Product Model

POW-LIO48300-16S

PowMr

FLOOR-STANDING LIFePO4 BATTERY

User Manual

Table of Contents

1 Overview

1.1 Scope

This user manual provides information, operating instructions, and maintenance guidelines for the POW-LIO48300-16S low-voltage residential energy storage battery series. The POW-LIO48 residential energy storage series is a lithium battery system developed by PowMr, designed to be compatible with various inverter brands available in the market.

1.2 Intended Audience

This manual is intended for professional technical personnel involved in the installation, operation, and maintenance of lithium batteries, as well as end-users seeking technical information.

1.3 Manual Usage

1. Before using the product, carefully review this user manual and keep it in a readily accessible location.
2. All information in this user manual, including images and symbols, is proprietary to PowMr. Unauthorized use of any part or all of the content is strictly prohibited for individuals outside the company.
3. Considering the potential for updates and corrections to the manual content, users are advised to use the provided documentation as a reference. For the latest user manual, please refer to the product documentation provided or contact customer service through the official website.

2 Product Introduction

2.1 Introduction

1. The POW-LIO48 residential energy storage series is a battery module developed by PowMr Energy designed for low-voltage lithium battery systems, primarily applied in the home energy storage sector. It achieves high-precision multi-cell voltage and temperature acquisition.
2. The module adopts a passive balancing method, with a maximum balancing current of up to 300mA, improving the overall lifespan of the battery pack.
3. The communication interfaces include RS232, RS485, CAN and dry contact communication methods, enabling parallel communication for up to 10 batteries.
4. Featuring an embedded BMS system, it effectively monitors battery over-temperature, over-voltage, over-current, and other conditions, reducing the risk of battery damage or even fire, thereby ensuring personal and property safety.

3 Safety Instructions

3.1 Labeling Explanation

To ensure user safety during product use, relevant labeling information with appropriate symbols is provided in this manual. The following lists symbols that may be used in this manual, so please read carefully.

Icon	Description
	Signifies a low-level potential hazard. Failure to avoid may result in minor or moderate injury to personnel.
	Indicates the presence of high voltage inside the battery module. Touching may lead to electric shock hazards.
	This is the ground protection port (PE). It should be securely grounded to ensure the safety of operating personnel.

3.2 Installation Tools

Prior to installation, prepare the following tools:

Category	Tools		
General Tools	Multimeter 	Protective gloves 	Insulated safety shoes 
	Protective clothing 	Safety goggles 	Antistatic wrist strap 
Installation Tools	Electric screwdriver 	Socket wrench 	Wire stripper 
	Phillips screwdriver (M4/M6) 	Electric drill 	Hammer 

3.3 Precautions

3.3.1 Preface

This document, "Operating Instructions and Precautions for Lithium-Ion Rechargeable Batteries," is exclusively applicable to batteries manufactured by PowMr.

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.

3.3.2 Declaration

1. If customers intend to use the battery for devices beyond the specifications outlined in this manual or under conditions not specified in this manual, they should contact PowMr technical support in advance. Specific experimental tests are required to verify the battery's performance and safety under such usage conditions.
2. PowMr disclaims any responsibility for any accidents arising from the use of the battery under conditions beyond the specifications outlined in this manual.
3. If necessary, PowMr will inform customers in writing about improvement measures for the correct operation and use of the battery.

3.3.3 Manual Storage

1. This manual covers crucial information for the POW-LIO48 Home Energy Storage Series. Prior to operating the product, carefully read this manual as it provides essential assistance in acquainting you with the product.
2. Store this manual securely for the convenience of relevant installation and maintenance personnel to refer to during operations.
3. Strictly follow the descriptions in this manual when operating the PowMr Home Energy Storage Series to avoid equipment damage, injuries, property loss, and other potential issues.

3.3.4 Label Protection

1. Warning labels on the POW-LIO48 Home Energy Storage Series contain crucial safety operation information. It is strictly prohibited to intentionally tear or damage them!
2. The product has a nameplate on the casing, providing essential parameter information. It is strictly prohibited to intentionally tear or damage it!

3.3.5 Safety Warning Labels

When conducting installation, routine maintenance, inspections, etc., on the POW-LIO48 Home Energy Storage Series, to prevent unauthorized individuals from approaching, engaging in improper operations, or accidents, adhere to the following conventions:

1. Erect clear signage at the switch locations of the PowMr products to prevent accidents caused by accidental closing.
2. Set warning signs or establish safety warning tape near the operating area to prevent unrelated personnel from approaching.
3. After maintenance or inspection, conduct a thorough on-site safety check.

3.3.6 Personnel Requirements

1. Only personnel with relevant professional qualifications are allowed to perform various operations on this product.
2. Operating personnel should be thoroughly familiar with the composition and working principles of the entire POW-LIO48 Home Energy Storage Series system.
3. Operating personnel should be fully acquainted with the "User Manual" for this product.

3.3.7 Measuring Instruments

WARNING

When performing electrical connections and trial operations on the energy storage backup battery, and to ensure that electrical parameters meet requirements, relevant electrical measuring equipment such as multimeters, power meters, etc., should be used. Note the following:

1. Use measuring equipment with a suitable range that conforms to on-site working conditions.
2. Ensure the correct and standardized electrical connections of the instruments to avoid dangers such as electric arcs.

3.3.8 Maintenance and Inspection

WARNING

When both the energy storage battery and the inverter are turned off, and electrical connections are confirmed to be disconnected, maintenance or inspection operations can be carried out on the energy storage battery cabinet. Pay attention to the following:

1. Ensure that the energy storage battery will not be accidentally re-energized.
2. Use a multimeter to ensure that the energy storage battery is completely de-energized.
3. For parts near potentially live components during operations, use insulating materials for insulation covering or grounding.
4. It is strictly prohibited to perform maintenance or inspection operations on live equipment! When performing maintenance or inspection on equipment, it must be ensured that at least two personnel are present at the site. Maintenance operations can only be carried out after the equipment is safely de-energized, fully charged, or discharged.

3.3.9 Operating Precautions

DANGER

1. Do not use the battery in extreme hot environments, such as direct sunlight or hot car interiors. Excessive heat can cause the battery to overheat, potentially leading to ignition, affecting battery performance, reducing battery lifespan, and causing personal injury.
2. In case of battery leakage and electrolyte entering the eyes, immediately rinse with clean water and seek medical assistance promptly.
3. Avoid submerging the battery in water or getting it wet!
4. Prohibit charging the battery near open flames or under extremely hot conditions! Do not use or store the battery near heat sources such as fire or heaters. If the battery leaks or emits an unusual odor, promptly move it away from open flames.
5. Please use a dedicated charger!
6. Do not reverse the positive and negative terminals!
7. Do not directly connect the battery to wall outlets or car cigarette lighters!
8. Do not throw the battery into fire or heat it!
9. Prohibit short-circuiting the positive and negative terminals with wires or other metal objects. Do not transport or store the battery together with necklaces, hairpins, or other metal objects!
10. Prohibit puncturing the battery casing with nails or other sharp objects. Avoid hitting or stepping on the battery!
11. Avoid impacts, throwing, or subjecting the battery to mechanical vibrations.
12. Prohibit direct welding to the battery terminals!
13. Prohibit disassembling the battery in any way!

14. Prohibit placing the battery in microwaves or pressure containers!
15. Prohibit combining the battery with disposable batteries (such as dry cells) or batteries of different capacities, models, or types!
16. If the battery emits an odor, heats up, deforms, changes color, or exhibits any other abnormal phenomena, discontinue use. If the battery is in use or charging, immediately remove it from the device or charger and cease usage.

4 Overview of Main Components

No.	Image	Name	Quantity
1		Battery	1
2		Red-Positive Power Line	1
3		Black-negative Power Line	1
4		Parallel communication cable	1
5		Product User Manual	1
6		Quality Certificate	

5 Product Introduction

5.1 Overview

POW-LIO Household Energy Storage Series Lithium Battery Module integrates PowMr's high-capacity and high-safety lithium iron phosphate battery cells. The module features a bottom roller design for easy and flexible energy maneuvering. Inside the module, a high-precision Battery Management System (BMS) unit is integrated, incorporating multiple protection functions. It continuously monitors and collects voltage and temperature within the module, enabling intelligent temperature control at the cell level and intelligent cell balancing. This enhances system efficiency and extends battery cycle life.

The module is constructed with a cold-rolled sheet metal outer shell filled with shock-resistant structural design, achieving high safety and reliability in accordance with household standards. Additionally, the module incorporates high stability and strong anti-interference design, ensuring the safe and reliable operation of the battery system.

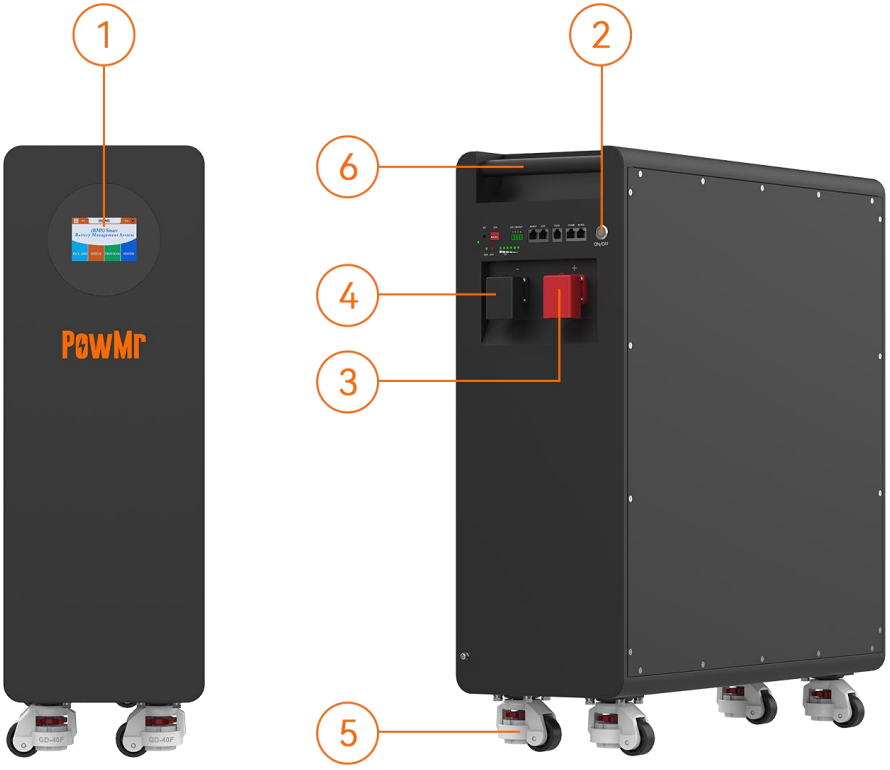
5.2 Advantages

- **Powerful Charging Capability:** Maximum charging current of up to 200A ensures fast charging, improving operational efficiency.
- **Sustained Discharge Support:** Delivers a continuous discharge current of 200A to meet high-load demands.
- **Parallel Expansion Capability:** Supports up to 16 batteries in parallel, with a maximum storage capacity of up to 258.8672kWh, providing flexible energy solutions for various scenarios.
- **Multiple Communication Interfaces:** Equipped with RS232/ RS485/ CAN / dry contact communication ports to enable efficient device-to-device communication within the system, enhancing the overall intelligence of the system.
- **Floor-standing Design with Wheels:** The compact design enhances space utilization, featuring high-quality Foma casters wheels at the bottom for smooth and stable mobility. This improves flexibility in power management, making it suitable for various environments.
- **Smart Touchscreen:** The intuitive display interface allows users to easily monitor battery operating data and status, as well as configure communication protocols, simplifying operation.
- **Comprehensive Protocol Integration:** Integrated with a variety of market-leading BMS

communication protocols, ensuring seamless compatibility with inverters and facilitating BMS communication between devices.

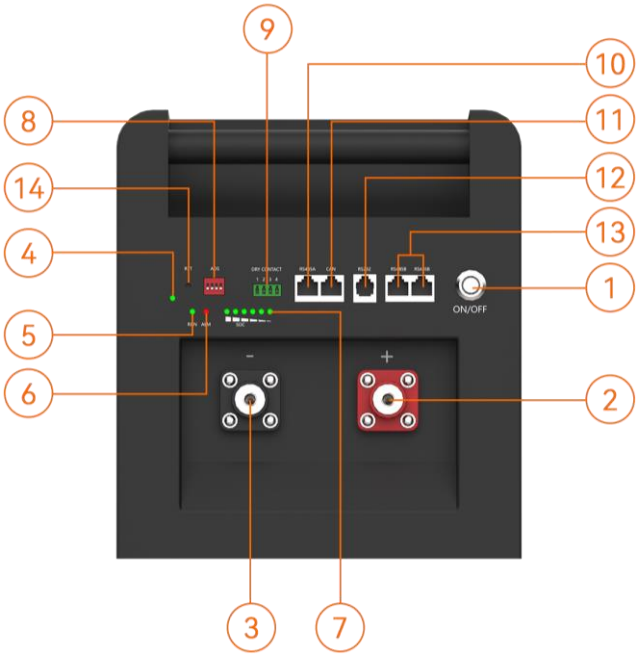
- **Remote Monitoring and Management:** Supports upper computer applications for remote access, enabling users to monitor battery status and make configuration adjustments anytime, without the need for on-site operations, enhancing convenience.
- **High-quality Battery Cells:** Built with A+ grade cells, ensuring high performance and stability, providing a reliable energy storage solution.
- **Intelligent Management System:** The high-quality Battery Management System (BMS) provides comprehensive safety for energy storage, continuously monitoring and adjusting battery status to extend service life.
- **Built-in Balancing Module:** The intelligent balancing module ensures up to 6000 cycles (0.2C, 25°C, 80% DOD), improving battery efficiency.
- **Safe Power Design:** Low-voltage switch design ensures safe power-on and reduces standby losses, providing users with a more secure experience.

5.3 Product Appearance



1	LCD Display Screen	4	Negative Terminal
2	Power Switch	5	Foma casters wheels
3	Positive Terminal	6	Handle

5.4 Battery Port Panel



No.	Item	Function	Notes
1	Power Switch	Used to start or shut down the battery	
2	Positive Terminal (+,M8)	Battery Positive Output	
3	Negative Terminal (-,M8)	Battery Negative Output	
4	Power Light (PWR)	Power Indicator Light	The indicator light lights up after powering on.
5	Operation Light (RUN)	Battery Operation Indicator Light	The signal light illuminates once the battery is operating normally.
6	Alarm Light (ALM)	Battery Alarm Indicator Light	

7	Capacity Light (SOC)	Battery Capacity Indicator Light	
8	DIP Switch (ADS)	Define Battery Communication Code	
9	Dry Contact	Dry Contact Communication	1. Dry Contact 1 – PIN1 to PIN2: Normally open, closed during fault protection; 2. Dry Contact 2 – PIN3 to PIN4: Normally open, closed during low battery alarm.
10	RS485A	485 Communication Interface	Communication with inverter via RS485
11	CAN	CAN Communication Interface	Communication with inverter via CAN
12	RS232	1. Monitor batteries and modify parameters. Perform software upgrades.	
13	RS485B	Communication between batteries.	Functions are the same, no distinction between left and right.
14	Reset Button (RESET)	Battery Reset	Briefly tap and release within 1-3 seconds.

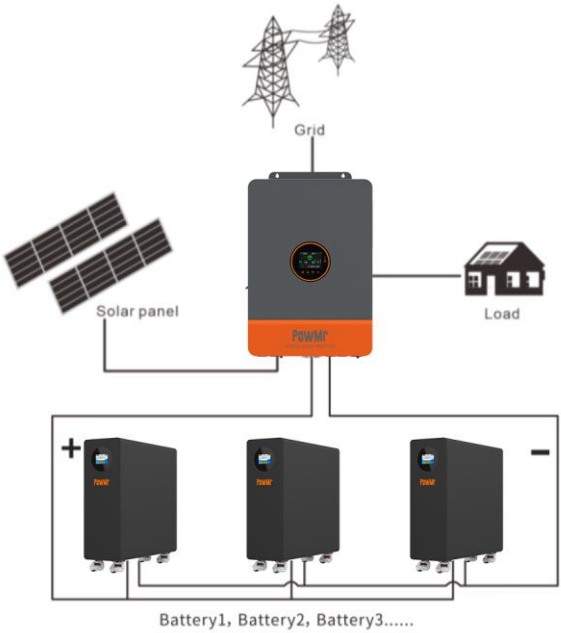
6 Principle and Structure

6.1 Operating Principle

Working Principle of Lithium Iron Phosphate Battery Energy Storage System: The battery packs are connected in parallel to the DC output of the energy storage inverter. When the grid power is normal, the inverter module operates normally, supplying power to the load (as shown in the figure) and charging the battery packs. When there is a power outage from the grid and photovoltaic sources, the battery packs provide uninterrupted power supply to the inverter, ensuring normal operation of household electricity. When grid power is restored, the battery packs are charged while simultaneously resuming power supply to the load. This intelligent power management mode is suitable for most residential, commercial, and industrial power scenarios.

6.2 Connection Structure

The connection diagram of lifepo4 battery energy storage system is shown in Figure below:



7 Battery Installation and Wiring

7.1 Preparation

1. Prepare tools: Cross-head screwdriver, multimeter, insulated gloves, rack, Ethernet cable, power cable.
2. Unboxing: Take the battery and other items from the packaging, first check if the battery's appearance is intact, then verify the completeness of accessories referring to the accessory list.

7.2 Safety Regulations

The installation, operation and maintenance of LiFePO4 Battery Energy Storage System should only be carried out by trained and qualified professionals. Before installation and use, please read the safety precautions and related operating procedures of this product carefully. The installation process must strictly abide by the following safety regulations and local safety regulations, otherwise it may cause personal injury or product damage.

- Please ensure that the inverter connected to the battery is a qualified power system;
- When installing the battery, please ensure that the power system is turned off and the battery pack is turned off;
- All power-saving cables must have corresponding insulation measures, and it is strictly forbidden to expose the power cord;
- Ensure that the battery and the power system are reliably grounded during installation.

7.3 Installation Notes

When begin to install the battery system, you should pay attention to the following matters:

- Installation Space: While ensuring there is sufficient space to accommodate the batteries, maintain a certain distance around the battery to allow for proper air circulation.
- Installation environment: The ambient temperature should be between 0℃ and 40℃ and relative humidity should be between 25% and 85% to ensure optimal operation.
- Cable specifications. To ensure that the use of the connection of the power supply line can meet the maximum current requirements of equipment operation.
- Project layout. Ensure the whole construction process of power equipment, batteries and other

reasonable layout.

- Wiring layout. Ensure that the wiring reasonable, orderly; and consider the moisture-proof, corrosion prevention.
- The installation site should be at least two or more peoples to operate.
- Please ensure the installation site safe before installation.

7.4 Battery Placement

WARNING!!

- Remember that this Pack is heavy so please be careful when removing it from the package, or install it .

Step 1. When receiving the product, open the wooden box. First check if all the accessories are complete. If any missing, please contact the dealer.

Step 2. The battery pack is very heavy and needs to use a forklift or more people. To remove the battery from the wooden box.

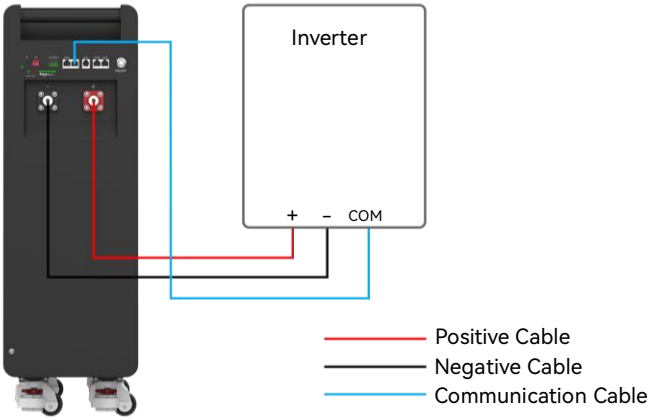
Step 3. After the battery pack is removed, ensure that the Foma caster wheels at the bottom are locked.

7.5 Battery Wiring

✧ **Single Battery Application:**

Step 1. Connect the inverter. Use a power cable to establish a connection between the battery and the inverter. Pay attention to polarity.

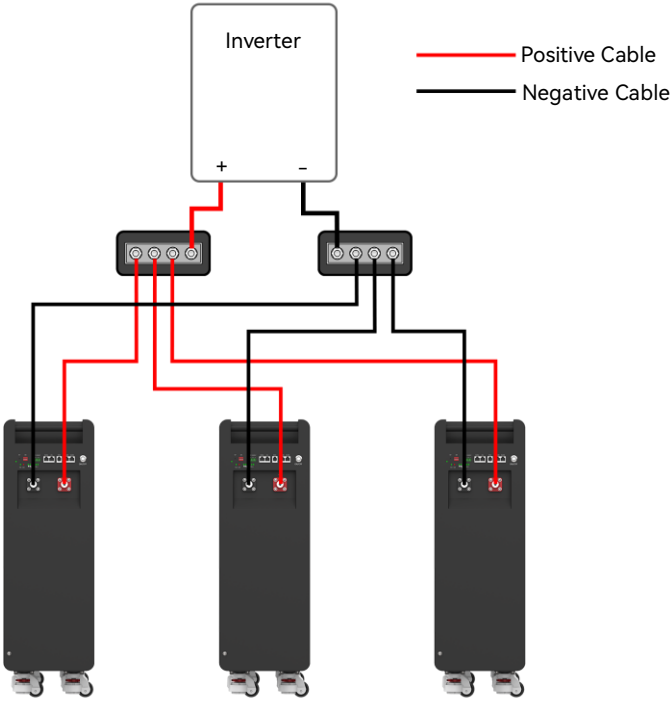
Step 2. Inverter BMS Communication. Connect the RS485A or CAN port to the communication port on the inverter using a communication cable.



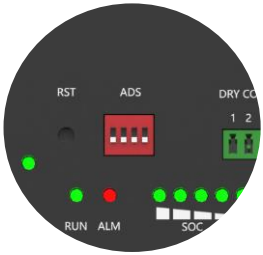
✧ **If multiple batteries are connected in parallel: (Using Three Batteries as an Example)**

Step 1. Use the battery parallel communication cable to connect each battery through the RS485B parallel port.

Step 2. Connect the power supply of each battery to the inverter. Use the power cable to connect the battery port of the inverter, paying attention to differentiate between positive and negative poles. If there are a large number of batteries, they can be integrated via a busbar to facilitate the wiring configuration at the inverter end.



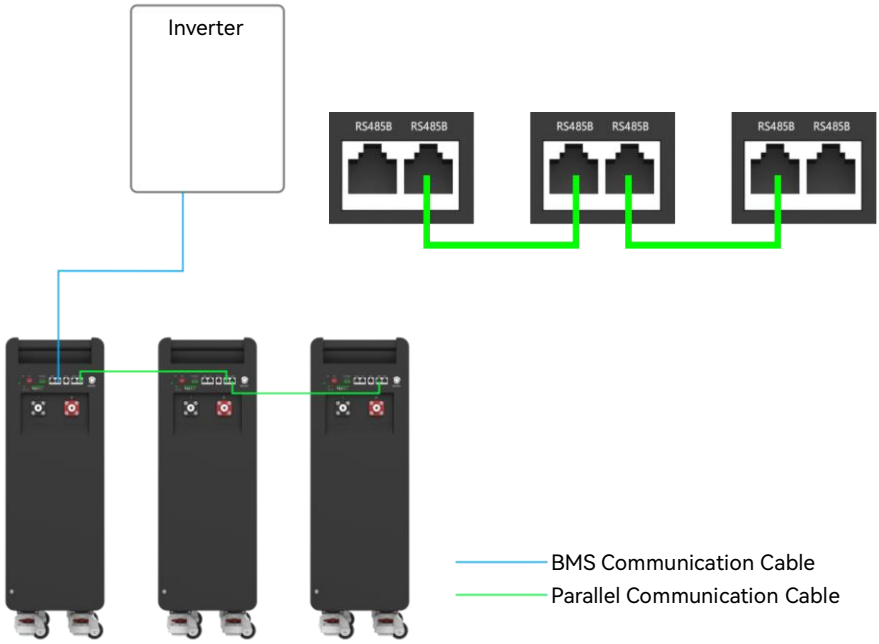
Step 3. Define the master-slave relationship of the batteries using the DIP switch. Define the master as 1, and the slaves as 2 to 15. For specific definition methods, please refer to Section 9.3. It support 15 battery in parallel.



Note

- The battery directly connected to the inverter via the communication cable is defined as the host. The host dip switch is set to 1 and needs to be switched before powering on.
- Define dip switches for other batteries sequentially from 2 to 15. Avoid duplicating dip switch settings to 1.

Step 4. Connect the inverter BMS communication. Use the BMS communication cable to connect the battery master to the inverter through the RS485A or CAN port.



8 Operation and Debugging

8.1 Power-On Sequence

After completing the connections between the inverter, battery, and mains power, initiate the battery by using the switch on the right side of the battery. Subsequently, start the inverter. Once the battery is operational, verify the communication status of the inverter. If the battery data is successfully transmitted to the inverter, it indicates successful communication between the inverter and the battery.

8.2 SOC Indicator & Status Indicator Guides

8.2.1 Battery LED Indicators

L8	L7	L6	L5	L4	L3	L2	L1
RUN	ALARM	SOC					

8.2.2 Battery Charging Level Indication

Status	Charge					
SOC(%)	L6	L5	L4	L3	L2	L1
0-16.6%	OFF	OFF	OFF	OFF	OFF	Flash2
16.6-33.2%	OFF	OFF	OFF	OFF	Flash2	light
33.2-49.8%	OFF	OFF	OFF	Flash2	light	light
49.8-66.4%	OFF	OFF	Flash2	light	light	light
66.4-83%	OFF	Flash2	light	light	light	light
83-100%	Flash2	light	light	light	light	light
RUN LED	light					

8.2.3 Battery Discharging Level Indication

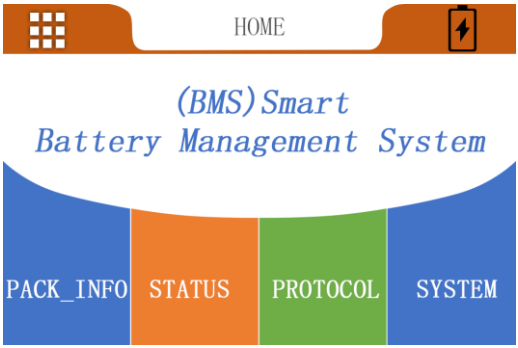
Status	Discharge					
SOC(%)	L6●	L5●	L4●	L3●	L2●	L1●
0-16.6%	OFF	OFF	OFF	OFF	OFF	light
16.6-33.2%	OFF	OFF	OFF	OFF	light	light
33.2-49.8%	OFF	OFF	OFF	light	light	light
49.8-66.4%	OFF	OFF	light	light	light	light
66.4-83%	OFF	light	light	light	light	light
83-100%	light	light	light	light	light	light
RUN LED	Flash(flash3)					

8.2.4 LED Flashing and Buzzer Mode Explanation

The buzzer alarm function is initially set to the off state and can be enabled through the upper computer.

Mode	Illuminated	Extinguished	MODE	Illuminated	Extinguished
Flash1	0.25s	3.75s	Buzzer1	0.25s	0.25s
Flash2	0.5s	0.5s	Buzzer2	0.25s	2s
Flash3	0.5s	1.5s	Buzzer3	0.25s	2s

8.3 LCD Screen Operation Guide



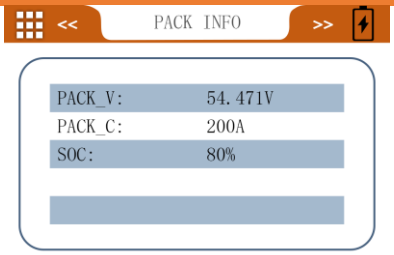
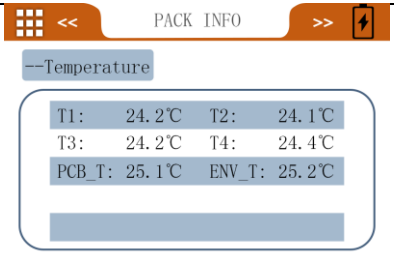
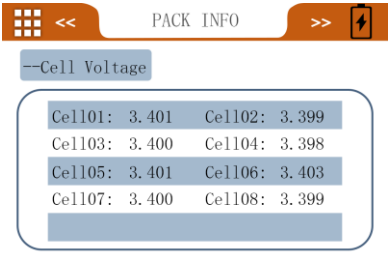
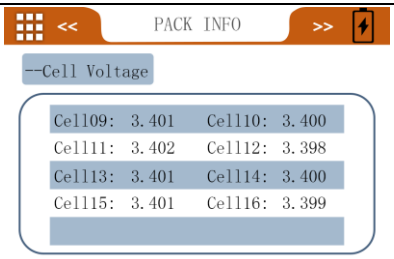
- When the screen goes dark, tap anywhere on the screen to reactivate the battery display.

8.3.1 Main Menu Page

Item	Description
	Click to return to the homepage.
	Click to view battery charge/discharge status
PACK_INFO	Displays battery pack voltage, charge/discharge current, state of charge (SOC), cell temperature, PCB temperature, ambient temperature, and cell voltage.
STATUS	Click to view BMS alarm or protection status.
PROTOCOL	Click to view the currently configured 485 and CAN communication protocols, with the option to manually change the protocol.
SYSTEM	Click to view the battery pack SN code and version number, with the option to change the language version.

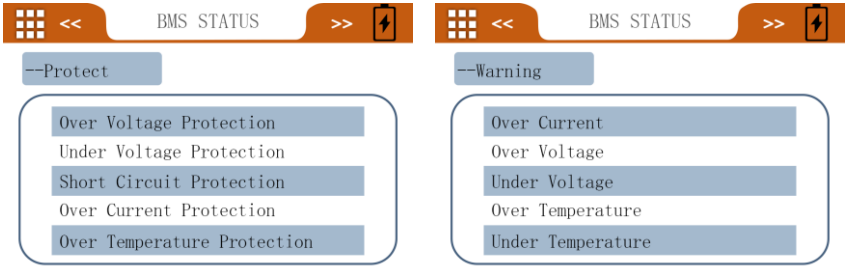
8.3.2 Enter the PACK_INFO Menu

Select PACK_INFO to enter the battery pack information interface. Use the "<<" and ">>" keys to scroll left and right through the display pages.

<table>
<tr><th>Display</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3"> 
</td><td>PACK_V</td><td>Battery Pack Current Voltage</td></tr>
<tr><td>PACK_C</td><td>Battery Pack Charge/Discharge Current</td></tr>
<tr><td>SOC</td><td>State of Charge (SOC)</td></tr>
<tr><td rowspan="5"> 
</td><td>T1</td><td>Temperature of Cell Group 1</td></tr>
<tr><td>T2</td><td>Temperature of Cell Group 2</td></tr>
<tr><td>T3</td><td>Temperature of Cell Group 3</td></tr>
<tr><td>T4</td><td>Temperature of Cell Group 4</td></tr>
<tr><td>PCB_T</td><td>PCB temperature</td></tr>
<tr><td> 
</td><td>ENV_T</td><td>Ambient temperature</td></tr>
<tr><td> 
</td><td colspan="2">Voltage of Cell 01 ~ Cell 08</td></tr>
<tr><td colspan="3">Voltage of Cell 09 ~ Cell 16</td></tr>
</table>

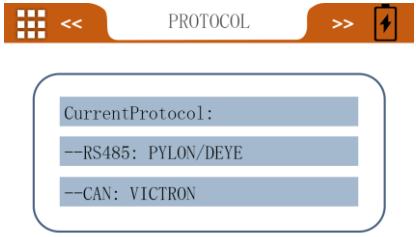
8.3.3 Enter the STATUS Menu

BMS STATUS Menu: Displays detailed battery protection and alarm information. Use the "<<" and ">>" keys to switch between protection and alarm pages. If a battery error occurs, navigate to this menu to view the corresponding protection or alarm details.



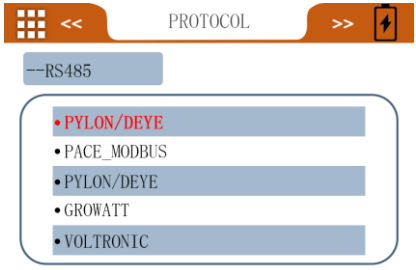
8.3.4 Enter the PROTOCOL Menu

Displays the current 485 and CAN protocols. To modify, click on the corresponding protocol.

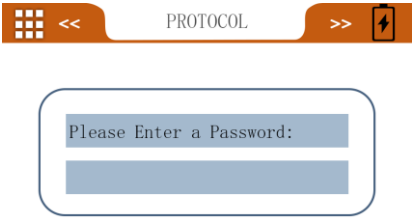


- **To change the 485 protocol:**

1. Click the current 485 protocol to enter the 485 protocol modification interface.

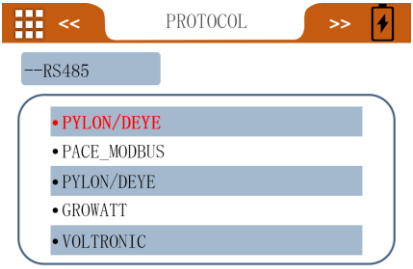


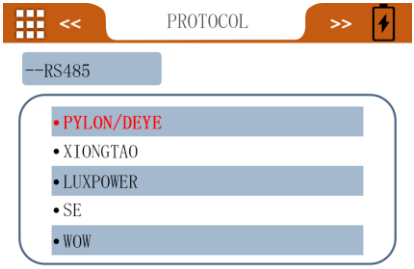
2. Click the current protocol (highlighted in red) to proceed to authorization verification before protocol changes.



3. Enter the password to obtain modification authorization (default password: "123456").

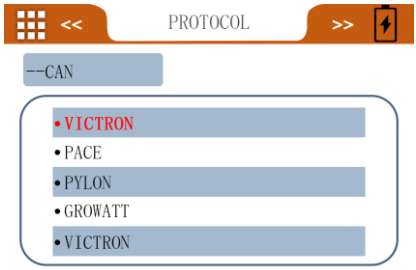
4. Select the desired protocol. Use "<<" and ">>" to browse all supported protocols.



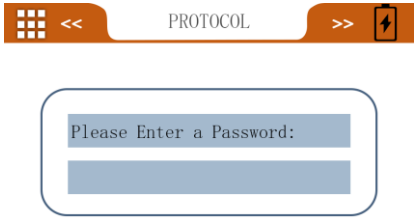


- **To Change the CAN Protocol:**

1. Click the current CAN protocol to enter the CAN protocol modification interface.

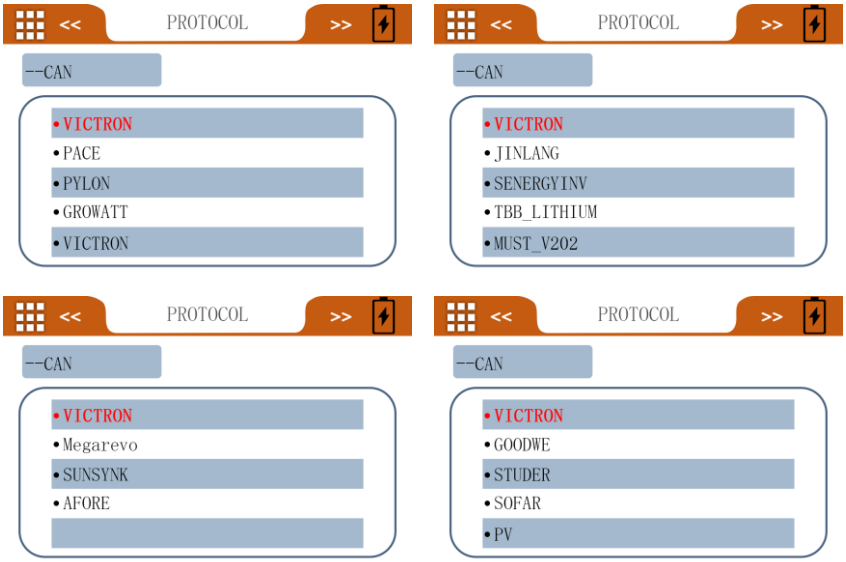


2. Click the current protocol (highlighted in red) to proceed to authorization verification before protocol changes.

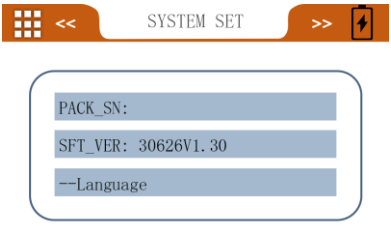


3. Enter the password to obtain modification authorization (default password: "123456").

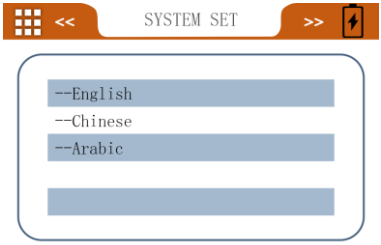
4. Select the desired protocol. Use "<<" and ">>" to browse all supported protocols.



8.3.5 Enter the SYSTEM Menu

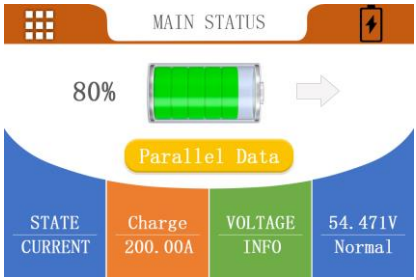
Display		Description
	PACK_SN	Displays the battery SN code.
	SFT-VER	Displays the battery version number.
	Language	Allows changing the language version.

Supported languages include:

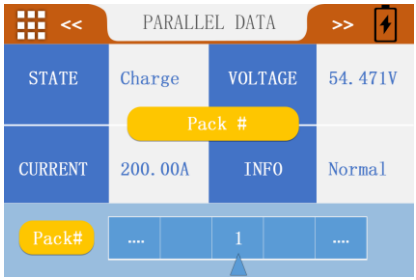


8.3.6 Battery Pack Main Status Page

1. Click the battery icon in the top right corner to enter the MAIN STATUS page.



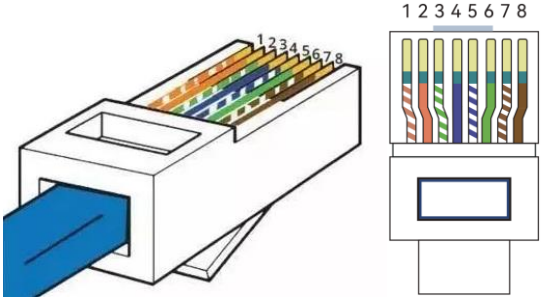
2. Click "Parallel Data" to access the parallel system data interface.



9 Debugging

9.1 RS485 & CAN Port Definition

1. Definition of RS485A port (default baud rate 9600bps) for communication between the battery and the inverter.

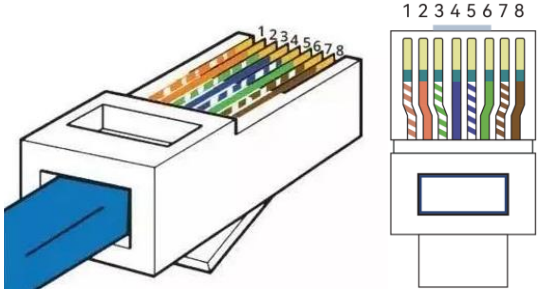


PIN2/7 (white & orange)	485-A
PIN1/8 (orange)	485-B

Note:

- The default RS485 protocol for the battery is set to Pylontech RS485 (V3.5) protocol. If compatibility with other inverters is needed, it is necessary to communicate through RS232 with the host computer to change the default protocol.

2. Definition of CAN port (default baud rate is 500K) for communication between the battery and the inverter.



PIN4(blue): CANH； PIN5(blue & white): CANL

Note:

- The battery is factory-set with the default CAN protocol, defaulting to Pylontech CAN protocol. If compatibility with other inverters is required, it is necessary to communicate through RS232 with the upper computer to change the default protocol.

Tip:

- For battery and inverter communication, choose either RS485 or CAN.

9.2 Upper Computer Software Operation Guide

Modifying Battery Parameters and Selecting Inverter Protocol via RS232 Upper Computer

➢ Tools

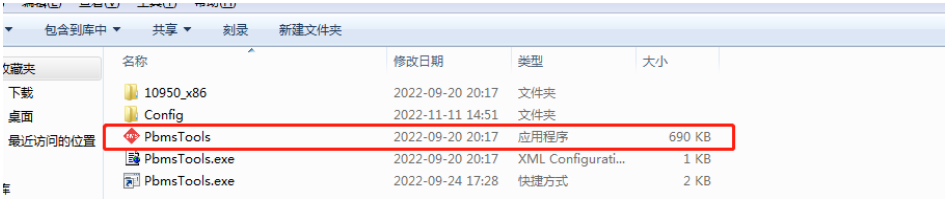
- Computer
- USB to RS232 Cable
- Monitoring Software: Pbms Tools HS1.0.9

NOTICE

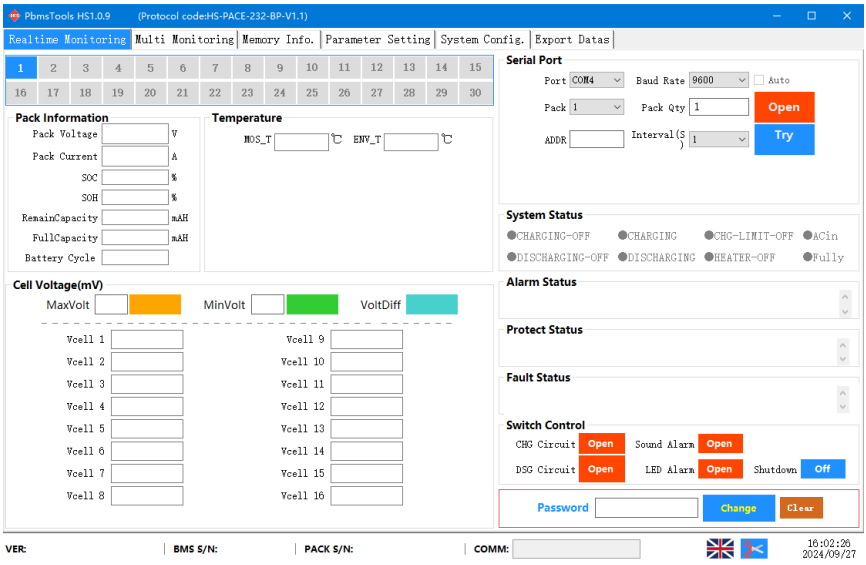
This guide applies to Pbms Tools HS1.0.9. For other software versions, please contact your supplier for the appropriate guide.

➢ Operating Steps

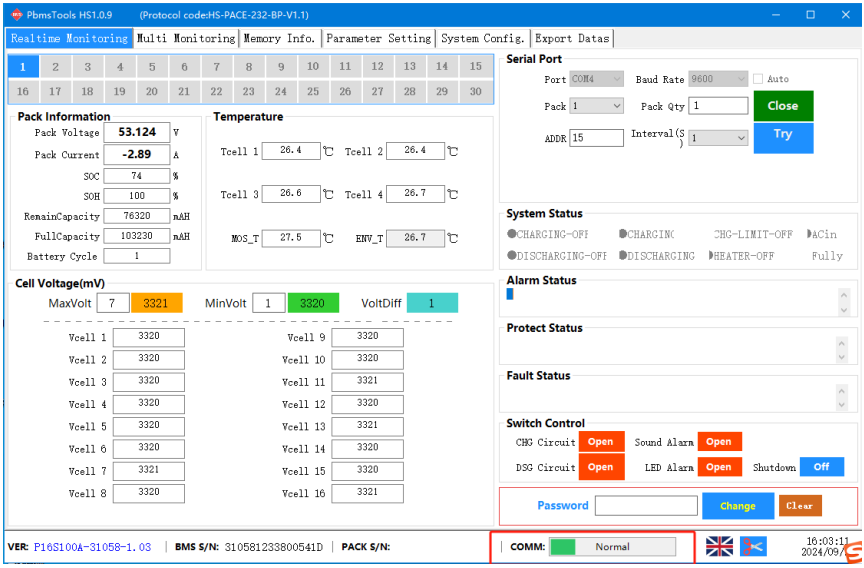
1. Connect the computer to the battery using a USB to RS232 cable. Plug the USB end into the computer's USB port and the other end into the battery's RS232 port.
2. Download and unzip the software package on the computer.
3. Open the extracted folder and select the application, as shown below:



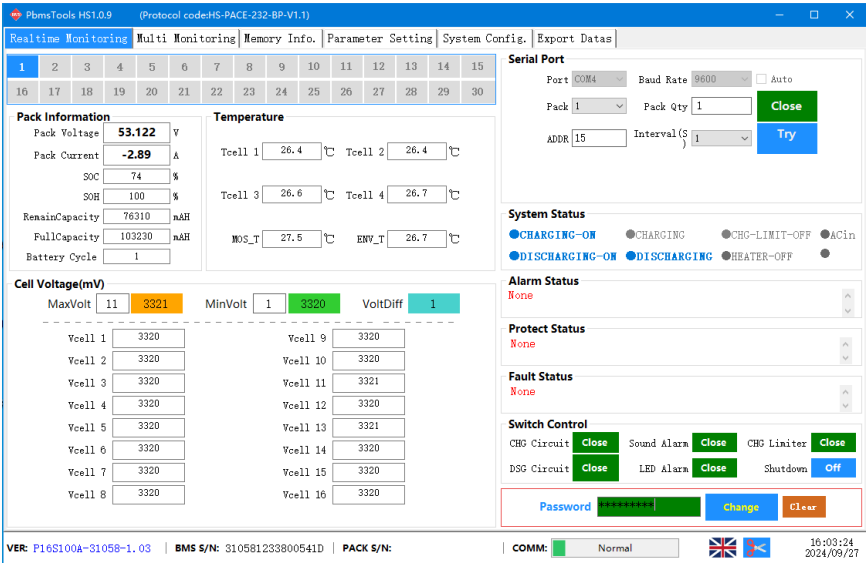
4. Double-click the above icon to enter the monitoring interface, as shown below:



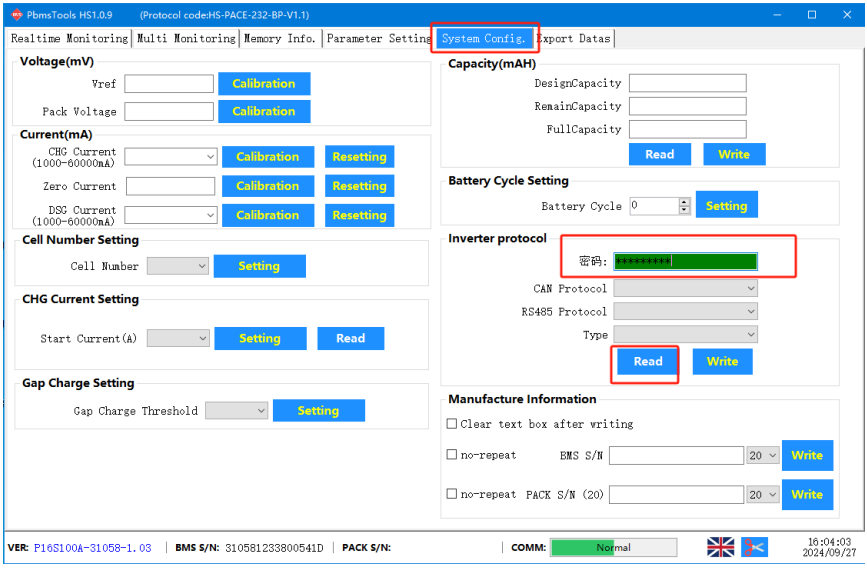
5. After entering the monitoring interface, click on the top right to open the serial port. Once communication with the battery is established, the left side will display real-time battery information, and the status bar in the lower right will turn green.



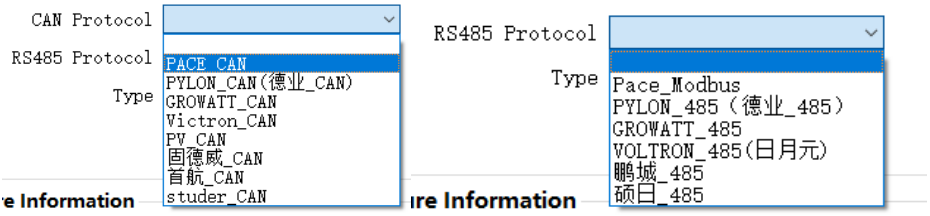
6. After successful communication, enter the password " Pz#188178" in the lower right password status bar. Upon correct input, the status bar will turn green.



7. Left-click on “System Config”, enter the password “Pz#168178” in the inverter protocol section, and then click “Read” to view the current protocol and protocol type.



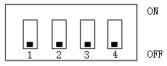
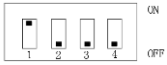
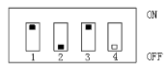
8. Click “CAN Protocol” or “RS485 Protocol” to select the corresponding inverter communication protocol, then click “Write” to change the battery BMS communication protocol and establish communication with the inverter.

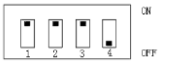
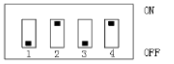
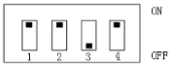
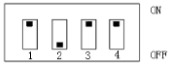
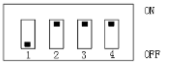
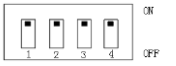


9. If the write fails, it indicates that the BMS does not include this inverter protocol, and a program upgrade is required. If the write is successful, click "Read" again to verify the selected protocol.

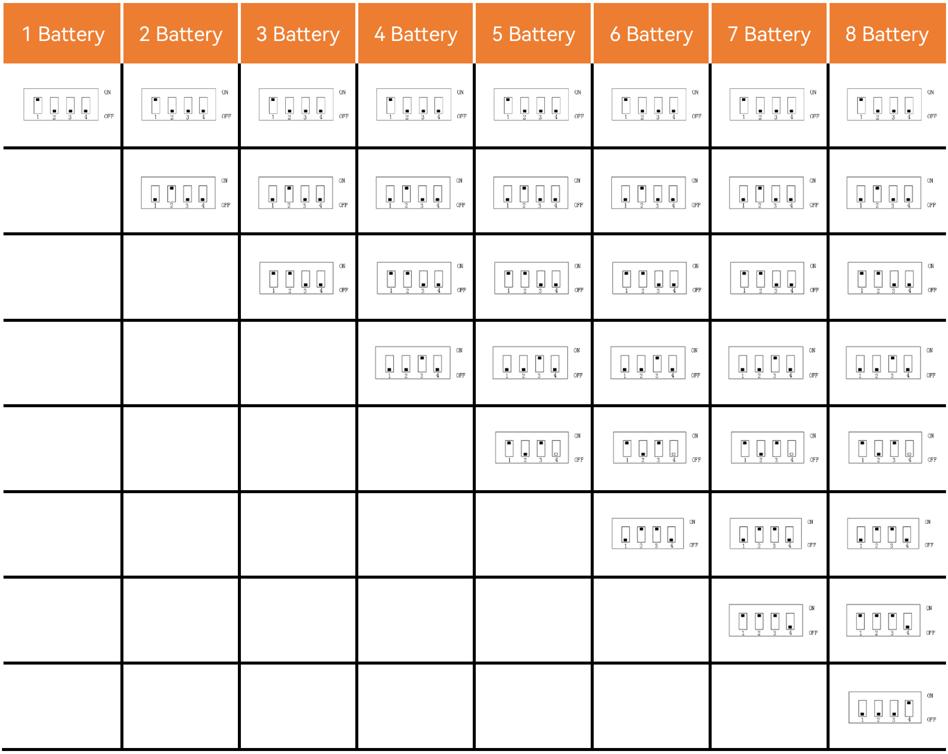
9.3 ADS DIP Switch Definitions

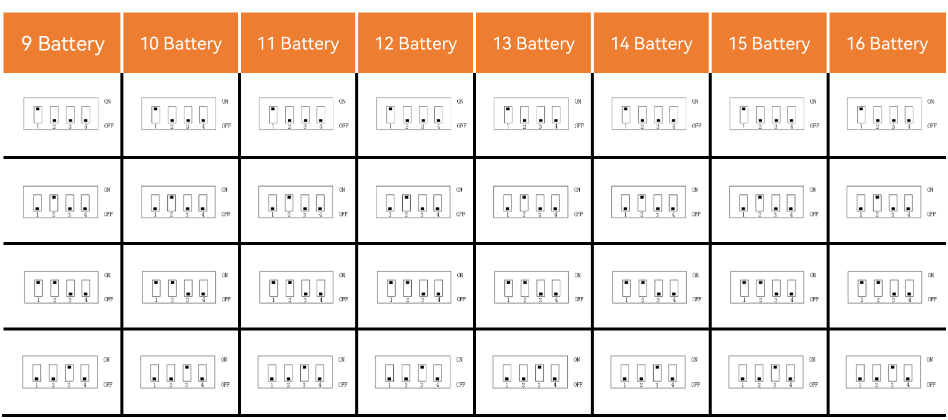
If operating in parallel mode, use the DIP switch to assign a communication code to each battery for the purpose of defining the master and slave configuration of the batteries.

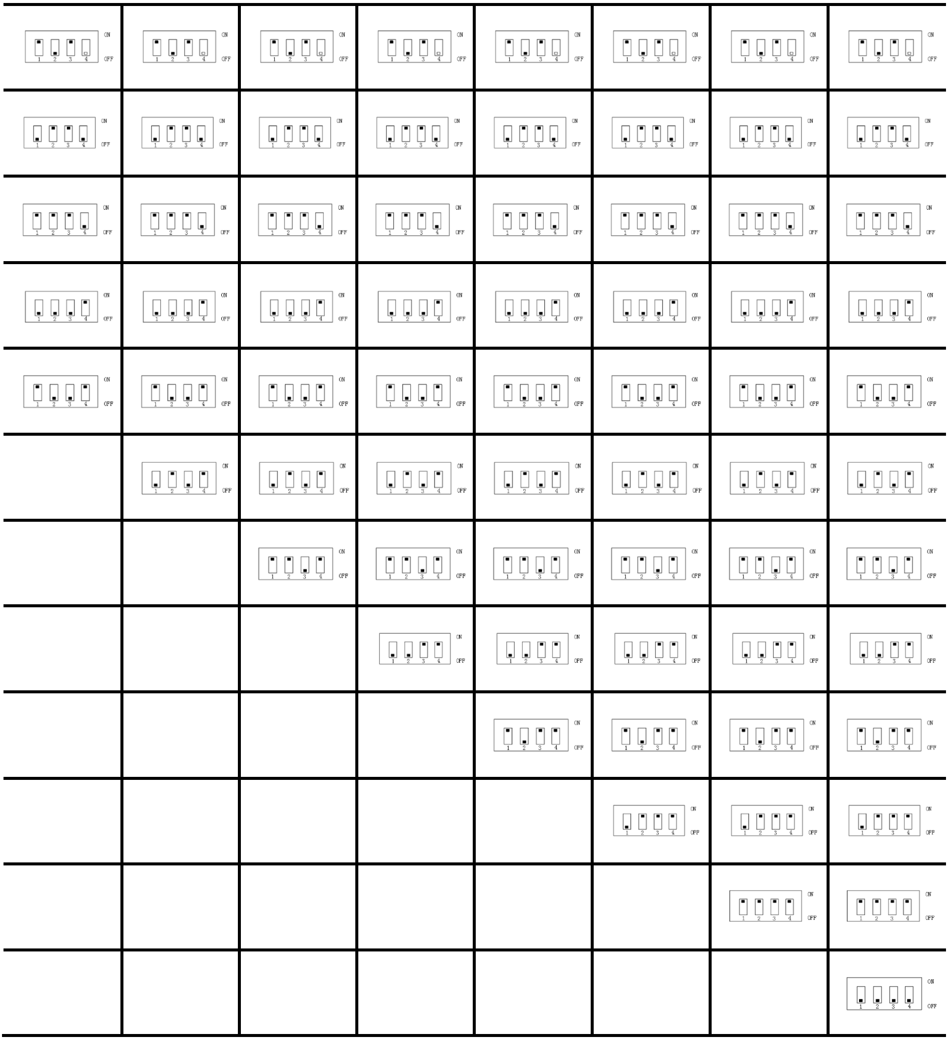
Address	DIP Switch Position				Illustration
	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	
1	ON	OFF	OFF	OFF	
2	OFF	ON	OFF	OFF	
3	ON	ON	OFF	OFF	
4	OFF	OFF	ON	OFF	
5	ON	OFF	ON	OFF	
6	OFF	ON	ON	OFF	

7	ON	ON	ON	OFF	
8	OFF	OFF	OFF	ON	
9	ON	OFF	OFF	ON	
10	OFF	ON	OFF	ON	
11	ON	ON	OFF	ON	
12	OFF	OFF	ON	ON	
13	ON	OFF	ON	ON	
14	OFF	ON	ON	ON	
15	ON	ON	ON	ON	

9.4 Battery Parallel Connection DIP Switch Diagram







9.5 Power-On Sequence

After the completion of the connections between the inverter, battery, and mains power, start each battery one by one. Then, turn on the inverter. After the battery startup, check if the communication between the inverter and the battery is normal. If the battery data is successfully uploaded to the inverter, it indicates successful communication between the inverter and the battery.

9.6 Common Issues and Solutions

No.	Fault Symptoms	Cause Analysis	Solution
1	No DC Output	Battery Voltage Too Low, Protection Activated	Startup after Charging Activation
2	Short Power Supply Time	Insufficient Battery Capacity or Failure to Reach Full Charge	Confirm Maintenance or Replace Battery
3	Battery Cannot Reach Full Charge	DC Voltage Output from Power System Lower than Minimum Charging Voltage	Adjust Device's DC Output Voltage to Suitable Charging Voltage for Battery
4	Unstable Battery Output Voltage with Significant Fluctuations	Interference with Management System Operation	Restart the System
5	Temperature Monitoring Too Low	Damage to Temperature-Sensing Crystal Head	Replace the Collection Line with a Temperature-Sensing Crystal Head
6	Unable to Charge	Single Cell Protection Activated upon Full Battery Charge	Discharge Protection Removal
7	MOS temperature abnormal	MOS tube damaged	Replace BMS
8	Discharge overcurrent protection	Inverter power exceeds limit	Match the number of batteries according to the inverter power value

9.7 Inverter Matching Information

Inverter Brand	LOGO	Communication Method	Inverter Communication Pin	Battery Communication Pin	Remarks
PowMr	PowMr	RS485	PIN7:RS485A PIN8:RS485B	PIN2/7:RS485A PIN1/8:RS485B	Default Battery Protocol Matching
SMA	SMA	CAN	PIN4:CANH PIN5:CANL	PIN4:CANH PIN5:CANL	Battery Protocol Change
VICTRON	victron energy	CAN	PIN7:CANH PIN8:CANL	PIN4:CANH PIN5:CANL	1. Battery Protocol Change 2. Customized Network Cable
Growatt	GROWATT	RS485	PIN7:RS485A PIN8:RS485B	PIN2/7:RS485A PIN1/8:RS485B	1. Default Battery Protocol Matching 2. Inverter Protocol Setting Option 2
GOODWE	GOODWE	CAN	PIN4:CANH PIN5:CANL	PIN4:CANH PIN5:CANL	Default Battery Protocol Matching
PYLONTECH	PYLONTECH	RS485	PIN7:RS485A PIN8:RS485B	PIN2/7:RS485A PIN1/8:RS485B	Default Battery Protocol Matching

LUXPOWER	LUX POWER TEK	RS485	PIN2:RS485A PIN1:RS485B	PIN2/7:RS485A PIN1/8:RS485B	1. Battery Protocol Change 2. Customized Network Cable
Voltronic Power	Voltronic Power Advancing Power	RS485	PIN5:RS485A PIN3:RS485B	PIN2/7:RS485A PIN1/8:RS485B	1. Default Battery Protocol Matching 2. Customized Network Cable
SOFAR	SOFAR SOLAR AUSTRALIA	CAN	PIN1:CANH PIN2:CANL	PIN4:CANH PIN5:CANL	1. Battery Protocol Change 2. Customized Network Cable
SRNE	SRNE	RS485	PIN7:RS485A PIN8:RS485B	PIN2/7:RS485A PIN1/8:RS485B	1. Default Battery Protocol Matching 2. Inverter Protocol Setting PYL
Deye	Deye	RS485 CAN	PIN4:CANH PIN5:CANL	PIN4:CANH PIN5:CANL	Default Battery Protocol Matching
MEGAREVO	MEGAREVO	CAN	PIN4:CANH PIN5:CANL	PIN4:CANH PIN5:CANL	Default Battery Protocol Matching
MUST	MUST	CAN	PIN6:CANH PIN5:CANL	PIN4:CANH PIN5:CANL	1. Battery Protocol Change 2. Customized Network Cable

10 Technical Specifications

Battery Model	POW-LIO48300-16S
System Voltage	51.2V
Rated Capacity	316Ah
Nominal Energy	16.1792kWh
Constant Voltage charging Voltage	58.4V
Max. Discharge Cutoff Voltage	43.2V
Recommended Discharge Cutoff Voltage	48V
Max Charging Current (Icm)	200A
Max Discharging Current	200A
Max. No. of Parallel Connections	16
Communication Interface	RS232/RS485/CAN/Dry Contac
Cycle Life	≥6000 Times @80%DOD, 25℃
Operating Temp	Charging: 0~60℃; Discharging: -10℃~65℃
Storage Temperature	-10℃~30℃
Nominal Operation Altitude	< 2000m
Nominal Operation Humidity	<90%RH
IP Grade	IP21
Recommended Operation Environment	Indoor
Dimensions (LxWxH)	680*650*235mm
Net Weight	110kg

11 Battery Maintenance and Care

11.1 Precautions Before Using Lithium Batteries

1. Please read and keep this manual carefully.
2. Pay attention to all warning labels on the battery; do not tear or damage warning labels.
3. Before use, confirm whether the battery model matches the inverter being used. Mismatched lithium batteries and inverters may cause damage to the lithium battery and electrical devices.
4. Inspect the lithium battery for intact appearance, without obvious signs of damage, leakage, heating, immersion in water, or smoking.

5. If the battery emits odors, heats up, deforms, or shows any other abnormalities, please stop using it immediately, move away from the battery, and contact the after-sales department.

WARNING:

- The battery is not a user-serviceable component. In the event of any abnormalities, please contact the after-sales department for inspection.
- Disassembling the battery without authorization will void the warranty policy and may lead to heating, smoking, ignition, or explosion of the battery.

11.2 Charging Environment

1. Charge the battery in an environment with a temperature of 0°C to 60°C, ensuring there are no flammable materials in the vicinity and good ventilation.
2. During the initial stage of charging, the battery capacity increases rapidly, and later it slows down. This is a safety program designed for charging and is considered normal.
3. In winter, when charging in low outdoor temperatures below 0°C, the battery will stop charging. This is normal. Place the battery in an environment with suitable temperatures to ensure effective charging.

4. During the charging process, the surface temperature of the battery box may increase, which is normal. Use it with confidence and avoid children's contact.

11.3 Storage Environment

1. Due to the internal resistance of lithium batteries, there will be some self-discharge over time when the battery is placed. A decrease in capacity after some time is normal.
2. Batteries intended for long-term storage (unused for more than 3 months) should be stored in a dry and cool environment. The battery pack should be stored under conditions of 23±2℃ temperature and 45%-75% humidity. For batteries left unused for an extended period, it is recommended to recharge them every 3 months to ensure that the battery voltage remains within the specified range.
3. When the battery pack is not in use for an extended period, perform regular maintenance charging; otherwise, it may lead to irreversible damage from complete discharge.
4. The lithium battery's safe storage self-discharge protection mode has the following technical standards:
   - When not in use for a long time, with the battery connected to a device, the safety period is a maximum of 3 months; otherwise, battery feedback may occur, and the issue may become irreparable.
   - When not in use for a long time, with the battery capacity not less than 80%, stored separately, the safety period is a maximum of 6 months; otherwise, battery feedback may occur, and the issue may become irreparable.
5. Avoid storing the battery in places with a risk of falling. Falling may cause uncontrollable damage to the battery's internal components, leading to leakage, heating, smoking, ignition, or explosion.
6. Do not use cleaning solvents to clean the battery.
7. Prohibit storage and use in areas with strong static electricity and strong magnetic fields; otherwise, it may damage the battery's safety protection device, posing a safety hazard.

Warning:

- Improper use leading to battery undervoltage and feedback is not covered under the warranty.

11.4 Operating Instructions

1. When connecting, ensure that the positive and negative terminals of the lithium battery and the polarity of the device connection wires are correctly aligned.
2. In subsequent use, try to keep the battery capacity above 10%, charge it promptly, and extend the battery's cycle life.
3. During normal use, it is advisable to reduce prolonged high-rate discharges. Follow the battery specifications for usage to extend the battery's service life.
4. Connecting the battery ends to any conductor can cause external short circuits. Different battery types may lead to varying degrees of consequences due to a short circuit, such as the battery becoming unusable, leakage, or explosion. Do not place the battery in a damp environment, and avoid mixing it with conductors (e.g., placing keys and batteries in the same pocket), as this may cause a short circuit.

Serious Warning:

- Avoid exposing the battery to rain or water, and never immerse the battery in water. Internal short circuits pose the risk of lithium battery explosion and fire, leading to permanent battery failure.

PowMr

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