

# User Manual

## HINAESS C14



**140A**  
Continuous Current

**10**  
Year Warranty

**280**  
Ah

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## Statement of Law

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This product complies with the design requirements of environmental protection and personal safety. The storage, use and disposal of the products shall be carried out in accordance with the product manual, relevant contract or relevant laws and regulations.

Customer can check the related information on the website of HINAESS TECH CO.,LTD when the product or technology is updated.

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Please note that the product can be modified without prior notice.

### Revision History

Revision NO.	Revision Date	Revision Reason
1.0	2024.1.1	First Published

## Safety Precautions



### Warning

- Please do not put the battery into water or fire, in case of explosion or any other situation that might endanger your life.
- Please connect wires properly while installation, do not reverse connect.
- To avoid short circuit, please do not connect positive and negative poles with conductor on the same device.
- Please avoid any form of damage to battery, especially stab, hit, trample or strike.
- Please shut off the power completely when removing the device or reconnecting wires during the daily use or it could cause the danger of electric shock.
- Please use dry powder extinguisher to put out the flame when encountering a fire hazard, liquid extinguisher could result in the risk of explosion.
- For your safety, please do not arbitrarily dismantle any component in any circumstances. The maintenance must be implemented by authorized technical personnel or our company's technical support. Device breakdown due to unauthorized operation will not be covered under warranty.



### Caution

- Our products have been strictly inspected before shipment. Please contact us if you find any abnormal phenomena such as unable to turn on.
- Please ground the product correctly before use to ensure your safety.
- In order for the product to be used correctly, please ensure that the relevant equipment is compatible and matched, and the parameters are set correctly.
- Please do not mix batteries from different manufacturers, different types and models, as well as old and new.
- The environment and storage method may affect the life of the product, please follow the user manual to ensure the normal operation of the device.
- For long-term storage, the battery should be recharged once every 6 months, to make SOC get to 50%.
- Please recharge the battery in 24 hours after it is fully discharged or over-discharge protection is activated.
- Formula of theoretical standby time:  $T=C/I$  (T is standby time(h), C is battery capacity(Ah), I is total current on the battery(A)).

# Preface

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## **Manual declaration**

Rack C14 battery energy storage system can provide energy to users through series combination in one cluster. And it can not be paralleled to use in one cluster, multiple clusters can be paralleled.

This user manual details the basic structure, parameters, basic procedures and methods of installation and operation and maintenance of the equipment.

# 1 Introduction

## 1.1 Brief Introduction

C14 battery system is a high voltage battery system unit, customers can choose a certain number of C14 according to their needs and PCS voltage range, by connecting series to make a RACK system, to meet the your long-term power supply needs. The product is especially suitable for application scene of big power, limited installation space, long power backup time and long service life.

## 1.2 Product Properties

C14 energy storage product's positive electrode materials are lithium iron phosphate, battery cells are managed effectively by BMS with better performance, the system's features as below:

- Comply with European ROHS and CE, employ non-toxic, non-pollution environment-friendly battery.
- Anode materials are lithium iron phosphate (LiFePO4), safer with longer life span.
- Carries battery management system with better performance, possesses protection function like over-discharge, over-charge, over-current, abnormal temperature.
- Self-management on charging and discharging, balancing function.
- Flexible remote upgrade and remote monitor.
- Flexible configurations allow parallel of multi clusters for longer standby time.
- Self-ventilation with lower system noise.
- Short circuit and reverse connection protection.
- Less battery self-discharge, then recharging period can be up to 10 months during the storage.
- No memory effect so that battery can be charged and discharged shallowly.
- The working environment temperature range is wide, -20°C~+55°C, and the cycle performance is good at high temperature.
- Touched LCD to monitor and setup locally.

## 1.3 Product identity definition

Battery Energy Storage System nameplate



Figure1-1 nameplate of C14

	<p>Battery voltage is higher than safe voltage, direct contact with electric shock hazard.</p>
	<p>Caution fire.</p>
	<p>Flammable and Explosive.</p>
	<p>The scrapped battery cannot be put into the garbage can and must be professionally recycled</p>
	<p>Read the user manual before using.</p>
	<p>If catch fire, do not put out with water.</p>
	<p>Do not place near open flame or incinerate.</p>
	<p>Keep away from children.</p>
	<p>After the battery life is terminated, the battery can continue to be used after it recycled by the professional recycling organization and do not discard it at will.</p>
	<p>This battery product meets European directive requirements.</p>

## 2 Product Specification

### 2.1 System Performance Parameter

Table 2-1 The parameter of RACK C14 system(2 Stacks 6 Slots&2 Stacks 8 Slots)

Rack 2 Stacks 6 Slots/ 1Cluser	Battery Rack Configuration	1P7S	1P8S	1P9S	1P10S	1P11S
	Configuration	7 Module + 1BCU +1BAU	8 Module + 1BCU +1BAU	7 Module + 1BCU +1BAU	7 Module + 1BCU+1BAU	7 Module + 1BCU+1BAU
	Rated energy (kWh)	100.352	114.688	129.024	143.36	157.696
	Rated voltage (V)	358.4	409.6	460.8	512	563.2
	Voltage range (V)	324.8-397.6V	371.2-454.4	417.6-511.2V	464-568	510.4-624.8
	Rated charge/ discharge (A)	140				
	Display	7" Touch screen				
	BMS	Included BAU&BCU&BMU				
	EMS	Remote monitor and control on server				
	Default Comm to PCS	CAN				
	Monitoring	CAN				
	Dimension (W/D/H)	1048*748*1613mm				
	Weight (Kg)	890	1000	1110	1215	1325
	Protection level	IP20				
Rack 2 Stacks 8 Slots/ 1Cluser	Battery Rack Configuration	1P12S	1P13S	1P14S	1P15S	
	Configuration	12 Module + 1BCU +1BAU	13 Module + 1BCU +1BAU	14 Module + 1BCU +1BAU	15 Module + 1BCU+1BAU	
	Rated energy (kWh)	172.032	186.368	200.704	215.04	
	Rated voltage (V)	614.4	665.6	716.8	768	
	Voltage range (V)	556.8-681.6	603.2-738.4	649.6-795.2	696-852	
	Rated charge/ discharge (A)	140				
	Display	7" Touch screen				
	BMS	Included BAU&BCU&BMU				
	EMS	Remote monitor and control on server				
	Default Comm to PCS	CAN				
	Monitoring	CAN				
	Dimension (W/D/H)	1048*748*2105mm				

	Weight (Kg)	1500	1605kg	1725kg	1850kg
	Protection level	IP20			
LCD Display	System&Cells detail datas	Yes			
	Wifi configuration for EMS	Yes			
	Real-time monitoring	Yes			
	Protocols select	Yes			
	Parameters setting	Yes			
	Outside device setup	Yes			
	BCU address setup	Yes			
	Fault warning	Yes			

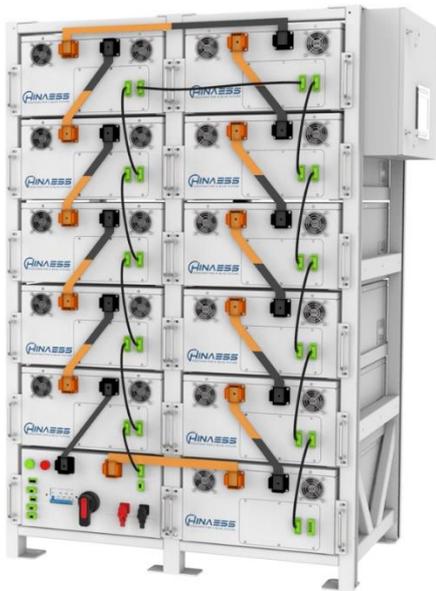


Figure2-1 RACK with 2 Stacks 6 Slots

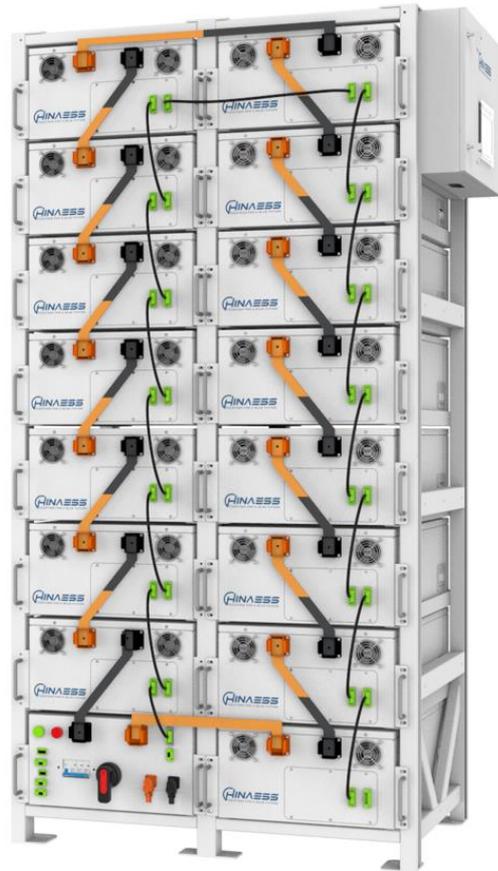


Figure2-2 RACK with 2 Stacks 8 Slots

## 2.2 Battery Module

Table 2-2 The parameter of C14 module

Battery Module C14	Rated voltage	51.2V
	Voltage range	44.8-56.8V
	Rated capacity	280Ah
	Rated energy	14.336kWh
	AC internal resistance	<5mΩ
	Dimension(W/D/H)	504*781*236mm
	Weight	108Kg

## 2.3 Interface Definition

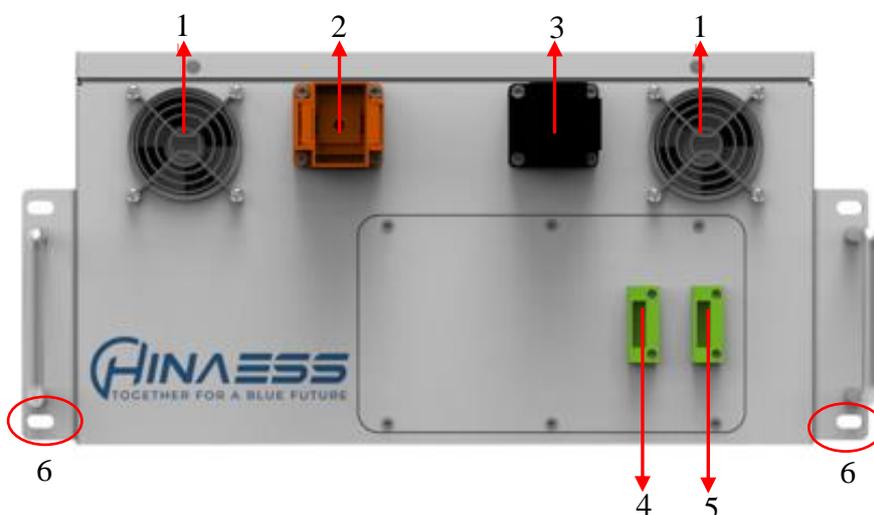


Figure2-3 The C14 module interface.

Table 2-3 Interface Definition

Item	Name	Definition
1	Fan	Fan*2
2	Positive terminal	Battery output positive side
3	Negative terminal	Battery output negative side
4	Comm BMU 1	Communicate to BMU or BCU
5	Comm BMU 2	Communicate to BMU
6	Grounding	⊕ Shell ground connection



Figure2-4 The interface of BCU BOX.

Table 2-4 Interface Definition

Item	Name	Definition
1	RUN	System normal run indicator
2	ALM	System alarm indicator
3	B-	Connect to battery module Negative side
4	B+	Connect to battery module Positive side
5	BMU	BCU-BMU comm port
6	BMS TOOL	Connect to use BMS TOOL to read system on laptop
7	AC Wake	Use a 220V AC power to turn on system,can work with DC Wake at the same time,AC will be priority to supply power
8	PCS CAN	When there is no BAU BOX,only one cluster and only BCU BOX,you can connect and communicate to PCS via this CAN port directly.
9	DC 24V	24Vdc output port,connect and supply power to BAU BOX
10	COM1 BAU CAN	Communicate to BAU CAN,or communicate to next cluster COM2 or COM1 when parallel multi clusters
11	COM2	Same to COM1
12	DC Wake	Switch on the system,power is from battery module
13	POWER	Switch on to make battery system output power.
14	P+	Battery system positive output terminal
15	P-	Battery system negative output terminal
16	Grounding	⊕ Shell ground connection

### 2.3.1 Communication port

Figure 2-5 COMM BMU1 and BMU2 on module interface definition



Table 2-5 Pin Definition

BMU1	Definition
PIN1	DC 24V+
PIN2	ADDR
PIN3	CANL
PIN4	CANH
PIN5	DC 24V-

BMU2	Definition
PIN1	DC 24V+
PIN2	ADDT
PIN3	CANL
PIN4	CANH
PIN5	DC 24V-

Figure 2-6 All ports on HV BCU BOX interface definition

	<table border="1"> <thead> <tr> <th>BMU</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>PIN1</td> <td>DC 24V+</td> </tr> <tr> <td>PIN2</td> <td>\</td> </tr> <tr> <td>PIN3</td> <td>CANL</td> </tr> <tr> <td>PIN4</td> <td>CANH</td> </tr> <tr> <td>PIN5</td> <td>DC 24V-</td> </tr> </tbody> </table>	BMU	Definition	PIN1	DC 24V+	PIN2	\	PIN3	CANL	PIN4	CANH	PIN5	DC 24V-		<table border="1"> <thead> <tr> <th>AC Wake</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>PIN1</td> <td>L</td> </tr> <tr> <td>PIN2</td> <td>GND</td> </tr> <tr> <td>PIN3</td> <td>N</td> </tr> </tbody> </table>	AC Wake	Definition	PIN1	L	PIN2	GND	PIN3	N
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PIN2	BAU CAN L																						

## 2.4 Battery Management System(BMS)

### 2.4.1 Voltage Protection

**Low Voltage Protection in Discharging :**

When battery Min.cell voltage or total voltage is lower than the rated protection value, the low voltage protection will be activated, and relay will in BCU BOX will cut off. Then battery system will cut off output and red alarm light will be on. When the voltage recover to rated value,relay will close again to output.

**Over Voltage Protection in Charging:**

When battery Max.cell voltage or total voltage is higher than the rated protection value, the high voltage protection will be activated, and relay will in BCU BOX will cut off. Then battery system will cut off output and red alarm light will be on. When the voltage recover to rated value,relay will close again to output.

## 2.4.2 Current Protection

### Over Current Protection in Charging:

When the charge current > 168A, over charge protection will be activated to stop charging, protection will be removed after delaying 30S and current is lower than 154A.

### Over Current Protection in Discharging:

When the discharge current > 168A, over discharge protection will be activated to stop discharging, protection will be removed after delaying 30S and current is lower than 154A.

## 2.4.3 Temperature Protection

### Low/Over temperature protection in charging:

When battery's temperature is beyond range of 0°C~+55°C during charging, temperature protection will be activated to cut off relay and stop charging.

The protection will be off when temperature is back to rated range.

### Low/Over temperature protection in discharging:

When battery's temperature is beyond range of -20 °C ~+55 °C during discharging, temperature protection will be activated to cut off relay and stop discharging.

The protection will be off when temperature is back to rated range.



### Caution

Battery system's work voltage should be in the range of inverter rated battery voltage.

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# 3 Installation and Configuration

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## 3.1 Environmental Requirement

### 3.1.1 Cleanliness

It will be better to keep a clean environment before installing system. Dust and humidity condition shall be regularly checked during the system continuous running.

### 3.1.2 Temperature

C14 system working temperature range: 0°C~55°C; Optimum temperature: 25°C;

**Caution:** Out of the working temperature range will cause the battery system over / low temperature alarm or protection and also make effect on the battery's cycle life.

### 3.1.3 Cooling System

It is better to equip a cooling system to keep the battery system work in a relevant temperature range.

### 3.1.4 Heating System

It is better to equip a heating system to keep the battery system work in a relevant temperature range. If the cells temp is lower than 0°C, the system will not allow to be charged.

### 3.1.5 Fire Extinguishing System

The site must be equipped with Fire Extinguishing system for safety purpose. The Fire Extinguishing system needs to be regularly checked to make sure it is normal .

### 3.1.6 Grounding System

Make sure the grounding point for battery system is stable and reliable before installing.

### 3.2 TOOLS

The following tools are required to install the battery pack: Table 3-1

 wire stripping pliers	 Diagonal pliers	 Cable crimper with crystal head
 Phillips screwdriver	 Torque wrench set	 multimeter
 Laptop	 USB-CAN analysis card	 CAT5 network cable

**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 with available insulated alternatives, except their tip, with electrical tape.

### 3.3 Safety Gear

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



Insulated gloves



Safety goggles



Safety shoes

### 3.4 Unpacking inspection

- When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, to prevent from being exposed to sun and rain.
- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and the case shall be checked for good condition.
- In the process of unpacking, handle with care and protect the surface coating of the object.
- Open the package, the installation personnel should read the technical documents, verify the list, according to the configuration table and packing list, ensure objects are complete and intact, if the internal packing is damaged, should be examined and recorded in detail.

Packing list of C14 1P15S(215kWh) IP20 RACK system is as follow:

Item	Specification	Quantity	Figure
Battery-C14	51.2/280Ah	15 PCS	
BCU BOX	HV Control box for one cluster	1 PCS	
RACK	2 columns 8 slots. Whole rack OR Flexible bracket	1 PCS	
Power cable-Positive, BAT BCU BOX-PCS	Orange/50mm <sup>2</sup> /L5000mm	1 PCS	
Power cable-Negative, BAT BCU BOX-PCS	Black/50mm <sup>2</sup> /L5000mm	1 PCS	
Module-Module copper bar in series	L=270mm	10 PCS	
Module-Module copper bar in series (Long)	L=657mm	1 PCS	
BCU-Module Positive copper bar, for odd quantity modules	L=390mm	1 PCS	
BCU-Module Negative copper bar	L=270mm	1 PCS	
Module-Module Comm cable 1	L=300mm	10 PCS	
Module-Module Comm cable 2	L=550mm	1 PCS	
Module-BCU comm cable	L=195mm	1 PCS	
BCU-BAU comm&power cable	L=2800mm,with 24V power cable	1 PCS	

Item	Specification	Quantity	Figure
AC Wake power cable	Black,3*1.5mm <sup>2</sup> , L=5000mm	1 PCS	
BCU-BCU Comm cable in parallel	When parallel clusters to use	1 PCS	
Screw 1	Hex socket combination screws,M8*20mm	34 PCS	
Screw 2	Hex socket combination screws,M6*20mm	64 PCS	
120 Ω CAN terminal resister	5P plug, plug into the last BMU 2	1 PCS	
120 Ω CAN terminal resister	2P plug, when parallel to use,plug into the last COM1 or COM2	1 PCS	
PCS CAN comm 2P plug on BCU BOX	Only to use when without BAU,prepare a comm cable on it,then BCU communicate to PCS directly	1 PCS	
BAU box	Include BAU,EMS,LCD		
BAU-PCS CAN comm cable	L=2000mm		
CAN analysis tool	Read BMS TOOL on laptop		
User Manual	C14 User manual	1	

## 3.5 Equipment installation

Table 3-2 Installation steps

<b>Step1</b>	Installation preparation	<ol style="list-style-type: none"> <li>1. The environment should be as requirements: "3.1.1~3.1.6"</li> </ol>
<b>Step 2</b>	Module Installation	<ol style="list-style-type: none"> <li>1. Confirm the placement</li> </ol>
		<ol style="list-style-type: none"> <li>2. Place the RACK and fix on the ground</li> </ol>
		<ol style="list-style-type: none"> <li>3. Measure the modules' output voltage</li> </ol>
		<ol style="list-style-type: none"> <li>4. Insert battery modules into the rack one by one</li> </ol>
		<ol style="list-style-type: none"> <li>5. Insert the BCU BOX into the rack</li> </ol>
<b>Step3</b>	Cable Connection	<ol style="list-style-type: none"> <li>6. Attach the BAU BOX to the top of the RACK side</li> </ol>
		<ol style="list-style-type: none"> <li>1. Connect grounding cable Between BCU BOX and modules and RACK</li> </ol>
		<ol style="list-style-type: none"> <li>2. Connect the bar between modules in series one by one</li> </ol>
		<ol style="list-style-type: none"> <li>3. Measure the total voltage of the modules in series after power bar being connected</li> </ol>
		<ol style="list-style-type: none"> <li>4. Check and confirm the BCU BOX's DC Wake breaker and Power handle is at OFF state.</li> </ol>
		<ol style="list-style-type: none"> <li>5. Connect the bar from the first module negative to BCU BOX negative;From the last module positive to BCU BOX positive.</li> </ol>
		<ol style="list-style-type: none"> <li>6. Connect the module-module comm cable between all modules</li> </ol>
		<ol style="list-style-type: none"> <li>7. Plug 120Ω CAN terminal into the last module's BMU2 port.</li> </ol>
		<ol style="list-style-type: none"> <li>8. Connect the Module-BCU comm cable</li> </ol>
<b>Step4</b>	Battery system self-check	<ol style="list-style-type: none"> <li>9. Connect the BCU-BAU comm&amp;power cable from BCU BOX to BAU CAN H&amp;L,and 24V+&amp;24V-.</li> </ol>
		<ol style="list-style-type: none"> <li>1. Switch on the POWER handle and DC Wake breaker of BCU BOX</li> </ol>
		<ol style="list-style-type: none"> <li>2. Wait some seconds to make system do self check</li> </ol>
		<ol style="list-style-type: none"> <li>3. RUN light on the BCU BOX will be green on if system is normally powered on after self check</li> </ol>
		<ol style="list-style-type: none"> <li>4. Check the system output voltage on the BCU BOX P+&amp;P-</li> </ol>
<b>Step5</b>		<ol style="list-style-type: none"> <li>5. Switch off DC Wake breaker and Power handle</li> </ol>
		<ol style="list-style-type: none"> <li>1. Connect Power Cable from P+&amp;P-to the inverter</li> </ol>

	Connect to Inverter	2. Connect the communication cable from the BAU CAN H&L to the inverter CAN H&L
Step6	Setup LCD	1. Enter LCD and login User 2,password:CJ123
		2. Select correct PCS CAN protocol
		3. Check and setup cluster address for every BCU,if only one cluser,it should be address 1.
Step7	Setup EMS	1. Configure the WIFI connection on the LCD
		2. Or you can directly plug a network cable to EMS WLAN port
		3. Station registration and web monitoring, etc., consult battery after-sales support engineers for details

### 3.5.1 Engineering coordination

Attention should be paid to the following items before construction:

- Power line specification.  
The power line specification shall meet the requirements of maximum discharge current for each product.
- Mounting space and bearing capacity.  
Make sure that the battery has enough room to install, and that the battery rack and bracket have enough load capacity.
- Wiring.  
Make sure the power line and ground wire are reasonable. Not easy to short-circuit, water and corrosion.

### 3.5.2 Installation preparation

1. Make sure the environment is meeting all technical requirements: “3.1”
2. Prepare equipment and tools for installation.
3. Confirm that the DC breaker and power handle are in the OFF state.

### 3.5.3 Mechanical installation

Installation method:

1. Place RACK and bolt to ground. The RACK has a fixed block on the back, which is used to keep the RACK at a certain distance from the wall

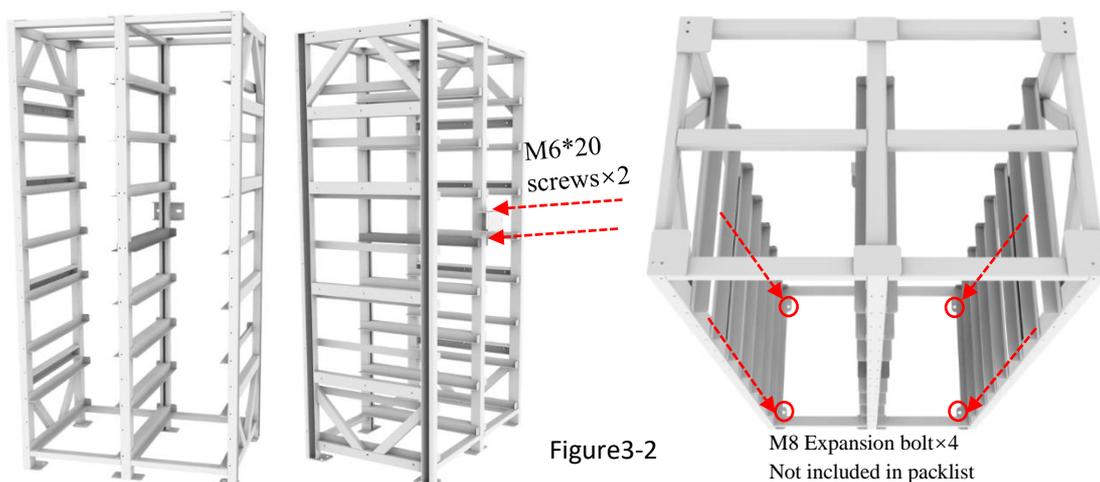


Figure3-2

2. Check and confirm the modules' voltage is good. Insert BCU BOX and modules into slots one by one.
3. Attach the BAU BOX to the top of the RACK side.



Figure3-3

4. Connect grounding cable Between BCU BOX and modules and RACK
5. Connect the bar between modules in series one by one
6. Measure the total voltage of the modules in series after power bar being connected
7. Check and confirm the BCU BOX's DC Wake breaker and Power handle is at OFF state.

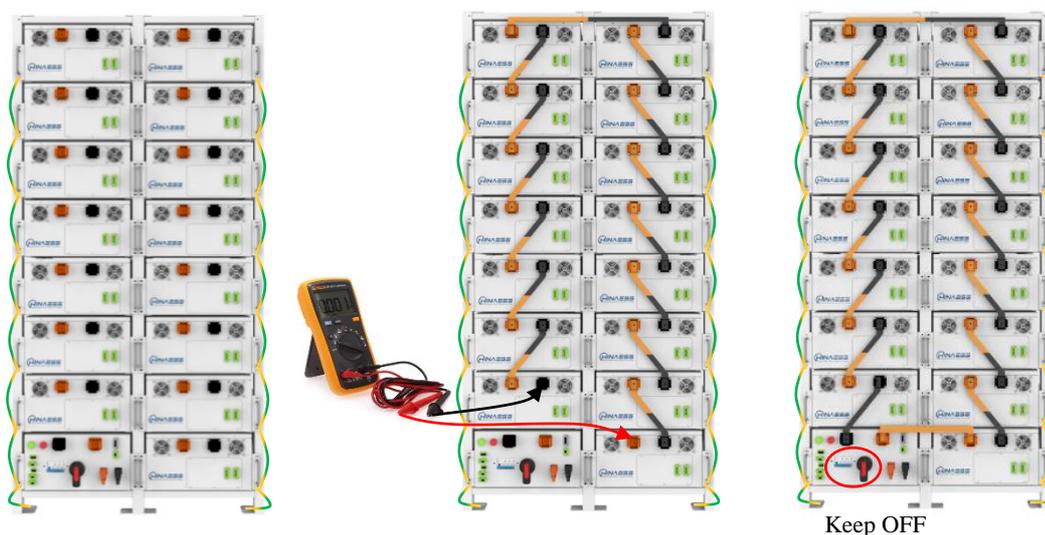
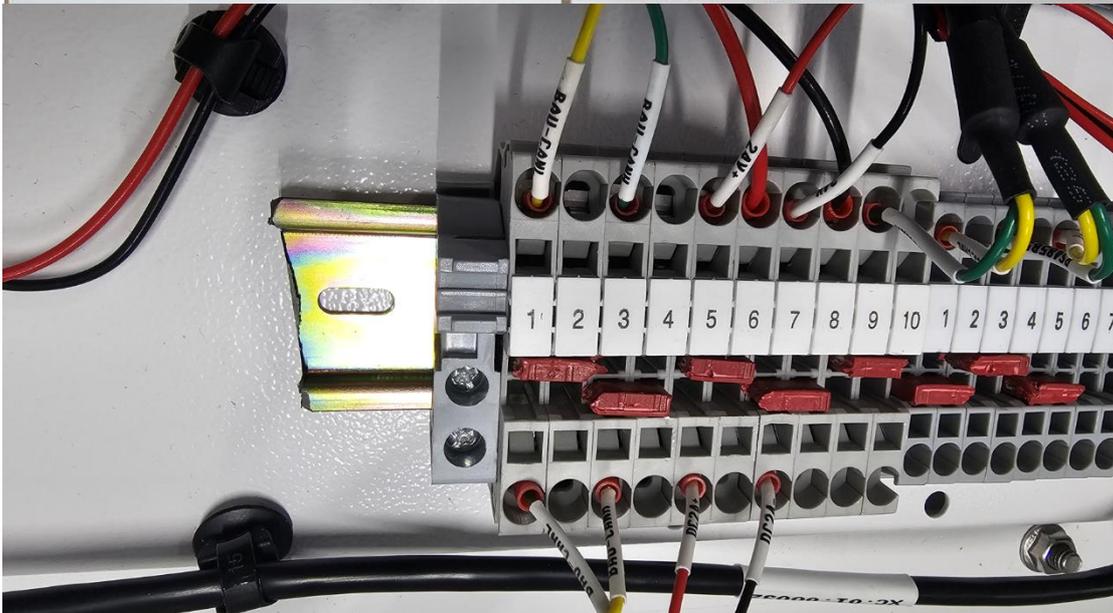
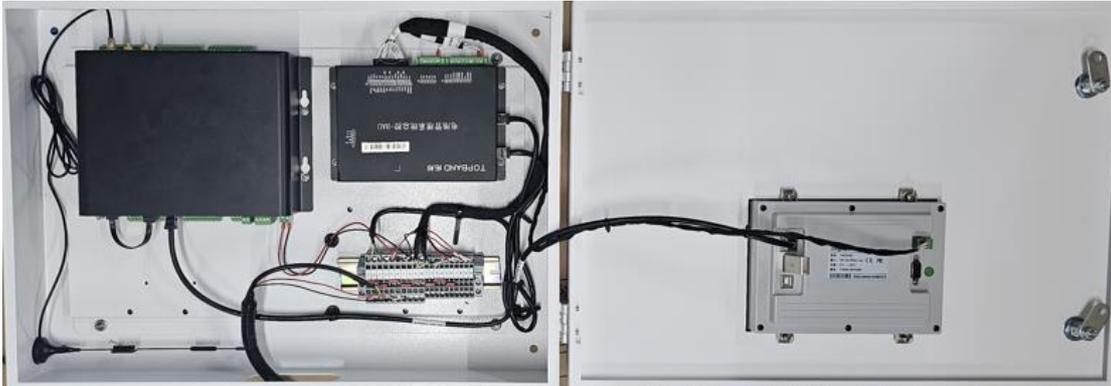
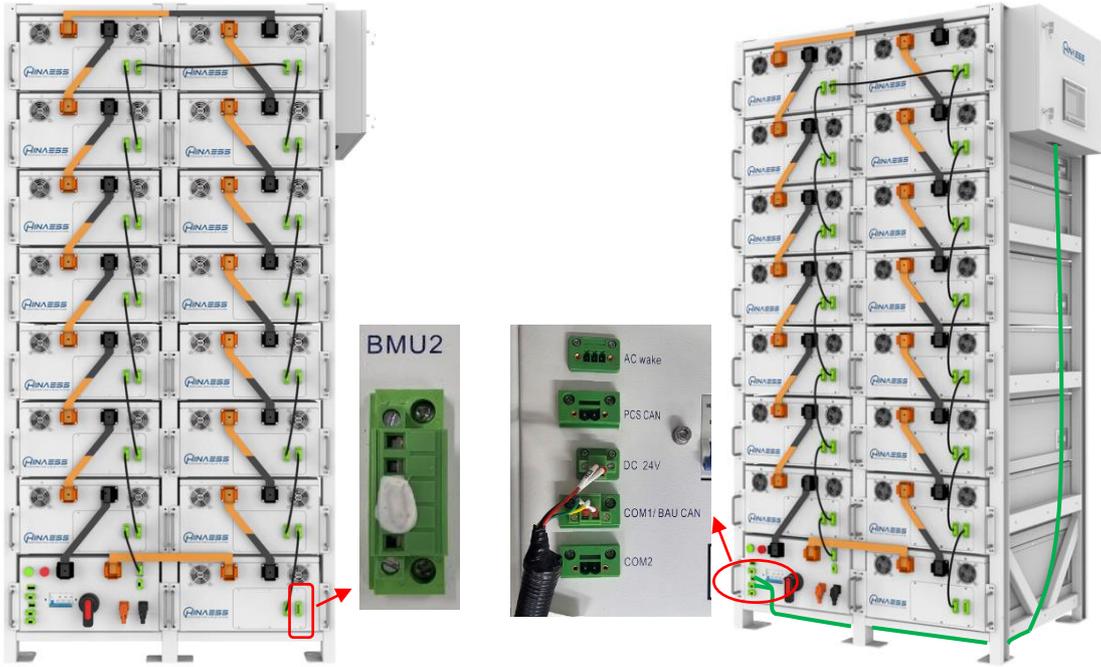


Figure3-4

8. Connect the module-module comm cable between all modules
9. Plug 120 Ω CAN terminal into the last module's BMU2 port.
10. Connect the Module-BCU comm cable
11. Connect the BCU-BAU comm&power cable from BCU BOX to BAU CAN H&L, and 24V+&24V-.



BAU CAN H ←→ BAU CAN H      24V+ ←→ 24V+

BAU CAN L ←→ BAU CAN L      24V- ←→ 24V-

12. Switch on the POWER handle and DC Wake breaker of BCU BOX to power on system  
Waiting for some minutes system will finish the self check ,and it will be green light on if everything is well.



13. Switch off DC Wake breaker and Power handle



### 3.5.4 System connect to inverter and Setup

1. Connect Power Cable from P+&P-to the inverter
2. Connect the communication cable from the BAU CAN H&L to the inverter CAN H&L

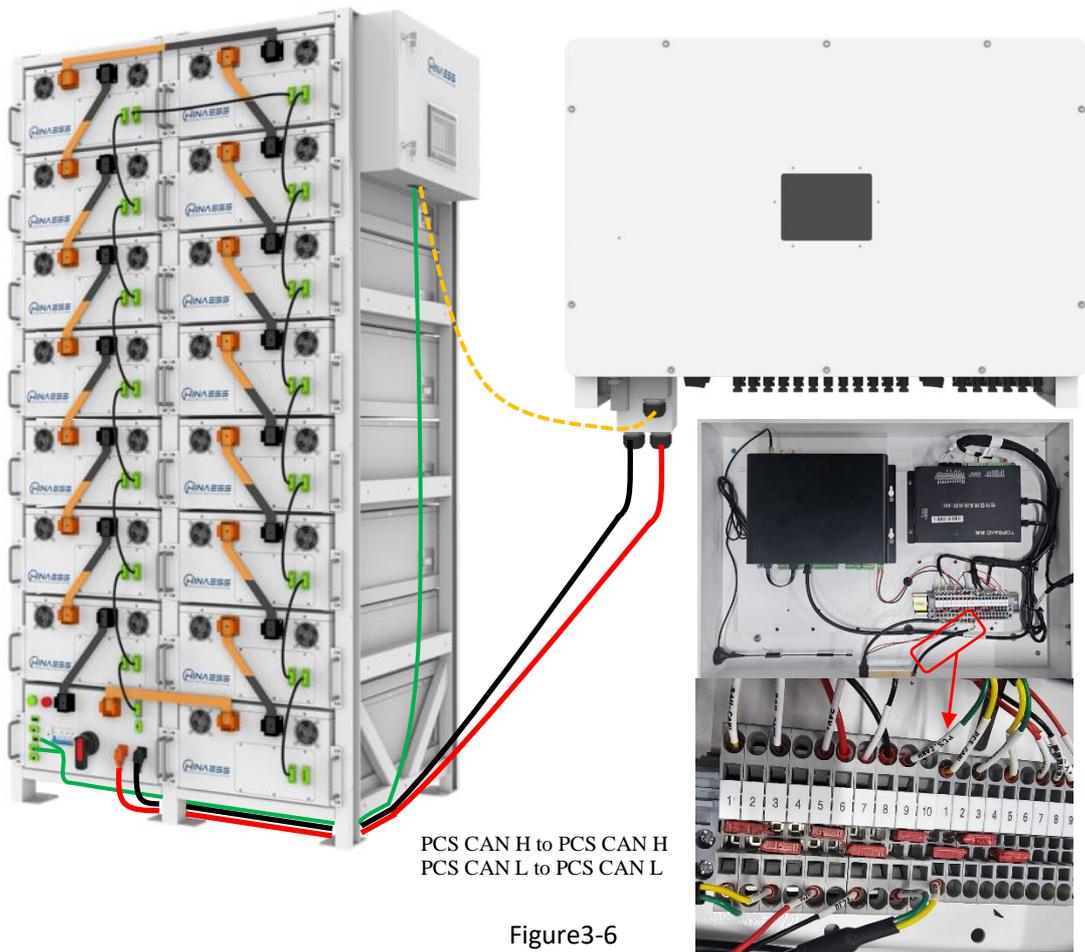
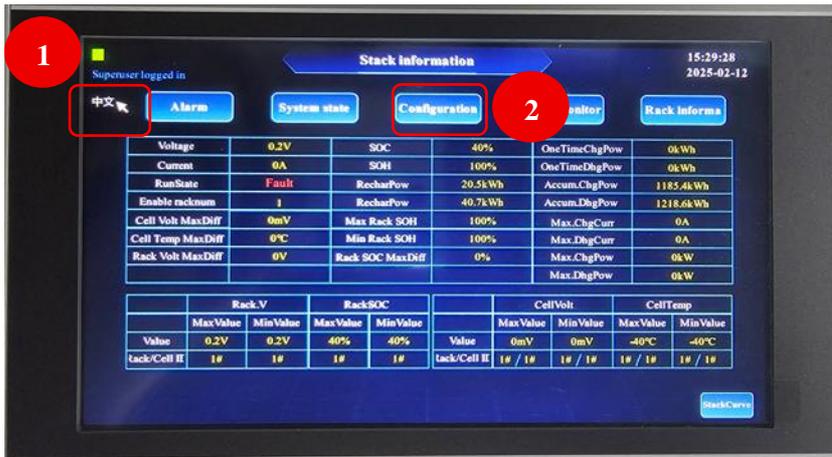
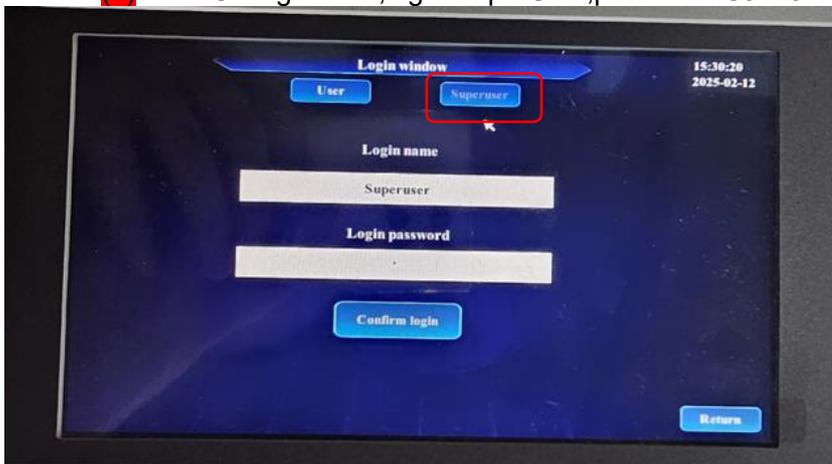


Figure3-6

3. (1) Enter LCD, change language to English



(2) Enter Configuration, login SuperUser, password: CJ123

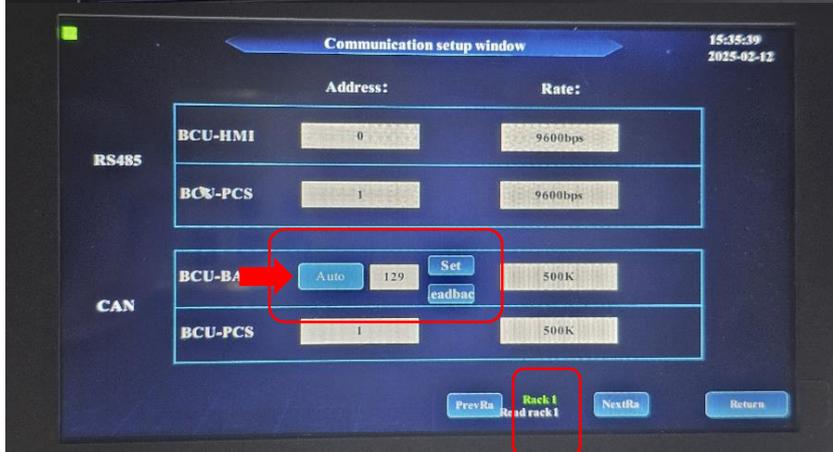
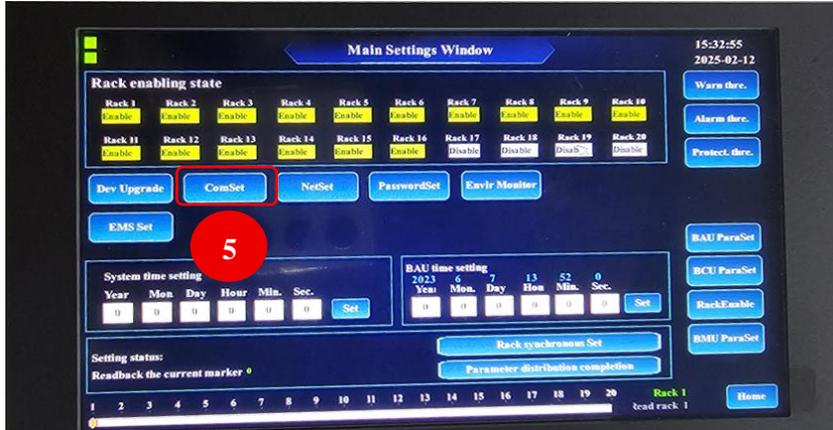
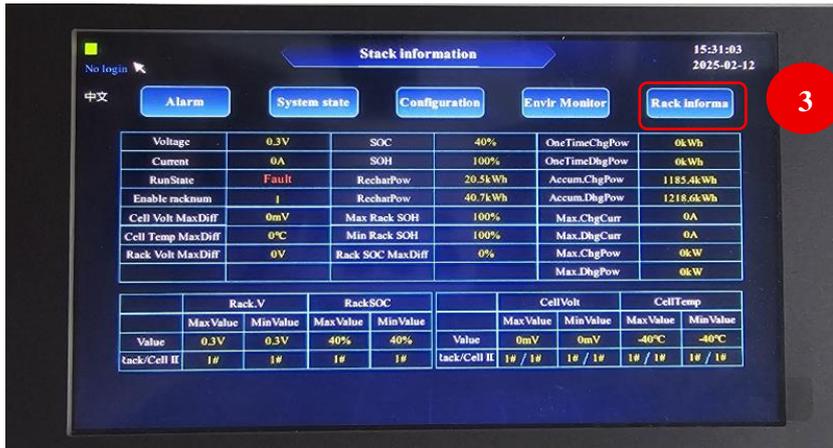


4. (1) Click to "Enable" all the RACKs, (2) then back to "HOME", (3) enter "RACK Informa", (4) look for which rack has datas, (5) you can remember number and change its address in "ComSet".

5. Do Step 4 operation one by one for all clusters in system individually.

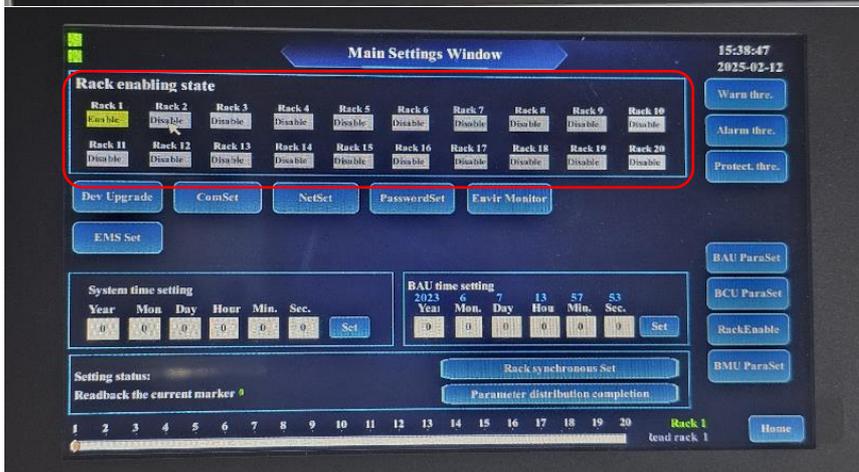
**Note:** because all the BCU boxes' address are different settings before sending in factory, so your BCU BOX address is random from 1~20, when you only have one cluster to use, it's better to setup address to 1, if you have two clusters in parallel, it's better to setup them to be 1 and 2 individually. If more clusters, you can do that one by one.



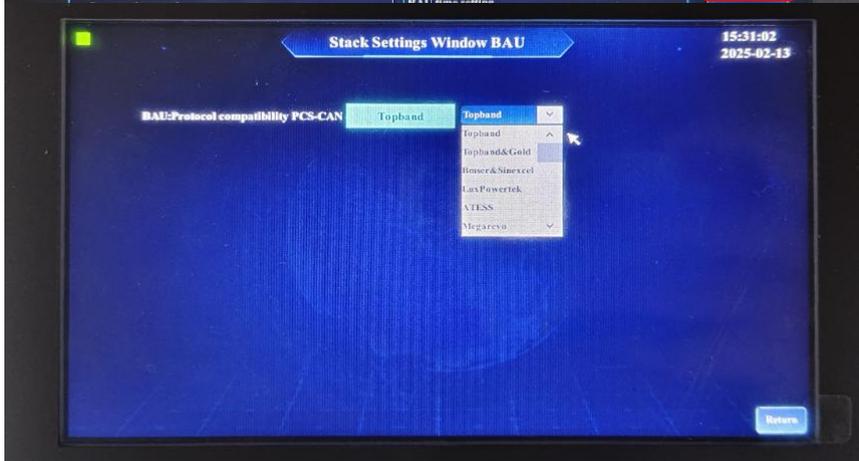
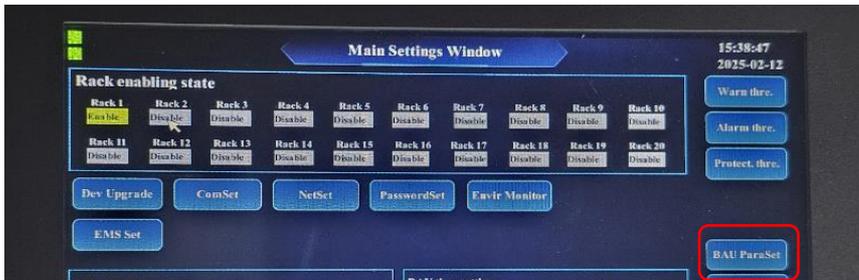


1. Select current rack number
2. Click  to change Auto to Manual
3. Insert the new address number "1" or "2" or else.
4. Set 
5. Do above for next Rack

- After address settings well,you can go to Rack Informa to see if new address rack has datas now,then go back to Configuration to Disable the others no use Rack.



- Enter BAU ParaSet,Select PCS protocol



- Setup done,now you can restart system to normally use.

**Danger:** The voltage of the battery is too high, please pay attention to do self-protection during the operation.

**Warning:**

Double check all the power cables and communication cable. Make sure the voltage of the Inverter is in the same level with the battery system.

- Switch on the inverter, to make sure all the power equipment can work normally.

**3.5.8 Wifi and Wlan and 4G configuration**

**WIFI:**

You can enter LCD EMS Set,insert Wifi name and password,the COMM light will flash if WIFI connect well.

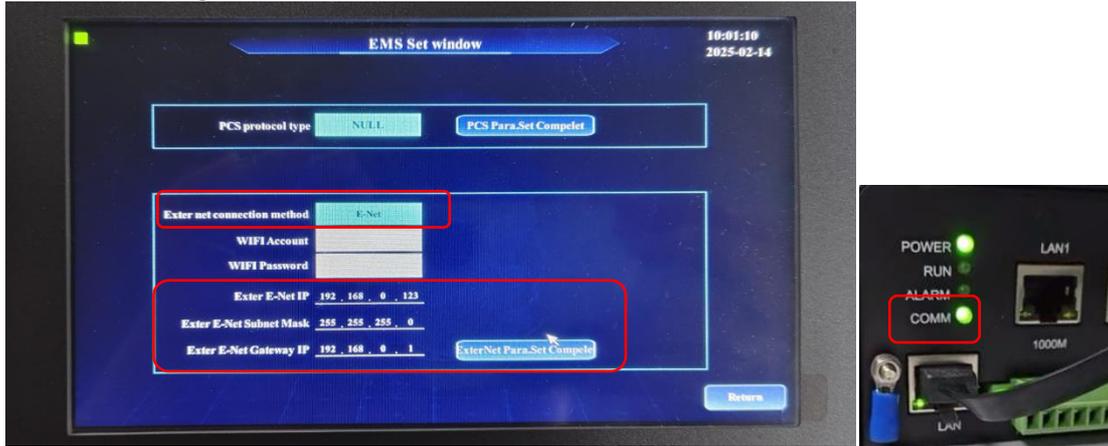


**WLAN(E-Net):**

Prepare a RJ45 network cable,connect from the Router to EMS LAN1 port.Change the IP to same with your local net IP.



The COMM light will flash if Ethernet connect well.



**4G:**

Insert the 4G card to EMS 4G interface directly to use. The COMM light will flash if 4G datas is well.



**3.5.9 Register your station on the monitor website after installation**

After installing completely and EMS is online,contact battery support engineer to help to register your system on the EMS Web,to real-time monitor system and do some remote operation such as remote update etc.

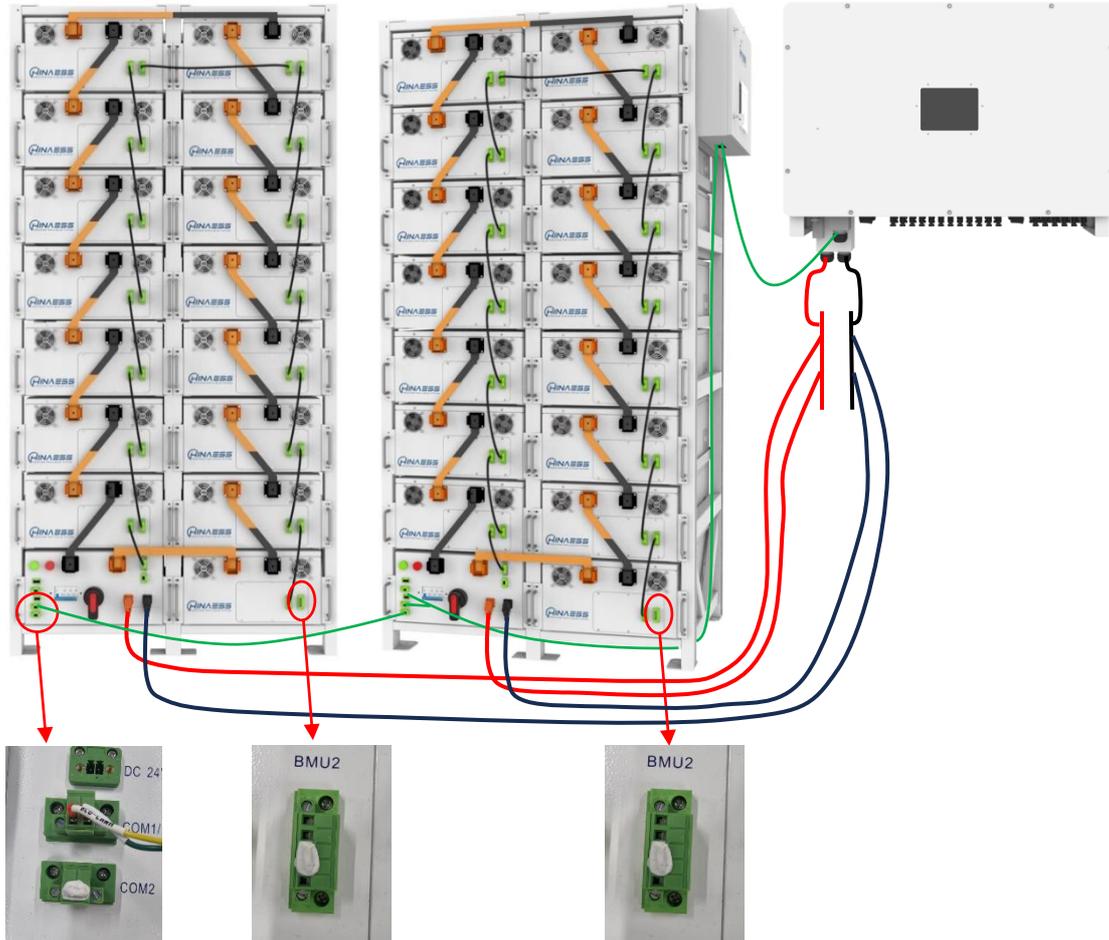


### 3.5.10 Parallel many clusters to use

#### Cable connection guidance

When you have many clusters in parallel to use, please follow below guidance of cable connection.

The LCD settings is same to 3.5.4

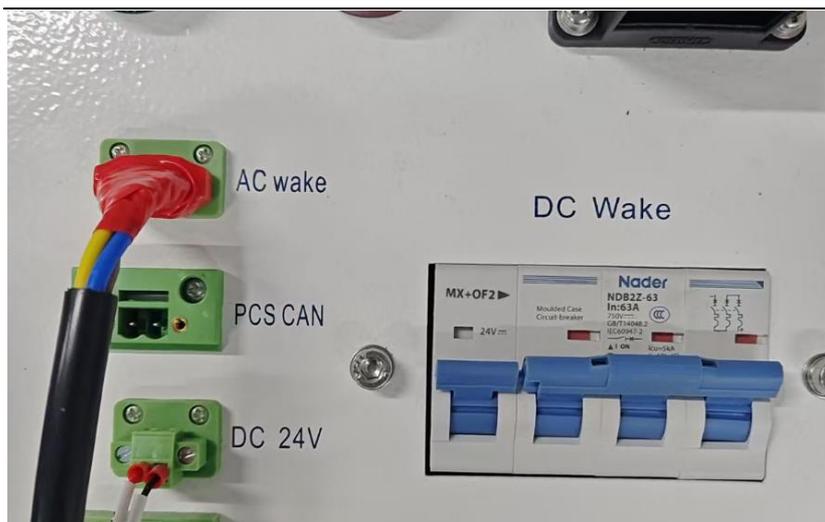


**Note:**

1. Before paralleling different clusters, must confirm the voltage difference is lower than 20V.
  2. Before parallel, all BCU BOXes address must be setted for different. Comm cable between different clusters are from the No.1 COM2 to next COM1, then COM2-COM1 one by one.
  3. If the BAT connect terminal on the PCS sides have place for many pairs of power cables connection, you can connect to PCS directly. If not, you can parallel power cables on the busbar firstly and from busbar to PCS.
- Or a DC Breaker also can be as a parallel point for two pairs of power cables, case by case to check.

### 3.5.11 AC Wake function

1. Our BCU BOX support two ways of wake ,one is DC wake which is powered by battery modules, another is AC wake which is powered by 220V AC supply.
2. You can use DC wake and AC wake at the same time, and AC will be priority to supply power to wake the system.
3. If AC lose, DC will continue to supply power seamless exchange.
4. You can get 220V AC power from PCS AC OUTPUT side, or from home grid, or some other AC power supply.
5. AC wake function will save some system energy, and when system is fault and off state, can't be woken up by DC, you can connect AC to wake up and check system, helpful for after-sale check and repair.



## 4 Maintenance

### 4.1 Trouble shooting

**Danger:** The C14 battery system is a high voltage DC system, operated by professional and authorized person only.

No	Problem	Possible Reason	Solution
1	The battery has no voltage output, ALM light is red on	The Power handle of the BCU BOX is not turned on	Turn on the Power handle
2		BCU doesn't communicate to BAU normally	Check the BCU-BAU CAN comm cable connection.
3		The address of BCU BOXes are conflicting or enable.	Check RACK address on the LCD
4		The relay in BCU BOX is not closed normally	Check "Alarm" on the LCD, to see what's wrong it is.
5		Battery is low protection or high protection.	Check the voltage of the modules.
7	DC Wake breaker trips automatically	The highest temperature is higher than 65°C; MinCell ≤ 2500mv; MaxCell ≥ 3800mv ; Charge and discharge current ≤ 1A within 72 hours when without communication	Check alarm on the LCD
8	Communication failure between battery and inverter	PCS protocol is wrong	Select correct protocol on the LCD

## 4.2 Battery Maintenance

**Danger:** The maintenance of battery only can be operated by professional and authorized person.

**Danger:** you need turn off the battery system firstly when you do some maintenance items.

### 4.3.1 Voltage Inspection:

**[Periodical Maintenance]** Check the voltage of battery system through the BMS TOOL or LCD. Check cells voltage is normal or not.

### 4.3.2 SOC Inspection:

**[Periodical Maintenance]** Check the SOC of battery system through the BMS TOOL or LCD.

### 4.3.3 Cables Inspection:

**[Periodical Maintenance]** Visual inspect all the cables of all clusters. Check the cables state and connection.

### 4.3.4 Balancing:

**[Periodical Maintenance]** In parallel system,if there is voltage gap between different clusters,BCU will do balance firstly,when the balance finish,it will become green on normally.

## 5 Storage Recommendations

- For long-term storage (more than 3 months), the battery cells should be stored in the environment: temperature range of 5~35°C, relative humidity <65% and contains non-corrosive gas .
- The battery should be around 50% SOC before storage.
- It is recommended to active the battery system (discharge and charge) every 3 months, and the longest duration of storage without charge and discharge cannot exceed 6 months.

**Caution:** The capacity of the battery will have reduction if not follow the above instructions to store the battery for a long term.

## 6 Shipment

Battery module will pre-charged to 50% SOC or according to customer requirement before shipment. The remaining capacity of battery cell is determined by the storage time and condition after shipment.

- The battery modules meet the UN38.3 certificate standard.



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