



USER MANUAL

MODEL: BSTE-512280 / 512314



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.

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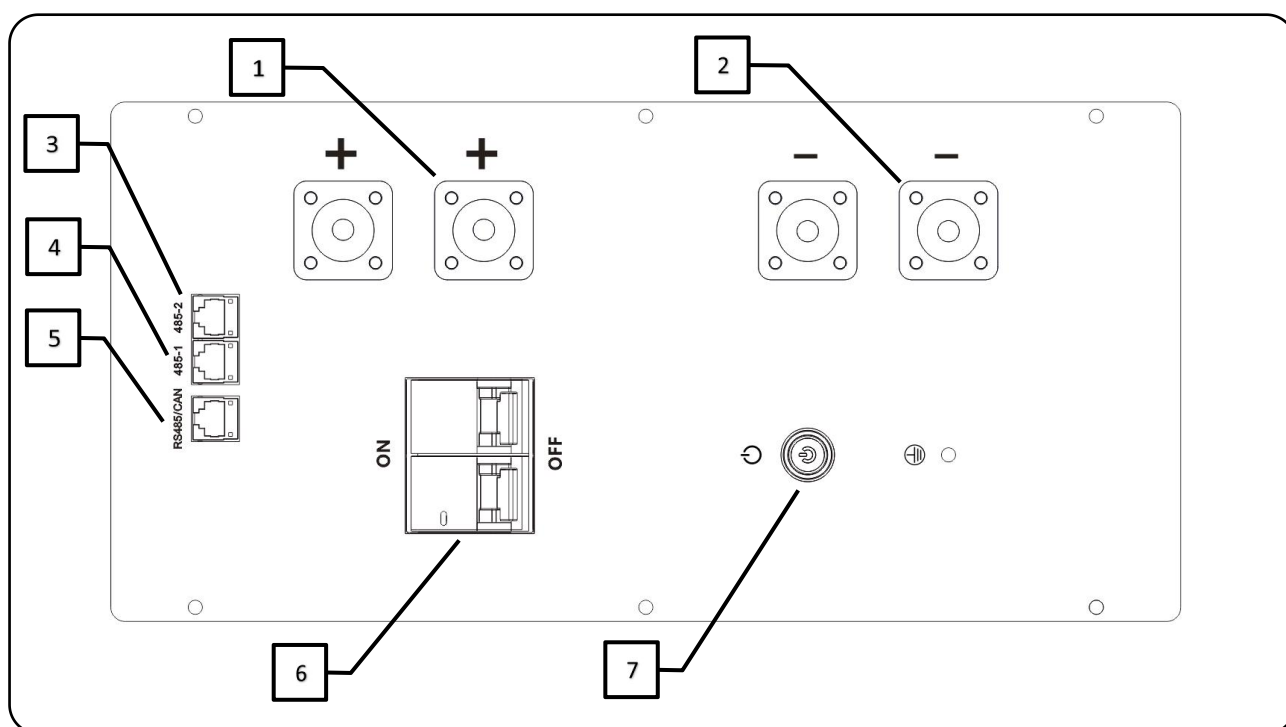
(Revision History)

Version No.	Date	Revision Content
A0	2026.2.3	Initial Version

1.1 Product Overview

This product is a floor-standing household energy storage lithium battery independently developed by our company. Equipped with a self-developed BMS protection system with long cycle life and high safety standards, it features a sturdy shell, exquisite appearance and easy installation. It can be widely adapted to off-grid, grid-connected and hybrid inverter energy storage systems.

1.2 Battery Interfaces



No.	Name	Description
1	B+	Battery positive output
2	B-	Battery negative output
3	485-2	Battery parallel communication
4	485-1	Battery parallel communication
5	RS485/CAN	Battery communication with PCS by RJ45 8P8C
6	Breaker	Control circuit output; turn the switch to ON when in use
7	Start	System start switch; press the button and the BMS will start

1.3 Product Features

Advantages

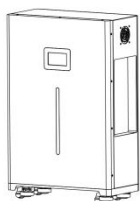
- The module is non-toxic, pollution-free and environmentally friendly.
- The positive electrode material is made of LiFePO_4 , featuring safety performance and long cycle life.
- Built-in soft start function to reduce the impact of current surges.
- When multiple modules are connected in series, the module addresses are set automatically.
- Supports module upgrading from a computer via CAN or 485 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

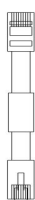
Protection and Alarm	Management and Monitoring
Charge/discharge stop	Automatic balancing
Over-voltage and over-charge protection	Intelligent charging model
Under-voltage and over-discharge protection	Charging/discharging current limitation
Charging/discharging over-current protection	Accurate capacity 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:



Main unit×1



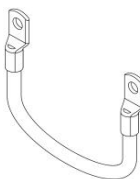
Network cable
(2 meters) x 1



Network cable
(1 meter) x 1



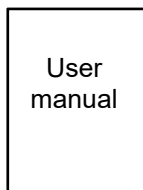
Positive cable (1.2
meters)×1



Negative cable (1.2
meters)×1



Grounding cable
(1.5 meters) x 1



User manual×1

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 should not be moved during use.
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: Do NOT induce vomiting; rinse mouth with water and seek immediate 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:

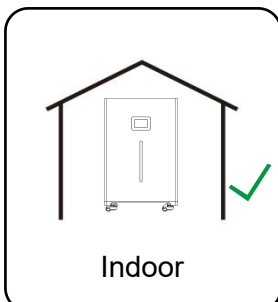
- Exposure to direct sunlight may cause alarms due to overheating, and ultraviolet rays will accelerate product aging. The ideal location is a place with an ambient temperature of 0~40°C.
- It is recommended to install the lithium battery in a place where it will not be directly exposed to rain and snow. 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 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:

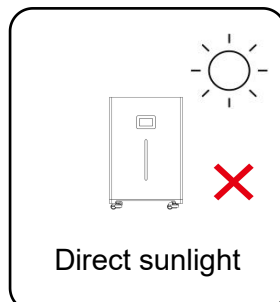


Despite careful construction, lithium batteries may still cause fires. Do not install lithium batteries in areas containing highly flammable materials or gases. Do not install lithium batteries in potentially explosive environments, and the distance from heat sources should be greater than 3 meters.

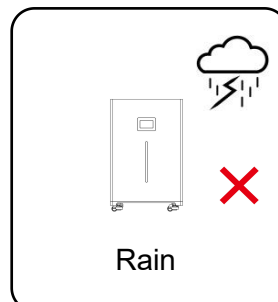
The wall structure where the lithium battery is installed must be fire-resistant.



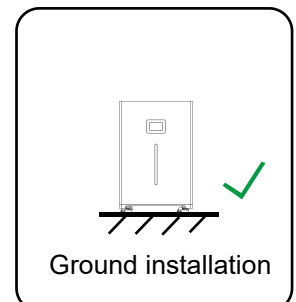
Indoor



Direct sunlight



Rain

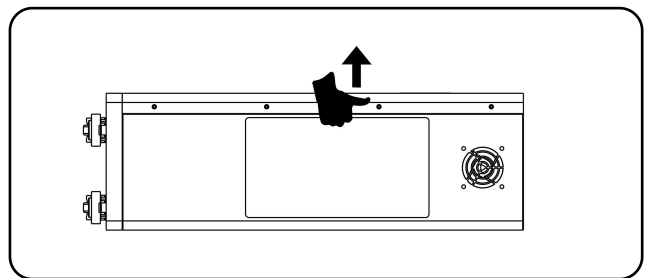
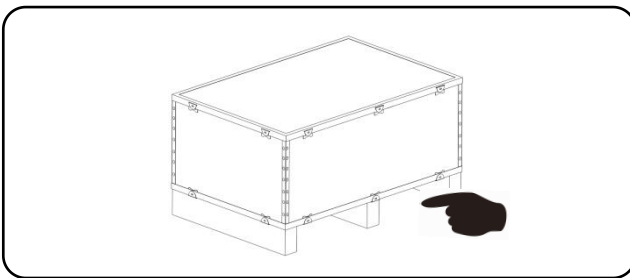


Ground installation

3.2 Handling

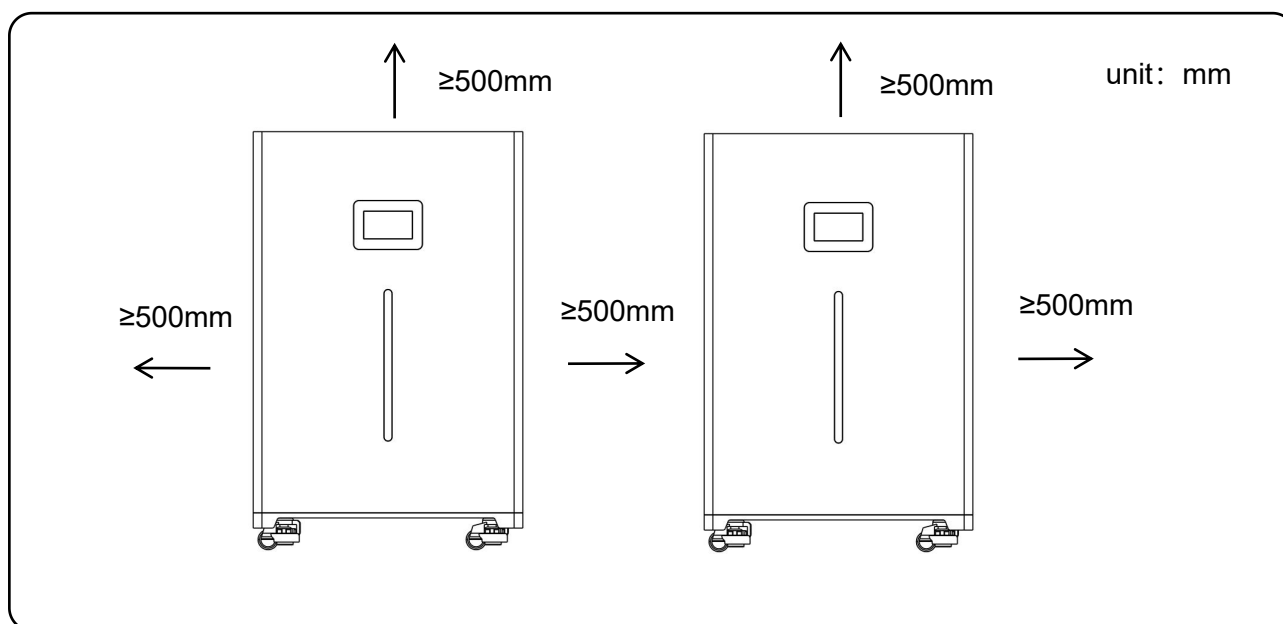
Please refer to the following instructions for handling the lithium battery:

1. A hand pallet truck can be used to move the lithium battery box.
2. Two people are required to take the product out of the shipping box. The product is equipped with handle positions on the sides.
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

- The lithium battery must be installed vertically 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. Move to a flat surface, preferably near a wall.
 2. Determine the installation distance and location.
 3. Rotate and secure the foot pad at the bottom to make it immovable.



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
B+ and B-	SC35-6/SC35-8	2AWG/35mm ²	6-8 N·m
Grounding	OT4-5	6AWG	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.



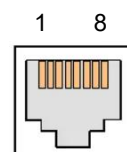
3.5 RS485/CAN Communication

- RS485: The default baud rate is 9600 bps, used for communication with the inverter. When this battery is the master, it can summarize slave data and communicate with the inverter.
- CAN: The default baud rate is 500 kbps, interface is used for communication with the inverter. When this battery is the master, it can summarize slave data and communicate with the inverter.

Note:

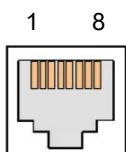
Before connecting the communication cable to the inverter, check that the communication pin sequence of the inverter and the battery matches; if not, you need to cut off one end of the RJ45 connector and adjust the pin sequence according to the following pin definitions. The pin definition of the battery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

Pin	Definition
1、 8	RS485-B
2、 7	RS485-A
3、 6	GND
4	CAN-H
5	CAN-L



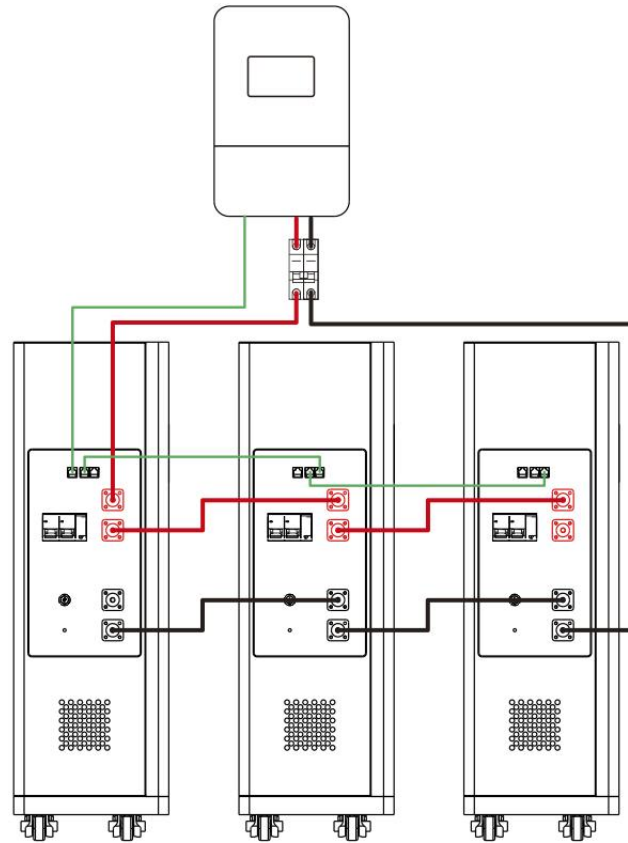
3.6 485-1/485-2 Parallel Communication

- The battery information can be viewed by connecting to the upper computer software with a baud rate of 9600 bps.
- By communicating with the upper computer software via the RS485 upper computer cable, all battery packs except the master can be viewed, and the address range of 1 to 15 can be set according to the address polling data.



Pin	485-1/OUT Definition	Pin	485-2/IN Definition
1、 8	RS485-B	1、 8	RS485-B
2、 7	RS485-A	2、 7	RS485-A
3、 6	GND	3、 6	GND
4	ADR-E	4	G
5	ADR-T	5	ADR-R

- A maximum of 16 batteries can be connected in parallel. Please use positive and negative cables to connect the parallel batteries. Standard network cables can be used to connect the communication interface 485-1/485-2.



Suitable for maximum 200A charging and discharging system requirements.

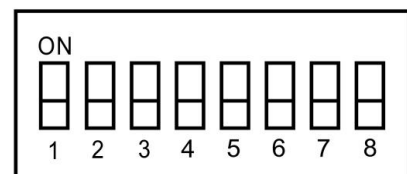
3.7 ADDR DIP Switch(Optional)

When battery packs are connected in parallel, the DIP switch of each battery can be used to distinguish different battery pack addresses. The hardware address can be set through the DIP switch on the board. Please refer to the following table for the definition of the DIP switch.



Note:

All batteries are factory-set with automatic DIP switches. Parallel communication connection can be achieved without manual DIP switching.



- Slave Settings

address	Dial the code switch position				Note
	# 1	# 2	# 3	# 4	
1	ON	OFF	OFF	OFF	Pack1
2	OFF	ON	OFF	OFF	Pack2
3	ON	ON	OFF	OFF	Pack3
4	OFF	OFF	ON	OFF	Pack4
5	ON	OFF	ON	OFF	Pack5
6	OFF	ON	ON	OFF	Pack6
7	ON	ON	ON	OFF	Pack7
8	OFF	OFF	OFF	ON	Pack8
9	ON	OFF	OFF	ON	Pack9
10	OFF	ON	OFF	ON	Pack10
11	ON	ON	OFF	ON	Pack11
12	OFF	OFF	ON	ON	Pack12
13	ON	OFF	ON	ON	Pack13
14	OFF	ON	ON	ON	Pack14
15	ON	ON	ON	ON	Pack15

- Master Settings

Number of units	Dial the code switch position				Note
	# 5	# 6	# 7	# 8	
1	OFF	OFF	OFF	OFF	Stand-alone use
2	ON	OFF	OFF	OFF	2 units in parallel
3	OFF	ON	OFF	OFF	3 units in parallel
4	ON	ON	OFF	OFF	4 units in parallel
5	OFF	OFF	ON	OFF	5 units in parallel
6	ON	OFF	ON	OFF	6 units in parallel
7	OFF	ON	ON	OFF	7 units in parallel
8	ON	ON	ON	OFF	8 units in parallel
9	OFF	OFF	OFF	ON	9 units in parallel
10	ON	OFF	OFF	ON	10 units in parallel
11	OFF	ON	OFF	ON	11 units in parallel
12	ON	ON	OFF	ON	12 units in parallel
13	OFF	OFF	ON	ON	13 units in parallel
14	ON	OFF	ON	ON	14 units in parallel
15	OFF	ON	ON	ON	15 units in parallel

- Parallel DIP Switch Settings

Number of computers	Dial the code switch position								Note
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Use single	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stand-alone use
Two units	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	The first host
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	The second slave
Three units	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	The first host
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	The second slave
	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	The third slave
...	...	...	...	...	...	...	...	...	...
15 set units	OFF	OFF	OFF	OFF	ON	ON	ON	ON	The first host
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	The second slave
	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	The third slave
	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	The fourth slave
	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	The fifth slave
	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	The sixth slave
	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	Seventh slave
	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	Eighth slave
	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	The ninth slave
	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	The tenth slave
	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	The eleventh slave
	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	Twelfth slave
	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	The thirteenth slave
	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	Fourteenth slave
	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	Fifteenth slave

3.8 Bluetooth Monitoring Connection

The lithium battery can be remotely monitored via Bluetooth.

1. Mobile devices can search for "EN BMS" in the App Store and Android App Market to download.
2. The App will display all detailed data of the device.
3. The details of each function switch setting will be displayed in the switch settings.



Note:

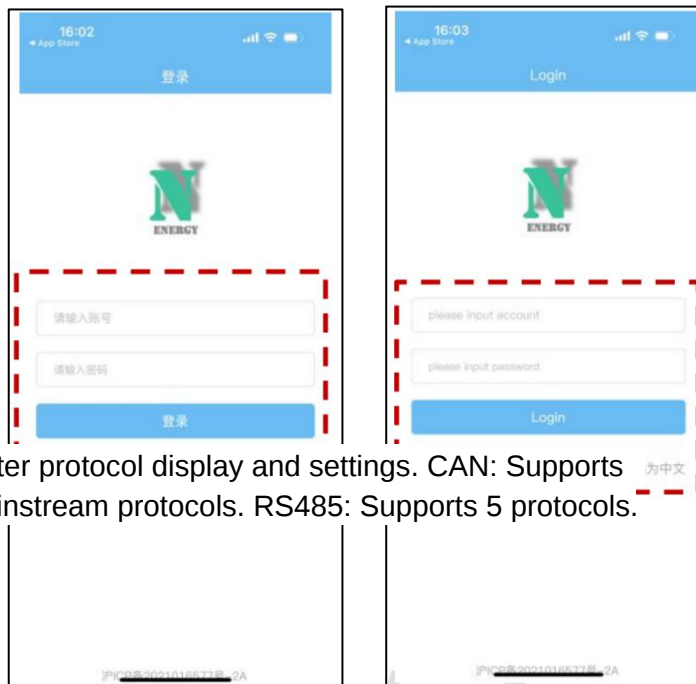
Android mobile devices can scan the QR code to download the App.



EN BMS

- User Login

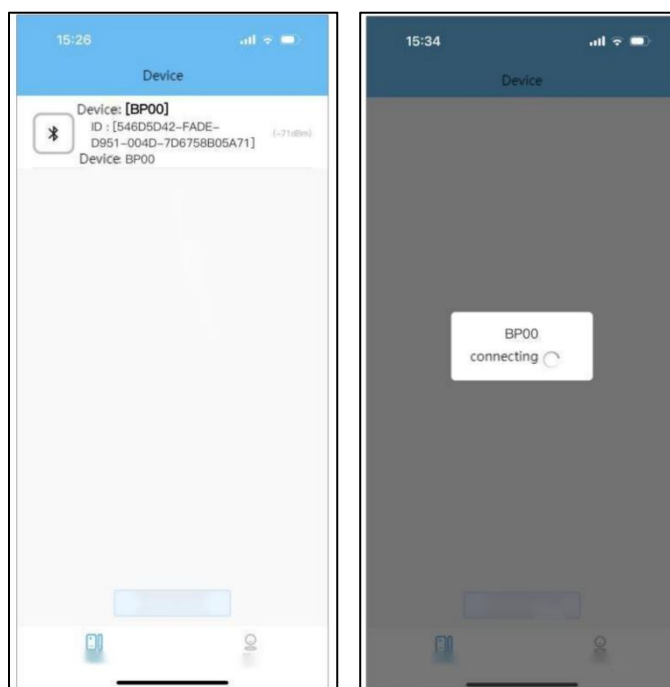
- Login interface
- Click "English" to switch directly to the English interface.
- Account:admin
- Password:111111.



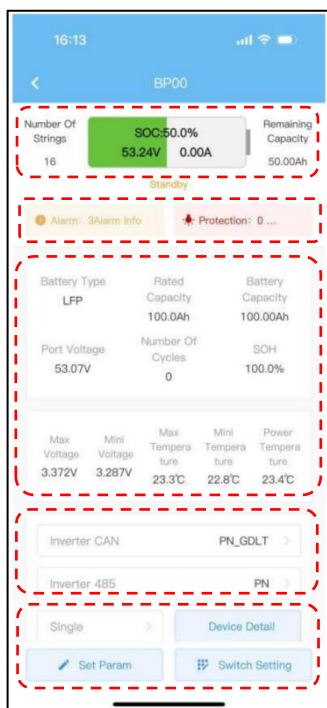
Inverter protocol display and settings. CAN: Supports 6 mainstream protocols. RS485: Supports 5 protocols.

- Device Connection

- After the user logs in, the "Device" interface will display the names of the searched devices.
- Click "Device BP00" to connect the mobile phone to the battery Bluetooth module.
- If the Bluetooth signal is unstable due to obstruction, click "Rescan Devices" to refresh the "Device" list.
- On the device page, click the Bluetooth icon on the left side of the device to customize the device name. Click "Save" and the name on the device interface will be displayed successfully.



- APP Main Interface Display



- Displays single-machine and parallel machine status, and battery working status.
- Displays device alarm status.
- Displays basic battery information. Single machine: Displays single machine information. Parallel machine: Displays statistical overall information.
- Inverter protocol display and settings. CAN: Supports 6 mainstream options and 10 protocols. 485: Supports 5 different RS485 protocols.
- Display of single machine and parallel machine, and switching between master and slave machines. Settings of The blue icon in the top right corner allows for language switching

- Switching and selection of protocols

Number		Corresponding agreement
Protocol Switch	P01	PN-GDLT
	P02	GRWT
	P03	VCTR
	P04	SMA-SF
	P05	GINL
	P06	STUD

4.1 LCD Display

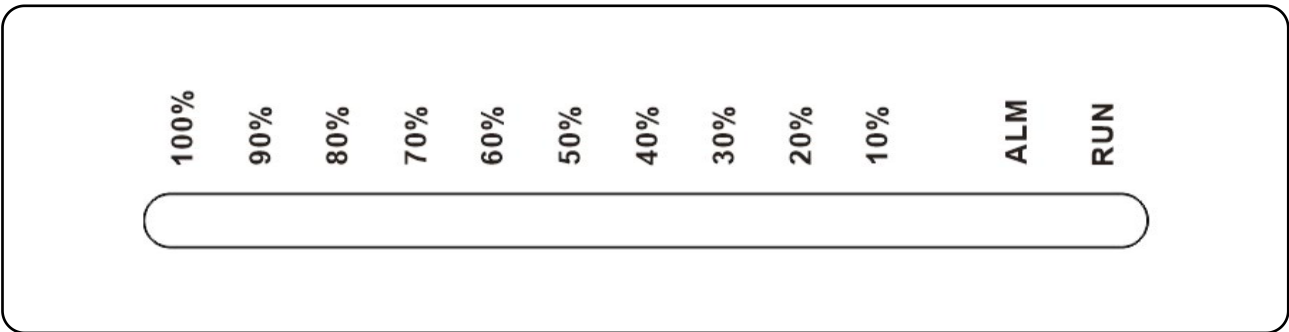


- Instruction Description :

Function	Description
CN	The blue icon in the top right corner allows for language exchange
Switch Status	Click to view the current status of various switches
ALM/PROT	Display the quantity and items of alarms and protections
Cell Num	Understand the voltage status of each battery cell
Temp Num	Understand the temperature condition of the battery cell
Protocol Sw CAN	Switch communication protocols according to specific needs

4.2 LED Indicators

- The current power consumption and operating status of the product are displayed through LED indicators (see the following table for details) for working status indication.



- Status and Capacity Indication:

State	RUN	ALM	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Pow er on	The blue lights illuminate in sequence, with one light turning on every 0.5 seconds											
Stan dby	Solid	-	0-20%: Solid Red; 20%-90%: Solid Green; 90%-100%: Solid Blue									
Char ge	Flas h	-	Display a blue flowing light indicating the position to the maximum SOC									
Disc harg e	Flas h	-	The SOC indicator is flashing green									
Shut down	After all green lights are lit, they will turn off in turn											
Alarm	-	Flas h	Display by status									
		OFF										
Prote ct	OFF	ON	Normal display SOC									
	-	OFF	Normal display SOC									
	OFF	OFF	All lights are off in the under voltage protection state									

- Flashing Description:

Flash mode	State
Flash 1	1S
Flash 2	0.5S

4.3 Battery System Parameters

Item		Parameter
Power Consumption	Low power consumption mode	$\leq 100\mu\text{A}$
Over charge Protection	Over charge detection voltage	3.65V
	Over charge release voltage	3.38V
Over discharge protection	Over discharge detection voltage	2.7V

	Over discharge release voltage	2.95V
Over current protection	Charge Over current Alarm	200A
	Charging Over current Protection	210A/0~10S
	Discharge Over-current Warning	-205A
	Discharge over-current protection	-210A/0~10S
Temp Protection	Detection temperature	55±2℃
Balance	Balance voltage	3.4V

- 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 $r_{14.34 \text{ kWh}}$ 'arged within 12 h 16.08 kWh



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.

825 x 530 x 256 mm

Electrical		
Model	BSTE-512280	BSTE-512314
Battery Type	LiFePO4	
Rated Voltage	51.2VDC	
Voltage Range	43.2 ~ 57.6VDC	
Nominal Capacity	280Ah	314Ah
Rated Capacity	14.33kWh	16.07kWh
Charging /Discharging Current	100A	
Max Charging /Discharging Current	200A	
Expandable Parallel Connection	1 ~ 15pcs	
Depth of Discharge	90%	
Cycle Life[1]	≥8000 Cycles	
Environmental		
Ambient Humidity	≤80%RH (No Condensation)	
Operating Temperature	Charge: 0 ~ 55℃ Discharge: -20 ~ 55℃	
Storage Temperature	-20 ~ 55℃	
Altitude	≤2000m	
Cooling Method	Intelligent fan cooling	
Communications		
Display	LCD Display/LED Indicator Light	
Communication	CAN/RS485/Bluetooth	
Mechanical		
Size	825*530*256mm	
Weight	125kg	130kg
Installation Method	Floor-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℃, 80% DOD