USER Manual

Sodium ion battery for household energy storage

Applicable series

48V 100AH



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48V100Ah

Version:1.1

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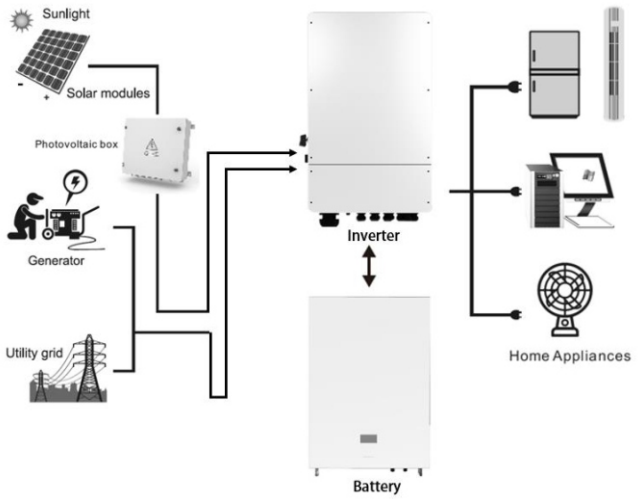
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1. Introduction

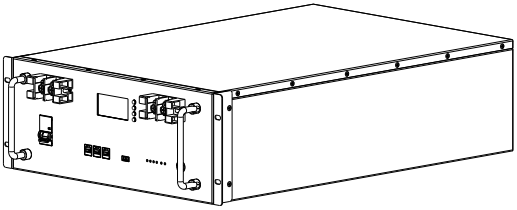
This series is a complete solution for the Sodium ion battery system for the home energy storage field.

The system is safe and reliable. It can be used in home storage, industrial and commercial energy storage and other fields.

The Energy storage pack is an essential component of the photovoltaic power generation system. It can provide electricity for the connected load, and it can also store photovoltaic solar modules, fuel generators, or wind energy generators by charging the remaining energy in case of emergency. When the sun goes down, energy demand is high, or there is a power outage, you can use the energy stored in the system to meet your energy needs at no additional cost. In addition, the energy storage Pack can help you achieve energy selfconsumption and ultimately achieve the goal of energy independence.



2. Product Parameters



Characteristic

· Safe, reliable and long life
· Dynamic identification, automatic paralleling, no need for DIP switches
· Support Bluetooth, mobile APP switching PCS protoco
· CAN/RS485/LAN interface
· Visualization, LCD screen display
· Flexible expansion, the number of parallel machines supports up to 15
· Remote intelligent upgrade maintenance

Model	48100R
Nominal voltage/Capacity	48V 100Ah(4.8KWh)
Cell parameters	Sodium ion
Size(L*W*H)	661*440*176mm
weight	~60KG
charging method	CC/CV
Recommend Charge current	≤ 50A
Recommend Charge cut-off voltage	62.4V
Recommended discharge current	≤ 75A
Recommend Discharge cut-off voltage	36.8V/10%
Display screen	LCD
Communication Interface	RS485/CAN
Cycle Life	＞4000@25℃,80%DOD
Model connection	1~15 in parallel
Working temperature	Charge: 0℃-45℃ Discharge :-20°C-+60℃
storage humidity	Short-term storage:-10~+45℃ Long-term storage: 0~+40℃ Recharge every three months
Storage humidity	5%~95%RH

3. Important safety warnings

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

- Do not expose the battery to flammable or harsh chemicals or vapors.
- Do not paint any part of the battery, include any internal or external components.
- Do not connect battery with PV solar wiring directly.
- Any foreign object is prohibited to be inserted into any part of the battery.
- Do not disassemble the battery. Take it to a qualified service center when service or repair is required.
- Warning!! Only qualified service persons are able to service this device.
- Our company will not bear any warranty claims for direct or indirect damage caused by violation of the above items.

3.1 Packing list

You will receive the following parts(Not a full set),sample as follow picture.

For customized requirements, please place an order with the manufacturer.

Rack mounted energy storage

No.	PARTS	NAME	SPECIFICATION	PICTURE
1	Standard parts	Battery	Rack mounted energy storage	
2	Standard parts	Connection Line 3-4	Used for battery parallel connection	
3	Standard parts	Standard Communication line	Used for parallel battery communication	
4	Standard parts	Certificate	Certificate	
5	Options parts	Communication	Used for Communication	

3.2 Before connection

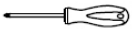
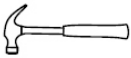
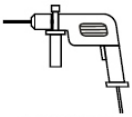
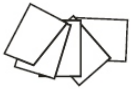
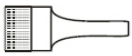
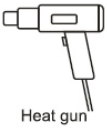
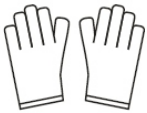
- After unpacking, please check the battery and pack list first, if the battery is damaged or spare parts are missing, please contact the dealer.
- Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode.
- Wiring must be correct, do not mix-connect the positive and negative cables, and ensure no short circuit with the external device.
- It is prohibited to connect the battery with AC power directly.
- The BMS in the battery is designed for 48 VDC, DO NOT connect battery in series. It is prohibited to connect the battery with different type of battery.
- Battery should be installed indoor and kept away from water, high temperature mechanical force and flames.

3.3 During operation

- If the battery system needs to be moved or repaired, the power must be cut off first and the battery is completely shutdown.
- It is prohibited to connect the battery with different type of battery.
- It is prohibited to put the batteries working with faulty or incompatible inverter.
- In case of fire, only dry powder fire extinguisher can be used, liquid fire extinguishers are prohibited.
- Please do not open, repair or disassemble the battery. We do not undertake any consequences or related responsibility due to violation of safety operation or violating of design, production and equipment safety standards.

4. Installation

Necessary installation Tools

 Clamp meter	 Multi-meter	 Label paper	 Phillips screwdriver
 COAX crimping tool	 Diagonal pliers	 Wire stripper	 Claw hammer
 Hammer drill	 Insulation tape	 Cotton cloth	 Brush
 Heat shrink tubing	 Heat gun	 Electrician's knife	 Protective gloves

Personal protective equipment

 Insulated Glove	 Safety Goggle	 Safety Shoes

Necessary installation environment



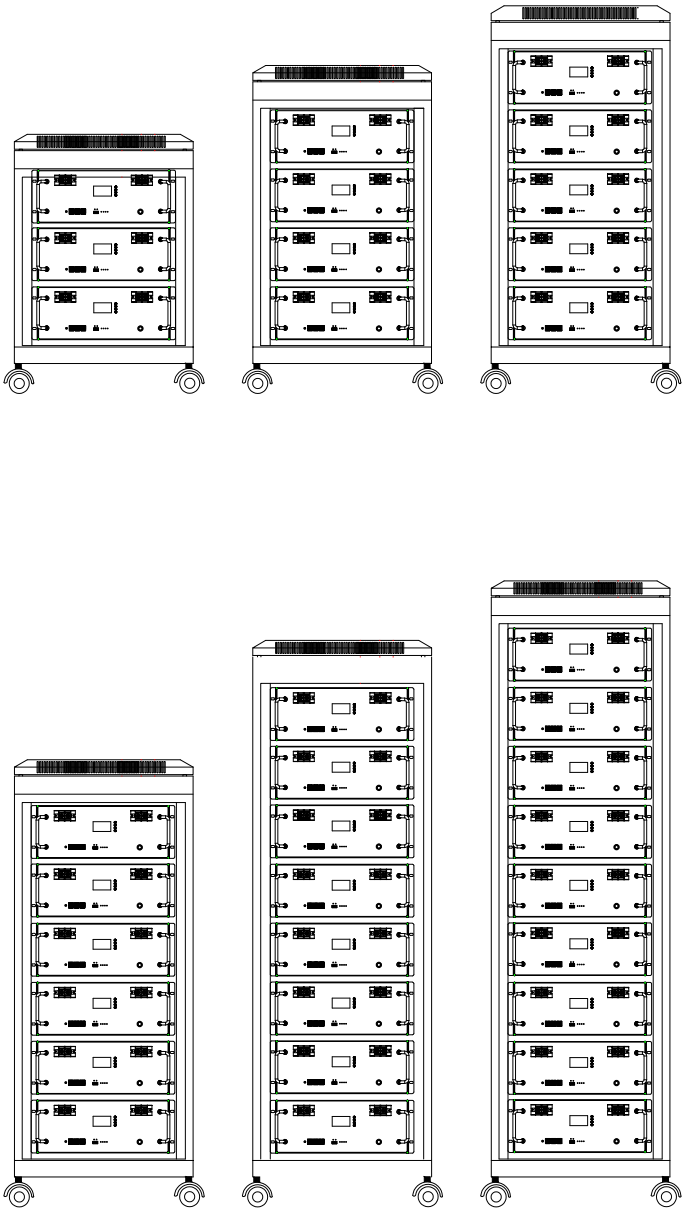
4.1 Installation position

Consider the following points to install the energy storage battery:

- Do not mount the battery on flammable construction materials. Please mount on a solid surface
- Install this battery module at eye level in order to allow the readability of LCD display at all times.
- For proper air circulation to dissipate heat, please leave a gap of about ＞0.3 meter from the ground,30 cm from the side of the device.
- The ambient temperature should be between 0℃ and 40℃and relative humidity should be between 25% and 85% to ensure optimal operation.
- Install the battery module in a dry, protected area with no excessive dust and sufficient air circulation. Do not operate in locations where the temperature and humidity are outside the specified range.
- The installation method shall be subject to the local regulations.
- Installation must be vertical or tilted backwards by maximum 10℃ - avoid forward or sideway stilt.
- There is minimal dust and dirt in the area.

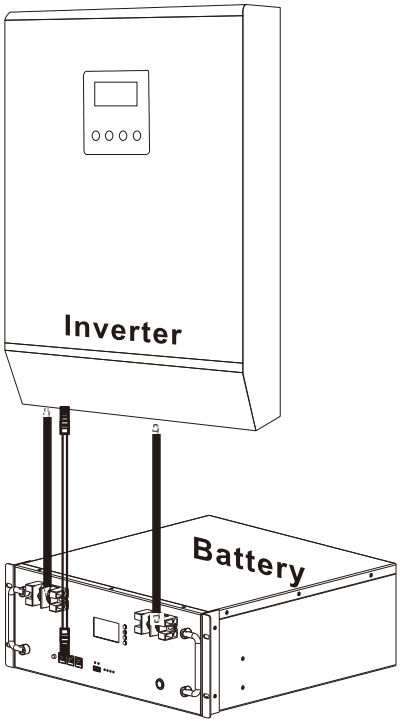
4.2 **Installation instructions**

As shown in Figure. four (1), place the battery inside the standard cabinet.

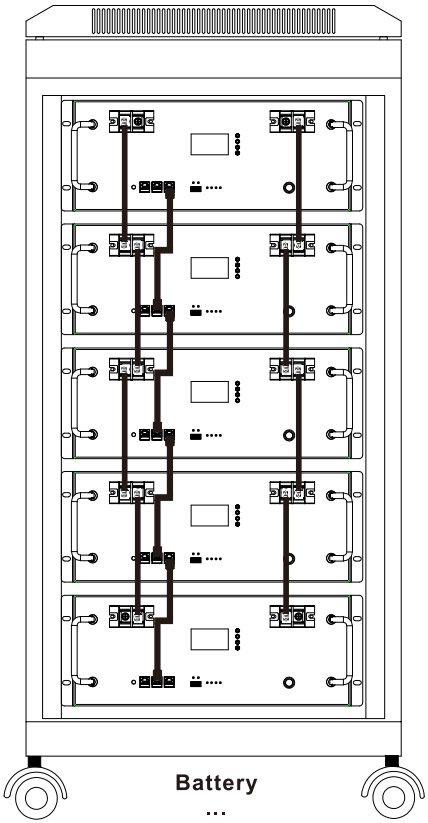


Connection Description

Connect the connecting wires in the attachment package according to four (2) diagrams.



Single Battery



Up to 15 parallel

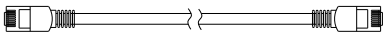
4 (2)

Annex

Connection Line (Red1500㎜ /Black1500㎜) Terminal *2PCS

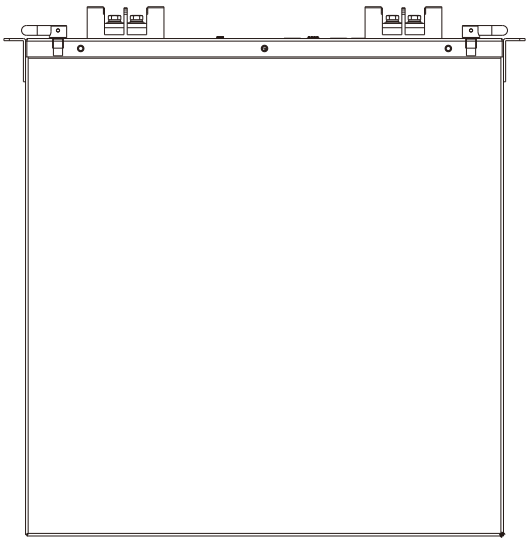


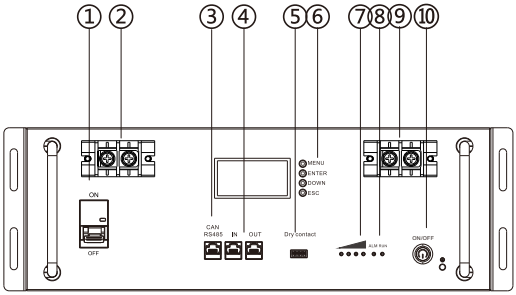
Communication line(1500㎜) Default standard network cable



5. Product operation introduction

5.1 Product overview

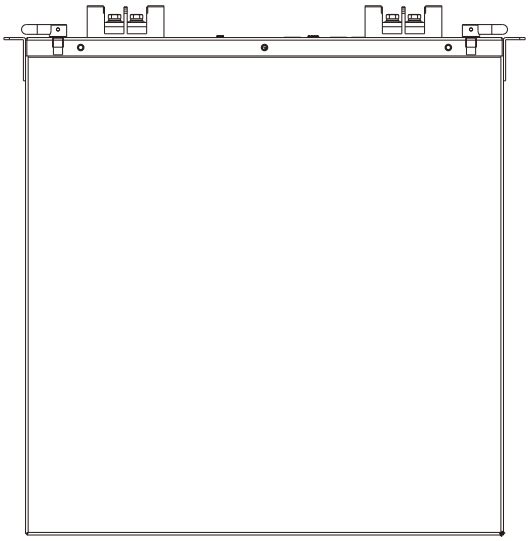


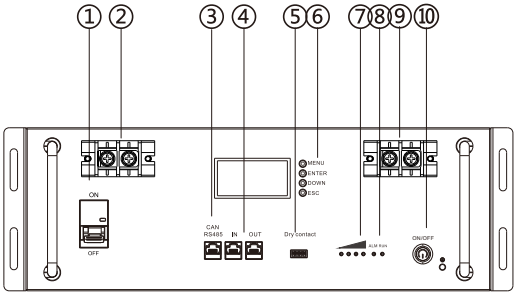


No.	Description	Silk-screen	Remark
1	Air switch	ON/OFF	
2	Slave battery positive	“+”	Output terminal
3	Communication port	RS485/CAN	Connect to inverter
4	Parallel port	IN/OUT	Parallel use
5	Dry Contact	Dry Contact	
6	Screen button	Menu/Enter/Down/Esc	
7	SOC		
8	Running status light	ALM/RUN	
9	Slave battery negative	“ -”	Output terminal
10	Weak current switch	Switch	

5.2 Host soft operation

5.2.1 Switch on/off





- Please turn on the air switch on the top of the product
- When the BMS is in the sleep state, press the weak current switch for 2~5 seconds and release it. The BMS is activated and the LED indicator lights are turned on in turn.
- When the BMS is active, press the weak current switch for 2~5 seconds and release it. The BMS is dormant. The LED indicator flashes for 5~10 seconds and then goes out

5.2.2 SOC

LED Indicator light Status Description

LED Indicator light Status Description												
PACK Status	PACKInformation	Display Logic								Remark	Duration
		SOC					ON/OFF	RUN	ALM		
		LED1	LED2	•••	LED19	LED20	LED21	LED22	LED23		
Application mode check	Parallel or single application mode check successful	Display based on actual SOC					●	★	★	Flashes 5 times	2S
	Wait for power cycle to dynamically merge PACK	Display based on actual SOC					●	★	★	1HZ	
Charge	0%-5% SOC	■					●	●		/	
	5%-10% SOC	■	■				●	●		/	
	...	■	■	■			●	●		/	
	95%-100% SOC	■	■	■	■	■	●	●		/	
Discharge	95%-100% SOC	●	●	●	●	●	●	●		/	
	...	●	●	●			●	●		/	
	5%-10% SOC	●	●				●	●		/	
	0%-5% SOC	●					●	●		/	
ALM	Level 3 or above fault	Display based on actual SOC					●		●	Check the Bluetooth APP for detailed fault content.	
RUN	Normal operation	Display based on actual SOC					●	●		Check the Bluetooth APP for detailed fault content.	
Shut down	/	/	/	/	/	/	★			LED depending on the previous status, blink 2 times, then shutdown	
Click	Show PACK ID						Closure			Returnafter 10s	

Remark :

★ : Blue LED Blink

● : Blue LED On

■ : Blue LED flash display

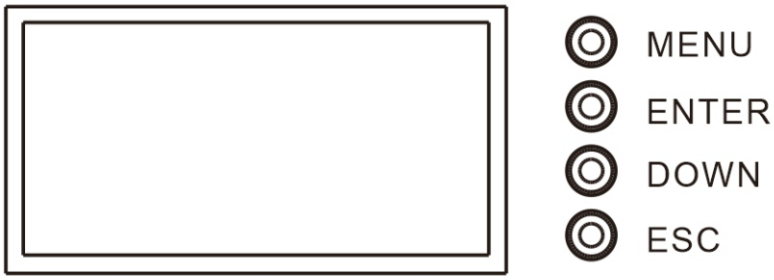
★ : Red LED Blink

● : Red LED On

※The LEDS switch can be controlled by soft key

Note: LED indicator alarm can be enabled or disabled through the upper computer. It is enabled by factory default.

5.2.3 Description of display keys



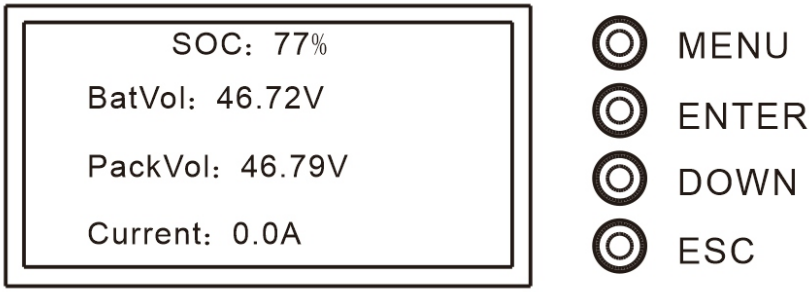
“MENU” ： Menu key

“ENTER” ： Enter key

“DOWN” ： Down key

“ ESC” ： Esc key

5.2.4 Description of display screen



Main interface：

“BatVol” ： Battery voltage

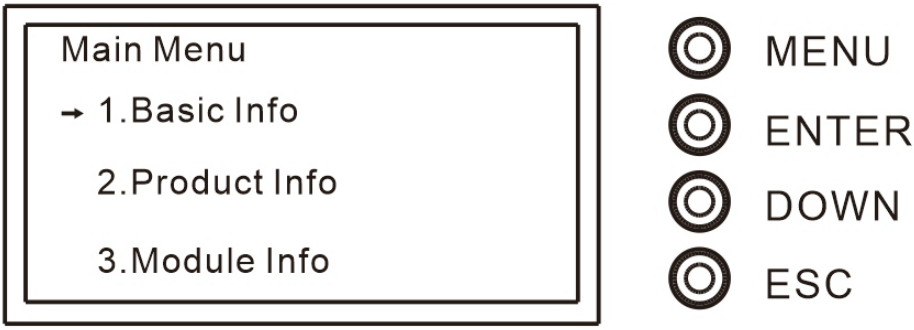
“PackVol” ： Output voltage



Main Menu：

“System Info”： System information

“System Setting”： System setting

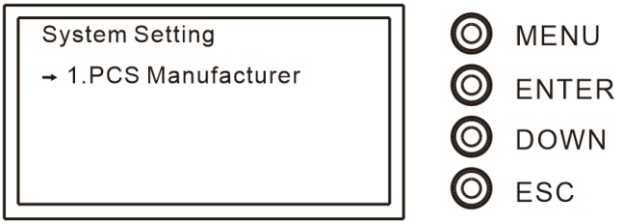


Battery Info ：

“Basic Info”： View basic battery information

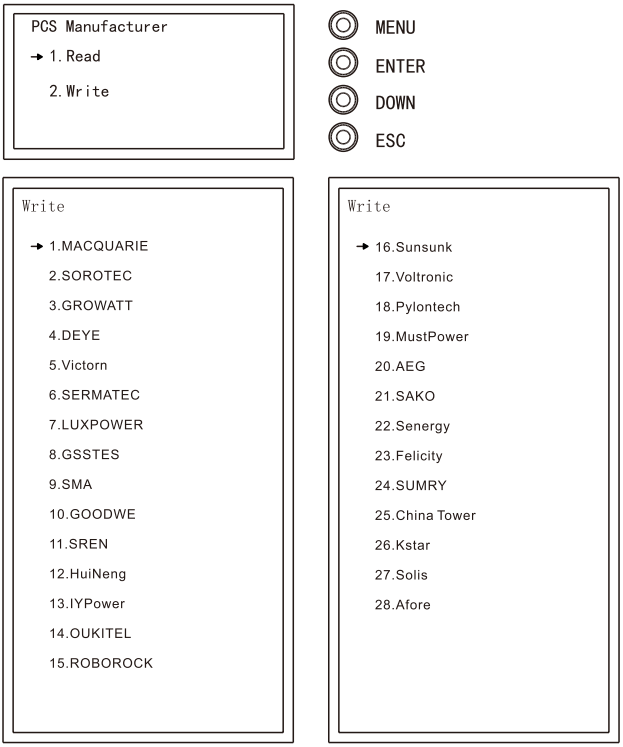
“Product Info”： Check the battery barcode and version

“Module Info”： Check the voltage of single electric core



System Setting ：

“PCS Manufacturer”： List of supported inverters



PCS Manufacturer：

“Read”： Read inverter brand selected by BMS

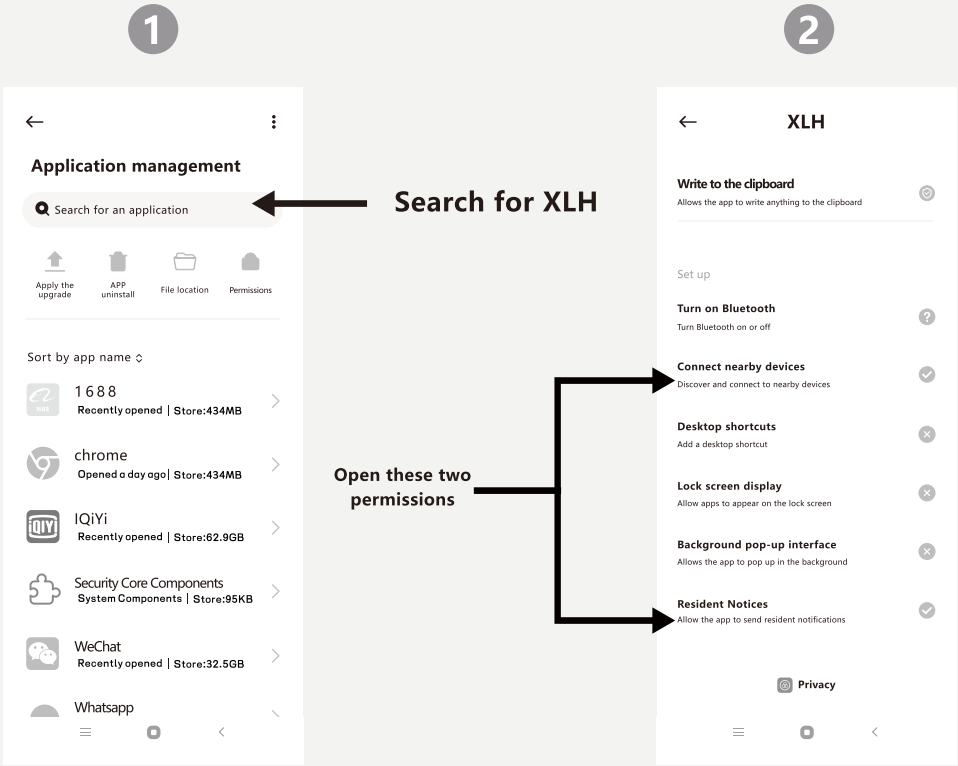
“Write”： Select inverter communication protocols of different brands

5.3 Description of optional functions

The following optional modules need to be ordered

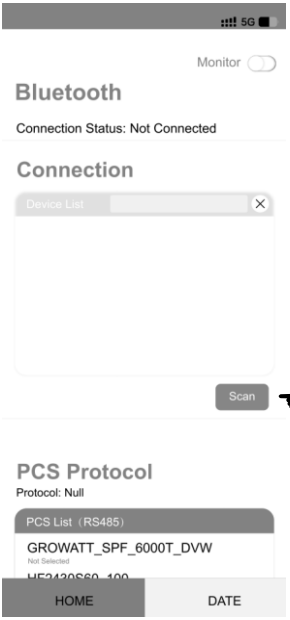
5.3.1 Bluetooth module description

∗Please search for "XLH" in the app store on your phone to download.

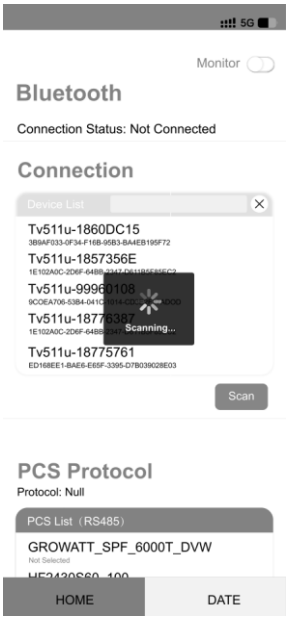


✧ Download mobile APP and open relevant APP permissions.

✧ Open the mobile phone Bluetooth and select the Bluetooth name of the product's external logo



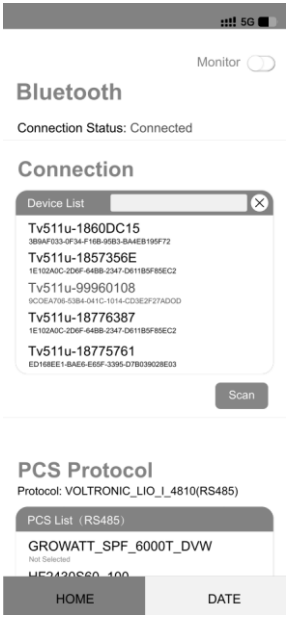
Click on "scan" to search for the Bluetooth serial number.



1.APP initialization interface

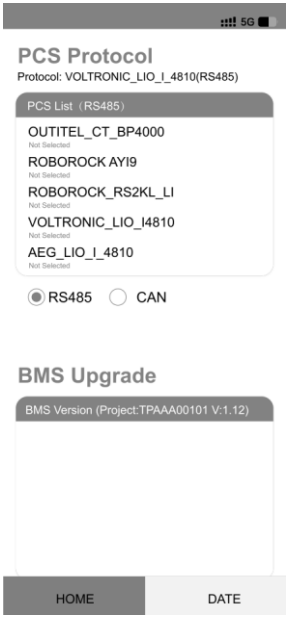
2.Bluetooth serial number search in progress



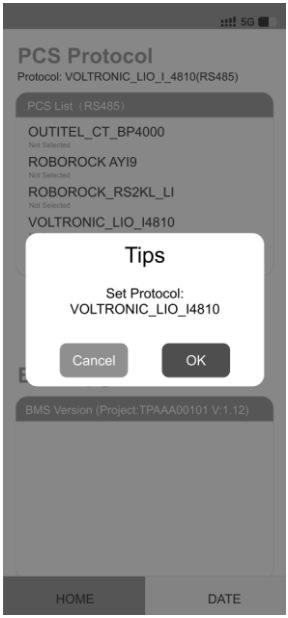


3. Access to the Bluetooth module

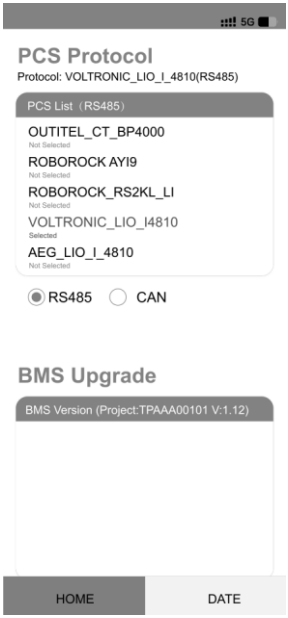
3. 4. Bluetooth serial number shows green that is connected successfully



5. Slide down to select PCS protocol



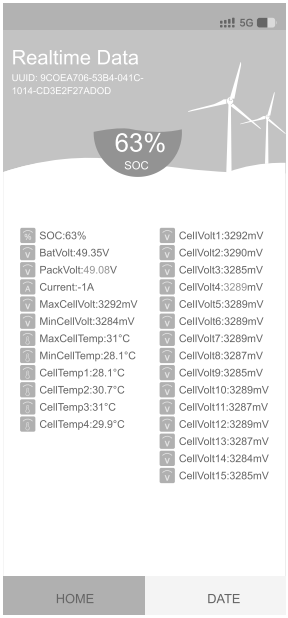
6. Connect the corresponding PCD serial number



7. PCD protocol link success



8.Viewing battery information after successful connection of Bluetooth sequence and PCD sequence.

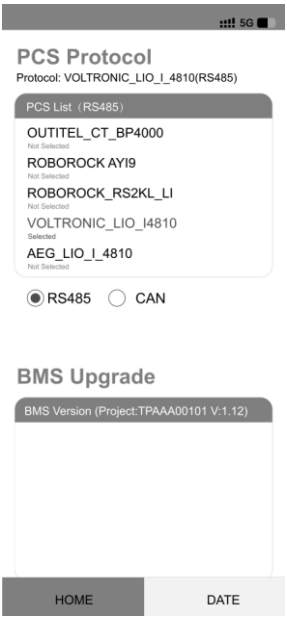


9.Click "Connected" to view the real-time parameters of the battery module (when the windmill is rotating in the picture, it means the battery data is updated in real time).

Append



•BMS Update Board

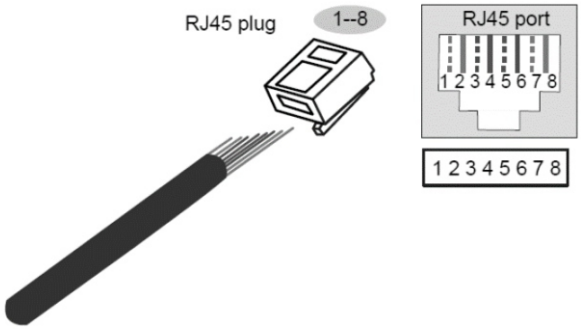


The PCS and BMS upgrade boards are not operable after the battery data real-time update is turned on.

Appendix I: BMS Parameters

● Definition of BMS interface

- **Communication port Definition**



RJ45 Port

CAN/RS485 Communication port

Pin	Function description	Describe	Remark
1	CAN2-H/inside	CAN-H	
2	CAN2-L/inside	CAH-L	
3	EXIT_12V-	The external dry contact assists in activating the negative terminal of the power interface	
4	CAN1-H	PCS CAN-H	External device communication
5	CAN1-L	PCS CAN-L	External device communication
6	EXIT_12V+	The external dry contact assists in activating the positive electrode of the power interface	
7	RS485_B	PCS RS485 B	
8	RS485_A	PCS RS485 A	

"IN" Parallel port

Pin	Function description	Describe	Remark
1	CAN2_H	CAN2-H/inside	CAN Communication
2	CAN2_L	CAN2-L/inside	
3	GND_ISO	ISO_GND	
4	GND_ISO	ISO_GND	
5	Master	Master pack select	
6	GND_ISO	ISO_GND	
7	Encode_out	Program address function ,output	
8	SW_wakeout	Synchronization power on	

"OUT" Parallel port

Pin	Function description	Describe	Remark
1	CAN2_H	CAN2-H/inside	CAN Communication
2	CAN2_L	CAN2-L/inside	
3	GND_ISO	ISO_GND	
4	Slave IN	Slave Pack select	
5	ISO_GND	SO_GND	
6	GND_ISO	ISO_GND	
7	Encode_IN	Program address function ,input	
8	SW_wakeout	Synchronization power on	

● BMS parameter description

No.	Item	General Parameter
1	Combination method	48 V 16S
2	Rated Capacity(Ah)*Parallel	PACK*Parallel
3	Nominal voltage/Capacity	48 V
4	Charging Voltage(V)recommend/max	62.4V/64V
5	Charging Current(A)recommend	0.5C/0.5C(total)
6	Discharge Cut-off Voltage(V)	45V / 10%
7	Max Discharging current(A)	100A* Parallel
8	Max Charging current(A)	100A* Parallel
9	Charge over Current protect(A)	110A* Parallel
10	Discharge over Current protect(A)	110A* Parallel
11	Internal Impedance	≤200mΩ
12	Communication mode	CAN or RS485
13	Host software and Communication mode	RS485
14	Working Temperature Range	Charge：0℃~45℃
		Discharge:：-20℃~+60℃
15	Storage Temperature Range	-10℃~45℃

Notes：Running the device, set the external charger or inverter parameters, please set according to the corresponding operation manual. Can not exceed the rated parameter requirements. If you need to order products with higher current value, please consult the agent.

Appendix II: Host soft operation

✧ Host soft operation

When the equipment manufacturer confirms that it is necessary, it can authorize to provide the customer with the host software and operating instructions.

Monitor.View.dll	2022/11/23 19:21	Application extension	435 KB
Newtonsoft.Json.dll	2021/3/17 20:03	Application extension	563 KB
Newtonsoft.Json	2021/3/17 19:58	XML document	551 KB
Nlog.config	2022/7/2 22:40	CONFIG file	3 KB
Nlog.dll	2021/10/24 18:23	Application extension	847 KB
Nlog	2021/10/24 18:23	XML document	1,607 KB
NPOI.dll	2017/3/21 15:53	Application extension	1,640 KB
NPOI.OOXML.dll	2017/3/21 15:53	Application extension	524 KB
NPOI.OpenXml4Net.dll	2017/3/21 15:53	Application extension	89 KB
NPOI.OpenXmlFormats.dll	2017/3/21 15:53	Application extension	2,072 KB
NPOI	2017/3/21 15:53	XML document	2,202 KB
PCANBasic.dll	2021/12/26 0:26	Application extension	465 KB
XLH_Monitor	2022/11/24 19:22	Application	193 KB

Monitor V1.1.16

Setting Debug Tools Help

DisConnect Monitor KeepAhead

Rack

BCU1

Name	Value	Uint	Name	Value	Uint	Name	Value	Uint	Name	Value	Uint	Name	Value	Uint
NumOfBcu	1	channels	SoxSoh	100.0	%	FltBatOv2	0	NA	FltUsoc2	0	NA	FltComSbcu	0	NA
NumOfDsgBcu	1	channels	SoxRsoc	**96.7**	%	FltBatOv3	0	NA	FltChgerOv	0	NA	FltPrllAddrFail	0	NA
NumOfChgBcu	1	channels	MaxRsoc	**96.7**	%	FltBatUv2	0	NA	FltChgerUv	0	NA	FltVWirDisconnect	0	NA
SystemState	4	NA	MinRsoc	**96.7**	%	FltBatUv3	0	NA	FltLmtOcc2	0	NA	FltHwChgCurrLmt	0	NA
WorkCurrMode	1	NA	ActiveDeltaSumV	**0.00**	V	FltDeltaOv2	0	NA	FltLmtOcc3	0	NA	FltUsoh	0	NA
PrllPwrOnState	0	NA	AllDeltaSumv	**0.00**	V	FltDeltaOv3	0	NA	FltLmtOcd2	0	NA			
MaxAllowDsgCurr	85.0	A	MaxCellTNum	0	channels	FltOcc2	0	NA	FltLmtOcd3	0	NA			
MaxAllowChgCurr	0.0	A	MinCellTNum	1	channels	FltOcc3	0	NA	FltCellOv4	0	NA			
DsgCutOffVol	300.0	V	MaxIntSumv	**49.40**	V	FltOcd2	0	NA	FltCellUv4	0	NA			
ChgCutOffVol	345.0	V	MinIntSumv	**49.40**	V	FltOcd3	0	NA	FltNtcOpen	0	NA			
FltLv1Warning	0	NA	MaxCellV1	**3287**	mV	FltOpc2	0	NA	FltNtcSc	0	NA			
FltLv2Warning	0	NA	MinCellV1	3270	mV	FltOpc3	0	NA	FltOsoc	0	NA			
FltLv3Protection	0	NA	MaxSocBatNum	1	channels	FltOpd2	0	NA	FltHeaterUv	0	NA			
FltLv4Failure	0	NA	MinSocBatNum	1	channels	FltOpd3	0	NA	FltHwScc	0	NA			
FltDsg	0	NA	MaxCellT	**21.3**	DegC	FltOtc2	0	NA	FltHwOcc	0	NA			
FltChg	0	NA	MinCellT	**21.1**	DegC	FltOtc3	0	NA	FltHwScd	0	NA			
PackCurrent	**-33773**	mA	RemainCap	**90317**	mAh	FltUtc2	0	NA	FltHwOcd	0	NA			
PackPower	0	W	TotalDsgCap	1109.5	Ah	FltUtc3	0	NA	FltHwOv	0	NA			
IntSumv	**49.40**	V	TotalChgCap	1318.8	Ah	FltOtd2	0	NA	FltHwUv	0	NA			
ExtSumv	**49.64**	V	TotalDsgEnergy	53	kWh	FltOtd3	0	NA	FltPrechgFail	0	NA			
MaxSumVBcuNum	1	channels	TotalChgEnergy	66	kWh	FltUtd2	0	NA	FltComAfe	0	NA			
MinSumVBcuNum	1	channels	FltCellOv2	0	NA	FltUtd3	0	NA	FltComWireless	0	NA			
MaxCellV1Num	11	channels	FltCellOv3	0	NA	FltDeltaOt2	0	NA	FltComCharger	0	NA			
MinCellV1Num	1	channels	FltCellUv2	0	NA	FltDeltaOt3	0	NA	FltComExt	0	NA			
CycleCount	14	NA	FltCellUv3	0	NA	FltUsoc1	0	NA	FltComMbcu	0	NA			

Connected

Appendix III: Emergency Management

Emergency process:

1.The external device catches fire and explodes:

A: Under the condition of ensuring safety, non-operating personnel immediately move to a safe location;

B: Under the condition of ensuring safety, the operator immediately cut off the external power supply of the equipment and the internal power supply.

C: Use fire-fighting equipment for fire-fighting treatment (the use of fire-fighting sand, fire-fighting blankets, fire-fighting water pipes)

D: If you cannot completely extinguish the fire, please call the local fire department for help.

E: Keep the accident site data so that the source of the accident can be traced.

2.The battery catches fire and explodes:

A: Under the condition of ensuring safety, non-operating personnel immediately move to a safe location;

B: Under the condition of ensuring safety, the operator immediately cut off the external power supply of the equipment and the internal power supply.

C: Use fire-fighting equipment for fire-fighting treatment (first the use of fire-fighting sand, fire-fighting blankets, then fire-fighting water pipes for cool the Pack)

D: If you cannot completely extinguish the fire, please call the local fire department for help.

E: Keep the accident site data so that the source of the accident can be traced.

✧ **This emergency procedure is a reference operation mode, which shall be determined according to the actual situation.**

