



USER MANUAL

VR - B16 - LV

LOW VOLTAGE HOUSEHOLD ENERGY

STORAGE BATTERY



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Preface

Overview

This document introduces energy storage batteries, including product introduction, application scenarios, system maintenance, and related technical data. Please read this manual carefully, understand the safety information, and familiarize yourself with the functions and characteristics of the energy storage product before installing and using it.

Intended Audience

This document is mainly applicable to the following personnel:

- Sales personnel
- System Engineer
- Installation and After-Sales Service Personnel

Battery Symbol Description

	Caution
	Read manual before use
	Do not throw spent batteries into trash bins
	Recycle through certified facilities
	CE Certified
	High voltage danger

01/Safety Precautions

1.1 Declaration

- When installing, operating, and maintaining equipment, it is necessary to first read this manual and follow the markings on the equipment and all safety precautions in the manual. When opening the packaging of a new product for the first time, please check the product and accessories first. If the product is damaged or missing parts, please contact your local distributor.
- The "Caution" and "Prohibited" items in the manual do not represent all safety precautions that should be followed, but are only supplementary to safety precautions. We do not assume any responsibility for violating general safety operation requirements or violating design, production, and use equipment safety standards.

- The equipment should be used in an environment that meets the design specifications, otherwise it may cause equipment failure, resulting in abnormal equipment functions or component damage, personal safety accidents, property losses, etc., which are not within the scope of equipment quality assurance.
- When installing, operating, and maintaining equipment, local laws, regulations, and standards should be followed. All safety precautions described in the manual are only supplementary to local laws, regulations, and norms. The company shall not be liable for any of the following situations or their consequences;
- Equipment damage caused by extreme weather or force majeure events such as earthquakes, floods, volcanic eruptions, mudslides, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, etc;
- Do not operate outside the specified conditions in this manual;
- The installation and usage environment does not comply with relevant international, national, or regional standards;
- Unauthorized disassembly, modification, or software code alteration is strictly prohibited;
- Not following the operating instructions and safety warnings in the product and documentation;
- Damage caused by you or your authorized third-party transportation;
- Damage caused by non-compliant storage conditions;
- Exceeding the product's service life.

1.2 Precautions

- The battery module should be installed in a cool (between 0 °C and 45 °C), dry, ventilated, and safe environment.
- Please use a dry cloth to wipe the battery and inverter when cleaning.
- If the battery needs to be stored for a long time, it is recommended to charge and discharge the battery every 3 months.
- All maintenance work needs to be completed by professionals.
- The maximum charging and discharging power of the inverter shall not exceed the max charging and discharging power supported by the battery module.
- When installing and disassembling equipment, please turn off all power before performing any related operations.
- Please keep the battery away from heat and water sources during use and storage.
- After the installation of the battery and inverter is completed, please take relevant measures to prevent children from approaching.
- Please carefully read the user manual before use.
- Please dispose of scrapped batteries in accordance with local regulations.
- It is recommended to store the battery in an environment with a temperature range of -20 °C-+45 °C and charge it regularly according to the following table. The charging temperature should not exceed 0.5C (C is the measured discharge rate of the battery relative to its maximum capacity). After long-term storage, its SOC needs to reach around 50%.

Storage environment/temperature	Relative humidity	Storage time	SOC
Below -20°C	/	Not allowed	/
-20°C~+35°C	5%~70%	Six months	20%<SOC<60%
-20°C~+45°C	5%~70%	Three month	20%<SOC<60%
Above +45 °C	/	Not allowed	/
Attention: Prolonged under-voltage can damage the battery system Charge the over-discharge system within seven days when the temperature exceeds 25 °C. When the temperature is below 25 °C, charge the over-discharge system within fifteen days. Regularly check whether the battery and its supporting terminals, connecting cables, and indicator lights are correct.			

1.3 Prohibitions

- Unauthorized disassembly and modification of batteries are prohibited.
- Any violent behavior that damages the battery, such as throwing, hitting, or pounding, is prohibited.
- It is prohibited to use batteries of different models and manufacturers in parallel.
- Do not place the battery in a high temperature environment above 60 °C.
- It is prohibited to short-circuit battery P+P - with metal conductive materials.
- It is prohibited to install batteries in non specified orientations.
- It is prohibited to connect battery modules in series.
- Smoking or using flames near batteries is prohibited.
- Installation or disassembly work is prohibited when the equipment is live.
- During the installation, maintenance, disassembly and other operations, it is prohibited for the operator to wear metal watches, bracelets, necklaces, rings and other metal accessories on their body.

1.4 Handling Measures for Battery Leakage

- Ensure adequate ventilation, and use spark-proof tools and explosion-proof equipment.
- Quickly evacuate personnel to a safe area, stay away from the leak area and be in the upwind direction.
- Use personal protective equipment. Avoid inhaling steam, smoke, gas, and dust.
- Take measures to prevent further leakage or overflow while ensuring safety.
- When a leak occurs, avoid contact with the leaked liquid or gas; Electrolyte is corrosive and contact may cause skin irritation and chemical burns; If in contact with battery electrolyte, the following measures need to be taken.

1. Inhalation: Evacuate the contaminated area to a safe location, immediately move to fresh air, and maintain unobstructed breathing; If breathing is difficult, give oxygen; If the patient ingests or inhales this substance, mouth to mouth resuscitation is not allowed; If breathing stops. Immediately perform cardiopulmonary resuscitation; And immediately seek medical assistance.

2. Skin contact: Immediately remove contaminated clothing, wash the skin contact area with plenty of water and soap, and seek medical assistance immediately.

3. Eye contact: Immediately rinse the eyes with clean water and seek medical assistance immediately.

4. Ingestion: Do not induce vomiting. Seek immediate medical attention.

1.5 Fire Handling Procedures

- If a fire occurs, the system should be powered off while ensuring safety.
- If a small fire occurs and the flames do not spread to the high-voltage battery section, carbon dioxide or ABC dry powder fire extinguishers can be used to extinguish the fire.
- When thoroughly inspecting the fire, do not come into contact with any high-voltage components and always use insulated tools for inspection.
- When extinguishing a fire, one should wear a breathing mask (compliant with MSHA/NIOSH requirements or equivalent) and wear full body protective clothing.
- Prevent fire water from contaminating surface and groundwater systems.

02/Product Introduction

2.1 Product Brief Introduction

2.1.1 Lithium iron phosphate battery system is a standard battery system unit, and customers can choose a certain number of batteries according to their needs, and form a larger capacity battery pack through parallel connection. Up to 16 units can be connected in parallel to meet the long-term power supply needs of users.

2.1.2 This product is particularly suitable for access network equipment, remote exchange offices, mobile communication devices, household energy storage devices, and hybrid inverter equipment.

2.2 Product Attributes

The positive electrode material of energy storage lithium-ion products is lithium iron phosphate, and BMS can effectively manage the battery with better performance. The characteristics of the system are as follows:

- Compliant with European ROHS and SGS certification, using non-toxic, pollution-free and environmentally friendly batteries.
- Cathode material: lithium iron phosphate (LiFePO_4), which is safer and has a longer service life.
- A battery management system (BMS) with better performance, equipped with overcharge, over-discharge, over-current, over temperature, under temperature, and short circuit protection functions.
- BMS is equipped with CAN/485 communication interface, which can communicate with computers/inverters, read various parameters of the battery pack, and monitor the status of the battery pack in real time.
- Self management of charging and discharging, no need for on duty personnel to guard.
- Single core balancing function.
- Flexible configuration allows for parallel use of multiple batteries for longer standby time.
- The system noise is relatively low.
- No memory effect, allowing the battery to be lightly charged and discharged.
- The working environment has a wide temperature range of $-10\text{ }^{\circ}\text{C}$ to $45\text{ }^{\circ}\text{C}$, with good cycle span and discharge performance.
- High energy density, small size, and lighter weight.

VORIS
SUSTAINABLE ENERGY

[illegible]

2.4 Appearance Introduction

External Interface Port Descriptions			
1	Battery Switch	2	P-Terminal
3	P +Terminal	4	Host computer USB communication port
5	Inverter CAN communication network port	6	Inverter 485 communication network port
7	Battery parallel CAN communication network port OUT	8	Battery parallel CAN communication network port IN
9	WIFI antenna (optional)	10	Grounding port
11	LED power level display		

2.5 Product Parameter Description

Battery Model	VR - B16 - LV
Cell Series-parallel Method	16S1P
Battery Rated Voltage	51.2V
Battery Rated Capacity	314Ah
Battery Rated Energy	16.07kWh
Suggested Working Voltage Range	44.8V~56.8V
Suggested Charging Voltage	56.8V
Maximum Charging Current	200A
Maximum Discharge Current	200A
Charging Temperature Range	0°C~55°C
Discharge Temperature Range	-20°C~55°C
IP Rating	IP20
Dimension (mm)	840*490*249mm(Excluding mounting lugs/casters)
Weight (kg)	≈ 121kg
Supported communication method	USB/RS485/CAN
Recommended depth of discharge	90%
Maximum number of parallel machines	16/33/64PCS(Optional)

2.6 Introduction to product fire suppression module

2.6.1 Overview of hot aerosol fire extinguishing device

The new type of hot aerosol fire extinguishing device is a breakthrough product in the fire protection field, featuring ultra-high fire extinguishing efficiency and reliability. This product boasts several advantages, including compact size, pressure-free storage, no need for pipe network laying and maintenance, high and rapid fire extinguishing efficiency, non-toxic and harmless properties, safety and reliability, as well as environmental friendliness. It is particularly suitable for use in relatively enclosed spaces such as communication equipment rooms, battery compartments, engine compartments, and battery boxes.

2.6.2 Function of aerosol fire extinguishing device

The suppression effect of S-type hot aerosol on fires is primarily manifested in the following aspects:

The fire-extinguishing mechanisms of general fire extinguishing agents mainly include isolation, suffocation, cooling, and chemical suppression. Different fire extinguishing agents have different fire-extinguishing mechanisms. The fire-extinguishing mechanism of thermal aerosol is mainly reflected in two aspects: one is the cooling effect of endothermic decomposition, and the other is the chemical suppression effect of gas phase and solid phase, which work synergistically. In addition, the gas phase components in the products of aerosol fire extinguishing agents also play a certain auxiliary role.

(1) The cooling and extinguishing effect of endothermic decomposition

The cooling effect of thermal aerosol fire extinguishing agents primarily relies on the endothermic decomposition of tetrametallic oxides and carbonates. Any fire can only release a limited amount of heat in a short period of time. If the solid particles in the aerosol can absorb a portion of the heat released by the fire source in a short time, the temperature of the flame will decrease. This will reduce the heat radiated to the burning surface and the heat used to break down vaporized combustible molecules into free radicals, thereby inhibiting the combustion reaction to a certain extent.

(2) Gas-phase chemical suppression

Under the influence of heat, the vaporized metal ions involved in the fire extinguishing and decomposition of thermal aerosols, such as Sr, K, Mg, or cations that have lost electrons, exist in the form of vapor. They undergo multiple chain reactions with the active radicals $H\cdot$, $\cdot OH$, and $O\cdot$ involved in combustion. Taking Sr as an example:



By repeating this process, the active radicals in the combustion are consumed in large quantities, leading to a continuous decrease in their concentration, which in turn suppresses the combustion.

(3) Solid-phase chemical inhibition

The solid particles in the hot aerosol fire extinguishing agent can adsorb the chain reaction intermediates $\cdot OH$, H , and $O\cdot$, and catalyze their recombination into stable molecules, thereby interrupting the branched chain reaction in the combustion process. Taking K as an example, the process is as follows:



In the aforementioned fire extinguishing effect, several fire extinguishing mechanisms interact and work synergistically. However, the gas transmission effect and the endothermic cooling effect of metal oxides or carbonates only play a supporting role, while the main fire extinguishing effect still relies on the chemical suppression effect of gas and solid phases.

2.6.3 Technical parameters of hot aerosol fire extinguishing device

- ① Startup method: hot start
- ② Starting temperature: $160^\circ\text{C} \rightarrow 180^\circ\text{C}$;
- ③ Operating ambient temperature: $-50^\circ\text{C} \rightarrow +90^\circ\text{C}$
- ④ Fire extinguishing density: $100\text{g}/\text{m}^3$
- ⑤ Spraying delay time: $\leq 5\text{s}$
- ⑥ Thermal spacing: $0.1\text{m} \leq 400^\circ\text{C}$; $0.2\text{m} \leq 200^\circ\text{C}$; $0.4\text{m} \leq 75^\circ\text{C}$
- ⑦ Surface temperature of the shell after spraying: $\leq 200^\circ\text{C}$
- ⑧ Device mass: $30 \pm 10\text{g}$
- ⑨ Physical reference image



2.7 LED Indicator Instructions

2.7.1 Flashing modes in various states

Operating method	On(S)	Off(S)
Flash1	0.5	3.5
Flash2	0.5	0.5
Flash3	0.5	1.5

2.7.2 Definition of flashing mode

BMS Status	Situation	Operating LED	Alarm LED	SOC LED			
				LED1	LED2	LED3	LED4
Shutdown		Off	Off	Off	Off	Off	Off
Fault	Cell fault	Flash2	Flash2	Flash2	Off	Off	Off
	Charge/Discharge MOS Fault	Flash2	Flash2	Off	Flash2	Off	Off
	AFE Fault	Flash2	Flash2	Off	Off	Flash2	Off
	Current-Sensing Resistor Fault	Flash2	Flash2	Off	Off	Off	Flash2
	Voltage fault	Flash2	Flash2	Off	Off	Off	Off
	Reverse connection fault	Flash2	Flash2	Off	Off	Off	Off
	short circuit	Flash2	Flash2	Flash2	Flash2	Flash2	Flash2
Protection	Total Voltage Over-Voltage Protection	Steady On	Steady On	Steady On	Steady On	Steady On	Steady On
	Cell Over-voltage Protection	Steady On	Off	Steady On	Steady On	Steady On	Steady On
	High/Low Temperature Charge Protection	Off	Steady On	Flash2	Flash2	Off	Off

	Charge Over-current Protection	Off	Steady On	Off	Off	Flash2	Flash2
	Total Voltage Under-Voltage Protection	Flash1	Steady On	Off	Off	Off	Off
	Cell Under-voltage Protection	Flash1	Off	Off	Off	Off	Off
	High/Low Temperature discharge Protection	Steady on	Off	Flash2	Flash2	Off	Off
	Discharge over-current protection	Steady on	Off	Off	Off	Flash2	Flash2
Standby	Normal	Flash1	Off	Based on SOC indication			
	Alarm	Flash1	Flash3				
Charge	Normal	Steady On	Off	Based on SOC indication (Top-level LED flashes twice)			
	Alarm	Steady On	Flash3				
Discharge	Normal	Flash3	Off	Based on SOC indication			
	Alarm	Flash3	Flash3				

2. 7. 3 Definition of power indicator

During standby/discharge:

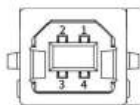
Capacity	LED1	LED2	LED3	LED4
0%	Off	Off	Off	Off
1%~24%	Steady On	Off	Off	Off
25%~49%	Steady On	Steady On	Off	Off
50%~74%	Steady On	Steady On	Steady On	Off
75%~100%	Steady On	Steady On	Steady On	Steady On

During charge:

Capacity	LED1	LED2	LED3	LED4
0%~24%	Flash2			
25%~49%	Steady On	Flash2		
50%~74%	Steady On	Steady On	Flash2	
75%~100%	Steady On	Steady On	Steady On	Flash2

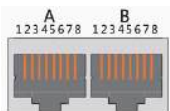
2.8 Definition description of BMS communication network port

USB interface definition(Host Computer Side):



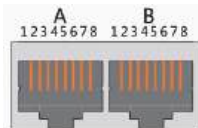
Interface	Definition Description	
X1 Communication port definition	PIN 1	VBUS
	PIN 2	D-
	PIN 3	D+
	PIN 4	GND

RS485/CAN Interface Definition: (Inverter Side)



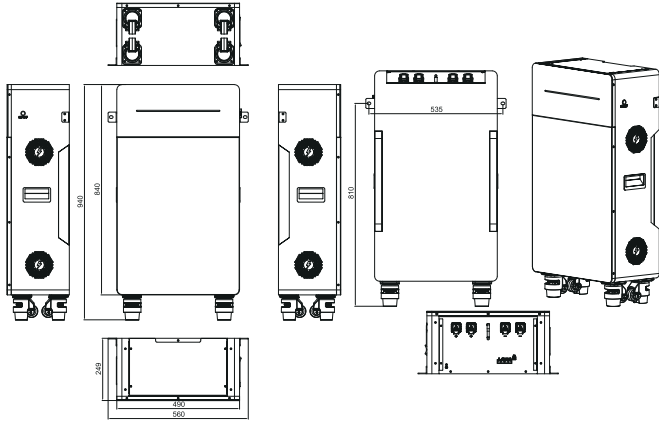
Interface	Definition		Definition			
X1 Communica tion port Definition	A Part CAN interface	PIN1	NC(No connection)	B Part RS485 Interface	PIN1	RS485 - B
		PIN2	NC(No connection)		PIN2	RS485 - A
		PIN3	CGND		PIN3	RS485 - GND
		PIN4	CAN 1 - H		PIN4	NC(No connection)
		PIN5	CAN 1 - L		PIN5	NC(No connection)
		PIN6	CGND		PIN6	RS485 - GND
		PIN7	NC(No connection)		PIN7	RS485 - A
		PIN8	NC(No connection)		PIN8	RS485 - B

CAN communication interface definition: (battery paralleling side)

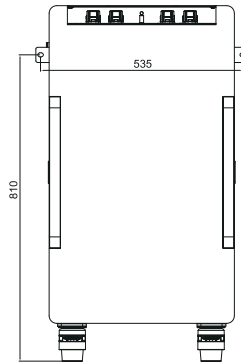


Interface	Definition		Definition			
X2 Communication port Definition	A Part CAN-2 parallel operation OUT interface	PIN1	CAN-2L	B Part CAN-2 parallel IN interface	PIN1	CAN-2L
		PIN2	CAN-2H		PIN2	CAN-2H
		PIN3	NC(No connection)		PIN3	NC(No connection)
		PIN4	NC(No connection)		PIN4	NC(No connection)
		PIN5	Automatic addressing OUT-P		PIN5	Automatic addressing IN-P
		PIN6	Automatic addressing OUT-P		PIN6	Automatic addressing IN-N
		PIN7	NC(No connection)		PIN7	NC(No connection)
		PIN8	NC(No connection)		PIN8	NC(No connection)

2.9 Product Dimension



2.10 Mounting Hole Dimensions Diagram



The delivery items are as follows:

- 1.Expansion screw: 235 color zinc M10*80mm, quantity 2 PCS
- 2.Screw: 304 stainless steel / 4*8mm black cross countersunk head (diameter 7mm) quantity 4PCS
- 3.Screws: 304 stainless steel/M6*12mm flat head Phillips, quantity 16 PCS
- 4.Power cable: UL3512 2AWG, black, L=1M, with one SC35-8 connector on each end, quantity: 1
- 5.Power cable: UL3512 2AWG, red, L=1M, with one SC35-8 connector on each end, quantity: 1
- 6.Network cable: 8-pin 2-core (1 pin connected to 3 pins, 2 pins connected to 5 pins) *1M,quantity: 1
- 7.Network cable: Regular network cable *1M, quantity: 1 piece

03/Product Installation

3.1 Pre-Installation Inspection

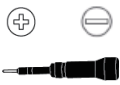
Before signing and installing the product, please carefully check the following:

- Check the outer packaging for any damage, such as holes, deformations, cracks, or other signs that may cause damage to the equipment inside the packaging box. If there is any damage, do not open the packaging and contact your distributor.
- Check if the battery model is correct. If there is any discrepancy, do not open the package and contact your distributor.
- Please verify the types and quantities of delivered items, and check for any physical damage. If any damage is found, please contact your distributor immediately.

3.2 Installation Tool Preparation



The illustration tool is for reference only, please refer to the actual product.

Tools and illustration			
			
Hammer Drill (with Drill Bit Set)	Insulated Torque Socket Wrench	Diagonal Cutting Pliers	Insulated Torque Screwdriver (Phillips/Slotted)
			
Multi-meter	Steel Tape Measure	Spirit Level	Cable Tie
		/	/
Manual forklift	Electric forklift	/	/
Personal protective equipment			
			
Insulating gloves	Protective gloves	Goggles	Dust mask
			/
Insulating shoes	Reflective Vest	Safety hat	/

3.3 Installation Requirements

3.3.1 Installation environment requirements

- Batteries should not be installed in environments with high temperature, humidity, or susceptibility to corrosion.
- Please avoid installing water pipes, cables, etc. inside the wall to prevent danger during drilling.
- The installation location should avoid areas that children can come into contact with, and avoid installing in easily accessible areas.
- The installation of batteries should avoid direct sunlight, rain, snow, and other environments. It is recommended to install them in a sheltered location.
- The battery protection level meets the requirements for indoor installation, and the installation environment temperature and humidity should be within a suitable range.
- Please ensure that the device indicator lights and all labels are easy to view, and that the terminals are easy to operate.
- Stay away from strong magnetic fields and avoid electromagnetic interference.

3.3.2 Installation Substrate Requirements

- The installation substrate must be made of non-flammable material with fire-resistant properties.
- Please ensure that the installation carrier is sturdy and reliable, capable of carrying the weight of the battery.

3.3.3 Requirements for installation and lifting angles

- Recommended battery installation orientations: vertical (with support feet facing downward) and horizontal (with indicator facing upward).
- Do not invert, tilt, or tilt the battery beyond the angle
- Requirements and Prohibitions for Product Packaging, Handling, and placement

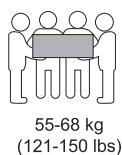
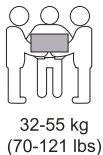
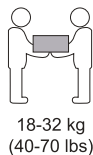
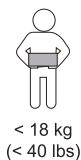


- Battery lifting requirements

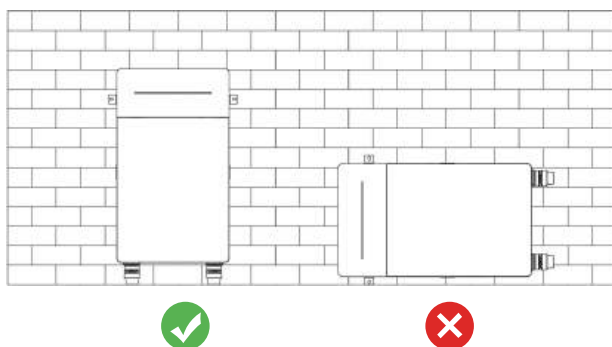
A. During transportation and handling, battery modules and their components should be protected from damage:

B. During transportation, consider the weight of the battery module system and carefully lift the battery modules and components;

C. Do not collide, pull, drag or step on the battery module, and do not touch any part of the battery module with unrelated objects;



- The installation angle of the battery is as follows



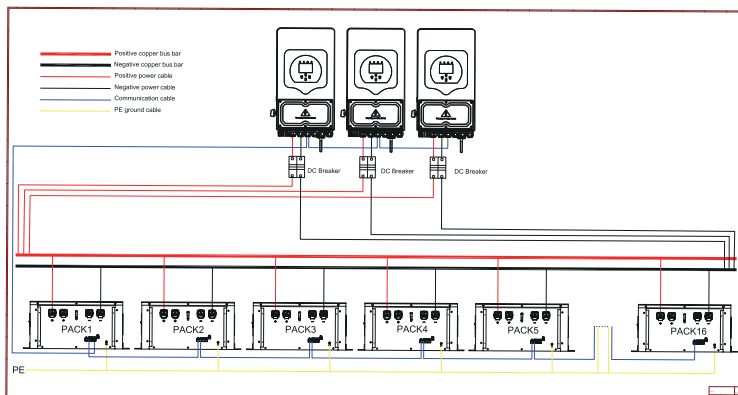
04/Battery Parallel Connection

4.1 Battery Parallel Connection

4.1.1 The connection method for multiple batteries in parallel operation is relatively special. The P+/P- wiring requires the use of a loop wiring method, along with CAN parallel communication. (As shown below)

4.1.2 When multiple batteries are paralleled and communicating with the inverter, only the PACK1 battery is responsible for communicating with the inverter. Therefore, the inverter communication port needs to be connected to the corresponding port of the PACK1 battery, otherwise communication with the inverter cannot be achieved.

4.1.3 The PACK1 battery serves as the main control unit, with the remaining batteries communicating through CAN parallel communication to ensure data synchronization and stable system operation. During wiring, parallel routing of strong and weak electrical circuits should be avoided to prevent signal interference. After completing the connection, it is necessary to check whether the contacts of each interface are secure. Only after confirmation can the power be turned on. Turn on the lithium battery switch and the circuit breaker switch in order to start the system.



Note: It is recommended that the busbar be matched according to the maximum power of the inverter module.

4.2 Power cable specifications

The specifications and lengths of the power cables for P+/P- parallel operation must be consistent, and the model of the power cables should be matched according to the maximum power of the inverter.

5KW Inverter	10KW Inverter	15KW Inverter
6AWG	4AWG	2AWG

4.3 Interface communication description

4.3.1 USB communication

The USB interface adopts a TYPE B port, through which the BMS can communicate with the host computer, thereby monitoring various battery information on the host computer side, including battery voltage, current, temperature, status, SOC, SOH, and battery production information. The default baud rate is 115200bps.

4.3.2 RS485 communication

The RS485 interfaces of BMS are all RJ45 network ports. The single-port RS485 is mainly used for data exchange between the battery pack and the inverter. (Note: If there is a dual-port RS485, it is used for parallel communication between battery packs)

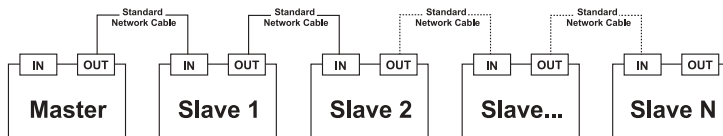
4.3.3 CAN communication

The CAN communication interface of BMS possesses the capability for data exchange between the battery pack and the inverter. The default baud rate is 500K, and the communication interface is an RJ45 network port. (Note: If there are dual-port IN/OUT, it is for CAN parallel communication between battery packs.)

4.3.4 Parallel wiring installation

When paralleling, it is important to note that only battery packs of the same type and string count can be used in parallel. Otherwise, if battery packs of different string counts are paralleled, the voltage difference between them can lead to mutual discharge, rendering them inoperable.

This product utilizes CAN parallel operation and parallel communication, as illustrated in the figure below:



Schematic diagram of parallel wiring

After the parallel wiring is completed, it is recommended to power on all devices simultaneously. If simultaneous power-on is not feasible, the main unit should be powered on first, followed by all subordinate units in the cascading order (the power-on sequence affects the continuity of address binding for subordinate units, so it is recommended to power on subordinate units closer to the main unit first in the cascading order). The default maximum number of parallel units is 16.

05/Battery-to-Inverter Connection

5.1 Battery Module-to-Inverter Connection

5.1.1 Connect the battery module P+/P- to the inverter BAT+/BAT-, and reverse connection is strictly prohibited.

5.1.2 Connect the battery and inverter communication network port with the correct communication network cable.

5.1.3 First turn on the battery switch until all batteries are successfully turned on, then turn on the inverter switch.

5.2 Inverter Settings

5.2.1 Complete the battery type, operating mode, and other settings according to the inverter user manual. If the inverter displays correct battery information and there are no alarms regarding BMS communication failures, it indicates that the battery module has successfully communicated with the inverter.

5.2.2 Other settings can be set according to the inverter manual and actual needs.

5.3 Protocol Selection Between Battery Module and Inverter

5.3.1 Method 1: Default Inverter for Battery Module at Factory

Step 1: Select the cable used by the default inverter according to the label on the communication cable. Connect the RJ45 port (CAN/RS485) on the battery end to the RJ45 (CAN/RS485) port on the inverter end with a cable.

Step 2: Turn on the battery module and inverter, and wait for normal operation. The battery is pre-configured at the factory to communicate with the RS485 ports of Voltronics, MecerKodak, Phocos, and Axpert inverters, and the CAN ports of DEYE, Sunsynk, SMK (Hybrid), Luxpower,

Sofar, and TBB inverters. The battery will automatically select the default inverter communication.

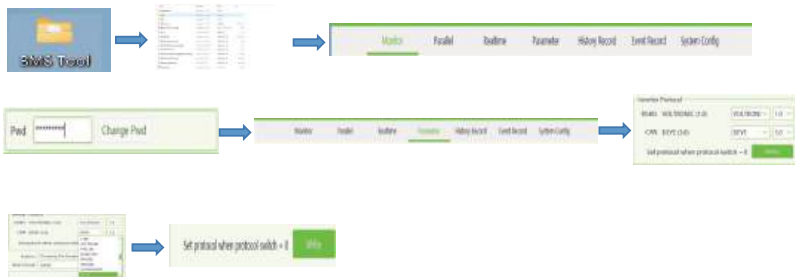
Step 3: After the battery successfully communicates with the inverter, the battery status will be displayed on the inverter: voltage, current, SOC, temperature, etc.

5.3.2 Method 2: Battery Module (Protocol Selection) - When communicating with inverters of other brands, such as: Growatt, Megarevo, INVT, Victron, SOLAX, MUST, SMA, etc.

Step 1: Turn on the battery, ensure the BMS is powered on normally (not in sleep mode), insert the provided USB-B communication cable into the battery's communication port, and connect the USB-A end to the computer;

Step 2: Extract the BMS monitoring software package to the current computer (requires .NET Framework 2.0 or higher). This software does not require separate installation; simply double-click the main program icon (BMS.exe file) to run it when the environment is ready. Enter the password: green1234 (The space is green, indicating that the password is correct).

Step 3: Click "Parameter Information" at the top of the system page, then click the "Read" button to retrieve battery parameters. Select the inverter protocol under "Protocol Type" and click the "Write" button to set the protocol. Once the system displays a successful operation message, the protocol selection is complete (please refer to the following images).



Step 4: Select the cable used by the inverter according to the label on the communication cable. Insert the RJ45 connector (CAN/RS485) from the battery side and the RJ45 connector from the inverter side into the interfaces on both sides. Restart both the battery and the inverter. The battery will automatically communicate with the inverter according to the selected protocol.

5.3.3 Method 3: The battery module is optionally equipped with a WiFi module, and the inverter protocol is selected through the APP. For specific operations, refer to the APP operation manual.

06/Communication Protocol Comparison Table

Low Voltage-RS485							
NO.	Inverter Name	Inverter Logo	Protocol	Abbreviation	Mode	Version	Inverter Communication Definition
1	PACEEX		PACE	"PACE"	RS485	1.3	
2	PYLONTECH		PYLON	"PYLN"	RS485	1.0	
3	EVADA				RS485		PIN 1-RS485_B PIN 2-RS485_A
4	XINDUN		PYLON/GROWATT /VOLTRONIC		RS485		PIN 1-RS485_B PIN 2-RS485_A
5	TECHFINE				RS485		PIN 1-RS485_B PIN 2-RS485_A
6	SUMRY				RS485		PIN 1-RS485_B PIN 2-RS485_A
7	SUNGERY				RS485		PIN 1-RS485_B PIN 2-RS485_A
8	VEICHI		VOLTRONIC	"VLTC"	RS485	1.0	PIN 1-RS485_B PIN 2-RS485_A
9	VOLTRONIC POWER		VOLTRONIC	"VLTC"	RS485	1.0	PIN 1-RS485_B PIN 2-RS485_A
10	GROWATT		GROWATT	"GRWT"	RS485	2.1	PIN 1-RS485_B PIN 2-RS485_A
11	SACOLAR		GROWATT	"GRWT"	RS485		PIN 1-RS485_B PIN 2-RS485_A
12	SRNE		SRNE	"SRNE"	RS485	1.0	PIN 1-RS485_B PIN 2-RS485_A
13	AFORE		AFORE	"AFOR"	RS485	1.0	
14	SOLAX POWER		SOLAX	"SOLX"	RS485	1.2	
15	VKINGNER		VKING	"VKIN"	RS485	1.0	

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16	MUST		MUST	"MUST"	RS485	1.1	PIN 1-RS485_B PIN 2-RS485_A
17	BAYKEE		BAYKEE	"BYKE"	RS485	1.0	
18	SMK SOLAR		SMK	"SMK"	RS485		PIN 1-RS485_B PIN 2-RS485_A
19	BIWATT		BITTA	"BITA"	RS485	1.1	
20	STONE		STONE	"STON"	RS485	2.1	
21	EPEVER		EVEPER	"EVPR"	RS485	1.5	
22	KSTAR		KSTAR	"KSTR"	RS485	5.0	
23	SUNFLY TECH		SUNFLY	"SNFL"	RS485	1.2	

Low Voltage-CAN

NO.	Inverter Name	Inverter Logo	Protocol	Abbreviation	Mode	Version	Inverter Communication Definition
1	SAJ ELECTRIC		PYLON	"PYLN"	CAN	2.1	PIN 4-CAN_H PIN 5-CAN_L
2	PYLONTECH		PYLON	"PYLN"	CAN	1.2, 2.0	
3	LIVOLTEK		PYLON	"PYLN"	CAN		PIN 1-CAN_H PIN 2-CAN_L
4	MEGAREVO		PYLON	"PYLN"	CAN		PIN 4-CAN_H PIN 5-CAN_L
5	SOLARCARRY		PYLON	"PYLN"	CAN		PIN 4-CAN_H PIN 5-CAN_L
6	CVTE		PYLON	"PYLN"	CAN		PIN 5-CAN_H PIN 6-CAN_L
7	HOYMILES		PYLON	"PYLN"	CAN		PIN 4-CAN_H PIN 5-CAN_L
8	CHISAGE ESS		PYLON	"PYLN"	CAN		PIN 4-CAN_H PIN 5-CAN_L
9	SOSEN		PYLON	"PYLN"	CAN		PIN 4-CAN_H PIN 5-CAN_L

10	VICTRON ENERGY		VICTRON	"VICT"	CAN	1.0	PIN 7--CAN_H PIN 8--CAN_L
11	GROWATT		GROWATT	"GRWT"	CAN	1.5	PIN 4--CAN_H PIN 5--CAN_L
12	SLENERGY		PYLON	"PYLN"	CAN		PIN 6--CAN_H PIN 3--CAN_L
13	AFORE		AFORE	"AFOR"	CAN	2.1	PIN 4--CAN_H PIN 5--CAN_L
14	AP SYSTEMS		ALTENERGY	"AEPS"	CAN	1.3	PIN 4--CAN_H PIN 5--CAN_L
15	SUNOHOO		PYLON	"PYLN"	CAN	2.1	PIN 4--CAN_H PIN 5--CAN_L
16	GOSPOWER		PYLON	"PYLN"	CAN	2.1	PIN 4--CAN_H PIN 5--CAN_L
17	AOHAI		PYLON	"PYLN"	CAN	2.1	PIN 4--CAN_H PIN 5--CAN_L
18	SOLAX POWER		SOLAX	"SOLX"	CAN	1.2	PIN 4--CAN_H PIN 5--CAN_L
19	VKINGNER		VKING	"VKIN"	CAN	1.0	PIN 4--CAN_H PIN 5--CAN_L
20	MUST		MUST	"MUST"	CAN	1.0	PIN 5--CAN_H PIN 6--CAN_L
21	GOODWE		GOODWE	"GDWE"	CAN	1.5	PIN 4--CAN_H PIN 5--CAN_L
22	SO FAR		SO FAR	"SOFA"	CAN	1.0	PIN 4--CAN_H PIN 5--CAN_L
23	LUXPOWER		LUXPOWER	"LXPR"	CAN	1.0	PIN 3--CAN_L PIN 4--CAN_H PIN 5--CAN_L
24	KSTAR		KSTAR	"KSTR"	CAN	1.18	PIN 4--CAN_H PIN 5--CAN_L
25	SOROTEC		SOROTEC	"SRTC"	CAN	1.0	PIN 3--CAN_H PIN 5--CAN_L
26	SMA		SMA	"SMA"	CAN	1.0	PIN 4--CAN_H PIN 5--CAN_L
27	SOLIS		GINLONG	"GNLG"	CAN	1.0	PIN 4--CAN_H PIN 5--CAN_L

28	DONNERGY		DONNERGY	"DONN"	CAN	1.0	
29	IMEON ENERGY		IMEON	"IMON"	CAN	1.0	PIN 14-CAN_H PIN 12-CAN_L
30	SCHNEIDER		SCHNEIDER	"SHDR"	CAN	2.0	PIN 4-CAN_H PIN 5-CAN_L
31	INVT		INVT	"INVT"	CAN	1.2	PIN 4-CAN_H PIN 5-CAN_L
32	INHENERGY		INHENERGY	"INHE"	CAN	1.0	PIN 4-CAN_H PIN 5-CAN_L
33	SENERGY		SENERGY	"SENR"	CAN	1.2	PIN 8-CAN_H PIN 7-CAN_L
34	SUNWAYS		SUNWAYS	"SNWY"	CAN	2.0	
35	STUDER		STUDER	"STDR"	CAN	1.0	
36	DEYE		DEYE	"DEYE"	CAN	1.0, 3.0	PIN 4-CAN_H PIN 5-CAN_L
37	SUNGROW		SUNGROW	"SNGR"	CAN	1.0	PIN 4-CAN_H PIN 5-CAN_L