ELEMAGIC-10.2 LV

User Manual

Light up every corner of the world with renewable energy.

Content

1 General Information

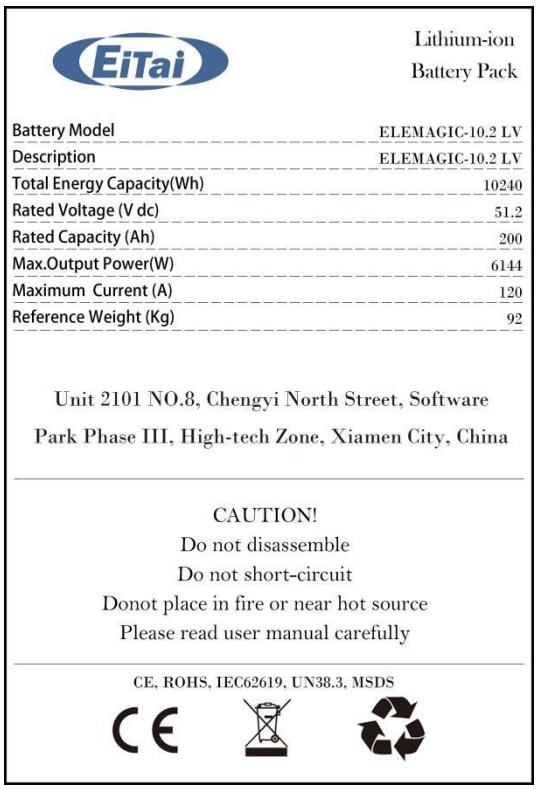
This manual introduces the **ELEMAGIC-10.2 LV** battery products. Which includes: battery information, using way, guide, safety information, installation guide, common issues and maintenance. Please read this manual carefully before using the battery. For any questions, please contact EITAI immediately for advice and clarification.

ELEMAGIC-10.2 LV is an energy storage unit,that is designed for residential application scenarios with the capability of short-term backup, not suitable for supporting life-sustaining medical devices. This product is intended for used only in accordance with the information provided in the enclosed documents and applicable local standards and regulations. Any other use may result in personal injury or property damage. The illustrations in this manual are only intended to help explain the concept of the system configuration, including use guidelines, safety precautions, common operating problems, and subsequent battery maintenance.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of EITAI. Unauthorized changes will not be allowed by warranty claims. EITAI shall not be liable for any damage resulting from such changes. Any use of the product other than described in the intended use section does not qualify as appropriate. The enclosed documentation is an integral part of this product. Please keep the documentation in a safe and convenient place for future reference.

The type labels were attached on the product, which contain the product identification information. For safe usage, the user must be well-informed of the contents in the type labels.

Labels:



2 Safety Measures

This section contains safety information that must always be observed when using or installing batteries. To prevent personal injury or property damage and ensure long-term operation of the batteries, please read this section carefully, always watch for warnings from all safety messages.

Environmental requirements:

1. Do not expose the battery to temperature above 50 °C;
2. Do not place the battery near any heat source;
3. Do not expose the battery to moisture or liquid;
4. Do not expose the battery to a corrosive gas or liquid;
5. Do not expose the battery to a combustible gas or liquid;
6. Place the battery in safe place that away from children and animals.

Operation Precautions:

1. Do not disassemble the battery;
2. Do not touch the battery pack with wet hands;
3. Do not smash, fall, or puncture the battery;
4. Do not short-circuit the terminal, and remove all metal jewelry items that may produce a short-circuit before installation and repair;
5. Always handle the products in accordance with the local safety regulations;
6. Store and use the battery in the user's manual, 8.Ensure reliable grounding;
7. Disconnecting all batteries to the wires before installation and repair;
8. The stacking of packaging batteries shall not exceed the quantity specified on the packaging.

3 Technical Parameters

Model	ELEMAGIC-10.2 LV
Electrical parameters	
Battery type	LiFePO4
Nominal capacity (Ah)	200
Nominal voltage (V)	51.2
Working voltage (V)	46.4~57.6
Nominal energy (kWh)	10.24
Available energy(kWh)	9.22 (90%DOD)
Maximum number of parallel	Max.15 pcs pack in parallel
Nominal DC power(kW)	4.1
Maximum DC power(kW)	6.14
Charging/ Discharging current (A)	Recommend: 80
	Max.: 120
General parameters	
Depth of discharge	90%
Dimension (H/W/D, mm)	876*528*135
Weight (kg)	92
Protection level	IP54
Working temperature	0℃~60℃
Storage temperature	0℃~35℃
Working humidity	5%~95%
Working altitude	≤2000m
Circle life	≥6000 times
Installation	Wall-mounted, floor-mounted
Cooling mode	Nature cooling
Communication port	CAN,RS485，RS232
Warranty	10years (5+5)
Certificate	CE, IEC62619, ROHS, UN38.3, MSDS

* The current is affected by temperature and SOC

4 Product Overview

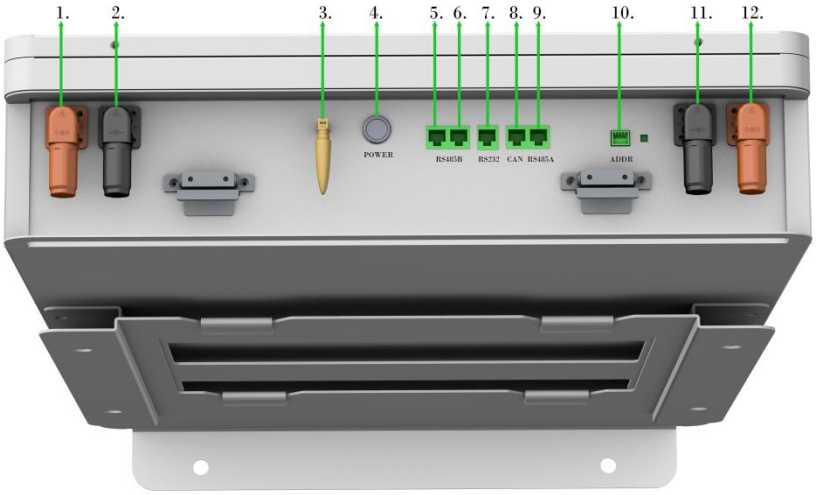
4.1 Brief Introduction

ELEMAGIC-10.2 LV is a lithium battery energy storage system with an operating voltage range of between 46.4~57.6v, it is used for household energy storage applications, in cooperation with low voltage inverters to achieve home energy storage purpose.

ELEMAGIC-10.2 LV has a built-in BMS (Battery Management System) which can manage and monitor cells information, including voltage, current and the temperature. In addition, the BMS can balances battery charging to extend lifespan. BMS has the protections including over-discharge, overcharge, over-current, high / low temperature, etc. The exterior is equipped with a touch color screen, which can clearly observe the status of the energy storage system or switch to the communication protocol with other brands.

The system can automatically manage the charging status, discharge state, balance state. Multiple batteries can be connected in parallel to expand storage capacity to meet larger capacity and continuous power support time, **ELEMAGIC-10.2 LV** support up to 15 parallel operations.

4.2 Hardware and Instructions

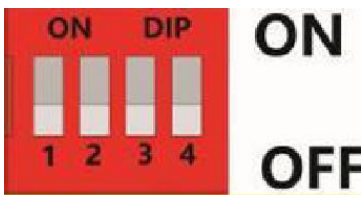


NO.	Items	NO.	Items
1.	Battery positive pole	2.	Battery negative pole
3.	WIFI (optional)	4.	Power Switch
5.	RS485B port-battery parallel communication	6.	RS485B port-battery parallel communication
7.	RS232 port-upper computer communication	8.	CAN port-inverter communication
9.	RS485A port-inverter communication	10.	ADDR dial address
11.	Negative pole	12.	Positive pole
Touch screen (front)			

4.2.1 Power Switch

Press the power switch, release the button, and the button is locked.

4.2.2 Dip Switch Definition



Schematic Diagram of the Dial-up Switch

The dial-dip switch is used to set the BMS address of each battery. The code value of the dial-ON position is 1, and the code value of the dial-1234 position is 0.

The host battery address is 1, and the slave battery address is 2 to 15. (The host is connected to the inverter, and the slave machines are arranged in numerical order according to the address)

The dial-up address table is as follows:

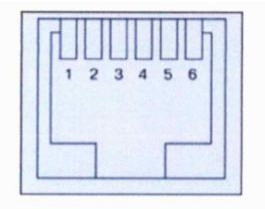
Dial-up code location				Ads	Dial-up code location				Ads	Dial-up code location				Ads	Dial-up code location				Ads
#1	#2	#3	#4		#1	#2	#3	#4		#1	#2	#3	#4		#1	#2	#3	#4	
0	0	0	0	X	0	0	1	0	4	0	0	0	1	8	0	0	1	1	12
1	0	0	0	1	1	0	1	0	5	1	0	0	1	9	1	0	1	1	13
0	1	0	0	2	0	1	1	0	6	0	1	0	1	10	0	1	1	1	14
1	1	0	0	3	1	1	1	0	7	1	1	0	1	11	1	1	1	1	15

4.2.3 RS485-A/CAN Inverter Communication Port

RS485-A					CAN			
	Definition description		Definition description			Definition description		Definition description
PIN1	RS485-B	PIN5	/		PIN1	/	PIN5	CAN-L
PIN2	RS485-A	PIN6	/		PIN2	/	PIN6	/
PIN3	/	PIN7	RS485-A		PIN3	/	PIN7	/
PIN4	/	PIN8	RS485-B		PIN4	CAN-H	PIN8	/

The CAN communication terminal (RJ45 port) follows the CAN/RS485 protocol and connects to the inverter BMS for communication. The BMS controls the charging current/charging voltage or discharge current/discharge cut-off voltage of the inverter based on the battery voltage and battery temperature through CAN/RS485 communication.

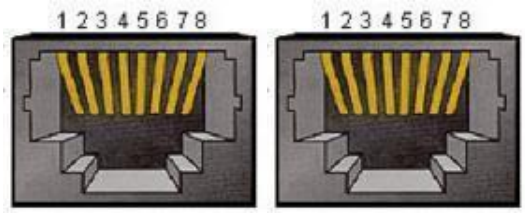
4.2.4 RS232 Upper Computer Port



	Definition description		Definition description
PIN1	/	PIN4	RX
PIN2	/	PIN5	GND
PIN3	TX	PIN6	/

RS232 communication port (RJ11 port) follows RS232 protocol, support the connection with upper computer to read and modify the battery spec.

4.2.5 RS485-B Battery Parallel Port



	Definition description		Definition description
PIN1	RS485-B	PIN5	/
PIN2	RS485-A	PIN6	/
PIN3	/	PIN7	RS485-A
PIN4	/	PIN8	RS485-B

4.3 LED Display Description

4.3.1 Enter Setting Page

Main setting page display the real time battery SOC, total voltage and current.

4.3.2 Check Voltage Information of Each Cell

Click the right arrow icon to check the voltage of each cell.

1) Respectively in the figure shows the single section of 16 series of batteries batteries voltage.

2) In green (3.308mv) shows the minimum voltage of cell, and is cell 5.

3) Figure in red (3.313mv) shows the highest voltage of cell, and is cell 1.

4) Voltage shows the values for the total voltage, Current shows the real time current.

4.3.3 Communication Protocol Setting

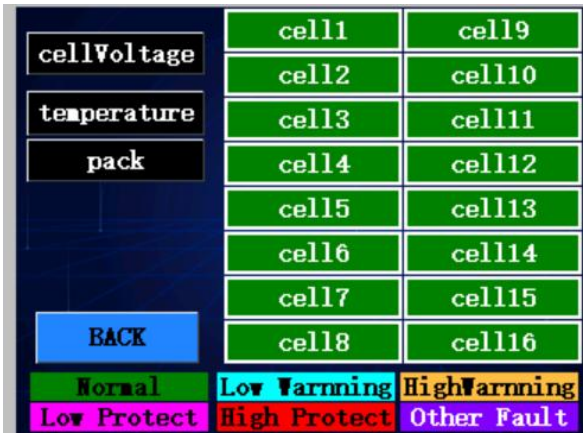
Click the right arrow icon to enter the setting page.

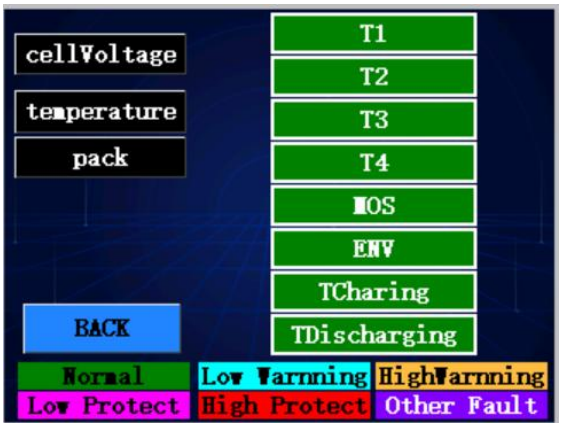
1) Click PYTHON - 485 can choose 485 communication protocol, select the needed protocol after enter the setting page, click SAVE to SAVE, click CANCEL to CANCEL the choice.

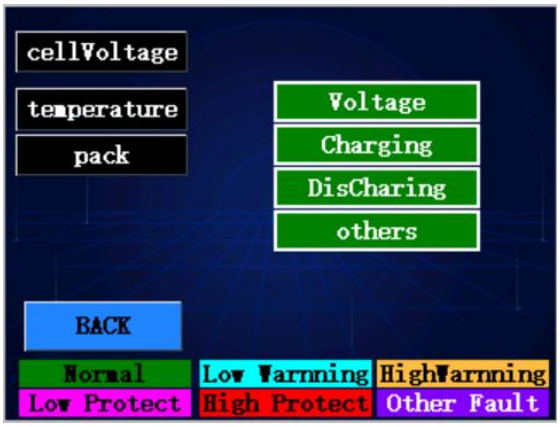
2) PYTHON - CAN click CAN select the CAN communication protocol, select the needed protocol after enter the setting page, click SAVE to SAVE,click CANCEL to CANCEL the choice.

4.3.4 Alarm Warning Information

When an alarm is generated, an alarm icon is displayed on the home page. Click the icon to view alarm details.







Name	Define
Cell voltage	Cell voltage
Temperature	Cell temperature
Pack	Battery pack status
Normal	Normal
Low warning	Low voltage warning
High warning	Over voltage warning
Low protect	Low voltage protection
High protect	Over voltage protection
Other fault	Others

5 Installation guide

5.1 Inspection Before Installation

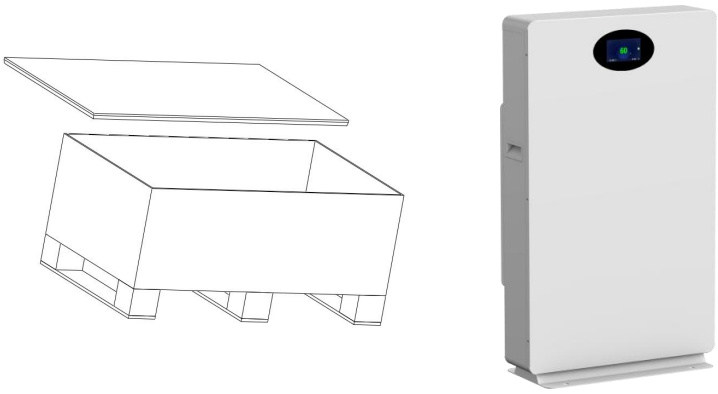
5.1.1 Check the Outer Packaging

Packaging materials and components may be damaged during transportation. Therefore, please check the packaging material before installing the battery. Check the surface of packaging materials for damage, such as holes and cracks. If any damage is found, do not unpack the battery and contact the dealer as soon as possible. It is recommended that you remove the packaging material within 24 hours before installing the battery.

5.1.2 Check Whether the Accessories Are Complete

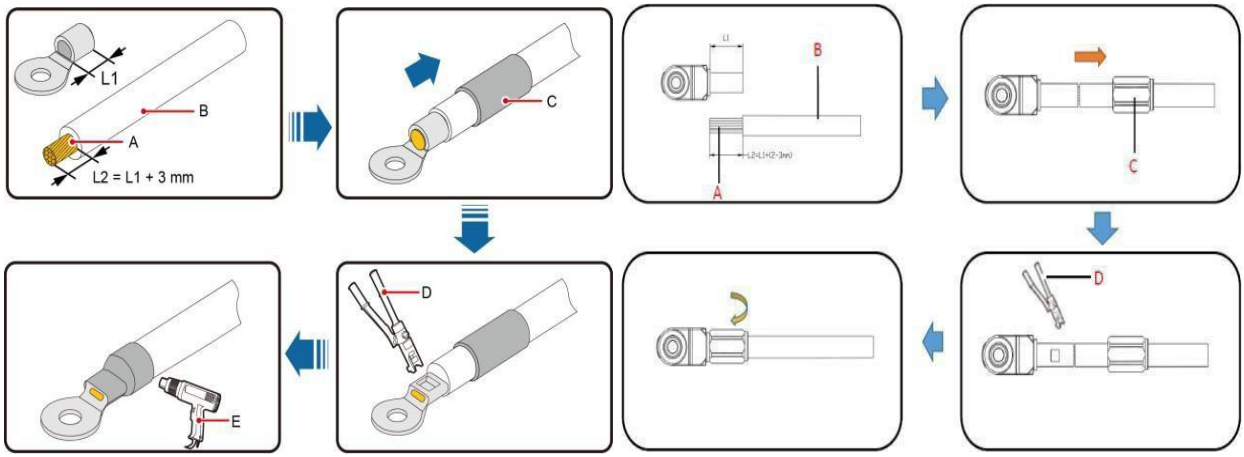
After opening the packing box, check whether the attached accessories are complete. If any damage or missing parts are found, contact your dealer.

Accessories list in the package



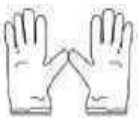
ELEMAGIC-10.2 LV					
NO.	Name	Model	Unit	Qty	Mark
1.	Battery	ELEMAGIC-10.2 LV	PCS	1	
2.	Wall-hanging- for battery locking	Steel	PCS	1	
3.	Wall-hanging- for wall locking	Steel	PCS	1	
4.	Base	Steel	PCS	1	
5.	Cross outer hexagon triple combination bolt	M8*16	PCS	6	
6.	Internal expansion screw	M10*80	PCS	4	
7.	RS232-USB cable		SET	1	For upper computer
8.	Connector	125A/200A, Orange +, Black -	SET	1	
9.	Extra soft silicone wire	4AWG/2AWG(black) 1.5M	PCS	1	For inverter connection
		4AWG/2AWG(red) 1.5M	PCS	1	
10.	Network Connector	1 to 2	PCS	1	For battery parallel
11.	OT cord end terminal	25-10	PCS	2	Back-up
12.	Heat shrinkable tube	Ø12 (40mm)	PCS	2	Back-up
13.	Communication cable	1+1 crystal head/1.5m	PCS	1	For inverter communication
		Network cable1m	PCS	1	Back-up
		1+1 crystal head /0.2m	PCS	1	For parallel communication
14.	Crystal head	8P/ gilding 3U	PCS	2	Back-up
15.	Built-in WIFI module		PCS	1	Optional
16.	User manual		PCS	1	

Manufacturing instructions for power cable terminals:



(A) Copper core line	(B) Insulation layer	(C) Heat-shrink tube		(A) Copper core line	(B) Insulation layer
(D) Hydraulic pliers	(E) Hot-air gun			(C) Protective cover	(D) Hydraulic pliers

5.2 Tools

Type	Tools			
Installation	Measuring tape 	Hammer drill 	Socket wrench 	Cross Screwdriver 
Protection	ESD gloves 	Safety goggles 	Dust mask 	Safety shoes 

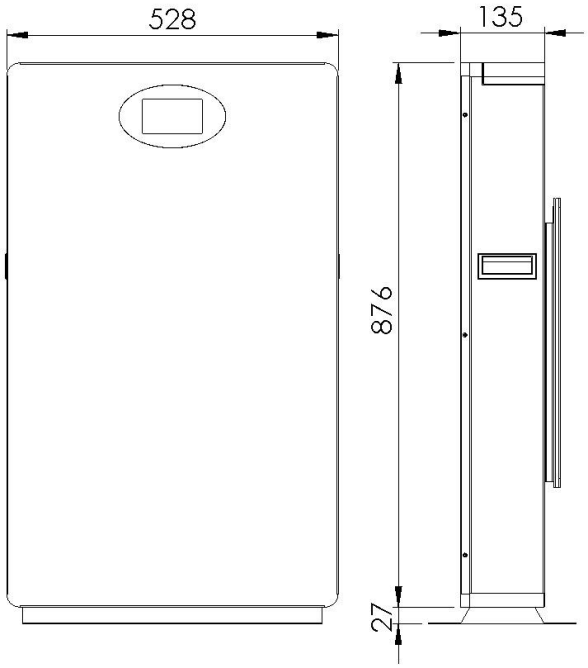
5.3 Installation Requirements

1. Install the battery in an indoor environment.
2. Place the battery in a safe position away from children and animals.
3. Do not place the battery near any heat source, and avoid generating sparks.
4. Do not expose the battery to moist air or liquid.

5. Do not expose the battery to direct sunlight.
6. Do not expose the battery to a combustible gas or liquid.
7. The mounting carrier shall be fire resistant. Do not install batteries on flammable buildings.

5.4 Installation Instructions

5.4.1 Overall Dimensions



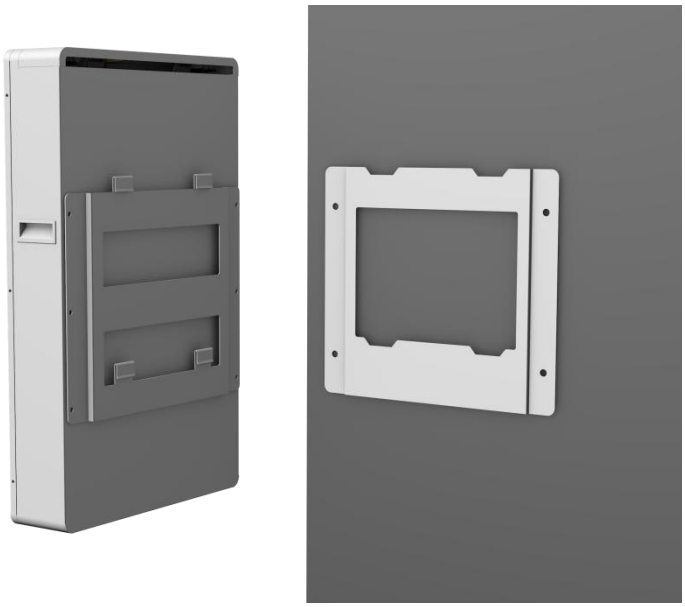
5.4.2 Installation Distance

To ensure ventilation, dry heat dissipation, keep 200mm open around the battery.

5.4.3 Fix the Battery

1.Wall Mounted Installation:

Fix the “wall-hanging- for wall locking” at the appropriate position on the wall and punch holes; knock in the expansion screw; lock the “wall-hanging- for wall locking”; install the battery on the wall with “Wall-hanging- for battery locking”; align the buckle to the wall sheet metal, as shown in the figure.



2.Ground Mounted Installation:

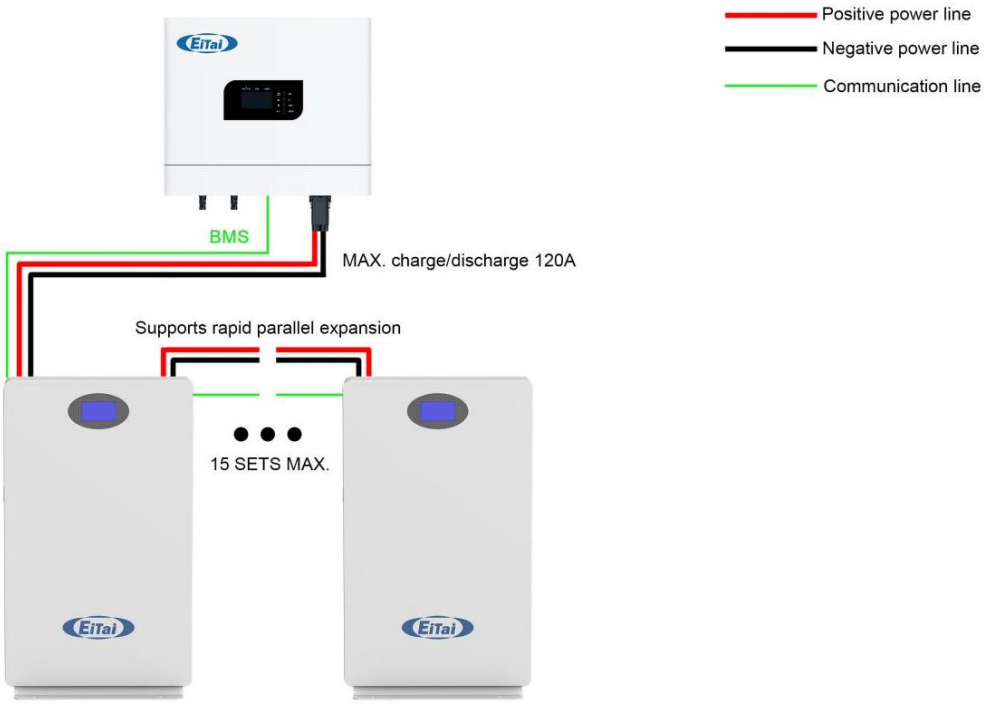
Make expansion screw holes on the ground according to the base; lock the base and battery with the corresponding fixing screws; secure the battery to the expansion screws.

5.4.4 Connect the Power Cable

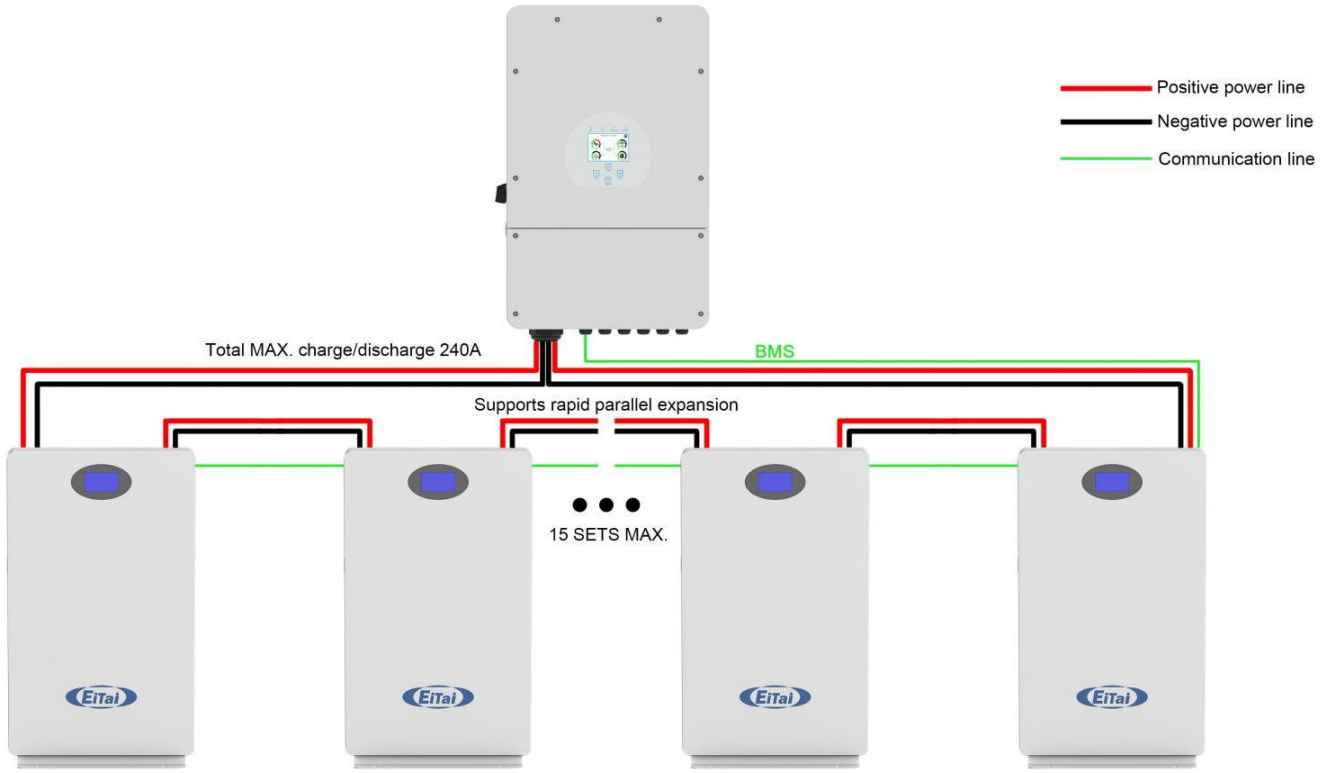
If need parallel, ensure that the voltage difference between parallel batteries is within 1V; for system efficiency, it is recommended the the battery production date within 1 year.

Put the positive battery terminals together, and the negative battery terminals together.

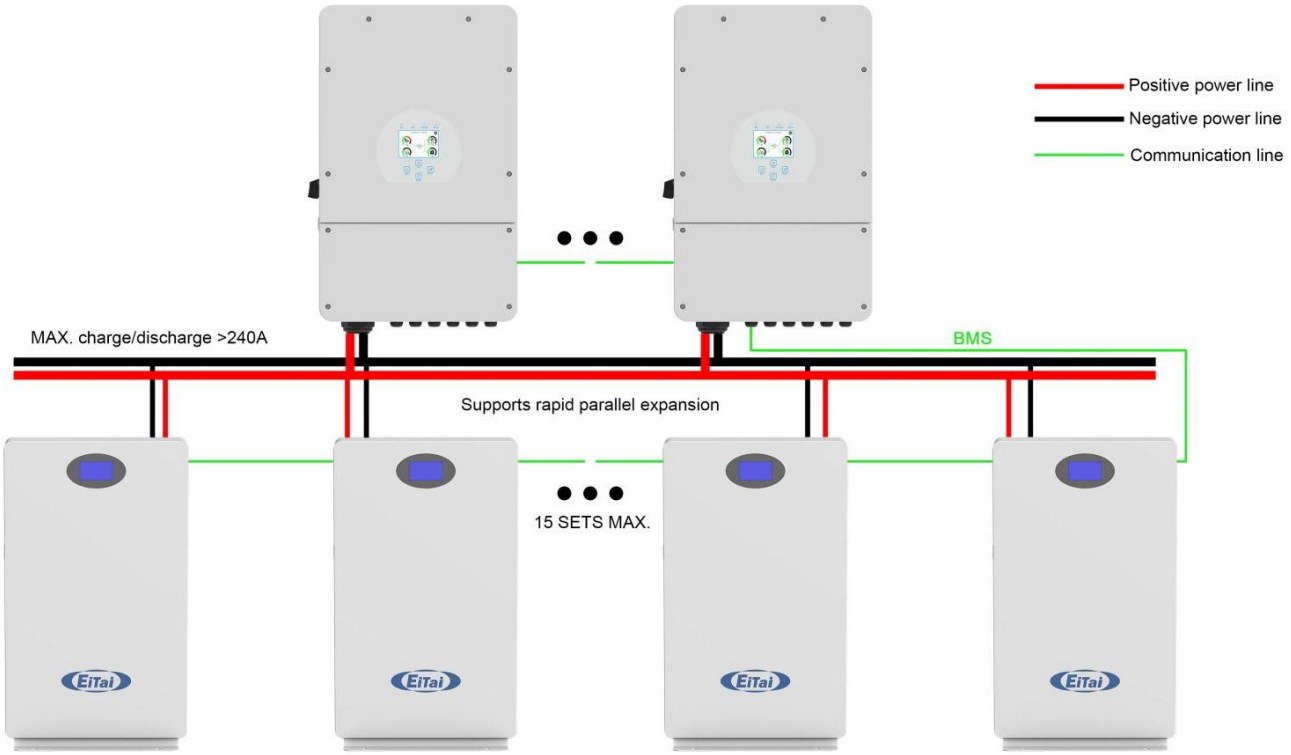
1. System <6kW:



2. System <12kW:



3. System >12kW:



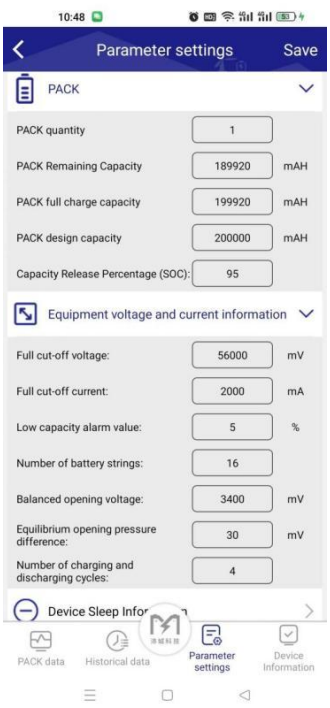
5.4.5 Set BMS Communication Address

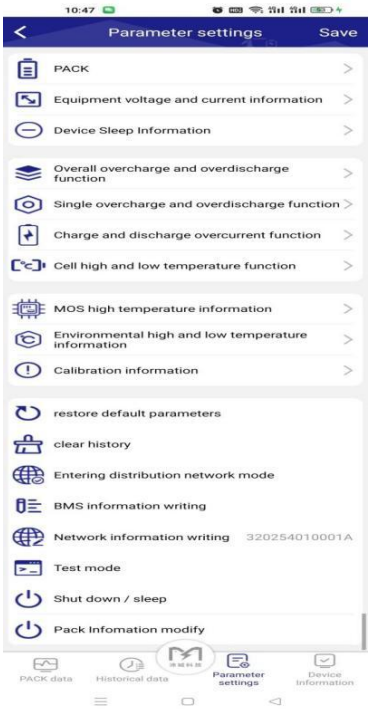
Please refer to 4.2.2: the dialing rule is to set the battery module address in sequence.

5.4.6 Connect the Built-in Wifi Module (Optional)

After downloading the monitoring software, you can choose between Bluetooth connection and wifi binding. After binding to wifi, you can remotely monitor, modify parameters, and upgrade programs.

If there is an optional wifi module, please refer to the attached wifi manual for specific connection settings.


10:48
Parameter settings
Save
PACK
PACK quantity
1
PACK Remaining Capacity
189920
mAH
PACK full charge capacity
199920
mAH
PACK design capacity
200000
mAH
Capacity Release Percentage (SOC):
95
Equipment voltage and current information
Full cut-off voltage:
56000
mV
Full cut-off current:
2000
mA
Low capacity alarm value:
5
%
Number of battery strings:
16
Balanced opening voltage:
3400
mV
Equilibrium opening pressure difference:
30
mV
Number of charging and discharging cycles:
4
PACK data
Historical data
Parameter settings
Device Information


10:47
Parameter settings
Save
PACK
Equipment voltage and current information
Device Sleep Information
Overall overcharge and overdischarge function
Single overcharge and overdischarge function
Charge and discharge overcurrent function
Cell high and low temperature function
MOS high temperature information
Environmental high and low temperature information
Calibration information
restore default parameters
clear history
Entering distribution network mode
BMS information writing
Network information writing
3202540100001A
Test mode
Shut down / sleep
Pack Infomation modify
PACK data
Historical data
Parameter settings
Device Information

6 Cleaning and Maintenance

6.1 Cleaning Work

Please note: please turn off the power supply of the system before cleaning. It is recommended to clean battery regularly. If the shell is dirty, please use a soft and dry brush or dust collector to remove the dust. Do not use solvents, or corrosive liquids to clean the enclosure.

6.2 Maintenance

6.2.1 Recharging Requirements During Normal Storage

The battery shall be stored in an environment with a temperature range of -10℃~45℃ and shall be maintained regularly according to the following table to 0.5C current is charged until 40%SOC after long storage.

Charging conditions during storage

Store the ambient temperature	Relative humidity of the storage environment	Storage time	SOC
Below -10℃		Prohibit	/
-10~25℃	5%~70%	≤12 months	30%≤soc≤60
25~35℃	5%~70%	≤6 months	30%≤soc≤60
35~45℃	5%~70%	≤3 months	30%≤soc≤60
Above 45℃		Prohibit	

6.2.2 Recharging Requirements for Excessive Discharge

Charge the over-discharge (90%DOD) battery within the time of meeting the table below, otherwise the over-discharge battery module will be damaged.

Charging requirements for excessive battery discharge

Storage environment temperature	Storage time	Note:
-10~25℃	≤ on Day 15	The battery pack disconnected to PCS, charge the battery with DC charger.
25~45℃	≤ on Day 7	
-10~45℃	<12 hours	Battery pack connect to the

7 Common Issues and Solutions

7.1 Common Issues and Solutions

The user can monitor the operating status, warning, and alarm information through the inverter LCD display.

1. The battery cannot be turned on, and the LED indicator lights all turn off the battery depth discharge and requires charging first. If the external charger supply voltage is 51V or above and the battery still cannot be opened, contact EITAI.

2. If red light shows system abnormal, please check below values:

1) Temperature: Above 60℃ or below 0℃, the battery protection turns on, could not charge.

Solution: Move the battery to normal operating temperature range between 0°C to 60 °C.

2) Temperature: above 60℃ or below -20℃, the battery cannot discharge.

Solution: Move the battery to normal operating temperature range between -20°C to 60 °C.

3) Current: If current is greater than 120A, the battery protection device will be turned on.

Solution: Stop using electrical appliances that exceed the maximum battery power load.

4) High voltage: If the battery voltage is above 57.6V or above, battery charging protection turns on.

Solution: The inverter will stop charging the battery if it sets the intelligent LI mode or a reasonable charging voltage.

5) Low voltage: The battery discharge protection is turned on when the battery discharges to 46.4V or lower.

Solution: Charge the battery until the red light goes off.

Excluding the above five points, if the fault cannot be found, turn off the battery and contact EITAI.

3. It's normal that the SOC LED are different if in multiple battery parallel systems. Before installing batteries in parallel, measure the voltage of each battery to ensure that the voltage difference of each battery is within 1V, and the the battery production date within 1 year.

1) When installing for the first time, please charge in full first to balance the capacity gap;
2) If the error is within 10% when the lowest SOC display percentage is compared with the highest SOC display percentage, and the SOC display percentage is the same within 10 minutes, it is normal operation;

3) Before expanding battery capacity, please charge and discharge the online battery to 45%-50%SOC; After expanding the capacity, charge the battery system to balance the capacity gap. Ensure that the capacity difference before parallel is no more than 10%. If the capacity gap is large, it will take about 2 cycles to balance the capacity gap. The actual equilibrium time depends on the capacity difference and the charge-discharge current.

Exclude the above three points. If the SOC display still fails, please contact EITAI.

7.2 Emergency

Please cut off the power supply and turn off the battery in an emergency.

1. **If the battery pack is damp or immersed in water**, do not get close to the battery, and then contact EITAI or an authorized dealer for technical support.
2. **Do not use water to fire when a fire!** Only dry powder extinguishers; place the battery pack in a safe area if possible.
3. **Battery leaking the electrolyte If the battery pack leaks the electrolyte**, avoid contact with leaking liquid or gas.

If someone is exposed to the leaking material, do the following immediately:

Inhalation: evacuate the contaminated areas and seek medical treatment.

Contact eye: Rinse eyes with running water for 15 minutes and seek medical treatment.

Contact skin: Wash the infected site with soap and water and seek medical treatment.

Swallow in: urge vomiting, and seek medical treatment.

Battery damage: Damaged battery is dangerous and must be treated with very carefully. Battery cannot be used or may be dangerous to person or property. If the battery pack is damaged, contact EITAI for handling.

7.3 About Battery System

1. The system treatment must comply with the locally applicable disposal regulations of electronic waste and second-hand batteries.
2. Do not treat the battery system along with household waste.
3. Avoid exposing the battery to high heat or direct sunlight.
4. Avoid exposing the battery to high humidity or corrosive environments.
5. Do not expose the battery to a combustible gas or liquid.

EITAI green energy, better service, getting "brighter".

Eitai（Xiamen）New Energy Technology Co.,Ltd.

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