USER MANUAL OF

PowerBase MATE HV

A05

OUR ENERGY WORKS FOR YOU

Zhongrui Green Energy Technology (Shenzhen) Co., Ltd.

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ZRGP is a national high-tech enterprise with a global vision. With independent research and development capabilities and focus on ESS solutions, ZRGP is becoming a world leading supplier of BMS, ESS, modules and monitoring systems. Our business scope integrates R&D, design, production and sales.

Headquartered in China, with multiple sales offices, product centers, factories, and wholly-owned subsidiaries around the world, ZRGP is committed to providing you with safe, lightweight and long-life green energy products.

ZRGP's industrial park boasts comprehensive facilities, including automated intelligent production lines, testing and aging sections, warehouse areas, office spaces, employee dormitories, cafeteria etc. A majority of the production and testing equipment possessed by the company is imported from Germany, whose advanced level and automation level are on the cutting edge of the industry.

21000m²
Factory Area

3GWh
Per Year

90+
Countries We Export To

Company Advantages

- Years of research and development experience
- Sales and after-sales outlets all over the world
- Highly information-based automated factory
- Scientific production process control ability

To produce world-class energy storage products
To serve the consumers in the global market

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1. Safety Precautions

It is very important and necessary to read the user manual carefully (in the accessories) before installing or using battery. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage battery, potentially rendering it inoperable.

Observe these instructions and keep them located near the Li-ion Battery for future reference.

For more information about this product, please visit the official website: http://www.zruipower.com

Work on a Li-ion Battery should be carried out by qualified personnel only.

1.1. General Warnings

While working on the Li-ion Battery wear protective eyeglasses and clothing.

Any uncovered battery material such as electrolyte or powder on the skin or in the eyes must be flushed with plenty of clean water immediately. Then seek medical assistance. Spillages on clothing should be rinsed out with water.

Explosion and fire hazard. Terminals of the Li-ion Battery are always alive; therefore, do not place items or tools on the Li-ion Battery. Avoid short circuits, too deep discharges and too high charge currents. Use insulated tools. Do not wear any metallic items such as watches, bracelets, etc. In case of fire, you must use a type D, foam or CO2 fire extinguisher.

Do not open or dismantle the battery. Electrolyte is very corrosive. In normal working conditions contact with the electrolyte is impossible. If the battery casing is damaged do not touch the exposed electrolyte or powder because it is corrosive.

Li-ion batteries are heavy. If involved in an accident, they can become a projectile! Ensure adequate and secure mounting and always use suitable handling equipment for transportation.

Handle with care because Li-ion Battery is sensitive to mechanical shock.

Do not expose cable outside, all the battery terminals must be disconnected.

Do not place at a child or pet touchable area.

Do not use cleaning solvents to clean battery.

Do not expose battery to flammable or harsh chemicals or vapors.

Do not paint any part of battery; include any internal or external components.

Do not drop, deform, impact, cut or spearing with a sharp object.

Do not wet the battery and avoid of direct sunlight.

Do not use a damaged battery.

Please contact the supplier within 24 hours if there is something abnormal.

Any foreign object is prohibited to insert into any part of battery.

The warranty claims are excluded for direct or indirect damage due to items above.

1.2. Charge and Discharge Warnings

If the battery is stored for long time, it is required to charge them every six months, and the SOC should be no less than 90%.

Battery needs to be recharged within 12 hours, after fully discharged.

Do not connect battery with PV solar wiring directly.

Use only with BMS approved by the supplier.

If charged after the Lithium Battery was discharged below the “Discharge cut-off voltage”, or when the Lithium Battery is damaged or overcharged, the Lithium Battery can release a harmful mixture of gasses such as phosphate.

The temperature range over which the battery can be charged is 0°C to 55°C. Charging the battery at temperatures outside this range may cause severe damage to the battery or reduce battery life expectancy.

The temperature range over which the battery can be discharged is -20°C to 55°C. Discharging the battery at temperatures outside this range may cause severe damage to the battery or reduce battery life expectancy.

1.3. Transportation Warnings

The battery must be transported in its original or equivalent package and in an upright position. If the battery is in its package, use soft slings to avoid damage.

Do not stand below a battery when it is hoisted.

Never lift the battery at the terminals or the BMS communication cables, only lift the battery at the handles.

NOTE：

- *Batteries are tested according to UN Handbook of Tests and Criteria, part III, sub section 38.3 (ST/SG/AC.10/11/Rev.5).*
- *For transport the batteries belong to the category UN3480, Class 9, Packaging Group II and have to be transported according to this regulation. This means that for land and sea transport (ADR, RID & IMDG) they have to be packed according to packaging instruction P903 and for air transport (IATA) according to packaging instruction P965. The original packaging complies with these instructions.*

1.4. Disposal of Lithium Batteries

Batteries marked with the recycling symbol must be processed via a recognized recycling agency. By agreement, they may be returned to the manufacturer.

Batteries must not be mixed with domestic or industrial waste.

Do not throw a battery into fire.

1.5. Before Connecting

◆After unpacking, please check product and packing list first, if product is damaged or lack of parts, please contact with the local retailer.

◆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 mistake the positive and negative cables, and ensure no short circuit with the external device.

◆It is prohibited to connect the battery and AC power directly.

◆ Battery system must be well grounded, and the resistance must be less than 1oumu;

◆Make sure the grounding connection set correctly before operation.

◆ Please ensured the electrical parameters of battery system are compatible to related equipment.

◆ Keep the battery away from water and fire.

1.6. In Using

◆ If the battery system needs to be moved or repaired, the power must be cut off and the battery is completely shut down.

◆ 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.

◆ It is prohibited to disassemble the battery (QC tab removed or damaged).

◆ 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 except trained technicians. We do not undertake any consequences or related responsibility which, because of violation of safety operation, or violation of design, production and equipment safety standards.

2. Introduction

The Power Base Mate HV Series lithium iron phosphate battery is an energy storage product developed by ZRGP, it can be used to support reliable power for various types of equipment and systems. The Power Base Mate HV Series is especially suitable for applications of high power, limited installation space, and restricted load-bearing and long cycle life.
The Power Base Mate HV Series has a built-in BMS battery management system, which can manage and monitor cell's information including voltage, current and temperature.

2.1. Lithium-iron Phosphate Battery

The lithium iron phosphate battery (LiFePO4 or LFP) is the safest of the mainstream lithium battery types. A single LFP cell has a nominal voltage of 3.2V. Nominal voltage for 96V of LFP battery consists of 30 cells connected in series.

LFP is the chemistry of choice for very demanding applications. Some of its features are:

◆ Rugged - It can operate in deficit mode during long periods of time.

◆ High round trip efficiency.

◆ High energy density - More capacity with less weight and volume.

◆ High charge and discharge currents - Fast charge and discharges are possible.

◆ Flexible charge voltages.

The lithium iron phosphate battery is therefore the chemistry of choice for a range of very demanding applications.

2.2. Power Base Mate HV Series Features

◆ The whole module is non-toxic, pollution-free and environment-friendly.

◆ Cathode material is made from LiFePO4 with safety performance and long cycle life.

◆ Battery management system (BMS) has protection functions including over-discharge, over-charge, and over-current and high/low temperature.

◆ The system can automatically manage charge and discharge state and balance current and voltage of each cell.

◆ Flexible configuration, multiple battery modules can be internal for expanding voltage and Capacity.

◆ Adopted self-cooling mode rapidly reduced system entire noise.

◆ The module has less self-discharge, up to 3 months without charging it on shelf, no memory effect, excellent performance of shallow charge and discharge.

◆ Working temperature range is from -20 ℃to 50℃, (Charging 0℃~50℃, discharging -20℃ ~50℃) withexcellent discharge performance and cycle life.

◆ Small volume, light weight, plug-in embedded design module, easy to install and maintain.

2.3. Specifications

Figure 2.1. Overall system diagram

No.	Items		Parameters				
1	Model		Power Base Mate HV Series				
2	Controller Module		ZR-MC500-100M3				
3	Battery Module Type		ZR-PBMH-10	ZR-PBMH-15	ZR-PBMH-20	ZR-PBMH-25	ZR-PBMH-30
4	Nominal Capacity (Ah)		50				
5	Battery Module Chemistry		LiFePO4				
6	Battery Module QTY		2	3	4	5	6
7	Nominal Energy(kWh)		9.60	14.4	19.2	24	28.8
8	Voltage	Nominal(V)	192	288	384	480	576
		Recommend Charging(V)	213	319.5	426	532.5	639
		Max. Charging(V)	219	328.5	438	547.5	657
		Discharge Cut-off(V)	175.8	263.7	351.6	439.5	527.4
9	Current	Max. Charging(A)	48				
		Max. Discharging(A)	48				
		Peak for 10s(A)	75				
10	Weight (Approx.)		140	195	250	305	360
11	Dimensions (H*W=29*D=15.75)		688 x 935 x 258	688 x 1220 x 258	688 x 1505 x 258	688 x 1790 x 258	688 x 2075 x 258
12	Communication		RS485, CAN, WIFI				
13	Cycle Life		8000 times@25℃				
14	Designed Calendar Life		≥10 years				
15	Safety Function		Over-charge, Over-discharge, Over-current, Low/High-temperature,Low-voltage, Short-circuit Protections				

2.4. Equipment Interface Instruction

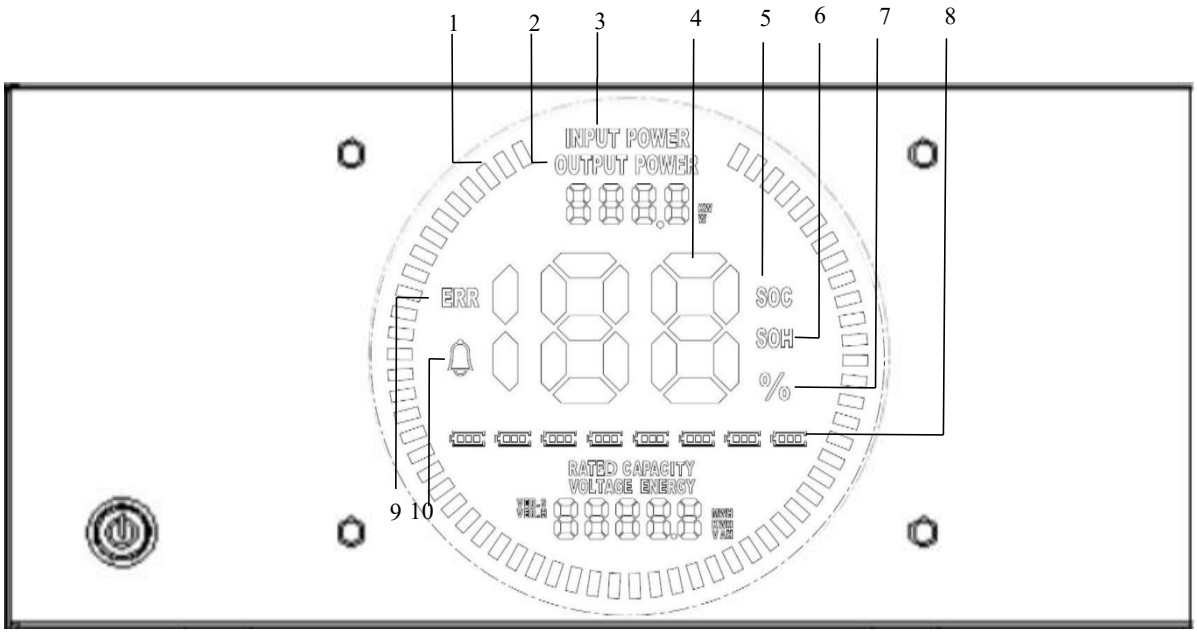


Figure 2.4.1 Display screen information

No.	Instructions	NO.	Instructions
1	Animated Streamline	6	Battery State of Health (SOH)
2	Discharge Power	7	Numerical Percentage
3	Charging Power	8	Number of Modules
4	Numerical Information	9	Fault (error)
5	Battery State of Charge (SOC)	10	Alarm (warning)

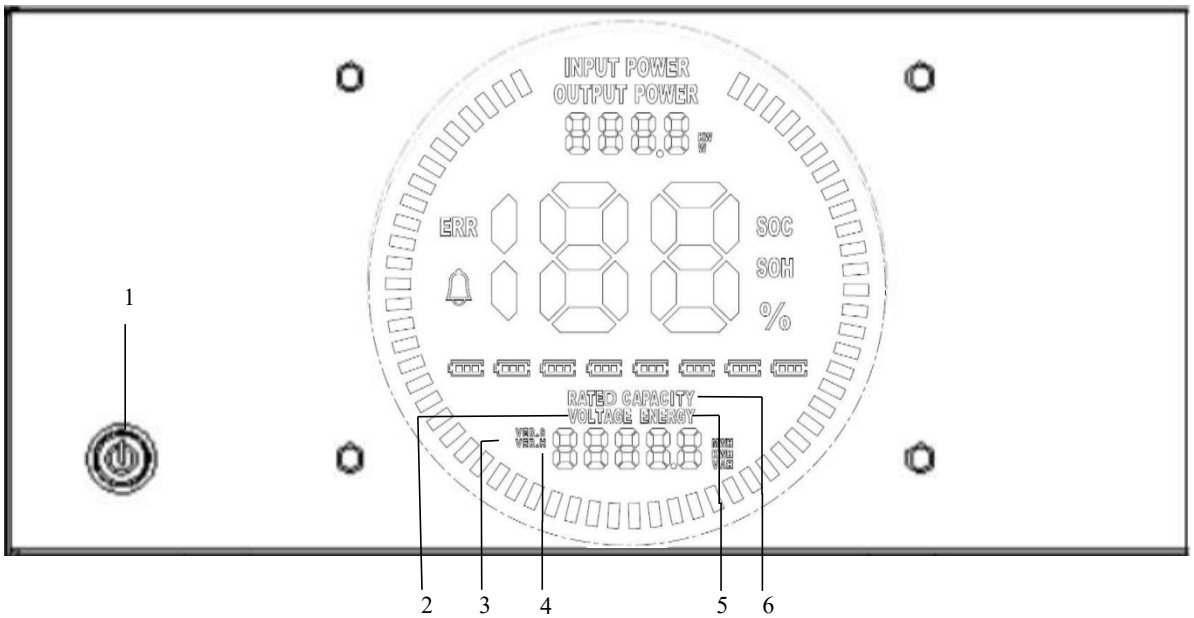


Figure 2.4.2 Display screen information

No.	Instructions	NO.	Instructions
1	On/Off	4	Hardware Version
2	Current Voltage Level	5	System Energy
3	Software Version	6	Rated Capacity

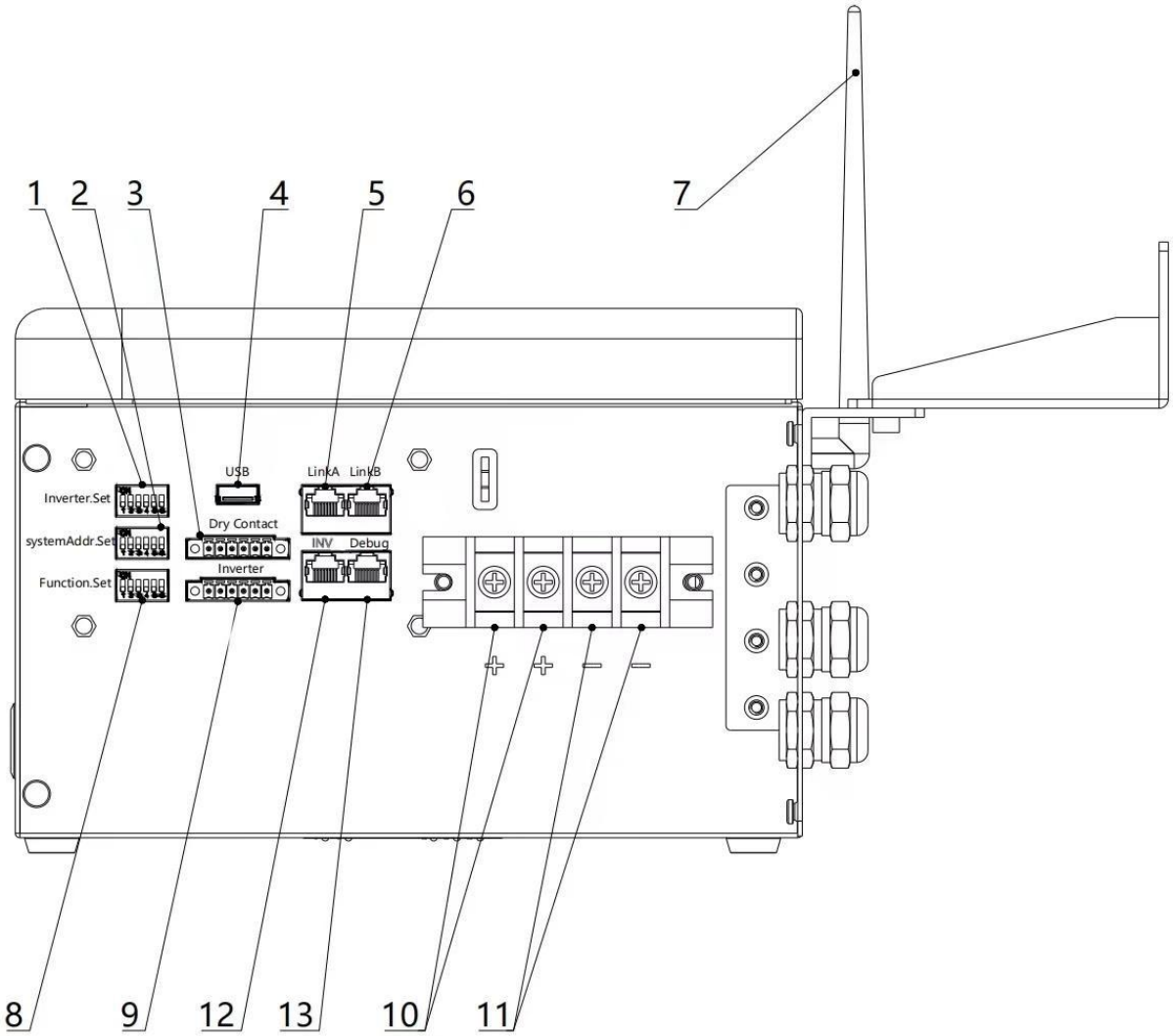


Figure 2.4.3 Interface definition of Controller module-1

No.	Instructions	No.	Instructions
1	Inverter Dial Switch	8	Function Dial Switch
2	Address Dial Switch	9	Inverter Communication Port(connector)
3	Dry Contact & GPIO Port	10	Power Positive
4	USB Port & Firmware Update	11	Power Negative
5	Reserve	12	Inverter Communication Port (RJ45)
6	Reserve	13	Debug Port & Monitoring
7	WiFi		

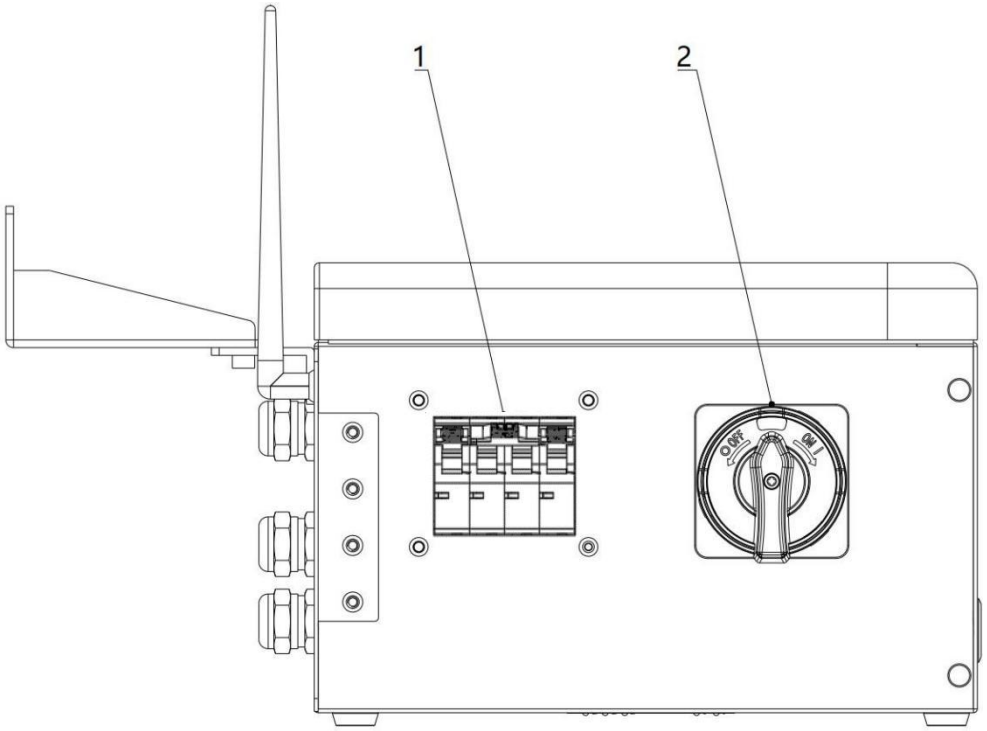


Figure 2.4.4 Interface definition of Controller module-2

No.	Instructions	No.	Instructions
1	Power Switch	2	Active Switch

Power Switch

Power switch: turn on/off the input and output of the whole system. Turn this switch up once to power on the system and turn it down to power off.

Active Switch

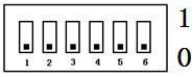
After powering on, please twist it to the right side to activate the main controller circuit. After waiting for power on, turn the rotary switch back to up.

Display Screen

Display screen: the interface can observe the operation status information SOC, SOH, charging and discharging power, alarm fault indication, charging and discharging status display and system status indication of the whole system.

Address Dial Switch

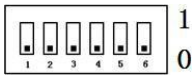
Dial switch: 6-digit dial switch, address "0" and "1", as shown in the figure. After setting, you need to restart the system and activate it.



Code	Dial Code Switch Position						Definition
	#1	#2	#3	#4	#5	#6	
1	ON	OFF	OFF	OFF	OFF	OFF	The host computer can monitor the operation of other systems by setting the mast battery pack

Function Dial Switch

Switch: 6 switches, “0” and “1”, refer to picture right. The settings will be active only after restart the battery.

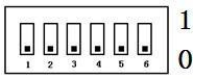


Use this dial switch to match the communication impedance, should set as below:

Code	Dial Code Switch Position					
	#1	#2	#3	#4	#5	#6
1	OFF	OFF	OFF	OFF	OFF	OFF

Inverter Dial Switch

ADD Switch: 6 ADD switches, ‘0’and ‘1’ refer to picture right.



When the host relates to the inverter, the host computer needs to communicate. Hardware address configuration is required on the host, and the hardware address can be set through the dial switch on the board.

1. Inverter protocol setting function of dial switch: The inverter communication protocol can be changed directly by setting the dial switch, the definitions are shown in the following table.

Code	Dial Code Switch Position						Definition
	#1	#2	#3	#4	#5	#6	
0	OFF	OFF	OFF	OFF	OFF	OFF	Monitoring Software setting mode
19	ON	ON	OFF	OFF	ON	OFF	Sofar_HV
20	OFF	OFF	ON	OFF	ON	OFF	Solis_HV

21	ON	OFF	ON	OFF	ON	OFF	Reserved
22	OFF	ON	ON	OFF	ON	OFF	SMA_HV
23	ON	ON	ON	OFF	ON	OFF	Schneider_HV
24	OFF	OFF	OFF	ON	ON	OFF	Reserved
25	ON	OFF	OFF	ON	ON	OFF	Reserved
26	OFF	ON	OFF	ON	ON	OFF	Reserved
27	ON	ON	OFF	ON	ON	OFF	Reserved
28	OFF	OFF	ON	ON	ON	OFF	Reserved
29	ON	OFF	ON	ON	ON	OFF	Reserved
30	OFF	ON	ON	ON	ON	OFF	Reserved
31	ON	ON	ON	ON	ON	OFF	Reserved
32	OFF	OFF	OFF	OFF	OFF	ON	Reserved
33	ON	OFF	OFF	OFF	OFF	ON	SolArk_HV
34	OFF	ON	OFF	OFF	OFF	ON	ATESS_HV
35	ON	ON	OFF	OFF	OFF	ON	Goodwe_HV
36	OFF	OFF	ON	OFF	OFF	ON	Sermatec_HV
37	ON	OFF	ON	OFF	OFF	ON	Reserved
38	OFF	ON	ON	OFF	OFF	ON	Invt_HV
39	ON	ON	ON	OFF	OFF	ON	ThinkPower_HV
40	OFF	OFF	OFF	ON	OFF	ON	KOYOE_HV
41	ON	OFF	OFF	ON	OFF	ON	Deye_HV
42	OFF	ON	OFF	ON	OFF	ON	Growatt-HV
43	ON	ON	OFF	ON	OFF	ON	Reserved
44	OFF	OFF	ON	ON	OFF	ON	Reserved
45	ON	OFF	ON	ON	OFF	ON	MEGAREVO

Automatic matching identification function of dial switches 50 ~ 63:
This function can automatically identify the inverter and set the protocol after it is turned on, Slave machines module does not need to set the address and quantity. The Controller performs automatic identification and re matching. the definitions are shown in the following table.

Address Coding	Dial Code Switch Position						Definition
	#1	#2	#3	#4	#5	#6	
56	OFF	OFF	OFF	ON	ON	ON	Enable the Wi-F function for network configuration
60	OFF	OFF	ON	ON	ON	ON	Identify network connection, 0-WiFi not connected, 1-connected to the router, 2-connected to the cloud platform
61	ON	OFF	ON	ON	ON	ON	Cast the version number of the current battery
63	ON	ON	ON	ON	ON	ON	Automatically detect the number of battery modules installed in parallel

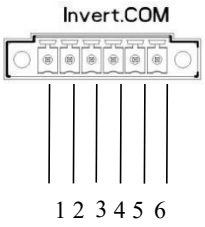
Inverter Communication Port (connector)

Terminal type: 6-Pin terminal block

Inverter CAN/RS485 communication port: (3.81mm port) follows can protocol and RS485 protocol.

Usage: reserved for direct connection with inverter, same function as the RJ45port (chapter" Inverter Communication Port (RJ45)"), either one of these two will be used.

Defined as below:

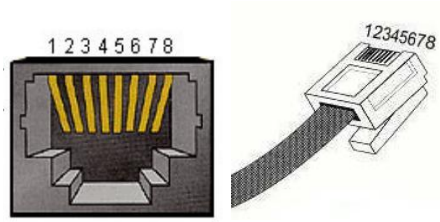
Port definitions	6Pin	Function
	1	RS485-B
	2	RS485-A
	3	RS485 -GND
	4	CAN-L
	5	CAN-H
	6	CAN -GND

Dry Contact & GPIO Port

Terminal type: 6-Pin terminal block

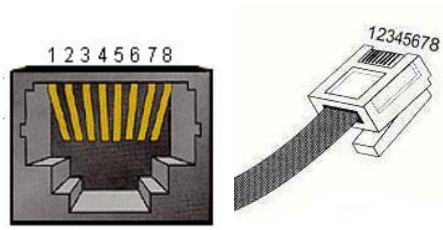
Usage: This is for General-purpose input & output (GPIO) which reserved for future communication and used for an uncommitted digital signal pin on an integrated circuit or electronic circuit (e.g. MCUs / MPUs) board which may be used as an input or output, or both, and is controllable by software.

Debug Port & Monitoring

Port Definitions	RJ45 Pin	Function
	1	RS485-B
	2	RS485-A
	3	CAN -GND
	4	RS485-GND
	5	RS485-GND
	6	CAN -GND
	7	CAN-H
	8	CAN-L

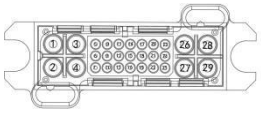
Usage: Connect the monitoring computer to query the data and monitor the running status of the system.

Inverter Communication Port (RJ45)

Port Definitions	RJ45 Pin	Function
	1	RS485-B
	2	RS485-A
	3	Reserved
	4	CAN- GND
	5	CAN- GND
	6	Reserved
	7	CAN-H
	8	CAN-L

Battery Power Positive & Negative

Positive and negative connection: the battery modules are connected in series through the connecting terminals. The power cable adopts waterproof connector. When connecting the power plug, its corresponding interface must be aligned.



3. How to Use EMS TOOLS

3.1. Monitoring Software Ems Tools Connection

1) Connect the Debug COM interface of the battery to the computer using the CAN box communication line (this accessory is an optional accessory, need to be purchased separately from the manufacturer).

2) Unzip the package file of the Monitoring Software Ems Tools in the same filedirectory, pay attention to the directory do not store other files.

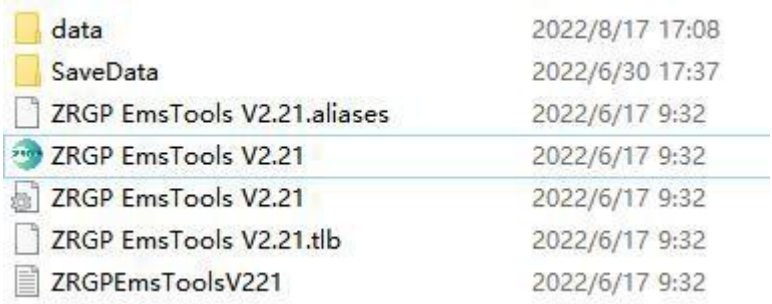


Figure 3.1. Unzip of Monitoring Software Ems Tools

3) This software is based on LabVIEW platform. Before opening EMS, you need to install a lab software, then open the Monitoring Software Ems tools icon, enter the Protocol selection interface.

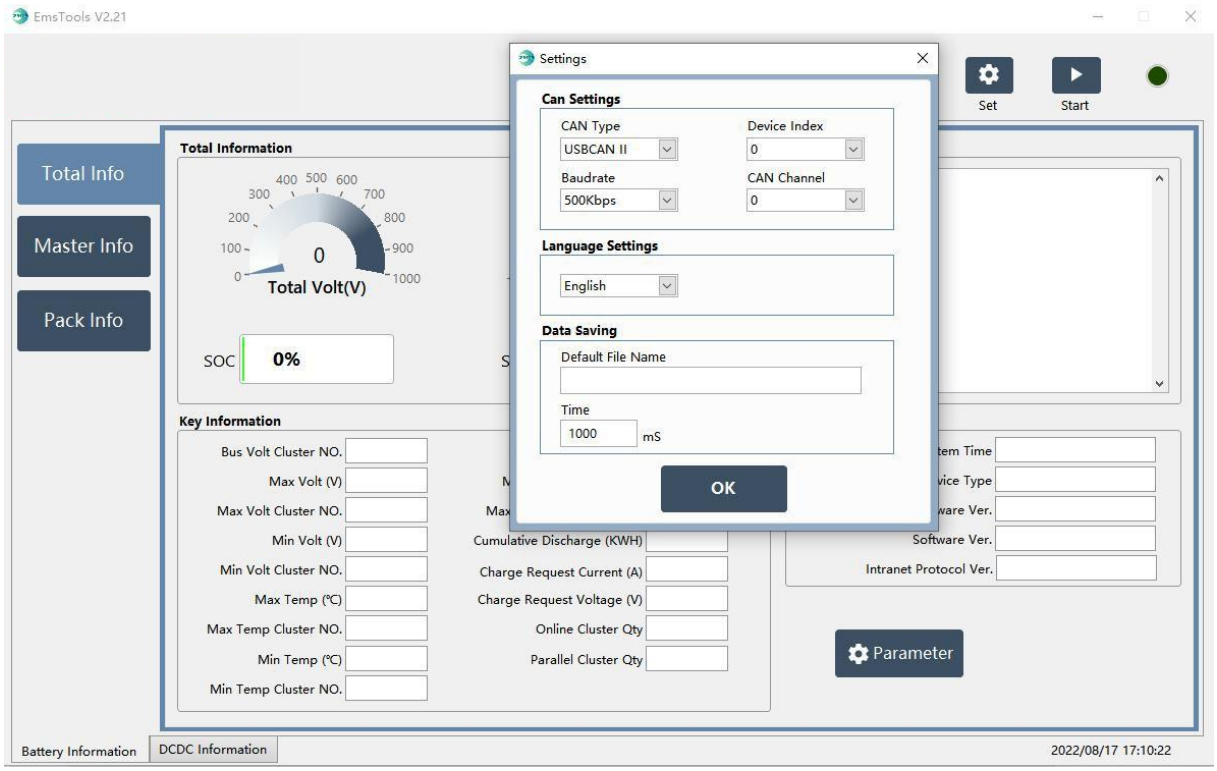


Figure 3.2. Protocol selection interface

4) Users can set different languages according to their own needs. We support tow languages, which are Simplified Chinese, English.

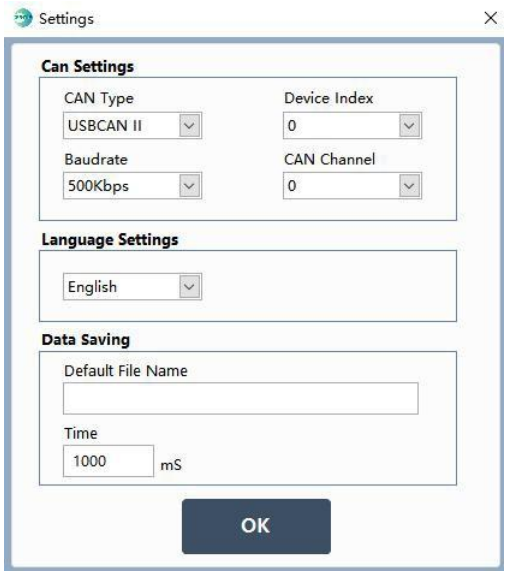
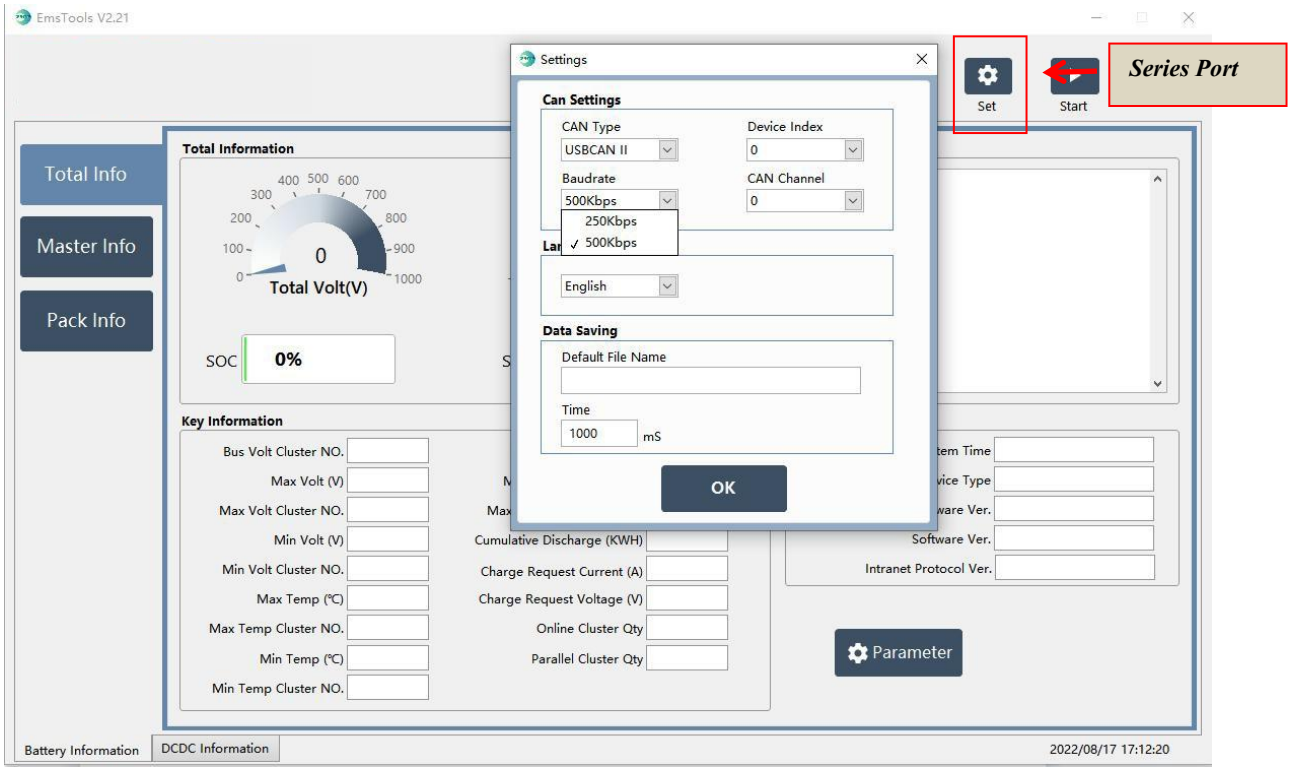


Figure 3.4. Monitoring Software Ems language selection

5) Select the serial port number in the EMS high voltage version of the Monitoring



Software EMS tool, and the default baud rate is 500. Click the OK buttons.

Figure 3.5. Monitoring Software Ems serial port settings

6) The corresponding functions can be selected through the navigation bar of the Monitoring Software EMS.

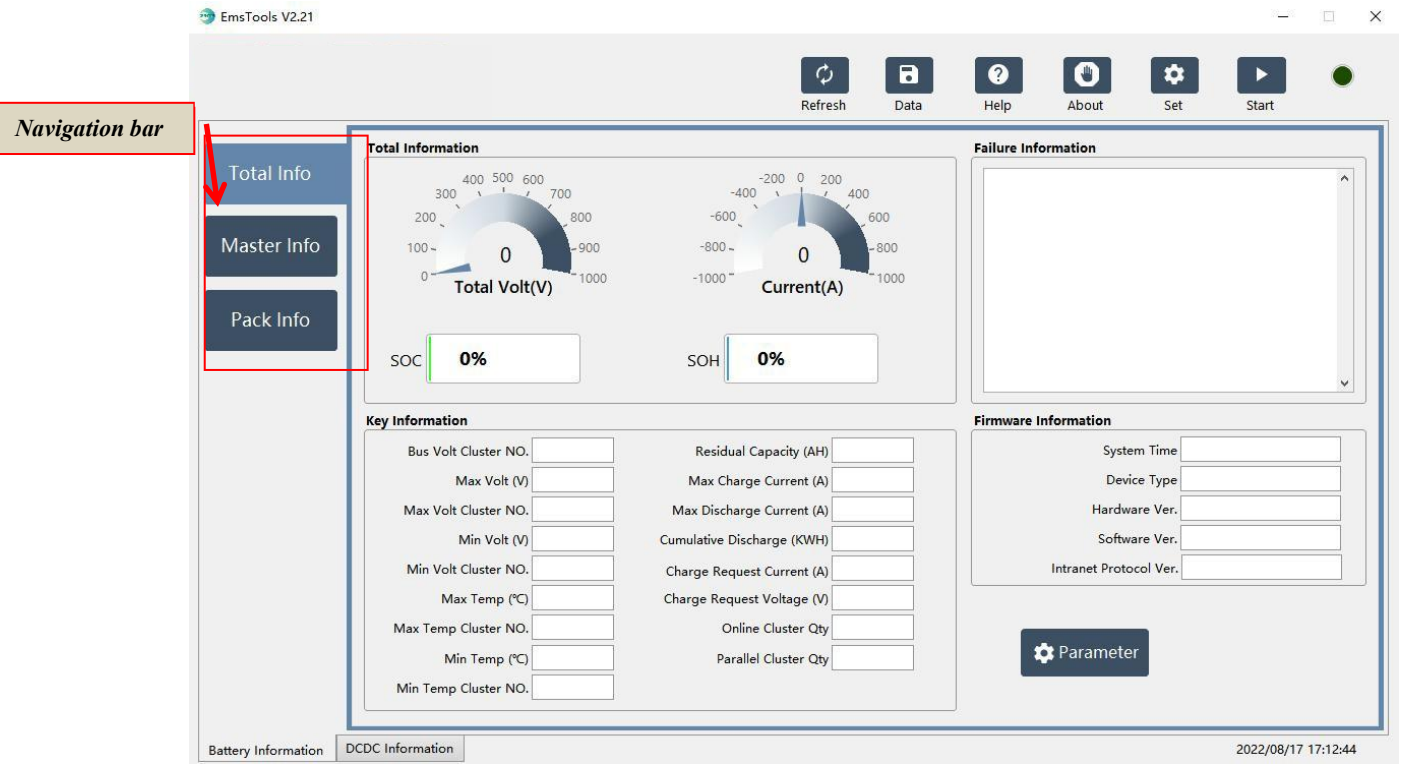


Figure 3.6. Monitoring Software Ems data acquisition

7) Cluster information operation information, you can select the corresponding operation information through the navigation bar. A total of 15 clusters can be monitored.

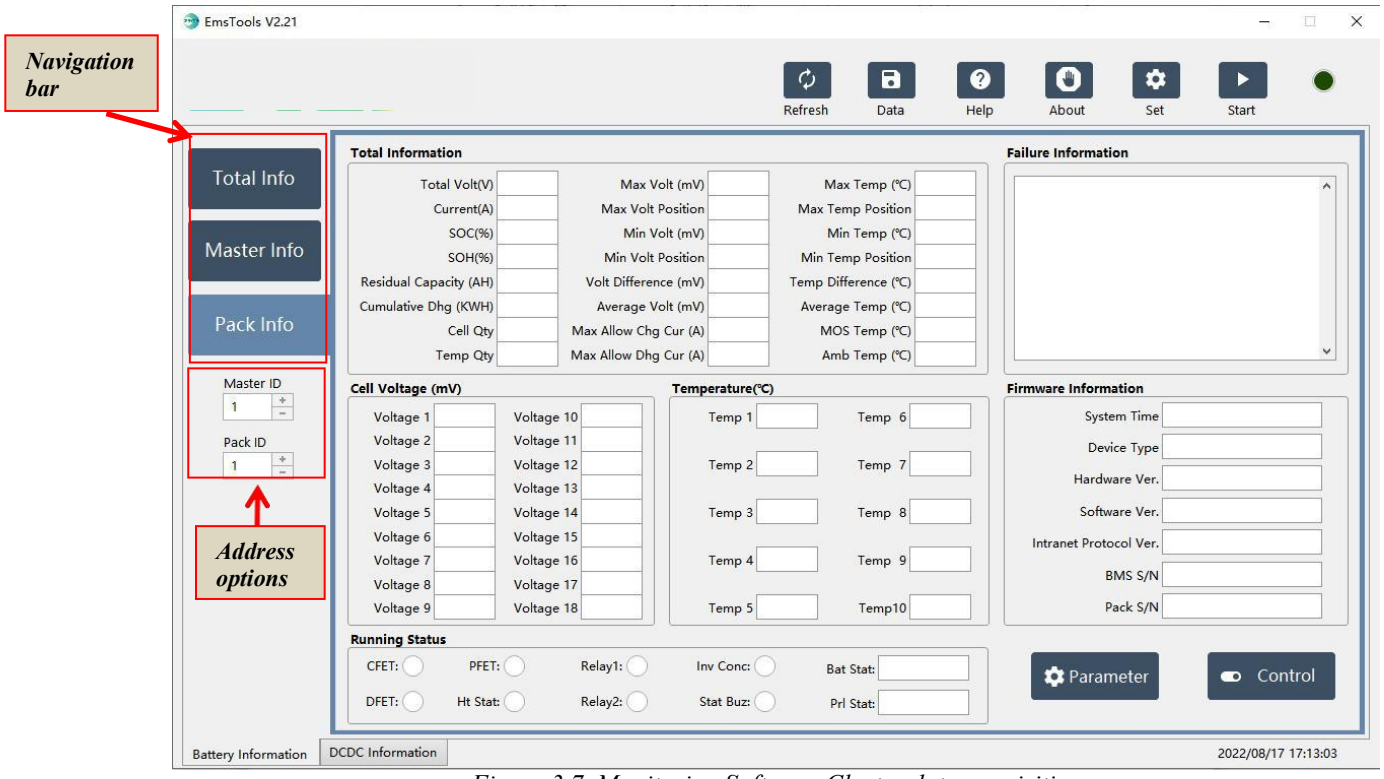


Figure 3.7. Monitoring Software Cluster data acquisition

8) The configuration parameter interface displays software version, hardware version, temperature quantity and module battery quantity of a cluster in real time.

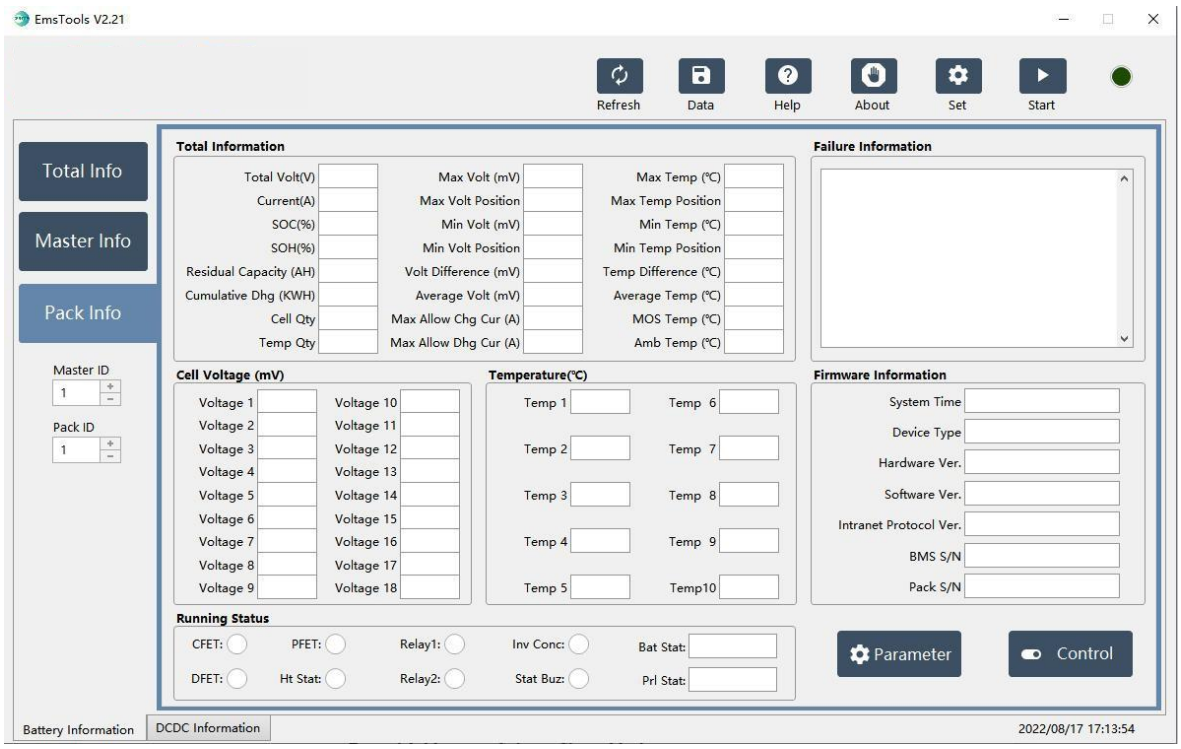


Figure 3.8. Monitoring Software Cluster Matching parameters

9) Mate HV needs to be automatically addressed on the host computer to run normally. First, go to the master interface, click Control, then click Auto AdrCellg, and finally click Strat Addr.This process requires entering the password, please contact the relevant personnel to provide.

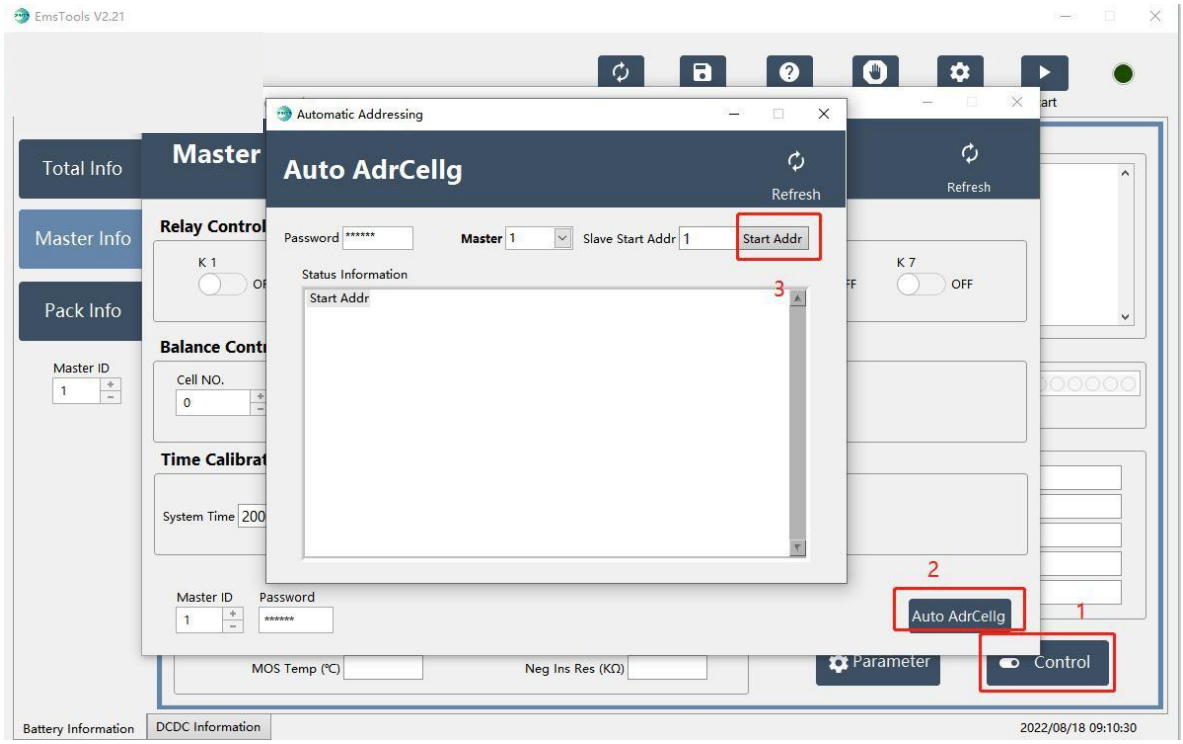


Figure 3.9. Automatic addressing interface

NOTE:

• The above contents only show the basic functions and operations of the monitoring software EMS tool. If you encounter any problems, please contact the supplier for solution.

4. How to Match Communication with Inverter

4.1. Supported Brands

At present, the energy storage products of our company have completed matching tests with some series inverters of the following brands, please refer to 2.4 for the corresponding protocol dial switch settings, we will continue matching tests with inverters of other companies. Please check our official website for the latest list of supporting brands.

4.2. Inverter Matching List

The list tab only lists the inverter manufacturers one of the same series products, general inverter manufacturers in the same series of other products, the communication protocol are the same, so our battery can be communicated with the other products of same series inverter, if encounter a series of products can't communication, please contact us.

The following inverter matching list may not be up to date. The list may change according to the software version upgrade, and the reference manual may does not change immediately according to the software version upgrade. Therefore, if the user wants to get the latest inverter matching support, please browse our the official website to check the relevant documents。

The inverter manufacturer may upgrade its software version, which may cause problems in the communication between our battery and the inverter. Therefore, before communicating with the inverter, please confirm whether the software version of the inverter is consistent with the list. If not, please contact us.

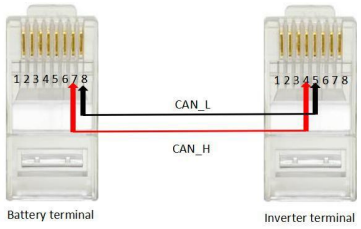
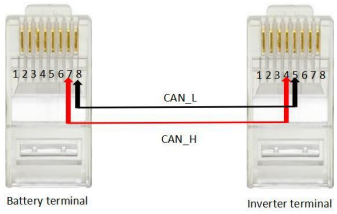
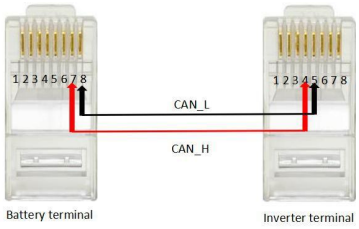
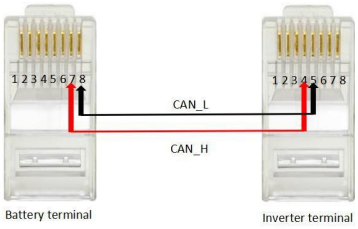
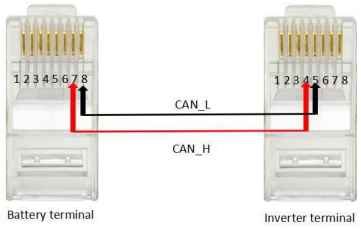
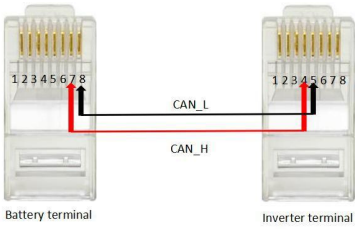
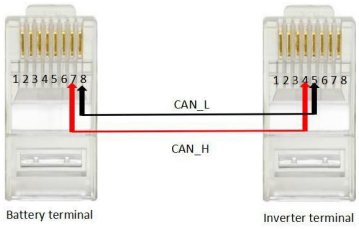
Inverter			Communication mode
Brand	**Type**	**Protocol Version**	
DEYE	ALL	/	CAN
Goodwe	GW5/6.5/8/10KN-ET	/	CAN
	GW5/6.5/8/10K-ET	/	CAN
ATESS	HPS30/50/100/120/150	/	CAN
Thinkpower	EPH4/5/6//8/10/12KTL	/	CAN
REVO	REVO E PLUS 3.2K-48	/	CAN
INVT	BD6/8/10/12KTL-RH1N	/	CAN

SOL-ARK	SOL-ARK 30/60K-3P	/	CAN
SAJ	H2-3/3.6/4/5/6/8/10K-S2	/	CAN
Growatt	SPH4000-10000TL3 BH-UP	/	CAN

4.3. Connection with Inverter

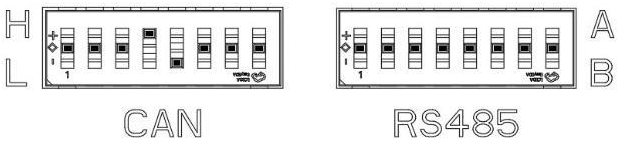
This section will introduce how to hardware connect series products with 8.2 section “Inverter Matching List”. Inverters manufacturers may upgrade their products, resulting in hardware communication interface changes. If communication is not possible in the application according to the following wiring method, please contact with us.

The CAN/RS485 communication port relates to the communication interface of inverter.

Connect to the DEYE inverter	Connect to the Goodwe inverter
	
Connect to the Growatt inverter	**Connect to the Sol-ark inverter**
	
Connect to the Sermatec inverter	**Connect to the Invt inverter**
	
Connect to the koyoe inverter	
	

a.If you are using the pin order select box, please refer to the table above to set the dial switch, according to the inverter brand.

b.For example, if you want to match a Deye inverter, you should dial 4 high and 5 low on the CAN side as shown in the following figure.



c.If the inverter brand is not shown in the table, please refer to the inverter manual or consult ZRGP's engineer.

NOTE:

- *For more connection options, please contact the supplier.*
- *The above CAN and RS485 communication connections are not connected the ground wire, in the application of relatively large interference, it is recommended to connect the ground wire, the ground wire connection method is a single-ended shielding line.*
- *If you want to view inverter matching and dip details, please visit our website https://zruipower.com/wp-content/uploads/2023/09/Inverter-Matching-Guide-ZRGP-battery1.pdf.*

5. Safe Handling of Lithium Batteries Guide

5.1. Schematic Diagram of Solution

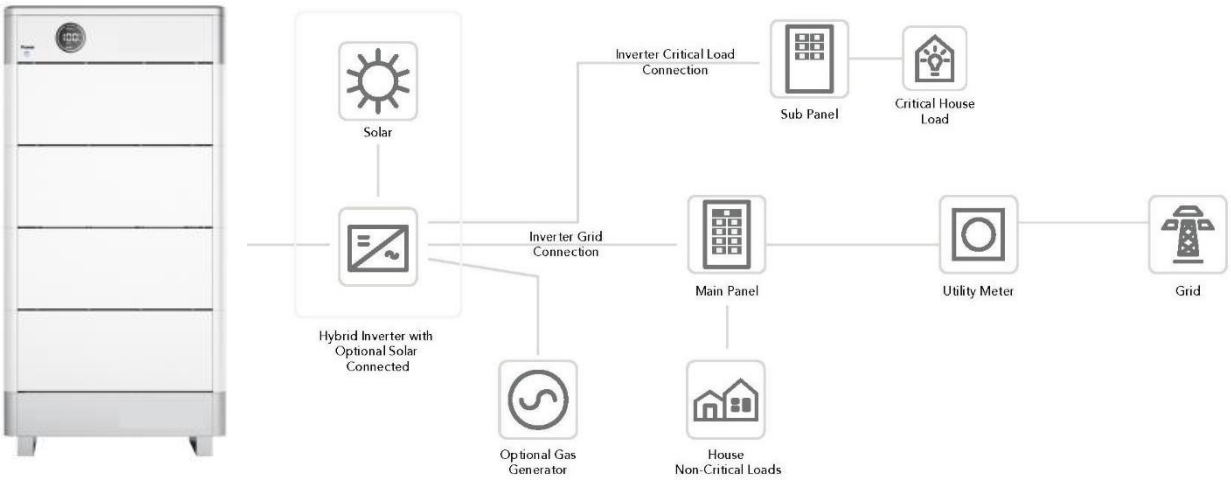


Figure 5.1. Schematic diagram of solution

5.2. Familiar with System

Be careful when unpacking the system. The whole system is heavy. Don't lift it with a pole. There are sliding wheels under the system to move. The weight of the battery can be found in the chapter "specifications".

Familiar with batteries. The battery poles are located on the right side of the battery. The battery polarity is shown on the left side of the battery. The positive pole is represented by "+" and the negative pole by "-".

Figure 5.2. Side view of the whole system

5.3. Precautions before Installation

Before installation, be sure to read the contents in Chapter 1 Safety Precautions, which is related to the operation Safety of installation personnel, please pay attention to.

5.4. Tools

The following tools are required to install the battery pack:

Wire cutter

Cable clamp

Screwdriver

NOTE:

- *Use properly insulated tools to prevent accidental electric shock or short circuits. If insulated tools are not available, cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.*

5.5. Safety Gear

It is recommended to wear the following safety gear when dealing with the battery pack:

Insulated gloves

Safety goggles

Safety shoes

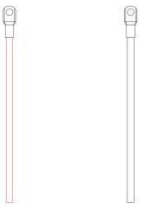
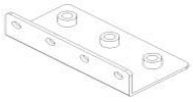
6.Installation

6.1. Package Items

Unpacking and check the Packing List:

1） Packing List

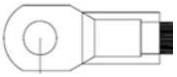
After receiving the complete system, please check to ensure that all the following components are not lost or damaged broken.

 Whole machine system×1	 User manual x 1	 Antenna x 1
 Controller fixing bracket×2	 UL10269,8AWG, red and black cable	 Flange stainless steel 304 self-tapping nails
 M4*12×3	 M512×3	 M4*8
 Pin order select box (optional)	 Stainless steel expansion bolt	 fixed bracket
 Communicationg cable	 Plastic expansion screw	 spanner
 Power line (red)	 Power line (black)	

2） Connector

Each system will be equipped with a positive connector and a negative connector. The two connectors are not connected to the cable, and users can wire according to the actual application needs.

Positive connector



Negative connector

Warning! All wiring must be performed by professionals. warning! It is very important to connect the battery with proper cable for the safe and efficient operation of the system. To reduce the risk, use the correct cable and terminal sizes recommended below.

Model	Nominal voltage (Vdc)	Cable specification	
		AWG	mm^2
ZR-PBMH-10	192Vdc	8	8
ZR-PBMH-15	288Vdc	8	8
ZR-PBMH-20	384Vdc	8	8
ZR-PBMH-25	480Vdc	8	8
ZR-PBMH-30	576Vdc	8	8

NOTE:

● *Safety and compliance with regulations require the installation of independent DC overload protector or disconnecting device between battery and inverter. Even if disconnecting devices are not required in some applications, overload protection is still required.*

3) Communication connecting line between system and inverter (Optional, 1800mm)

4) Pin order select box (optional)

Set the pin order of the communication cable of battery and inverter, cooperate with 2 standard network cable.

6.2. Installation Location

Make sure that the installation location meets the following conditions:

◆ The area is completely water proof.

◆ The floor is flat and level.

◆ There are no flammable or explosive materials.

◆ The ambient temperature is within the range from 0°C to 50°C.

◆ The temperature and humidity is maintained at a constant level.

◆ There is minimal dust and dirt in the area.

◆ The distance from heat source is more. than 2 meters.

◆ The distance from air outlet. of inverter is more than 0.5 meters.

◆ Do not install outside directly.

◆ Do not cover or wrap the battery case or cabinet.

◆ Do not place at a children or pet touchable area.

◆ The installation area shall avoid of direct sunlight.

◆ There are no mandatory ventilation requirements for battery module, but please avoid ofinstallation in confined area. The aeration shall avoid of high salinity, humidity, or temperature.

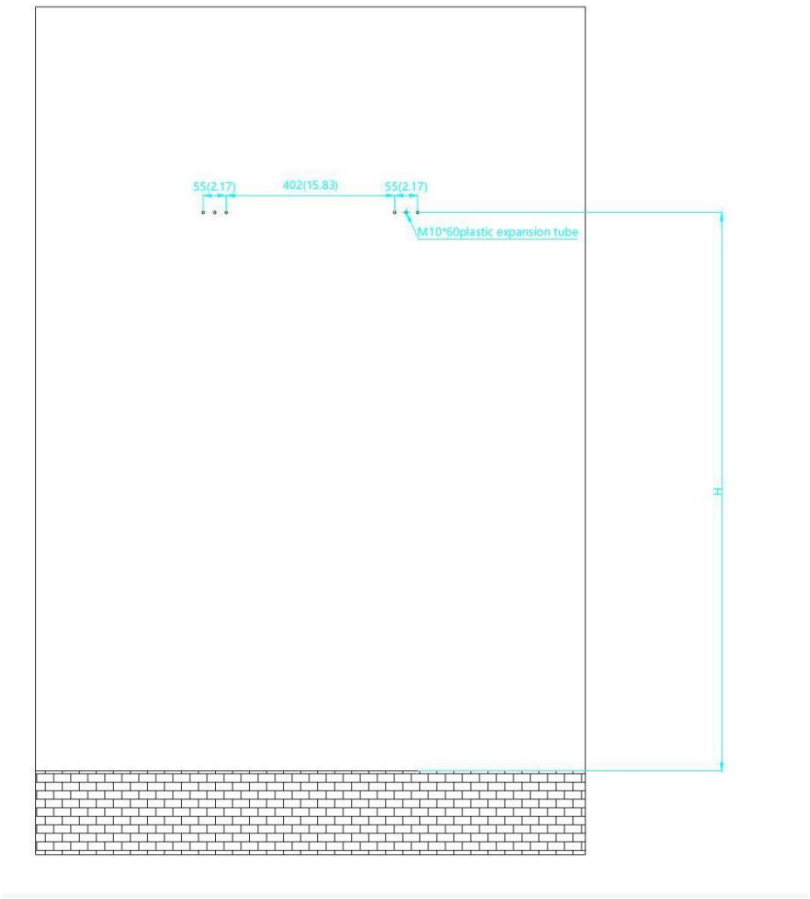
CAUTION

If the ambient temperature is outside the operating range, the battery pack stops operating to protect, itself. The optimal temperature range for the battery pack to operate is 0°C to 55°C. Frequent exposure, to harsh temperatures may deteriorate the performance and life of the battery pack.

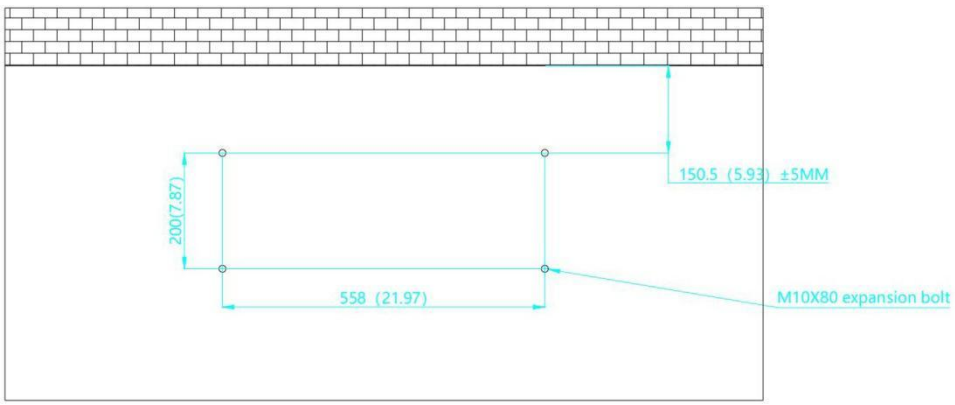
6.3. System Installation

A. Mate HV the Whole System

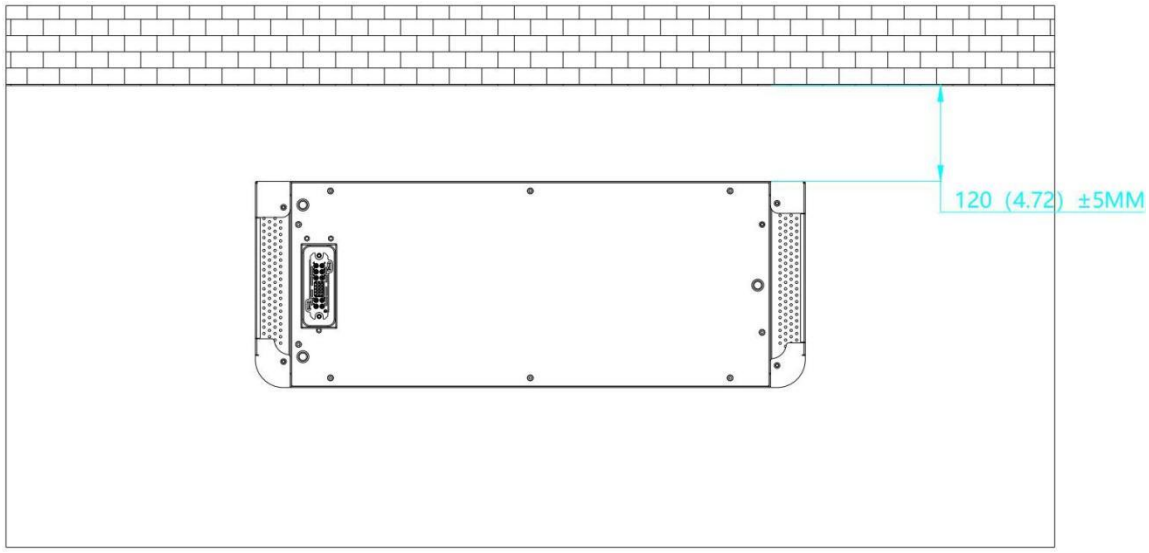
1） According to the current number of modules, make sure the corresponding dimensions. The figure below indicates specific dimensions.

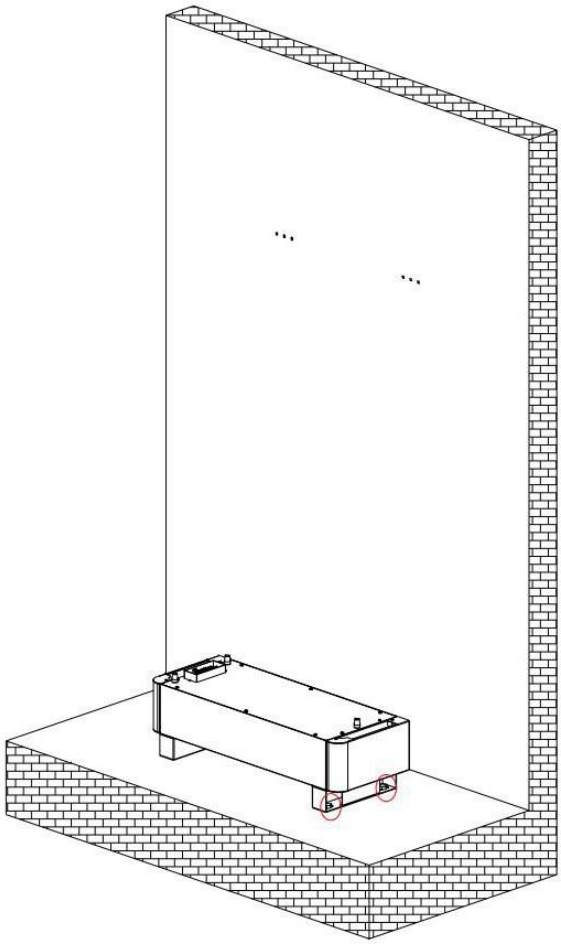


2） Pre-embed the expansion bolts based on the dimensions as the graph below showed.



3） Set down the base, make sure that the base is 120mm away from the wall first, and then lock the screws.

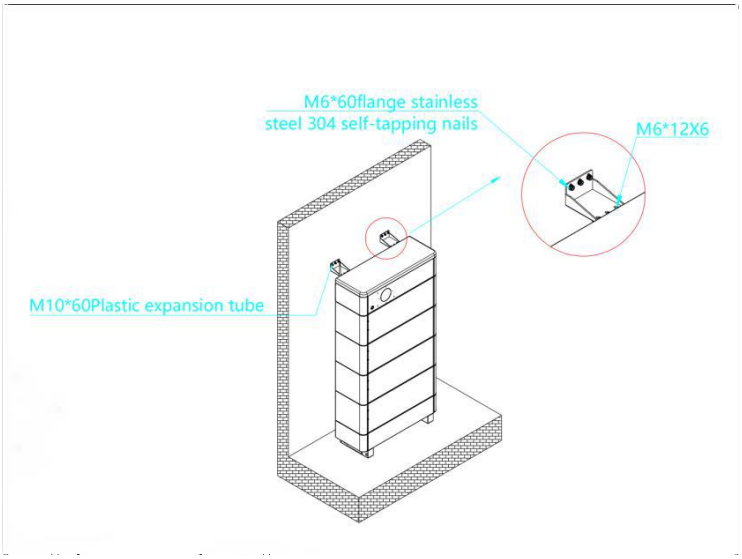


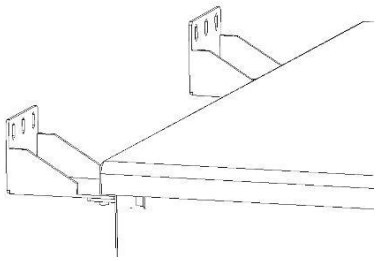


4） Align and stack the required modules and cover the controller finally.

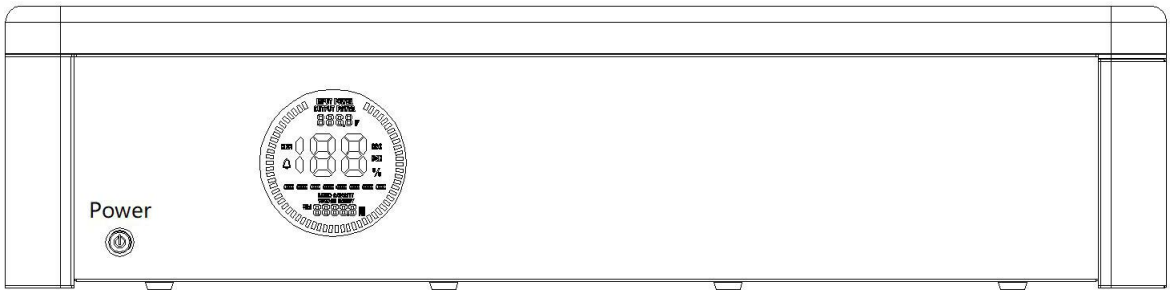
Note: Due to the side panels are already fixed on master and slaves, users need to dismantle those firstly.

5） Assemble and lock the controller fixing bracket according to the position of holes on the wall as the graph below shows. After this step, check whether the cluster is 120±5mm away from the wall and whether the height of cluster can match the holes on the wall one more time.

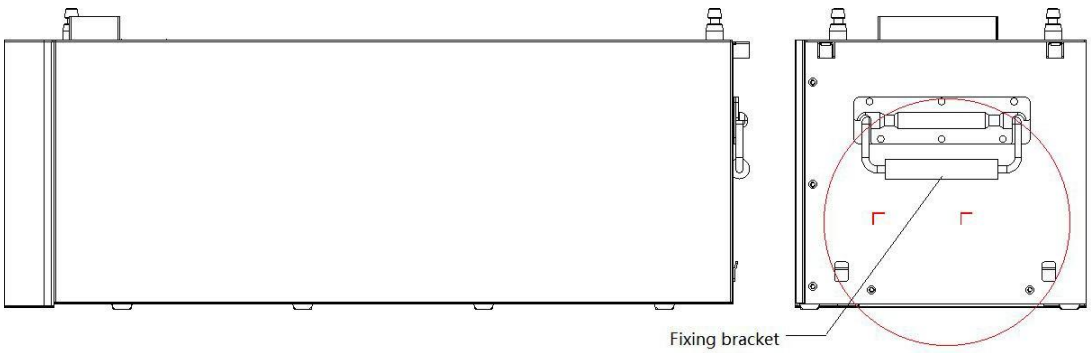




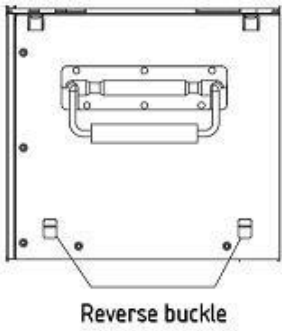
6) Turn up the power switch, then turn right the Active switch, turn on the Controller switch, and observe that the display screen has no alarm protection status,the number of battery modules has no loss and flicker, and the system parameters and status display are normal, finally turn the activation switch back on.

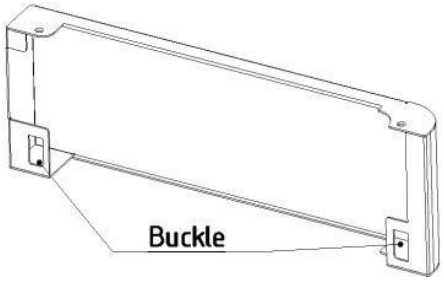


7) Assemble the fixing brackets for the battery module accessories into a long strip and mount them in the middle of the left-hand side of the system.

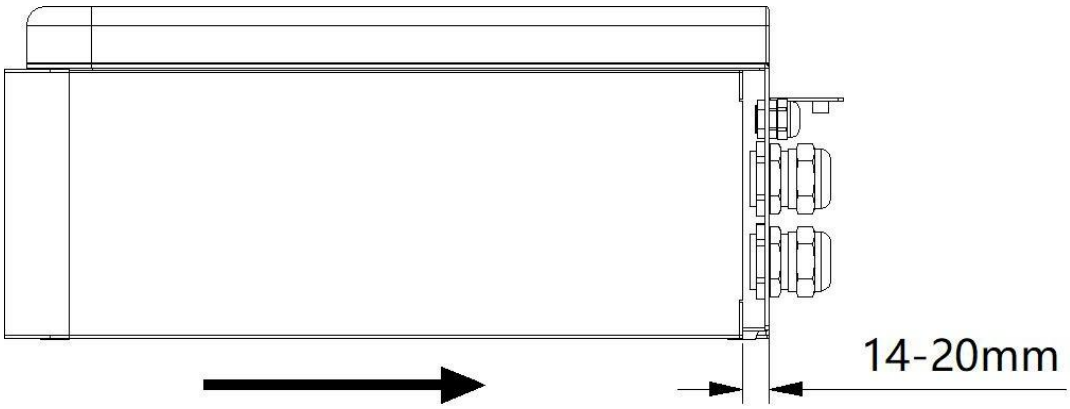


8)After normal operation, the system protection side plate shall be installed on the battery module and the main control device to prevent scratches and bumps inside the battery Connect and fix the barbs at both ends of the battery module with the snap of the protective side plate





9)Install the protective side plate and fix the screws, the right side of the main control board shall be 14~20mm away from the side of the main control box and put the side plate to the right against the box until it is closed. Finally, completing the installation of the main control side plate.



NOTE:

- *Before starting the system, the operator should strictly check the connection terminal to ensure that the terminal is firmly connected, check whether the battery address is set correctly, and whether the inverter switches are in the off state. Do a good job in safety protection and turn on the inverter in the following order, when installing the system, the battery module bottom insulation skin remove the lower connector of the battery module is covered by a PC piece, which should be torn off before installation.*

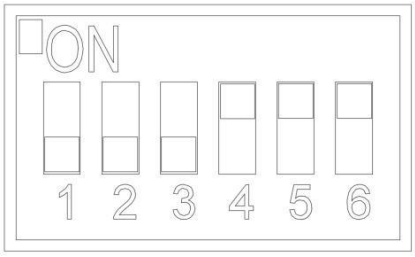
Note: after installation, please do not forget to contact the supplier to register online for full warranty

NOTE:

- *In order to avoid current pulse during start-up, predischarge function should be added to high voltage system. All connected batteries should be turned on first, and then the circuit breaker between high voltage system and inverter should be turned on.*
- *Circuit breaker shall be installed between high voltage system and inverter to protect system safety.*
- *All installation and operation must comply with local electrical standards.*

7. Wi-Fi Configuration

1) Screw the antenna into the antenna connection port firmly before Wi-Fi configuration.
2) Set the inverter dip switch of the battery to 56 to enable battery WI-FI.



3) Download and install ZRGP APP from Google or Apple Store by searching Z-Cloud.

Figure 7.1. Install the APP

4) You may acquire the Register Code from your installer for new account registration. If you already had an account, you may use it to login the APP directly otherwise you need to create an account.

Figure 7.2. Start the APP & Create an account & Sign in

5) Turn to the page ‘ToolBox’ then click the Network, following by the instruction of network setting for WIFI configuration.

Figure 7.3. Network Setting

6) Connect your mobile phone to the WI-FI hotspot from the master controller which SSID is same as controller's serial number (SN) and the password is 12345678. Make sure this connection is successful by checking whether Wi-Fi symbol on screen shine periodicity or not.

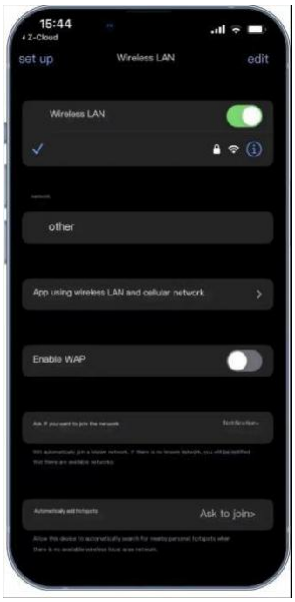


Figure 7.4. Network Setting

7) Enter the SSID and password of your private WI-FI for connecting master controller to your private WI-FI. Make sure the Wi-Fi symbol on screen will shine constantly.

Figure 7.5. Connecting Private Wi-Fi

8) Ask your installer to assign all your products to your account.

9) Turn to main page of the APP, create a plant, and set a recognizable name, your email and address for it.

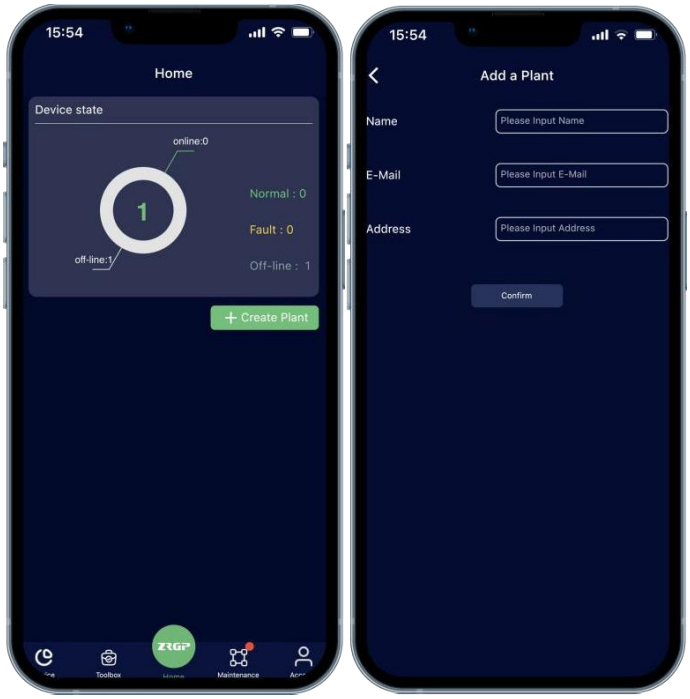


Figure 7.6. Create A New Plant

10) Click the confirm button to create your plant and all your products will show up as their SN, select proper products and confirm.

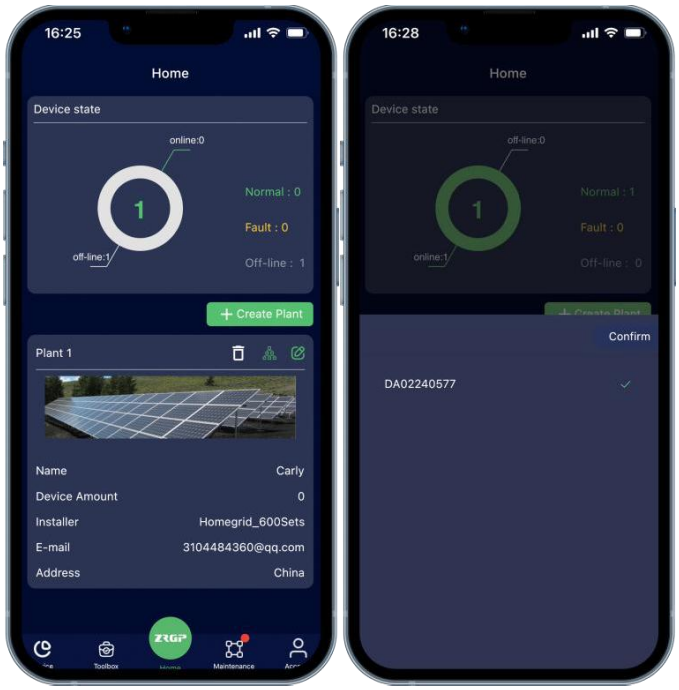


Figure 7.7. Manage Your Plant & Confirm Your Products

11) Now you can manage your products in the APP, and you can also manage them in Website, ask your installer for the site URL.

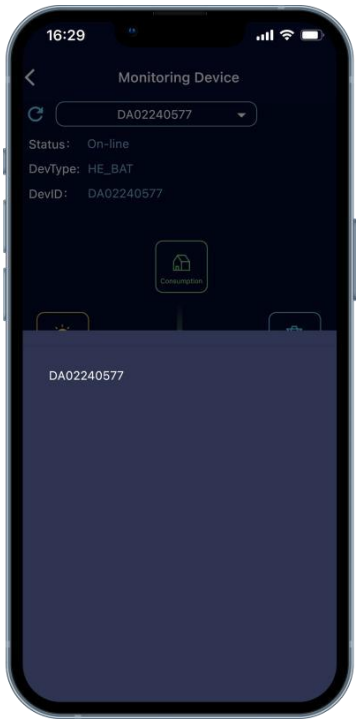


Figure 7.8. Manage Your Products

12) After the product is connected to Wi-Fi, the running status, real-time power, daily power consumption and cumulative power of the product can be monitored in real time on the network platform or mobile APP. It can also be used to configure parameters.

Figure 7.9. Monitoring Device

8.Trouble Shooting Steps

8.1. Problem Determination Based On

1) Whether the system can be opened.

2) If the system is turned on, check whether the display is on.

3) If the display goes off, check whether the system can be charged / discharged.

8.2. Preliminary Determination Steps

1) The system cannot be turned on and the system display is not illuminated. If the external switch of the system is turned on and the external power supply voltage exceeds 384V (4 stacked modules), the system still cannot be started and operated, please contact the dealer.

2) The system can be turned on, but the display shows a fault and cannot be charged or discharged. If the red light is on, it indicates that the system is abnormal. Please check the following values:

a) Temperature: Above 50℃ or under -20℃ , the system could not work in discharging.

Above 50℃ or under 0℃ , the system could not work in charging.

b) Current: If current is greater than 50A, battery protection will turn on.

Solution: Check whether current is too large or not, if it is, to change the settings on power Supply side.

c) High Voltage: If charging voltage above 438V (4 stacked modules), battery protection will turn on.

Solution: Check whether voltage is too high or not, if it is, to change the settings on power supply side.

d) Low Voltage: When the battery discharges to 351.6V(4 stacked modules) or less, battery protection will turn on.

Solution: Charge the battery for some time.

Excluding the four points above, turn off battery and repair.

8.3. The Battery Cannot Be Charged or Discharged

1) Cannot be charged:

Disconnect the power cables, measure voltage on power side, if the voltage is 424~432V (4 stacked modules) restart the battery, connect the power cable and try again, if still not work, turn off battery and contact distributor .

2) Unable to discharge:

Disconnect the power cables and measure voltage on battery side, if it is under 352V (4 stacked modules) please charge the battery; if voltage is above 384V and still cannot discharge, turn off battery and contact distributor.

9. Storage, Transportation and Emergency Situations

9.1. Storage

Recharge and maintain the battery pack regularly every three months to ensure the battery is in the best condition.

Don't store the battery at 0% SOC for over one month, this may result in permanent damage to the battery and violet the warranty.

9.2. Transportation

Battery packs need to be packed before they can be shipped, during transportation, severe impact, extrusion, direct sunlight, and rain should be protected.

9.3. Emergency Situations

1). Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below. Inhalation: Evacuate the contaminated area and seek medical attention.

Contact with eyes: Rinse eyes with flowing water for 15 minutes and seek medical attention.

Contact with skin: Wash the affected area thoroughly with soap and water and seek medical attention.

Ingestion: Induce vomiting and seek medical attention.

2). Fire
NO WATER! Only dry powder fire extinguisher can be used; if possible, move the battery pack to a safe area before it catches fire.

3). Wet Batteries

If the battery pack is wet or submerged in water, do not allow any person access, and then contact an authorized dealer for technical support.

4). Damaged Batteries

Damaged batteries are dangerous and must be handled with extreme care. They are not suitable for use and may cause danger to persons or property. If the battery pack appears to be damaged, place it in the original container and return it to an authorized dealer.

NOTE:

- Damaged batteries may leak electrolyte or produce flammable gas.

- In case a damaged battery needs recycling, it shall follow the local recycling regulation to process, and using the best available techniques to achieve a relevant recycling efficiency.

Our Energy Works For You

Website

Linkedin

www.zruipower.com support@zruipower.com +86(0755)2833 9703

ADD:Rm B0302, Building 1, Skyworth Maker World Science Park, No. 12, Gaoke Avenue, Baolong Street, Longgang District, Shenzhen