1, 9.6-2:



Pic 9.6-2

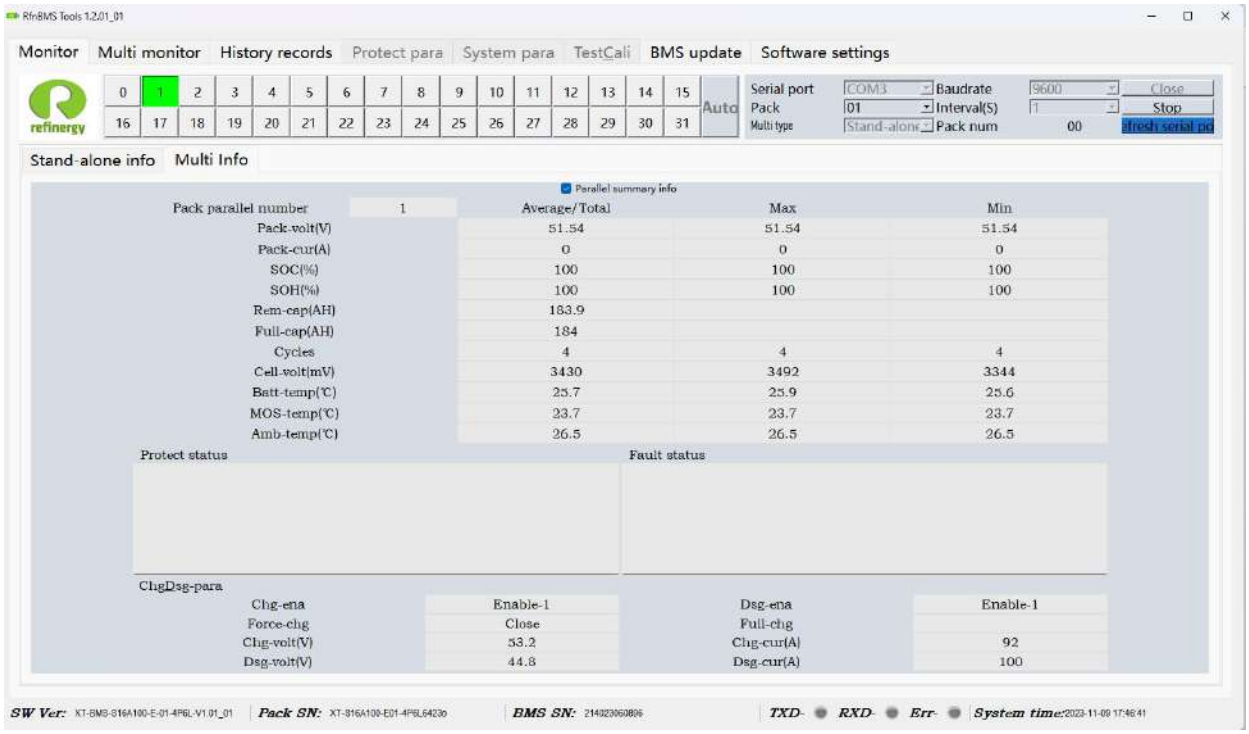


Pic 9.6-2

9.7 Real-Time Monitoring Interface

The real-time monitoring interface can view each battery data and battery parallel data, as shown in below Picture 9.7-1 and 9.7-2 :

Single battery data diagram 9.7-1



Parallel battery data diagram 9.7-2

9.8 Parallel Monitoring Interface

Select the "Parallel Monitoring" function page and click the "Display" button to display the parallel monitoring data. Check "Auto Save" and it will be automatically saved every 0.5 hours for 2000/4000 pcs records. Click "Export Data" to export data of .csv file type, which can be opened with excel and then saved as an excel type file. Perform the required operations as shown in Figure 9.8-1:

Pic 9.8-1

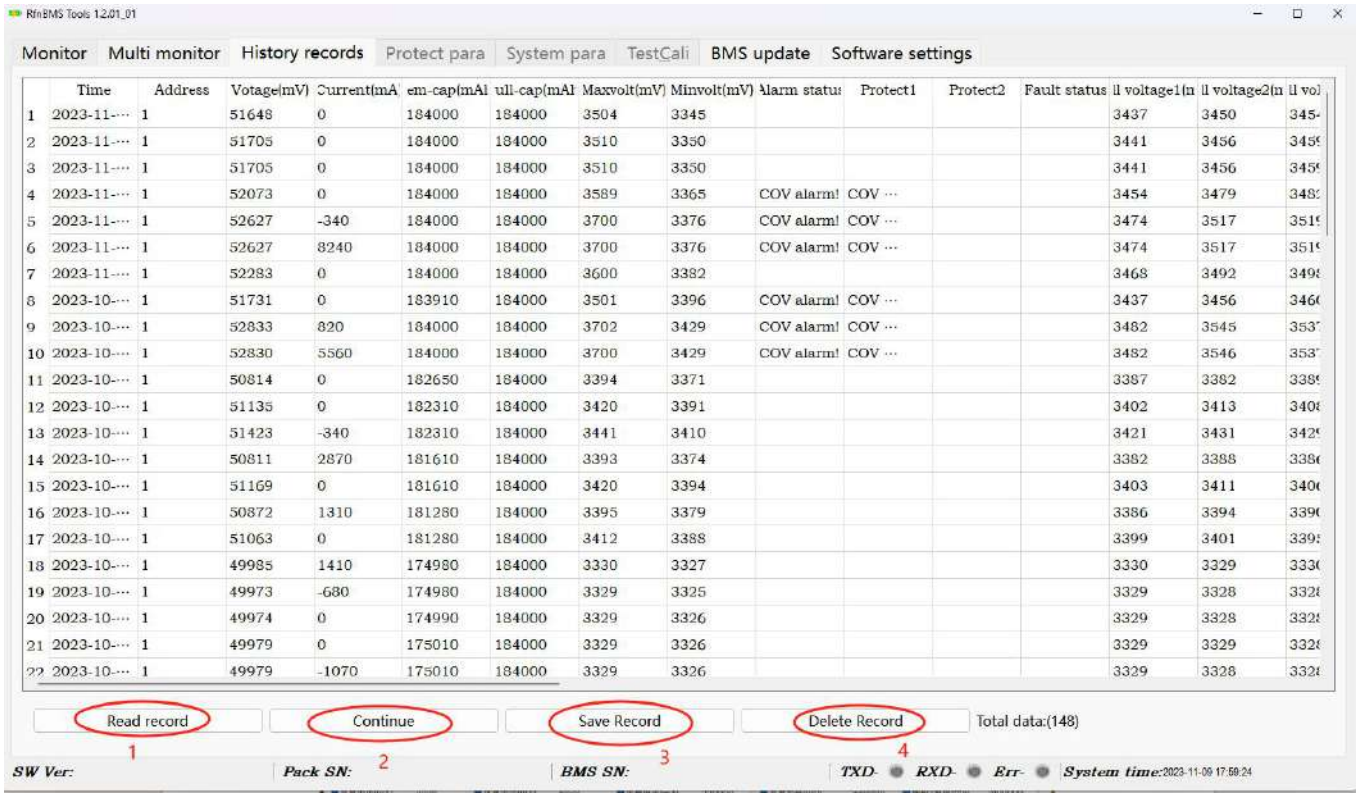
9.9 Historical Data Interface

Click "Read Record" to start reading the history records of BMS, and at the same time display the "Total Data Amount", which is the total number of records.

During the reading process, you can click "Pause".

Click "Save Record" to export the read record, which is saved as a .csv file type by default.

Click "Delete Record" to delete all records;



Pic 9.9-1

9.10 Protection Parameter Interface

Before entering the protection parameter interface, you need to the password 123456 in the software setting interface. If passwords is correct, it should display in red as shown in Figure 9.10-1.

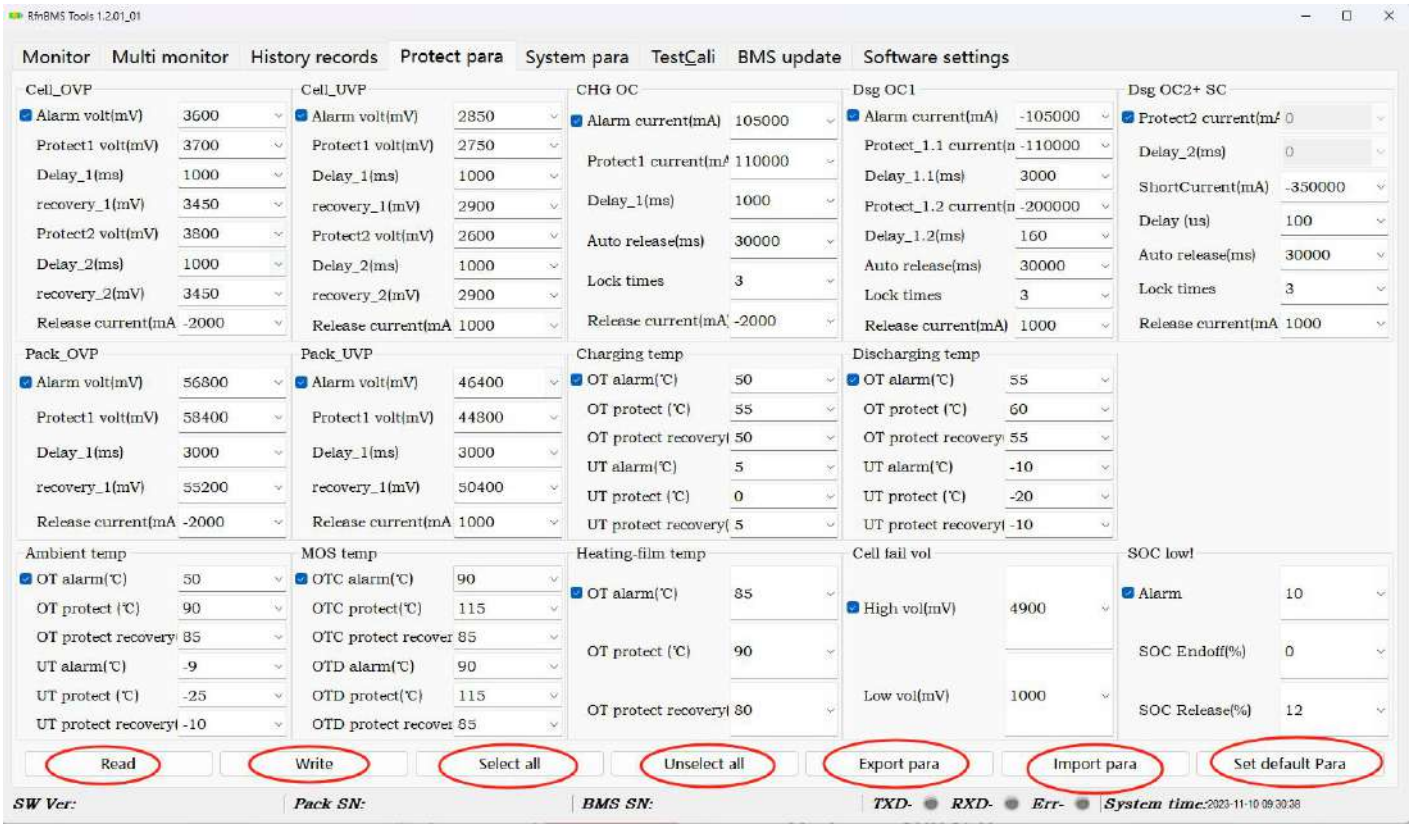
All parameter values in the protection parameter interface have been changed according to client's requirements, and customers do not need to set parameters anymore. "Select all" and "Deselect all" to facilitate reading all or customizing the reading operation. "Read all"/"Write all", read or write the indicated content items; "Export parameters", export and save the parameters displayed on the page of the host computer, the parameters is saved to default files "alarmParm.xml", this is for back up the parameters; "Import parameters", import the protection parameters that is previously saved to the host computer, and perform operations as needed.

[Note:] Remember not to import the file incorrectly, because there is no file parameter identification function!!!

"Set Default Parameters", is to restore the default parameters compiled into the code. Note that these are not the default parameters provided by client, because they are generally modified as required before shipping out from factory.

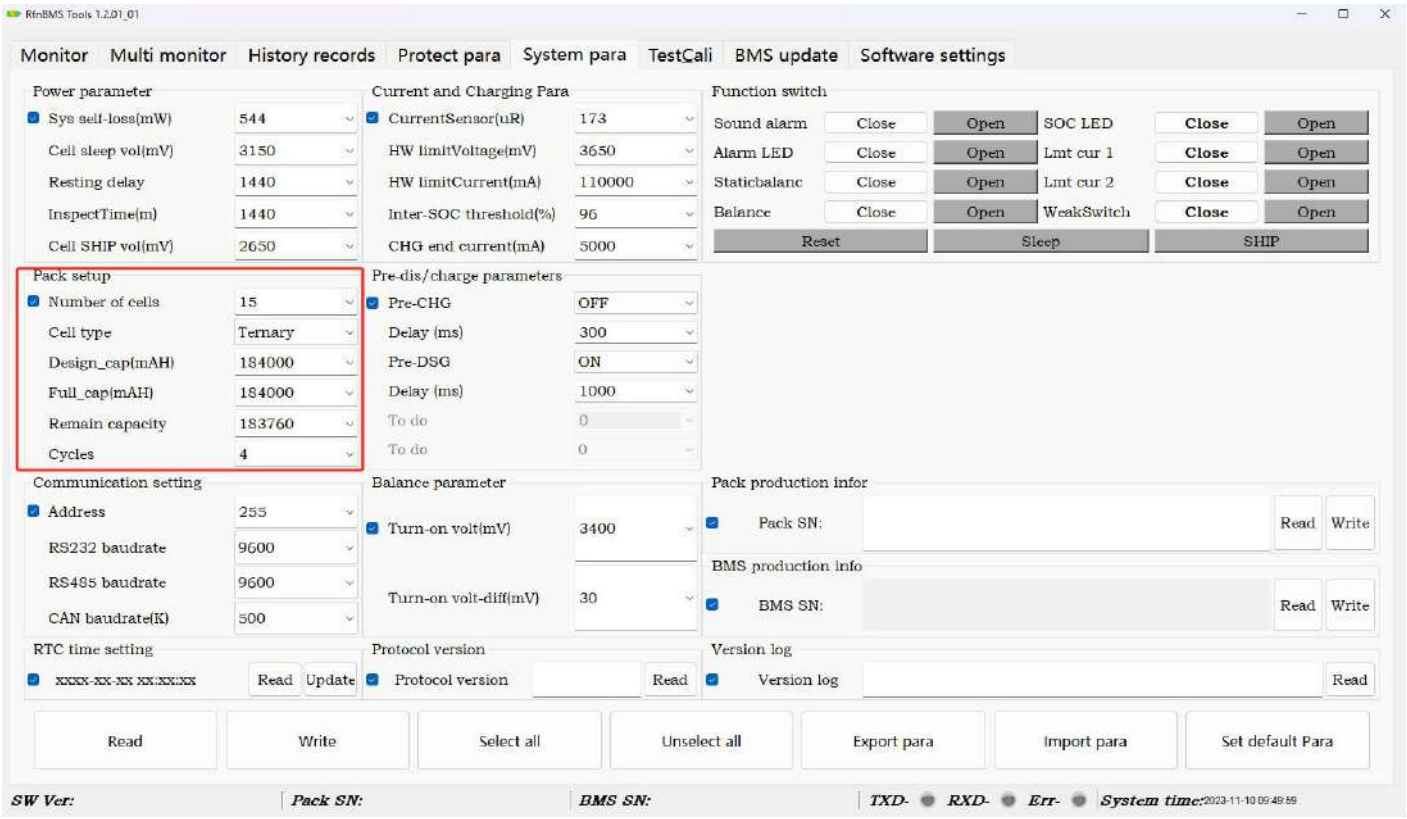
[Note] Protection parameters generally have a valve value range limit, so if the parameter exceeds the valve value range, writing may fail.

Pic 9.10-1



9.11 System Parameter Interface

Click to enter the system parameter interface. Users only need to check whether the Pack setting parameters correspond to the current product, as shown in Figure 9.11-1 below:



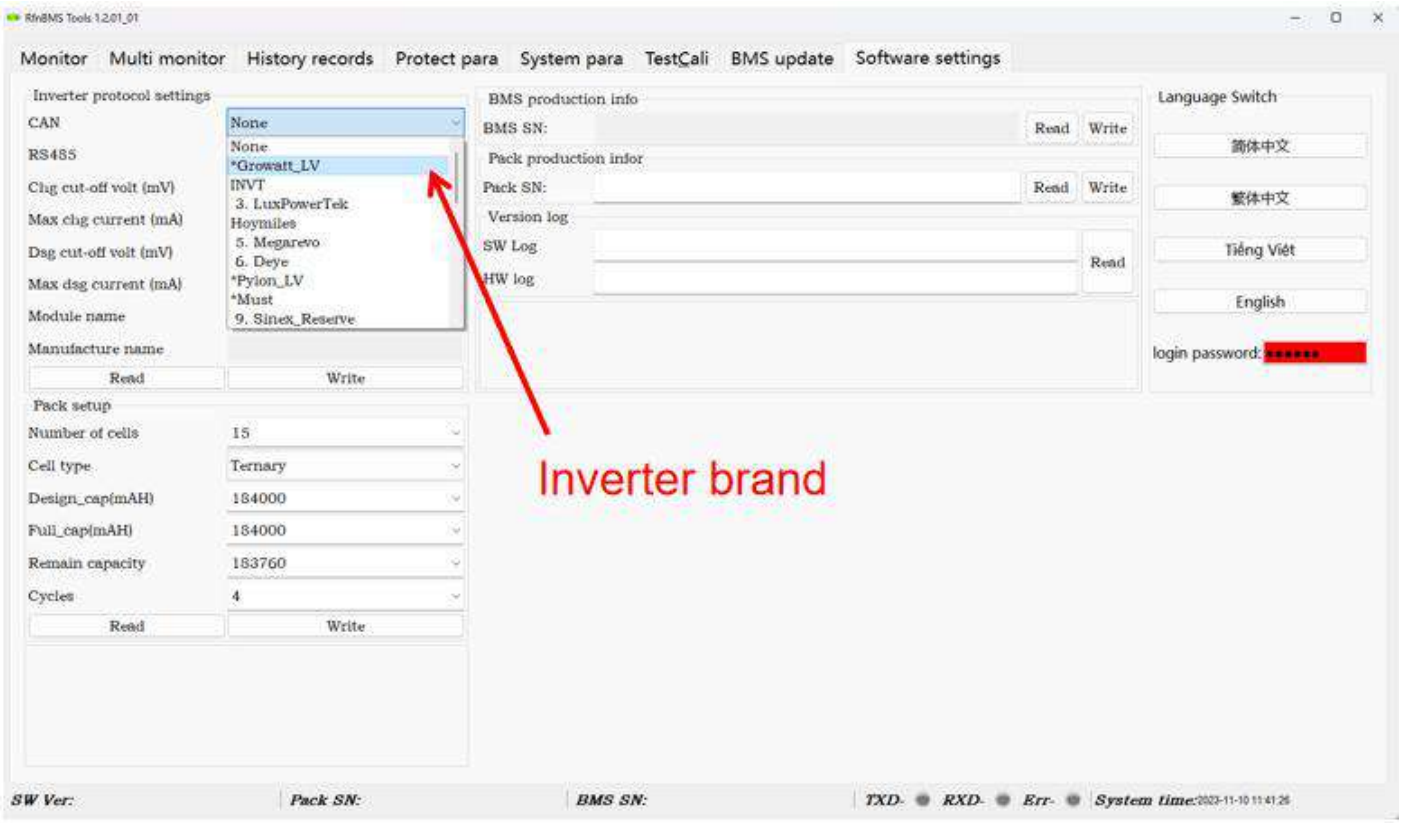
Pic 9.11-1

9.12 Software Setting Interface

When the Pack is connected to the Lithium battery inverter and the Pack is charged and discharged through the inverter, the communication protocols of different brands inverters can be set through the "Inverter Protocols Settings" in the software settings interface. The Pack communicates with the inverter generally through CAN or RS485, you can choose one of them.

Therefore, choosing different protocols for the CAN and RS485 communication ports can easily realize the automatic adaptation of the inverter.

For example, if Growatt is selected as CAN, then the Pack's CAN can send and identify the CAN protocol of the Growatt inverter, that is, communicate with the CAN interface of the Growatt inverter. RS485 Select Voltronic, then Pack's RS485 can send and identify the RS485 protocol of the Voltronic inverter, that is, communicate with the RS485 interface of the Voltronic inverter, as shown in Figure 9.12-1:



Pic 9.12-1

10. Mobile APP Download And Use

First step: Scan the download or enter the link to download the APP.

Bluetooth APP(Android)

Android download link:

https://picsheet.nekoki.top/Refingy/RFN_Android_BT_SmartBMS_V1.0.6_04.apk

iOS download:

Apple system go to the mall search: “ RfnBMS ” download.

Second step: Add devices using APP scan，or enter the SN to add the device.

11. Common Faults & Solutions

No.	Fault	Solution
1	Temperature Anomaly	Shutdown the battery and wait for 2.5hours, if problem is not solved, please contac after-sales in time.
2	Over Temperature	
3	Low temperature discharge	Shutdown the battery and wait the temperature to rise, then restart the battery, if problem is not solved, please contact after-sales in time.
4	Overcharge current	Shutdown and restart the battery, if problem is not solved, please contact after-sales in time.
5	Overdischarge current	
6	Pack Over-voltage	
7	Pack under-voltage	Connect and charge the battery as soon as the battery is turned on and wait the voltage to rise.
8	Low temperature charge	Shutdown the battery and wait the temperature to rise, then restart the battery, if problem is not solved, please contact after-sales in time.
9	Voltage difference of single cell is too big	Shutdown the battery and wait for 2.5hours, if problem is not solved, please contact after-sales in time.
10	Temperature sensor failure	Shutdown and restart the battery, if problem is not solved, please contact after-sales in time.
11	MOS failure	
12	Fail to communicate with inverter	Shutdown the battery and check the communication cable then restart,if problem is not solved, please contact after-sales in time.
13	Inconsistent Protocol	Please contact after-sales in time.
14	MOS over temperature	Shutdown the battery and wait for 2.5hours, if problem is not solved, please contact after-sales in time.

12. Battery Maintenance

Items	Maintenance Period
If the battery is not in use, charge the battery fully and then discharge the battery to 20-50%	Every three months
Check whether there is loose in installation, if yes please fasten	Every six months
Check whether the shell is damaged, if yes please touch up the paint or contact after-sales	Every six months
Check whether the exposed cables is worn, if yes please replace or contact after-sales	Every six months
Check whether there is debris accumulation, if yes please clean it, so as not to affect the heat dissipation of battery	Every six months
Check whether there is water or pests, so as to avoid the long-term intrusion to the battery	Every six months