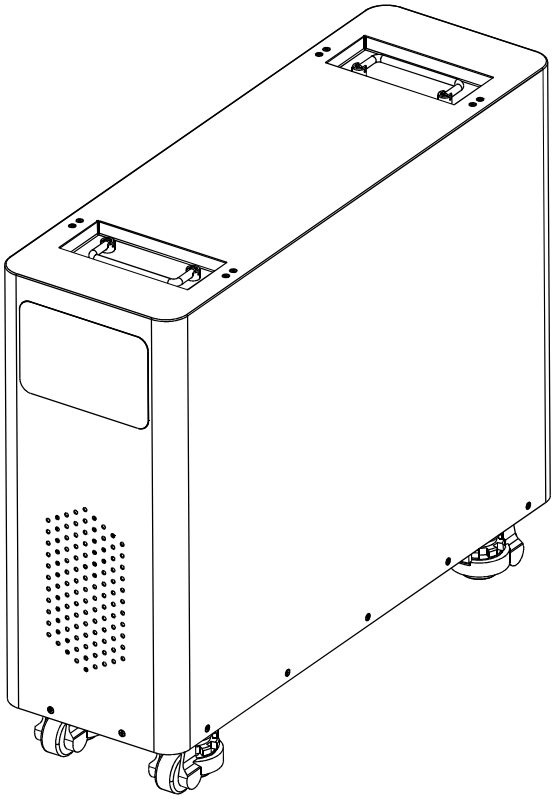
Energy Storage System

User Manual

Version: 1.0

For On / Off Hybrid Solar Storage System



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1.Safety Precautions

- It is very important and necessary to read the user manual carefully before installing or using the battery. Failure to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, death, or may damage the battery and the whole system.
- If the battery is stored for a prolonged time, it is requirement that they are charged every three to six months, and the SOC should be no less than 80%.
  The battery needs to be recharged within 12 hours, after fully discharging.
- Do not expose cable outside.
- All battery terminals must be disconnected before maintenance.
- Do not use cleaning solvents to clean the battery.
- Do not expose the battery to flammable or harsh chemicals or vapors.
- Do not paint any part of the battery, include any internal or external components.
- Do not connect battery with PV solar wiring directly.
- Any foreign object is prohibited to be inserted into any part of the battery.
- Any warranty claims are excluded for direct or indirect damage due to items above.

1.1.Before Connecting

- After unpacking, please check the battery and packing list first, if the battery is damaged or spare parts are missing, please contact the dealer.
- Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode;
- Wiring must be correct, do not mix-connect the positive and negative cables, and ensure no short circuit with the external device;
- It is prohibited to connect the battery with AC power directly;
- The embedded BMS in the battery is designed for 25.6V/51.2VDC, please DO NOT connect battery in series;
- It is prohibited to connect the battery with different type of battery;
- Please ensure the electrical parameters of battery system are compatible to inverter;
- Keep the battery away from fire or water.

1.2.During Operation

- If the battery system needs to be moved or repaired, the power must be cut off first and the battery is completely shutdown;
- It is prohibited to connect the battery with different type of battery;
- It is prohibited to put the batteries working with faulty or incompatible inverter;
- In case of fire, only dry powder fire extinguisher can be used, liquid fire extinguishers are prohibited;
- Please do not open, repair or disassemble the battery. We do not undertake any consequences or related responsibility due to violation of safety operation or violating of design, production and equipment safety standards.

2.Battery Specifications

Battery Specifications				
Model	THS5		THS10	THS15
Nominal Parameters				
Voltage	25.6V	51.2V	51.2V	51.2V
Capacity	200Ah	100Ah	200Ah	280Ah
Energy	5.12KWh		10.24KWh	14.33KWh
Dimensions (L * W * H)	580*440*160mm		640*250*650mm	780*650*248mm
Weight	45.5Kg		92.5Kg	128Kg
Basic Parameters				
Service Life (25℃)	5 years			
Cycle Time (80%DOD, 25℃)	6000 cycles			
Storage Time/Temperature	5 months (25℃), 3 months (35℃), 1 month(45℃)			
Operating Temperature	-20℃ to 60℃ @60±25% relative humidity			
Storage Temperature	0℃ to 45℃ @60±25% relative humidity			
Case Protection Class	IP21			
Electronic Parameters				
Nominal Voltage	25.6VDC	51.2VDC	51.2VDC	51.2VDC
Maximum Charging Voltage	28.8VDC	57.6VDC	57.6VDC	56.8VDC
Discharge Cut-off Voltage	21.6VDC	40VDC	43.2VDC	43.2VDC
Maximum Charge And Discharge Current	200A	100A	200A	200A

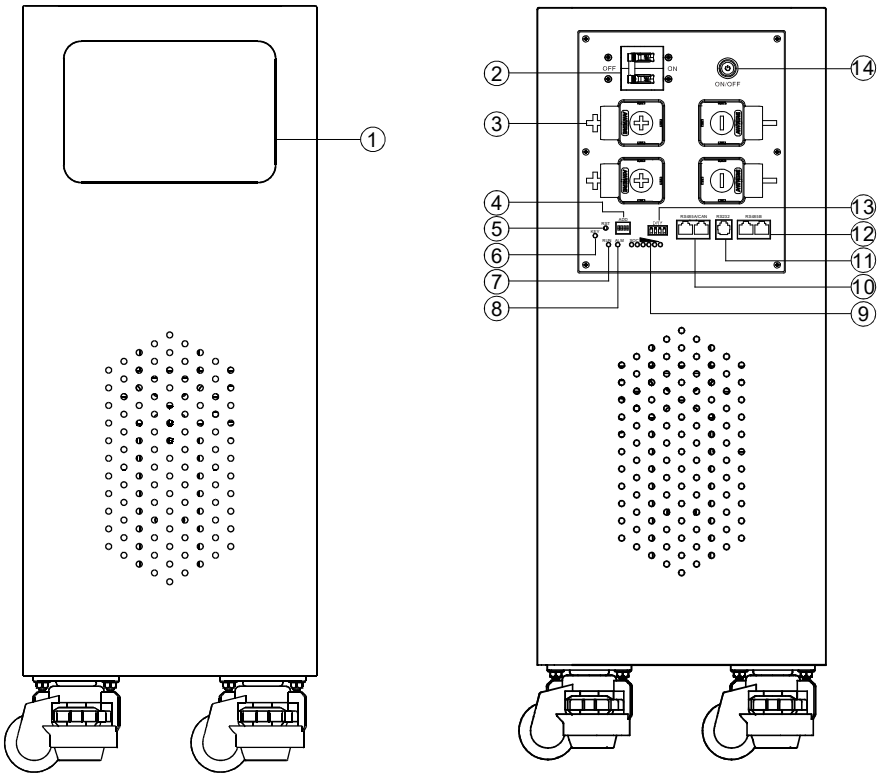
3.Battery Introduction

3.1.Main Features

- LiFePO4 composition – provides exceptional safety and longevity
- High safety and reliability
- 6,000cycles/ 5 years' service life
- Consistent performance over wide temperature range
- Wall-mounted, convenient installation
- Integrated state-of-the-art BMS to manage and monitor battery information including voltage, current and temperature as well as balance cell charging/discharging rates
- 5 years' warranty

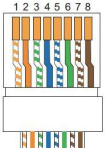
3.2.Interface Introduction

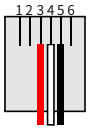
- This section details the interface functions of the upper shell and the lower shell.
- The interface diagram is as follows:



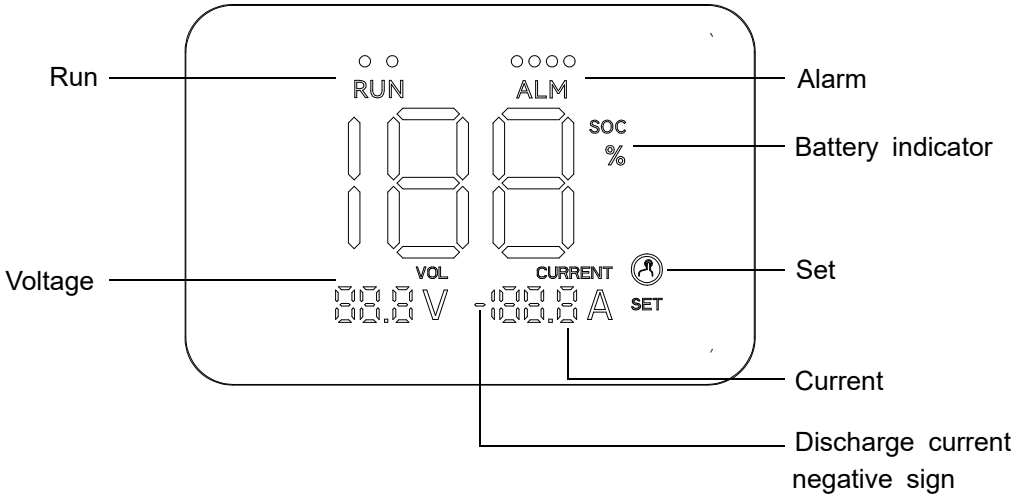
1	Display Area	2	DC breaker	3	BAT(-)/(+)
4	Address	5	Reset	6	LED(key)
7	LED(RUN)	8	LED(ALM)	9	LED(SOC)
10	RS485A/CAN (Connect inverter)	11	RS232(Connect PC)	12	RS485B (Connect other battery)
13	Dry contact	14	Battery turn On/Off		

3.2.1.Communication interface definition

Number	Communication	Function	Interface Type	Picture	Instruction
⑩	RS485A	Connect inverter	RJ45		1 & 8-RS485-B 2 & 7-RS485-A
	CAN				4-CAN-H 5-CAN-L
⑫	RS485B	Connect other battery	RJ45		1 & 8-RS485-B 2 & 7-RS485-A

Number	Communication	Function	Interface Type	Picture	Instruction
⑪	RS232	Connect PC	RJ11		3-TX 4-RX 5-GND

3.2.2.Display Function Description

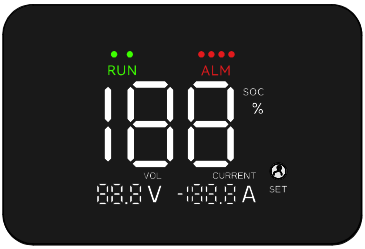


3.2.2.1 Alarm mode

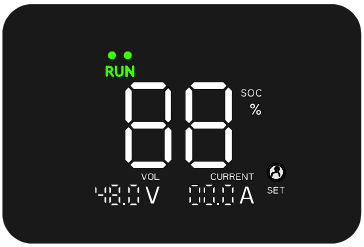
- When the code break screen is on, when the BMS sends the protection status message, the buzzer rings for 10 times (10S) and stops. At the same time, the alarm light blinks, and when the protection or fault is removed, the alarm light goes out;
- When the BMS sends the protection status information, the broken code screen will not automatically light up, but will not alarm until it is lit up. The buzzer will ring for 10 times (lasting 10S) and then stop. At the same time, the alarm light blinks, and when the protection or fault is removed, the alarm light goes out;

3.2.2.2 Touch key Description

- After the BMS board is turned on, all the LED lights on the display board will first light up, and the buzzer will sound ' beep'. After about 2 seconds, the electricity, voltage, current, setting and operation will be displayed by default.

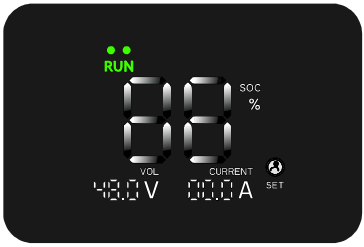


LED lights are fully on



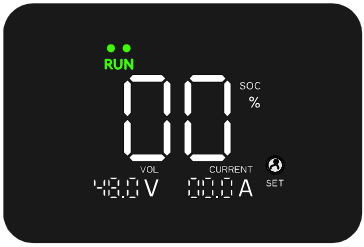
LED display status after 2 seconds

- Long press the ‘SET’ button for 5 seconds, the buzzer will sound ‘beep’ and enter the CAN protocol setting mode of the inverter at the same time. The ’SET’ indicator light will light up, and the two ’8’ in the battery display area will flash. Click the ‘SET’ button to switch between different CAN interface numbers. After selecting the number, wait for 5 seconds and the settings will automatically exit（the buzzer will sound ‘beep’ twice). (Note: The interface number beyond the set range of the BMS board cannot be saved successfully, and the battery display area will display 00.)



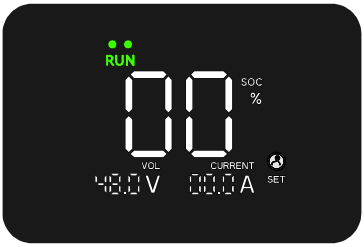
LED display status while long press ‘SET’ for 5 seconds

CAN	
No.	Inverter
1	PYLON
2	Grow att
7	GoodWe
10	Voltronic
12	Luxpow ertek
13	Sorotec
14	GINLONG
15	Schneider
17	SMA
28	Senergy
30	MUST
31	MEGAREVO
33	TBB
35	STUDER



Display status beyond BMS board settings

- Long press the setting button for 10 seconds, the buzzer will sound 'beep' and enter the inverter RS485 protocol setting mode at the same time. Figure '1' on the battery display area is long on and the two '8' flash. Then short press the setting button to switch to select a different inverter RS485 port number, and wait for 5 seconds after selecting the number, the setting will automatically exit (the buzzer will sound beep twice). After exiting the setting, the inverter setting mode is automatically saved. (Note: The interface number beyond the set range of the BMS board cannot be saved successfully, and the battery display area will display 00.)



Display status beyond BMS board settings

Inverter RS485 protocol setting mode

RS485	
No.	Inverter
1	PYLON
2	Grow att
3	Voltronic
12	Luxpow ertek
15	Schneider
36	SRNE

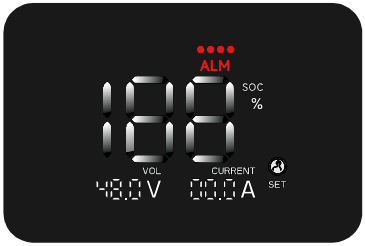
The set CAN and RS 485 interface numbers will be saved on the BMS board.

- The '-' indicator light does not light up during charging, and it lights up during discharging.

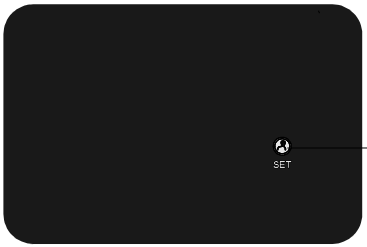
'-' indicator light does not light up

'-' indicator light lights up

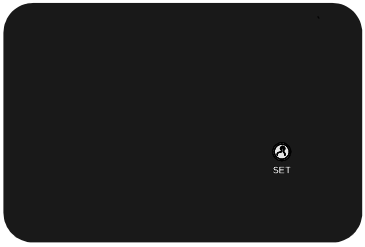
- After receiving the alarm fault command from the BMS board, the battery display area and the 'ALM' red indicator light flash, and the buzzer emits a 'beep beep. . .' alarm sound.



- The display panel will automatically turn off after 1 minute of inactivity. Click the 'SET' button to wake up the display again（the buzzer will sound beep).



- After the BMS board is turned off, the display board will turn off.



3.2.3 Display Content

When powered on/sleep activated, touch the finger touch key on the SET and the values of SOC, voltage and current will be displayed.

Display Content				
Model	THS5		THS10	THS15
SOC	0 to 100%			
Voltage	21.6~28.8V	40 V~57.6 V	43.2 V~57.6 V	43.2 V~57.6 V
Current	0~199.9A	0~99.9A	0~199.9A	0~199.9A

3.2.4. Battery Status Display

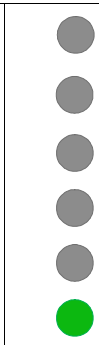
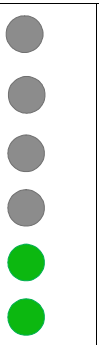
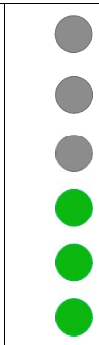
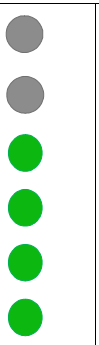
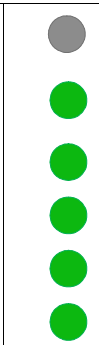
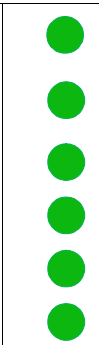
When all the switches are turned on, All led indicators will light up or flash. The meaning of the LED indicator is as follows.o

System Status	Events	ON/OFF	RUN	ALM
POWER OFF	Power Off	OFF	OFF	OFF
Standard	Normal	ON	Blinking1	OFF
	Alarm	ON	Blinking1	Blinking3
Charging	Normal	ON	ON	OFF
	Alarm	ON	ON	Blinking3
	Over Charge Protection	ON	ON	OFF
	High temperature,Over Current	ON	OFF	ON
Discharging	Normal	ON	Blinking3	OFF
	Alarm	ON	Blinking3	Blinking3
	Over Discharge Protection	ON	OFF	OFF
	Over Current，Short Current	ON	OFF	ON

LED blinking flash description

Blinking flash	LED ON	LED OFF
Blinking1	0.25S	3.75S
Blinking2	0.5S	0.5S
Blinking3	0.5S	1.5S

SOC Indicator

Capacity indicator LED						
SOC	0～17%	18～33%	34～50%	51～66%	67～83%	84～100%

: LED ON :LED OFF

3.3. Connectors

- Charge/discharge connector: Connect the positive (+) and negative (-) terminals of the battery to the inverter via a DC isolator.
- Canbus/485 active communication port between battery and inverter.
- USB to RS485: Obtain the dynamic monitoring data of the battery from the host computer.
- Address: Reserve address portal for multiple parallel.

3.4. Button Function

3.4.1.ON/OFF

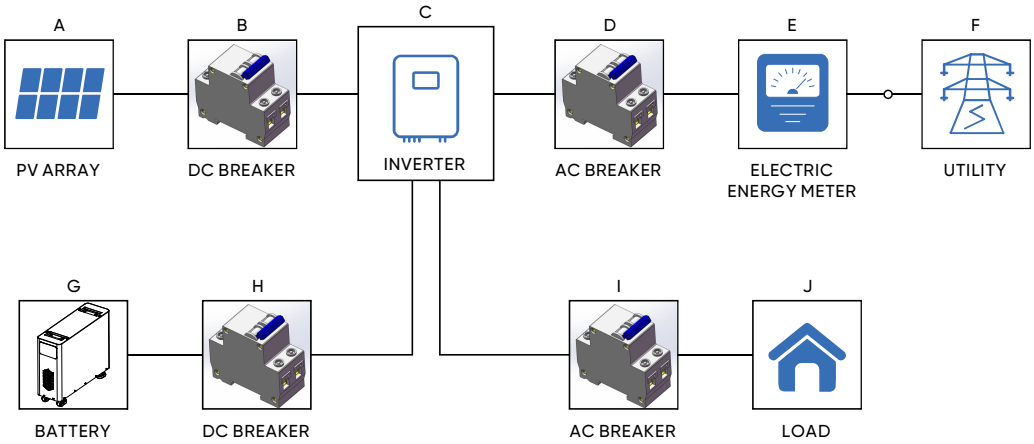
When the ON/OFF switch is pressed, the battery is turned ON, and when the ON/OFF switch is pressed again, the switch springs up and the battery is turned off.

3.4.2.RST function

- Press this RST button for 3 to 6 seconds while the battery sleeps. The battery will be activated when the LED indicator flashes from the RUN indicator to the lowest capacity indicator.
- When the battery is activated, press this RST button for 3 to 6 seconds. The batterywill be put to sleep when the LED indicator flashes from the lowest capacity indicator to the RUN light.
- When the battery is active, press this RST button for 6 to 10 seconds. The battery is reset and all LED indicators light up for 1.5 seconds.

4.Safe Operation Instructions

4.1.System Diagram



4.2.Tools

The following tools are required to install the battery pack :

- Wire cutters
- Crimping pliers
- Screwdriver

CAUTION

Use properly insulated tools to prevent accidental electric shock or short circuit.
If insulated tools are not available, cover exposed surfaces of metal tools with electrical tape, except for their tips.

4.3. Safety Devices

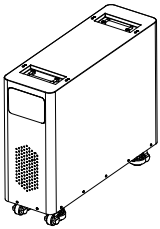
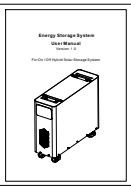
The following safety gear is recommended when handling battery packs:

- Insulating gloves
- Safety goggles
- Safety shoes

5. Mounting

5.1 List of Items

Please check the packing thoroughly after receiving the goods. If any items are missing, or if there is any damage to the outer packaging or the unit itself when unpacking, please contact us immediately.

NO.	Picture	Item	Quantity	Specification	Source
1		Battery (THS5)	1	25.6V-200Ah /51.2V-100Ah 580*440*160mm	Standard
		Battery (THS10)		51.2V-200Ah 660*570*160mm	
		Battery (THS15)		51.2V-280Ah 780*570*248mm	
2		Communication network cable	1	0.5m, Blue	Standard
3		PCS/Bat parallel network cable	1	1.5m, orange	Standard
4		Positive power cable	1	1.5m, red	Standard
5		Negative power cable	1	1.5m, black	Standard
6		Outer hexagonal screw	4	M8*20	Standard
7		User Manual	1		Standard

5.2.Mounting Position

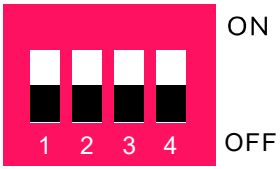
Make sure the installation location meets the following： conditions:

- The installation site must be suitable for the size and weight of the battery;
- It must be mounted on a firm surface to withstand the weight of the battery;
- The area is waterproof;
- There are no flammable or explosive materials nearby;
- Ambient temperature in the range of 0°C to 45°C;
- A constant level of temperature and humidity;Minimal dust and dirt in the area;
- Install to avoid leaning forward or sideways.

If the ambient temperature is outside the operating temperature range, the battery pack will stop working to protect itself. The optimal temperature range for battery packs to work is 0°C to 45°C. Frequent exposure to harsh temperatures may reduc e battery pack performance and longevity.To avoid electrocution or other injuries, check existing electronic or plumbing fixtures before drilling. Batteries are heavy, so handle them with care so as not to damage the product or injure the installer.

5.3.Use The Battery in Parallel

When batteries need to be used in parallel, the maximum connection is 16 batteries. When packs are used in parallel, you can use the DIP switch on the BMS to set addresses to distinguish different packs. Do not set the same address. For the definition of the BMS DIP switch, see the following table.

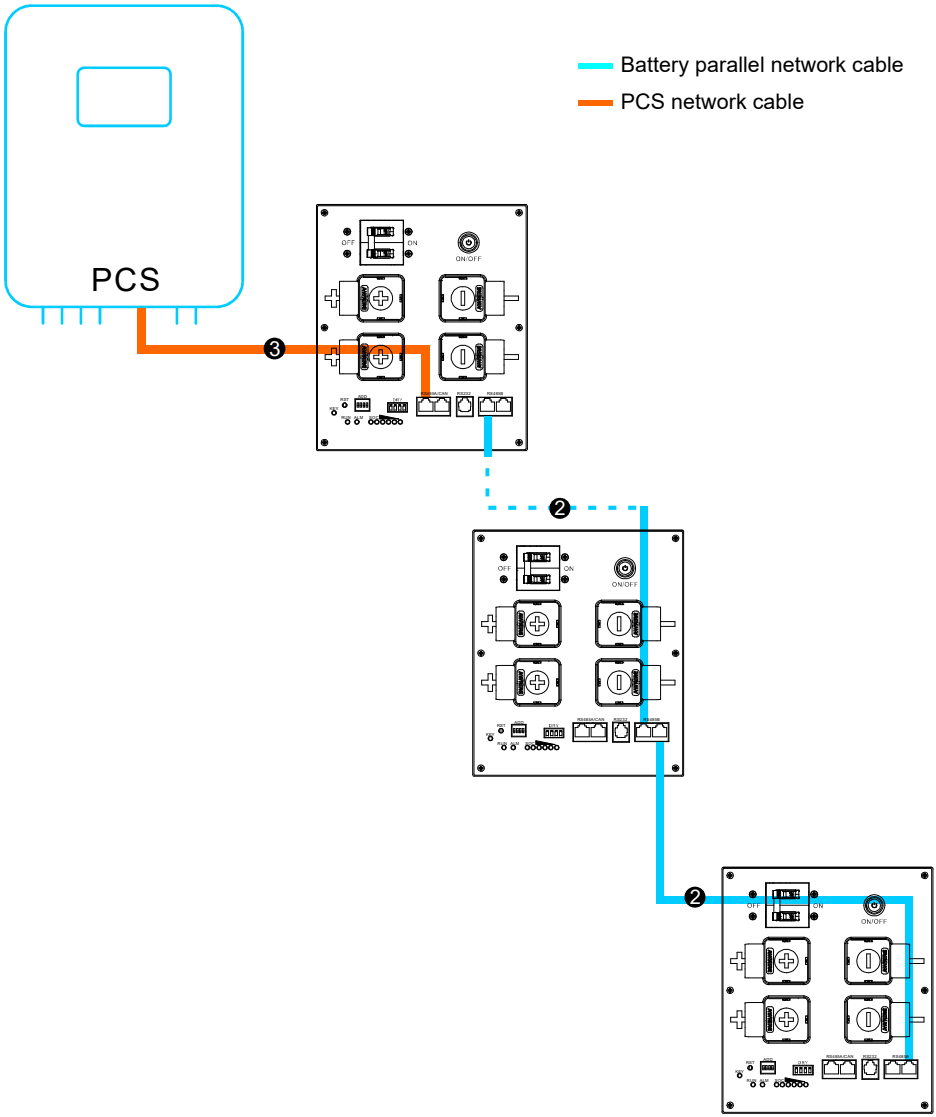


Parallel	Addresses	Dip switch location			
		1	2	3	4
Slave1	0	OFF	OFF	OFF	OFF
Master	1	ON	OFF	OFF	OFF
Slave2	2	OFF	ON	OFF	OFF
Slave3	3	ON	ON	OFF	OFF
Slave4	4	OFF	OFF	ON	OFF
Slave5	5	ON	OFF	ON	OFF
Slave6	6	OFF	ON	ON	OFF
Slave7	7	ON	ON	ON	OFF
Slave8	8	OFF	OFF	OFF	ON
Slave9	9	ON	OFF	OFF	ON
Slave10	10	OFF	ON	OFF	ON
Slave11	11	ON	ON	OFF	ON
Slave12	12	OFF	OFF	ON	ON
Slave13	13	ON	OFF	ON	ON
Slave14	14	OFF	ON	ON	ON
Slave15	15	ON	ON	ON	ON

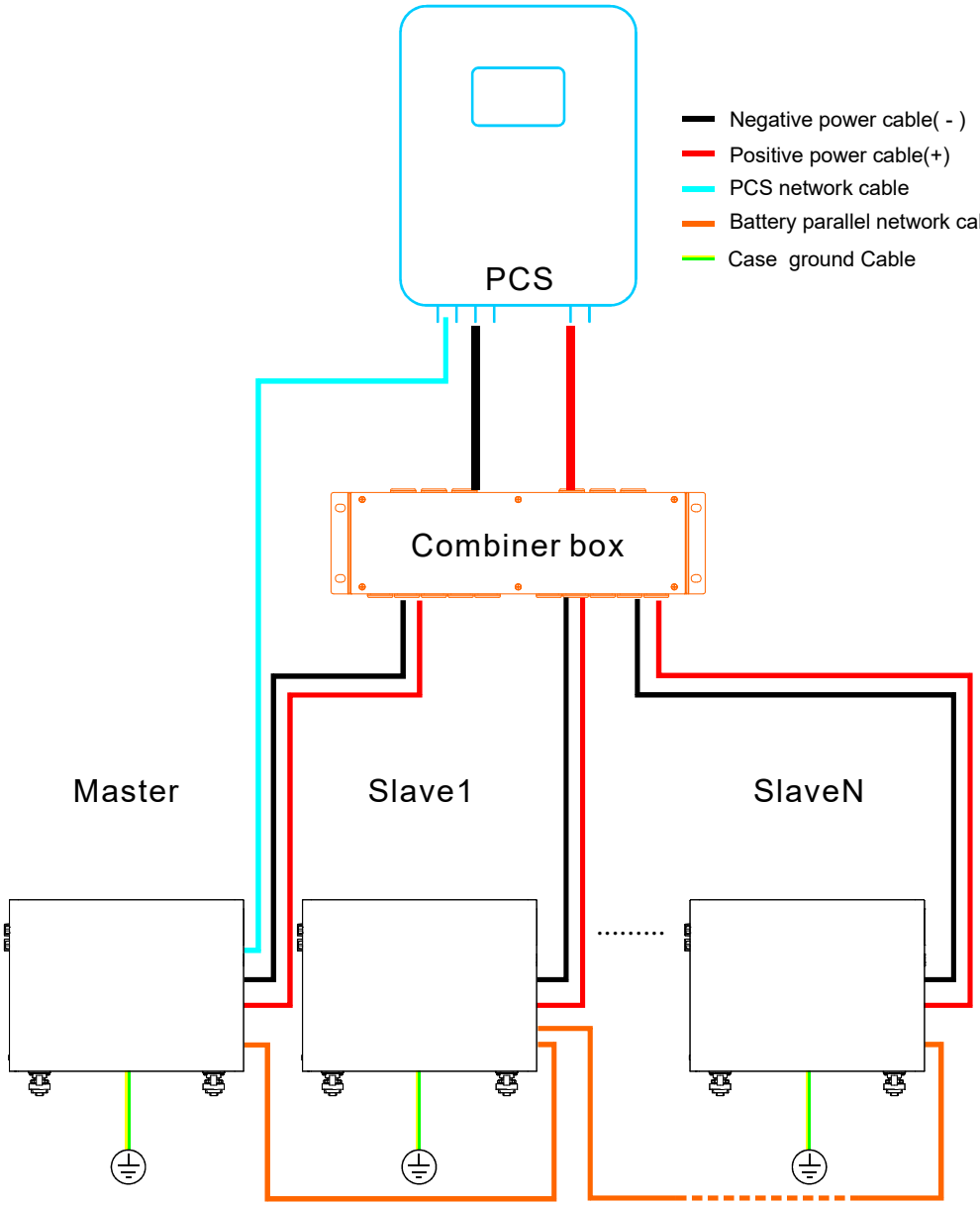
CAUTION

We recommend connecting 2-4 batteries depending on the application scenario.When the batteries need to be used in parallel, the maximum connection is 16 cells, but we recommend connecting 2-4 cells depending on the application scenario. When connecting to an off-grid solar inverter, Canbus/RS485 communication that does not require a battery to be connected to the inverter is supported, just plug and play if the inverter brand factory does not have a Canbus/RS485 port.

RS485/CAN communication parallel connection diagram.



As shown below, select the appropriate parallel power cable and associated connectors.



Note:

1.If you connect a hybrid inverter, make sure to consult the sales manager of the relevant inverter brand before connecting.

2.The appearance of the battery case will change, and the specific object shall prevail.

6. Product Warranty

If you have purchased this product from one of our factories, you should be aware that a warranty is provided for this product in addition to other rights and remedies that consumers are entitled to by law.

You are entitled to a replacement or refund for a major failure and to compensation for any other reasonably foreseeable loss or damage. You also have the right to have the goods repaired or replaced if they are of substandard quality and do not constitute a major fault.

For the above products, you will receive our factory warranty, which lasts for 5 years from the date of manufacture. The factory warranty covers the cost of any repairs or spare parts for an agreed period from the date the equipment is delivered, subject to the following conditions.

6.1 Factory Warranty Coverage

The factory warranty does not cover damage caused by:

-Damage to product seal (open case)

-Shipping damage

-Incorrect installation or commissioning

-Did not follow the user manual, quick installation instructions

- Improper use or operation

-Inadequate ventilation of equipment

-Failure to comply with applicable safety regulations

- Force majeure

It also does not include surface appearance defects that do not affect the use of the product.

6.2 Warranty Conditions

If the battery is defective during the agreed factory warranty period, unless this is impossible or disproportionate, the factory will choose one of the following options at its discretion:

-Or battery repair

-Or on-site battery repair

-Replace with a device whose model is equivalent to its age.

In the latter case, the remaining warranty rights will be transferred to the replaced equipment and your rights will be documented at the factory.

In particular, if the factory's repair measures result in unreasonable costs, the meaning of the above clause is excessive.

-- Taking into account the value of the equipment in the absence of defects

-- Considering the importance of equipment defects

-- After considering the possibility of replacement equipment working, the customer can resume work without major inconvenience.