



LifePO4 Battery

ML Series

User Manual

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1 Safety Information

1.1 Symbols



Caution, risk of electric shock



Do not place or install near flammable or explosive materials



Install the product out of reach of children.



Read the instruction manual before starting installation and operation.



Heavy weight may cause serious injury to the back.



Do not dispose of the product with household wastes.



Recyclable



Disconnect the equipment before carrying out maintenance or repair.



Observe precautions for handling electrostatic discharge sensitive devices.

1.2 Safety Instructions

For safety reasons, installers are responsible for familiarizing themselves with the contents of this document and all warnings before performing installation.

1.2.1 General Safety Precautions

Over-voltages or wrong wiring can damage the battery pack and cause deflagration, which can be extremely dangerous.

All types of breakdowns of the product may lead to a leakage of electrolyte or flammable gas.

Avoid installing the battery pack where flammable materials are stored. Do not install in places where explosive gas or chemicals are present.

The utility grid, solar input, and battery voltage must be disconnected from the Battery Pack wiring. Wiring must be carried out by a qualified person.

Battery Pack is not user serviceable.

1.2.2 Battery Handling guide

Do not expose battery to open flame.

Do not place the product nearby flammables. It may lead to fire or explosion in case of accident.

Do not expose or place near water sources like downspouts or sprinklers.

Do not store this product in a place exposed to direct sunlight.

A ventilated area is strongly recommended for handling the product.

Store at cool and dry place. (Do not store in greenhouses and storage areas for hay, straw, chaff, animal feed, fertilizers, vegetables or fruit products.)

Store the product on a flat surface.

Store the product out of reach of children and animals.

Store the product where it should be minimal dust and dirt in the area.

Do not disconnect, disassemble or repair by unqualified personnel. Service must be made by qualified personnel only.

Do not damage the unit in such ways as dropping, deforming, impacting, cutting or penetrating with a sharp object. It may cause a leakage of electrolyte or fire.

Do not touch if liquid is spilled on the product. There is a risk of electric shock. Handle the battery wearing the insulated gloves.

Do not step on the product or the product package. The product may be damaged.

Do not place any foreign objects on the top of the Battery Pack.

Do not put the battery pack upside down on the ground.

Do not connect anode and cathode terminal block opposite direction.

Do not charge or discharge damaged battery.

If the battery pack is installed in the garage, then ensure the product is above the height of the vehicle bumper.

The battery pack only be installed indoors. If installed outdoors, do not allow the battery pack to be exposed to direct sunlight and water source as it may cause:

- Power limitation phenomena in the battery

(with a resulting decreased energy production by the system)

- Premature wear of the electrical/electromechanical components and mechanical components.

- Reduction in performance, service life and possible damage of the battery

Only use the product with supplier recommend inverter and solar charge controller (MPPT) .

Do not connect any AC conductors or Photo-voltaic conductors directly to the battery pack and should be only connected to the Inverter and solar charge controller (MPPT) .

1.2.3 Response to Emergency Situations

The battery comprises multiple batteries and Sophisticated BMS that are designed to prevent hazards resulting from failures. However, we cannot guarantee their absolute safety if battery is mishandled. If a user happens to be exposed to internal materials of the battery cell due to damage on the outer casing, the following actions are recommended.

Inhalation: Leave the contaminated area immediately and seek medical attention.

Eye contact: Rinse eyes with running water for 15 minutes and seek medical attention.

Contact with skin: Wash the contacted area with soap thoroughly and seek medical attention

Ingestion: Induce vomiting and seek medical attention.

If a fire breaks out in the place where the battery pack is installed, perform the following countermeasures:

Fire extinguishing media

Respirator is not required during normal operations.

Use FM-200 or CO₂ extinguisher for battery fire.

Use an ABC fire extinguisher, if the fire is not from battery and not spread to it yet.

Firefighting instructions

If fire occurs when charging batteries, if it is safe to do so, power off the switch.

If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire.

If the battery pack is on fire, do not try to extinguish but evacuate people immediately

Effective ways to deal with accidents

On land: Place damaged battery into a segregated place and call local fire department or service engineer.

In water: Stay out of the water and do not touch anything if any part of the battery, inverter, or wiring is submerged.

Do not use submerged battery again and contact the service engineer.

1.3 Qualified Personnel

This guide and the tasks and procedures described herein are intended for use by skilled workers only. A skilled worker is defined as a trained and qualified electrician or installer who has all of the following skills and experience:

Knowledge of the functional principles and operation of on-grid and off-grid (backup) systems.

Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.

Knowledge of the installation of electrical devices

Knowledge of and adherence to this guide and all safety precautions and best practice



Make sure all power is off and wires are disconnected when maintaining/servicing the battery

2 Product Introduction

2.1 General Information

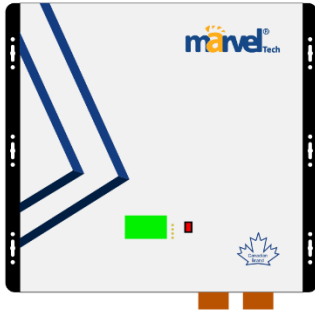
This Battery system is a high-tech product researched and developed product. With its integration, miniaturization, light-weight, intelligent centralized monitoring, battery maintenance and management, unattended, energy conservation and environmental protection, are widely applied in remote access network equipment, remote switch unit, mobile communication, transmission equipment, home storage and other areas as a backup power supply.

2.2 Product Features

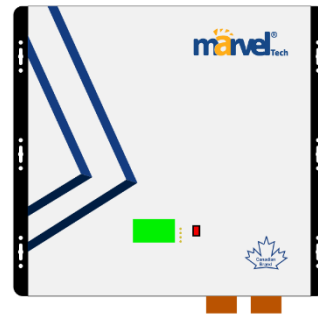
- The battery adopts LiFePO₄ as cathode material; LiFePO₄ cell life cycle could reach 6000 times at 80% DOD and 70%EOL@25°C.
- The system adopts high performance of BMS battery management module. The BMS has the protection function in current, voltage and temperature, it also makes a good communication between battery system and the host equipment;
- Monitoring unit will automatically measure the battery charge and discharge current, charge and discharge voltage, single cell surface temperature;
- Auto-power cut off function. It will have the alarm information if the battery voltage is lower than the alarm value, when the voltage is too low, it will protect the batteries by automatic power cut off;
- The system has a good electromagnetic compatibility;
- All intelligent design, equipped with centralized monitoring module, it realizes the computer management which can communicate with the remote central control center;
- Effective combinations of Power control technology with computer which realize real-time monitoring and control all kinds of parameters and state;
- The battery owns Bluetooth and APP functions;
- Up to 16 batteries can be connected in parallel.
- Flexible installation: Indoor

2.3 Appearance and Mechanical Drawing

ML200-25.6



ML100-51.2



ML200-51.2



ML280-51.2



ML400-51.2



2.4 Electrical Performance

2.4.1 Battery Pack Parameters

Battery model	25.6V200Ah	51.2V100Ah	51.2V200Ah	51.2V280Ah	51.2V400Ah
Nominal voltage (V)	25.6	51.2	51.2	51.2	51.2
Voltage range (V)	22~28.8	44~57.6	44~57.6	44~57.6	44~57.6
Nominal Capacity (Kwh)	5.12	5.12	10.24	14.34	20.48
Battery type	LFP				
Group approach	8S2P	16S1P	16S2P	16S1P	16S4P
Rated charging current (A)	150	100	150	200	200
Maximum charging current (A)	160@8s	130@8s	160@8s	210@8s	210@8s
Charging operating temperature (°C)	0~55°C				
Rated discharge current (A)	150	100	150	200	200
Maximum discharge current (A)	160@8s	130@8s	160@8s	210@8s	210@8s
Discharge operating temperature	-10~60°C				
Battery weight (Kg)	45	45	95	140	194
Battery size (L×W×H:mm)	570*523*164 ±2	570*523*164 ±2	1200*450* 172±2	450*180* 1200±2	678.5*463* 883±2
Package Method	Carton + wooden case	Carton + wooden case	Wooden case	Wooden case	Wooden case
Cycle life @ RT	6000 @70%EOL,0.5C/0.5C				
Communication protocols	RS485 /CAN				
Bluetooth function /LCD display	YES				
Parallel function	YES				
Match the inverter	GoodWe, Growatt, SMA, Sungrow, Crestec, Shouhang, Deye, Jinlang, Sanjing, INVT, Riyueyuan, Shuori, Meixerox, etc., support the Peneng agreement				

2.4.2 BMS and Display

The batteries are supplied with a LiFePO4 Battery Management System (BMS) that can monitor and optimized each single prismatic cell during charge & discharge, to protect the battery pack overcharge, over discharge, short circuit. Overall, the BMS helps to ensure safe and accurate running.

Battery supports up to 16 batteries in parallel. However, it is not recommended to connect more than 4 batteries in parallel for safety or local electrical rules.

1) ML-200-25.6&ML-100-51.2&ML-200-51.2 Display

```
Vsum: 52.71 V
Im: 0.00 A
SOC: 49.98 %
FCC: 100.0 AH
```



Main Interface

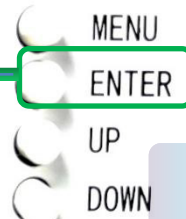


```
CVmax: 3296 mv
CVmin: 3294 mv
CTmax: 24.8 °C
CTmin: 24.1 °C
```



Maximum and minimum cell voltage / maximum and minimum cell temperature

```
>> Analog Data >>
--Sys Status >>
--Para Setting >>
--Sys Setting >>
```



Press the menu key of main interface to enter the above interface

```
>> Analog Data >>
```

```
>> PackV: 52.71 V
--Im: 0.00 A
--Temperature >>
--Cell Voltage >>
```

Select the item and press the menu key to enter the sub option

```
--T1: 24.5 °C
--T2: 24.1 °C
--T3: 24.5 °C
--T4: 24.8 °C
```

Click temperature to view detailed data

```
>> Analog Data >>
--Sys Status >>
--Para Setting >>
--Sys Setting >>
```

```
>> Status: Idle
--Warn/Alarm >>
```

System status press to enter sub option to view detailed fault

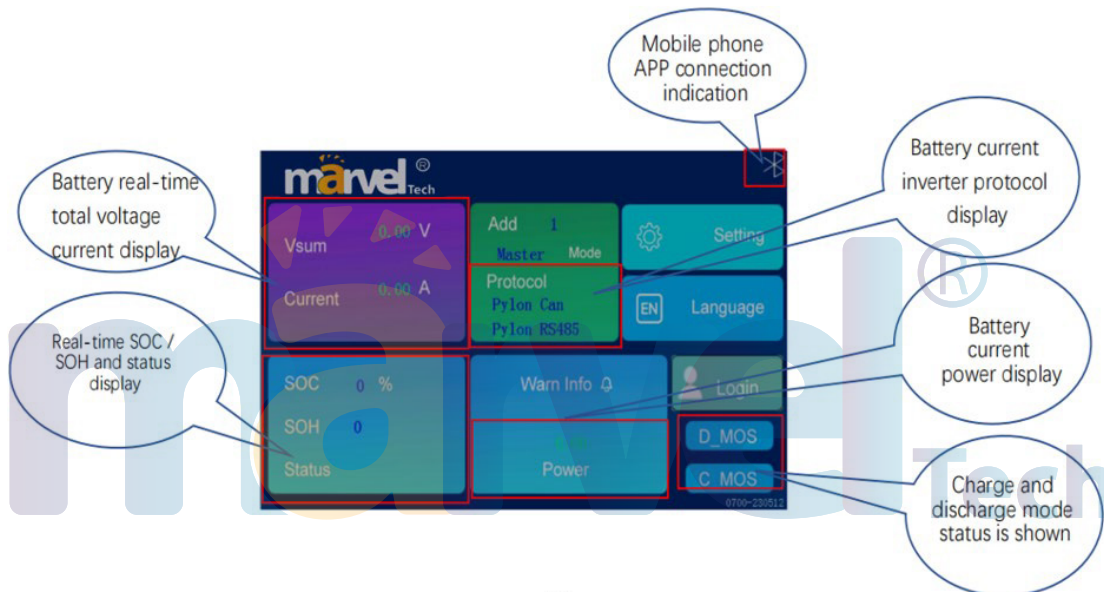
2) ML-280-51.2&ML-400-51.2 Display

Enter the welcome screen after the first time.

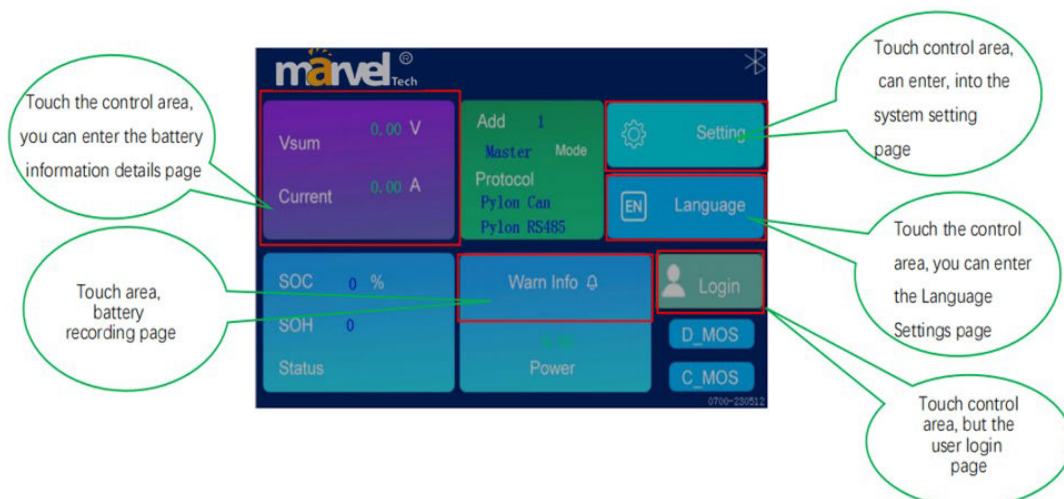


After 3S, enter the system home page, and the display interface is as follows:

(1) The interface touch area is described as follows:

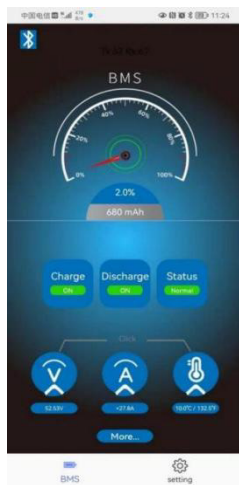


(2) The interface information is as follows:



2.4.3 Bluetooth & App Function

The battery has Bluetooth & app functions. You can easily check the working status of the battery in your mobile phone.



Please log in to our company's website to download the app installation file or consult your local dealer.

2.5 Transportation and Storage

2.5.1 Transportation

Based on the character of cell, proper environment for transportation of LiFePO₄ battery pack need to be created to protect the battery. Battery should be stayed in the ware house -20°C~35°C where it's dry, clean, shade, and well-ventilated. The battery should be stored in 45~55% SOC during transportation. Product is adapted to the truck, boat, transport. When in transport, it should be covered to avoid the sunlight, and with civilized loading and unloading. With product packaging box allows using any kinds of transport, battery in loading and unloading process should be light moving gently to prevent throwing, rolling, pressing. Direct rain and mechanical impact of rain and snow should be avoided in transportation.

2.5.2 Storage

Product storage should be kept in dry warehouse, not sun and rain. The harmful gases are not allowed in the warehouse, as well as flammable and explosive products and corrosive chemicals. To avoid mechanical impact, stress and strong magnetic field effect, avoid direct sunlight and away from heat source not be less than 2m, the packing box should pad off the ground at least 20 cm high, away from the wall, window, or the air inlet at least 50cm.

TIPS: Under the provisions of the conditions of storage period of more than 3 months of products should charge once, storage period of more than 6 months products must check and test the capacity, store for more than 1 years of products must be re-examined, only can be used when is qualified.

1	Storage Temperature	Less than 1 month	-20~35°C
		Less than 6 months	-10~30°C
2	Storage humidity	45~75%RH	

3 Installation

3.1 Install Location

Required:

There must be no flammable or explosive materials nearby.

The recommended ambient temperature should be within the range of -10 ~45°C.

Battery pack must be installed on walls that are upright and can support battery weight.

Product shall be installed indoor.

Recommended:

The building should be designed to withstand earthquakes.

The install position should be waterproof and properly ventilated area.

Install the product on a flat wall, surface or heavy-duty cabinet. Use proper supports, brackets and/or straps to handle the weight of the battery.

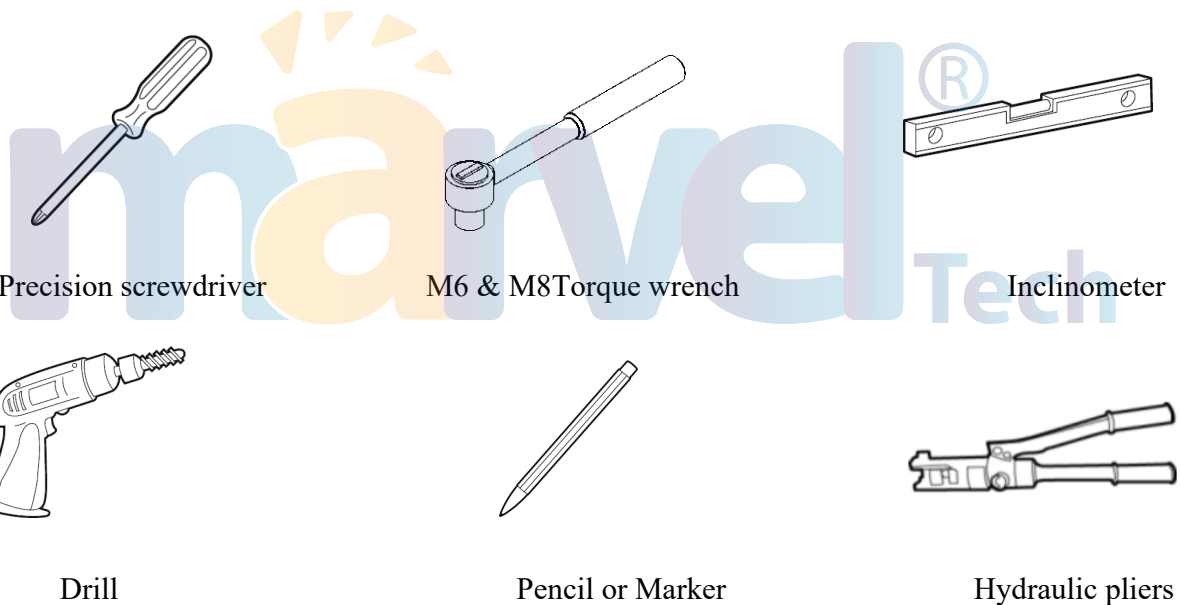
Install the product out of reach of children and animals.

CAUTION!

If the ambient temperature is outside of the operating range, the battery pack may stop operating to protect the internal components. The optimal temperature range for the battery pack to operate is from 10°C to 30°C. Frequent exposure to harsh temperatures may deteriorate the performance and overall life of the battery and will void the warranty.

3.2 Tools/Safety Gears Required

The following tools are required to install the battery:



It is recommended to wear the following safety gears when handling the battery.



NOTE

The product is heavy and challenging to lift. Lift handles are recommended.

3.3 DC Cable Prepared

3.3.1 Choose DC Cable

It is suggested the battery pack be kept as close as possible to the inverter or DC load. The following is a suggested wiring option for 1meter DC cable.

Please find the following minimum wire size, in case of DC cable longer than 1m, please increase the cross section of cable to reduce the loss.

NO	Model	DC Output voltage	Wire Gage
1	ML-200-25.6	25.6VDC	35mm ²
2	ML-100-51.2	51.2 VDC	35mm ²
3	ML-200-51.2	51.2 VDC	35mm ²
4	ML-280-51.2	51.2 VDC	50mm ²
5	ML-400-51.2	51.2 VDC	50mm ²

Performance of any product can be improved by thicker cable and shorter runs, so if in doubt, round up and keep the length as short as possible.

For more wiring configurations for your specific system, please contact your distributor for more information.

WARNING

The torque rating range for DC terminal is 9NM-12NM, and the suggested torque rating is 9NM. Over torquing may cause the bolt to break.

3.3.2 Fabrication of DC Cable

You can choose a DC cable manufacturing method according your battery or inverter connection ports.

a) Copper o-terminal

Manufacturing steps of battery connected power DC line:

Step 1: select the battery model, select the corresponding model wire, and peel off the front section of the cable for 15mm;

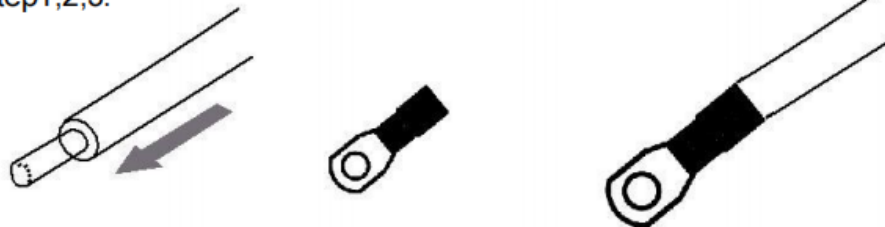
Step 2: use the corresponding M8 or M6 o-terminal;

Step 3: insert the stripped wire into the o-terminal and press it tightly with the crimping fixture;

Step 4: select the box terminal crimping according to the model of circuit breaker between inverter and battery;

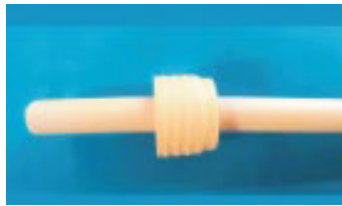
Step 5: install the connecting wire according to the requirements of Chapter3.4.3 (reverse connection of positive and negative wires is strictly prohibited).

Step1,2,3.



b) Aviation terminal

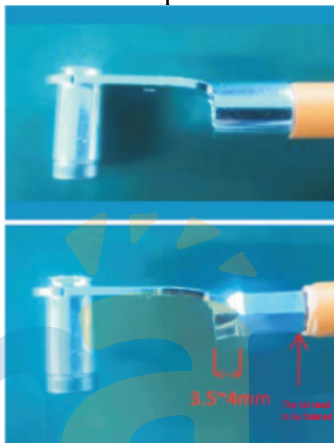
Step1: Thread the wire into the sheath



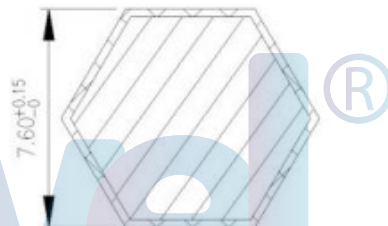
Step2: Strip the wire skin $12.0 + 0.5 / - 0\text{mm}$



Step3: ①Crimping terminal: Refer to the right figure for dimensions 25mm^2 Riveting size requirements.
 ②3.5-4mm shall be reserved at the front end of the crimping hole without pressure riveting, and the tail shall be flattened. The pressure shall be maintained for 2 seconds during crimping.



25mm riveting size



Step4: Install the riveted terminal into the plug body.



Step5: Install the upper cover of the plug into the plug body



Step6: Install the sheath into the plug body and complete the assembly.



Tips: The holding force of the harness after riveting is $25\text{mm}^2 \geq 1900\text{Nmin}$; If the holding force is insufficient or the terminal is excessively extended, please adjust the riveting size appropriately.

3.4 Battery Pack Installation

CAUTION!

Make sure that the inverter AC and DC disconnects are turned off before connecting the power cable to the battery pack.

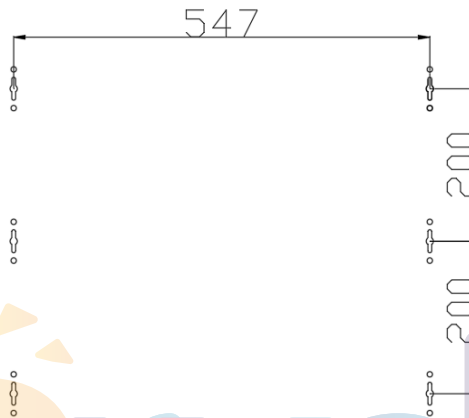
NOTE!

USE PROPER BRACKETS, SUPPORTS, AND/OR STRAPS TO HANDLE THE WEIGHT OF THE BATTERY. WELL-VENTILATED, HEAVY-DUTY BATTERY CABINET IS RECOMMENDED.

3.4.1 Battery Installation

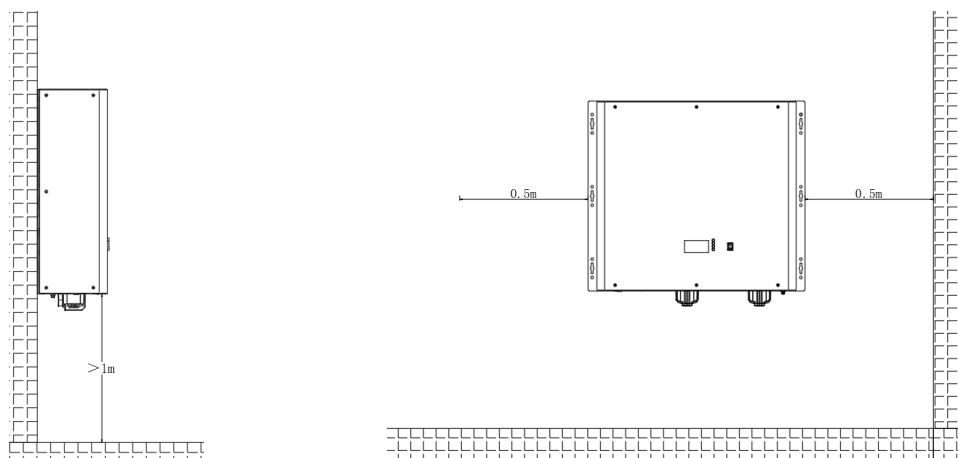
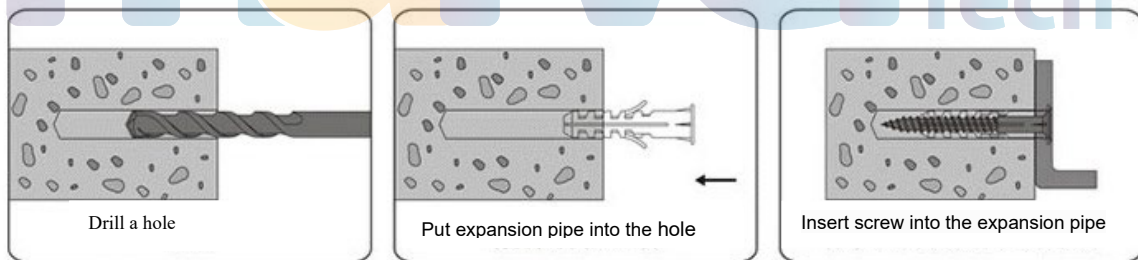
Wall Mounted Battery Installation

Step1: Use an M8 drill bit with a drilling depth of about 40mm, and drill the corresponding hole position according to the following battery installation dimensions;



ML-200-25.6/ML-100-51.2 Installation Size

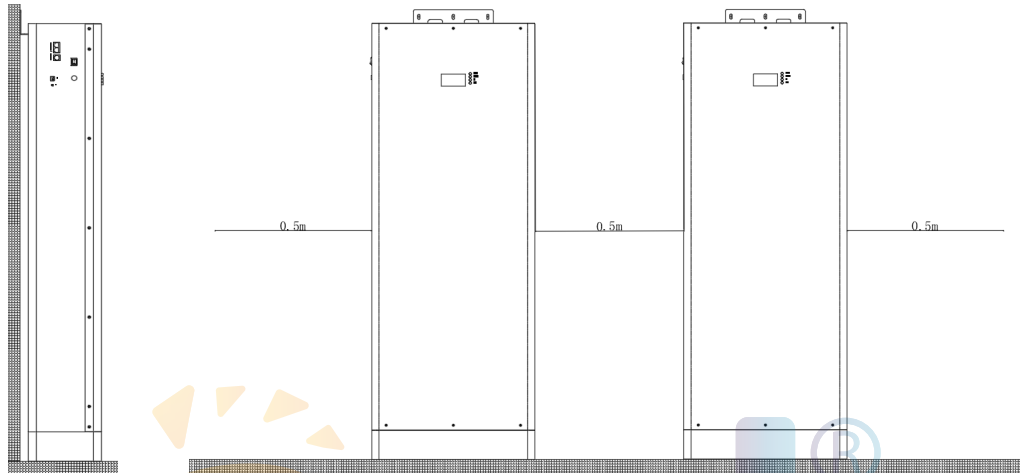
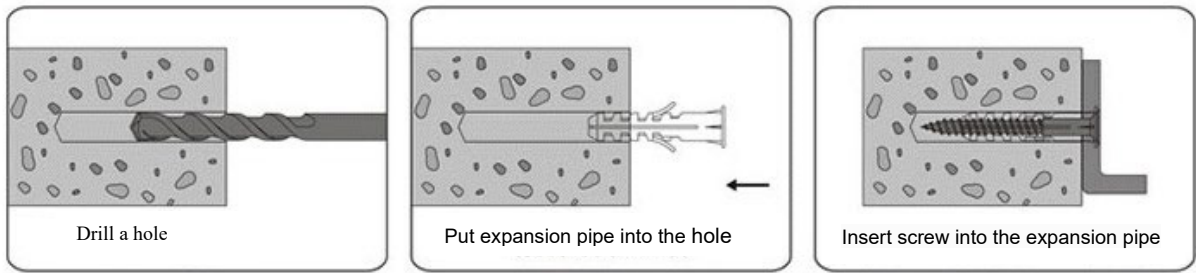
Step2: Move the battery to the corresponding position and fix the battery with M5 cross flange self-tapping screw.



Vertical Battery Installation

Step1: Use M8 drill bit with drilling depth of about 40mm, and drill the corresponding hole position according to the following battery installation dimensions;

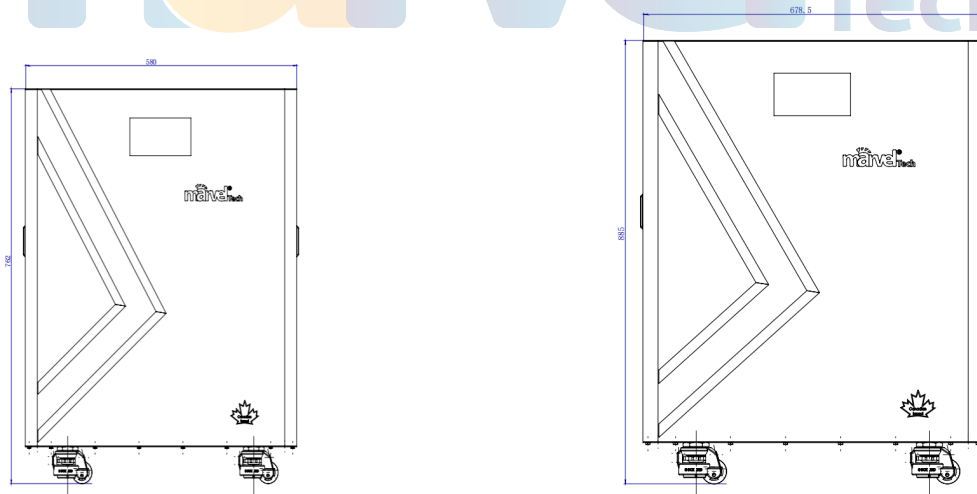
Step2: Move the battery to the corresponding position and fix the battery with M6 expansion bolt. Please note the distance of batteries.



ML-200-51.2 Installation Size

Floor-to-ceiling installation

Step1: Remove the product from the outer packing box to ensure that the bottom four wheels hit the product floor, and move the product in place



ML-280-51.2 Installation Size

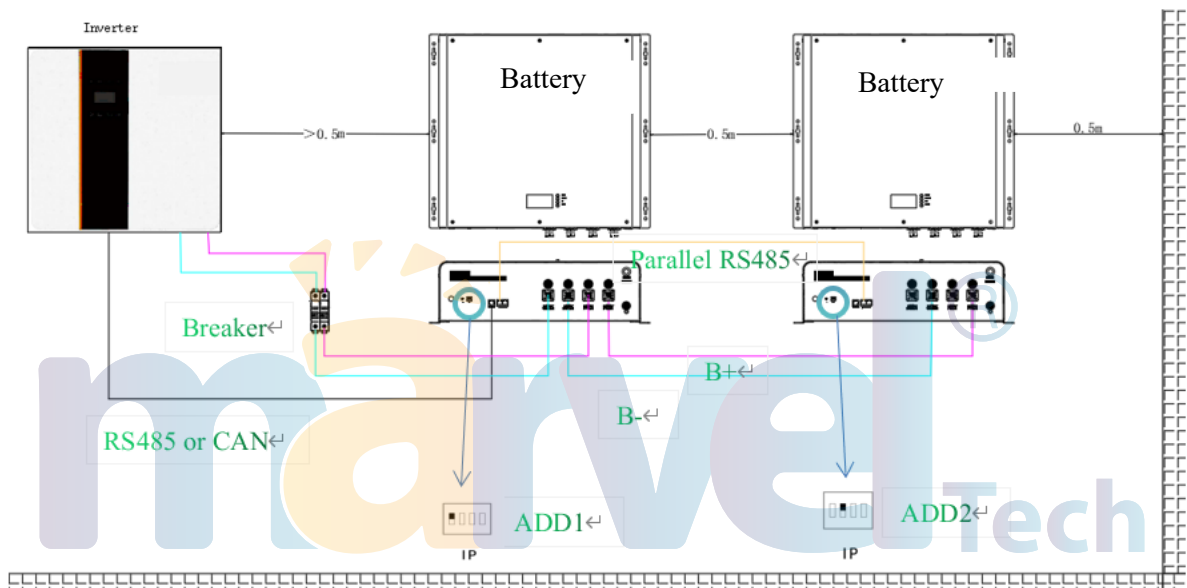
ML-400-51.2 Installation Size

Step2: Turn the red part of the four wheels to make the black support column fall and contact the ground until the wheel leaves the ground. Adjust the height of the four supports to ensure the smooth product placement.

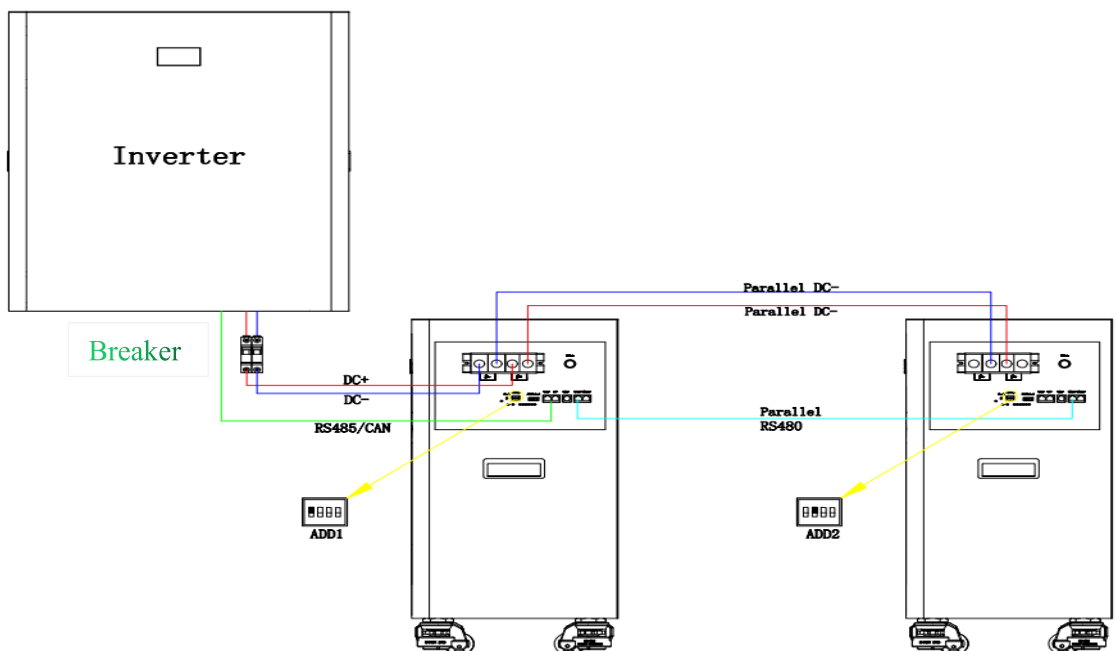


3.4.2 System Installation Guide

Connect the parallel batteries with wires according to the following schematic diagram (the following is a operation diagram of two parallel batteries)



25.6V200Ah/51.2V100Ah battery system connection method



51.2V200Ah/280Ah/400Ah battery system connection method

4 Commissioning and operation

4.1 Operating Conditions

Installation Location	Indoor (Wall-Mounted or Flat-Mounted)
Operating Temperature	14 to 113°F (-10 to 45°C)
Operating Temperature (Recommended)	59 to 86°F (15 to 30°C)
Humidity	15% to 85%
Altitude	Max. 6,562ft (2,000m)
Cooling Strategy	Natural Convection

4.2 Battery Debugging Steps

Step 1: Check whether the power line is connected correctly and whether the connecting nut is tightened in place; Whether the inverter part is connected normally

Step 2: Check whether the communication wiring harness is connected normally as required

Step 3: Connect the PC host computer and select the corresponding communication protocol between the battery and the inverter (please see 4.3.2 Setting Protocol By BMS Host Software (PC))

Step 4: Set the DIP switch: When the host battery communicates with the inverter, the host battery address needs to be set to 1, and other parallel batteries need to be set in order (please see 4.4.2 Dial Switch Setting)

Step 5: After the preparation is completed, turn on the battery switch→ circuit breaker → inverter load switch in order

Step 6: Check whether the system is working properly, if it is abnormal, check or contact the local dealer in order

CAUTION

1. Please strictly follow the above steps for debugging
2. If not using the battery pack for a long time or if there is any fault on the pack, turn off the power switch.

4.3 Communication Protocol Setting

You can choose the below two ways to select your matched inverter communication protocol.

4.3.1 Setting Protocol by Battery LCD

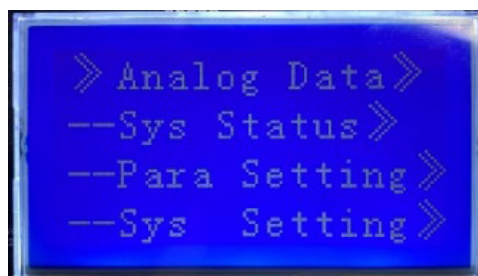
Through the button on the right side of the battery display screen, enter "sys setting → com setting → -- C" successively to select the inverter protocol. The list of communication protocols is as follows:

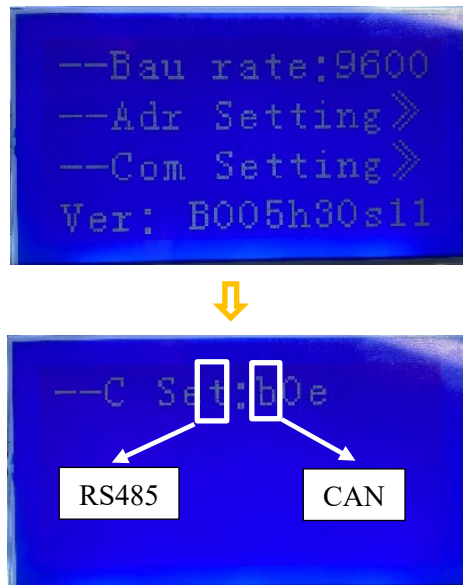
Communication Protocols List

CAN	Supplier	Protocol	RS485	Supplier	Protocol
0	reserve	reserve	0	Surge power	Szxj Battery Modbus Protocol-V1.13
1	PYLON	CAN-Bus-protocol-PYLON-low-voltage-V1.2-20180408	1	PYLON	PYLON low voltage protocol RS485 V3.5 20200227
2	Growatt	Growatt BMS CAN-BUS-protocol-low-voltage-v1.08	2	Growatt	SPF-RS485_protocal_1xSxxP_ESS_V2.01

3	Sofar	Low voltage BMS general CAN protocol description (standard frame) V2.1.003	3	reserve	reserve
4	GoodWe	BMS Protocol (CAN) for Solar Inverter Family V1.2	4	PACE	PACE BMS Modbus Protocol for RS485V1.3
5	SMA	SMA-Sunny Island-CAN	5	reserve	reserve
6	Luxpower tek	Luxpowertek Battery CAN Protocol	6	Voltronic	Voltronic Inverter and BMS 485 Communication Protocol 20201208
7	MUST	MUST-PV1800F-CAN Communication Protocol1.04.04	7	reserve	reserve
8	REVO	REVO-CAN1.0-211111	8	reserve	reserve
9	reserve	reserve	9	reserve	reserve
a	reserve	reserve	a	reserve	reserve
b	VICTRON	CAN-Bus-protocol-VICTRON-low-voltage-V1.2-20180408	b	reserve	reserve
c	INVT	INVT_5K_BMS_ProtocolV1.01 1	c	reserve	reserve
d	Kstar	KSPP CAN_Protocol-V1.11	d	reserve	reserve
e	reserve	reserve	e	reserve	reserve
f	reserve	reserve	f	reserve	reserve

After entering -- C page, set the communication protocol. The display screen protocol display is represented by three hexadecimal digits. The first number represents RS485 protocol, the second number is reserved, and the third number is CAN protocol option, as shown in the below picture.





The detailed steps of modifying the agreement are as follows:

1. The initial page displays the default protocol of the battery. If it needs to be modified, first click "Enter" and the first number is in the flashing state. At the time, enter the RS485 protocol selection state. Select the corresponding number or letter through the "up" key / "down" key and compare with the **Communication Protocol List** in the above table, so as to select corresponding inverter protocol (RS485) is required. The selection numbers/letters range is 15 bits(0-D).
2. After selecting RS485 protocol, click "Enter" to automatically jump to the third number. At the time, the third number is in flashing state and enters the CAN protocol selection state. The selection range is 15 bits(0-D). Select corresponding inverter protocol (CAN) is required by pressing "up" key / "down" key and referring to the number or letter corresponding to the **Communication Protocol List**.
3. After selecting the CAN protocol, you need to click the "enter" key. After a few seconds, the protocol is successfully replaced and saved without power on again.

4.3.2 Setting Protocol By BMS Host Software (PC)

BMS Host software need to install with PC. Log in to our website or consult the local dealer to obtain the BMS upper computer software, but we suggest that the upper computer software should be used by professional installers.

When connect the Master or RS485 communication port from the battery to a computer, the host software information displays on 7 different tabs:

Home: SOC%, voltage, current, cycles, capacity and running status, cell balancing, temperature

Date: Real Data Recode

Storage: System Message

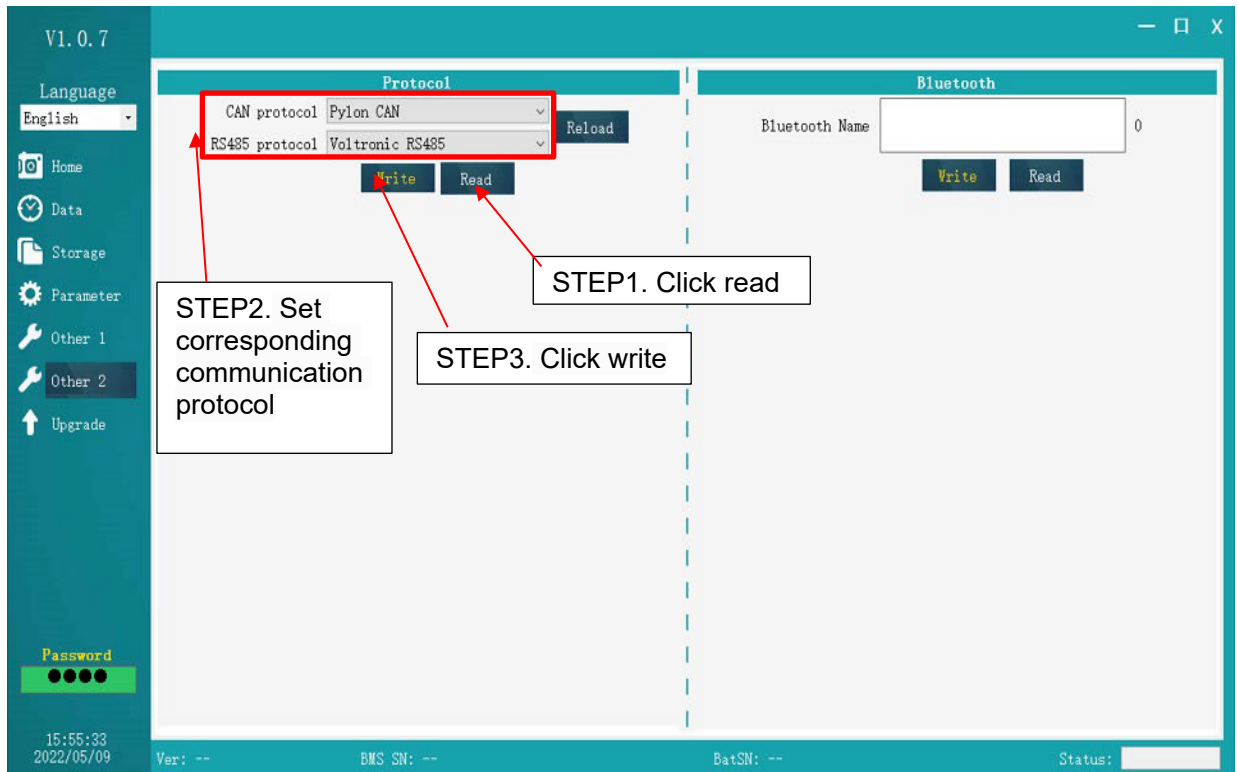
Parameter: Do not use

Other1: Do not use

Other2: Select inverter communication protocol and Bluetooth name.

Upgrade: Upgrade Program

Connect the BMS host PC computer, enter the "other 2" menu, select the corresponding inverter communication protocol, and then operate step by step according to the mode shown in the figure below.

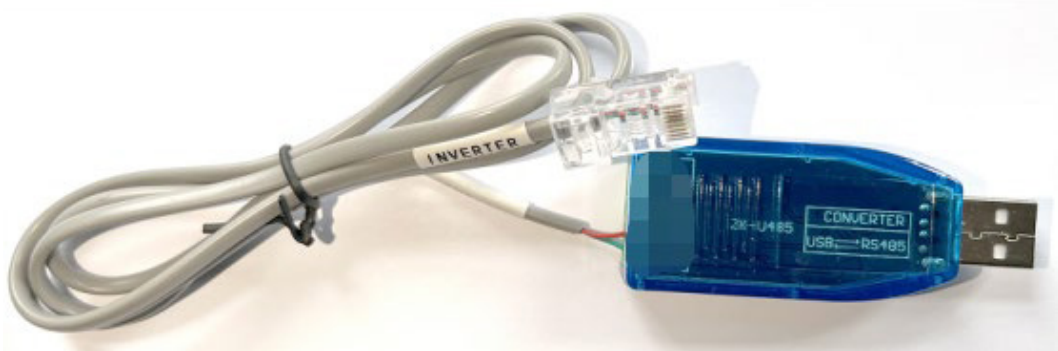


NOTE: Both Master and RS485 ports can connect with PC and other parallel batteries. The Master/RS485 communicate to PC need to buy USB to 485 tools.

Master/RS485 to PC or Parallel

Master/RS485 Port Define

RS485-8P8C-RJ45		RS485-8P8C-RJ45	
RJ45 pin	definition	RJ45 pin	definition
1, 8	RS485-B	9, 16	RS485-B
2, 7	RS485-A	10, 15	RS485-A
3, 6	GND	11, 14	GND
4, 5	NC	12, 13	NC



USB to RS485 tool

4.4 Communication with INVERTER or MPPT

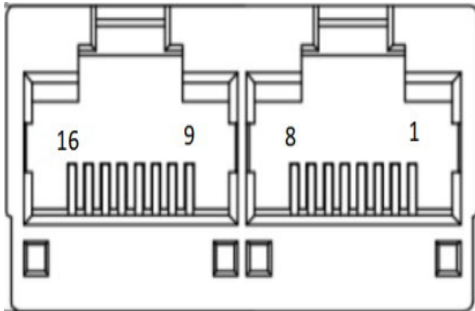
Before using the battery system, the inverter, the MPPT and the battery system must be connected by communication lines. Connect the RS485 communication port of the battery pack to the inverter and MPPT. After all external wiring harnesses are connected, they can work normally after starting up.

The battery has two independent RS485 isolated communication interfaces, and the default communication baud rate is 9600bps. One RS485 interface is used as the internal communication port for battery parallel (RS485 port) or to view the detailed information of the battery through the host computer software (Master port). One RS485 interface is used for external inverter communication, and this port can also be used as the CAN communication port (CAN/RS485 port).

4.4.1 Master/RS485/CAN Ports Introduction

- Internal Master/RS485 parallel communication port. As shown in the below :

Master/RS485 to PC or Parallel Port



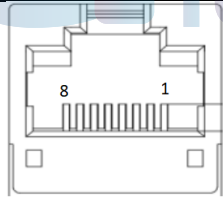
Master/RS485 Port Define

RS485-8P8C-RJ45		RS485-8P8C-RJ45	
RJ45 Pin	Definition	RJ45 Pin	Definition
1、 8	RS485-B	9、 16	RS485-B
2、 7	RS485-A	10、 15	RS485-A
3、 6	GND	11、 14	GND
4、 5	NC	12、 13	NC

- Connected externally to the inverter communication port of RS485/CAN. It can be compatible with multiple inverter protocols. As shown in the figure below:

CAN/RS485 Port Define

RS485-- 8p8c vertical RJ45 socket is adopted	
RJ45 PIN	Define
1、 8	RS485-B1
2、 7	RS485-A1
4	CANH
5	CANL
6	GND



NOTE: Communication line is required for RS485 or CAN communication.

4.4.2 Dial Switch Setting

When the battery is connected to the PC host, the address should be set to 0 to communicate with the PC host computer;

When the battery is used in parallel, set the address through the dial switch on the battery to distinguish different addresses. It is necessary to avoid setting the address to the same.

When the battery communicates with the inverter (or controller), the address of the corresponding battery connected to the inverter (controller) must be set to 1, otherwise the communication cannot be established.



Dial switch interface

The details of setting method are shown in the table below:

NO.	Module Address	BMS Module ID	ID Arrangement			
			1#	2#	3#	4#
1	0x01	1	ON	OFF	OFF	OFF
2	0x02	2	OFF	ON	OFF	OFF
3	0x03	3	ON	ON	OFF	OFF
4	0x04	4	OFF	OFF	ON	OFF
5	0x05	5	ON	OFF	ON	OFF
6	0x06	6	OFF	ON	ON	OFF
7	0x07	7	ON	ON	ON	OFF
8	0x08	8	OFF	OFF	OFF	ON
9	0x09	9	ON	OFF	OFF	ON
10	0x0A	10	OFF	ON	OFF	ON
11	0x0B	11	ON	ON	OFF	ON
12	0x0C	12	OFF	OFF	ON	ON
13	0x0D	13	ON	OFF	ON	ON
14	0x0E	14	OFF	ON	ON	ON
15	0x0F	15	ON	ON	ON	ON
0	0x00	0	OFF	OFF	OFF	OFF

5 Troubleshooting

Check the indicators on the front of the battery to determine the status of the battery pack. A warning state is triggered when a condition, such as voltage or temperature, is outside battery's rating. When the battery pack status falls outside of set limits, it enters a warning state. When a warning is reported, turn off the DC source immediately.

Use the monitoring software to identify the cause of the warning.

Warning Alarms:

Battery Over Voltage

Battery Under Voltage

Battery Over Temperature

Battery Under Temperature

Battery Discharge Over Current

Battery Charge Over Current

The fault state is cleared when the battery pack recovers to normal operation. If battery pack is not working correctly and the issue persists, contact a qualified technician or your distributor.

If the battery pack or the inverter indicates FAULT or fails to operate, contact your distributor immediately.

6 Liability Limitation

Any product damage or property loss caused by the following conditions does not assume any direct or indirect liability.

Product modified, design changed or parts replaced without authorization;

Changes, or attempted repairs and erasing of series number or seals by non technician;

System design and installation are not in compliance with standards and regulations;

Failure to comply with the local safety regulations;

Transport damage (including painting scratch caused by rubbing inside packaging during shipping). A

claim should be made directly to shipping or insurance company in this case as soon as the container/packaging is unloaded and such damage is identified;
Failure to follow any/all of the user manual, the installation guide and the maintenance regulations;
Improper use or misuse of the device;
Insufficient ventilation of the device;
The maintenance procedures relating to the product have not been followed to an acceptable standard;
Force majeure (violent or stormy weather, lightning, overvoltage, fire etc);
Damages caused by any external factors.

