



User Manual

Energy Storage Battery

HZEB-LCT-20

V1.2.0.20251113

Contents

All Rights Reserved	1
About The Manual	2
1. Safety Precautions	3
1.1 Terms and Symbols	4
1.2 Safety Precautions	5
1.3 Security Measures	5
2. Product Introduction	8
2.1 Features	8
2.2 Appearance	9
2.3 Appearance Description	9
2.3.1 Control Panel Definition	9
2.3.2 Signal Area Description	10
2.3.3 Communication Interface Definition	11
2.3.4 Indicator Light Status	12
2.3.5 SOC Status Indicator Light	15
2.3.6 Address Dialer	19
2.4 Screen Interface Description	20
2.4.1 Home Page Main Interface	20
2.4.2 Check Battery Status	21
2.4.3 View Battery Details	22
2.4.4 Check Battery BMS Status	23
2.4.5 Select Battery Communication Protocol	24
2.4.6 System Settings	25
2.5 Host Computer Connection	26
2.6 Specifications	27
2.7 Product Identification Card	29
3. Storage and Packaging	30
3.1 Inspection Before Signing	30
3.2 Accessories Inspection	30
3.3 Required Tools	32

3.4 Safety Devices	33
3.5 Equipment Storage	34
4. System Installation	35
4.1 Installation Requirements	35
4.2 Floor Installation	37
4.2.1 Installation Location Selection	37
4.2.2 Precautions	38
4.2.3 Mobility Requirements	39
4.2.4 Fuma Wheel Fixed	40
4.3 Single System Installation	42
4.3.1 Single Unit Wiring Overview	42
4.3.2 Wiring Details For a Single Unit	43
4.3.3 Installation Steps	43
4.4 Parallel System Installation	44
4.4.1 Parallel Wiring Overview Diagram	45
4.4.2 Parallel Wiring Details Diagram	47
4.4.3 Installation Steps	47
4.5 System Installation Check	48
5. System Operation	49
5.1 Check Before Power On	49
5.2 Battery Power-up	50
5.3 Battery Protocol Selection	51
5.4 Battery Power Down	52
5.5 Mobile APP Download	53
5.6 APP Bluetooth WiFi Network Configuration and Settings	53
6. Inspection, cleaning, and maintenance	53
6.1 Inspection	54
6.2 Cleaning	54
6.3 Maintenance	54
7. Troubleshooting	55

8. Battery Recycling	57
8.1 Cathode Material Recycling Orocess and Steps	57
8.2 Anode Material Recycling	57
8.3 Diaphragm Recycling	58
8.4 List of Recycled Equipment	58

All Rights Reserved

This document is copyrighted by Yichun Dawnice Manufacture and Trade Co., Ltd.. No part of this document may be excerpted, copied, translated, annotated, or reproduced in any form or by any means without our company's prior written authorization.

Trademarks and Licensing

The trademarks used in this manual are the property of our company. All other trademarks or registered trademarks mentioned in this manual are the property of their respective owners.

Software License

* It is prohibited to use, in any way, in whole or in part, data from firmware or software developed by our company for commercial purposes.

* Reverse engineering, hacking, or any other operations that compromise the original programming of the software developed by our company are prohibited.

Disclaimer

Our company shall not be liable for any personal injury, property damage, product damage, or consequential damages arising from or caused by any of the following circumstances.

* Equipment damage caused by force majeure events such as earthquakes, floods, volcanic eruptions, mudslides, lightning strikes,

fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, extreme weather, and voltage fluctuations;

- * Failure to use the product in accordance with the instructions in this manual;

- * The installation, operation, and storage environment does not comply with relevant international, national, or regional standards.

- * Unqualified personnel shall not be allowed to install, use, repair, dismantle, or otherwise operate the equipment.

- * Using unauthorized spare parts.

- * Unauthorized modification or technical changes to the product or software.

- * You made a mistake in shipping the goods yourself or through a third party.

- * The materials and tools you provided yourself do not meet international, national, or regional standards.

- * Damage caused by your own or a third party's negligence, intentional misconduct, fault, or improper operation.

About The Manual

This manual provides information on the transportation and storage, mechanical installation, electrical connections, start-up and shutdown operations, troubleshooting, and maintenance of battery energy storage systems. Before transporting, storing, installing, operating, using, or/and maintaining the equipment, please read this manual first, strictly follow its contents, and adhere to all safety precautions indicated on the equipment and in this manual. In this manual, "equipment" refers to the products, software, components,

spare parts, and/or services related to this manual; "our company" refers to our company (producer), seller, or service provider of the equipment; and "you" refers to the entity responsible for transporting, storing, installing, operating, using, and/or maintaining the equipment.

This document applies to the following product models of our company:

HZEB-LCT-20

*Unless otherwise specified, in this manual, the terms "system" and "energy storage system" refer to this particular product model.

How To Use This Manual

Please read this manual carefully before using the product and keep it in an easily accessible place. To provide the best customer experience, the content of this manual may be updated and revised, therefore some errors or slight discrepancies with actual conditions may exist. We will not notify you of any changes in information. Please obtain the latest manual from your sales channels.

1. Safety Precautions



Warning !

Please read and follow all safety warnings and instructions carefully. Failure to do so may result in electric shock, fire, serious injury, or even death. Please keep these instructions safe for future reference.

This product is designed as an integrated system and must be operated by trained and qualified personnel, including but not limited to:

- * Technical Support Engineer
- * Installation Engineer
- * Commissioning Engineer
- * Electrical Engineer
- * Maintenance Engineer

Operators should be familiar with the characteristics and safety requirements of lithium batteries. If you are unsure whether you possess the necessary skills to complete this integration, please do not use this product.

1.1 Terms and Symbols

Symbol explanation is to ensure user safety and property security while using this product, and to ensure optimal and effective product use, this manual provides users with the following safety information highlighted by the symbols below.

The following symbols may appear in this manual to highlight information; their meanings are as follows:

Table 1.1 Symbol Explanation

 Danger	This indicates a dangerous situation. Failure to take action could result in a high-risk situation such as death or serious injury.
 Warning	This indicates a potential for damage or injury. Failure to take precautions could result in a medium-level risk, such as serious personal injury or damage.



Notice

This indicates a potential for equipment damage or property loss. Failure to take precautions may result in equipment damage, data loss, performance degradation, or other unforeseen consequences.

1.2 Safety Precautions

Read all safety instructions carefully before performing any work and follow them when handling batteries.

Incorrect operation may result in:

- * Injury or death of the operator or third party
- * Damage to system hardware.

Skills of qualified personnel:

- * Training in electrical system installation and commissioning and hazard handling.
- * Understand this manual and other related documents.
- * Know your local regulations and directives.

1.3 Security Measures



Notice:

* It is very important and necessary to read the user manual carefully before installing or using the battery . Failure to follow any instructions or warnings in this document may result in electric shock, serious injury or death, or may damage the battery and make it unusable. Damage caused by improper operation is not covered by the product warranty.

* If the battery is stored for a long time, it needs to be charged every six months, and the charging SOC should not be less than 90%.

- * When the battery is fully discharged, it needs to be recharged within 12 hours.
- * Do not connect the power terminals in reverse.
- * All battery power terminals must be disconnected during maintenance.
- * If there is any abnormality, please contact the supplier within 24 hours.
- * Do not use cleaning agents to clean the battery.
- * Do not expose batteries to flammable or irritating chemicals or vapors.
- * Do not connect the battery directly to the photovoltaic solar circuit.
- * Do not insert any foreign objects into any part of the battery.
- * Direct or indirect damages caused by the above reasons are not covered by the warranty.



Warning !

Before connecting:

- * After unpacking, please check the product and the packing list first. If the product is damaged or parts are missing, please contact your local retailer.
- * Before installation, be sure to cut off the grid power and ensure that the battery is in the off state.
- * The wiring must be correct, do not mix up the positive and negative poles of the cables, and ensure that there will be no short circuit with external devices.
- * It is strictly forbidden to directly connect the battery and AC power supply.

- * The embedded BMS in the battery is designed for 51.2Vdc, do not connect the batteries in series.

- * The battery must be grounded and the resistance must be less than 0.10 M Ω .

- * Please ensure that the electrical parameters of the battery system are compatible with the relevant equipment.

- * Please keep the battery away from water and fire.



Notice:

Precautions for use:

- * If the battery system needs to be moved or repaired, the power supply must be disconnected and the battery completely shut down.

- * Do not connect the battery to a different type of battery.

- * Do not connect the battery to a faulty or incompatible inverter.

- * It is strictly forbidden to disassemble the battery.

- * Except for staff or authorized personnel, do not open, repair or disassemble the battery. The company does not assume any consequences or related responsibilities caused by violations of safe operation or violation of design, production and equipment safety standards.

- * It is forbidden to connect in parallel with other models.

Note: This manual cannot cover all possible situations during operation, maintenance, and repair. If you encounter any situations not explained in this manual, please prioritize following local regulations and standards and contact our company promptly.

Revision History

The latest version in the change history contains updates from all

previous document versions.

- * V1.1.0.20251020

First edition

- * V1.2.0.20251113

Image and content optimization

2. Product Introduction

HZ-LCT is our company's latest 51.2V low-voltage DC energy storage system product (hereinafter referred to as this product), which can provide reliable power support for residential buildings and is a good partner for environmentally friendly living.

- * This product needs to be used with a low-voltage inverter and is compatible with mainstream brand inverters on the market.

- * This series of products supports parallel use of up to 15 unit.

2.1 Features

This product has the following features:

- * High voltage accuracy ($\leq 20\text{mV}$)

- * High current accuracy ($\leq 2\%@\text{FS}$)

- * Short circuit protection function

- * Adjustable overcurrent protection

- * Parameter adjustable settings

- * LED status indication function

- * Charge equalization function

- * Flexible configuration, multiple batteries can be connected in parallel to expand capacity

- * Self-cooling method is adopted to significantly reduce system

noise and reduce the system's own power consumption

2.2 Appearance

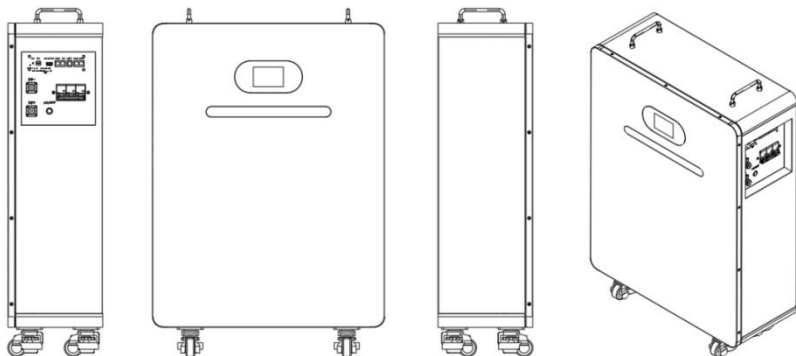


Figure 2.2 Battery appearance

2.3 Appearance Description

2.3.1 Control Panel Definition

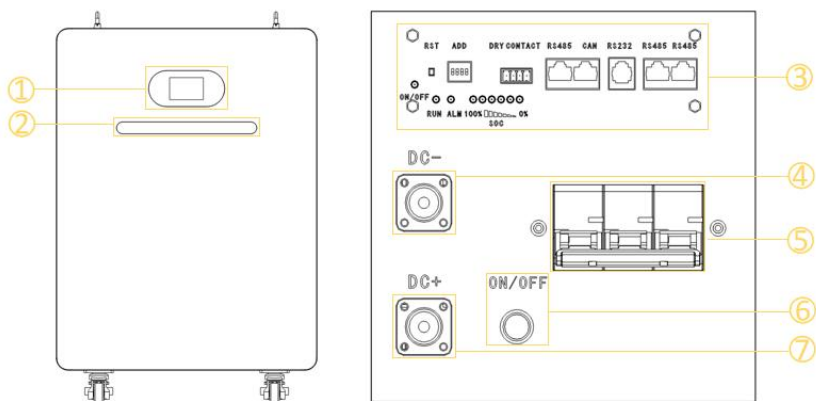


Figure 2.3.1 Control Panel

Table 2.3.1 Panel Explanation

No.	Interpretation	Description
1	Display screen	Display operation area
2	Indicator lights	SOC status indicator light
3	Signal area	Indicator lights & communication area
4	DC-	Battery wiring negative terminal
5	Breaker	Battery power interface power switch
6	ON/OFF Switch	Battery power switch
7	DC+	Battery interface positive terminal

2.3.2 Signal Area Description


Figure 2.3.2 Signal Region
Table 2.3.2 Definition of Signal Region

No.	Interpretation	Description
1	RST	Reset button
2	ADD	Dip switch
3	DRY CONTACT	Dry Contact
4	RS485	Inverter RS485 communication port
5	CAN	Inverter CAN communication port
6	RS232	Host computer communication port
7	RS485	Battery parallel port 1

8	RS485	Battery parallel port 2
9	ON/OFF	Battery switch indicator
10	RUN	Battery running indicator
11	ALM	Battery warning indicator
12	SOC	Battery indicator

2.3.3 Communication interface definition

RJ45 Registered Jack

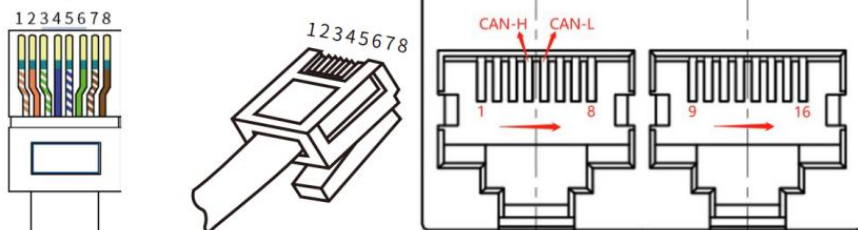


Figure 2.3.3 Communication Interface

Table 2.3.2 Definition of Signal Region

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

2.3.4 Indicator light status



Figure 2.3.4 Indicator light status

Table 2.3.4.1 Indicator Light Definitions

State	Normal/Alarm/Protection	ON / OFF	RUN	ALM	Power indicator LED						Explanation
		●	●	●	●	●	●	●	●	●	
Power off	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All LEDs turn off
Static state	Normal	ON	Flash1	OFF	According to the power indicator						Standby mode
	Alarm	ON	Flash1	Flash3							Module low voltage
Charging	Normal	ON	ON	OFF	According to the power indicator(Battery indicator LED flashes up to 2)						The LED for maximum battery level flashes (flash 2). The ALM does not flash during an overcharge warning.
	Alarm	ON	ON	Flash3							
	Over-discharge protection	ON	ON	OFF	ON	ON	ON	ON	ON	ON	If there is no mains power indicator light, it will switch to standby mode.
	Temperature, overcurrent, and fail-safe protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging

Discharging	Normal	ON	Flash3	OFF	According to the power						
	Alarm	ON	Flash3	Flash3							
	UV protect	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging

Discharging	Temperature, overcurrent, short circuit, reverse connection, and fail-safe protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Invalid		OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging

Table 2.3.4.2 Explanation of Power Indicator Lights

State		Charging						Discharge					
Capacity indicator light	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●	
SOC	0%–	OFF	OFF	OFF	OFF	OFF	Flash2	OFF	OFF	OFF	OFF	OFF	ON

(%)	16.6%												
	16.6%												
	–	OFF	OFF	OFF	OFF	Flash2	ON	OFF	OFF	OFF	OFF	ON	ON
	33.2%												
	33.2%												
	–	OFF	OFF	OFF	Flash2	ON	ON	OFF	OFF	OFF	ON	ON	ON
	49.8%												
	49.8%												
	–	OFF	OFF	Flash2	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	66.4%												
	66.4%												
	–	OFF	Flash2	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	83.0%												
	83.0%	Flas											
	–	h2	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
	100%												
RUN LED		ON						Flash3					

2.3.5 SOC status indicator light

Table 2.3.5.1 Description of SOC Status Indicator Lights

State	Led 1	Led 2	Led 3	Led 4	Led 5	Led 6	Led 7	Led 8	Led 9	Led 10	ALM	RUN
Power-on self-test	The LEDs light up sequentially, then turn off completely and switch to the next color, proceeding from left to right.											
Fault status	SOC is displayed normally.										ON	OFF
Protection status	SOC is displayed normally.										Flashing for 1 second	
											Overvoltage causes the light to not turn on.	ON
	All lights are off in undervoltage protection mode.										OFF	
Alarm status	SOC is displayed normally.										Flashing for 1 second	
											Overvoltage causes the light to not turn on.	OFF
Charging status	Display SOC, from maximum SOC light to full SOC light flow										-	Flashing for 1 second
Discharge state	The SOC indicator light flashes, once every 2 seconds.										-	Flashing for 1 second
Idle state	Display SOC										-	ON

Power off	The water flows from left to right, eventually disappearing completely.
-----------	---

Table 2.3.5.2 Charging Status Description

SOC	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	ALM	RUN
$0 < S \leq 10\%$	running light										-	Blue Flash ①
$10\% < S \leq 20\%$	Blue	running light									-	Blue Flash ①
$20\% < S \leq 30\%$	Blue	Blue	running light								-	Blue Flash ①
$30\% < S \leq 40\%$	Blue	Blue	Blue	running light							-	Blue Flash ①
$40\% < S \leq 50\%$	Blue	Blue	Blue	Blue	running light						-	Blue Flash ①
$50\% < S \leq 60\%$	Blue	Blue	Blue	Blue	Blue	running light					-	Blue Flash ①
$60\% < S \leq 70\%$	Blue	Blue	Blue	Blue	Blue	Blue	running light				-	Blue Flash ①
$70\% < S \leq 80\%$	Blue	Blue	Blue	Blue	Blue	Blue	Blue	running light			-	Blue Flash ①
$80\% < S \leq 90\%$	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	running light		-	Blue Flash ①
$90\% < S \leq 100\%$	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	running light	-	Blue Flash ①

Table 2.3.5.3 Discharge Status Description

SOC	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	ALM	RUN
$0 < S \leq 10\%$	Green Flash	-	-	-	-	-	-	-	-	-	-	Green Flash ①
$10\% < S \leq 20\%$	Green Flash	Green	-	-	-	-	-	-	-	-	-	Green Flash ①
$20\% < S \leq 30\%$	Green	Green	Green Flash	-	-	-	-	-	-	-	-	Green Flash ①
$30\% < S \leq 40\%$	Green	Green	Green	Green Flash	-	-	-	-	-	-	-	Green Flash ①
$40\% < S \leq 50\%$	Green	Green	Green	Green	Green Flash	-	-	-	-	-	-	Green Flash ①
$50\% < S \leq 60\%$	Green	Green	Green	Green	Green	Green Flash	-	-	-	-	-	Green Flash ①
$60\% < S \leq 70\%$	Green	Green	Green	Green	Green	Green	Green Flash	-	-	-	-	Green Flash ①
$70\% < S \leq 80\%$	Green	Green	Green	Green	Green	Green	Green	Green Flash	-	-	-	Green Flash ①
$80\% < S \leq 90\%$	Green	Green	Green	Green	Green	Green	Green	Green	Green Flash	-	-	Green Flash ①
$90\% < S \leq 100\%$	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green Flash	-	Green Flash ①

Table 2.3.5.4 Description of the stationary state

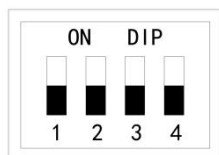
SOC	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	ALM	RUN
$0 \leq S \leq 10\%$	Green	-	-	-	-	-	-	-	-	-	-	Green
$10\% < S \leq 20\%$	Green	Green	-	-	-	-	-	-	-	-	-	Green
$20\% < S \leq 30\%$	Green	Green	Green	-	-	-	-	-	-	-	-	Green
$30\% < S \leq 40\%$	Green	Green	Green	Green	-	-	-	-	-	-	-	Green
$40\% < S \leq 50\%$	Green	Green	Green	Green	Green	-	-	-	-	-	-	Green
$50\% < S \leq 60\%$	Green	Green	Green	Green	Green	Green	-	-	-	-	-	Green
$60\% < S \leq 70\%$	Green	Green	Green	Green	Green	Green	Green	-	-	-	-	Green
$70\% < S \leq 80\%$	Green	Green	Green	Green	Green	Green	Green	Green	-	-	-	Green
$80\% < S \leq 90\%$	Green	Green	Green	Green	Green	Green	Green	Green	Green	-	-	Green
$90\% < S \leq 100\%$	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	-	Green

Table 2.3.5.4 Description of Hibernation State

SOC	10%	20%	30%	40%	50%	60%	70%	80%	90%	100 %	ALM	RUN
$0 < S \leq 100\%$	-	-	-	-	-	-	-	-	-	-	-	-

2.3.6 Address dial

When multiple batteries are used in parallel, the addresses (ADD) of each battery must be different and correctly sequenced to ensure normal use of the system. The DIP switch setting definition should refer to the following table.

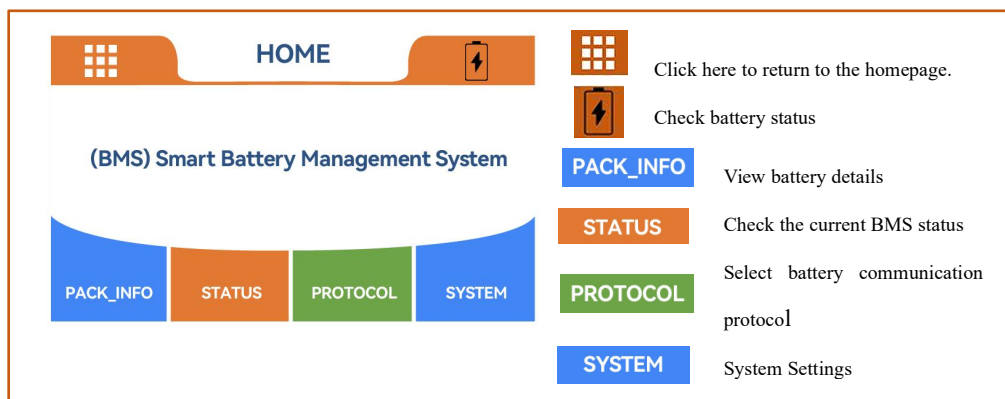

Table 2.3.6 Address Dial Codes
Table 2.3.6 Address Dial Code Instructions

ADD	DIP switch position			
	#1	#2	#3	#4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON

11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

2.4 Screen Interface Description

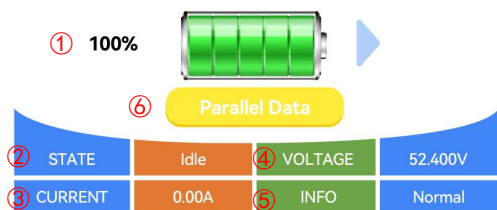
2.4.1 Homepage Main Interface



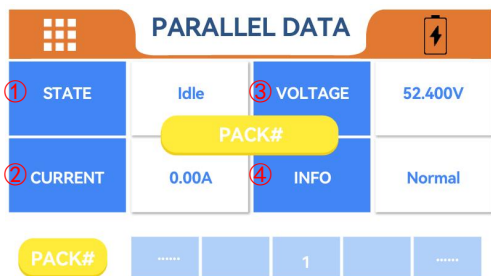
2.4.2 Check battery status



Click this icon on the homepage to enter this page.



- ① Current Battery SOC
- ② Current Battery Status
- ③ Current Battery Current
- ④ Current Battery Voltage
- ⑤ Current Battery Information
- ⑥ Parallel Data Information



Parallel Data

Click this icon in the image above to enter the page.

- ① Current Battery Status
- ② Current Battery Current
- ③ Current Battery Voltage
- ④ Current battery information

2.4.3 Check battery details



①

②

③

④

⑤

PACK_V:	52.4V
PACK_C:	0.00A
SOC:	14%
RM_CAP:	30.00Ah
FULL_CAP:	206.00Ah

Click this icon in the image above to enter the page.

① Current Battery Voltage

② Current Battery Current

③ Current Battery SOC

④ Current Battery Capacity

⑤ Total battery capacity



--Temperature:

①

②

③

T1:	27.1°C	T2:	27.1°C
T3:	28.0°C	T4:	28.0°C
PCB_T:	28.0°C	EVN_T:	27.1°C

Click this icon in the image above to enter the page.

① Cell temperature at corresponding cell sampling point

② Current temperature of the protection board

③ Current ambient temperature



--Cell Voltage:

①

Cell01:	3.27V	Cell05:	3.27V
Cell02:	3.27V	Cell06:	3.27V
Cell03:	3.27V	Cell07:	3.27V
Cell04:	3.27V	Cell08:	3.27V

Click this icon in the image above to enter the page.

① Cell voltage at corresponding cell sampling point

2.4.4 Check battery BMS status



BMS STATUS




STATUS

➔

--Warning:

① · Over Current

② · Over Voltage

③ · Under Voltage

④ · Over Temperature

⑤ · UnderTemperature

Click this icon on the homepage to enter the page.

① High current warning (red text indicates warning status)

② Overvoltage warning (red text indicates warning status)

③ Low voltage warning (red text indicates warning status)

④ Overheat warning (red text indicates warning status)

⑤ Low temperature warning (red text indicates warning status)



BMS STATUS




STATUS

↶

➔

--Protect:

① · Over Voltage Protection

② · Under Voltage Protection

③ · Short Circuit Protection

④ · Over Current Protection

⑤ · Over Temperature Protection

Click this icon in the image above to enter the page.

① Overvoltage protection (red text indicates protection status)

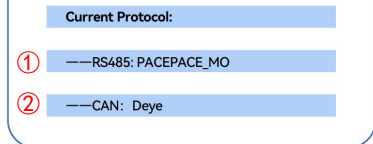
② Undervoltage protection (red text indicates protection status)

③ Battery short circuit protection (red text indicates protection status)

④ Overcurrent protection (red text indicates protection status)

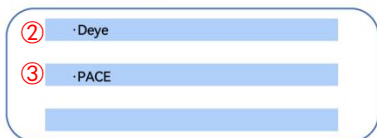
⑤ Overheat protection (red text indicates protection status)

2.4.5 Select battery communication protocol


PROTOCOL

Click this icon on the homepage to enter the page.

- ① Select RS485 communication (choose according to the communication channel compatible with the inverter).
- ② Select CAN communication (choose the communication channel compatible with your inverter).


--RS485: PACEPACE_MO

Click this icon on the homepage to enter the page.

- ① Click this icon to select the next page of the agreement.
- ② The current communication protocol is RS485.
- ③ Protocol Name (Select inverter protocol for communication)

Note: CAN communication same operation as above

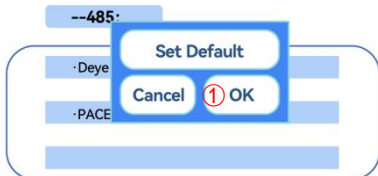

·Deye

Or other protocol icons

Click this icon in the image above to enter the page.

- ① Select matching protocol, then enter password (123456)
- ② OK Key (Press to confirm password)

Note: CAN communication same operation as above


·Deye

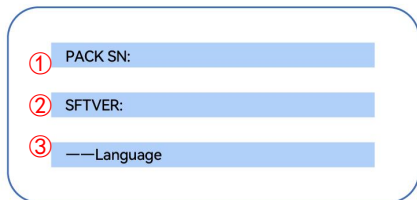
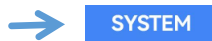
Or other protocol icons

Click this icon in the image above to enter the page

- ① After entering the password, select the appropriate protocol to display this page, and click OK to complete the protocol matching.

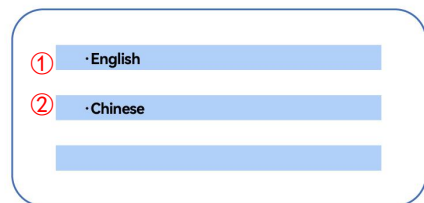
Note: CAN communication same operation as above

2.4.6 System Settings



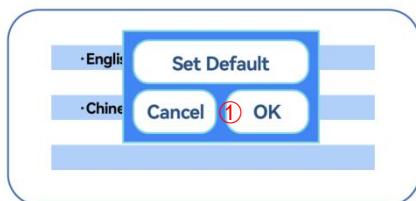
Click this icon on the homepage to enter the page.

- ① Battery SN Code
- ② Battery Software Version
- ③ Language Selection



Click this icon in the image above to enter the page.

- ① English (Choose the interface language that suits you)
- ② Chinese (Choose the interface language that suits you)



Click this icon in the image above to enter the page.

- ① Select the appropriate language on this page and click OK to complete the language matching.

Note: The same procedure applies to selecting other languages.

2.5 Host computer connection

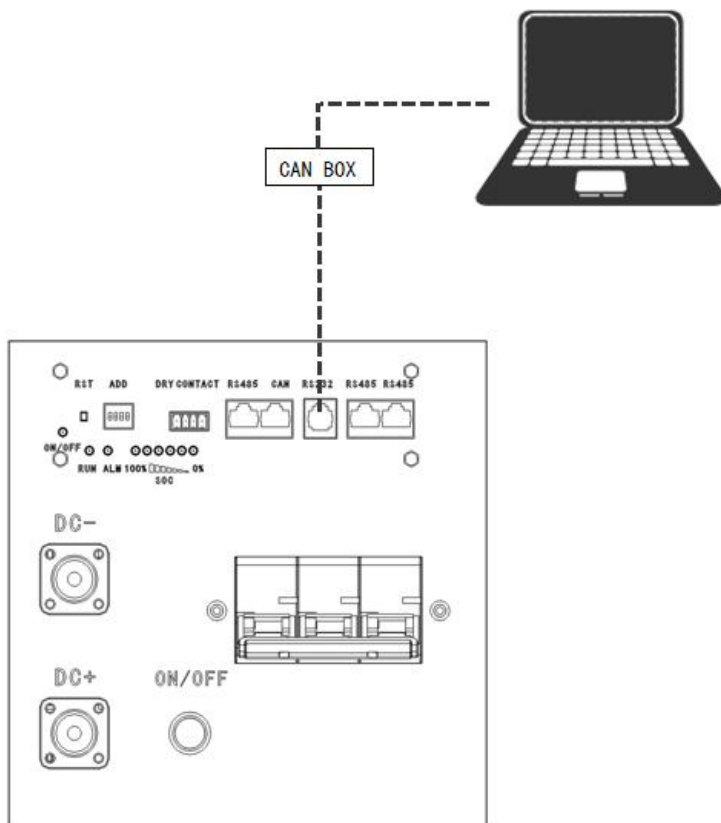


Figure 2.5 Host computer connection

If you are using a computer to monitor the battery, connect the USB to CAN bus communication cable between the battery's RS232 interface and the computer's USB interface, and then use the host computer software on the computer to monitor the battery parameters in real time.

2.6 Specifications

Table 2.6 Specifications

Main parameters	HZEB-LCT-20
Battery Type	LiFePO ₄
Built-in circuit breaker	125A 2P, 60Vdc
Nominal Energy (kWh) ^[1]	20.99
Capacity(Ah)	410
Nominal Voltage(V)	51.2
Voltage Range(V)	44.8~57.6
Max.Charge/Discharge Current (A) ^[2]	200
Charge/Discharge Rate (C)	0.5C
Usable Energy(kWh@90%DOD)	18.89
Other parameters	
Dimension(W*D*H/mm)	650*265*850
Weight(kg)	180
Display Mode	HMI Display
IP Rating	IP21
Operating Temperature	Charging: 0~55°C / Discharging: -20~55°C
Recommended Operating Temperature	15~35°C
Storage Temperature	0~35°C
Humidity	90%
Working Altitude (m)	≤2000
Cycle Life ^[3]	≥6000 Cycles (25°C) 0.5C/0.5C,90%DOD,70%EOL)
Cumulative Discharge Energy	33.7 MWh
Communication Interface	CAN、RS485
Scalability	Up to 15 units in parallel

Installation Method	Ground Mounted
Protection	Short circuit protection, overcharge protection, over-discharge protection, overcurrent protection, over-temperature protection
Warranty Period ^[4]	5+5 years
Safety	MSDS, UN38.3

[1]DC usable energy, test conditions: 25°C, 0.5C charge & discharge, 90% DOD. System usable energy may vary due to system configuration parameters.

[2]The current is affected by temperature and SOC.

[3]Battery cell life standard, using cells that meet the requirements of this standard.

[4]Conditions apply, refer to Dawnice Warranty Agreement.

2.7 Product identification card

 Energy Storage Battery Pack	
Model: HZEB-LCT-20	Cell Type: LiFePO ₄
Rated voltage: DC51.2V	Voltage range: 44.8V-57.6V
Energy: 20.992kW·h	Capacity: 410Ah
Recharging current: <200A	Discharge current: <200A
Working humidity: 0~90% (non-condensing)	
Working temperature: -10℃~+55℃	
Protection Level: IP21	
Date of manufacture: 2025.XX.XX	
Manufacturer: Jiangxi Hertz New Energy Technology Co.,Ltd	
Supplier:Yichun Dawnice Manufacturer and Trade Co.,Ltd	
   	
Made in China	

Figure 2.7 Product Identification Card

Tag Explanation :



Do not place near open flames or burn.



Do not place in a humid environment.



Used batteries should not be thrown in the trash; they need to be recycled by professionals or organizations.



MSDS Material Inspection and Certification Mark

UN38.3

Dangerous Goods Transport Certification Mark

3. Storage and Packaging

3.1 Inspection before signing

Before signing for the product, please check the following carefully:

- * Check the outer packaging for damage, such as deformation, holes, cracks, or other signs that may cause damage to the device inside the box. If there is any damage, do not open the package and contact your dealer.

- * Check if the device model is correct, if not, do not open the package and contact your dealer.

- * Check whether the delivered parts are of the correct type and quantity and whether they are damaged. If they are damaged, please contact your dealer.

3.2 Accessories inspection

Before installing the product , please check the following accessories in detail :

Table 3.2 Accessories List

No.	Accessories	Appearance	Explanation	Quantity
1	Battery		Provide power	1
2	Power Line		Red & Black power lines	2

3	Communication Line		RJ45 communication cable	1
4	Fixed Plate		Fixed battery	1
5	Cross-groove Recessed Hexagonal Head Three-piece Combination Bolt		Fixed battery	18
6	Expansion Bolts		Fixed battery	2
7	Fuma Wheel		Support/Mobile battery	4
8	User Manual		Product user manual	1

3.3 Required tools

The following tools are needed to install the battery:

Table 3.3 Tool List

No.	Accessories	Appearance	Explanation
1	Hammer		Open box
2	Utility Knife		Open box
3	Screwdriver		Fixed battery assembly
4	Handheld Electric Drill		Fixed battery assembly
5	Insulated Torque Wrench		Install cables and busbars
6	Insulated Torque Wrench		Install cables and busbars
7	Multimeter		Measure battery voltage



Notice:

Use properly insulated tools to prevent electric shock or short circuits. If insulated tools are not available, cover all exposed metal surfaces with electrical tape and remove all tools (except for the tips).

3.4 Safety devices

The following safety equipment is recommended when handling battery packs:

Table 3.4 Required Equipment

No.	Accessories	Appearance	Explanation
1	Insulating Gloves		Prevent electric shock
2	Safety Shoes		Prevent injury from falling
3	Helmet		Protect head

4	Reflective Vest		Improve visibility
5	Dust Mask		Prevent dust
6	Goggles		Protect your eyes

3.5 Equipment Storage

If the equipment is not put into use immediately, please store it according to the following requirements:

- * Make sure the outer packaging box is not removed and the desiccant inside the box is not lost.

- * It is recommended to install the equipment within 3 days after removing the packaging box. If the equipment is not installed, it needs to be repacked in the original packaging box for storage.

- * Keep away from flammable, explosive, corrosive and other environmental items during storage.

- * Make sure to store in a cool place away from direct sunlight.

- * Storage SOC range: 30%-60%, charge and discharge cycle every 3 months.

- * Storage temperature range:

When the temperature is $-20^{\circ}\text{C} \leq \text{temperature} < 10^{\circ}\text{C}$, the storage time shall not exceed 1 month.

When the temperature is $10^{\circ}\text{C} \leq \text{temperature} \leq 35^{\circ}\text{C}$, the storage

time shall not exceed 1 year.

When the temperature is $35^{\circ}\text{C} < \text{temperature} \leq 55^{\circ}\text{C}$, the storage time shall not exceed 1 month.

* Storage humidity range requirement: 0~90%RH without condensation. If moisture condensation is found on the battery interface, the battery system cannot be installed.

4. System Installation

4.1 Installation Requirements

Installation environment requirements:

* The equipment must not be installed in flammable, explosive, corrosive environments.

* The installation location must be away from water pipes, cables, etc. in the wall to avoid danger when drilling.

* The installation environment needs to be protected from sunlight, rain, snow, etc. It is recommended to install it in a sheltered location. If necessary, a sunshade can be built.

* The installation space must meet the equipment ventilation and heat dissipation requirements and operating space requirements.

* The equipment protection level meets the requirements for indoor and outdoor installation, and the temperature and humidity of the installation environment must be within the appropriate range.

* The equipment should be installed at a height that is convenient for operation and maintenance, ensuring that the equipment indicator lights and all labels are easy to see and the

wiring terminals are easy to operate.

- * The equipment installation altitude is lower than the maximum operating altitude of 2000m.

- * Keep away from strong magnetic field environment to avoid electromagnetic interference. If there is a radio station or wireless communication equipment below 30MHz near the installation location, please ensure that the distance between the battery and the wireless electromagnetic interference equipment is greater than 30m.



Warning !

Cleaning is essential; dust and metal shavings must be removed and the environment kept clean before installing and starting the system. Without a dustproof enclosure, the system cannot be installed in dusty areas.



Warning !

Temperature; if the ambient temperature is outside the operating range, the battery pack will stop working as a self-protection mechanism. Frequent exposure to harsh temperatures may reduce battery performance and battery pack lifespan.



Danger !

Fire suppression system; for safety reasons, it is best to have a fire suppression system. Fire protection systems require regular inspection to maintain proper function. For usage and maintenance

requirements, please follow local fire equipment guidelines.



Danger !

Handling heavy objects: Please handle with care to avoid injury. Choose an appropriate handling method and limit the weight of the object to be handled according to the product's weight. Refer to the following diagram :



Figure 4.1 Schematic diagram of handling

Table 4.1 Definition of Transport

Weight	Transportation Method	Number of Recommendations
> 18 kg	Manual handling	1 person
18~32 kg	Manual handling	2 person
32~55 kg	Manual handling	3 person
55~68 kg	Manual handling	4 person
> 68 kg	Mobile machinery	Forklift

4.2 Ground-mounted installation

4.2.1 Installation location selection



Notice:

The battery should be installed in a clean, flat location, away from direct sunlight, water, and fire sources, and at a suitable temperature. The recommended installation location should meet the following dimensional requirements: ($0 \leq N \leq 29$).

Note: This requirement applies only to ground installations.

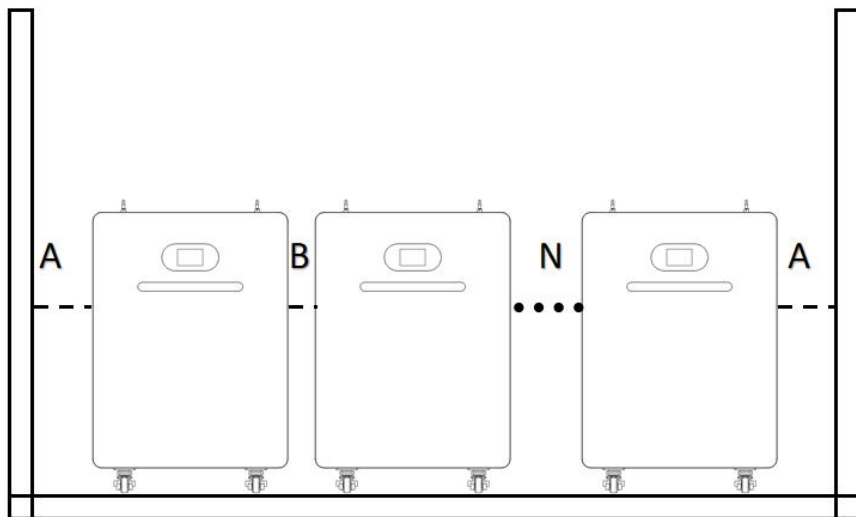


Figure 4.2.1 Spacing Diagram

Table 4.2.1 Interval Definition

No.	Distance (mm)
A	200
B	100

4.2.2 Precautions



Notice:

The following requirements should be followed during relocation and installation; otherwise, there is a risk of personal injury and

equipment damage.

The following requirements should be followed when installing and moving the equipment:

Wall mounting: Place the battery flush against the wall and secure it with bolts. Keep the battery out of reach of children and pets.

The following is an installation diagram:

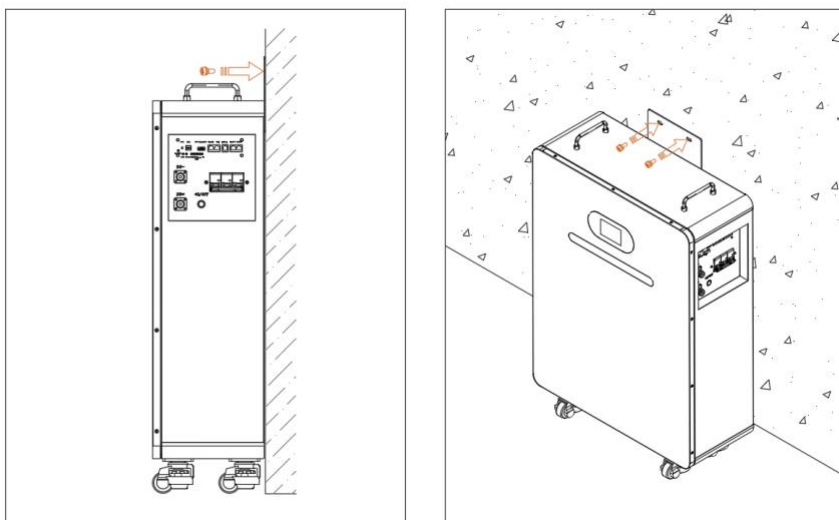


Figure 4.2.2 Installation diagram

4.2.3 Mobility requirements



Notice:

Pushing or pulling the battery from the front or back is prohibited; it may only be pushed or pulled from the side.

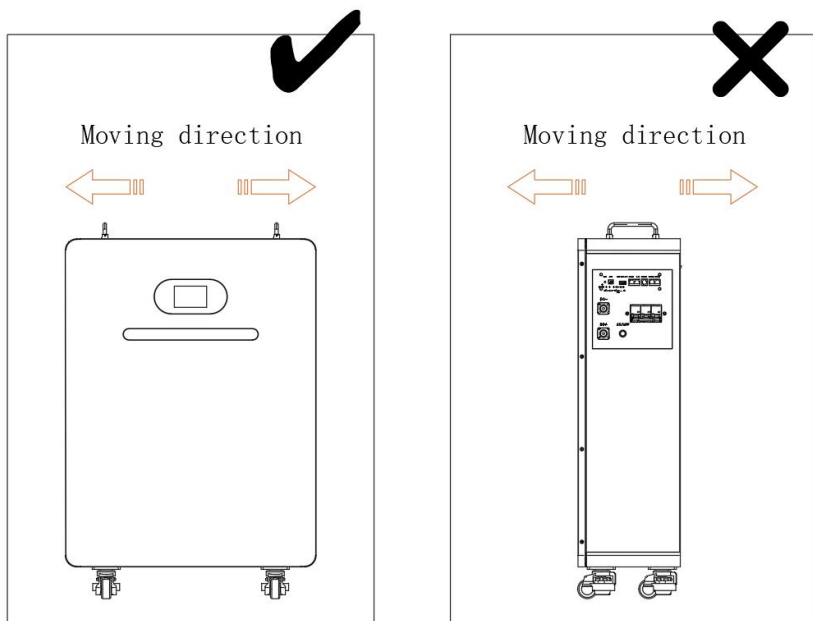


Figure 4.2.3 Movement Requirements

4.2.4 Fuma wheel fixed

After moving to the installation position, use the gear-lifting feet on each of the forma wheels until the battery is secure.

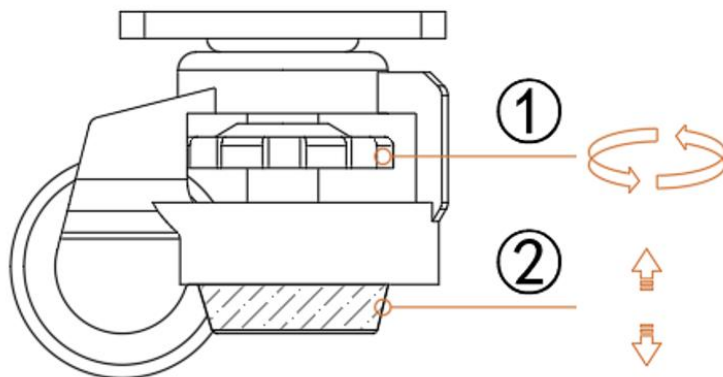


Figure 4.2.4 Fixing of the caster wheel

Fixing method: Please rotate gear ① to firmly press the rubber pad ② onto the ground.

4.3 Single system wiring

4.3.1 Single unit wiring overview

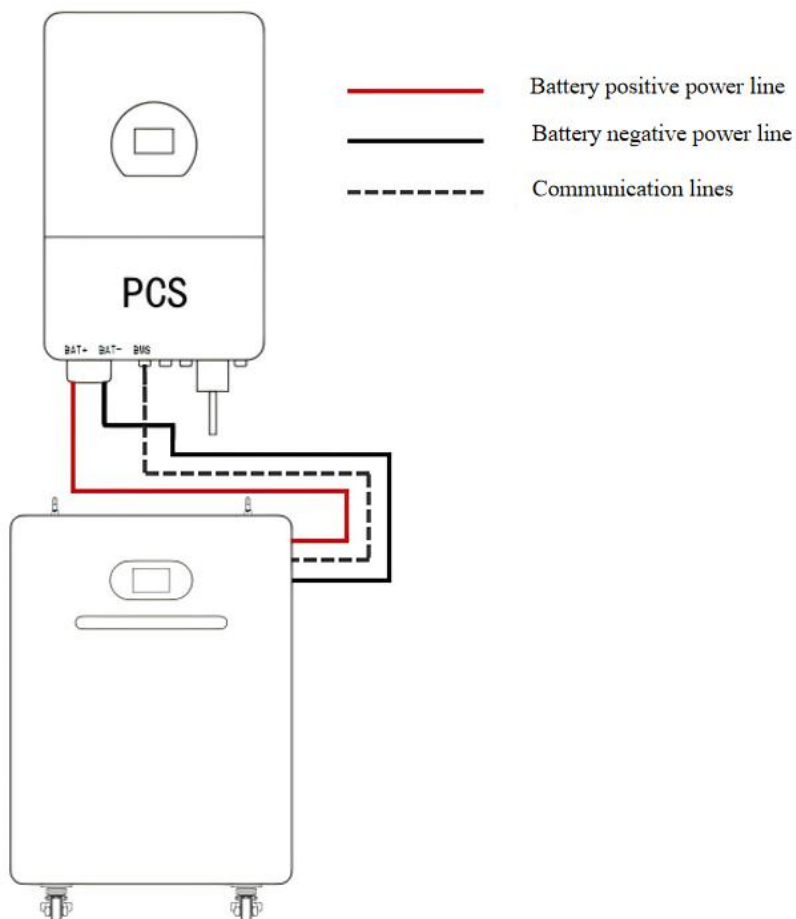


Figure 4.3.1 Overview of single unit wiring

4.3.2 Single-Unit Wiring Detail Diagram

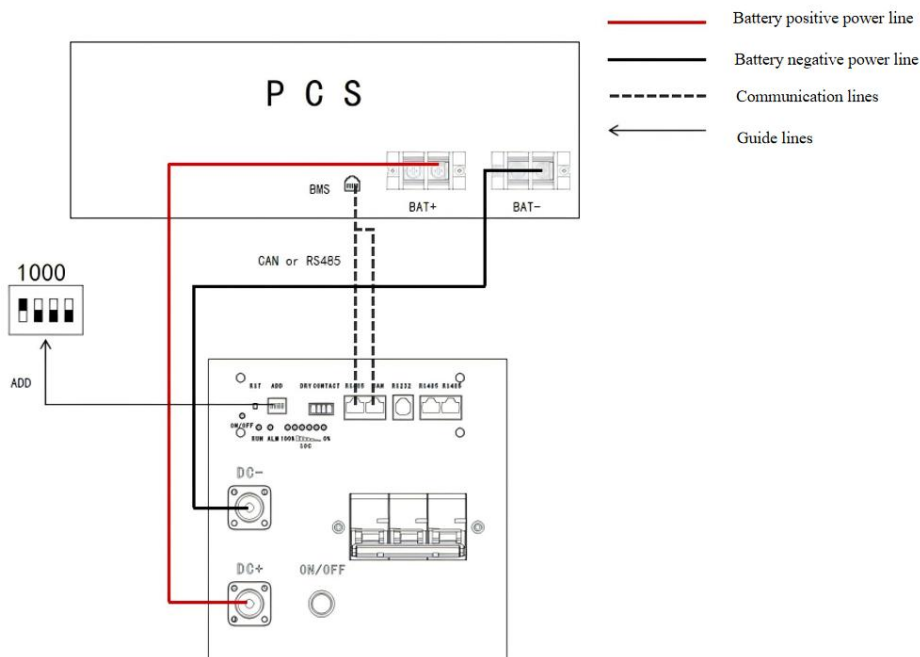


Figure 4.3.2 Single unit wiring

4.3.3 Installation steps

Step 1: Wear protective gloves.

Step 2: Install the positive and negative power cables for the battery:

- * Remove the protective cover from the battery power terminal.
- * Connect the battery's positive/negative power lines to the battery's positive/negative connectors DC+/DC-.
- * Reinstall the protective cover onto the battery's positive/negative connector.

Step 3: Connect the inverter:

Connect the other end of the battery's positive/negative power

lines to the corresponding positive/negative interfaces BAT+/BAT- on the inverter.

Step 4: Connect the communication cable:

Connect the RJ45 communication cable to the CAN/RS485 interface and then to the inverter's BMS communication interface.

Step 5: Perform battery DIP switch operation:

Set the DIP switch ADD to 1000.

4.4 Parallel system installation



Notice:

When multiple units are connected in parallel, the main unit (i.e., battery No. 1) needs to establish a communication connection with the inverter.



Warning !

Pay attention to distinguishing the positive and negative terminals of the cable. Avoid misusing the communication lines between the PCS and the battery, or between batteries.

Avoid cross-connecting batteries as much as possible.

4.4.1 Parallel Wiring Overview Diagram

Single inverter:

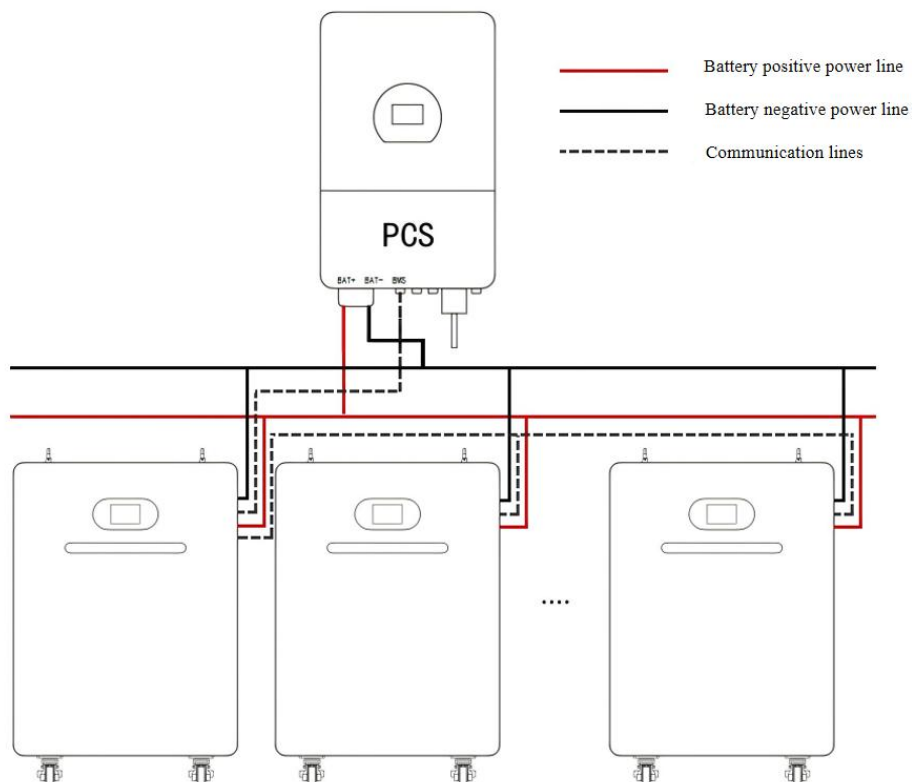


Figure 4.4.1.1 Parallel Wiring

Multiple inverters:

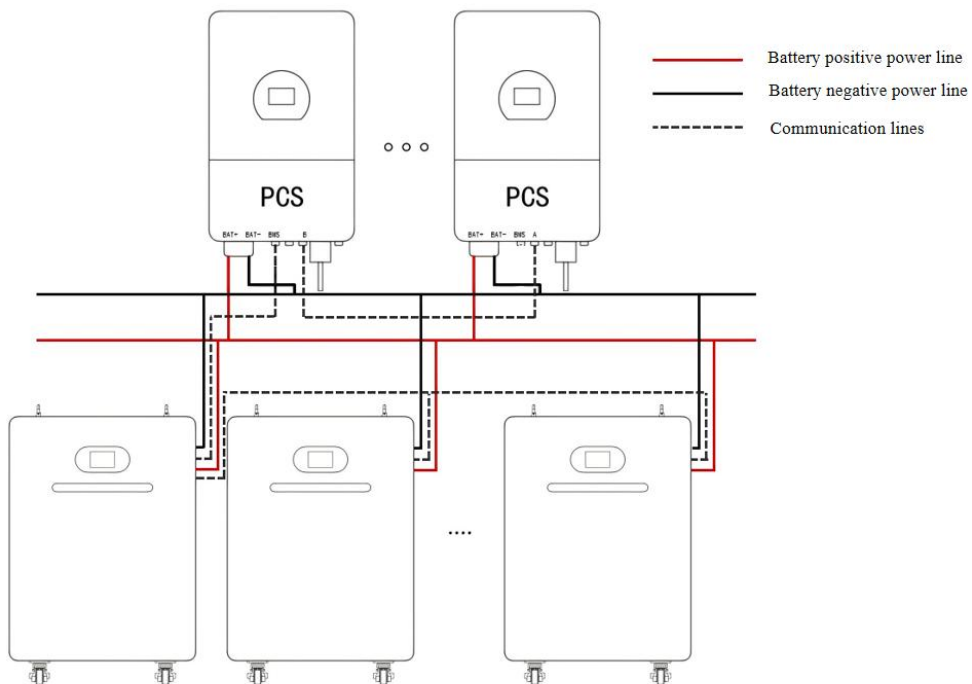


Figure 4.4.1.2 Parallel Wiring

4.4.2 Parallel wiring details diagram

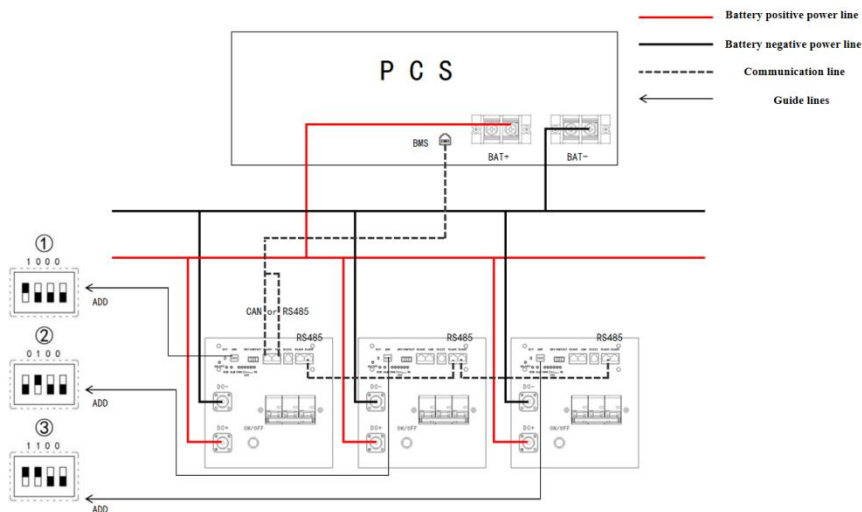


Figure 4.4.2 Parallel Wiring

4.4.3 Installation steps

Step 1: Wear protective gloves.

Step 2: Install the positive and negative power cables for the battery.

- * Remove the protective cover from the battery power terminal.
- * Connect the positive/negative power cables of the battery from the positive/negative connector of the host to the positive/negative connector DC+/DC- of the first slave battery, and then connect the positive/negative power cables from the first slave battery to the last slave battery.

* Reinstall the protective cover onto the battery's positive/negative connector.

Step 3: Connect the inverter.

Connect the other end of the battery's positive/negative power lines to the corresponding positive/negative interfaces BAT+/BAT- on the inverter.

Step 4: Connect the communication cable.

* Communication lines between the battery and inverter:

Connect the RJ45 communication cable to the CAN/RS485 interface of the main unit and the BMS communication interface of the inverter.

* Communication lines between batteries:

Connect the communication cable RJ45 to the first RS485 port of the master unit and then to the first RS485 port of the first slave unit. Connect the second RS485 port to the RS485 port of the next slave unit, and so on until the last slave unit is connected.

Step 5: Perform battery DIP switch operation.

Follow the DIP switch table to dial the switches sequentially, starting from the host machine. See Chapter 2.3.6 for details.

4.5 System installation check



Notice: The positive and negative power lines connected to the inverter must be connected in the following manner: the positive terminal of the battery is connected to the positive terminal of the inverter's battery port, and the negative terminal of the battery is connected to the negative terminal of the inverter's battery port. Otherwise, it will cause the system to spark.



Notice: In a parallel battery system, the power cables between

batteries must be connected in the correct order: positive to positive and negative to negative. Otherwise, the system may spark.



Notice: The CAN/RS485 interface of the first battery must be connected to the battery communication interface of the inverter; otherwise, the inverter will not be able to communicate with the battery.



Notice: The parallel communication interface RS485 of the first battery is connected to the parallel communication interface RS485 of the next battery, and so on, so that the communication of multiple batteries is connected together; otherwise, multiple batteries will not be able to communicate correctly.

After connecting the battery, please check the following:

- * Use of positive/negative cables
- * Connection of positive/negative terminals
- * All screws have been tightened.
- * All cables have been secured.
- * Communication cable connection is correct
- * Battery DIP switch correct
- * Installation of protective cover

5. System Operation

5.1 Check before power on

When the battery system is powered on, be sure to check the following to prevent system damage.

- * The inverter is installed firmly, the installation location is

convenient for operation and maintenance, the installation space is convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.

* The power line and communication line are connected correctly and firmly.

* The cable bundling complies with the routing requirements, is reasonably distributed, and is not damaged.

5.2 Battery Power-up



Notice: The circuit breakers between the inverter and the battery and between batteries must be installed in accordance with local laws and regulations

Step 1 Close the battery circuit breaker.

Step 2 Press the battery switch button.

Step 3 Close the circuit breaker between the battery and the inverter. (Optional)

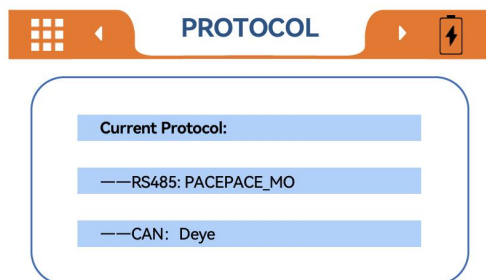
Step 4 Power on the inverter used in the system. For detailed operations, refer to the user manual of the corresponding inverter model.

Step 5 Close the load air switch.

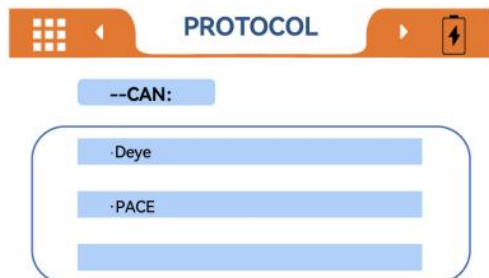
5.3 Battery Protocol Selection



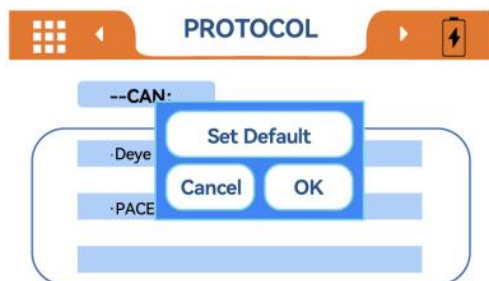
On the HOME page, click PROTOCOL to enter the communication protocol selection page.



Click on CAN or RS485 to enter the CAN or RS485 communication protocol selection.



Click on any agreement (left and right arrow keys to view other agreements) to enter the modification confirmation page, and enter the password: 123456.



Redirecting to this page, select: Set default: Set to the default value; Cancel: Cancel the setting agreement; OK: Confirm the setting agreement.

5.4 Battery power down

To shut down the battery system follow these steps in this order:

Step 1 Press the button switch.

Step 2: Confirm that the indicator light is off.

Step 3: Disconnect the power circuit breaker.

5.5 Mobile APP Download

According to the mobile phone system, select the download link:

Android entrance: Mobile phones that support GMS can download PACEEX App through Google Play Store, and Android phones that do not support GMS can install APK directly.

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

iOS entrance: Search for PACEEX downloads in the App Store

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

5.6 APP Bluetooth WiFi network configuration and settings

Scan the following QR code to view the APP operation process



6. Inspection, cleaning, and maintenance

6.1 Inspection

Inspect the wiring and contacts for looseness, damage, cracks, deformation, leakage, or any other type of damage. If the battery is found to be damaged, it must be replaced. Do not attempt to use or charge a damaged battery. Do not touch the liquid inside a cracked battery. Regularly check the battery's state of charge. Lithium iron phosphate batteries will slowly self-discharge when not in use or stored.

Consider replacing the battery if you observe any of the following:

- * Battery runtime is less than 70% of its original runtime.
- * Battery charging time has significantly increased.

6.2 Cleaning

If necessary, clean the battery with a soft, dry cloth. Never use liquids, solvents, or abrasives to clean the battery.

6.3 Maintain

Table 6.3 Maintenance Instructions

Maintenance Items	Maintenance Cycle
If the battery is not put into use, it shall be fully charged and then discharged to 30%–60%.	Every 3 months
Check whether the wall mount bracket is installed loose. If so, please tighten the corresponding position.	Every 6 months
Check the casing for damage. If any is found, please have it repainted or contact after-sales service.	Every 6 months

Check the exposed cables for wear. If any are found, replace the cables or contact after-sales service.	Every 6 months
--	-------------------



Warning:

* If you find any problems that may affect the battery or the battery and energy storage inverter system, please contact after-sales personnel. Unauthorized disassembly is prohibited ; any damage caused by unauthorized disassembly shall be borne by the dismantling party.

* If you find that the copper wire inside the conductive wire is exposed, do not touch it. There is a danger of high voltage. Please contact after-sales personnel. Do not disassemble it without permission.

* If any other emergency occurs, please contact after-sales personnel immediately, and the operation should be performed by professionals under the guidance of after-sales personnel.

7. Troubleshooting

To determine the status of the battery system, users can check the protection mode through the alarm/protection information interface on the battery screen or additional battery status monitoring software. Once the user understands the protection mode, please refer to the table below for solutions.

Table 7 Troubleshooting

Trouble type	Trouble occurrence conditions	Troubleshooting methods
Overvoltage Protection	Individual cell voltage $\geq 3.65V$, total voltage $\geq 58.4V$	Discharge current $> 2A$
Undervoltage Protection	Individual cell voltage $\leq 2.7V$, total voltage $\leq 43.2V$	Activation is achieved by connecting to the charger and

		receiving a charging current.
Overcurrent Protection During Charging and Discharging	Charge/discharge current $\geq 210\text{A}$	Automatically deactivated after 1 minute; Charging/discharging current $> 1\text{A}$
Short Circuit Protection	Reversed polarity of the power cord; short circuit during charging and discharging.	There is charging current, load removal
High Temperature Protection During Charging and Discharging	The charging/discharging cell temperature is $\geq 55^{\circ}\text{C}$	Charge/discharge cell temperature $\leq 50^{\circ}\text{C}$
Low Temperature Protection During Charging	The charging cell temperature is $\leq 0^{\circ}\text{C}$	Battery cell temperature during charging: $\geq 5^{\circ}\text{C}$
Discharge Low Temperature Protection	Discharge cell temperature $\leq$ -20°C	Discharge cell temperature $\geq$ -15°C
Environmental High Temperature Protection	Ambient temperature $\geq 55^{\circ}\text{C}$; Battery ambient temperature too high; Abnormal heat source present in the vicinity.	Ambient temperature $\leq 50^{\circ}\text{C}$
Environmental Low Temperature Protection	Ambient temperature $\leq -30^{\circ}\text{C}$; Battery ambient temperature too low.	Ambient temperature $\geq -25^{\circ}\text{C}$

8. Battery Recycling

Advanced hydrometallurgical processes are used to recover aluminum, copper, lithium, iron, and other metals from discarded LiFePO₄ batteries, achieving a comprehensive recovery efficiency of up to 80%. The specific process steps are as follows:

8.1 Cathode material recycling process and steps

Aluminum foil is an amphoteric metal used as a collector.

* First, it is dissolved in an alkaline NaOH solution, allowing aluminum to enter the solution as NaAlO₂. After filtration, the filtrate is neutralized with sulfuric acid solution, and then precipitation is performed to obtain Al(OH)₃. When the pH value is above 9.0, most of the aluminum will precipitate, and the resulting Al(OH)₃ can be analyzed to achieve a level of chemical purity.

* The filter residue was dissolved in sulfuric acid and hydrogen peroxide, allowing lithium iron phosphate to enter the solution as Fe₂(SO₄)₃ and Li₂SO₄, separating it from the carbon black and carbon coating the surface of the lithium iron phosphate. After filtration, the pH of the filtrate was adjusted with NaOH and ammonia. First, iron was precipitated with Fe(OH)₃, and the remaining solution was precipitated with saturated Na₂CO₃ solution at 90° C.

* Since FePO₄ is slightly soluble in nitric acid, the filter residue is dissolved in nitric acid and hydrogen peroxide to directly precipitate FePO₄. Impurities such as carbon black are separated from the acidic solution. Fe(OH)₃ is leached from the filter residue, and Li₂CO₃ is precipitated at 90° C with saturated Na₂CO₃ solution.

8.2 Anode material recycling

The recycling process for anode materials is relatively simple. After separating the anode plates, the purity of copper can reach over 99%, which can be used for further purification of electrolytic copper.

8.3 Diaphragm recycling

The membrane material is harmless and has no recycling value.

8.4 List of recycled equipment

Automatic dismantling machine, crusher, wet metal pool, etc.

**Yichun Dawnice Manufacture and Trade Co., Ltd.**

Add :No. 111 Yishang Avenue, Yuanzhou District, Yichun City, Jiangxi, China

After-sales email: aftersale@dawnnice.com

Postcode: 336000

※ The product information and parameters are subject to change without prior notice.