MGENERGY

Rechargeable Li-ion
Battery Pack

User Manual

Attention

The purchased products, services should be restrained by commercial contracts of the Company and their terms. Some of the products, services described in this document may not be within the range of procurement. Unless the contract specifies otherwise, the Company does not make any representation or warranty, expressed or implied regarding the contents of this document.

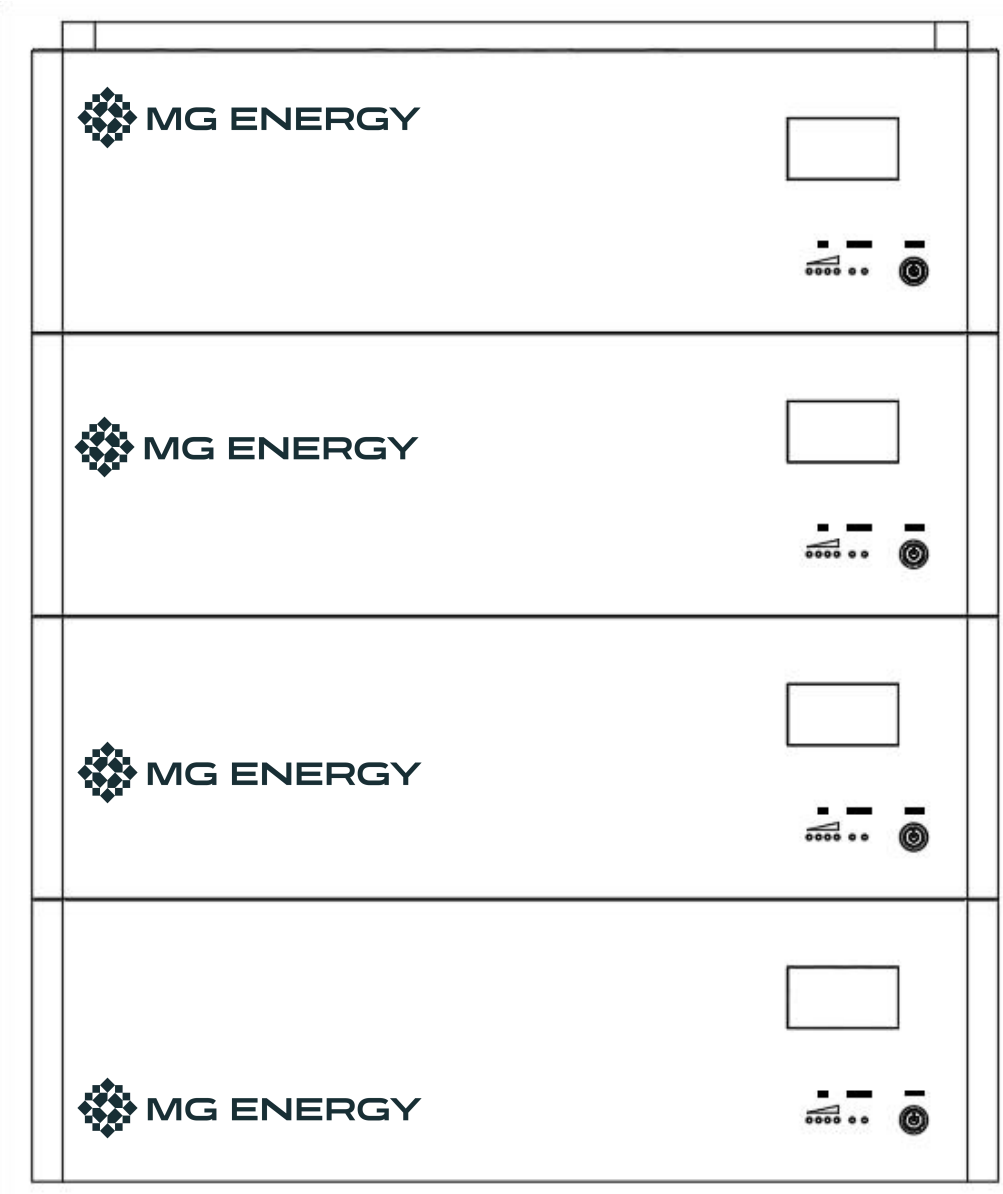
Proper keeping of the Manual

The manual is an important part of product, and you may print the electronic document of manual into a paper document as required, and properly keep the paper and electronic document for subsequent reference. All shall operate the equipment in accordance with the requirements in the manual at anytime.

Copyright statement

The current version was last updated on Apr. 25th, 2025.

TC B05 III
Rechargeable Li-ion Battery Pack
User Manual



Note: Please read and understand all the contents of this Manual carefully before installation and use of the product, and please keep this Manual properly for look-up at any time.

Table of Contents

1. Instructions

Thank you very much for choosing the TC B05 III series household energy storage system developed and produced by our company. Please read and understand all contents of the Manual carefully before installing and using the product. If you have any suggestions during the use, please do not hesitate to give us feedback.

1.1 Range of Application

The installation and user manual of TC B05 III series is applicable to the installation and use of the following products:

No.	Applicable to the countries with 110V /220V mains voltage
1	TC B05 III

The product should be used in compliance with local standards, laws and regulations, because any non-compliance with the use may lead to personal injuries and property loss.

The drawings provided in this Manual are used to explain the concepts related to the product, including product information, installation guide, electrical connection, system debugging, safety information, common problems and maintenance, etc.

The internal parameters of this product have been adjusted before delivery. No internal parameters can be changed without permission. Any unauthorized changes to the settings will invalidate the warranty, and the Company will not be liable for any loss resulting therefrom.

This Manual and other related documents are an integral part of the product and should be kept properly for onsite installation personnel and related technical personnel to consult.

1.2Meaning of Abbreviations

AC	Alternating Current
DC	Direct Current
PV	Photovoltaic
BMS	Battery Management System
PCS	Power Conversion System
RJ45	Registered Jack 45
SOC	State Of Charge
C	Charge C-rate
RS485	RS485 Communication Interface
CAN	Controller Area Network

1.3Symbol Stipulations

There may be following symbols herein, and their meanings are as follows.

Symbols	Description
	Indicate a hazard with a high level of risk which, if not avoided, will result in death or serious injuries.
	Indicate a hazard with a medium level of risk which, if not avoided, could result in death or serious injuries.
	Indicate a hazard with a low level of risk which, if not avoided, could result in minor or moderate injuries.
	Warning information about device or environment safety. If not avoided, equipment damage, data loss, performance degradation or other unanticipated results may be resulted in. The "NOTICE" does not involve any personal injuries.

2 .Safety Precautions

2.1 Safety Symbols

This product contains the following symbols, please pay attention to identifying.

Symbols	Description
	Observe enclosed documentation.
	RCM identification.The product meets the requirements of the applicable Australian Standard.
	Without a transformer.
	Material Safety Data Sheet
	CE certification
UN38.3	Transportation Testing for Lithium Batteries and Cells
RoHS COMPLIANT	Comply with RoHS standard
	The Energy storage system should not be disposed together with the household waste.

2.2 General Safety

2.2.1 Important Notice

Before installing, operating and maintaining the device, please read this Manual first and follow the symbols on the device and all the safety precautions in this Manual.

The matters indicated with "DANGER", "CAUTION", "ATTENTION" and "NOTICE" in this Manual do not represent all the safety matters to be observed, but are only the supplements to all the safety precautions. The Company will not be liable for any violation of general safety operating requirements, or any violation of safety standards for the design, production and use of the device. The device must be used in an environment that meets the requirements of the design specifications. Otherwise, the device may fail, and the abnormal device function or component damage, personal safety accident, and property loss arising from this are not covered within the quality assurance scope of the device. When installing, operating, and maintaining the device, the local laws, regulations, and codes shall be followed. The safety precautions in this Manual are only supplements to local laws, regulations, and codes. The Company shall not be liable for any of the following circumstances.

- The device is not run under the conditions of operating described in this Manual.
- The installation and operating environment is beyond the requirements of relevant international or national standards.
- The product is disassembled or changed, or the software code is modified without authorization.
- The operation instructions and safety warnings related with the product and in the documents are not followed.
- Damage of the device is caused by abnormal natural environment (force majeure, such as earthquake, fire, and storm).
- Transportation damage is caused during customer's own transportation.
- The storage condition does not meet the requirements of the product related documents and causes damage.

2.2.2 General Requirements

	Operating when the power is on is strictly prohibited during installation.
	It is strictly prohibited to install, use, and operate any outdoor equipment or cables (including but not limited to transporting equipment, operating equipment and cables, plugging and removing signal ports connected to the outdoor, working at altitude, and outdoor installation) in severe weather, such as thunder, rain, snow, and gale level 6.
	In case of any fire, evacuate the building or equipment area and press the fire alarm bell or dial the fire call. Under any circumstances, re-entry into a burning building is strictly prohibited.
	Under no circumstances should the structure and installation sequence of the device be changed without the manufacturer's permission.
	The battery terminal components shall not be affected during transportation. And, the battery terminal bolts shall not be lifted or transported.
	It is strictly prohibited to alter, damage or block the marks and nameplates on the device.
	The composition and working principle of the entire photovoltaic power generation system, as well as the relevant standards of the country/region where the project is located shall be known fully.
	After the device is installed, the empty packing materials, such as cartons, foam, plastics, and cable ties, shall be removed from the device area.

2.2.3 Personnel Safety

- When operating the device, appropriate personal protective equipment shall be worn. If any fault that may lead to personal injury or damage of the device is found, immediately terminate the operation, report to the responsible person, and take effective protective measures.
- Before using any tools, learn the correct method of using the tool to avoid injuries and damage of the device.
- When the device is running, the temperature of the case is high, which may cause burns. Therefore, do not touch the case.
- In order to ensure personal safety and normal use, reliable grounding should be carried out before use.
- Do not open or damage the battery. The electrolyte released is harmful to skin and eyes, so avoid touch it.
- Do not place irrelevant items on the top of the device or insert them into any part of the device.
- Do not place flammable items around the device.
- Never place the battery in the fire to avoid explosion and prevent the personal safety from being endangered.
- Do not place the battery module in water or other liquids.
- Do not short-circuit the battery terminals, because short-circuiting of the battery may cause combustion.
- The battery may pose a risk of causing electric shocks and large short-circuit currents. When using the battery, the following precautions should be paid attention to:

a) The metal objects, such as watch and rings, shall be removed.

b) Tools with insulated handles should be used.

c) Rubber gloves and shoes should be worn.

d) The charging power supply shall be disconnected before connecting or disconnecting terminals of the battery.

e) Check whether the battery output line is connected correctly.If the battery power line is accidentally connected to the ground wire, disconnect the power line from the ground wire.

- Do not clean the internal and external electrical components of the cabinet with water or detergent.
- Do not stand, lean or sit on the device.
- Do not damage any modules of the device.

2.3 Personnel Requirements

- The personnel in charge of installation and maintenance must be strictly trained to understand all safety precautions and master proper operation methods.
- Only qualified professionals or trained personnel are allowed to install, operate and maintain the device.
- The personnel who operate the device, including the operators, trained personnel and professionals, must have special operation qualifications required by the local country, such as high voltage operation, working high above the ground, and special equipment operation qualification.
- The replacement of device or components (including software) must be carried out by professionals or authorized personnel.

2.4 Electrical Safety

2.4.1 General Requirements

Before carrying out electrical connections, ensure that the device is not damaged, or an electric shock or fire may occur.

Never install or remove any power cables when the power is on. The electric arcs or sparks may be generated at the moment when the power cable contacts with the conductor, which may cause fire or personal injuries.

- All the electrical connections must meet the electrical standards of the country/region where the project is located.
- The cables prepared by users themselves shall comply with local laws and regulations.
- Special insulating tools should be used in high-voltage operations.
- Before connecting the power cord, ensure that the label identification on the power cord is correct.
- Operations on the device are allowed only five minutes after the device is completely powered off.
- The insulation layer of the cable may be aged or damaged when the cable is used in a high temperature environment. Therefore, the distance between the cable and the heat source must be at least 30mm.
- Cables of the same type should be bundled together. Whereas, the cables of different types should be routed at least 30mm apart, and shall not be wrapped together or crossed.

2.4.2 Grounding Requirements

- When installing the device to be grounded, the protective grounding wire must be installed first; when removing the device, the protective grounding wire must be removed at last.
- It is forbidden to destroy the grounding conductor.
- It is forbidden to operate the device without a grounding conductor installed.
- The device shall be permanently connected to the protective grounding wire. Before operating the device, electrical connection of the device shall be checked to ensure that the device is reliably grounded.

2.5 Installation Environment Requirements

- This product is for indoor use only, and is strictly prohibited to be used in outdoor environment.
- Do not install or use this product in an environment where the temperature is lower than -10 °Cor higher than 50 °C.
- It should be installed in a dry and well-ventilated environment to ensure good heat dissipation performance.
- The product can be installed at a maximum altitude of 2,000m.
- The installation position should be away from the fire source.
- The product should be installed and used away from children and animals.
- The installation position should be far away from water sources, such as faucets, sewer pipes, and sprinklers, to avoid entering of water.
- The device should be placed on a firm and flat supporting surface.
- Do not place any inflammable or explosive items around the device.
- When the device is running, do not block the ventilation vent or heat dissipation system to prevent fire caused by high temperature.

The operation and service life of the energy storage is related to the operating temperature. The energy storage should be installed at a temperature equal to or better than the ambient temperature.

3 .Product Introduction

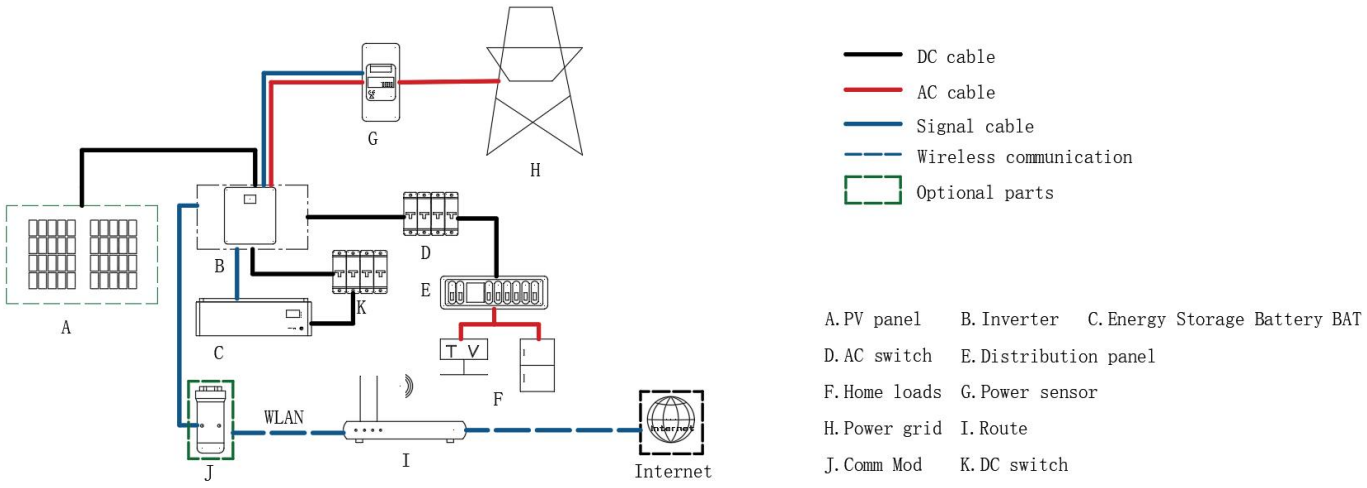
3.1 Brief Introduction to Product

The new-generation home energy storage system TC B05 III adopts a modular design, consisting of a power module and battery expansion modules. Users can flexibly combine these modules according to their needs, effortlessly scaling the total system capacity.

By connecting with compatible inverters, it converts DC power into AC output with two voltage specifications—220V and 110V—meeting the diverse needs of users worldwide.

The lithium iron phosphate batteries with high performance and long service life are used in the energy storage module. Meanwhile, the modular structure design is adopted. Each energy storage module is internally integrated with the intelligent BMS system, which can be easily expanded and can be combined into 80Kwh battery pack at most.

The typical topological diagram for application of the system is as follows:



3.1.1 Recommended Circuit Breaker

The CB-125A moulded case circuit breaker complies with IEC/EN 60947-2standard.

The moulded case circuit breaker is applicable to circuits with frequency of AC 50 Hz, rated AC voltage up to 220/230/240V(1P),380/400/415V(2P/3P/4P)rated DC voltage up to 60/110V(1P),125V/220 V(2P),rated current up to 125 A.It provides overload and short circuit protection, and can also be used forinfrequent switching of the circuit under normal circumstances.

Accessories that can be assembled include auxiliary contact AX-X3, alarmcontact AL-X3, and shunt release SHT-X3、Overvoltage release OVT-X3,undervoltage release UVT-X3, overvoltage and undervoltage release OUVT-X3

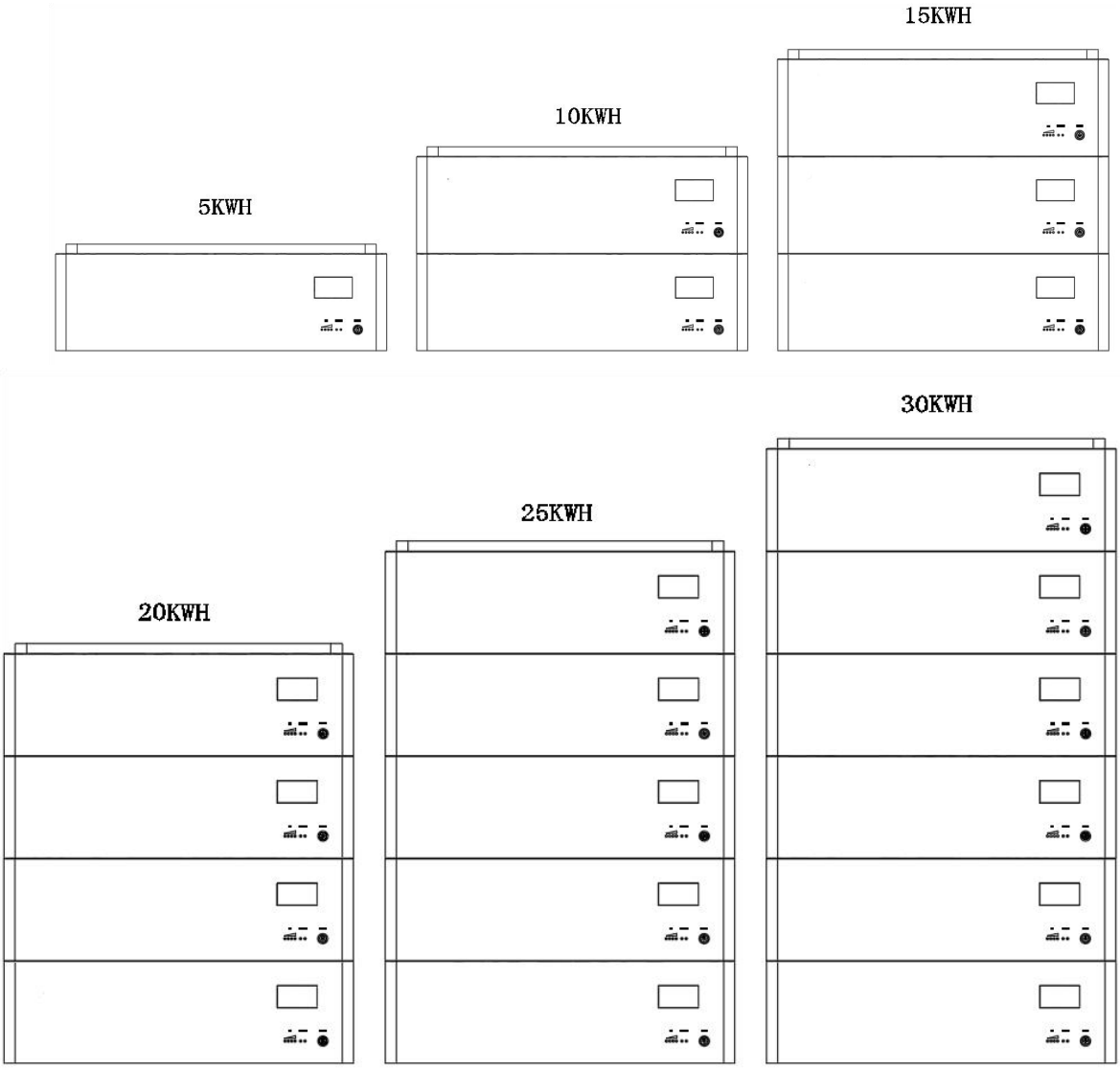
Refer to table 1 for Key Technical Parameters.

Table 1 Key Technical Parameters

Rated Working voltage (Ue)	1P: AC 220V or 230V or 240V 2P, 3P, 4P: AC 400V or 415V 1P:DC 60V or 110V 2P:DC125V/220V
Rated limit short-circuit breaking capacity (Icu)	AC:10kA DC:20kA(1P60V、2P125V) 10kA(1P110V、2P220V)
Enclosure protection class	IP20
Altitude	≤2000m
Pollution level	Level 3
Installation category	Class III

3.2 Description of Energy Storage Capacity

TC B05 III series energy storage system supports the capacity expansion with up to six energy storage modules. The voltage of a single battery is 51.2V and the capacity is 102Ah.



3.2.1 Energy Storage Battery Module Communication Description

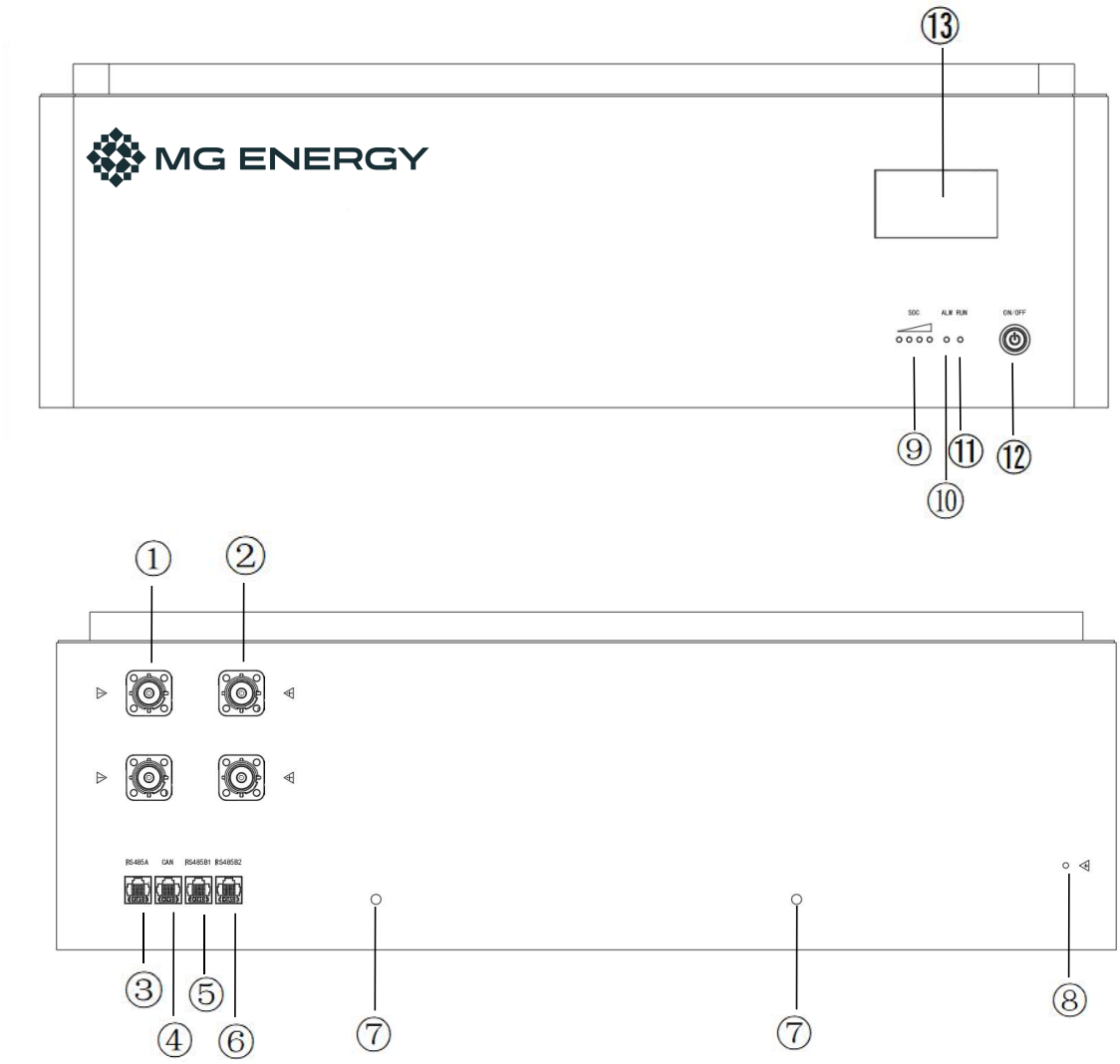
CAN communication

CAN communication, the default

communication rate is 250K. RS485

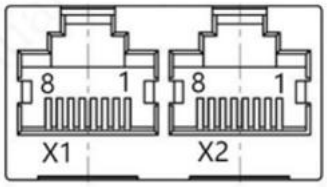
communication

With dual RS485 interface, you can view the pack information. The default baud rate is 9600bps. If it is necessary to communicate with the monitoring equipment through RS485, the monitoring equipment, as the host, polls the data according to the address.



①	Negative Terminal	⑧	Ground Terminal
②	Positive Terminal	⑨	SOC
③	RS485A	⑩	（LED）ALM
④	CAN	⑪	（LED）RUN
⑤	RS485B1	⑫	Power switch（LED）ON/OFF
⑥	RS485B2	⑬	LCD screen
⑦	Mounting hole for bracket		

3.2.2 Interface definition

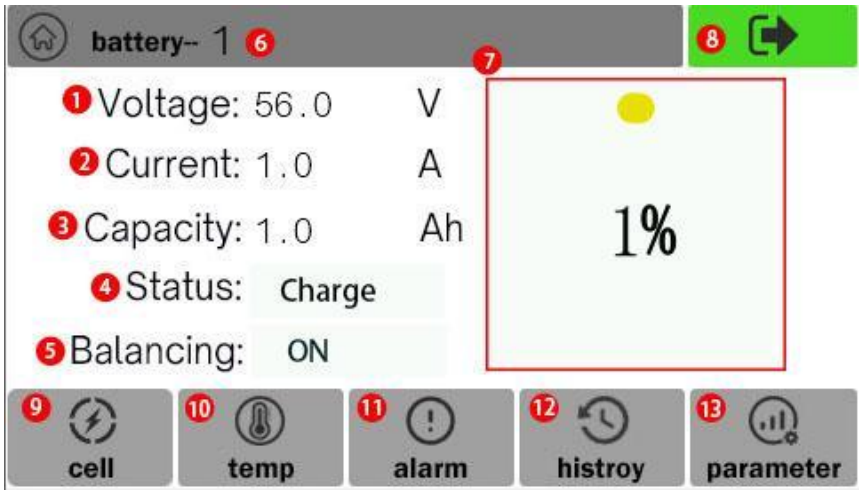


RS485 and CAN Interface

(RS485---(Upper computer communication, 485 upgrade(X1))		(CAN-Inverter CAN/RS485 communication (X2))	
PIN	Explain	PIN	PIN
PIN1	（Empty）	PIN1	（Empty）
PIN2	（Empty）	PIN2	（Empty）
PIN3	RS485A1	PIN3	（Empty）
PIN4	（Empty）	PIN4	CAN-BUSH
PIN5	RS485B1	PIN5	CAN-BUSL
PIN6	（Empty）	PIN6	（Empty）
PIN7	（Empty）	PIN7	RS485A1
PIN8	（Empty）	PIN8	RS485B1

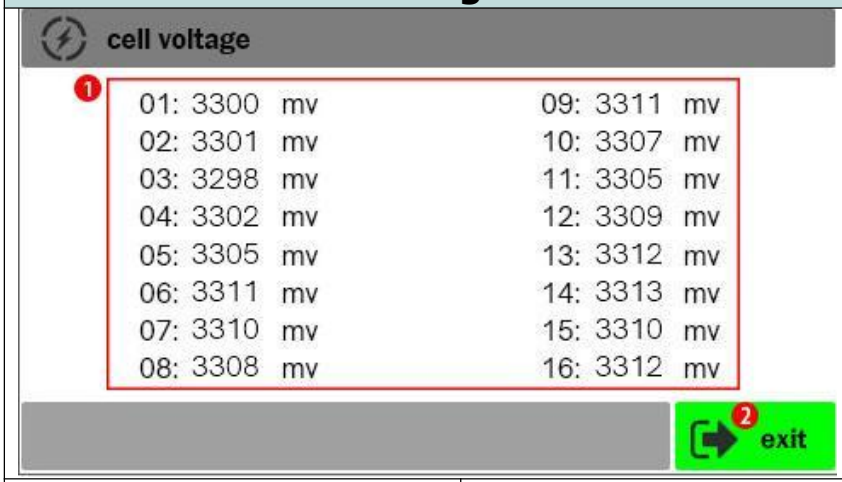
3.3 Screen Operation Instructions

3.3.1 Home page

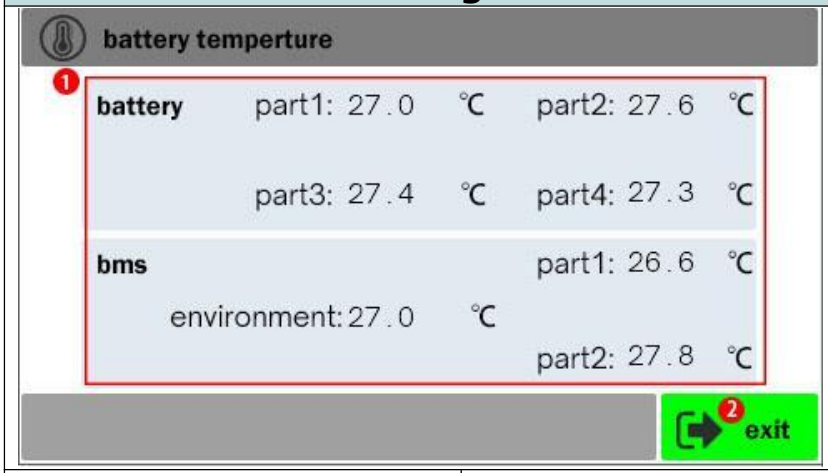
image	Description
	1.Total Battery Voltage 2.Current 3.Capacity 4.Status 5.Balancing 6.Page Corresponding address 7.SOC 8.Return to the Parallel details 9.Voltage Details 10.Temperature Details 11.Alarm Details 12.Alarm Recording 13.Settings

Instructions	(1) Click "⑨"~"⑫",go to the appropriate page; (2) Click "⑬",enter password through the pop-up keyboard to enter the "Settings Page";if it's a host,go to the "Settings Page",if it is a slave,go to the "Additional Settings Page"; (3) Click "⑧",Go to the "Parallel Details" page.

3.3.2 Voltage Details Page

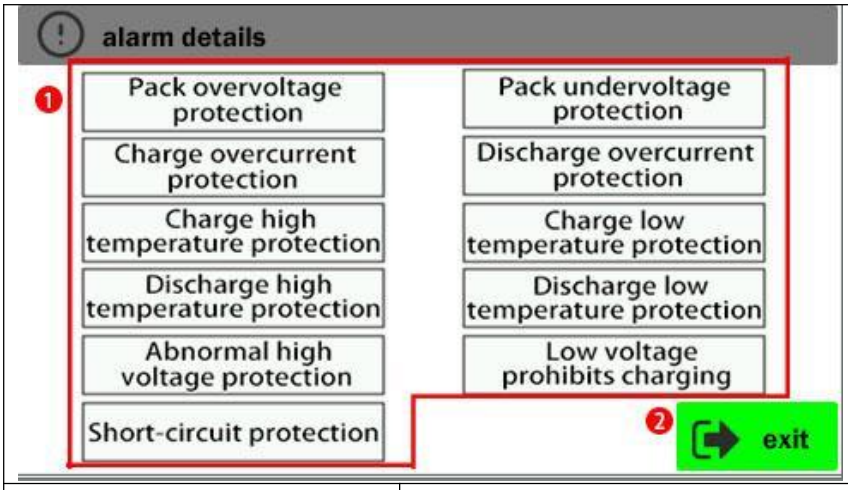
image	Description
	1.Cell voltage 2.Return to the Home Page
Instructions	(1) Click "②" to return to the "Home page".

3.3.3 Temperature Details Page

image	Description
	1.Temperature Display 2.Return to the Home Page
Instructions	(1) Click "②" to return to the "Home page".

3.3.4 Alarm Details Page

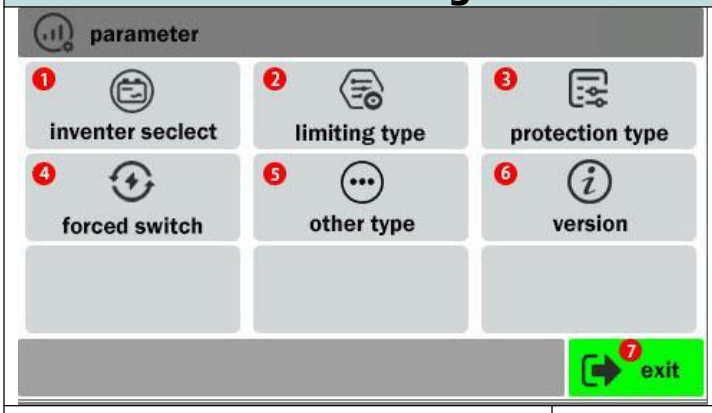
image	Description

	1.Alarm Details 2.Return to the Home Page
Instructions	(1) Click "②" to return to the "Home page".

3.3.5 Alarm Recording Page

image	Description
	1. The Serial number of the Latest Alarm Record 2.Number of Alarm Records 3.Serial Number 4.Alarm Time 5.Alarm Abbreviation 6.Previous 7.Next 8.Delete 9.Return to the Home Page
Instructions	1.Click "⑧" to clear the alarm records. 2.Click "⑨" to return to the home page. 3.If there are too many records, you can click "⑥" or "⑦" to turn the page. Note: The upper limit of alarm records is 100. For abbreviations, please refer to the appendix.

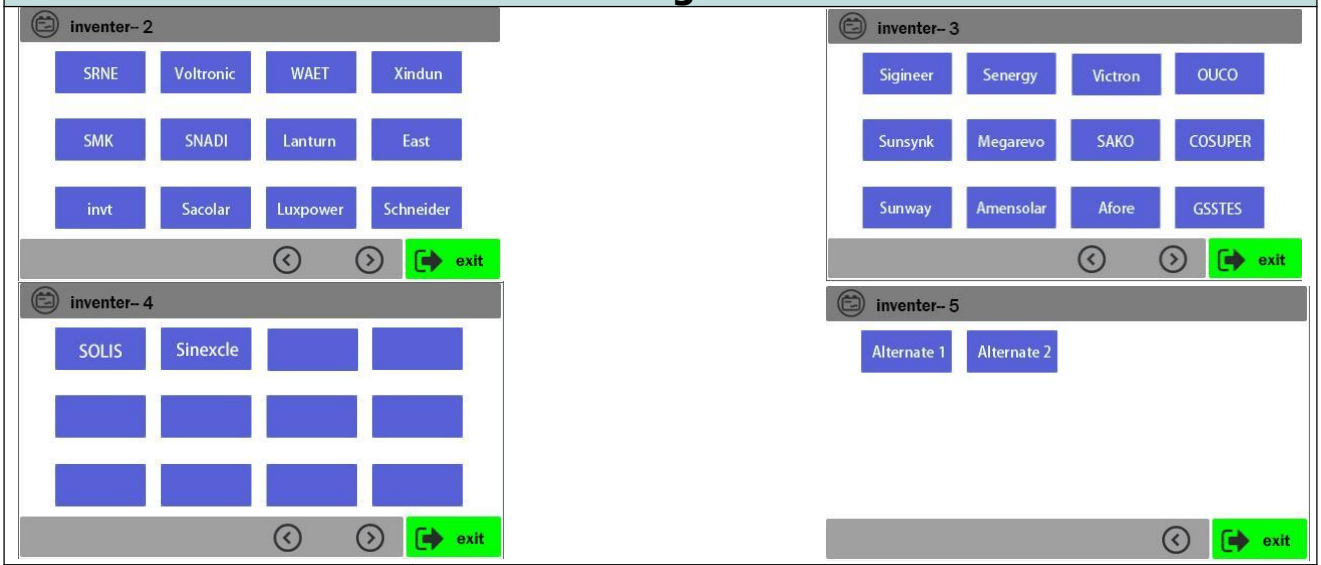
3.3.6 Settings Page

image	Description
	1.Inverter Protocol Selection 2.Limit type 3.Protection type 4.Forced swich 5.Other type 6.Version Information 7.Return to the Home Page
Instructions	(1) Click"①"~"⑥",go to the appropriate page; (2) Click"⑦",return to the "Home page".

3.3.7 Protocol Selection Page

image	Description
	1.Inverter Selection 2.Next 3.Return to the Settings Page
Instructions	(1) Click "②", go to the "More Protocols Page". (2) Click "③", return to the "Settings Page". (3) Click on the name of the inverter, and the icon color changes to green, which means that this protocol is selected.

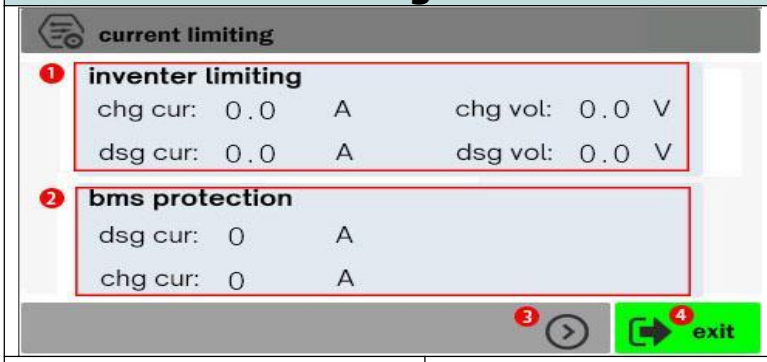
3.3.8 Additional Protocols Page

image


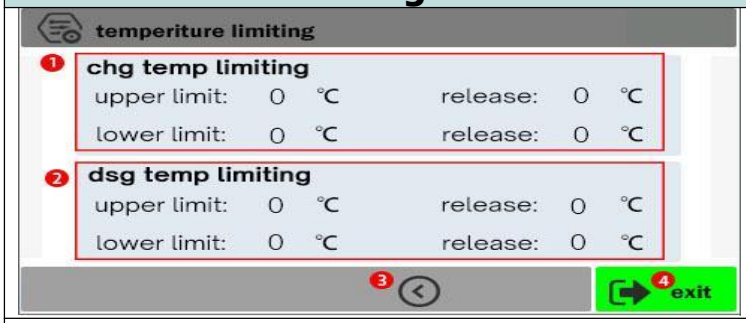
Instructions	(1) Click the button below to turn the page back and forth; (2) Click on the name of the inverter, and the icon color changes to green, which means that this protocol is selected; (3)"Alternate 1" and "Alternate 2" are alternate protocols and cannot be selected at this time.

3.3.9 Limiting Type Page

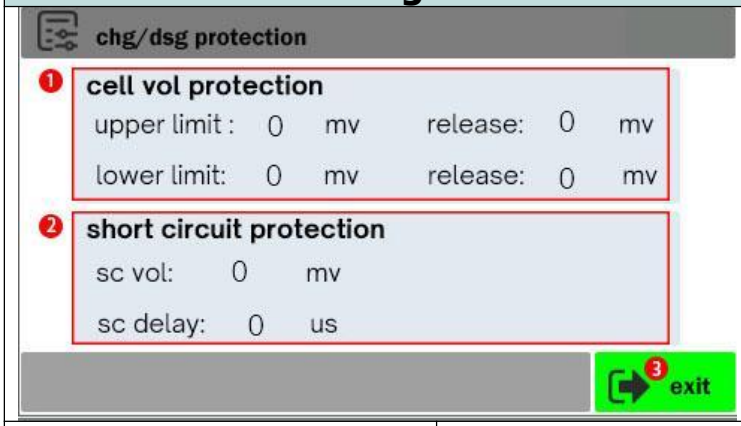
3.3.9.1Page 1

image	Description
	1.Inverter Limit Settings 2.BMS Current Protection Settings 3.Next 4.Return to the Settings Page
Instructions	(1) Click"③",go to the next page; (2) Click"④",return to the "Settings Page".

3.3.9.2Page 2

image	Description
	1.Charging Temperature Limiting 2.Discharging Temperature Limit 3.Previous 4.Return to the Settings Page
Instructions	(1) Click"③",go to the previous page; (2) Click"④",return to the "Settings Page".

3.3.10 Protection Type Page

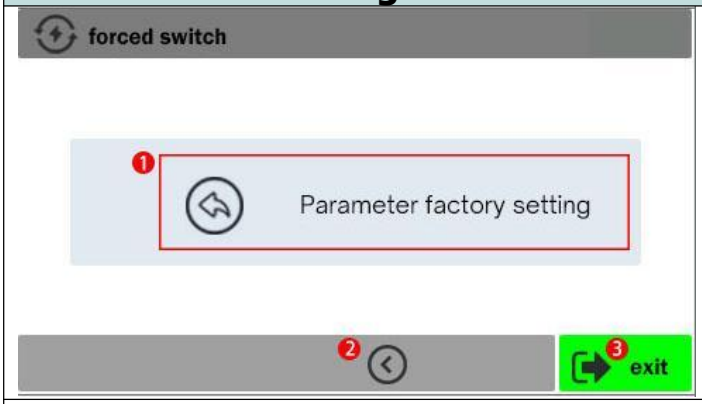
image	Description
	1.Single - cell Voltage Limit 2.Short - circuit Protection Limit 3.Return to the Settings Page
Instructions	(1) Click"③",return to the "Settings page".

3.3.11 Forced Switch

3.3.11.1Page 1

image	Description
	1.Strong open - circuit discharge MOS 2.Next 3.Return to the settings page
Instructions	(1) Click"②",go to the next page; (2) Click"③",return to the "Settings page".

3.3.11.2Page 2

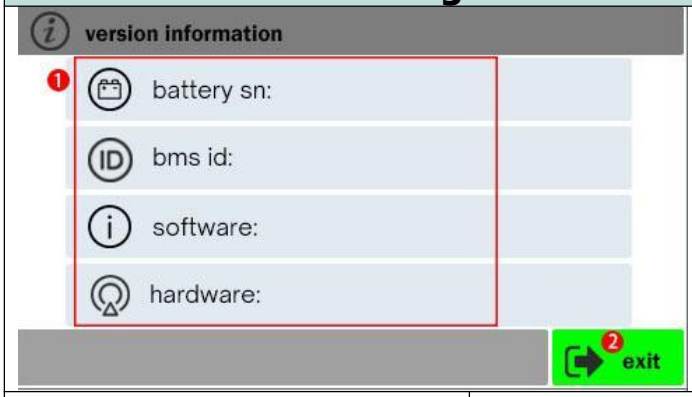
image	Description
	1.Parameter factory settings 2.Previous 3.Return to the settings page
Instructions	(1) Click"②",go to previous page; (2) Click"③",return to the "Settings page".

3.3.12 Other Type page

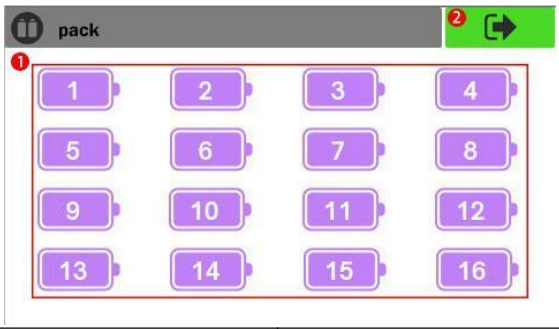
image	Description
	1.Address 2.Fully automatic address function release 3.Return to the settings page

Instructions	(1) "②"This option is not selected by default,In this case, the address will automatically change* according to the parallel wiring;When checked,The address can be manually changed to any legal address 1~20. * Automatically changes: If the network port 3 of the BMS is not connected to the network port 4 of the other BMS,address 1 is maintained and cannot be changed;if it is connected normally, the address will automatically change to slave 2,wait for the host to assign an address,or you can manually change it to any legal slave address 2~20. (2) Click"③",return to the "Settings page".

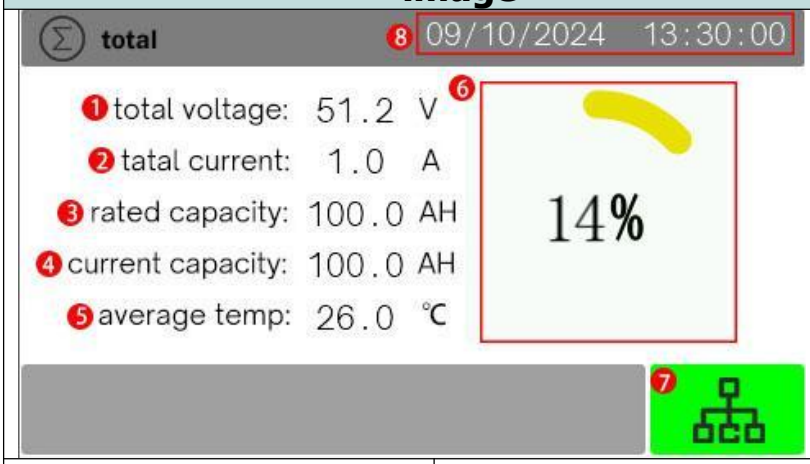
3.3.13 Version information page

image	Description
	1.Version Information 2.Return to the Settings Page
Instructions	(1) Click"②",return to the settings page.

3.3.14 Parallel operation details page

image	Description
	1.parallel 2.Return to the settings page
Instructions	(1) When the battery pack exists,click the battery address icon to enter the specified battery-related information page, if the battery pack has an alarm, the edge of the corresponding icon will turn red; (2) Click"②",go to the "Total Data Page".

3.3.15 Total data page

image	Description
	1.Total voltage 2.Total current 3.Total capacity 4.Current capacity 5.Rated temperature 6.Average SOC 7.Skip 8.Time
Instructions	(1) Click"⑦",return to the "Parallel Details Page".

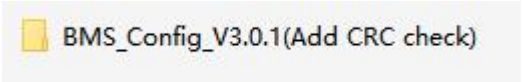
3.3.16 appendix

Charge overcurrent protection	OCC
Charge low temperature protection	UTC
Charge high temperature protection	OTC
Discharge overcurrent protection	OCD
Discharge low temperature protection	UTD
Discharge high temperature protection	OTD
Pack overvoltage protection	OV
Pack undervoltage protection	UV
Short - circuit protection	SC
Emergency stop	RPSD Activated
Charge/discharge MOS fault	C-MOSfault/D-MOSfault

3.4 Monitoring

3.4.1 Start the upper computer. The operation steps are performed as follows:

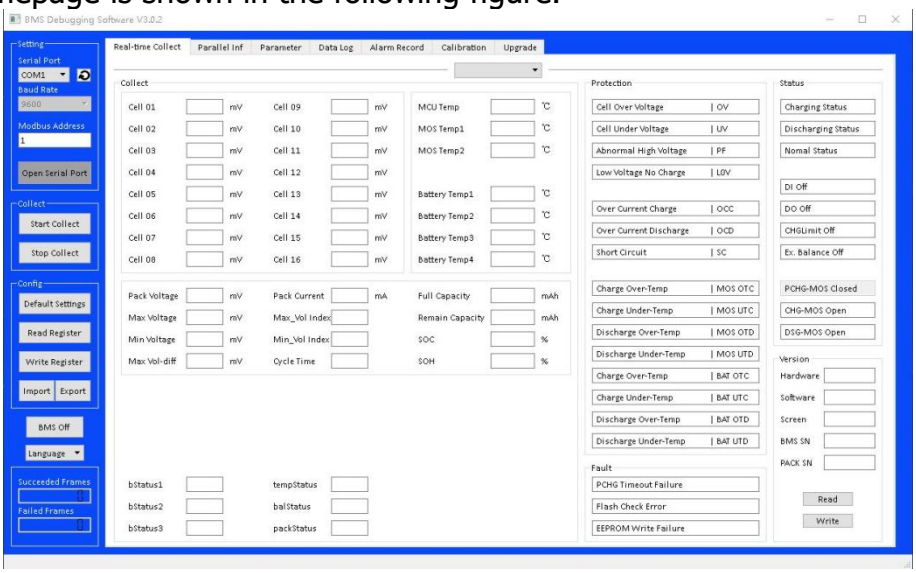
1.Unzip the attached host software package.



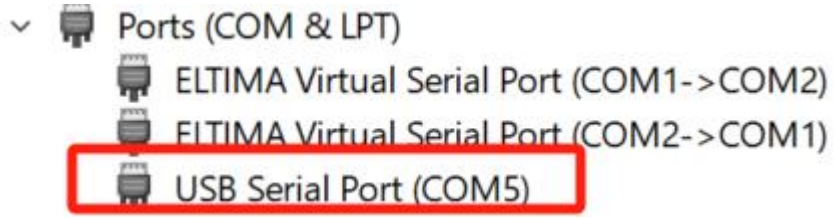
2.After unzip, double click to open the upper computer software, named "bt_bms. exe".

iconengines			文件夹	2024-12-03 1...	
imageformats			文件夹	2024-12-03 1...	
platforms			文件夹	2024-12-03 1...	
translations			文件夹	2024-12-03 1...	
bt_bms.exe	630,272	190,753	应用程序	2024-12-03 1...	3EB085A4
D3Dcompiler_47.dll	3,706,880	1,561,094	应用程序扩展	2023-11-15 8...	7E1C1D...
libEGL.dll	22,016	7,679	应用程序扩展	2016-06-10 1...	88D08F84
libgcc_s_dw2-1.dll	120,334	48,992	应用程序扩展	2015-12-29 6...	C7169767
libGLESV2.dll	2,801,664	1,020,948	应用程序扩展	2016-06-10 1...	74F42242
libstdc++-6.dll	1,540,622	426,728	应用程序扩展	2015-12-29 6...	CB92081F
libwinpthread-1.dll	79,360	33,010	应用程序扩展	2015-12-29 6...	2D82EC...
opengl32sw.dll	15,220,736	5,178,864	应用程序扩展	2014-09-23 1...	CEFAC4...
Qt5Core.dll	5,384,704	2,376,234	应用程序扩展	2024-12-03 1...	A93CD9...
Qt5Gui.dll	5,283,840	2,035,641	应用程序扩展	2016-06-10 1...	8AE99AF0
Qt5SerialPort.dll	79,360	29,816	应用程序扩展	2016-06-11 2...	00AF9D...
Qt5Svg.dll	348,160	139,892	应用程序扩展	2016-06-11 1...	ECC5E5...
Qt5Widgets.dll	6,358,528	2,583,961	应用程序扩展	2016-06-10 1...	8ADFD6...
Qt5Xml.dll	216,064	80,763	应用程序扩展	2016-06-10 1...	86DAA2...

3.The homepage is shown in the following figure.



4. Set serial port number, baud rate, and MODBUS address

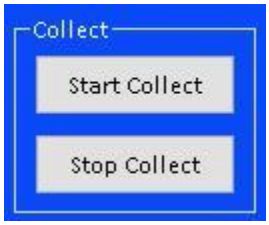


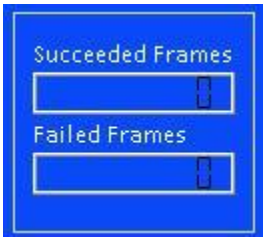
Serial port selection: Plug in the 485 communication tool and find the USB Serial Port under the port in the device manager, as shown in the above figure. The parentheses indicate COMX, which means select COMX on the upper computer.

MODBUS address: It needs to be consistent with the address on the BMS device connected to the upper computer.

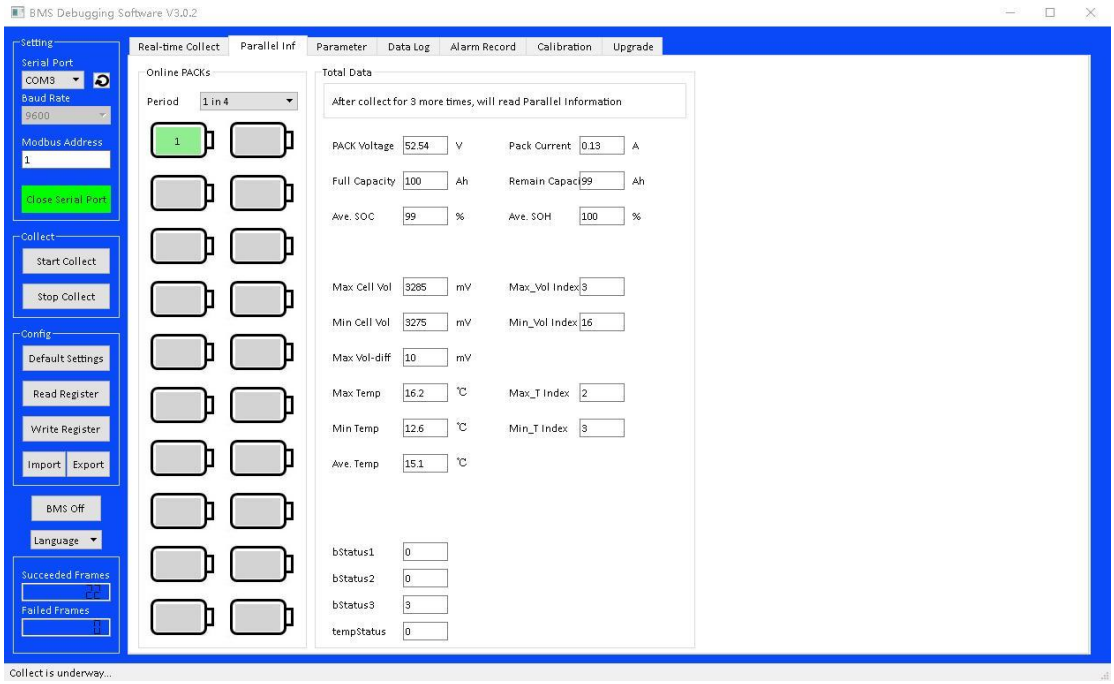
3.5 Test Connection

1. Click "Start Collection" (bottom left image), observe whether the collected data on the homepage is displayed or whether the MODBUS sending frame rate is normal (bottom right image). If communication fails, the MODBUS failure frame rate will increase.





2. Switch to the parallel information page, 20 battery symbols are used to display the number of successful parallel batteries, and the collection frequency can be selected. If address 1 is a host, you can view the total parallel data.

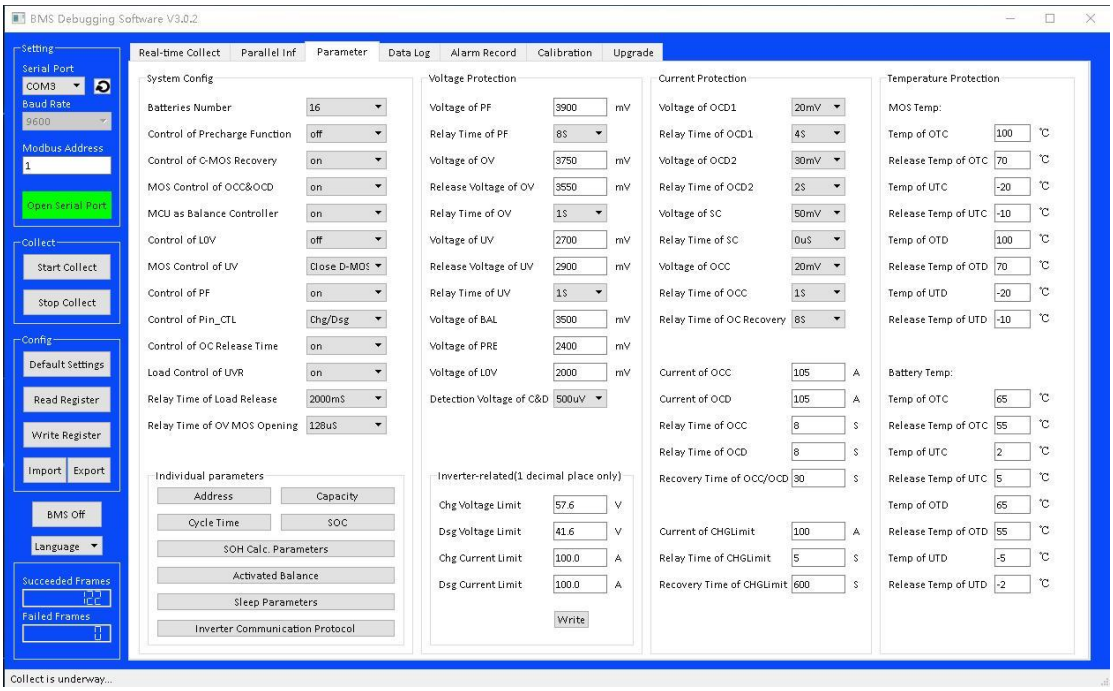


3.6 System parameter configuration instructions

1. Parameter reading, modification, import and export

Switch to the parameter settings page and click read register to read the current parameter settings of BMS. After modifying the parameters, you need to click on write register. After successful writing, there will be a pop-up reminder. Clicking on default parameters will automatically restore to the default parameters of the upper computer, but it will not be directly written to BMS. You need to click the write

register button to write. Click Export, select the parameter items that need to be exported in the pop-up window, click OK, select the save location and name it in the pop-up window, and then click Save. Click on 'Import Parameters' and select the parameter file to import. After successful import, a pop-up message will appear. The inverter related parameters and individual parameter settings section require clicking the corresponding write button after modifying the parameters.



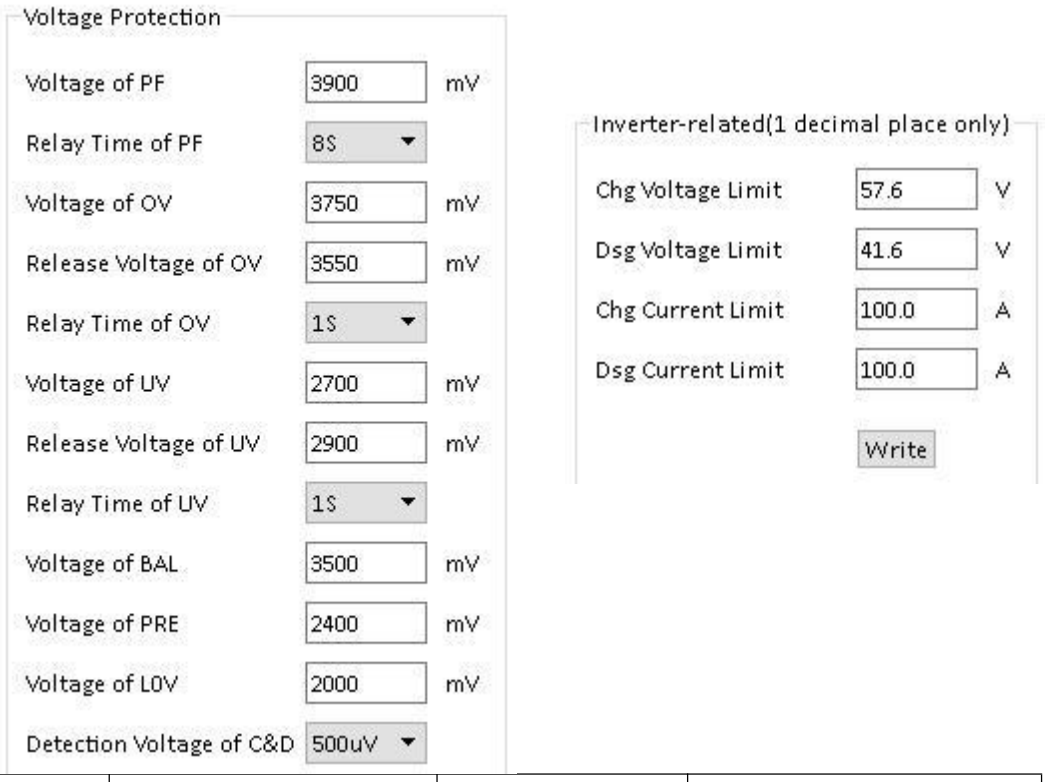
2. Common parameter modification instructions

Note: After modifying the parameters, click on "Write" and the prompt "Write successfully" indicates successful setting; If the prompt fails, please close the pop-up window and click write again.

2.1 System settings

Set up	Default parameters	Remarks
Number of battery cells	16 strings	Set according to the actual number of battery cells
Write BMS address	2	Modify the MODBUS address of BMS
Write battery capacity	100Ah	Modify battery capacity
Write SOC	100	If the current capacity is known, it can be directly modified

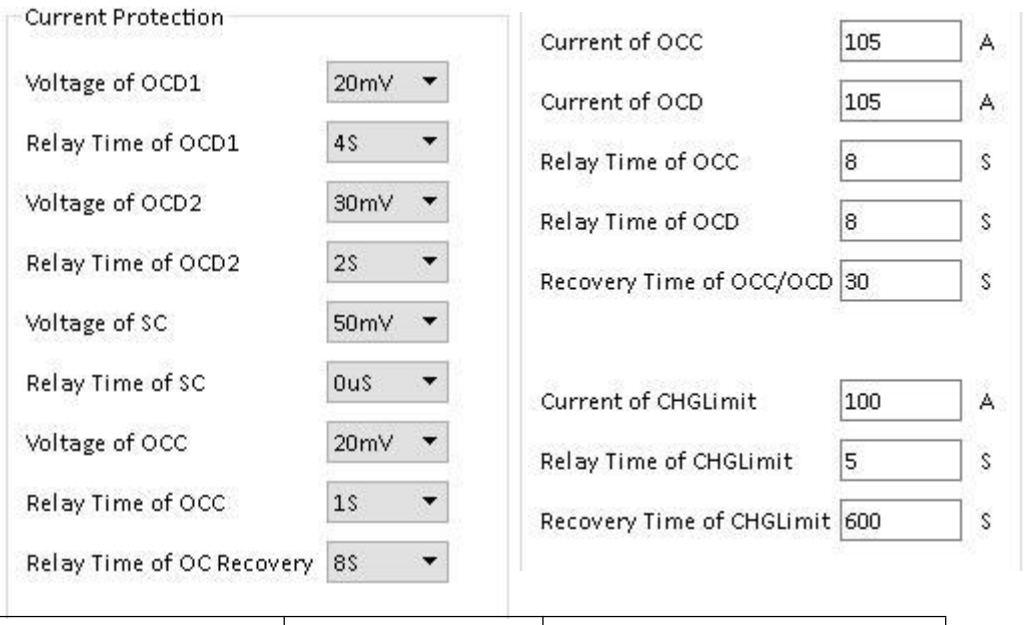
2.2 Voltage setting



	Set up	Default parameters	Remarks
Voltage protection	Abnormal high voltage protection voltage	3900mV	Can be set according to actual needs
	Abnormal high voltage protection delay	8s	
	Over voltage protection voltage	3750mV	Stop charging when the single cell voltage reaches the set value; Can be set according to battery cell parameters
	Over voltage protection release voltage	3550mV	Can be set according to actual needs

	Over voltage protection delay	1s	
	Under voltage protection voltage	2700mV	When the single cell voltage reaches the set value and stops discharging, it triggers single cell under voltage protection; Can be set according to battery cell parameters
	Under voltage protection release voltage	2900mV	Release the under voltage protection of the single cell when the single cell voltage reaches the set value; Can be set according to the battery cell
	Under voltage protection delay	1s	
	Balanced opening voltage	3500mV	Can be set according to actual needs
	Precharge opening voltage	2400mV	Can be set according to actual needs
	Low voltage prohibited charging voltage	2000mV	Can be set according to actual needs
	Charging and discharging state detection voltage	500μV	Can be set according to actual needs
Inverter related values	Inverter charging voltage limit	57.6V	Can be set according to inverter requirements
	Inverter discharge voltage limiting	41.6V	Can be set according to inverter requirements
	Inverter charging current limiting	100A	Can be set according to inverter requirements
	Inverter discharge current limiting	100A	Can be set according to inverter requirements

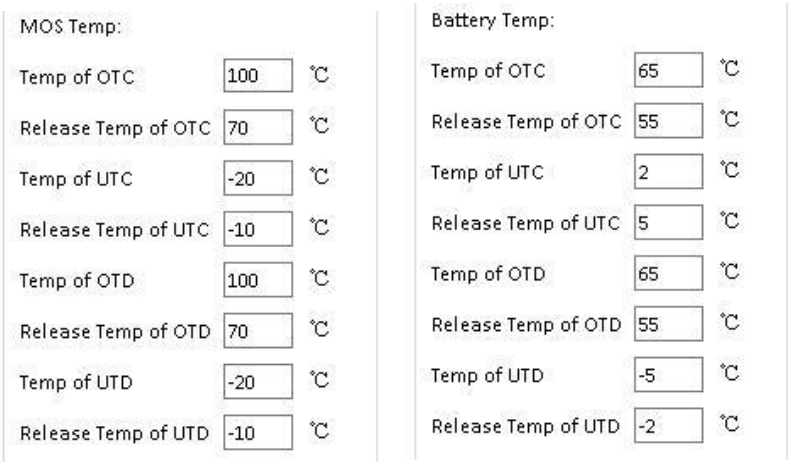
2.3 Current setting



	Set up	Default parameters	Remarks
Current	Discharge over-current 1 protection voltage	20mV	No need to adjust
	Over-current discharge 1 protection delay	4S	
	Discharge over-current 2 protection voltage	30mV	
	Discharge over-current 2 protection delay	2S	
	Short circuit protection voltage	50mV	According to the inverter regulation, control the duration of short-circuit protection when the inverter is turned on
	Short circuit protection delay	0μs	
	Charge the over-current protection voltage	20mV	No need to adjust
	Charge over-current protection delay	1S	
	Overflow auto-recovery delay	8S	

protection	Charging over-current protection	105A	Trigger charging over current protection when the charging current reaches the preset value; Can be set according to actual use and BMS specifications and models
	Discharge over-current protection	105A	Trigger discharge over current protection when the discharge current reaches the preset value; Can be set according to actual use and BMS specifications and models
	Charging and over-current protection time	8S	Can be set according to actual needs
	Discharge and over-current protection time	8S	Can be set according to actual needs
	Over-current protection recovery delay	30S	Can be set according to actual needs
	Current limiting plate protects current)	100A	When the charging current reaches the preset value, limit the charging current to around 10A; Can be set according to actual use
	Flow limit protection time	5s	Can be set according to actual needs
	Current limiting protection recovery time	600s	Can be set according to actual needs

2.4 Temperature setting

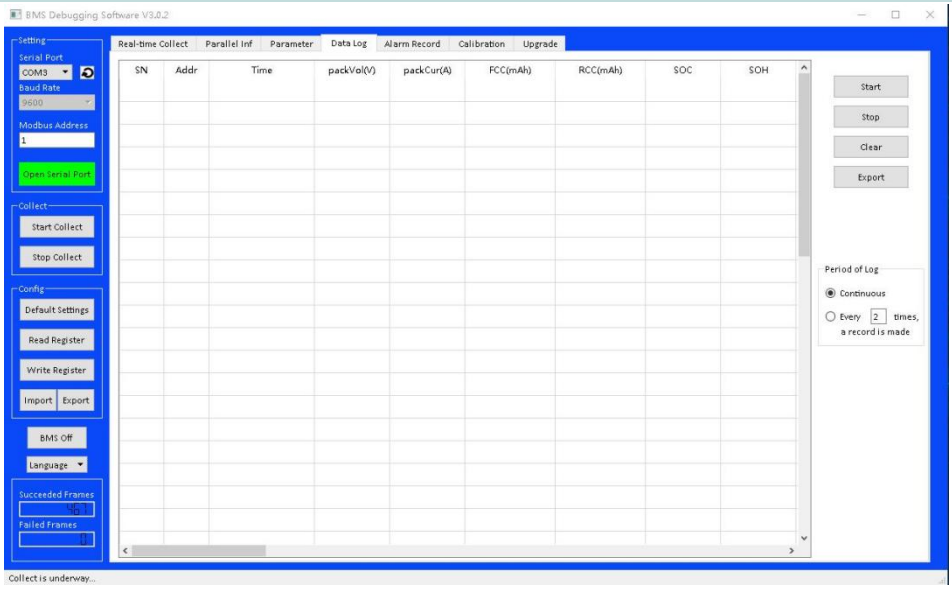


	Set up		Default parameters	Remarks
Temperature	MOS temperature	Charging high temperature protection	100°C	Stop charging when the set value is reached, triggering high temperature protection for charging; Can be set according to actual needs
		Charging with high temperature protection for release	70°C	Reaching the set value to release the high temperature protection during charging; Can be set according to actual needs
		Charging low temperature protection	- 20°C	Stop charging when the set value is reached, triggering low-temperature protection for charging;Can be set according to actual needs
		Charging with Low temperature protection and release	- 10°C	Reaching the set value to release the low-temperature protection during charging; Can be set according to actual needs
		Discharge high temperature protection	100°C	Stop discharging when the set value is reached, triggering high-temperature protection for discharge; Can be set according to actual needs
		Discharge with high temperature protection and release	70°C	Release the high temperature protection during discharge when reaching the set value; Can be set according to actual needs

Temperature protection		Discharge low temperature protection	- 20℃	Stop discharging when reaching the set value and trigger low-temperature protection for discharge; Can be set according to actual needs
		Discharge for cryogenic protection and release	- 10℃	Reaching the set value to release the discharge low-temperature protection; Can be set according to actual needs)
	Battery temperature	Charging high temperature protection	65℃	Stop charging when the set value is reached, triggering high temperature protection for charging; Can be set according to actual needs
		Charging with high temperature protection for release	55℃	Reaching the set value to release the high temperature protection during charging; Can be set according to actual needs
		Charging low temperature protection	2℃	Stop charging when the set value is reached, triggering low-temperature protection for charging; Can be set according to actual needs
		Charging with low temperature protection and release	5℃	Reaching the set value to release the low-temperature protection during charging; Can be set according to actual needs.
		Discharge high temperature protection	65℃	Stop discharging when the set value is reached, triggering high-temperature protection for discharge; Can be set according to actual needs
		Discharge with high stemperature protection and release	55℃	Release the high temperature protection during discharge when reaching the set value; Can be set according to actual needs
		Discharge low temperature protection	-5℃	Stop discharging when reaching the set value and trigger low-temperature protection for discharge; Can be set according to actual needs
		Discharge for cryogenic protection and release	-2℃	Reaching the set value to release the discharge low-temperature protection; Can be set according to actual needs

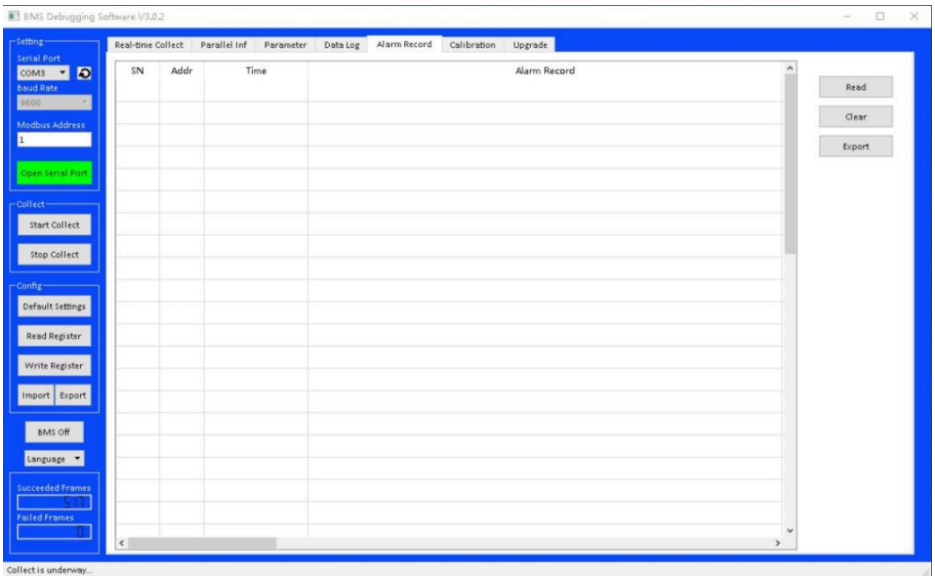
3.7 Collection records

Switch to the collection record page and select the recording frequency before starting the collection. After clicking on start recording, start recording according to the selected recording frequency, mainly recording the current, voltage, and remaining capacity of the device. To stop recording, click Stop Recording. To export records, click on Export Records, select the file save location and name it, then click Save. To clear records, click on 'Clear Records'. (Note: Save in xls file format).



3.8 Alarm records

Switch to the alarm record page, click on 'Read Record' to access the latest alarm records stored in BMS, up to a maximum of 100 records. To export records, click on Export Records, select the file save location and name it, then click Save. To clear the record, click the clear record button. It should be noted that the alarm records stored inside the BMS will also be cleared at the same time. (note: save in xls file format).

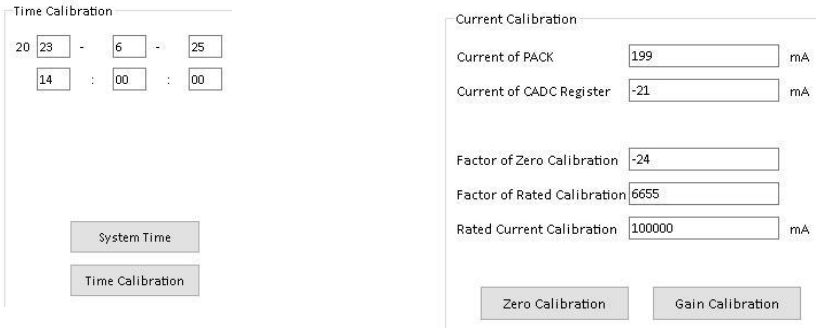


3.9 Calibration

The product has been calibrated before leaving the factory. If any parameter values are found to be incorrect, they can be recalibrated.

1. Time calibration

On the calibration page, fill in the current time and click "Time Calibration", as shown in the figure.



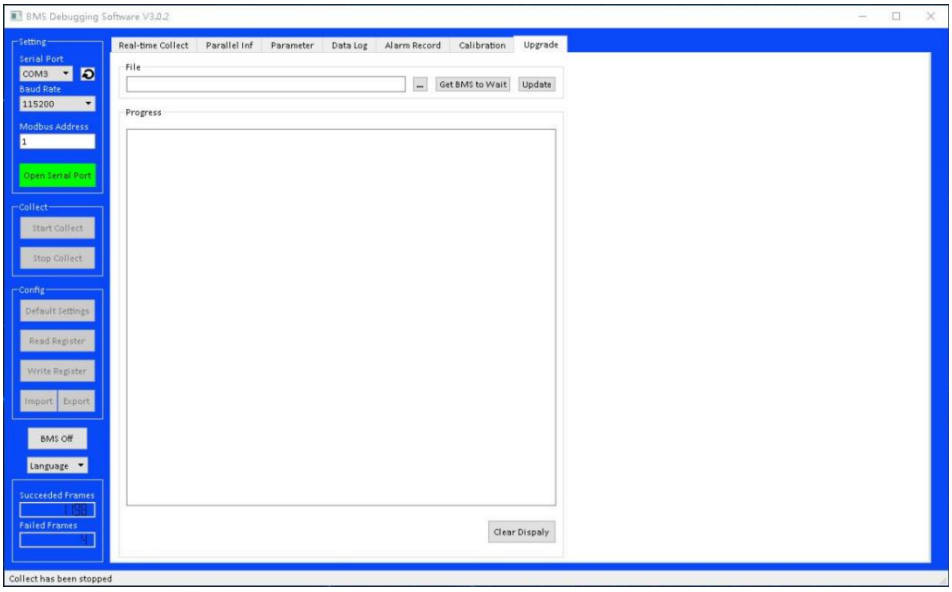
3.Current calibration

2.1 Zero point calibration: Charge the battery, set the charging current to 0A, and click "Zero point calibration".

2.2 Gain calibration: Turn on charging, set the charging current to 40A, fill in the "rated current calibration" (rated current calibration value is 40020), and click on gain calibration.

3.10 BMS upgrade

After entering the password, switch to the upgrade page and select the upgrade file, which is in bin format. Turn on the BMS and click the BMS switch to wait button. At this time, all indicator lights of the BMS will turn off, and the progress box will display 'Return IAP successful'. Click on 'Upgrade' and wait for the program upgrade to complete. After the upgrade is successful, the process box will display 'Upgrade Completed' and all BMS indicator lights will briefly light up before returning to normal.



3.11 Troubleshooting

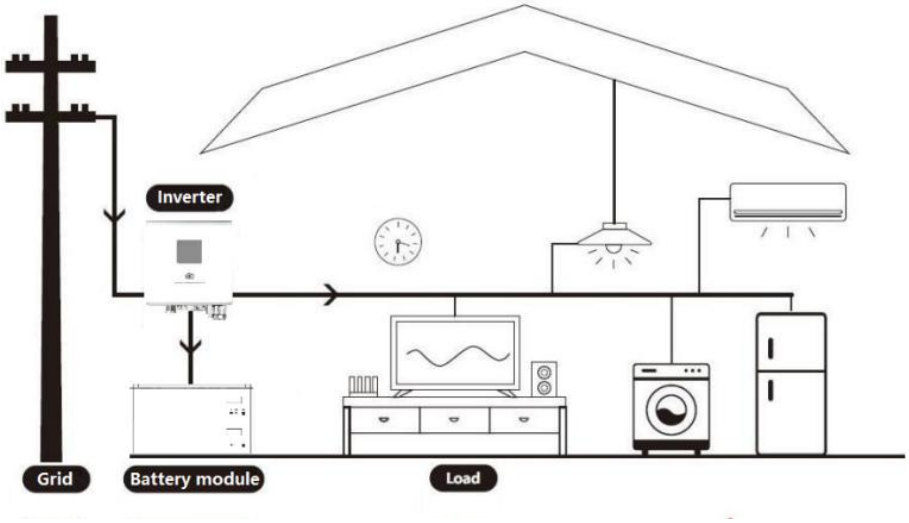
Fault	Inspect
Unable to collect data and normal read/write registers	Check whether the serial port is selected correctly or occupied, whether the MODBUS address is consistent with the BMS, and whether the communication line sequence is correct

4 Application Scenarios and Settings

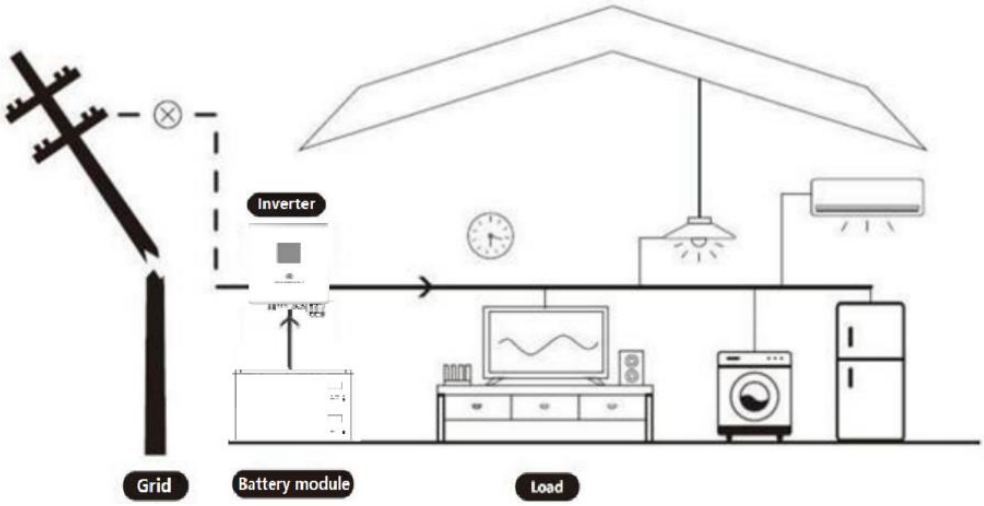
4.1 Application Scenarios

4.1.1 Application Scenarios with Only Mains Power but No Photovoltaic

When the mains is normal, it charges the battery and supplies power to the loads.

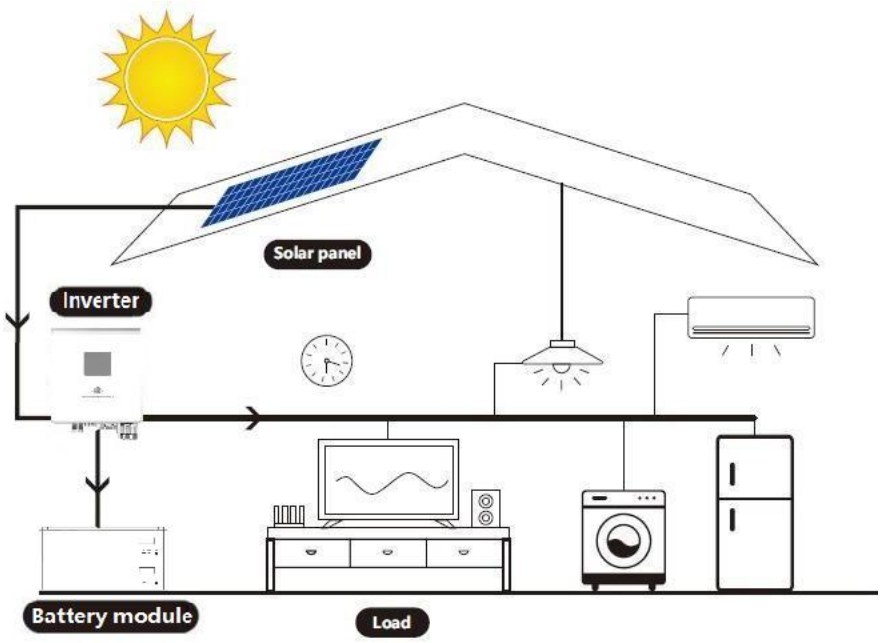


When the mains is disconnected or stops working, the battery supplies power to the load through the power module.

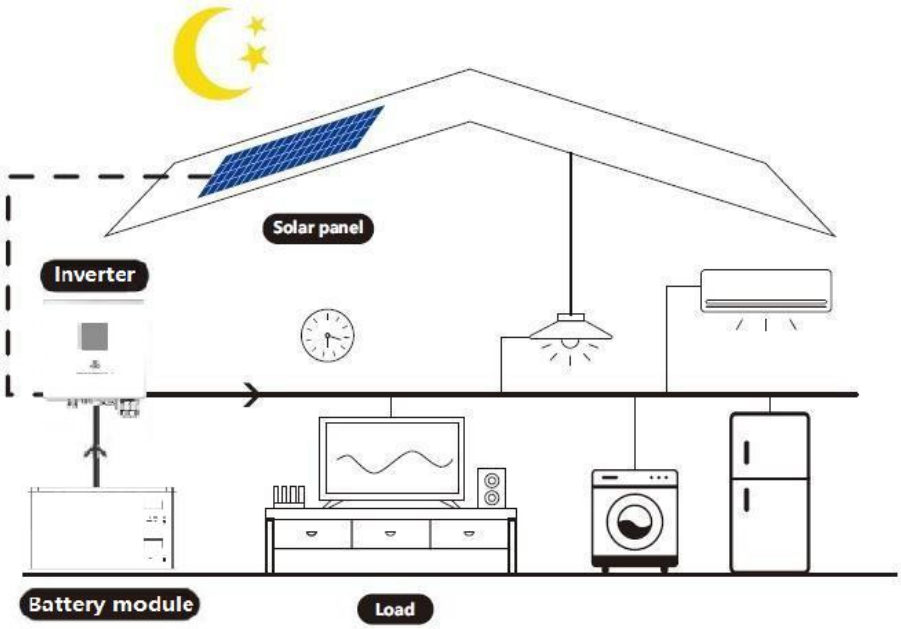


4.1.2 Application Scenarios with Only Photovoltaic but No Mains Power

During the day, the photovoltaic directly supplies power to the loads while charging the battery.

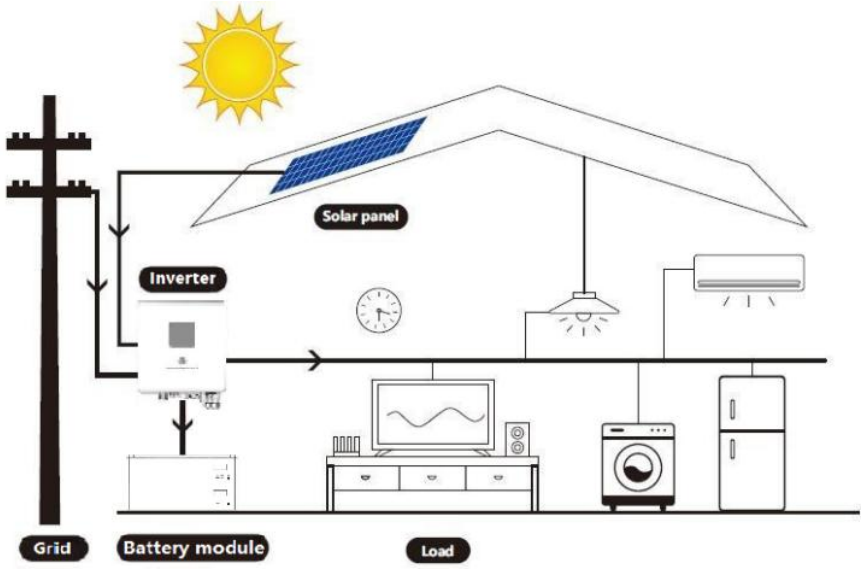


At night, the battery supplies power to the loads through the power module.

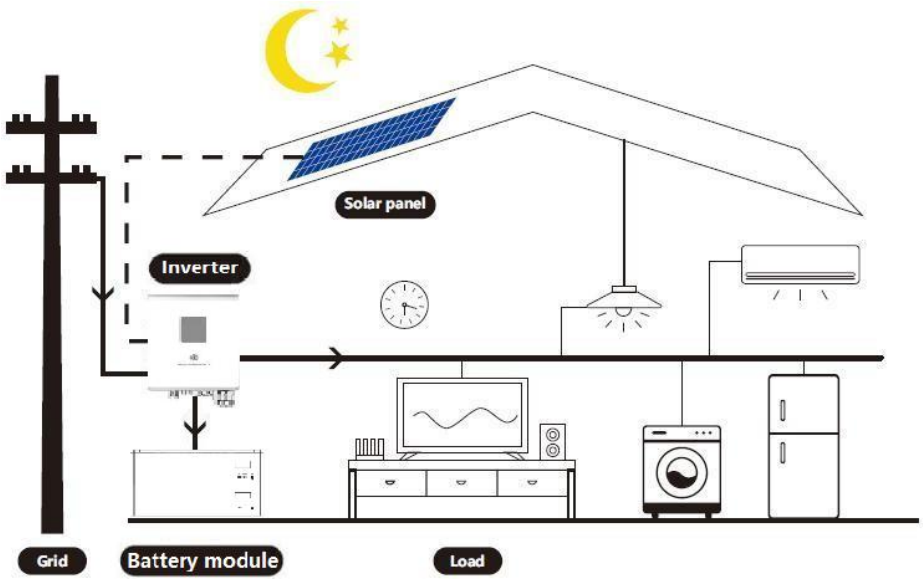


4.1.3 Complete Application Scenarios

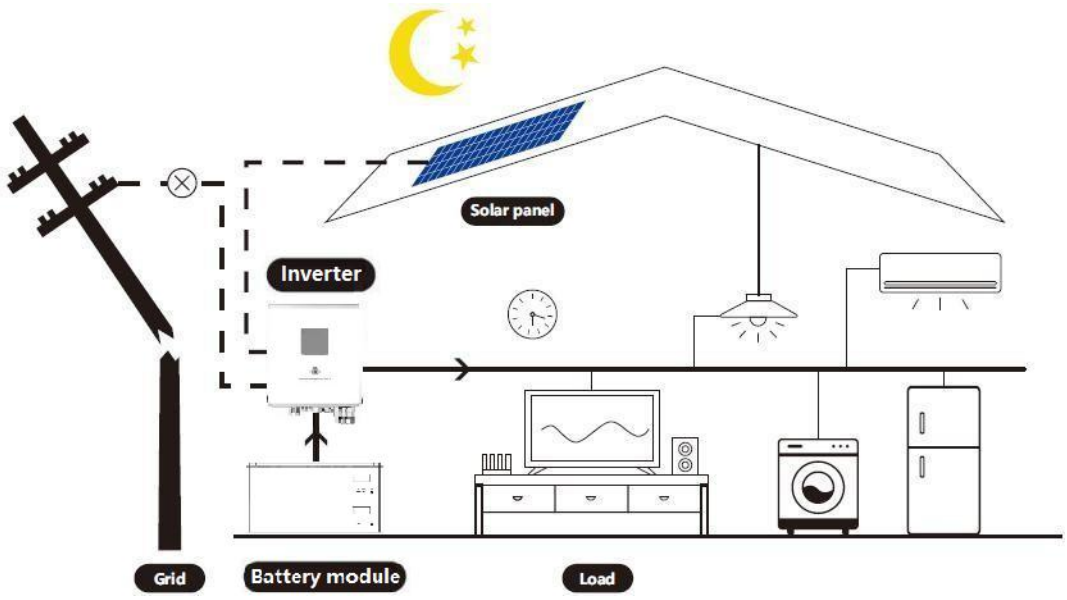
During the day, the mains and photovoltaic simultaneously charge the battery and supply power to the loads.



At night, the mains supplies power to the loads, and continues to charge the battery, if the battery is not fully charged.



If the mains is disconnected, the battery supplies power to the loads.



4.2 Load Working Mode

Load working mode	PCS setting	Description
PV priority mode	SOL	switching to the Mains when the PV fails or the battery is lower than the set value of parameter
Mains priority mode	UTI	Mains priority mode, switching to inverter only when the mains fails.
Inverter priority mode	SBU	switching to the mains only when the battery is under voltage or lower than the set value of parameter

5. System Installation

5.1 Inspections before Installation

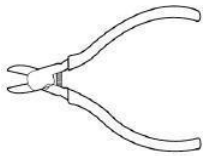
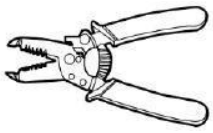
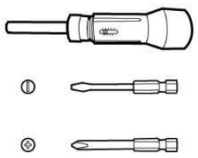
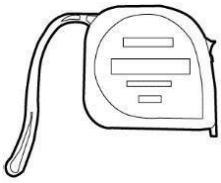
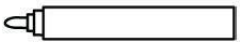
Inspection of outer package

Before opening outer package of the energy storage, check if there is any visible damage on the outer package, such as holes, cracks or other signs of possible internal damage, and check the type of energy storage. If there is any abnormality on the package or model of the energy storage is inconsistent, do not open it and contact us as soon as possible.

Inspection of deliverables

After opening outer package of the energy storage, check if the deliverable is complete and whether there is any visible external damage. If any items are missing or damaged, please contact us.

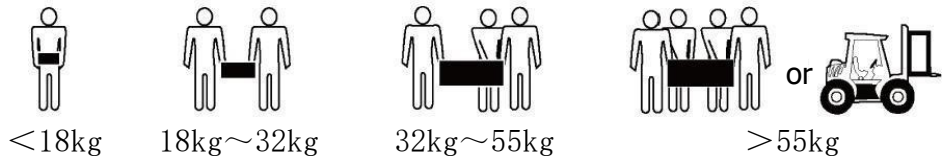
5.2 Preparation of Tools and Meters

Types	Tools and meters		
Installation tool			
			
Personal protective equipment			
			

5.3 Selection of Installation Location

5.3.1 Basic Requirements

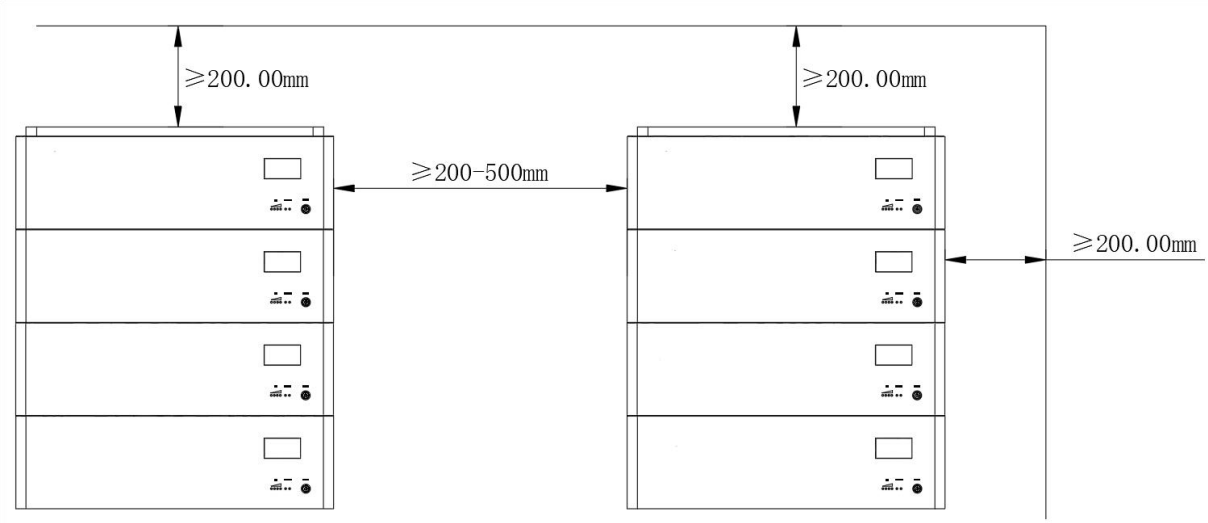
- When the energy storage is running, the temperature of the case and the radiator will be high. Therefore, do not install them in a place that is easy to touch.
- Do not install in areas where flammable and explosive materials are stored.
- If the energy storage is installed in areas with salt damage, it will be corroded and may cause fire. Therefore, do not install it outdoors in areas with salt damage. The areas with salt damage are defined as the areas which are not 500m away from shore or will be affected by sea breezes. The areas affected by the sea breezes vary depending on meteorological conditions (e.g. typhoons, monsoons) or topographical conditions (dams, hills).
- Do not install in the place where children can touch.
- The energy storage cannot be installed forwardly, horizontally, inversely, backwardly or sideways.
- When drilling holes on walls or ground, the goggles and protective gloves shall be worn.
- During drilling, the device should be shielded to prevent debris from falling into the device. After drilling, the debris shall be cleaned up in time.
- When handling any heavy objects, you should be prepared to bear loads to avoid being crushed or sprained.
- When handling the device by hand, wear protective gloves to avoid injury.



＜18kg　18kg～32kg　32kg～55kg　＞55kg

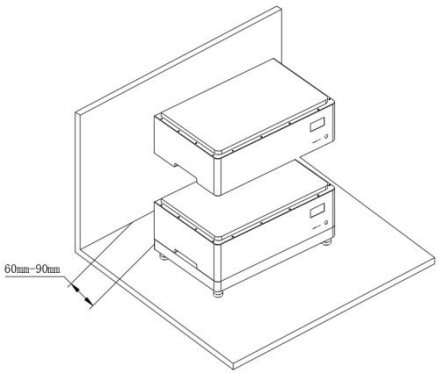
5.3.2 Installation Space Requirements

When installing the energy storage, certain space shall be left around it to ensure sufficient space for installation and heat dissipation.

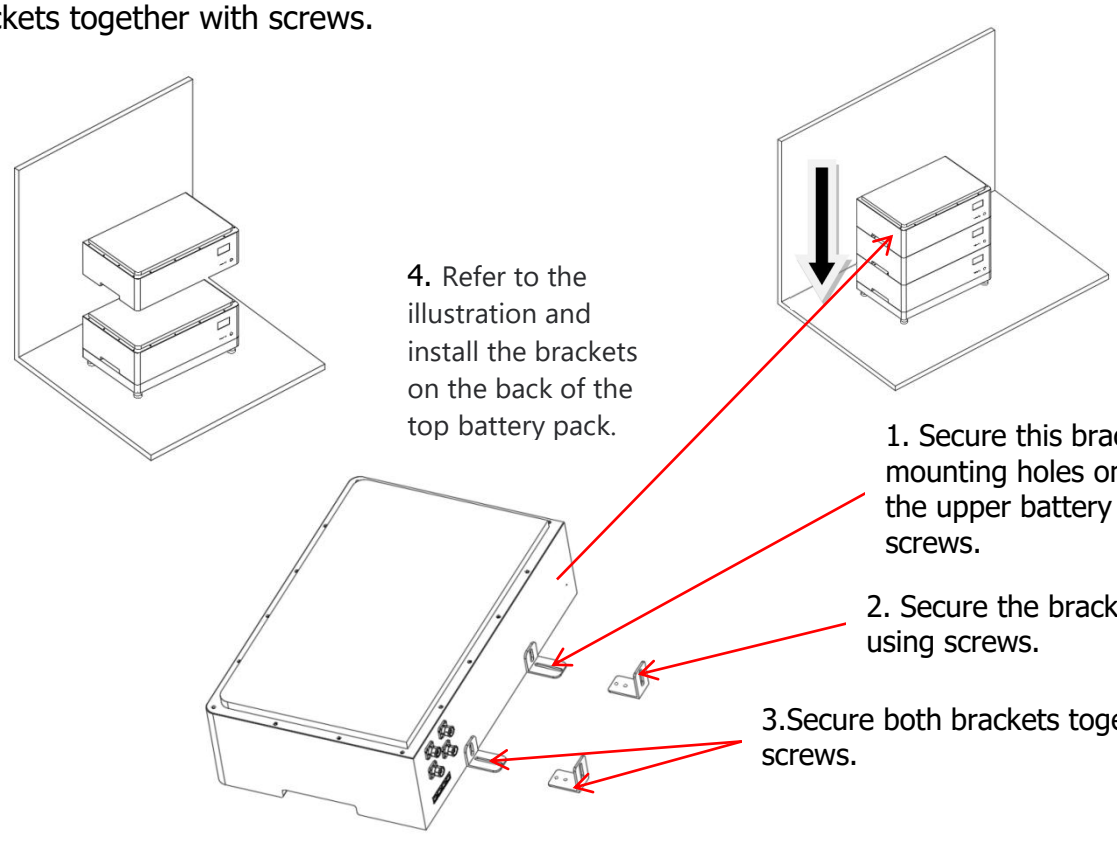


5.4 Device Installation

First, place the base unit in the correct position. The installation site should be flat, and the ground must be solid. Maintain a distance of 60-90 mm between the device and the wall. Then, stack the first battery pack onto the base unit.



If multiple batteries are needed, please follow the instructions below to secure battery modules stack to a wall structure. Firstly place one battery pack on the base, then stack the other battery packs on top of it one by one. Next, install two brackets—one secured with screws to the mounting holes on the back of the top battery pack, and the other fixed to the wall using screws. Finally, fasten the two brackets together with screws.

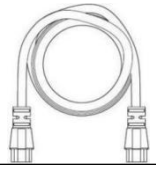


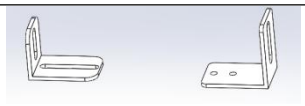
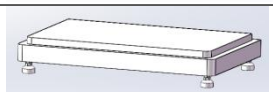
6. Electrical Connection

Before electrical connection, please ensure that the switches of the energy storage and power module and all switches connected to the energy storage are in the "OFF" state, and the power module is in the OFF state. Otherwise, the high voltage of the device may cause electric shock.

- The device damage caused by incorrect wiring is not covered in warranty scope of the device.
- The operations related to electrical connections must be carried out by professional electrical technicians.
- When carrying out electrical connections, the operator must wear personal protective articles.

6.1 List of product accessories

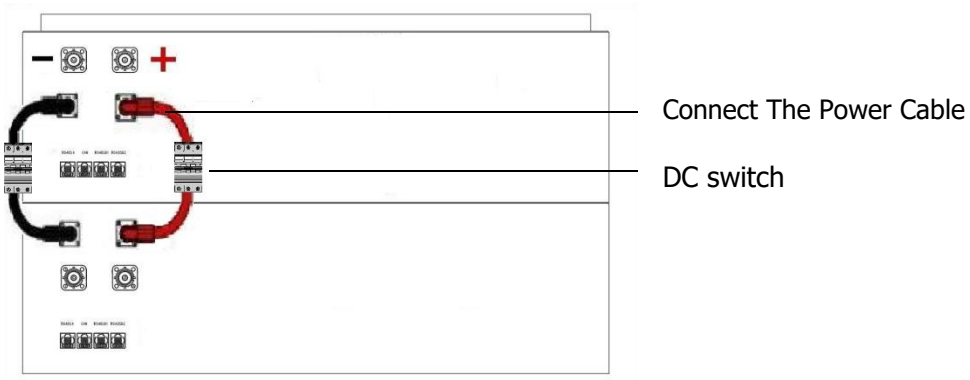
No.	Cables	Description	Recommended specifications	Source
1	Certificate of approval	The Product Quality Act clearly stipulates that all products must be inspected and labeled as qualified before leaving the factory.		Provide with the product together
2	User Manual	Instructions and precautions for use		Provide with the product together
3	Positive and negative outgoing lines	Connecting line between battery and inverter		Provide with the product together
4	Parallel connection cable of energy storage	Power cable between the storage battery modules		Provide with the product together
5	Signal line of energy storage	Signal cable between the storage battery modules		Provide with the product together
6	Desiccant	Keep product dry		Provide with the product together

7	Warning posted	Safety instructions and precautions		On the product
8	Ground Wire	grounding cable between battery modules		provided with the product
9	Bracket	Secures the battery pack to the wall		provided with the product
10	Base Unit	Base for the battery pack(s)		provided with the product

6.2 Internal Electrical Connection of Energy Storage

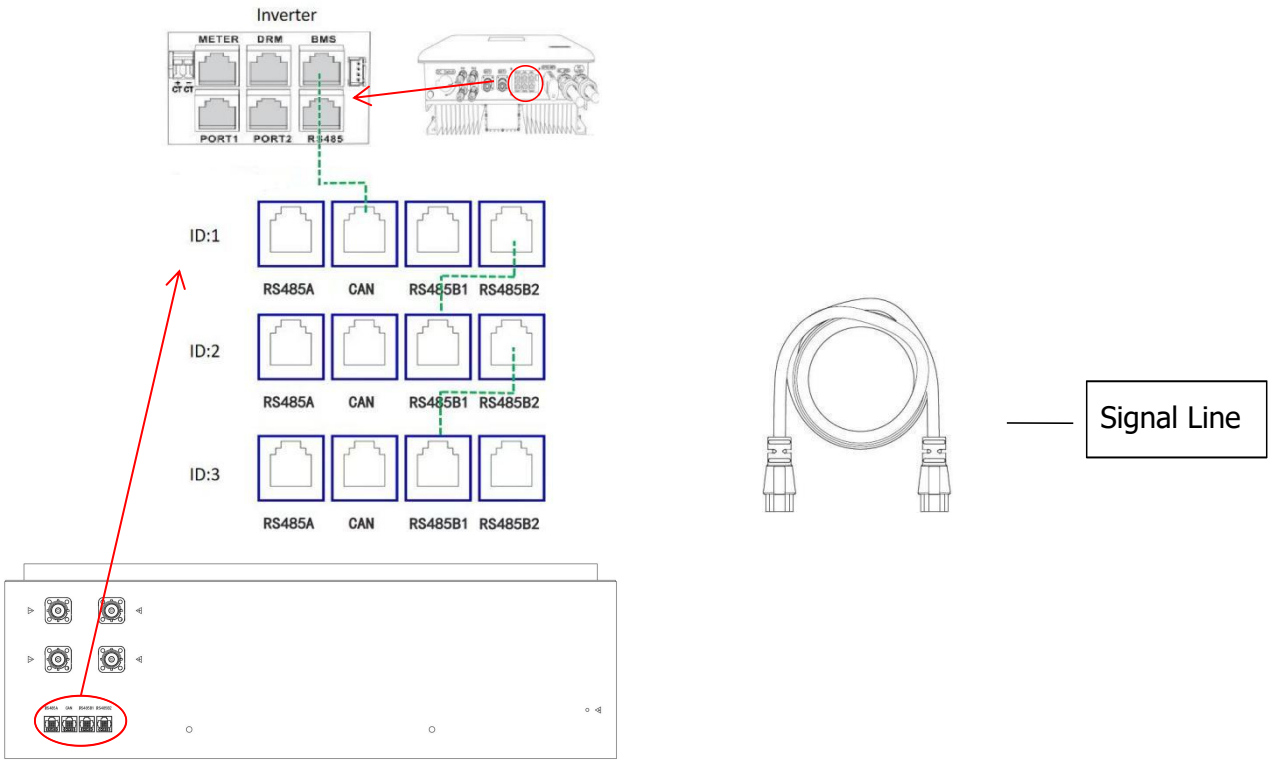
6.2.1 Connecting Power Cord

Before connecting the energy storage battery module, ensure the unit is powered off and all indicator lights are off. Use the provided power cables as follows: first, connect the positive (red) cable to the DC switch and then to the positive terminal of the adjacent battery or power module. Next, connect the negative (black) cable to the DC switch, and then connect it to the negative terminal of the adjacent battery or power module. Always ensure the red cable is connected to the red (positive) terminal and the black cable to the black (negative) terminal.



6.2.2 Connecting Signal Line

The TC B05 III is connected to the inverter via a signal cable. The communication interface of the TC B05 III is a CAN interface, with an additional RS485A interface reserved. RS485B1 and RS485B2 are parallel communication interfaces. The communication interface of the inverter is a BMS port, which is used to connect to the CAN interface of the lithium-ion battery. The connection is shown in the figure below.



Communication connection method of the inverter and parallel system setup method for battery packs.

After the communication connection between the battery pack and the inverter is completed, the data monitoring of the battery pack is accomplished by the inverter monitoring system.Running information of the inverter(generating capacity,alarm,running status)can be uploaded to the server via WiFi/GPRS.The user can monitor and view the information with web or APP as required.The user needs to register an account and bind the equipment to WiFi/GPRS serial number.The serial number of WiFi/GPRS shall be attached to the packing box and WiFi/GPRS.

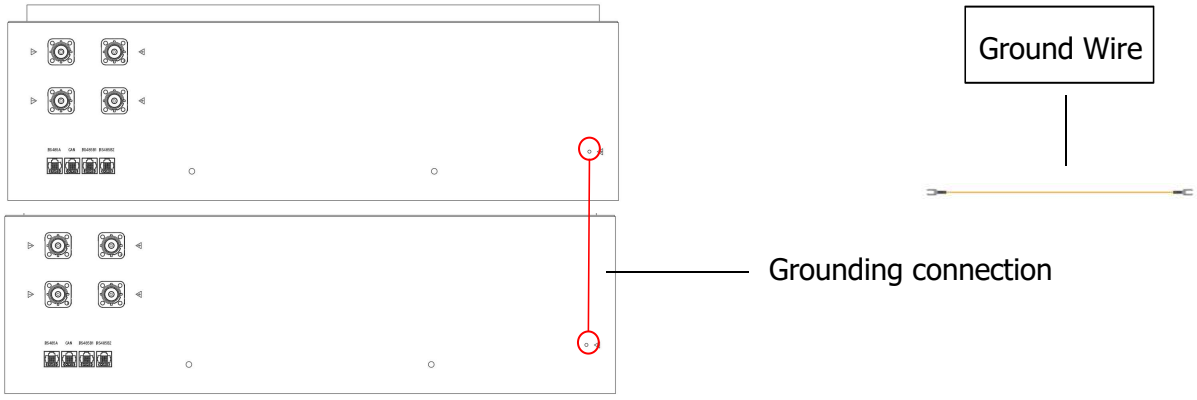
APP:Android customers may search"SOLARMAN" in the App Store.

·IOS customers may also search"SOLARMAN"in the App Store,

·For specific manual at APP and the website, please visit https://www.solarman.cn.

6.2.3 Connect the grounding wire

Each energy storage battery module shall be connected to the grounding wire provided with the product.



7.System Debugging

7.1Inspections before Power-On

No.	Inspection items	Acceptance criteria	Validation
1	The energy storage is installed in place	The installation is correct, secure and reliable.	☐Yes ☐No
2	The installation environment meets requirements	The installation space is reasonable and the environment is clean and tidy without any construction remains.	☐Yes ☐No
3	The energy storage power cord is correctly connected	The positive and negative terminals are connected correctly without any missing.	☐Yes ☐No
4	The energy storage signal line is correctly connected	The signal line is connected reliably	☐Yes ☐No
5	The grounding is reliable	The grounding wire is correctly and reliably connected.	☐Yes ☐No
6	The switch of the energy storage battery module is off	All switches connected to the energy storage are in the "OFF" state.	☐Yes ☐No
7	All air switches of the power module are off	All air switches of the power module are in the "OFF" state.	☐Yes ☐No

7.2 Power-On of Energy Storage Battery Module

After power-on check and confirmation, first turn on the switch of the energy storage battery module. If there are multiple modules, please turn on the power switch one by one according to the address sequence.

7.3 Power-off

1) Turn external power source off.
2) Press the power switch/button on the battery pack, and all indicators on the device will turn off.
3) Switch OFF the disconnection device between battery system and inverter, if available.

8.System Maintenance

8.1 System Power-Off

- During the operation of the energy storage system, maintenance operations are strictly prohibited. Before performing any maintenance, the main switch of the energy storage system must be turned off. When shutdown is required, the power switch/button must be turned off first. After the system is powered off, residual electricity and heat remain in the chassis, which may cause electric shock or burns. Therefore, it is necessary to wait for 5 minutes after system power-off, wear protective gloves, and confirm that all indicators of the energy storage device are off before performing maintenance operations.
- All modules must be isolated separately during maintenance procedures. Follow the power-off operation steps below to turn off the power button, disconnect the circuit breaker, and disconnect the parallel communication cable between each battery pack

Power-off operation steps of the system:
Step 1 Turn off the switch between the power unit and AC output.
Step 2 Turn off the switch between the power unit and AC input.
Step 3 Turn off the switch between the power unit and the PV string.
Step 4 Turn off the switch between the power unit and the energy storage battery unit.
Step 5 Turn off all switches on the energy storage units until all indicator lights are extinguished, ensuring the energy storage system is successfully de-energized.
Step 6 Disconnect the DC switch between the battery pack and the inverter.
Step 7 Disconnect the DC switch between battery packs.
Step 8 Disconnect the parallel communication cables from each battery pack.

8.2 Routine Maintenance

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

8.3 Troubleshooting

8.3.1 Fault Code and Handling Methods

Items	Methods	Maintenance interval
System cleanliness	Check if the radiator is covered or dirt on a regular basis.	Once every six months to one year.
Running status of system	• Observe whether the energy storage appearance is damaged or deformed. • Listen to whether the energy storage has any abnormal sound during running. • When the energy storage is running, check whether the energy storage parameters are set correctly.	Once every six months.
Electrical connection	• Check if any cable connection is off or loose. • Check if any cable is damaged, and especially if there are cuts on the sheath where the cable contacts with the metal surface. • Check if the unused DC input terminals, energy storage terminals, COM ports, and waterproof covers are locked.	Half a year after first debugging and testing, and once every six months to one year thereafter.
Grounding reliability	Check if the grounding cable is grounded reliably.	Half a year after first debugging and testing, and once every six months to one year thereafter.

Charging over-current protection	OCC
Charging low temperature protection	UTC
Charging high temperature protection	OTC
Discharge over-current protection	OCD
Discharge low temperature protection	UTD
Discharge high temperature protection	OTD
Single cell overvoltage protection	OV
Single cell undervoltage protection	UV
short circuit protection	SC
Emergency stop alarm	RPSD Activated
Charge/discharge MOS fault	C-MOS fault/D-MOS fault

8.3.2 Common Faults and Handling Methods

Faults	Handling measures
No display on the screen	Check if the battery air switch or the PV air switch has been closed; if the switch is in the "ON" state; press any button on the screen to exit the screen sleep mode.
Battery over voltage protection	Measure if the battery voltage exceeds rated, and turn off the PV array air switch and Mains air switch.
Battery under voltage protection	Charge the battery until it returns to the low voltage disconnection recovery voltage.
Fan failure	Check if the fan is not turning or blocked by foreign object.
Heat sink over temperature protection	When the temperature of the device is lower than the recovery temperature, normal charge and discharge control is resumed.
Bypass overload protection, inverter overload protection	①Reduce the use of power equipment; ②Restart the unit to resume load output.
Inverter short circuit protection	①Check the load connection carefully and clear the short-circuit fault points; ②Re-power up to resume load output.
PV over voltage	Use a multimeter to check if the PV input voltage exceeds the maximum allowable input voltage rated.
Battery missed alarm	Check if the battery is not connected or if the battery circuit breaker is not closed.

8.4 Battery Storage and Maintenance

8.4.1 Battery Storage Requirements

Do not put the battery into fire. The battery may explode.
Do not open or damage the battery. The electrolyte flowing out from the battery is harmful to the skin and eyes. The electrolyte may also be toxic;

1. When being stored, the batteries shall be placed correctly in accordance with the marks on the packing case. Do not put them upside down or on the side.
2. When stacking up the battery packing cases, the stacking requirements on the outer package shall be met.
3. The batteries should be handled with care, and damage to batteries should be strictly prohibited.

4. Requirements for the storage environment:

- Ambient temperature: -10°C to 55 °C, recommended storage temperature: 20°C to 30°C.
- Relative humidity: 5%RH-80%RH.
- Dry, well ventilated, and clean.
- The corrosive organic solvents, gases and other substances shall be kept away.
- Exposing to direct sunlight shall be avoided.
- The distance from the heat source should not be less than two meters.

5. When being stored, the battery shall be disconnected from the external connection. If there is an indicator light on the battery panel, the indicator light shall be off.

6. The warehouse keeper shall make monthly statistics on the battery storage, and regularly inform the planning link of the battery inventory. If any battery has been stored for nearly 15 months (-10 °C to 25 °C), 9 months (25 °C to 35 °C), or 6 months (35 °C to 55 °C), recharging shall be arranged in time.

7. When the stored batteries are going to be delivered, the first-in first-out principle should be followed.

8. After the battery is produced and tested, it shall be recharged to at least 50% SOC before being stored. If the device will not be used for a long period of time, discharge the battery to 45% to 60% of the battery capacity and disconnect the battery output to avoid the battery runs out;

9. Do not touch the battery pack with wet hands.

10. Do not squeeze, drop, or pierce the battery.

11. The battery should always be disposed in accordance with local safety regulations.

12. The battery should be stored and recharged in accordance with this User's Manual.

13. Do not reverse polarity of the battery when storing or transporting the batteries, the batteries shall not be stacked up without protective packaging,

and the number of stacked packed batteries should not exceed the number specified on the packaging.

14. All operators of the energy storage system shall comply with the user manual, installation and service manual, and quality assurance requirements. Any damage to the device resulting from neglecting or misreading of the user's manual, installation and service manual, and the quality assurance requirements will invalidate the product warranty.

8.5 Requirements for Charging of Battery

The batteries to be stored for a long period of time (unused, for more than 3 months) must be kept in a dry and cool place. The storage voltage is 51V-53V. The batteries should be stored in a clean environment of 23±2℃ and humidity of 45%-75%. If the battery will be shelved and not used for a long period of time, it should be recharged every 3 months to ensure that the battery voltage is within the above range.

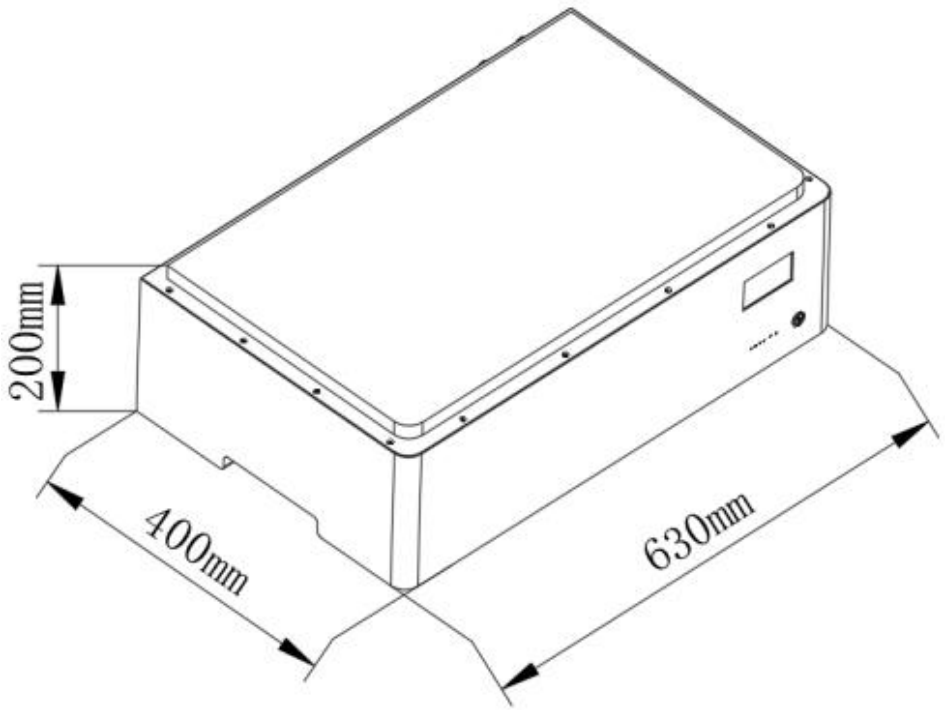
As for batteries and long-term storage, routine maintenance is required. Please charge the battery to 40% SOC at a current of 0.2C according to the requirements in the table below.

Ambient temperature for storage	Relative humidity for storage environment	Storage Time	SOC
<-10℃	/	Prohibited	/
-10~25℃	5%~70%	≤12 months	30%≤SOC≤60%
25~35℃		≤6 months	
35~45℃		≤3 months	
>45℃	/	Prohibited	/

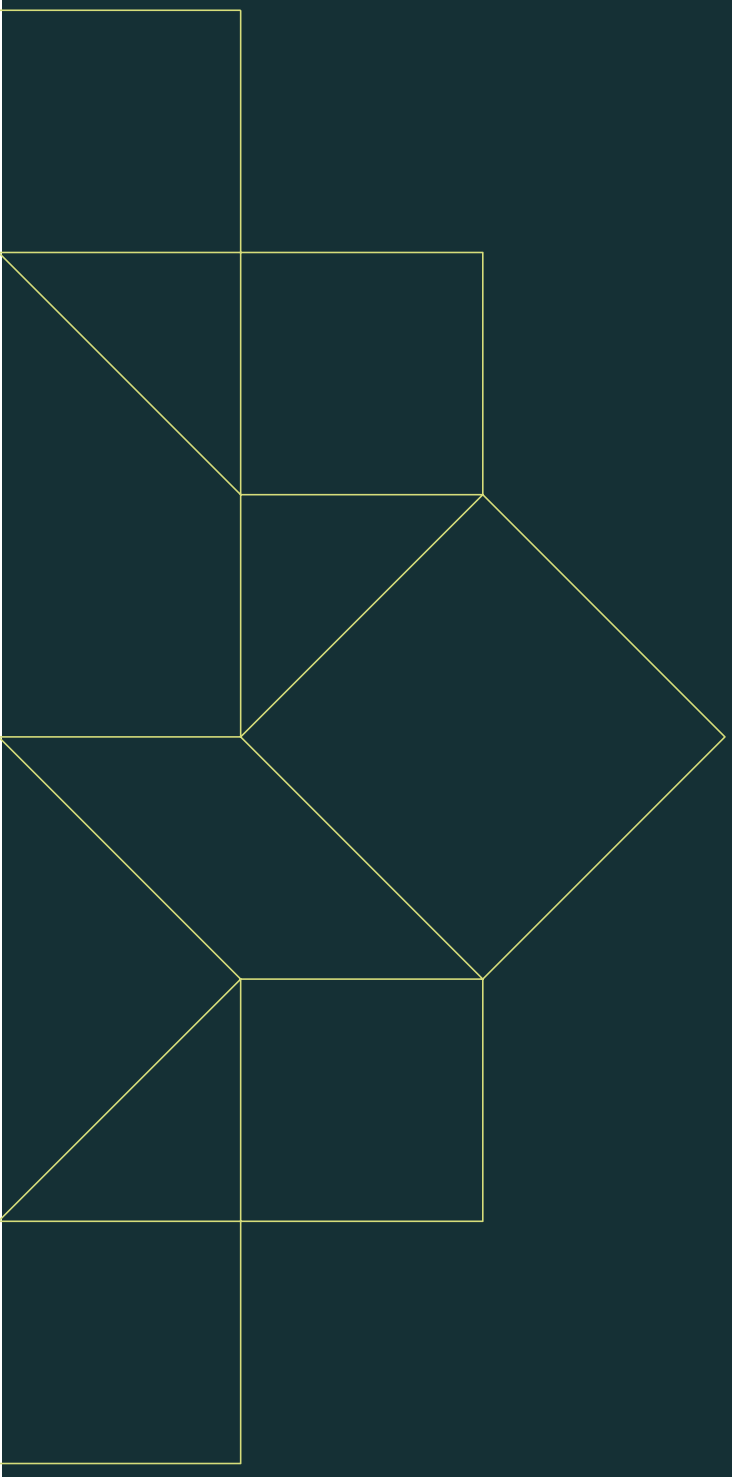
8.6 Device Cleaning

It is recommended to clean and maintain the product from time to time. When cleaning, the dust and stains on the product shall be removed with a piece of soft dry cloth or vacuum cleaner, especially when cleaning the heat dissipation and air vents on both sides of the product. The product shall not be cleaned with organic solvents, corrosive liquids and other cleaning products.

8.7 Battery Module Data



Technical Parameters	
Model	TC B05 III
Battery Type	LiFePO4
Energy	5222Wh
Rated Capacity	102Ah
Rated Voltage	51.2V
Working Voltage Range	40～58.4V
Max Charge Current	100A
Max Discharge Current	100A
Standard Charge Current	50A
Standard Discharge Current	50A
DOD	98%
Max Parallel Quantity	16
Designed Life-span	10 years
Operating Temperature	Charge：5～60℃ Discharge：-10～60℃
Operation Humidity	5～95%
Nominal Operation Altitude	＜3000m
IP Rating	IP20
Installation Method	Stacking
Net Weight	45±3kg
Dimension (L*W*H)	630±3*400±3*200±3mm



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