essis

User Manual

LV LFP Battery

ESS-W51100L

5.12KWh

Copyright Notice

Trademark copyright

Caution

Please read the manual carefully, following identifications on the equipment and all safety precautions in the manual. Contents of the manual will be updated irregularly according to products’ versioning upgrading or other reasons.

The manual is only intended as a guide for use unless otherwise agreed and all statements, information, and suggestions in this manual do not constitute any express or implied warranties. The latest manuals are available on ‘www.essis.com’.

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Preface

Overview

This document mainly introduces the product introduction, application scenarios, installation instructions, system maintenance and related technical data of the 'ESS-W51100L' energy storage battery module.

Suitable

This document is primarily intended for the following people:

- Sales Engineer
- System Engineer
- Installation and after-sales engineer
- End User

Symbol Description

The following symbols may appear in this article, and their meanings are as follows.

Symbol	Explanation
Danger	Indicates a hazard with a high risk of death or serious injury if not avoided.
Warning	Indicates a hazard with a medium risk that, if not avoided, could result in death or serious injury.
Caution	Indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.
Notice	Used to transmit equipment or environmental safety warning information. Failure to avoid it may result in equipment damage, data loss, reduced equipment performance, or other unpredictable results. "Notice" does not involve personal injury.
Explanation	Supplementary explanation of key information in the main text. "Instructions" are not safety warning information, and do not involve personal, equipment and environmental damage information.

Modify records

The modification log accumulates the description of each document update. The latest version of the documentation contains updates from all previous documentation versions.

Document version

Document Version 1 (2024-4-19)

First official release.

Document Version 2 (2025-11-14)

Update Waterproof version

Document Version 3 (2026-01-22)

Update 3.1 Product Introduction.

Update 3.2 Appearance Description.

Update 4.1 Check before Installation.

Update 4.4 Equipment Installation.

Update 6.4 Operation of Bluetooth.

Content

1 Safety Precautions

1.1 General Security

Statement

When installing, operating and maintaining the equipment, you must read this manual first, and follow the signs on the equipment and all safety precautions in the manual. When a new product is unpacked for the first time, please check the product and packing list first, if the product is damaged or missing parts, please contact your local distributor.

The "Notice", "Caution", "Warning" and "Danger" in the manual only serve as a supplement to all the safety precautions. You also need to comply with relevant international, national or regional standards, as well as industry practices. We do not assume any responsibility for violating general safety operation requirements or violating safety standards for design, production and use of the equipment.

This equipment should be used in an environment that meets the design specifications, otherwise it may cause equipment failure, resulting in abnormal equipment function or component damage, personal safety accidents, property damage, etc., which are not within the scope of equipment quality assurance.

All operations such as transportation, installation, operation, use and maintenance of equipment should comply with the local laws, regulations, execution standards, and regulatory requirements of the customer. The safety precautions in this manual only act as supplements to local laws, regulations, and norms.

In the event of any of the following situations, ESSIS shall not be held responsible.

- Equipment damage caused by extreme environments (earthquakes, floods, typhoons, volcanic eruptions, etc.), force majeure, and other factors.
- Do not operate under the conditions of use described in this manual.
- The installation and use environment violate relevant international, national or regional standards.
- Fail to follow the operating instructions and safety warnings in the product and documentation.
- Unauthorized disassembly, modification of the product or modification of the software code.
- Damage caused by customers or third-party transportation entrusted by customers.
- Damage caused by storage conditions that do not meet product requirements.

- Damage caused by improper customer or third-party operations not attributable to ESSIS.
- Beyond product life.

1.2 Personal Security

Danger

- Live operation is strictly prohibited during the installation process. It is prohibited to install or remove cables with electricity. There will be electric arcs, sparks, or explosions, which can lead to fire or personal injury, when the cable core comes into contact with the conductor.
- When the equipment is electrified, non-standard and incorrect operation may cause fire, electric shock or explosion which leading to personal injury or property damage.
- It is strictly prohibited to wear conductive objects such as watches, bracelets, bracelets, rings, necklaces and so on during the operation to avoid being burned by electric shock.
- Special insulation tools must be used during the operation process to avoid electric shock injuries or short circuit faults. The insulation withstand voltage level must meet the requirements of local laws, regulations, standards, and specifications.
- Special protective equipment must be used during the operation process, such as wearing protective clothing, insulated shoes, goggles, safety helmets, insulated gloves, etc.。

1.3 Electrical Security

Danger

- Before making electrical connections, please ensure that the equipment is not damaged, otherwise it may cause electric shock or fire.
- Unstandardized and incorrect operation may cause accidents such as fires or electric shocks.

Warning

- When installing equipment that needs to be grounded, the protective ground wire must be installed first; when equipment is removed, the protective ground wire must be removed last.

1.4 Battery Security

Danger

- It is strictly prohibited to short-circuit the positive and negative terminals of the battery, otherwise it may cause battery short circuit. Battery short circuit can instantly generate a large current and release a large amount of energy, causing battery leakage, smoke, release of combustible gases, thermal runaway, fire, and explosion. To avoid battery short circuits, live maintenance is not allowed.
- Do not expose the battery to high temperature environments or heating equipment, such as high-temperature sunlight, ignition sources, transformers, heaters, etc. Overheating the battery may cause liquid leakage, smoke, release of combustible gases, thermal runaway, fire or explosion.
- It is strictly prohibited for the battery to receive mechanical vibration, drop, collision, hard object puncture, and pressure impact, otherwise it may cause battery damage or fire.
- It is strictly prohibited to disassemble, modify or damage the battery to avoid liquid leakage, smoke, release of combustible gases, thermal runaway, fire, or explosion.
- The use or replacement of incorrect battery models poses a risk of fire and explosion. Please use the specified model of battery recommended by the manufacturer.
- The battery electrolyte is toxic and volatile. When electrolyte leakage or abnormal odor occurs, contact with the leaked liquid or gas should be avoided. Non-professional personnel are not allowed to approach. Please contact professional personnel immediately for handling. Professional personnel should wear goggles, rubber gloves, gas masks, protective clothing, etc., promptly power off the equipment, remove the leaking battery and contact a technical engineer for handling.
- The gas generated by battery combustion can irritate the eyes, skin, and throat. Attention should be paid to protection.

Warning

- Before removing the packaging of the battery, during storage and transportation, ensure that the outer packaging box is intact and undamaged and place it correctly according to the packaging box identification. It is strictly prohibited to place it upside down, sideways, vertically, or obliquely. When stacking, it should comply with the stacking requirements on the outer packaging to avoid any impact or drop that may cause battery damage and scrapping.

- After removing the packaging of the battery, it should be placed in the required direction. It is strictly prohibited to place it upside down, sideways, vertically, tilt or stack it to avoid any impact or drop that may cause damage to the battery and scrap it.
- After the battery is discharged, it should be charged in a timely manner, otherwise it may cause damage to the battery due to over discharge.

1.5 Machinery Security

⚠ Caution

- When handling equipment by hand, safety protective equipment such as protective gloves and safety shoes should be worn to avoid injury.
- When carrying heavy objects, be prepared to bear the weight to avoid being crushed or sprained by heavy objects.

＜18kg (＜40lb) | 18~32kg (40~70lb) | 32~55kg (70~121lb) | ＞55kg (＞121lb)

2 Security Requirements

2.1 General requirements

- Do not disable the equipment protection device and ignore the warnings and preventive measures in the manual and equipment.
- Do not power on the device until it has been installed or confirmed by a professional.
- Direct contact, contact with other conductors, or indirect contact with power supply equipment through damp objects are prohibited. Before touching any conductor surface or terminal, the voltage at the contact point should be measured to confirm that there is no risk of electric shock.
- When the device is running, the temperature of some internal casings is high, there is a danger of burns, please do not touch.
- Installation, operation, and maintenance must be carried out in accordance with the steps in the manual. Do not modify, add, or change equipment without authorization, and do not change the installation sequence without authorization.
- It is necessary to obtain permission from the power department of the country or region in order to connect to the grid for operation.
- When liquid is found entering the equipment, please immediately turn off the power and prohibit further use.
- Before installing the cable, it is necessary to confirm that the cable label identification is correct and that the cable terminals have been insulated and protected.
- Please regularly check the equipment connection terminal screws to ensure they are tightened and not loose.
- If the cable is damaged, it must be replaced by professional personnel to avoid risks.
- It is strictly prohibited to artificially alter, damage or obstruct the markings and nameplates on the equipment, and timely replace any markings that have become unclear due to long-term use.
- It is strictly forbidden to alter, damage or cover the signs and nameplates on the equipment.
- Arc welding, cutting, and other operations on equipment are prohibited without our company's evaluation.
- Before installing, operating, and maintaining the battery, please read the instructions provided by the battery manufacturer and comply with the battery manufacturer's requirements.

- Please use the battery within the specified temperature range. When the ambient temperature is below the lower limit of the working temperature, charging is prohibited to avoid internal short circuits caused by low-temperature charging.
- Before removing the packaging of the battery, it is necessary to check whether the packaging is intact. Batteries with damaged packaging cannot be used. If damaged, please notify the transporter and manufacturer immediately.
- Damaged batteries (such as drops, collisions, bulging or dents in the casing) may cause leakage or the release of flammable gases. Do not use damaged batteries. When the battery is damaged by liquid leakage, structural deformation, etc., please immediately contact the installer or professional operation and maintenance personnel for removal and replacement. Do not store damaged batteries near other equipment or flammable materials, and non-professionals are not allowed to approach damaged batteries.
- It is strictly prohibited to place installation tools, metal parts, and debris on the battery during the installation process. After installation, clean the battery and surrounding items in a timely manner.
- If the battery accidentally drips with water, it is prohibited to continue installation. It should be transported to a safe isolation point and promptly scrapped.
- Before installing the battery pack, the battery should be checked for the following two conditions. If either condition occurs, it is considered abnormal:

（1）：The battery pack casing has obvious deformation or damage;

（2）：The voltage between the positive and negative terminals of the battery pack output is not within the normal range.

- Determine if the positive and negative terminals of the battery are accidentally grounded. If accidentally grounded, disconnect the battery terminal from the ground.
- Do not perform welding, grinding, or similar work around the battery to avoid generating electrical sparks, arcs, and fire hazards.
- It is prohibited to use equipment that does not comply with local laws, regulations, and regulatory requirements for charging and discharging.
- During installation and maintenance, the battery circuit should remain disconnected.
- When the battery malfunctions, the surface temperature may be too high and contact should be avoided to avoid burns.

2.2 Personnel Requirements

- Personnel responsible for installing and maintaining equipment must first undergo strict training, master the correct operating methods, understand various safety precautions, and relevant standards of the country/region where they are located.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain equipment.
- Only qualified professionals or trained personnel are allowed to install, operate and maintain the equipment.
- Only qualified professionals are allowed to dismantle safety features and overhaul equipment.
- Replacement of equipment or parts (including software) must be done by professionals or authorized personnel.

2.3 Grounding Requirements

- When installing equipment that needs to be grounded, the protective ground wire must be installed first; when equipment is removed, the protective ground wire must be removed last.
- The equipment should be permanently connected to the protective ground. Before operating the equipment, check the electrical connections of the equipment to ensure that the equipment is properly grounded.
- It is forbidden to operate the equipment without the grounding conductor installed.
- It is forbidden to damage the grounding conductor.

2.4 Wiring Requirements

- The selection, installation, and routing of cables must comply with local laws, regulations, and specifications.
- All cables must be securely connected, well insulated, and of appropriate specifications.
- The use of cables in a high temperature environment may cause the insulation layer to deteriorate and be damaged. The distance between the cable and the heating device or the periphery of the heat source area should be at least 30mm.
- Similar cables should be tied together, with a straight and neat appearance and no skin damage; Different types of cables should be laid separately, and intertwining or cross laying is prohibited.

2.5 Environment Requirements

- The installation and use environment must comply with local laws and regulations as well as relevant international and regional standards for lithium battery products. The person using this device has an obligation to protect it from fire or other damage.
- Corresponding preventive measures need to be taken for installation in areas with frequent natural disasters such as floods, mudslides, earthquakes, typhoons, etc.
- The temperature and humidity environment for equipment storage should be suitable, stored in a clean, dry, well ventilated area, and prevent dust and condensation.
- It is strictly prohibited to place equipment near heat or ignition sources, such as smoke, candles, heaters, or other heating devices. Heating the equipment may cause damage to the equipment or cause a fire.
- It is strictly prohibited to store flammable and explosive materials in the equipment area.
- When the equipment is running, do not block the ventilation openings, heat dissipation systems, or use other items to cover it to prevent high temperature damage to the equipment or ignition.
- It is strictly forbidden to install, use and operate outdoor equipment and cables (including but not limited to handling equipment, operating equipment and cables, plugging and unplugging signal interfaces connected to the outdoors, high-altitude) under severe weather such as lightning, rain, snow, and strong winds. work, outdoor installation, etc.).
- It is strictly prohibited to install the equipment in an environment with direct sunlight, dust, smoke, volatile gases, corrosive gases, infrared radiation, and high organic solvents or salts.
- The site selection should comply with local laws, regulations, and relevant standards.
- When installing equipment, please ensure that the installation surface is sturdy and meets the load-bearing requirements of the equipment.

2.6 Recycle Requirements

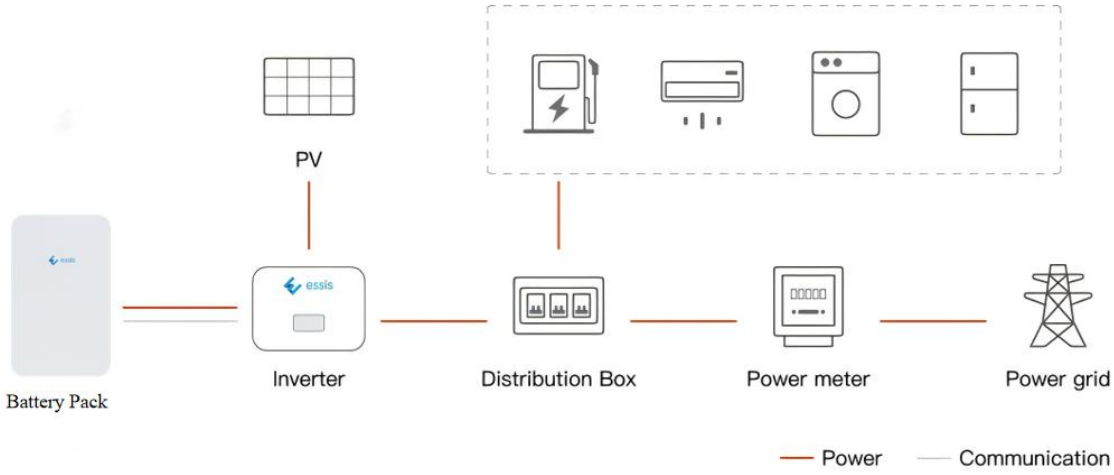
- Please dispose of used batteries according to local laws and regulations, do not dispose of batteries as household waste.
- If the battery leaks or bulges, please contact technical support or battery recycling company for disposal.
- When the battery cannot be used beyond its service life, please contact a battery recyclingcompany for disposal.

- Avoid exposing the battery to high temperature or direct sunlight.
- Avoid exposing batteries to high humidity or corrosive environments.

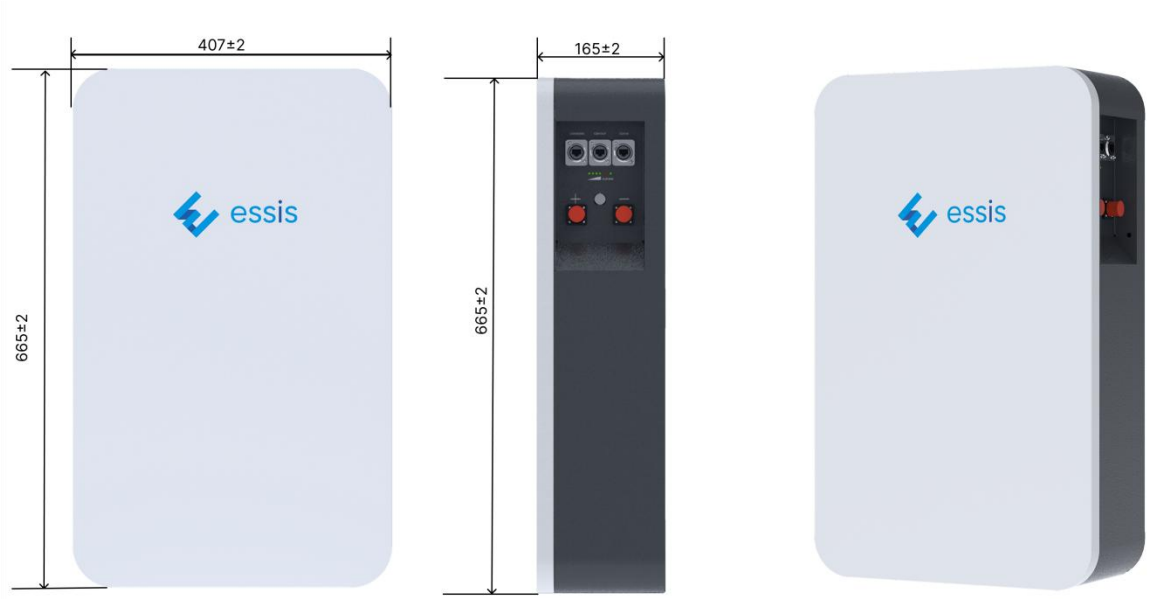
3 Product Description

3.1 Product Introduction

Essis wall mounted energy storage battery pack is a modular product designed for energy storage applications, widely used in small and medium-sized energy storage systems. A single battery pack is composed of a battery cell, BMS (Battery Management System), and an outer shell. The BMS of each module has independent voltage acquisition, temperature detection and various protection functions, as well as passive equalization function. By changing the number of parallel battery packs, the optimal configuration of the entire energy storage system can be achieved.



Product size



Model

Essis household energy storage battery pack model：ESS-W 51100 L

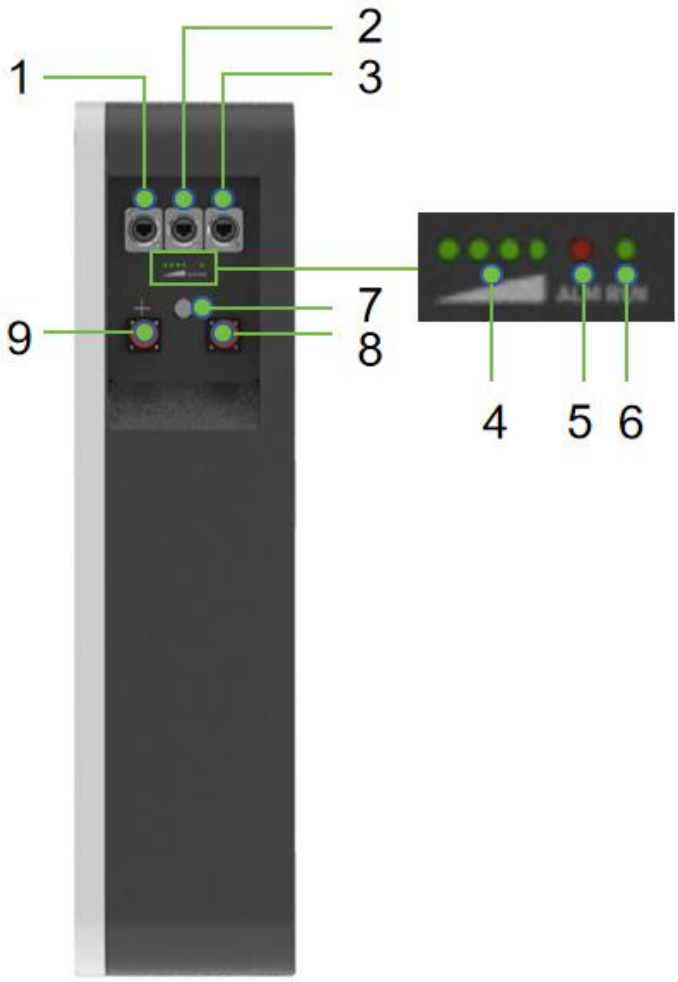
No.	Acronym	Explanation
1	ESS	Abbreviation for ESSIS
2	W	Wall mounted battery module
3	51100	The module voltage is 51V and the cell capacity is 100Ah.
4	L	Low voltage battery module

Specification parameters

Model	ESS-W51100L
Cell Type	Lithium Iron Phosphate（LFP）
Cell Quantity	16
Maximum Number of Parallel Connections	16
Nominal Voltage（V）	51.2
Rated Capacity（Ah）	100
Rated Energy（kWh）	5.12
Standard Charge Current（A）	50
Standard Discharge Current（A)	50
Operation Voltage（V）	T>0℃ 40~58.4V T<=0℃ 32~58.4℃
Dimension W*D*H （mm）	410*164.5*665
Cycle Life	25 ℃ 0.5C/0.5C,≥8000cyls@80%
Weight（Kg）	51.02
Operation Temperature（℃）	Charge：0~65 Discharge：- 20~65
Storage Temperature（℃）	<One Month：-20~45 >One Month:0~35
Communication	RS485/CAN
Humidity	5~95%
Altitude（M）	<4000

3.2 Appearance Description

Battery Module



1 CAN/RS485Communication	2 COM OUT Communication	3 COM IN Communication
4 SOC Light	5 Alarm Light	6 Running indicator
7 External switch	8 Output negative interface	9 Output positive interface

Description: The communication interface is divided into three interfaces. CAN/RS485 is the communication interface between the battery pack and PCS, and COM OUT/COM IN is the communication interface between the battery pack and the upper computer.

3.3 Protection

Overcharge protection

When the voltage of any single cell or the entire battery pack is higher than the protection value during charging, the battery cannot be charged. When the voltage of each cell and the entire battery is restored to the release voltage range or there is an effective discharge current, the normal state is restored.

Over-discharge protection

When the voltage of any single cell or the entire battery pack is lower than the protection value during discharge, the battery cannot be discharged. The normal state is restored when the voltage of each cell and the entire battery pack is restored to the release voltage range or when there is an effective charging current.

Overcurrent protection

During charging and discharging, when the current is higher than the protection value, the BMS will limit the battery working current. When the system latency time is met, it will be released from protection.

Over-temperature protection

If any battery/ambient/MOS temperature is out of range, the BMS will stop charging or discharging or both.

Cryogenic protection

If any battery/ambient/MOS temperature falls below that range, the BMS will stop charging or discharging or both.

4 System Installation

Danger

During the battery installation process, pay attention to the positive and negative poles. It is strictly prohibited to short circuit the positive and negative poles of a single battery pack or battery cluster, otherwise it may cause a short circuit in the battery and cause fire hazards.

Warning

It is strictly prohibited to place installation tools, metals, and other conductive substances on the battery during the battery installation process. After the battery installation is completed, clean the battery and surrounding items in a timely manner to prevent short circuits.

Warning

After removing the packaging of the battery, it should be placed in the required direction. It is strictly prohibited to place it upside down, sideways, cubed, tilted, or stacked to avoid any impact or drop that may cause damage to the battery.

Caution

- The battery pack should be moved slowly to prevent collisions and bumps.
- When handling batteries, they should be handled with care, and it is strictly prohibited to touch the batteries, and personal safety should be taken into account.
- When installing the battery, please install and fix it in a bottom-up order to prevent tipping.

Notice

- Before installing the battery pack, the battery should be checked for the following two conditions. If either condition occurs, it is considered abnormal:

（1） The battery pack casing has obvious deformation or damage;

（2） The voltage between the positive and negative terminals of the battery pack output is not within the normal range.

4.1 Check before Installation

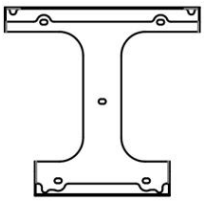
Check the outer packaging

Before unpacking the components of the energy storage system, check the outer packaging for visible damage, such as holes, cracks, or other signs of possible internal damage, and check the model number. If there is any abnormal packaging or model mismatch, do not open it and contact your dealer as soon as possible.

Check delivery

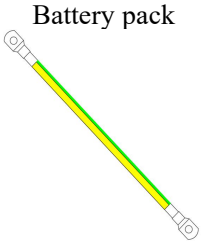
After unpacking the energy storage unit, check that the delivery is complete and free of any visible external damage. If anything is missing or damaged, please contact your dealer.

Battery pack

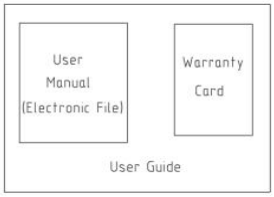


Wall mounted bracket

Cable

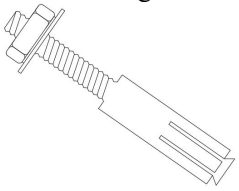


Grounding wire



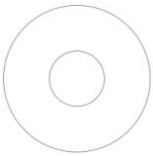
User manual

Screw



Expansion screws

Screw



Flat washer

NO	Name	Quantity
1	Battery pack	1pcs
2	Wall mounted bracket	1pcs
3	Red Power Cable*1m	1pcs
4	Black Power Cable*1m	1pcs
5	Grounding wire 30cm	1pcs
6	User manual	1pcs
7	Communication lines 1m	1pcs
8	M8*70 Expansion screws	4pcs
9	M8*16 Outer hexagon screw	4pcs
10	Warranty card	1pcs
11	Flat washer	4pcs

4.2 Preparation of Tools Instruments

Tools	
Screwdriver (slot, cross)	wrench
Diagonal pliers	wire stripping pliers
Strap	Multimeter
Insulating tape	hydraulic pliers
Clamp current meter	insulation gloves
Protective goggles	safety shoes

4.3 Choose the Installation Location

Basic requirements

The battery pack must be fixed on a solid ground such as cement, and cannot be installed with the pack tilted forward, horizontally, upside down, backwards, or sideways.

When installing energy storage, ensure that there are no other equipment or flammable or explosive materials around, and reserve sufficient space to ensure installation heat dissipation and safety isolation requirements.

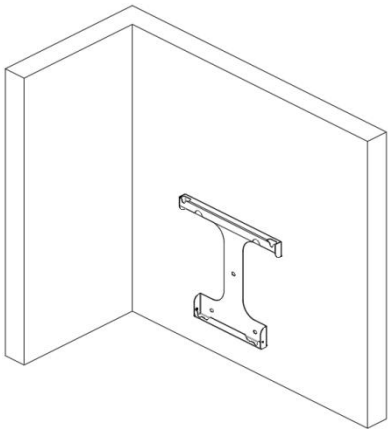
Installation space requirements

When installing battery packs, it is necessary to pay attention to product heat dissipation and ensure that the product has sufficient heat dissipation space.

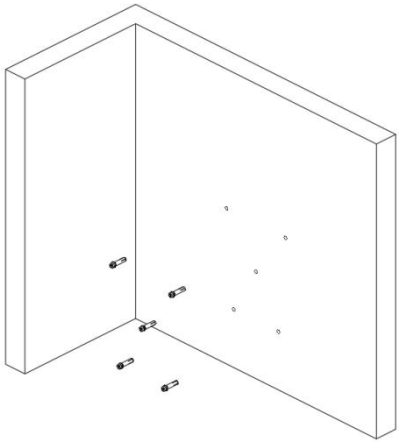
4.4 Equipment Installation

Battery installation steps:

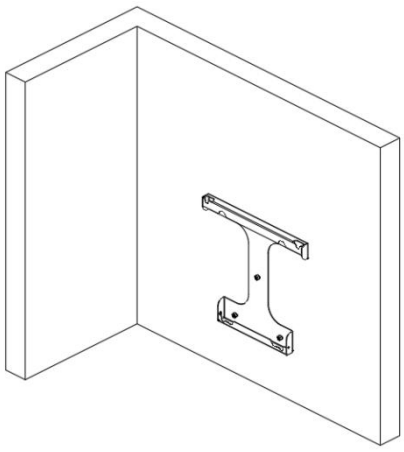
1. Stick the wall bracket on the wall to mark the hole position,the wall must have enough hardness, and use the spirit level for leveling.The backpack must be perpendicular to the ground while drawing the holes.The bottom of backpack the is about 300mm from the ground.



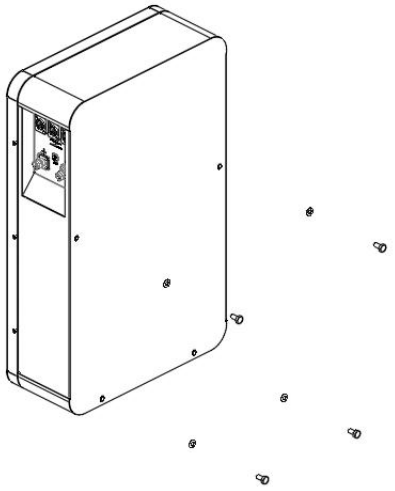
2. Use a gun drill to drill holes in the wall, the hole diameter is 12mm, the depth is 50mm, the screws are tightened, and the wall bracket is fixed on the wall.



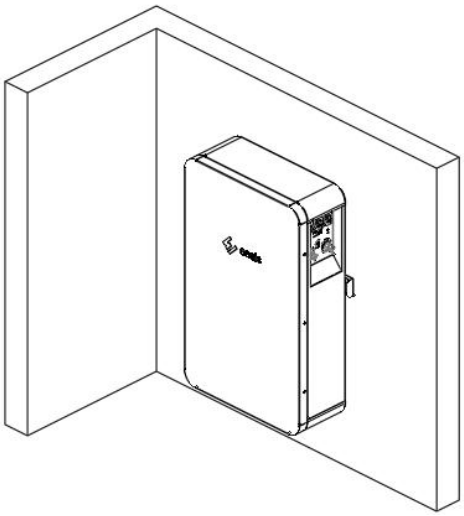
3.Secure the back bracket to the wall using M8*70 expansion nuts.



4.Secure the M8*16 screw and flat washer to the rear of the battery pack.



5.Mount the battery pack onto the back frame.Ensure that the head of each screw and the washer are fully seated within the back frame.



5 Electrical Connections

Precautions

Danger

- Pay attention to the positive and negative poles during battery installation, and it is strictly prohibited to short circuit the positive and negative poles of a single battery or battery pack string, otherwise it may cause a battery short circuit.
- Smoking or using open flames near batteries is prohibited.
- Please use professional protective equipment and insulation tools to avoid electric shock injuries or short circuit faults.

Warning

- Equipment damage caused by incorrect wiring is not covered by the equipment warranty.
- Operations related to electrical connection must be carried out by professional electrical technicians.
- When making electrical connections, operators must wear personal protective equipment.

Explanation

The cable colors in all the electrical connection diagrams in this chapter are for reference only, and the selection of cables should comply with local cable standards (yellow-green bi-color wires can only be used for protective grounding).

5.1 Prepare the Cable

No.	Cable	Type	Source
1	Communication wire	Outdoor shielded twisted pair	come with product
2	Connector (+)	4AWG (Orange)	come with product
3	Connector (-)	4AWG (Black）	come with product
4	Ground wire	6 mm^2 yellow and green cable	come with product

Explanation：

The selection of the minimum wire diameter of the cable should conform to the local cable standard.

The factors that affect the selection of cables are: rated current, cable type, laying method, ambient temperature and maximum expected line loss.

5.2 External Electrical Connections

The connection between Essis battery packs only needs to be completed after stacking, and the wire speed provided with the box can be connected to the corresponding position. The specific wiring is as follows:

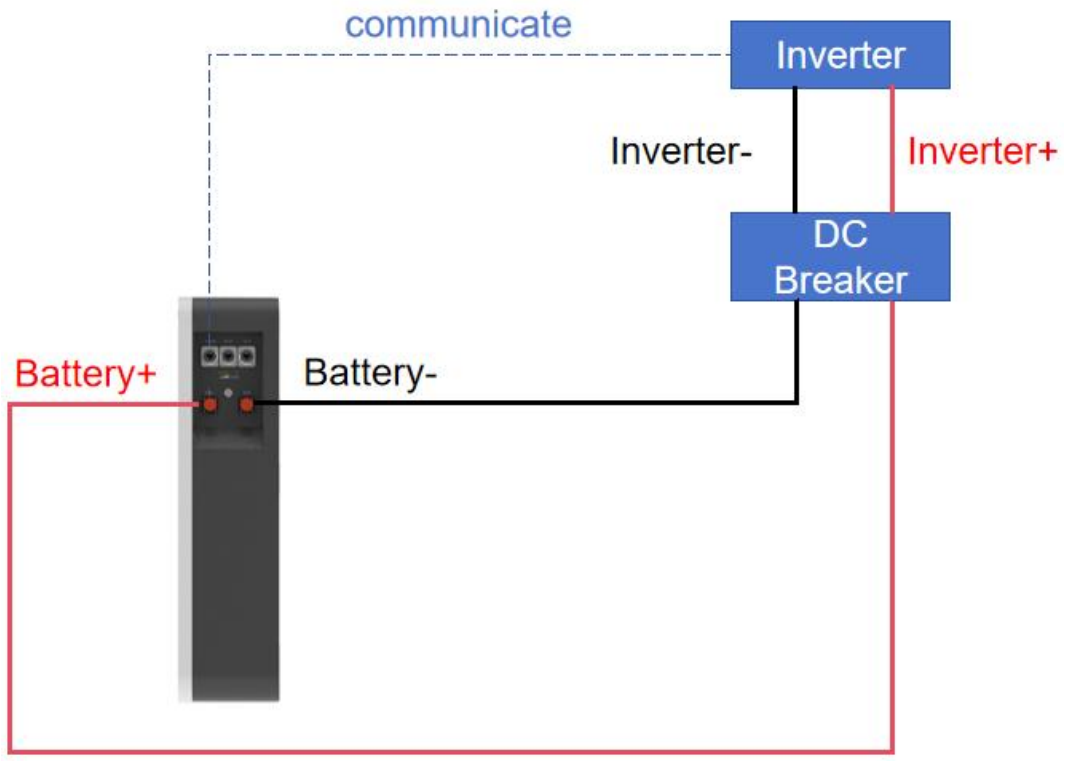
Battery module interface	**Docking interface**	**Explanation**
Positive electrode of battery module	The positive electrode of the inverter	Positive output
Negative electrode of battery module	The negative electrode of the inverter	Negative output
CAN/RS485	Connect the PCS interface	Communication interface between battery module and pcs
COM OUT/IN	Parallel module communication interface	Communication interface between battery modules

5.3 Communication Interface Definition

Crystal head picture	Serial No.	Definition
	1	RS485-B
	2	RS485-A
	3	GND
	4	CAN-H
	5	CAN-L
	6	GND
	7	RS485-A
	8	RS485-B

6 System Debugging

6.1 System Connection



6.2 Check before Power-on

No.	Checking item	Acceptance standard
1	Installation	Install correctly, firmly and reliably
2	Cable layout	Reasonable cable layout to meet user requirements
3	Binding wire	The cable tie should be uniform, no sharp corners left at the cutting point
4	Grounding wire	Connect correctly, firmly and reliably
5	Installation environment	Reasonable installation space, no construction remnants

6.3 System Power on

After opening the packaging of the battery module, if it is not installed immediately, the switch needs to be turned off.

The battery switch is a push-button type. Press the switch button once, and the LED indicators on the panel will flash sequentially from left to right. The operation indicator begins to flash slowly, and the battery pack enters standby mode.

At this point, the voltage across the positive and negative terminals of the battery module is 51.2V, enabling normal output.

Press the switch button again. The LED indicators on the panel will flash sequentially from right to left. The operation indicator will turn off, and the battery pack will enter the shutdown state.

The host unit implements a one-button system power function, meaning the system can be started or stopped by operating the host unit's switch function.

LED indicator description

●	●	●	●	●	●
SOC				ALARM	RUN

Capacity indication

State		Charge				Discharge			
SOC Lamp		L4●	L3●	L2●	L1●	L4●	L3●	L2●	L1●
State of Charge	0~25%	OFF	OFF	OFF	Blinking	OFF	OFF	OFF	Being on
	25~50%	OFF	OFF	Blinking	Being on	OFF	OFF	Being on	Being on
	50~75%	OFF	Blinking	Blinking	Being on	OFF	Being on	Being on	Being on
	≥75%	Blinking	Being on	Being on	Being on	Being on	Being on	Being on	Being on
Operation Lamp●		Being on				Blinking			

Blink Description

Blinking Type	On	Off
Blink 1	0.25s	3.75s
Blink 2	0.5s	0.5s
Blink 3	0.5s	1.5s

State indication

System State	Operation State	RUN	ALM	SOC				Explanation
		●	●	●	●	●	●	
Off	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	All off
Standby	Normal	Blink1	OFF	OFF	OFF	OFF	OFF	Standby
Charging	Normal	Being on	OFF	Display according to SOC				
	Over-current alarm	Being on	Blink2					
	Over-voltage protection	Blink1	OFF	OFF	OFF	OFF	OFF	
	Temperature, over-current protection	Blink1	Blink1	OFF	OFF	OFF	OFF	
Discharging	Normal	Blink3	OFF	Display according to SOC				
	Alarm	Blink3	Blink3					
	Temperature, over-current and circuit protection	OFF	Being on	OFF	OFF	OFF	OFF	Stop discharging, automatic sleep without action for 48 hours when offline
	Under voltage protection	OFF	Off	OFF	OFF	OFF	OFF	Stop discharging

Battery pack dialing instructions

（1） Manual dialing method：

Definition of dial switches bit1 to bit8: bit1 to bit4 are used to set addresses, and bit5 to bit8 are used for the number of slaves.

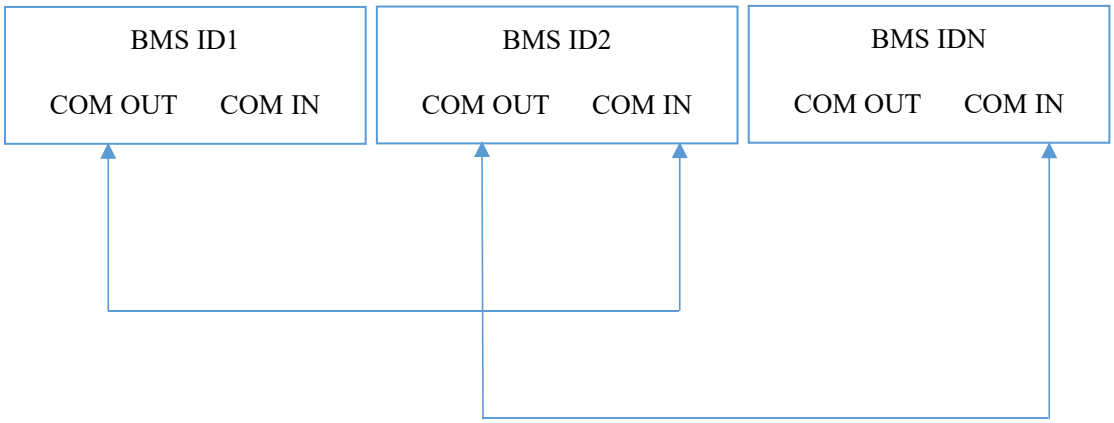
Host settings: bit1 to bit4 are set to 0, the host address is fixed to 0, and bit5 to bit8 are set based on the number of parallel slaves.

Slave settings: bit1 to bit4 are set according to the order of settings, and the slave address range is 1 to 15. bit5 to bit8 are fixed to 0.

Example of parallel dialing code setting

Number of parallel machines	**Dial switch position**								**Explanation**
	1#	2#	3#	4#	5#	6#	7#	8#	
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
2	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	First host
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Second slave
3	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	First host
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Second slave
	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Third slave

（2） Automatic dialing method：



Explanation：

This battery pack supports automatic dialing function. After connecting the communication cable according to the diagram, the battery module can be used normally.

6.4 Operation of Bluetooth

1. Install the app

- IOS Version

Turn on Bluetooth, open the App Store on your mobile phone, search for “EN BMS” (note the spaces between the words), and download and install the application.

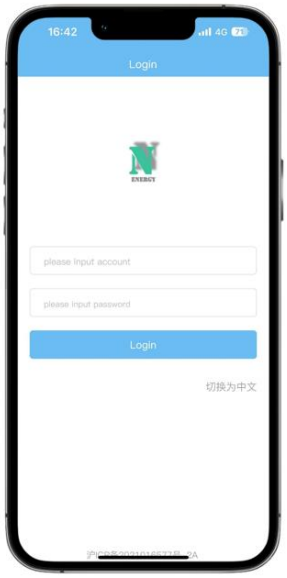
- Android Version

Turn on Bluetooth and scan the QR code to install the App

After downloading, please go to Settings to grant the app “Location Permissions.”

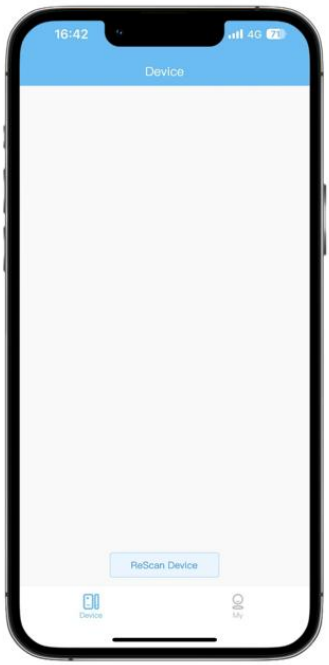
1. Login

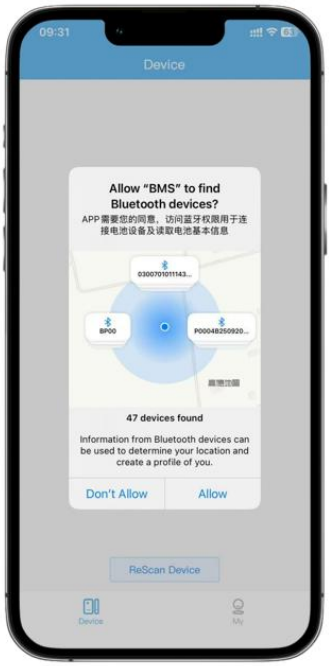
- After opening the APP, enter the login interface to log in with your account.
- Login account: admin, login password: 111111

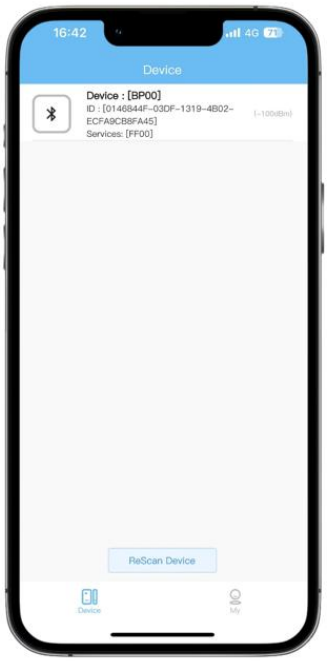


2. Device Connection

- After the battery powers on successfully, place it near the connected device.
- Click on the Rescan Device (if you can't find it, click multiple times)
- Allow BMS to discover Bluetooth devices.

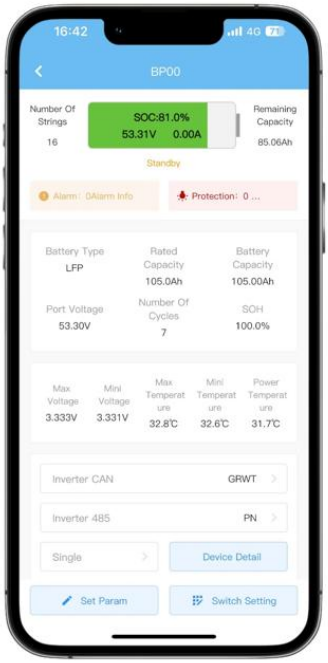






3. Parameter Settings

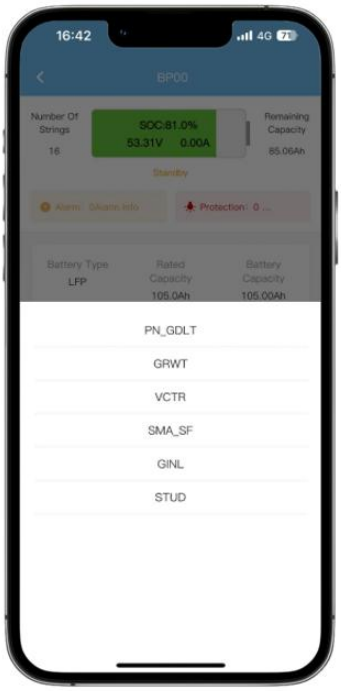
- Main interface display



- Inverter communication

CAN Communication: Click on Inverter CAN and select the inverter protocol you need.

485 communication: no need to change the protocol, the system is self-adapting.



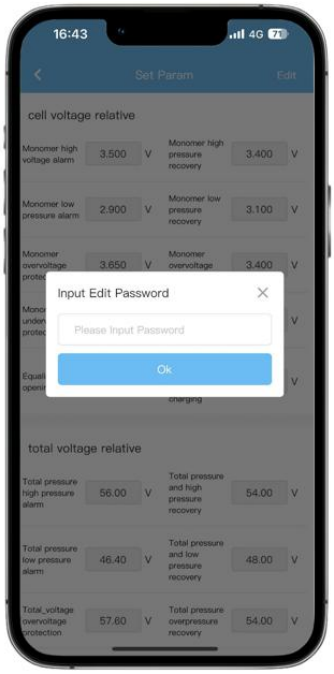
- Specific parameters

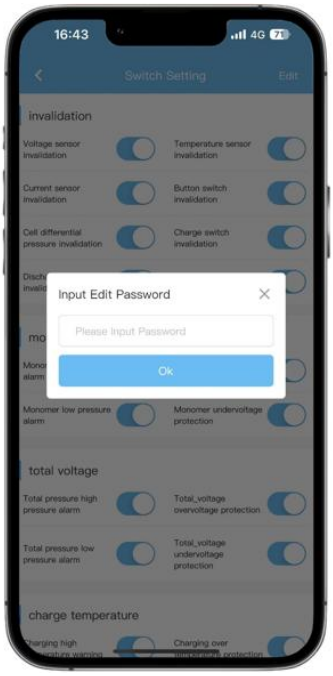
Click Device Detail to display battery pack parameters (voltage, temperature)

- Modify the parameters
- Switch setting

Click on the set parameter, password: 111111

Note: The safety parameters of the product have been set at the factory, and non-professionals should not modify the parameters without authorization.





6.5 Inverter brand

Supported inverter brands

BMS Inverter Communication Protocol Matching Table

Inverter Manufacturers		Agreement Name	communication method	Baud rate	Switching Protocol Method	Protocol Version
PYLONTECH	PYLONTECH	CAN-Bus-protocol-PYLON	CAN	500K	Upper computer switching PN-GDLT	V1.3
GOODWE	固德威 GOODWE	GOODWE Communication Protocol	CAN	500K	Upper computer switching PN-GDLT	V1.5
Solis	solis	CAN communication protocol	CAN	500K	Upper computer switching GINL	V1.0
SUNGROW	SUNGROW	CAN-Bus-protocol-PYLON	CAN	500K	Upper computer switching PN-GDLT	V1.3
SOFARSOLAR	SOFAR SOLAR 首航新能源	Sofarsolar Energy Storage Inverter BMS General Protocol CAN Description	CAN	500K	Upper computer switching SMA-SF	V1.0
Growatt-SPF	Growatt	Growatt BMS CAN-Bus-protocol-low-voltage	CAN	500K	Upper computer switching GRWT	V1.05
Growatt-SPH	Growatt	Growatt BMS communication protocol of growatt low voltage battery	CAN	500K	Upper computer switching GRWT	V1.01
SMA	SMA	FSS-ConnectingBat-TI-en-20W	CAN	500K	Upper computer switching SMA-SF	V2.0
Victron	victron energy	can-bus_bms_protocol	CAN	500K	Upper computer switching VCTR	V1.0
Luxpowertek	LUXPOWER	Luxpowertek Battery CAN Protocol	CAN	500K	Upper computer switching PN-GDLT	V1.0
Sol-Ark	Sol-Ark	Sol-Ark CAN Bus Protocol	CAN	500K	Upper computer switching PN-GDLT	V1.2
Studer	STUDER	Technical specification Studer BMS Protocol	CAN	500K	Upper computer switching Studer	V1.03
TBB	TBB POWER	TBB Li-ion Battery BMS Platform CAN Protocol V1.02	CAN	500K	Upper computer switching PN-GDLT	V1.02
Deye	Deye 德业	CAN-Bus-protocol-PYLON-v1.3	CAN	500K	Upper computer switching PN-GDLT	V1.0
LIVOLTEK	LIVOLTEK	LIVOLTEK CANBUS Protocol of Low Voltage SystemV1.0	CAN	500K	Upper computer switching PN-GDLT	V1.0
SOROTEC	SOROTEC	2_CAN protocol 1.0	CAN	500K	Upper computer switching PN-GDLT	V1.0
MEGAREVO	MEGAREVO	Shenzhen MEGAREVO Technology Hybrid Inverter_5K_BMS Protocol V1.01	CAN	500K	Upper computer switching PN-GDLT	V1.01
Afore	Afore	Luxpowertek Battery CAN Protocol	CAN	500K	Upper computer switching PN-GDLT	V1.0
Socolar	Socolar	Growatt BMS CAN-Bus-protocol-low-voltage	CAN	500K	Upper computer switching GRWT	V1.05
PYLONTECH	PYLONTECH	RS485-protocol-pylon-low-voltage	485	9600	Automatic Adaptation	V3.5
SRNE	srne	PACE BMS Modbus Protocol for RS485	485	9600	Automatic Adaptation	V1.3
Deye	Deye 德业	RS485-protocol-pylon-low-voltage- Add protocol design- Deye 12 9600	485	9600	Automatic Adaptation	V1.0
Growatt-SPF	Growatt	SPF BMS RS485 protocol	485	9600	Automatic Adaptation	V2.01
SMKSOLAR	SMKSOLAR 斯曼科新能源	Lithium protocol GT version 20220510.html	485	9600	Automatic Adaptation	V2.01
Voltronic Power	Voltronic Power	Voltronic Inverter and BMS 485 communication protocol	485	9600	Upgrading Voltronic program	V1.0
EASUN POWER	EASUN POWER	Voltronic Inverter and BMS 485 communication protocol	485	9600	Upgrading Voltronic program	V1.0
MPP Solar	MPP Solar	Voltronic Inverter and BMS 485 communication protocol	485	9600	Upgrading Voltronic program	V1.0
EPEVER	EPEVER	Lithium Battery BMS-Link Communication Address Table V1.4.pdf	485	9600	Upgrading EPEVER program	V1.4

7 System Maintenance

7.1 Power off the System

Danger

- Please use special protective equipment and insulation tools to avoid electric shock injuries or short circuit faults.
- Smoking or using open flames near batteries is prohibited.
- It is prohibited to use water or any solvent to clean the battery.

Warning

After the system is powered down, there is still residual electricity and heat in the chassis, which may cause electric shock or burns. So after 5 minutes of powering down the system, wear protective gloves before operating the energy storage. Only when all indicator lights for energy storage are turned off can maintenance operations be carried out on the energy storage.

System power-off operation steps

Long press and hold to shut down the pack host. Normally, the slave machine will be shut down simultaneously. If communication is abnormal, each slave machine needs to be shut down separately.

7.2 Routine Maintenance

To ensure the long-term good operation of the energy storage system, it is recommended to perform routine maintenance on the system as described in this chapter.

Caution

When performing maintenance on system cleaning, electrical connection, and grounding reliability, the system must be powered off first.

Maintenance List

Check the content	Inspection Method	Maintenance cycle
System cleaning	Check whether the heat sink at the bottom of the PCS is blocked and dusty.	Once every six months to one year.
System operating status	Observe whether the appearance of the energy storage is damaged or deformed. Listen to see if there is any abnormal sound during the operation of the energy storage device. When the energy storage is running, check whether the parameters of the energy storage are set correctly.	Once every six months.
Electrical connections	Check whether the cable connection is disconnected or loose. Check whether the cable is damaged, and focus on checking whether the skin of the cable in contact with the metal surface has any traces of cuts. Check whether the unused DC input terminals and COM ports are locked.	Half a year after the first commissioning, and once every six months to a year thereafter.
Ground reliability	Check whether the grounding cable is reliably grounded.	Half a year after the first operation, and once every six months to a year thereafter.

7.3 Fuse replacement (Optional)

The recommended fuse model is AEY-150A and the supplier is AEY.

Fuse parameter：

70VDC≤Voltage; Electricity≤150A；

Steps to replace：

- Step 1 ：Open the battery pack.
- Step 2 ：Remove the old fuse.
- Step 3 ：Install new fuses.

7.4 Battery Storage

Battery module storage requirements

- When the battery module is stored, it should be placed correctly according to the label of the packing box, and should not be placed upside down or sideways.

- When the battery module packaging boxes are stacked, they should meet the stacking requirements on the outer packaging.
- When handling the battery module, it is required to handle it with care, and it is strictly forbidden to damage the battery module.
- Storage environment requirements:

  (1) recommended storage temperature: 20℃~30℃

  (2) Dry, ventilated, clean

  (3) Avoid contact with corrosive organic solvents, gases and other substances.

  (4) Avoid direct sunlight.

  (5) The distance from the heat source should not be less than two meters.
- When the battery module is stored, it must be disconnected from the outside, and the switch on the panel must be turned off.
- Monthly statistics of battery storage should be conducted, and timely arrangements should be made to recharge battery packs that have been stored for too long.
- When using the stored battery modules, the principle of first-in, first-out should be followed.
- The battery module needs to be replenished to at least 50% SOC before long-term storage.

Expired storage judgment conditions

- In principle, it is not recommended to store battery modules for a long time, and they shouldbe used in time. Stored battery modules should be handled as follows.
- The recommended storage conditions for the battery pack are 0 ℃ -35 ℃, relative humidity ≤ 60%, and the battery's replenishment cycle is 6 months.
- If the battery module is deformed, damaged or leaked, it will be scrapped directly.
- The maximum allowable period and number of times to store and replenish power is 3 yearsor 3 times, such as: replenishment once every 8 months, the maximum allowable 3 times; replenishment once every 12 months, the maximum allowable 3 times; The allowable periodand number of times suggest that the battery module should be scrapped.
- Long-term storage of lithium batteries will cause capacity loss. After lithium batteries are stored at the recommended storage temperature for 12 months, the general irreversible capacity loss is 3% to 10%. If the customer conducts the discharge test and

acceptance according to the specification, there is a risk of failing the test for battery modules with acapacity less than 100% of the rated capacity after storage.

Battery module pre-charging inspection

- The appearance inspection of the battery module is required before the battery module is replenished, and the battery module that passes the inspection can be recharged for the next step, and the unqualified battery module is discarded.
- If the battery module does not have any of the conditions listed below, it will be judged as passing the appearance inspection.

  （1）Deformation of the battery module

  （2）Damaged battery module casing

  （3） Battery module leaks

Abbreviation

BMS	Battery management system
BAT	Battery
COM	Communication
DC	Direct current
PACK	Battery pack
SOC	State of charge