LEADPOWER
领湃科技

LP-HESS-S2.5-00-B01
Battery Box
User Manual

Safety Instructions

Thank you very much for choosing the LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box from Hunan Leadpower Technology Co., Ltd. To better use and maintain this product, please read this user manual carefully before use and understand the relevant safety operations. All installation, commissioning, and maintenance should be carried out by professional personnel.

Safety Signs

This manual uses the following safety signs, please comply with them.

 Danger

"Danger" indicates a high potential risk that could lead to death or serious injury if not avoided.

 Warning

"Warning" indicates a moderate potential risk that could lead to moderate or serious injury if not avoided.

 Caution

"Caution" indicates a potential risk that could lead to equipment failure or property loss if not avoided.

 Note

"Note" is additional information in the manual, emphasizing and supplementing the content, providing tips or tricks for optimizing product use, which will help you solve a problem or save your time.

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Chapter 1 Product Introduction

The LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box mainly includes battery modules, BMS modules, output interfaces, etc., which can store and release electrical energy according to the requirements of AC/DC inverter systems, and support capacity expansion. It can form a household photovoltaic storage system with photovoltaics and inverters, storing excess photovoltaic energy in the battery under the control of the inverter, and releasing the stored electricity to power the load when the photovoltaic energy is insufficient.

1.1 Model Identification

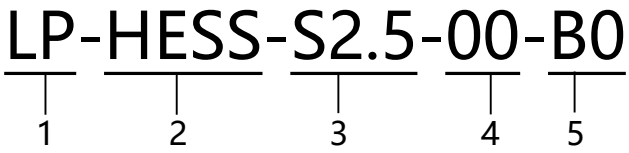


Table 1-1 Model Identification Explanation

Identifier	Meaning	Value
1	Product Identification	LP: Hunan Lingpai New Energy Technology Co., Ltd.
2	2 Product Series	HESS: Home Energy Storage System
3	System Capacity	S2.5: Rated capacity of 2.5kWh
4	4 Cooling Method	00: Natural cooling
5	Version Number	B0: Model B (software version) first edition

1.2 Product Features

※ New square aluminum shell lithium iron phosphate battery, safe and reliable, long cycle life;

※ 8-series battery modules + battery management system + rack-mounted standard chassis integrated;

※ Modular design, flexible configuration, easy installation;

※ Strong environmental adaptability, wide operating temperature range;

※ Comprehensive protection functions (overvoltage, undervoltage, short circuit, reverse connection, overload, overcurrent, overtemperature, low temperature, balance, sleep);

※ Equipped with RS232 interface and RS485 interface;

※ Centralized LCD monitoring display and LED indicator, the operating status is clear at a glance.;

1.3 Product Appearance

The overall appearance of the product is shown in the figure below (subject to actual delivery):

Figure 1-3 Product Appearance Diagram

1.4 Interface Definition

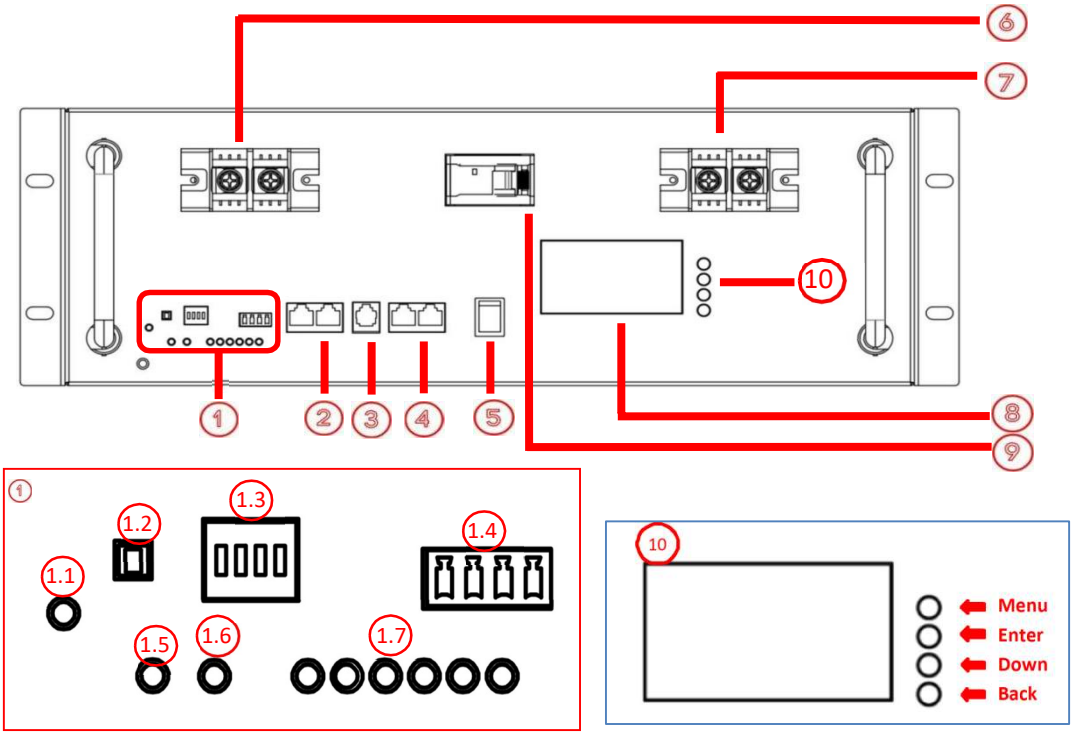


Figure 1-4 Product Interface Diagram

Table 1-4 Interface Definition Explanation

S/N	Name	Description
1	Display Panel Interface	The encoding switch is used to set the address of each BMS protection board, supporting multi-module expansion
1.1	Power On/Off Indicator Light Power	On/Off status indication (ON/OFF)
1.2	Reset Button	Press and hold the reset button for 3-6 seconds, the 9 LED lights light up in sequence, the system enters sleep; after sleep, press and hold the reset button for 3-6 seconds to wake up
1.3	Dip Switch	RS485 daisy chain, set the address through 4 dip address switches
1.4	Dry Contact	[Dry Contact 1]-PIN1 to PIN2: Normally open, closes when low battery [Dry Contact 2]-PIN3 to PIN4: Normally open, closes when protection fault
1.5	Operation Light	In standby state, the green operation light flashes, charging and discharging are possible
1.6	Alarm Light	Red LED light indicates fault when alarm, protection
1.7	Battery Level Indicator	6 green LED lights indicate the current battery pack SOC
2	External Communication Port	External communication port, CAN/RS485 communication port
3	RS232 Communication Port	RS232 communication port
4	Internal Parallel Communication Port	Internal parallel communication port, RS485 communication port
5	System Switch	System power ON/OFF
6	Battery Positive Output	Battery external output positive interface
7	Battery Negative Output	Battery external output negative interface

8	Display	Battery information display
9	9 Air Switch	Controls the output of the battery system
10	Menu Button	Used to operate the content of the display
10.1	Menu Button	Menu options, including battery pack information, cell information, temperature information, status information, etc.
10.2	Confirm Button	Select the corresponding menu item, which will light up, press confirm to enter the corresponding information interface for inquiry.
10.3	Down Button	Press once to move down once.
10.4	Back Button	After information inquiry, if you need to view other content, press back..

1.5 Product Main Parameters

Table 1-5 Product Main Parameters:

S/N	Name	Specification Parameter
1	Cell	LFP 3.2V/100Ah
2	Cell Series-Parallel Method	1P8S
3	Rated Capacity	100Ah
4	Nominal Voltage	25.6V
5	Operating Voltage	18.4-28.8V
6	Battery Capacity	2.56kWh
7	Rated Charge/Discharge Current	0.5C/1C
8	Cycle Life	≥4600 cycles
9	Operating Temperature	Charging: 0℃~55℃; Discharging: -20℃~55℃;
10	Weight (Kg)	About 26±1Kg

1.6 System Introduction

1.6.1 System Functions

This product consists of 8 series of lithium iron phosphate batteries and a high-performance battery management system. Through the positive and negative power ports on the front panel, electrical energy can be stored and output. The main functions of the system are as follows:

> It has single-cell voltage, total voltage detection, overcharge, and undercharge alarm and protection functions;

> It has temperature detection, high and low temperature alarm and protection functions;

> It has charging and discharging current detection, overcurrent alarm and protection functions; and it has short circuit protection functions;

> It has LED battery level indication, which can display the remaining capacity of the battery, working mode, and alarm protection status;

> The protection parameters such as overcharge, undercharge, charging and discharging overcurrent, overtemperature, and undertemperature can be set through the upper computer software;

> It supports 4-bit address encoding;

> It has RS485 communication interface, RS232 communication interface, and dry contact function;

> It has pre-charge function;

> It has reverse connection protection function;

1.6.2 Operating Modes

This product has multiple operating modes: standby mode, sleep mode, charging mode, discharging mode, and power-off mode:

> Standby Mode

■ When the system is connected to electricity through the button switch, and there is no overvoltage, undervoltage, overcurrent, short circuit, high temperature, low temperature, etc., the system is in standby state. At this time, the operation light flashes, and the battery can be charged and discharged.

■ When the system is in sleep state, press the reset button for 3-6 seconds, the LED indicator lights up in sequence, and switch to standby mode.

> Sleep Mode

■ The system has manual and automatic sleep functions. When there is no external charging and discharging for 24 hours, the battery automatically enters sleep state.

■ When the battery pack over-discharge protection and more than 30S has not recovered, the system enters sleep state.

■ In standby or discharge mode, press the reset button for 3-6 seconds, the LED indicator lights up in sequence, and the system enters sleep.

■ It can be put into sleep mode through the upper computer command.

> Charging Mode

■ When the system detects the charger, and the charging current reaches the effective charging current, it enters the charging mode.

> Discharging Mode

■ When the system detects the load connection and the discharging current reaches the effective discharging current, it enters the discharging mode.

> Power-off Mode

■ The battery triggers under-voltage protection, execute button power-off or button switch power-off, the system enters power-off mode.

■ The wake-up conditions for power-off mode: 1. Charging activation; 2. Button power-on.

■ The external switch controls the power-on and power-off, with the highest priority. The switch is closed for power-on, and the switch is open for power-off.

1.6.3 LED Indicator Instructions

This product has 9 LED indicator lights, 6 green LED lights for battery level indication for the current battery pack SOC, 1 red LED light for fault indication during alarm and protection, 1 green LED light for battery standby, charging, and discharging status indication, and 1 green LED light for battery power-on and power-off status indication. The specific instructions are as follows:

●	●	●	●	●	●	●	●	●
ON/OFF	RUN	ALARM	SOC					

> Capacity Indication

State		Charging						Discharging					
Capacity Indicator Lights		L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
		●	●	●	●	●	●	●	●	●	●	●	●
Battery Capacity	0～17%	Off	Off	Off	Off	Off	Flash2	Off	Off	Off	Off	Off	Solid
	18～33%	Off	Off	Off	Off	Flash2	Solid	Off	Off	Off	Off	Solid	Solid
	34～50%	Off	Off	Off	Flash2	Solid	Solid	Off	Off	Off	Solid	Solid	Solid
	51～66%	Off	Off	Flash2	Solid	Solid	Solid	Off	Off	Solid	Solid	Solid	Solid
	67～83%	Off	Flash2	Solid	Solid	Solid	Solid	Off	Solid	Solid	Solid	Solid	Solid
	84～100%	Flash2	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid
Running Indicator Light		Solid						Flash (Flash 3)					

> Status Indication

System State	Operation State	RUN	ALM	Battery Indication LED						Description
		●	●	●	●	●	●	●	●	
Power-off	Sleep	Off	Off	Off	Off	Off	Off	Off	Off	All off
Standby	Normal	Flash 1	Off	Based on battery level indication						Standby Status
	Alarm	Flash 1	Flash							Battery level below 5%
Charging	Normal	Solid	Off	Based on battery level indication (the highest battery level LED flashes 2)						The highest battery level LED flashes 2, ALM does not flash when overcharge alarm
	Alarm	Solid	Off							
	Overcharge Protection	Solid	Off	Solid	Solid	Solid	Solid	Solid	Solid	If there is no mains power, the indicator light turns to standby state
	Temperature, overcurrent, failure protection	Off	Solid	Off	Off	Off	Off	Off	Off	Stop charging
Discharging	Normal	Flash 3	Off	Based on battery level indication						
	Alarm	Flash 3	Off							
	Under-voltage protection	Off	Off	Off	Off	Off	Off	Off	Off	Stop discharging
	Temperature/overcurrent/short circuit/reverse connection/failure protection	Off	Solid	Off	Off	Off	Off	Off	Off	Stop discharging
Failure		Off	Solid	Off	Off	Off	Off	Off	Off	Stop charging and discharging

> LED Flash Explanation

Flashing Mode	ON	Off
Flash 1	0.25s	3.75s
Flash 2	0.5s	0.5s
Flash 3	0.5s	1.5s

1.6.4 Communication Functions

The energy storage battery box is equipped with RS232, RS485, CAN, and dry contact communication interfaces, and the specific communication functions are as follows:

> RS232 Communication:

The product can communicate and maintain upgrades with the upper computer through the RS232 interface, thus it is possible to monitor various information of the battery through the upper computer, including battery voltage, current, temperature, status, and battery production information, with a default baud rate of 9600bps.

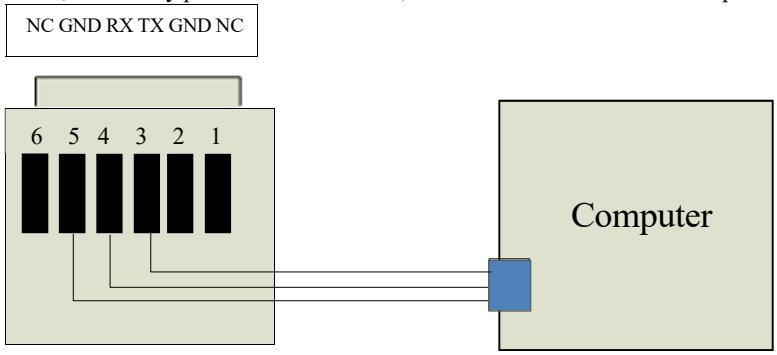


Figure 1-6-4.1 External RS232 Interface Connection

> CAN Communication

CAN communication, default communication rate 500K, when the battery pack is connected in series, the battery pack data, status, and information are uploaded to PCS through internal RS485 communication series connection, and connected to PCS as shown in the figure below.

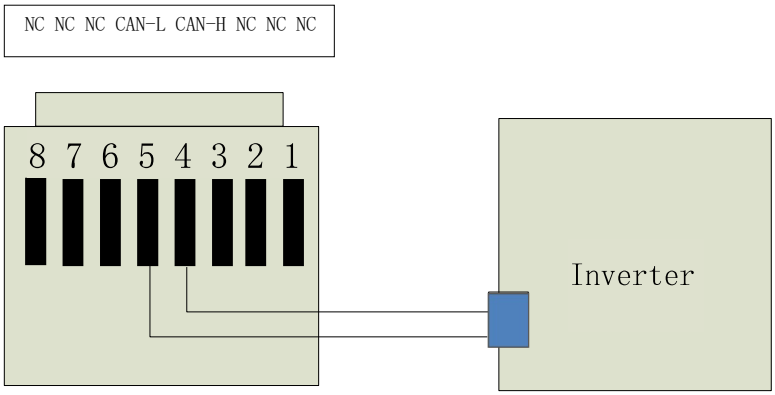


Figure 1-6-4.2 External CAN Interface Connection

> RS485 Communication

When the battery pack is connected in series, the battery pack data, status, and information are uploaded to PCS through external RS485 communication, with a default baud rate of 9600bps. The external RS485 interface connection is shown in the figure below.

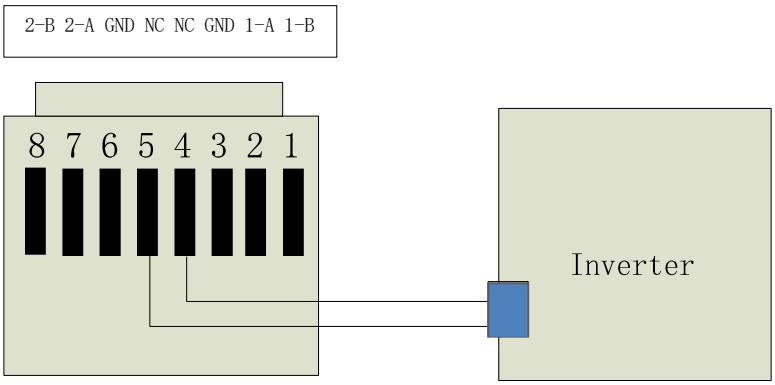


Figure 1-6-4.3 External RS485 Interface Connection

> Internal RS485 Communication

When multiple machines are connected in parallel, the internal RS485 communication port is used for parallel communication, and the terminal device can read the total of all parallel PACK battery data through the external communication port RS485/CAN. When multiple machines are connected in parallel, the internal RS485 interface connection is shown in the figure below.

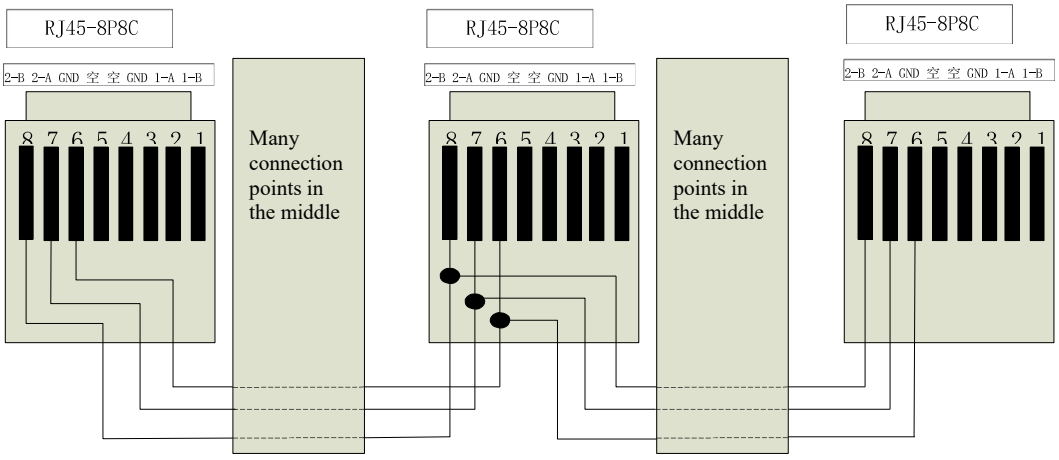
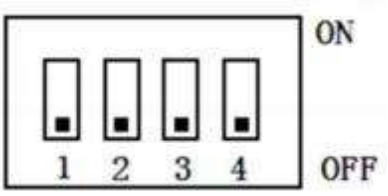


Figure 1-6-4.4 Internal RS485 Interface Connection

> Dip Switch Settings

When used in parallel, the address can be set through the dip switch to distinguish different PACKs, and the address should not be set to the same; parallel machine use address setting: the definition of the dip switch refers to the table below (up to 15 sets of parallel machines are supported):



Address	Dip Switch Position				Description
	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	Single machine use
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

Chapter 2 Installation .

This chapter introduces the installation of the LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box, including unboxing inspection, installation preparation, and specific installation steps.

Note

1. The disassembly and installation of the product must be carried out by professional personnel.

2. The front of the module packaging box (with labels) should be placed upwards, do not invert.

3. During the transportation and disassembly process of the product, strong impact or violent disassembly is prohibited.

4. The number of layers stacked during transportation and storage should not exceed 5 layers, exceeding 5 layers may cause product damage due to compression.

5. The product should be installed upright.

2.1 Unboxing Inspection

After the LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box product arrives, please check the following items:

1. Check the product name, model, and specifications, box number, box quantity, and packaging situation;

2. Check the random accessories according to the shipping attachment list to see if they are complete and correct (as shown in Figure 2-1);

3. Check the product packaging to see if there is any collision damage during transportation;

4. Open the outer packaging of each module and check the appearance of each module to see if there is any transportation damage;

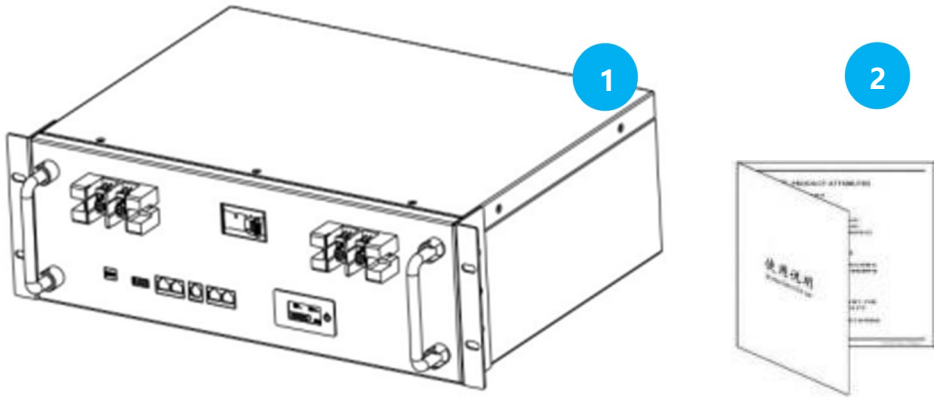


Figure 2-1 Shipping Parts Diagram

Table 2-1 Shipping Parts Quantity

S/N	Name	Quantity	Remarks
1	Battery Box	1 PCS	/
2	Accessories Bag	1 PCS	Including user manual

2.2 Installation Preparation

2.2.1 Installation Environment

> The installation and use environment must comply with the relevant laws and regulations of the local country and the relevant international, national, and regional standards for lithium battery products;

> The installation position should not be reached by children and should be kept away from the daily working and living areas; > When installing outdoors, please choose a shaded installation point or build a sunshade to avoid direct sunlight or rain;

> When installing in the garage, it is necessary to stay away from the direction of vehicle travel. It is recommended to install the energy storage on the wall above the car bumper to avoid accidental collisions;

> When installing in the basement, it is necessary to maintain ventilation. Do not place flammable or explosive items around the equipment. It is recommended to install on the wall to avoid water accumulation;

> The installation location should be clean and away from fire sources and heat sources. Do not place flammable or explosive items around the equipment. There should be no large amounts of infrared radiation, organic solvents, or corrosive gases.

> The installation location should avoid water accumulation and stay away from water sources such as faucets, drainage pipes, sprinklers, etc., to prevent water seepage;

> Energy storage will be corroded when installed outdoors in salt-harm areas. Please do not install directly outdoors in salt-harm areas;

2.2.2 Installation Space

The battery box should be placed on a flat surface and can be arranged in a stackable manner. The number of layers stacked should not exceed 5 layers and should be firmly fixed. The distance between the left and right sides of the product and the wall is recommended to be 200-500mm.

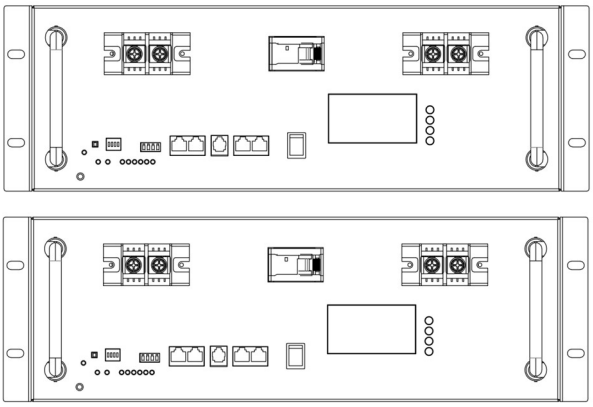


Figure 2-2-2 Shipping Parts Diagram

2.3 Product Installation .

2.3.1 Product Handling

The product can be moved to a place close to the installation point by forklift from the transportation vehicle, and then moved to the installation point by manual handling or mechanical transportation. As shown in Figure 2-3:

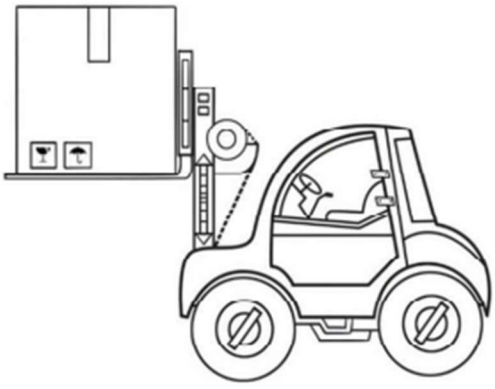
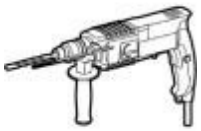
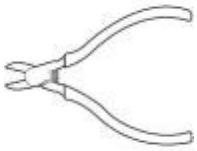
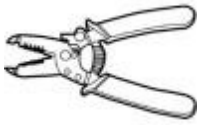
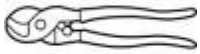
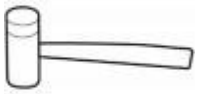
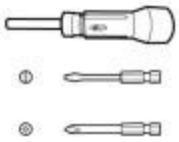
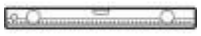


Figure 2-3-1 Forklift Moving Diagram

2.3.2 Product Handling

Table 2-3 Installation Tools and Protective Equipment

Tool Type	Tools and Instruments		
Tools	 Impact drill	 Torque socket wrench	 Torque wrench
	 Wire stripper	 Wire cutter	 Rubber hammer
	 Torque screwdriver	 Crimping pliers	 Zip tie
	 Multimeter	 Marker pen	 Steel ruler
	 Level ruler	 Heat shrink tube	 Heat gun
Protective Equipment	 Safety gloves	 Safety goggles	 Dust mask

2.3.3 Cable Connection

This chapter mainly introduces the cable connection of the LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box.

Danger

Before making the electrical connection, please ensure that all switches of the LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box are in the "OFF" state, otherwise the high voltage of the energy storage may cause an electric shock hazard.

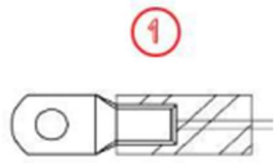
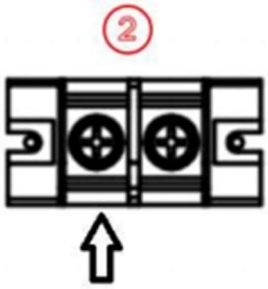
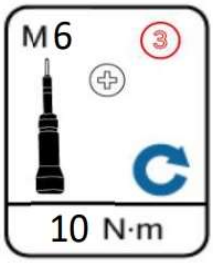
1) The electrical connection should comply with the installation regulations of the country/region where the equipment is located;

2) When arranging the communication cable, please note that the communication cable should be separated from the direct current cable, and the cable should be laid away from the source of interference to avoid signal interference affecting the communication;

3) The protective layer of the communication cable is inside the connector, cut off the excess core wire. The core wire should be fully inserted into the terminal hole, no leakage, and the cable connection should be tight;

4) Please use the plug to block the unused waterproof gland hole and tighten the lock cap;

5) If multiple communication cables need to be connected, please ensure that the outer diameter of the communication cables is the same;

		
1. Prepare the connection cable bundles between the inverter and the battery box, and the connection terminal uses M6 terminal, 3AWG wire, or according to the inverter configuration.	2. Connect the inverter and battery box connection cable bundles to the battery box output end connector (M6 screw).	3. Use M6 cross screws and tighten with a torque of 10N·m.

The parallel installation method of the LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box can refer to the following figure:

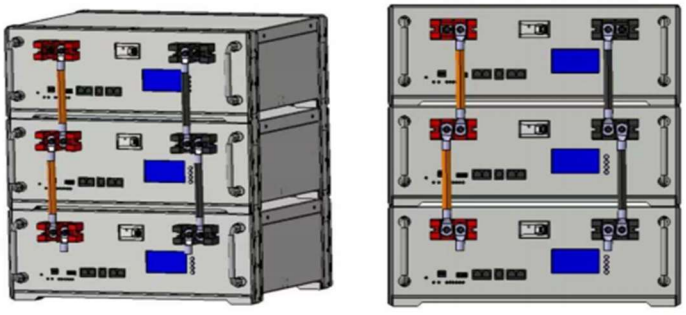


Figure 2-3 Product Parallel Installation Diagram

2.4 Post-installation Check

1. The equipment is installed in a reasonable position, meeting the safety distance requirements;

2. The surrounding environment meets the installation and operation requirements of the equipment;

3. The wiring is correct and reasonable, the grounding wire is well connected to the ground net, and the construction unit is required to test the grounding resistance value;

Chapter 3 Inspection and Operation

This chapter introduces the power-on inspection, system debugging, and usage precautions of the LP-HESS-S2.5-00-B01 Home Energy Storage Battery Box.

3.1 Power-up Inspection

Table 3-1 Inspection Items and Acceptance Standards are shown in the following table:

S/N	Item Name	Item Acceptance Standard
1	Energy Storage Installed Correctly	Energy storage are installed firmly and reliablely.
2	Cable Arrangement	The cable arrangement is reasonable and meets user requirements.
3	3 Wire Tie Binding Aesthetically pleasing	Wire ties are even and the sharp corners should not be left in the cut.
4	Reliable Grounding	The grounding wire connection is correct and firm and reliable.
5	5 Disconnect Switch	All switches connected to the energy storage are in the "OFF" state.
6	Cable Connection	The output and input wire connections are correct and firm and reliable.
7	7Seal Unused Terminals and Interfaces	Unused terminals and interfaces are fitted with waterproof caps.
8	Installation Environment Meets Requirements	The installation space is reasonable, the environment is clean and tidy, and there are no construction residues.

3.2 Product Operation Parameters

Table 3-2 Battery Charging and Discharging Operation Parameters and Rated Values are shown in the following table:

S/N	Item Name	Specification Parameter Value
1	Nominal Voltage	25.6V
2	Charge Cut-off Voltage	28.8V
3	Discharge Cut-off Voltage	18.4V
4	Standard Charging Current	0.5C
5	Standard Discharging Current	0.5C
6	Maximum Continuous Discharging Current	1C
7	Operating Temperature	Charging: 0℃~55℃; Discharging: -20℃~55℃
8	8 Storage Temperature	15℃~35℃
9	Relative Humidity	5%-95%

3.3 BMS and Functional Parameters

Table 3-3 Battery BMS Parameters and Functional Parameters and Rated Values are shown in the following table:

S/N	Indicator Items		Factory Default Parameter	Is It Adjustable	Remarks
1	0Cell Overcharge Protection	Cell Overcharge Alarm Voltage	3.6V	Adjustable	
		Cell Overcharge Protection Voltage	3.65V	Adjustable	
		Cell Overcharge Protection Delay	1.0S	Adjustable	
	Cell Overcharge Protection Removal	Cell Overcharge Protection Removal Voltage	3.38V	Adjustable	
		Discharge Removal	When discharge current > 1A		
2	0Cell Undercharge Protection	Cell Undercharge Alarm Voltage	2.9V	Adjustable	After undercharge Protection if still unable to recover, it will enter low power mode
		Cell Undercharge Protection Voltage	2.8V	Adjustable	
		Cell Undercharge Protection Delay	1.0S	Adjustable	
	Cell Undercharge Protection Removal	Cell Undercharge Protection Removal Voltage	3.0V	Adjustable	
		Charge Removal	When charging is applied it can be activated		
3	0Overall Overcharge Protection	Overall Overcharge Alarm Voltage	28.4V	Adjustable	
		Overall Overcharge Protection Voltage	28.8V	Adjustable	
		Overall Overcharge Protection Delay	1.0S	Adjustable	
	Overall Overcharge Protection Removal	Overall Overcharge Protection Removal Voltage	27.04V	Adjustable	
		Discharge Removal	When discharge current > 1A		
4	0Overall Undercharge Protection	Overall Undercharge Alarm Voltage	23.6V	Adjustable	After undercharge Protection if still unable to recover, it will enter low power mode
		Overall Undercharge Protection Voltage	22.8V	Adjustable	
		Overall Undercharge Protection Delay	1.0S	Adjustable	
	Overall Undercharge Protection Removal	Overall Undercharge Protection Removal Voltage	24V	Adjustable	
		Charge Removal	When charging is applied it can be activated		
5	0Charging Overcurrent Protection	Charging Overcurrent Alarm Current	55A	Adjustable	
		Charging Overcurrent Protection Current	60A	Adjustable	
		Charging Overcurrent Protection Delay	1.0S	Adjustable	
	Charging Overcurrent Protection Removal	Automatic Removal	1min later it will automatically remove		
		Discharge Removal	When discharge current > 1A		
6	Discharge Overcurrent 1 Protection	Discharge Overcurrent 1 Alarm Current	105A	Adjustable	
		Discharge Overcurrent 1 Protection Current	110A	Adjustable	
		Discharge Overcurrent 1 Protection Delay	1.0S	Adjustable	
	Discharge Overcurrent 1 Protection Removal	Automatic Removal	1min later it will automatically remove		
		Charge Removal	When charge current > 1A		
7	Discharge Overcurrent 2	Discharge Overcurrent 2 Protection Current	≥150A	Adjustable	
	Discharge Overcurrent 2 Protection Removal	Automatic Removal	1min later it will automatically remove		
		Charge Removal	When charge current > 1A		
8	Short Circuit Protection	Short Circuit Protection Current	≥350A		
		Short Circuit Protection Removal	When charging, short circuit protection can be removed		

			After the load is removed, it is automatically removed		
9	MOS High Temperature Protection	MOS Overtemperature Alarm Temperature	90℃	Adjustable	
		MOS Overtemperature Protection Temperature	105℃	Adjustable	
		MOS Protection Removal Temperature	85℃	Adjustable	
10	Cell Temperature Protection	Charging Low Temperature Alarm Temperature	5℃	Adjustable	
		Charging Low Temperature Protection Temperature	0℃	Adjustable	
		Charging Low Temperature Protection Removal Temperature	2℃	Adjustable	
		Charging High Temperature Alarm Temperature	50℃	Adjustable	
		Charging High Temperature Protection Temperature	55℃	Adjustable	
		Charging High Temperature Protection Removal Temperature	52℃	Adjustable	
		Discharging Low Temperature Alarm Temperature	-15℃	Adjustable	
		Discharging Low Temperature Protection Temperature	-20℃	Adjustable	
		Discharging Low Temperature Protection Removal Temperature	-15℃	Adjustable	
		Discharging High Temperature Alarm Temperature	50℃	Adjustable	
		Discharging High Temperature Protection Temperature	55℃	Adjustable	
		Discharging High Temperature Protection Removal Temperature	52℃	Adjustable	
11	Ambient Temperature Alarm	Ambient Low Temperature Alarm Temperature	-15℃	Adjustable	
		Ambient Low Temperature Protection Temperature	-20℃	Adjustable	
		Ambient Low Temperature Protection Removal Temperature	-15℃	Adjustable	
		Ambient High Temperature Alarm Temperature	55℃	Adjustable	
		Ambient High Temperature Protection Temperature	65℃	Adjustable	
		Ambient High Temperature Protection Removal Temperature	60℃	Adjustable	
12	Full Charge Judgment	Full Charge Voltage	>27.75V	Adjustable	
		End Current	<2A	Adjustable	

3.4 BMS Software Update

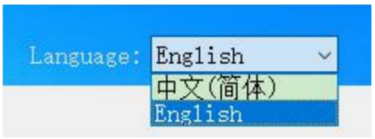
When upgrading, first ensure that the BMS product is in standby mode, please disconnect the discharge load and charger.

3.4.1 Operation Steps and Instructions

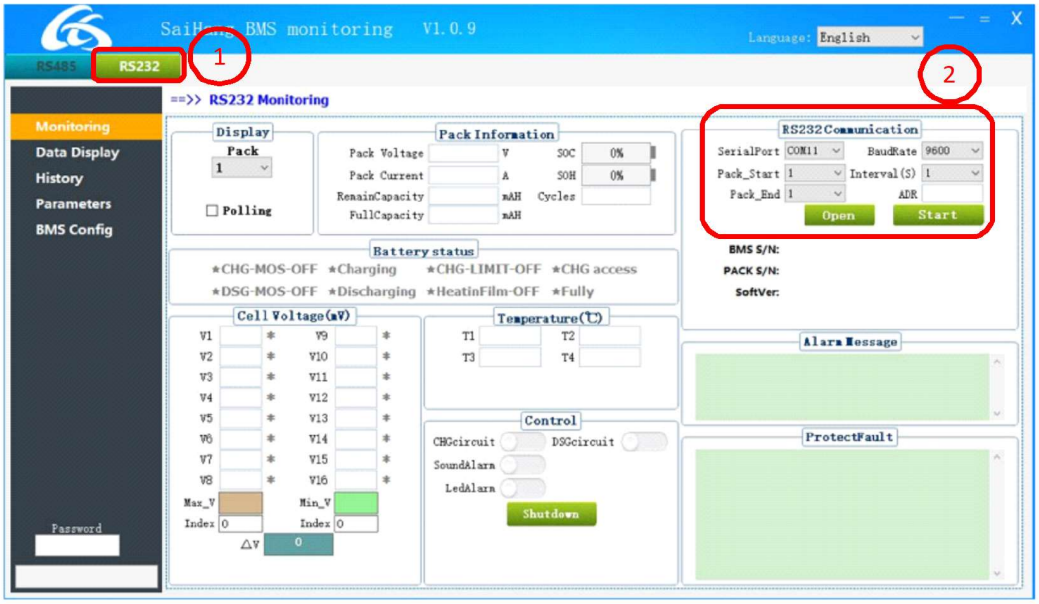
Table 3-4-1 Software Update Required Resources:

		
232-USB conversion cable, DB9 is a male head, and the driver is installed	DB9 female to RJ45 conversion cable	Computer installed software upper computer

1、 In the "Default Language" dropdown, select the language you want to switch to and then save.。

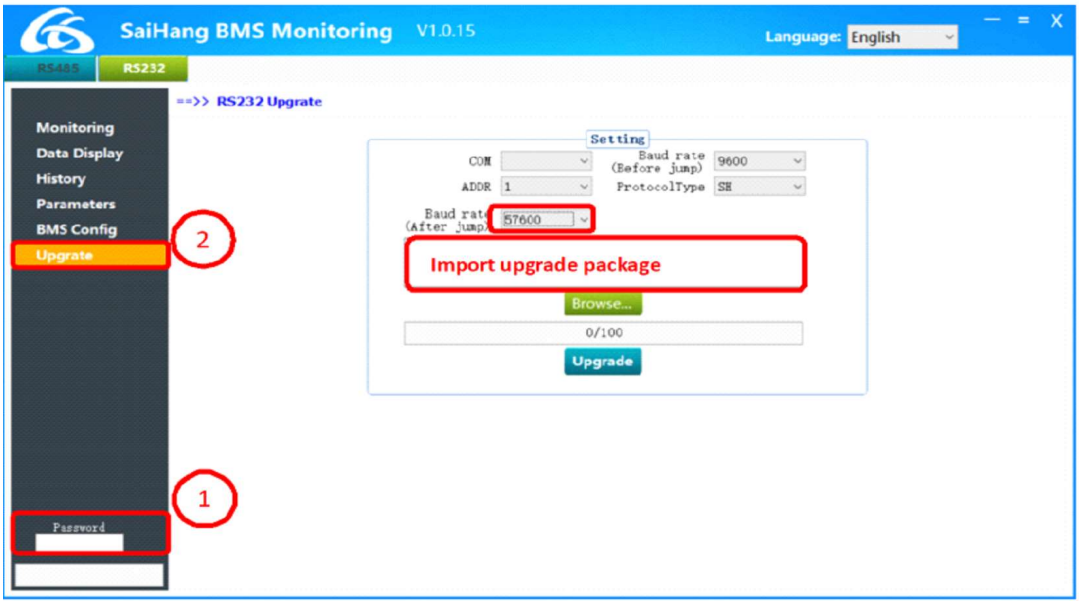


2、 Unzip the upper computer package, and double-click SHbmsTools.exe in the unzipped folder to open the upper computer and enter the RS232 operation interface；



3、Select the serial port corresponding to the 232 USB cable (view through Device Manager), keep other configurations unchanged, and then click to open the serial port and start monitoring. At this time, you can judge whether the communication between BMS and the upper computer is normal by whether there is data transmission on the upper computer；

4、When the communication between the upper computer and BMS is normal, remember the serial port number and click to close the serial port. Enter "shbms" (lowercase) in the permission password box, and the upgrade option will be displayed. Click to select and enter the upgrade page.



5、 Select the 232 communication serial port number you just remembered, change the baud rate to 57600 after the jump, and select the upgrade file through the browse button. After doing all this, click the upgrade button to upgrade. (Note: The upgrade process will power off, and you need to disconnect the power supply lines from the pack to the outside world.)

Chapter 4 Maintenance Guarantee

1. Hunan Leadpower New Energy Technology Co., Ltd. promises to provide you with related quality assurance and repair services from the date of purchase, with the product serial number on the nameplate or the product sales contract.

2. If the equipment fails, please call the customer service hotline and contact the dealer or our company directly. The transportation costs caused during the product quality guarantee period shall be borne by the user.

3. The following situations are not covered by the warranty:

> Man-made faults;

> Outside the quality guarantee period;

> The nameplate serial number is changed or lost;

> Loss or damage caused by force majeure;

> Unauthorized disassembly or modification;

> Damage to the equipment caused by violation of equipment operation and use regulations;

> Damage to the equipment caused by non-compliance with the document operation is not within the scope of the equipment quality warranty;

4. The faulty products replaced will be processed by our company, and users should store the faulty products properly; for products that need to be repaired, users should give a reasonable and sufficient amount of time. We apologize for any inconvenience caused to your use.

5. Due to product version upgrades or other reasons, the content of this document will be updated from time to time. Unless otherwise agreed, this document is intended as a guide only and all statements and recommendations in this document do not constitute any express or implied warranty of any kind

Appendix

Equipment Operation and Maintenance Record

Project Name:		Project Location:	
Installation Date:		Equipment Model:	
Quantity of Equipment:		Equipment Serial Number:	
Software Version:		Hardware Version:	
Fault Phenomenon			
Handling Results			
Field Operation Status			
Operation and Maintenance Records			