USER MANUAL

MODEL: BSTG-512100 / 512200

1.Due to product development, product specifications and functions may change. The latest manual can be obtained via https://www.bestsolar-group.com. Every effort has been made to make this document complete, accurate and up-to-date. However, individuals reviewing this document, as well as installers or service personnel, should note that the company reserves the right to make changes without notice and shall not be liable for any damages, including indirect, incidental or consequential damages arising from reliance on the provided materials, including but not limited to omissions, typographical errors, arithmetic errors or listing errors in the materials provided in this document.

2.The company shall not be liable for the customer's failure to comply with correct installation instructions, nor shall it be liable for upstream or downstream systems provided by the company's equipment.

3.The customer shall bear full responsibility for any modifications made to the system; therefore, any hardware or software modifications, manipulations or changes not explicitly approved by the manufacturer shall result in the immediate cancellation of the warranty.

4.Considering the numerous possible system configurations and installation environments,the following requirements must be met：

- Sufficient space to accommodate the equipment.
- Keep away from irritating chemicals or vapors.
- Potential flammability hazards.

5.The company shall not be liable for defects or malfunctions caused by the following reasons:

- Improper use of the equipment.
- Deterioration caused by transportation or specific environmental conditions.
- Incorrect or no maintenance at all, and long-term undercharging of the battery.
- Tampering or unsafe repairs.
- Use or installation by unqualified personnel.

Catalogue

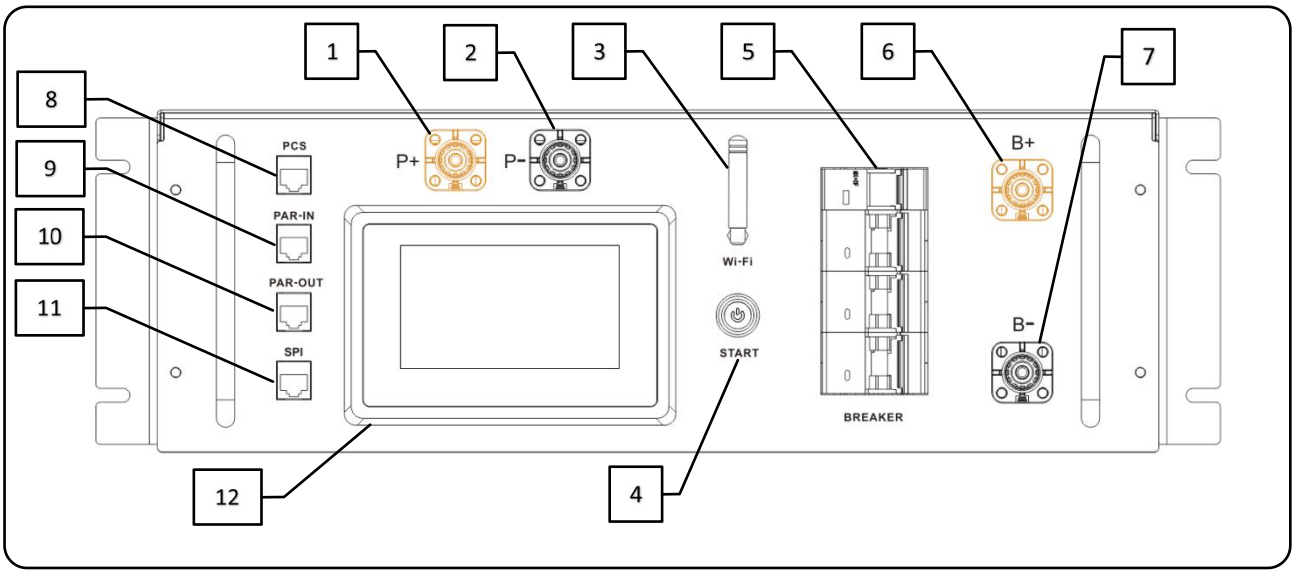
（**Revision History**）

Version No.	Date	Revision Content
A0	2026.4.8	Initial Version

1.1 Product Overview

This product is a rack-mounted household high-voltage energy storage lithium battery independently developed by our company. Equipped with our proprietary BMS protection system, it boasts a long cycle life and high safety standards. The casing is sturdy, the appearance is exquisite, and the installation is simple. It can be widely applied to off-grid, grid-connected, and hybrid inverter energy storage systems.

1.2 Power Distribution Unit Interfaces



No.	Name	Description
1	P+	Connect to the positive pole of the inverter-Connect 4AWG cable
2	P-	Connect to the negative pole of the inverter-Connect 4AWG cable
3	WIFI	Remotely monitor and upgrade batteries through an application
4	START	System start switch, Press the button BMS will works
5	BREAKER	Control circuit output, turn the switch to ON when use
6	B+	Connect to the positive terminal of the battery
7	B-	Connect to the negative terminal of the battery
8	PCS	Battery communication with PCS by RJ45 8P8C
9	PAR-IN	Detecting ports and parallel interfaces
10	PAR-OUT	Detecting ports and parallel interfaces
11	SPI	Communicate with the battery through this port
12	LCD	Display,Status indicator

1.3 Product Features

Advantages

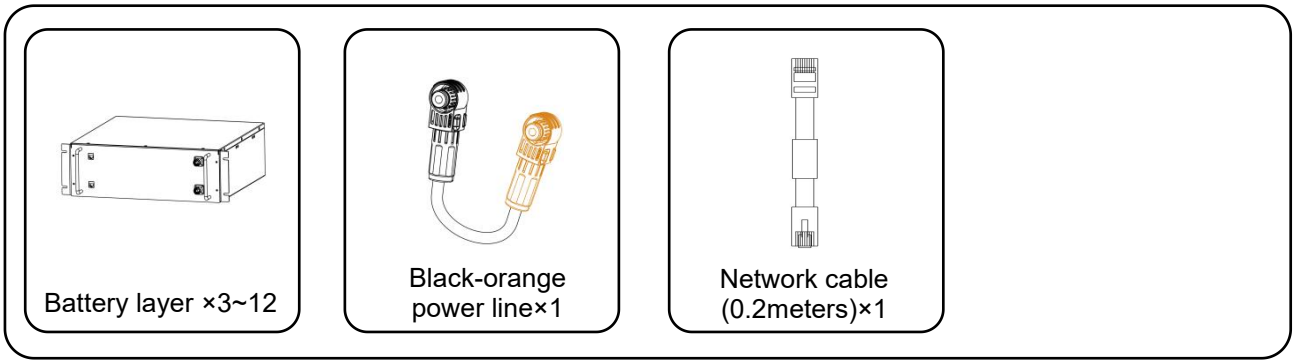
- The module is non-toxic, pollution-free and environmentally friendly.
- The positive electrode material is made of LiFePO4, featuring safety performance and long cycle life.
- Built-in soft start function to reduce the impact of current surges.
- When multiple modules are connected in series, the module addresses are set automatically.
- Supports module upgrading from a computer via CAN or WIFI communication.
- The built-in management system has protection functions such as over-discharge, over-charge, over-current and high/low temperature protection.
- The system can automatically manage the charging and discharging status of each battery and has a voltage balancing function.
- Flexible configuration; multiple battery modules can be connected to expand capacity.
- Suitable for load design of household appliances, communication base stations, optical storage and charging equipment, etc., easy to install and operate.
- The module has low self-discharge, no memory effect and good shallow charge-discharge performance.

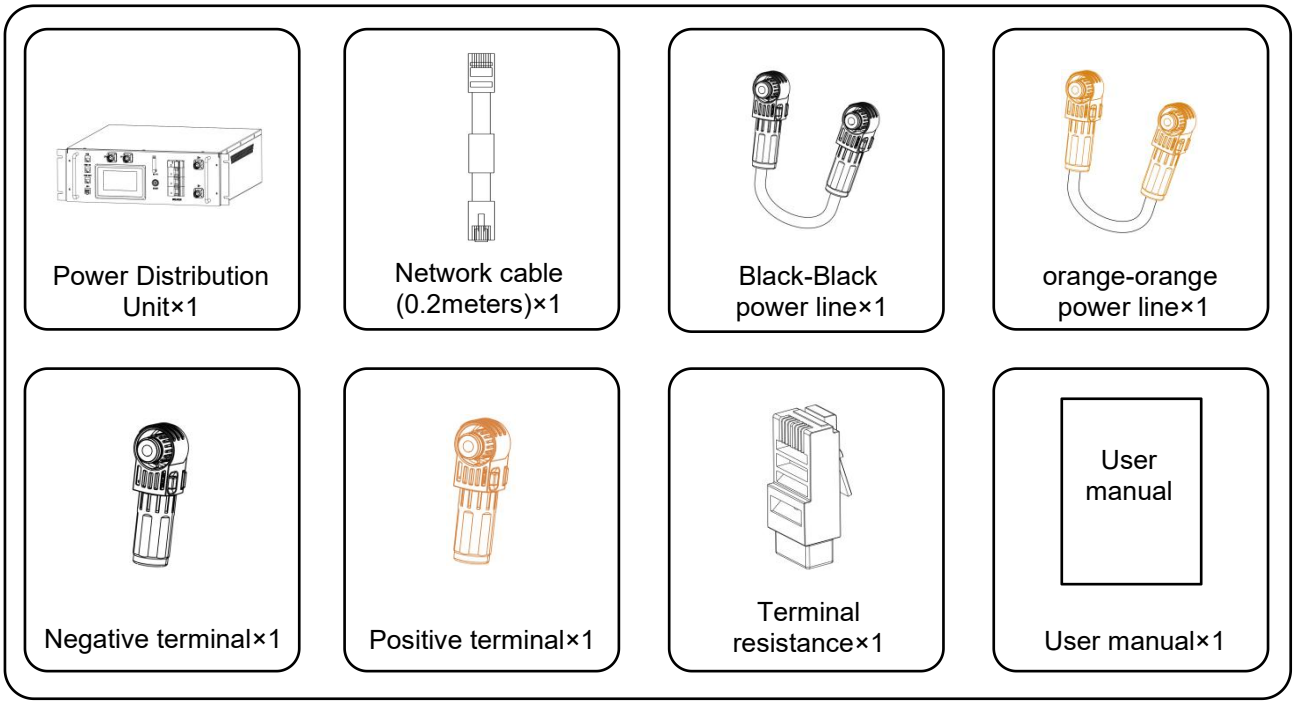
Functions

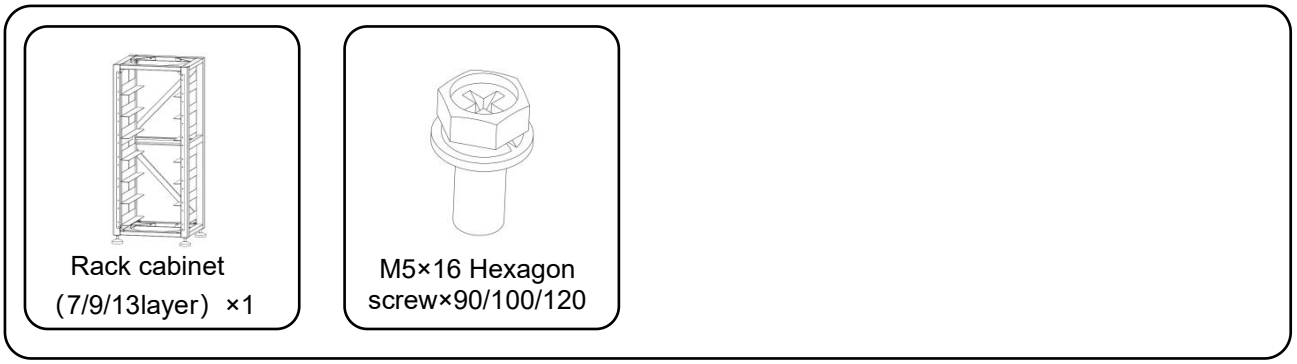
Protection and Alarm	Management and Monitoring
Charge/Discharge stop	Cell Balance
Over-Voltage and Over-Charge Protection	Intelligent Charging Model
Under-Voltage and Over-Discharge Protection	Charging/Discharging Current limitation
Charging/Discharging Over-Current Protection	Accurate Capacity Calculation
High/low temperature Protection	Soft Start
Short Circuit Protection	History Record

1.4 Packaging

Please ensure that your machine package contains the following items:







If anything is missing, please contact your local distributor.

1.5 Installation Tools

Note:

Use insulated tools correctly to prevent accidental electric shock or short circuit. If the tools are not insulated, cover the entire exposed metal surface of the available tools (except the tip) with electrical tape.

Screwdriver

Wire stripper

Copper terminal crimping tool

Impact drill

Network cable crimping tool

Multimeter

Insulated gloves

Insulated shoes

2.1 Symbol Explanations

	Keep away from open flames or flammable materials.
	Potential hazards exist when the equipment is working. Personal protective equipment should be worn during operation.
	Electric shock warning. Before performing any operation or maintenance, please turn off the equipment power supply.
	Maintenance personnel must wait 5 minutes after turning off the power before starting work.
	Grounding: Indicates the connection position of the PE cable.
	Do not place in areas accessible to children.
	Keep the battery away from open flames or ignition sources.
	Before operating the battery system, please read the product's operation and use manual.
	The product shall not be disposed of as household waste.
	The product components are recyclable.

2.2 Usage Notices

Lithium batteries are manufactured in accordance with applicable safety and technical guidelines and shall only be used in installations that comply with the following specifications:

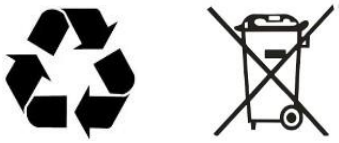
1. This battery requires permanent fixed installation.
2. Electrical installation operations must strictly comply with the regulations and standards of the local country where it is located.
3. Lithium batteries must be installed in accordance with the instructions and technical specifications in this manual.
4. Only connect to specified matching inverters for use.
5. It is strictly prohibited to directly connect the battery to photovoltaic solar panel lines.
6. It is prohibited to connect the battery with batteries of different types or batches.
7. All power supplies must be disconnected during maintenance.
8. If an abnormality occurs, please contact the supplier within 24 hours.
9. Except for company personnel or other authorized personnel, no one shall open, repair or disassemble the battery.
10. On-site installation shall be equipped with fire-fighting facilities that meet relevant requirements, such as fire sand, dry powder fire extinguishers, etc.

2.3 Disposal Notices

1. This product shall not be disposed of as household waste.
2. If the product leaks electrolyte, avoid contact with the leaked liquid or gas. If exposed to the leaked substance, immediately perform the following operations:

- Inhalation: Evacuate the contaminated area and seek medical attention.
- Eye contact: Rinse eyes with running water for 15 minutes and immediately seek medical attention.
- Skin contact: Thoroughly clean the affected area with soapy water and seek medical attention.
- Ingestion: Immediately induce vomiting and seek medical attention.

3. If a fire accidentally occurs, do not use water to extinguish it; only use dry powder fire extinguishers or carbon dioxide fire extinguishers.
4. If the battery module is wet or submerged in water, do not allow anyone to approach it and cut off all power switches on the inverter side.
5. If the battery needs to be disposed of or recycled, it must be isolated and local waste management regulations must be followed and respected.It is recommended to use the European Union (EU) Regulation 2023/1542 for disposal and adopt the best available technology to achieve relevant recycling.



3.1 Installation Location

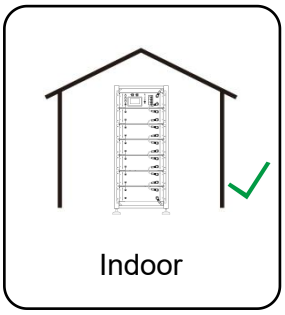
When selecting an installation location, the following criteria should be considered:

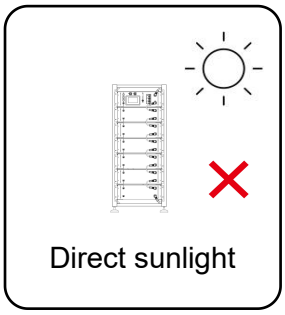
- Exposure to direct sunlight may cause alarms due to overheating, and ultraviolet rays will accelerate product aging. The ideal location is a place with an ambient temperature of 0~40°C.
- It is recommended to install the lithium battery in a place where it will not be directly exposed to rain and snow. The ideal installation location is a north-facing wall indoors.
- If multiple lithium batteries are installed on-site, a gap of at least 500mm should be maintained between each lithium battery and all other installed equipment. The bottom of the lithium battery should be at least 1000mm above the ground or floor.
- The LED status indicators or display screen on the front panel of the lithium battery should not be blocked.
- If the lithium battery is to be installed in an enclosed space, there must be sufficient ventilation to prevent overheating.

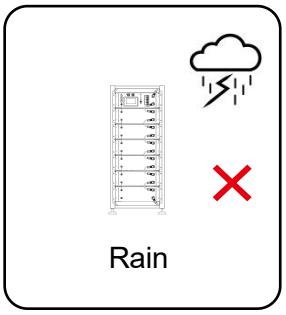
Fire prevention warning:

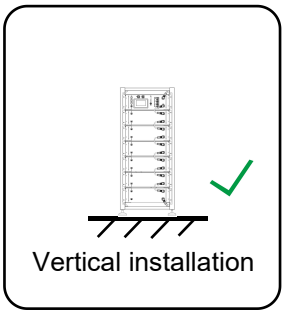
Despite careful construction, lithium batteries may still cause fires. Do not install lithium batteries in areas containing highly flammable materials or gases. Do not install lithium batteries in potentially explosive environments, and the distance from heat sources should be greater than 3 meters.

The wall structure where the lithium battery is installed must be fire-resistant.









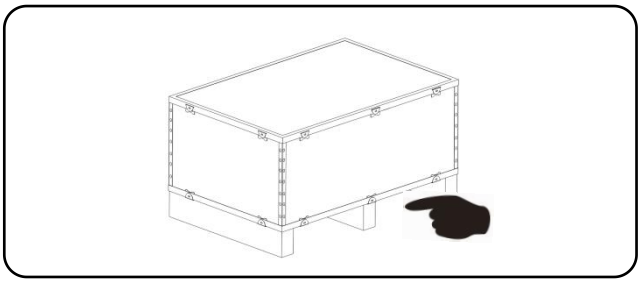
3.2 Handling

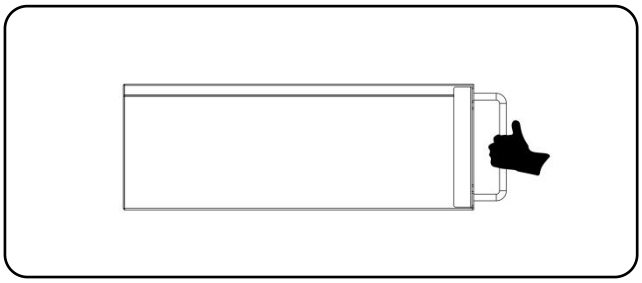
Load-bearing warning:

The maximum load-bearing capacity of the cabinet is ≥ 3 times the weight of the lithium battery

Please refer to the following instructions for handling the lithium battery:

1. A hand pallet truck can be used to move the lithium battery box.
2. It requires two people to take the product out of the shipping box. There are two handles on the front of the product.
3. When placing the product, do so slowly and gently. This ensures that internal components and the external chassis are not damaged.

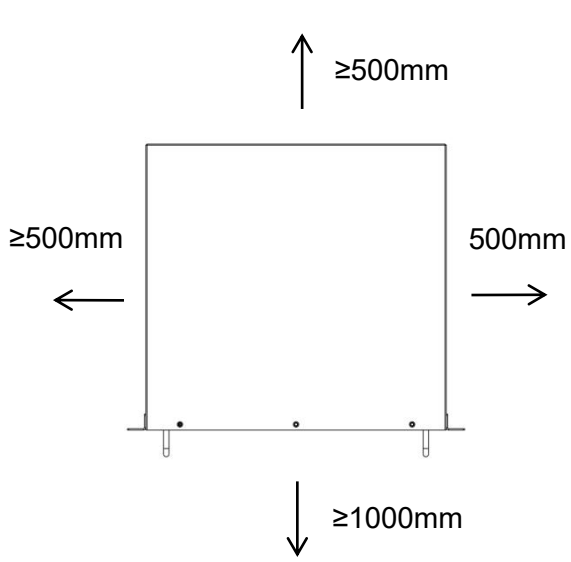




3.3 Installing the Battery

- Lithium batteries must be installed horizontally, with a maximum inclination of ±5 degrees.
- Install the lithium battery on a structure capable of supporting the product's weight.
- To avoid overheating, always ensure unobstructed air circulation around the lithium battery. A gap of at least 500mm should be maintained between products.

1. Configure a cabinet with the appropriate number of layers for lithium batteries.
2. Push the lithium batteries in series into the cabinet, and then push the PDU on top of the lithium batteries.
3. Secure the lithium battery and PDU to the cabinet using M5x16 Phillips screws, tightening them to a torque of 5 N·m.



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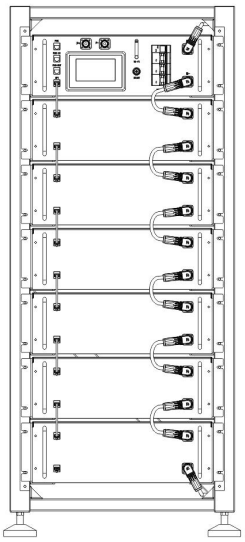


3.4 Installing Cables

- Before connecting to the inverter, ensure that the battery voltage is within the matching range of the inverter.
- Select the appropriate DC cable, please refer to the following table for specific specifications.
- This product contains dangerous voltages and should be installed by qualified electrical or service personnel with experience in handling dangerous voltages.

Wiring Position	Cable Copper Terminal	Cable Specification Range	Torque Value
P+ and P-	SC25-6/SC25-8	25mm²/4AWG	6-8 N·m
Grounding	OT4-5	12AWG	3-4 N·m

Danger:

Before installing the battery cables, ensure that the battery switch is turned off.

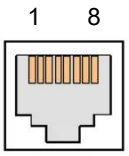
Before installation, use a multimeter to confirm that the voltage at the battery terminals is 0Vdc.

3.5 PCS Communication

- RS485: If a 485 device is used, the default baud rate is 9600. It can serve as a communication interface with the host computer software and can also be used for communication with the inverter.
- CAN: If a CAN device is used, the default baud rate is 250K. It can serve as a communication interface with the host computer software and can also be used for communication with the inverter.

Note:

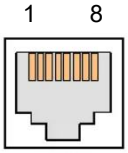
Before connecting the communication cable to the inverter, check that the communication pin sequence of the inverter and the battery matches;
if not, you need to cut off one end of the RJ45 connector and adjust the pin sequence according to the following pin definitions. The pin definition of the battery PDU port is as shown above.



Pin	PCS Definition
1	CAN0H
2	CAN0L
3	GND
4	CAN1H
5	CAN1L
6	COM
7	RS485A-1
8	RS485B-1

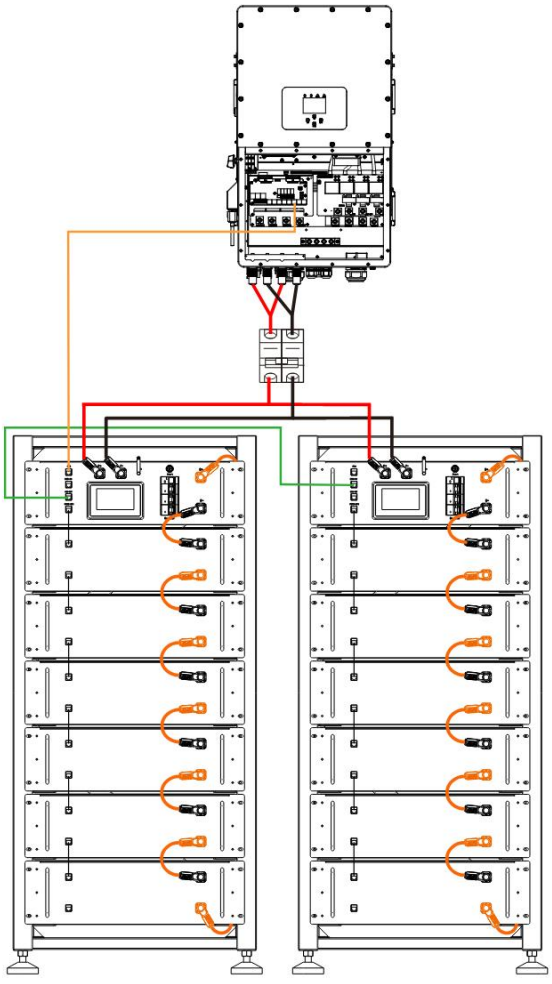
3.6 PAR-IN/ PAR-OUT Parallel Communication

- PAR-IN:When connecting a 485 device, the host computer software can be connected via a baud rate of 9600, allowing access to battery information. When connecting a CAN device, the host computer software can be connected via a baud rate of 250K, allowing access to battery information. If this device is the main battery, this interface can be left unused and no connection is required.
- PAR-OUT:When connecting a 485 device, the host computer software can be connected via a baud rate of 9600, allowing access to battery information. When connecting a CAN device, the host computer software can be connected via a baud rate of 250K, allowing access to battery information. If this device is the main battery, it can be used as a parallel cluster communication output interface. If this battery is the last system in the parallel cluster, a terminal resistance needs to be connected.

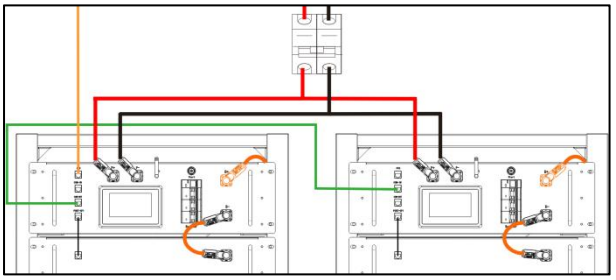


Pin	IN Definition	Pin	OUT Definition
1	CAN0H	1	CAN0H
2	CAN0L	2	CAN0L
3	GND	3	GND
4	CAN1H	4	CAN1H
5	CAN1L	5	CAN1L
6	COM-DI	6	COM-DO
7	RS485A-1	7	RS485A-1
8	RS485B-1	8	RS485B-1

- Currently, up to 14 battery systems can be clustered together. The positive and negative cables of the battery clusters are individually connected to the combiner box or circuit breaker. The OUT/IN interface of the clustered system can be connected for communication using a standard RJ45 network cable.



The picture is a schematic diagram of the parallel system wiring.

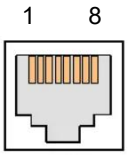


3.7 SPI Communication

This position is the communication interface between the host in the PDU and the slave in the battery pack. The host monitors the voltage and temperature conditions in the battery pack through RJ45 standard network cable connection and communication.

Note:

The SPI interface of the PDU is connected to the IN interface of the battery layer below, and the OUT interface of this battery is connected to the IN interface of the next battery in series, and so on.



Pin	SPI Definition
1	IP-IN
2	IM-IN
3、4、5、6、7、8	/

3.8 WIFI

Lithium batteries can be remotely monitored and updated via OTA through WIFI, and this feature will incur additional charges.

1. Mobile devices can search for "Xiaodan Energy Storage" in the App Store and Android App Market to download.
2. The App will display all detailed data of the device.

Note:

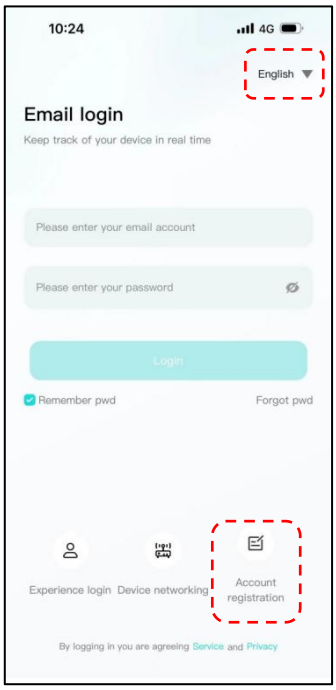
Android mobile devices can scan the QR code to download the App.

WeChat Mini Program Scan Code

APP Download

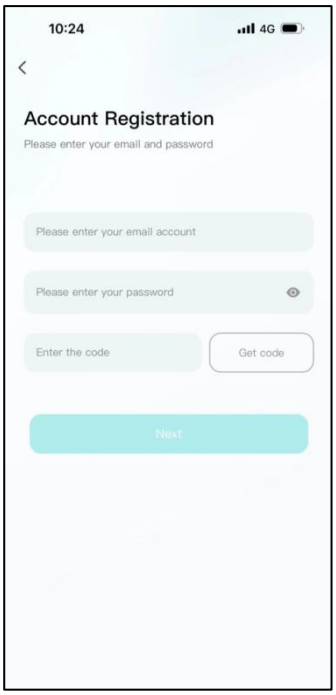
- User Login

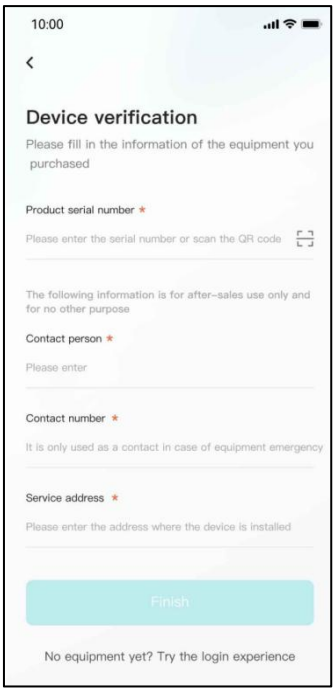
- Login interface.
- Click "English" to switch directly to the English interface.
- Currently, login via email account is supported



- Register

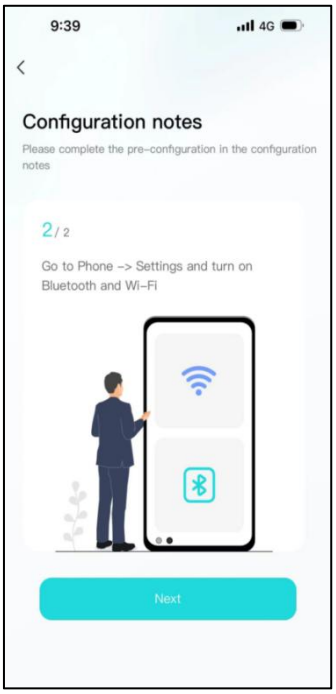
- Click the "Account Registration" button to proceed with the registration process.
- Register using an email account.
- After registration, enter the device serial number (SN) or device QR code for identity verification

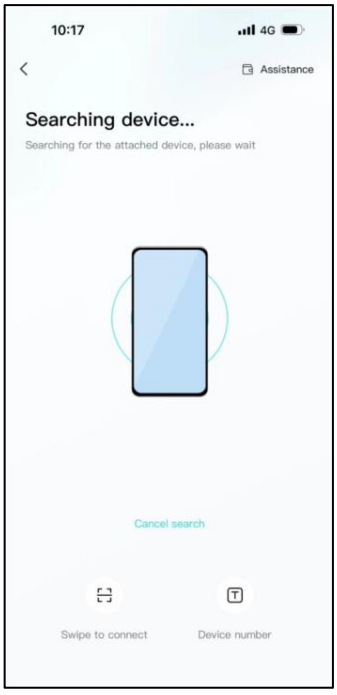


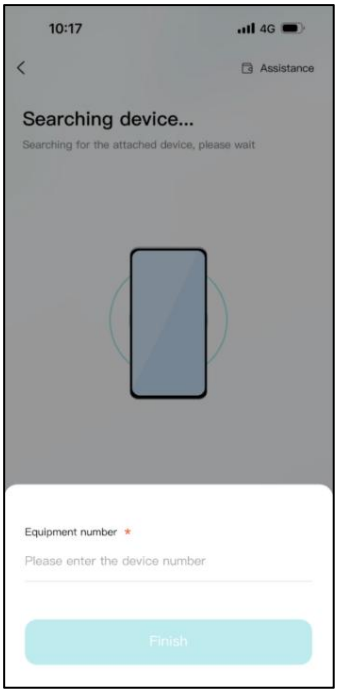


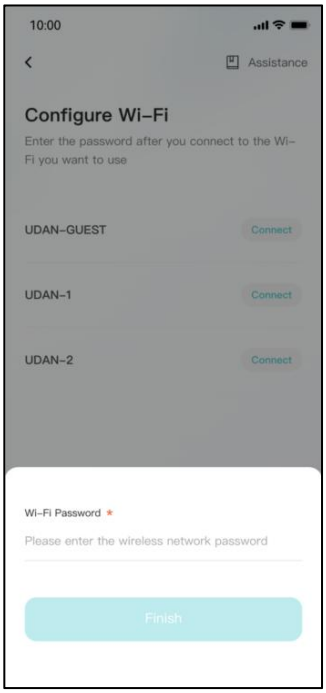
- Device Connection

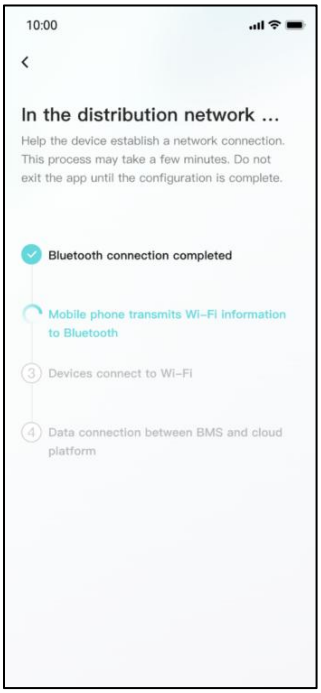
- Preparation before distribution: Ensure that the device is on, turn on the mobile phone Bluetooth and wireless LAN functions.
- Connected devices: The current App supports Bluetooth search, device scanning, and manual input of SN code .
- Select the WiFi you want to use and click the "Connect" button. Enter the WiFi password and click the "Finish" button to distribute the network.

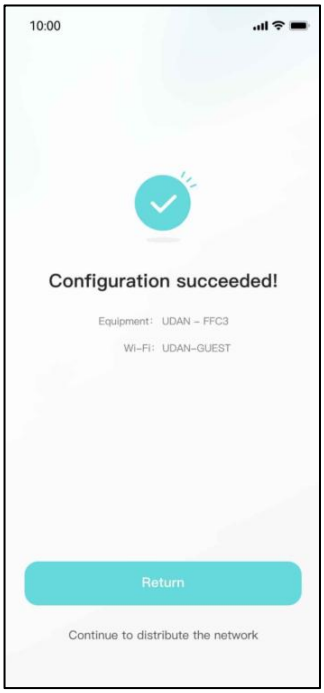












- APP Main Interface Display

- The top area: displays the device name, battery energy, and message entry.
- Middle area: Displays the current battery charging and discharging status, battery percentage, current power, and estimated full time.
- The bottom area: Displays the device battery, charging time, and health check overview data of the day in the form of a card. You can click the corresponding card to view the details.

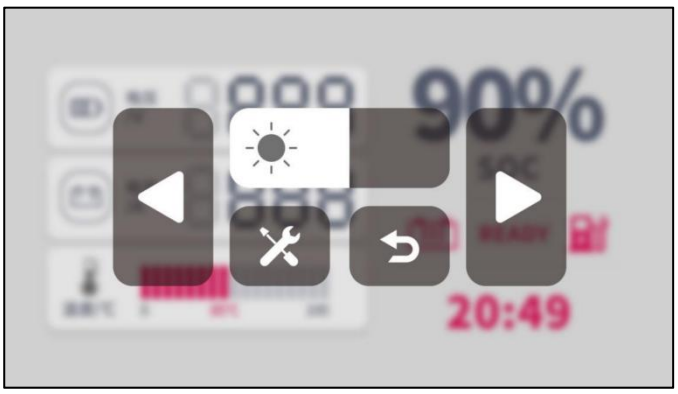
4.1 LCD Display

- Instruction Description:

Function	Description
	Display system voltage status
	Display system charging and discharging current
	Display system battery pack temperature

- Click on any position on the screen to pop up the button shown below. The specific instructions are as follows:

- Click   to switch between different user mode styles (including day/night mode).
- Swipe left and right  to adjust screen brightness.
- Click  to enter engineering mode and view more information.
- Click  to return to the interface.



- After entering engineering mode

- The top displays the date and fault.
- The middle part displays information such as total voltage, SOC, total current, and so on.
- The navigation menu is displayed at the bottom, allowing you to switch and view the interface details.

- Others

- Click to enter the heating information and insulation resistance to view the current system data.
- Diagnostic information allows for the inspection of system fault status.
- The cumulative time information interface allows you to view the cumulative charging and discharging time.

- Set up

- Click "Settings" to enter the settings interface, which includes language settings and brightness settings.
- Click the "Back" button to return to the previous screen.

4.2 Battery System Parameters

Item		Parameter
Power Consumption	Low power consumption mode	≤100μA
Over charge Protection	Over charge detection voltage	3.65V
	Over charge release voltage	3.35V
Over discharge protection	Over discharge detection voltage	2.8V
	Over discharge release voltage	3.3V
Over current protection	Charge Over current Alarm	100A
	Charging Over current Protection	110A/0~15S
	Discharge Overflow Warning	-100A
	Discharge over-current protection	-110A/0~15S
Temp Protection	Detection temperature	56℃

- Regularly check the installation environment, such as dust, water, insects, etc. Ensure it is suitable for the IP20 battery system.
- Check the connection of power connectors, grounding points, power cables and screws annually.
- For long-term storage, charge the battery every 6 months, and the SOC should not be less than 50%.
- After the battery module is discharged, it must be recharged within 12 hours.

Note:

When checking connectors and cables, ensure that the system has been completely powered off for 5 minutes before performing maintenance.

- If the screen and LED status indicators are too dirty to read, they can be cleaned with a cloth.

Note:

Do not use any solvents, abrasives or corrosive materials to clean the battery.

Electrical			
Model	BSTG-512100		
Battery Type	LiFePO4		
Rated total Voltage	307.2V	409.6V	614.4V
Voltage Range	259.2～345.6V	345.6～460.8V	518.4～691.2V
Rated Capacity	30.72kWh	40.96kWh	61.44kWh
Series Quantity	6pcs	8pcs	12pcs
Nominal Voltage	51.2V		
Nominal capacity	100Ah		
Charging /Discharging Current	50A		
Max Charging /Discharging Current	100A		
Size Per Layer	440(490)*418*150mm		
Weight Per Layer	45KG		
Depth of Discharge	90%		
Cycle Life[1]	≥6000 Cycles		
Environmental			
Ambient Humidity	≤80%RH（No Condensation）		
Operating Temperature	Charge：0～55℃ Discharge：-20～55℃		
Storage Temperature	-20～55℃		
Altitude	≤2000m		
Cooling Method	Natural Cooling		
Communications			
Display	LCD Display/LED Indicator Light		

Communication	CAN/RS485/Bluetooth/Wi-Fi		
Mechanical			
Dimension	506*550*1300mm	506*550*1620mm	506*550*2248mm
Weight	55kg	75kg	98kg
Installation Method	Rack-Mounted		
Protection Level	IP20		
Certification Standard			
Safety Regulations	IEC62619		
EMC	EN IEC 61000-6-1/2/3/4		
Transportation	UN 38.3		

[1] Test conditions: 0.2C charge and discharge, maintain an ambient temperature of 25±2°C, 80% DOD

Electrical			
Model	BSTG-512200		
Battery Type	LiFePO4		
Rated total Voltage	307.2V	409.6V	614.4V
Voltage Range	259.2～345.6V	345.6～460.8V	518.4～691.2V
Rated Capacity	61.44kWh	81.92kWh	122.88kWh
Series Quantity	6pcs	8pcs	12pcs
Nominal Voltage	51.2V		
Nominal capacity	200Ah		
Charging /Discharging Current	50A		
Max Charging /Discharging Current	100A		
Size Per Layer	520(574)*418*145mm		
Weight Per Layer	85KG		
Depth of Discharge	90%		
Cycle Life[1]	≥6000 Cycles		
Environmental			
Ambient Humidity	≤80%RH（No Condensation）		
Operating Temperature	Charge：0～55℃ Discharge：-20～55℃		
Storage Temperature	-20～55℃		
Altitude	≤2000m		
Cooling Method	Natural Cooling		
Communications			
Display	LCD Display/LED Indicator Light		

Communication	CAN/RS485/Bluetooth/Wi-Fi		
Mechanical			
Dimension	789*626*1265mm	789*626*1571mm	789*626*2183mm
Weight	74kg	95kg	130kg
Installation Method	Rack-Mounted		
Protection Level	IP20		
Certification Standard			
Safety Regulations	IEC62619		
EMC	EN IEC 61000-6-1/2/3/4		
Transportation	UN 38.3		

[1] Test conditions: 0.2C charge and discharge, maintain an ambient temperature of 25±2°C, 80% DOD