PRODUCT MODEL

POW-LIO51300-16S

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-LIO51300-16S low-voltage residential energy storage battery series. The POW-LIO51 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-LIO51 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 communication interfaces include RS232, RS485, CAN and dry contact communication methods, enabling parallel communication for up to 10 batteries.
3. 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.
4. This manual covers the types, sizes, performance, technical characteristics, warnings, and precautions of the lithium battery system. This specification is applicable exclusively to the battery systems provided by PowMr Energy.

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-LIO51 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-LIO51 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-LIO51 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-LIO51 Home Energy Storage Series system.
3. Operating personnel should be fully acquainted with the "User Manual" for this product.

3.3.7 Power-On Measurement

DANGER

After the energy storage battery is installed, there is a high voltage present, and accidental contact with the positive and negative terminals may result in electric shock injuries. Therefore, when conducting power-on measurements, attention should be paid to the following:

1. Take necessary insulation protection measures (such as wearing insulated gloves).
2. Accompanying personnel must be present to ensure personal safety.

3.3.8 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.

3.3.9 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.

3.3.10 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		Power Cable	2
3		Parallel communication cable	1
4		BMS communication cable	1
5		Host Communication Cable	
6		Fixed brackets and screw fittings (set)	1
7		Product User Manual	1

5 Product Introduction

5.1 Overview

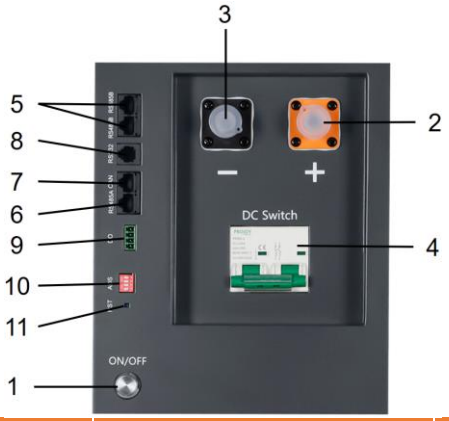
POW-LIO Household Energy Storage Series Lithium Battery Module integrates PowMr's high-capacity and high-safety lithium iron phosphate battery cells. The module features a bottom roller design for easy and flexible energy maneuvering. Inside the module, a high-precision Battery Management System (BMS) 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 Product Appearance

1	LCD Display Screen	7	Reset Button
2	Function Keys	8	Power Switch
3	Signal Indicator Lights	9	Circuit Breaker
4	Terminal Panel	10	Pulley
5	DO Port	11	Handle
6	ADS DIP Switches		

5.3 Battery Port Panel



No.	Item	Function	Notes
1	Low-voltage Switch	Used to start or shut down the battery	
2	Positive Terminal Port (+)	Battery Positive Output	
3	Negative Terminal Port (-)	Battery Negative Output	
4	DC Circuit Breaker	Overcurrent Protection Device	
5	RS485B	Communication between batteries.	Parallel Communication for Batteries
6	RS485A	485 Communication Interface	Communication with inverter via RS485A
7	CAN	CAN Communication Interface	Communication with inverter via CAN
8	RS232	1. Monitor batteries and modify parameters. 2. Perform software upgrades.	
9	DO Port	Dry Port	
10	DIP Switch (ADS)	Definition of Battery Parallel Communication Address Code	
11	Reset Button (RST)	One-Key Battery Reset	

6 Battery Installation and Wiring

6.1 Battery Installation

✧ **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.
3. Before connecting the wires, ensure that the built-in switch in the battery is in the off position.

✧ **Selecting Mounting Location**

Consider the following points to install the energy storage Pack:

1. Do not mount the Pack on flammable construction materials. Mount on a solid surface;
2. The ambient temperature should be between 0℃ and 40℃ and relative humidity should be between 25% and 85% to ensure optimal operation.
3. The recommended installation is Vertical adherence.
4. Install the battery module in a dry, protected area with no excessive dust and sufficient air circulation. Do not operate in locations where the temperature and humidity are outside the specified range.

✧ **Mounting The PACK**

WARNING!!

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

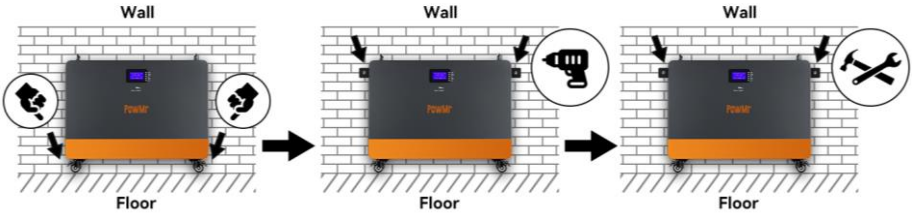
When installing the Pack bracket, use appropriate screws to fix it. After that, the equipment should be firmly bolted. The pack can be run indoors or outdoors. However, only professional personnel can enter this area for installation or maintenance.

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.

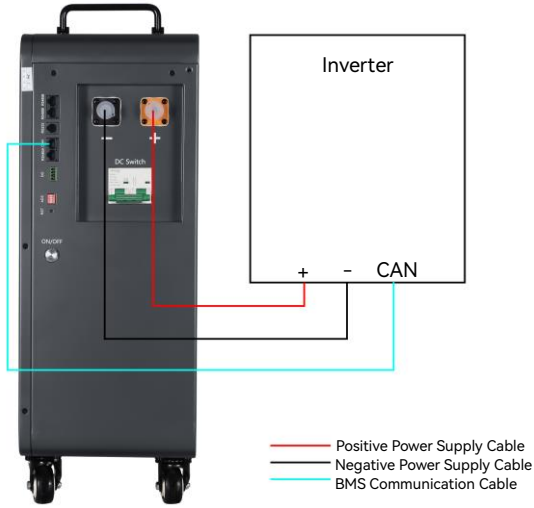
Step 3. After the battery pack is taken out, it is recommended to place it against the wall. At the same time, brake the universal wheel at the bottom of the battery pack. Install battery pack 2 fixed supports and punch 10*80MM holes in the wall with impact drills. Plug the explosion screw into the hole. Fasten the battery pack to the wall with screws. Complete the installation.



✧ **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.

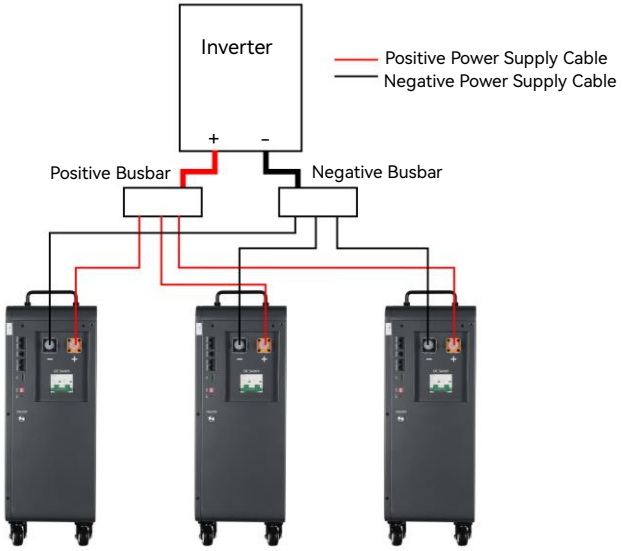
Step 2. Inverter BMS Communication. Connect the RS485A or CAN port to the communication port on the inverter using a communication cable.



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

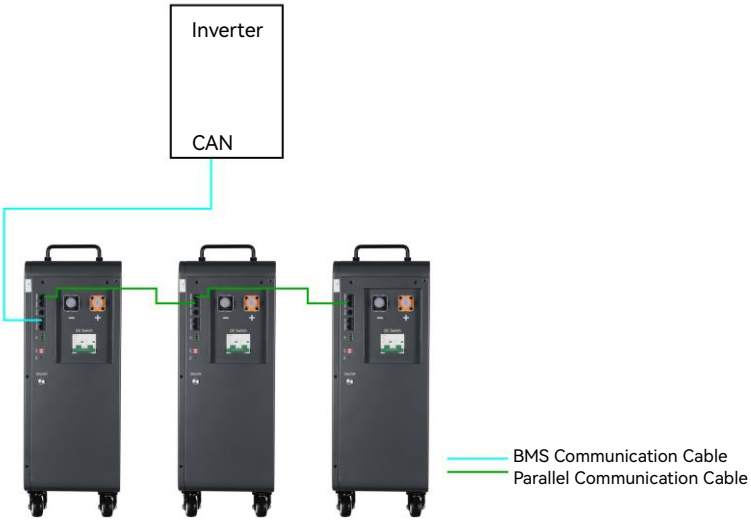
Step 1. Use the battery parallel communication cable to connect each battery through the RS485B parallel port.

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 7.7. It support 15 battery in parallel.

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.



7 Operation and Debugging

7.1 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.

7.2 SOC Indicator & Status Indicator Guides

7.2.1 Battery LED Indicators

L8●	L7●	L6●	L5●	L4●	L3●	L2●	L1●
RUN	ALARM	SOC					

7.2.2 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					

7.2.3 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)					

7.2.4 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

7.3 LCD Display and Function Key

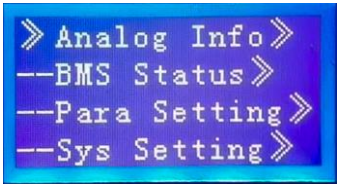
Function Key	Description
MENU	Enter Menu Interface
ENTER	Confirm Selection or Enter Option
UP	Go Back to Previous Item
DOWN	Go to Next Item
ESC	Exit to Previous Level

- When the BMS enters sleep mode, pressing any key can activate the screen.
- When it enters standby mode, if there are no keystrokes for 1 minute, the LCD will enter Shutdown Mode. Pressing any key will activate the screen.

7.4 Display Interface Navigation and Setup Guide

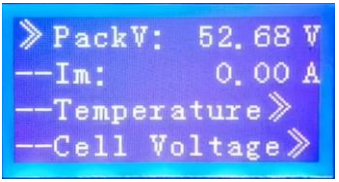
1. Upon battery startup, the interface will display the following content.

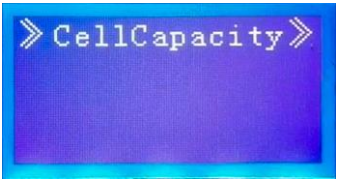
2. Press the **MENU** key to access the menu bar.



Menu Items	Description
Analog Info	Display Battery Voltage, Cell Voltage, and Temperature, Cell Capacity
BMS Status	Display Alarm or Protection Records, BMS Current Status
Para Setting	For Manufacturer Use Only
Sys Setting	For Baud Rate Setting, Non-modifiable

3. **Analog Info** Menu:



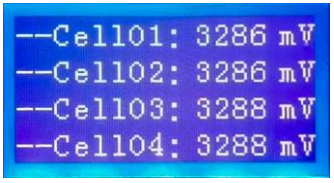


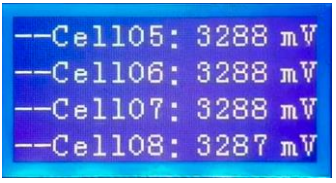
- **Temperature:**

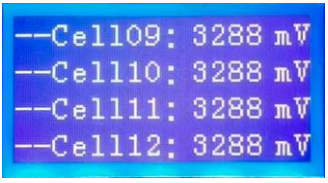
Browse Cell Temperature.

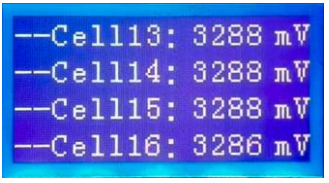
- **Cell Voltage:**

Browse Cell Voltage.



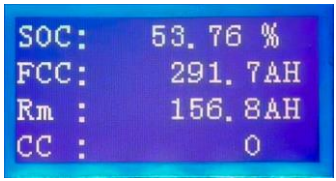






- **Cell Capacity:**

Browse Cell Capacity and State of Charge.



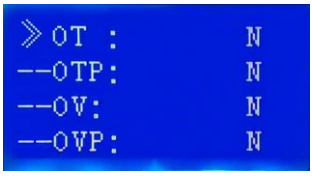
4. **BMS Status** Menu:

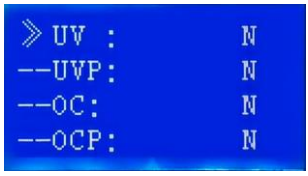
- **Record:**

Browse Alarm and Protection Records.

- **BMS Status:**

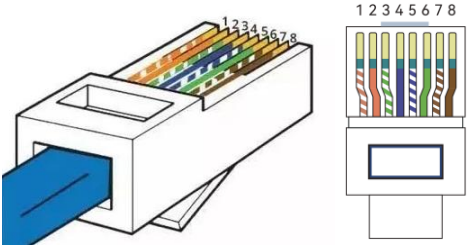
Browse Current BMS Status.





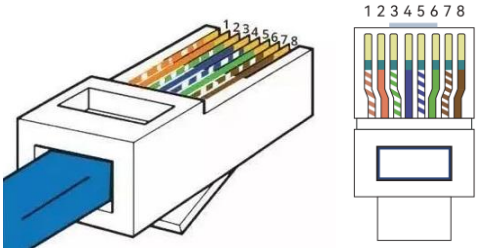
7.5 RS485 or CAN Inverter Communication

1. RS485 Vertical RJ45 Socket



PIN2/7	485-A1
PIN1/8	485-B1
PIN3/6	GND
PIN4/5	NC

2. CAN Vertical RJ45 Socket

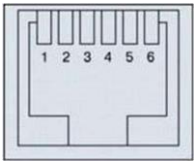


PIN9/10/11/14/16	-
PIN12	CAN-L
PIN13	CAN-H
PIN15	GND

7.6 RS232 Upper Computer Communication

7.6.1 Tools

1. Computer
2. USB to RS232 Cable



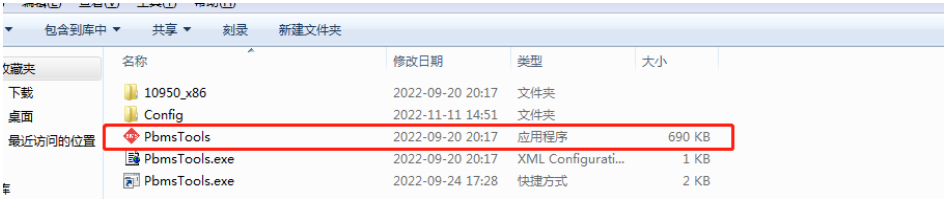
RJ11 Pinout	Definition Description	RJ11 Pinout	Definition Description
1	NC	4	RX
2	NC	5	GND
3	TX	6	NC

RS232 Vertical RJ11 Socket

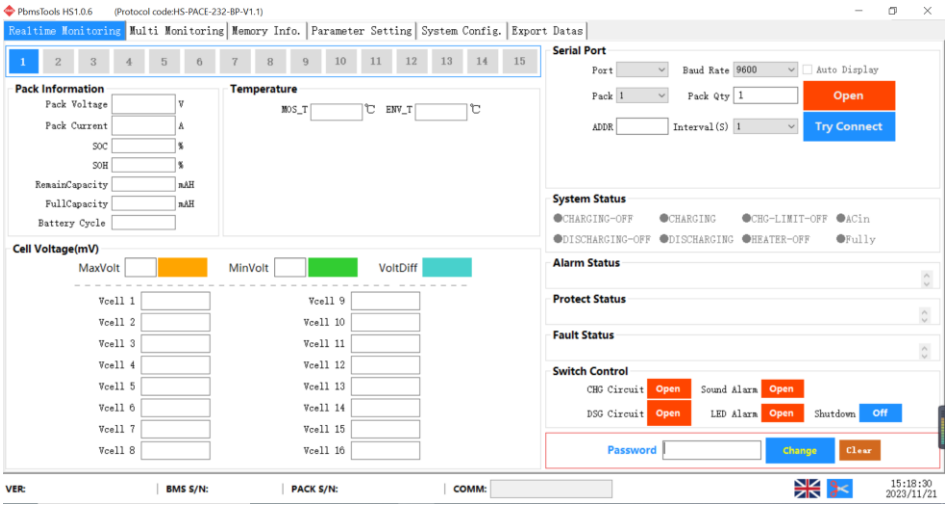
3. Monitoring Software

7.6.2 Operating Steps

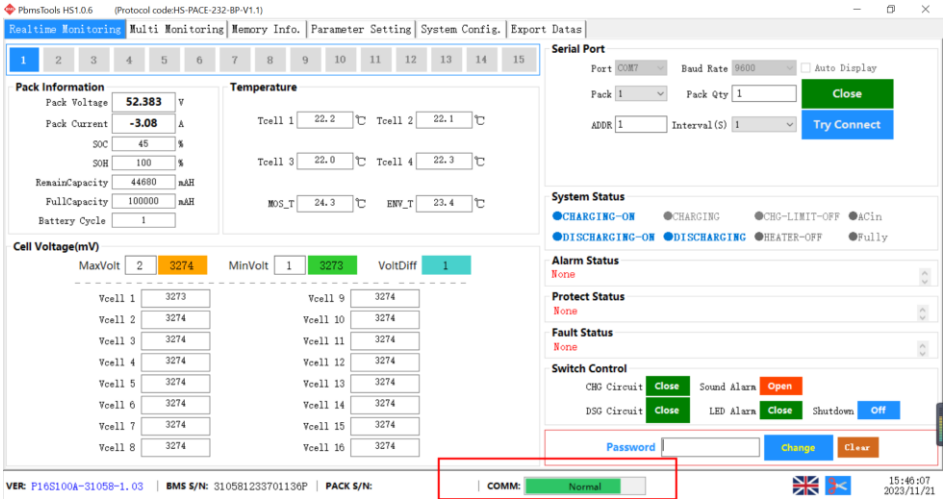
1. Connect the computer to the battery using a USB to RS232 cable. Plug the USB end into the computer's USB port and the other end into the battery's RS232 port.
2. Download and unzip the software package on the computer.
3. Open the extracted folder and select the application, as shown below:



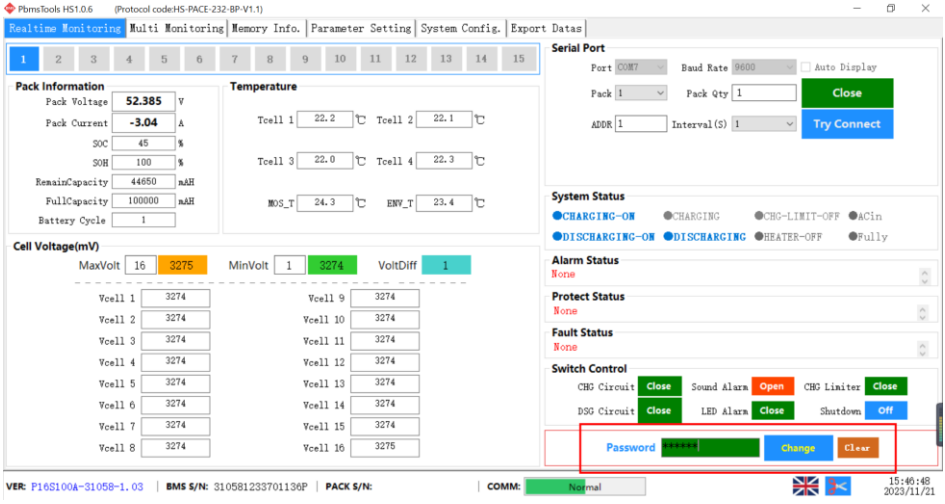
4. Double-click the above icon to enter the monitoring interface, as shown below:



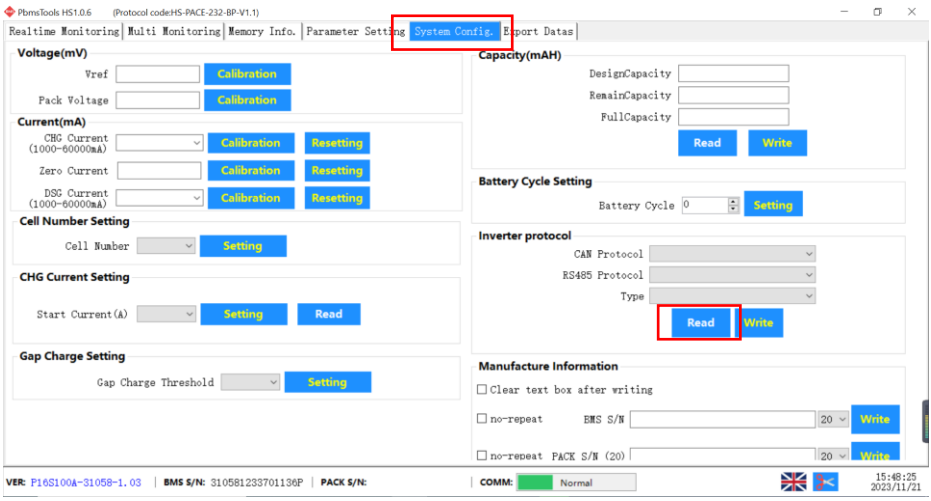
5. After entering the monitoring interface, click on the top right to open the serial port. Once communication with the battery is established, the left side will display real-time battery information, and the status bar in the lower right will turn green.



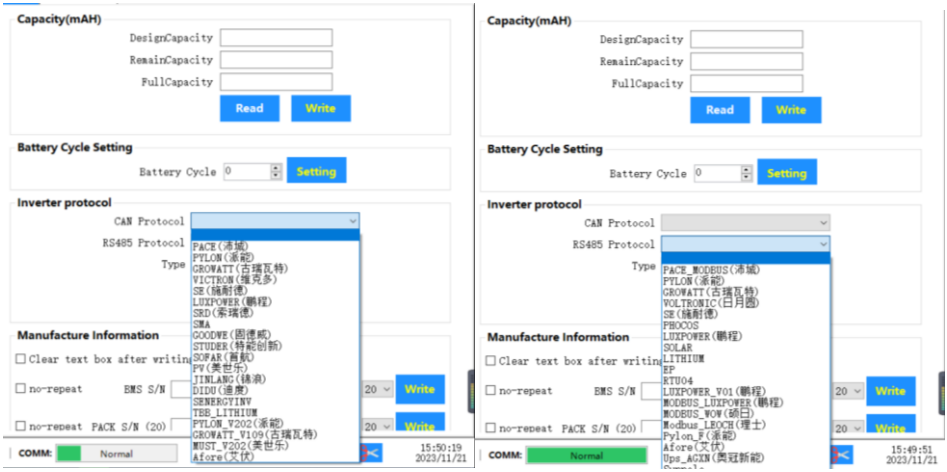
6. After successful communication, enter the password "123456" in the lower right password status bar. Upon correct input, the status bar will turn green.



7. Left-click on "System Config," as shown below:



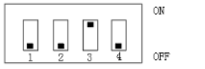
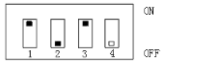
8. In the middle-right part of the display interface (Inverter Protocol), click "Read" to check if the battery matches the actual inverter brand. If not, click on the CAN or 485 protocol and choose the protocol that matches the inverter, as shown below:



9. After selecting the protocol, click the "Write" button. 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.

7.7 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	
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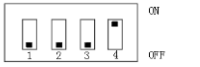
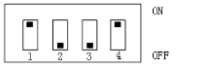
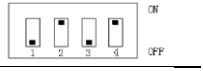
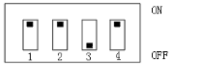
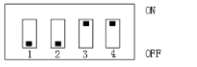
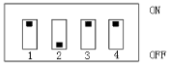
7	ON	ON	ON	OFF	
8	OFF	OFF	OFF	ON	
9	ON	OFF	OFF	ON	
10	OFF	ON	OFF	ON	
11	ON	ON	OFF	ON	
12	OFF	OFF	ON	ON	

13	ON	OFF	ON	ON	
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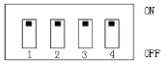
15	ON	ON	ON	ON	

7.8 Common Issues and Solutions

No.	Fault Symptoms	Solution
1	The battery pack has ceased operation.	1. Activate the switch and verify that it is in the ON position. If the battery state of charge (SOC) is low, it requires charging. 2. If the battery pack voltage is low or it has entered sleep mode, you will need to press the "RST" button for 3 to 6 seconds, or initiate charging.
2	There is a lack of communication; the inverter is unable to receive any data from the BMS.	1. Verify the integrity of the communication cable and examine the RJ45 PIN configuration. **CAN:** PIN4: CANH, 485A-A PIN5: CANL, 485A-B **RS485A:** PIN2: 485A-A PIN1: 485A-B 2. If necessary, replace the communication line. Provide feedback to the dealer and arrange for a replacement. 3. Check the firmware of inverters or other devices connected to the Battery Management System (BMS) and update if required. 4. For communication function upgrades, seek guidance from the authorized agent or manufacturer. 5. Ensure the correctness of the inverter and battery protocol. Using different protocols or incorrect connections may lead to errors.
3	The battery pack reports an erroneous State of Charge (SOC).	1. If the inverter receives data from the Master BMS but the State of Charge (SOC) is lower than the total SOC, for instance, if there are 9 packs with a total capacity of 1800Ah but the inverter reads only 1600Ah, it suggests a potential disconnection. Please check if any pack is disconnected. Additionally, inspect the RS485B communication cable (yellow) and the RS485 communication cable. Replace any broken cables. RJ45 PIN configurations are as follows: **CAN:** PIN4: CANH, PIN5: CANL **RS485A:** PIN2: 485-A, PIN1: 485-B

		2. If there's a large tolerance in SOC data, discharge the battery completely first, then charge it fully with a low current, and perform a discharge learning cycle. If any pack shows incorrect readings, it's recommended to read the BMS data (when authorized) using host software. After that, reset the BMS and perform calibration. 3. When multiple batteries are connected in parallel, SOC variations may occur. It's advisable to discharge each pack individually with a low current until the SOC alarm appears, then recharge them in parallel until fully charged.
4	How can the package be opened to discharge?	1. Reset the Battery Management System (BMS) of a single battery pack; the LED will blink to indicate the reset process has begun. 2. Activate the power switch and the DC switch on the battery pack side. **WARNING:** Ensure that the operating parameters of the equipment do not exceed the rated working voltage and current of the pack. Exceeding the rated voltage and current may cause damage to the pack or other failures.
5	The battery pack is unable to communicate with external devices.	1. Verify if the operational parameters of the device and battery are suitable; mismatched parameters may cause issues. 2. If the device draws excessive current upon startup, triggering battery protection, the LED on the battery panel should flash. In such instances, adjust your equipment parameters accordingly or seek assistance from the dealer for resolution. 3. It may be necessary to update BMS parameters to ensure compatibility with the device, followed by resetting the BMS and restarting your device.
6	Replace the faulty battery pack.	Please contact your supplier for assistance, as professional installers are required to perform the replacement. We recommend either replacing all packs or ensuring that the replacement pack matches the voltage and specifications of the existing packs. **NOTE:** When replacing batteries, ensure that the same module is replaced simultaneously, and that the voltage matches.
7	Spare parts	For spare parts replacement or emergency maintenance, certain

	replacement or emergency maintenance	components may be available from sales or authorized agencies, while others may need to be purchased separately. It is imperative to exercise caution and turn off the power switch before replacing any parts.
8	Environmental safety	Safety measures need to be implemented to maintain a secure environment for both the battery pack and external devices. It is advisable to install safety devices such as fire-fighting sand, fire-fighting blankets, and fire-fighting water pipes. Additionally, monitoring equipment including sound, light, electricity, smoke detectors, and other relevant devices should be installed.

7.9 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	
Deye	Deye 德业	RS485 CAN	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	1. 485 parallel protocol 12 2. CAN parallel protocol 00
GOODWE	固德威 GOODWE	RS485 CAN	PIN1:RS485A PIN3:RS485B PIN4:CANH PIN5:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	1. 485 parallel protocol PYLON 2. CAN parallel protocol PYLON
Growatt	Growatt	RS485 CAN	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	1. 485 parallel protocol L04 2. CAN parallel protocol L52

VICTRON		CAN	PIN7:CANH PIN8:CANL	PIN4:CANH PIN5:CANL	CAN parallel protocol
Sermatec		RS485 CAN	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	CAN parallel protocol PYLON
HUAWEI		RS485	PIN4:RS485A PIN3:RS485B	PIN2:RS485A PIN1:RS485B	High Voltage Solution
LUXPOWER		RS485 CAN	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN3:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	1. 485 Parallel Protocol GSL1 2. CAN Parallel Protocol GSL1
MUST		RS485 CAN	PIN2:RS485A PIN1:RS485B PIN6:CANH PIN5:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	
Voltronic Power		RS485	PIN5:RS485A PIN3:RS485B	PIN2:RS485A PIN1:RS485B	485 Parallel Protocol PYLON

Studer SOLIS		CAN	PIN4:CANH PIN5:CANL	PIN4:CANH PIN5:CANL	CAN Parallel Protocol
SUNGROW		CAN	PIN5:CANH PIN7:CANL	PIN1:CANH PIN2:CANL	High Voltage Inverter
SOFAR		RS485 CAN	PIN3:RS485A PIN4:RS485B PIN1:CANH PIN2:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	
INVT		CAN	PIN3/5:CANH PIN2/4:CANL	PIN4:CANH PIN5:CANL	CAN Parallel Protocol PYLON
SOROTEC		RS485 CAN	PIN7:RS485A PIN6:RS485B PIN3:CANH PIN5:CANL	PIN2:RS485A PIN1:RS485B PIN4:CANH PIN5:CANL	

8 Technical Specifications

Battery Model	POW-LIO51300-16S
Max. No. of Parallel Connections	15
Rated Capacity	280Ah
Voltage at End of Discharge	≤44.8V
Charging Voltage	56V
Limited Charging Voltage (Ucl)	58.4V
Internal Impedance	≤12mΩ
Discharge Cut-off Voltage (Udo)	40V
Max Charging Current (Icm)	200A
Max Discharging Current	200A
Operation Temperature	Charge: 0~55℃; Discharge: -20~55℃
Storage Temperature	-20℃~50℃
Communication Interface	RS232/RS485/CAN
Cycle Life	≥6000 Times @80%DOD, 25℃
Nominal Operation Altitude	< 3000m
Protection Grade	IP20
Recommended Operation Environment	Indoor
Dimensions (LxWxH)	766x221x530mm
Net Weight	125kg

9 Battery Maintenance and Care

9.1 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.

9.2 Charging Environment

1. Charge the battery in an environment with a temperature of 0℃ to 55℃, 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 -20℃, 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.

9.3 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.

9.4 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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