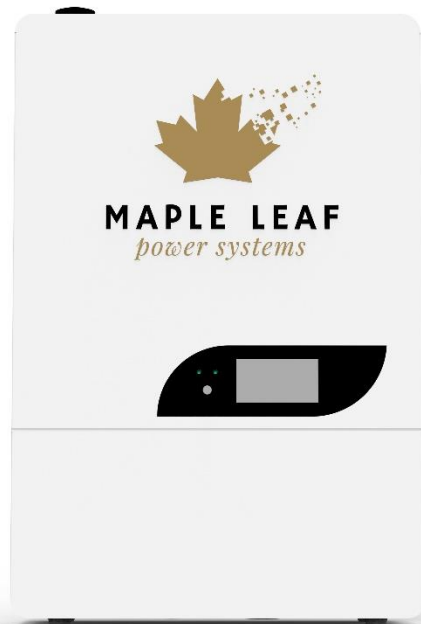




# MapleLeaf POWERWALL-51.2V100AH

**Updated: 2023-05-09**





## About This Product

The MAPLELEAF POWERWALL Series Battery uses the most environmentally friendly LiFePO4 cells, which removes constraints on operating temperature and eliminates the risk of thermal runaway and fire. The built-in smart Battery Management System (BMS) integrates multiple safety concepts, including Overcharge and Over-discharge Protection, Temperature Observation, Overload Monitoring, and Cell Balancing.

The MAPLELEAF POWERWALL Series Battery is manufactured in accordance with UL1973 & UL9540A standards and uses materials that meet flame retardant requirements. The BMS is designed with redundant protection. The battery also supports a WIFI platform monitor and can be used in parallel with up to 14 units to create a wall-mounted Energy Storage System with 70~105kWh of energy.

This installation manual contains important information about the procedures and features of MAPLELEAF Lithium batteries. Please read all instructions in this manual before installation, operation, transportation, storage, and maintenance.





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# 1. Safety Attention

Improper operation could result in electrical shocks, burns, and other personal injuries, as well as equipment damage. Therefore, it is crucial to read the important security information and strictly adhere to all the safety rules outlined in this instruction manual.

Below is a list of safety rules that must be followed when operating this product. For specific security instructions regarding the use and maintenance process, please refer to the warning note provided in the corresponding section.



**Risk:** Failure to comply with the following provisions may result in casualties or equipment damage.

Do not touch the live parts of the equipment unless you have confirmed the voltage or temperature of the equipment.

Only professional electricians or qualified personnel are authorized to install, operate, overhaul, and maintain the equipment. When conducting maintenance or overhauls, at least two individuals must wear safety shoes, insulated gloves, and establish warning signs for safety purposes.

To ensure safe operation, it is essential to follow the safety instructions provided in this manual and strictly comply with all safety instructions outlined in the installation manual for this product.



**Warning:** Failure to comply with the following provisions may result in personnel injury or equipment damage.

When moving, transporting, or placing equipment, ensure that it is positioned horizontally.

The equipment should be installed on fire-retardant objects, and flammable materials must not be placed inside or near the box.

Avoid leaving foreign objects inside the product.

The monitoring system should not be controlled by connecting and disconnecting the input power except in emergency situations.

The product should be regularly maintained and cleaned.

It is important to establish a system to record the operation and maintenance of the equipment.



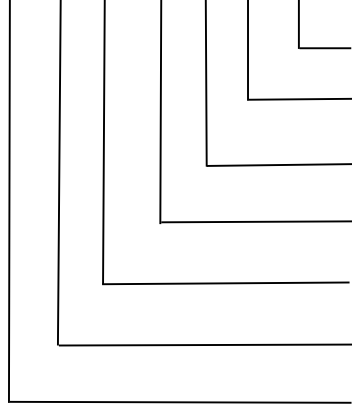
**Warning:** Electrostatic Discharge (ESD)

Personnel who is handling the equipment must wear a properly grounded anti-static bracelet and avoid holding the printed circuit board by its edges to prevent static electricity. Contacting electrically conductive objects like metal sheets can help eliminate electrostatic discharge.

## 2. Product Introduction

### 2.1 Product Name

RS-W 51 XXX A-ML-00



1. Label changes/software parameters
2. Stands for MapleLeaf
3. Version iteration updates material numbers (sorted alphabetically)
4. Nominal Capacity XXXAh
5. Nominal Voltage 51.2V
6. Wall-mounted
7. Residential Storage

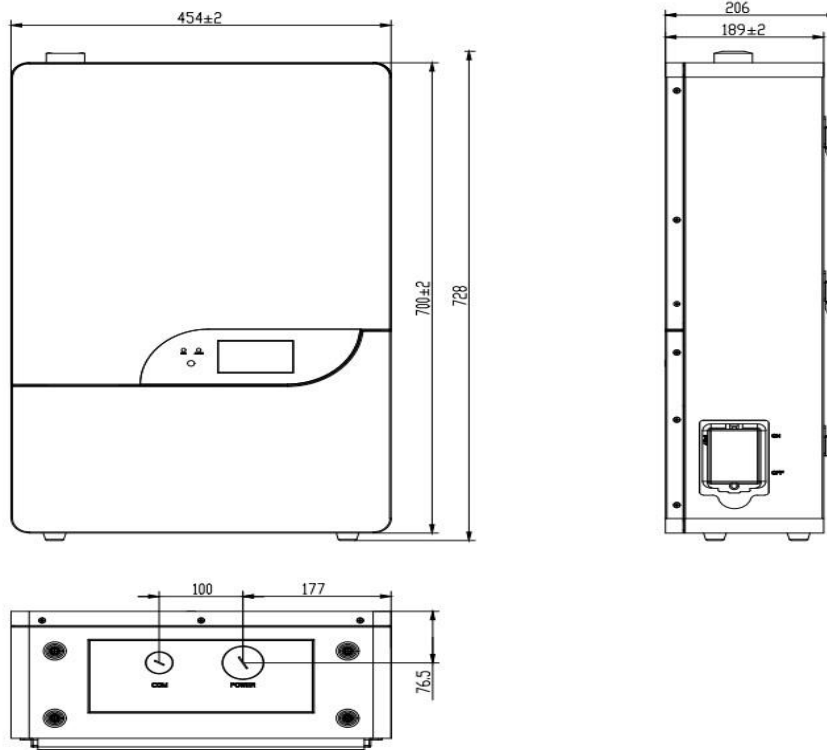
### 2.2 Technical Parameter

| Item                             | RS-W51100A |  |
|----------------------------------|------------|--|
| Battery type                     | LiFePO4    |  |
| Nominal voltage                  | 51.2V      |  |
| Nominal capacity                 | 100Ah      |  |
| Nominal energy                   | 5.12kWh    |  |
| Usable energy                    | 5.0kWh     |  |
| Recommended charge current       | 50A        |  |
| Max continuous charge current    | 80A        |  |
| Max continuous discharge current | 100A       |  |
| Peak discharge current (3s)      | 350A       |  |
| Max continuous discharge power   | 5kW        |  |
| Peak discharge power (3s)        | 15 kW      |  |
| Standard charge voltage          | 56.0V      |  |

|                                     |   |  |  |
|-------------------------------------|---|--|--|
| Recommended floating charge voltage | 54.0V                                     |  |  |
| End discharging voltage             | 43.2V                                     |  |  |
| IP rating                           | IP55                                      |  |  |
| Self-discharge rate (Sleep mode)    | Residual capacity ≤ 3%/month; ≤ 20%/years |  |  |
| Dimensions(W * H* D) in mm          | 454* 670 * 170                            |  |  |
| Battery module weight               | ~60.7kg                                   |  |  |
| operation temperature               | 0~45°C(32~113°F)                          |  |  |
| Recommended operation temperature   | 15-30°C(59~86°F)                          |  |  |
| Storage temperature for short time  | -10~45°C (14~113°F)                       |  |  |
| Storage temperature for long time   | 10~35°C (50~95°F)                         |  |  |

## 2.3 Product pictures

Product dimension (Unit:mm) :



### 3. Storage & Transport

#### Storage:

To ensure the proper functioning and longevity of the battery, it is important to prepare the right environment and charge it in a timely manner. Here are some guidelines to follow:

- Store the battery in a dry, clean, well-ventilated and shaded warehouse. The storage temperature should be within the range of -10 to 30°C, and the relative humidity should be between 45% and 85%RH.
- Avoid deep-discharging the battery as it can cause damage to the battery modules. Therefore, make sure to charge the battery within 15 days after it has been over-discharged.
- Handle the batteries with care to prevent dropping, turning over, or stacking them in a way that can cause serious damage.
- Keep the battery out of reach of children and pets.
- Before storing the battery, ensure that its state of charge (SOC) is at 50%. Check the SOC monthly to make sure it does not fall below 20%, as the battery will self-discharge in approximately 2 months at 20% SOC. Additionally, check the voltage every 3 months and recycle the battery every 6 months if it is not in use for an extended period of time.

#### Transport:

Lithium-ion batteries are considered hazardous goods, so it is crucial to follow these guidelines when transporting them:

- Adhere to all general transport regulations, including legal regulations specific to the mode of transport.
- During transport, ensure that the batteries are not stacked more than four layers high, and that they are kept upright with their faces up to prevent falling.
- Do not transport the batteries upside down, and do not lift them by their terminal cables.
- Avoid subjecting the batteries to vibrations during transport.
- Check the battery immediately after transport to ensure that there has been no damage or leakage.



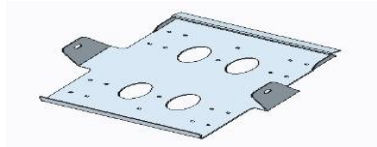
## 4. Installation

### 4.1 Installation Preparation


#### 1) Environment Requirement

|                        |   |
|------------------------|---|
| Application scenarios  | Residential energy storage systems  |
| Operating Environment  | Indoors or under a dark eave and place away from strong electromagnetic radiation |
| Recommended salt spray | An area 2km from the coast  |
| Operating Temperature  | 0~45°C (32~113°F)   |
| IP grade               | IP55  |
| Storage Temperature    | -10°C~30°C (14°F~86°F)  |
| Operating Humidity     | 5%~95%  |
| Install Altitude       | ≤4000m  |
| Install location       | Under the roof  |

#### 2) Check the packing list

| Parts                        | QTY   | Photo  |
|------------------------------|-------|--|
| Inverter communication cable | 1 pcs |  |
| Expanding screw M8*60        | 8 pcs |  |
| Wall mounting bracket        | 1 pcs |  |



|                             |      |   |
|-----------------------------|------|---|
| Modules communication cable | 1pcs |  |
|-----------------------------|------|---|

- Check the battery box for any signs of damage, such as cracks or dents.
- Inspect the battery terminals and connections to ensure they are clean, free of dirt, fluids, and corrosion.
- Verify that all battery cables and their connections are tight, intact, and not broken or frayed.
- Check the torque on the terminal bolts to ensure they are properly tightened.
- Replace any damaged batteries or cables to prevent potential malfunctions or safety hazards.

### 3) Tools & Materials

The following insulated tools and materials are required:

- Positive and negative battery cables. We recommend copper cables 2AWG. The battery power cables are not included. Please refer to the published Battery Cable Sizing Chart for the proper size, based on your system specification.
- Positive and Negative Terminal luge recommendation: M10\*1.5 (diameter: 10mm or 3/8in).
- Screwdriver.
- RJ45 cable.
- Wall Mount hangers.
- OHSA (Occupational Health and Safety Administration) approved personal protective equipment.

|   |   |  |
|---|---|--|
|  |  |  |
| Insulated gloves  | Safety Glasses  | Safety Shoes   |

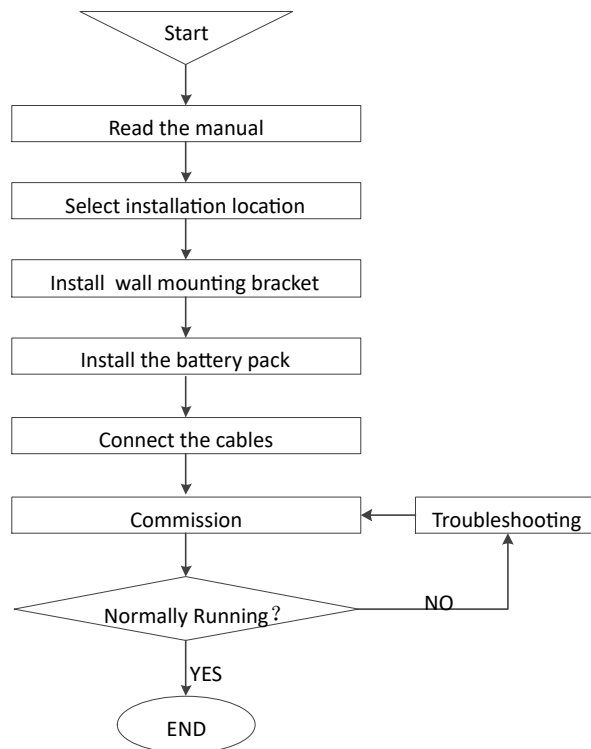
### CAUTION:

- If the ambient temperature exceeds the operating range, the battery pack may stop operating to protect itself. Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

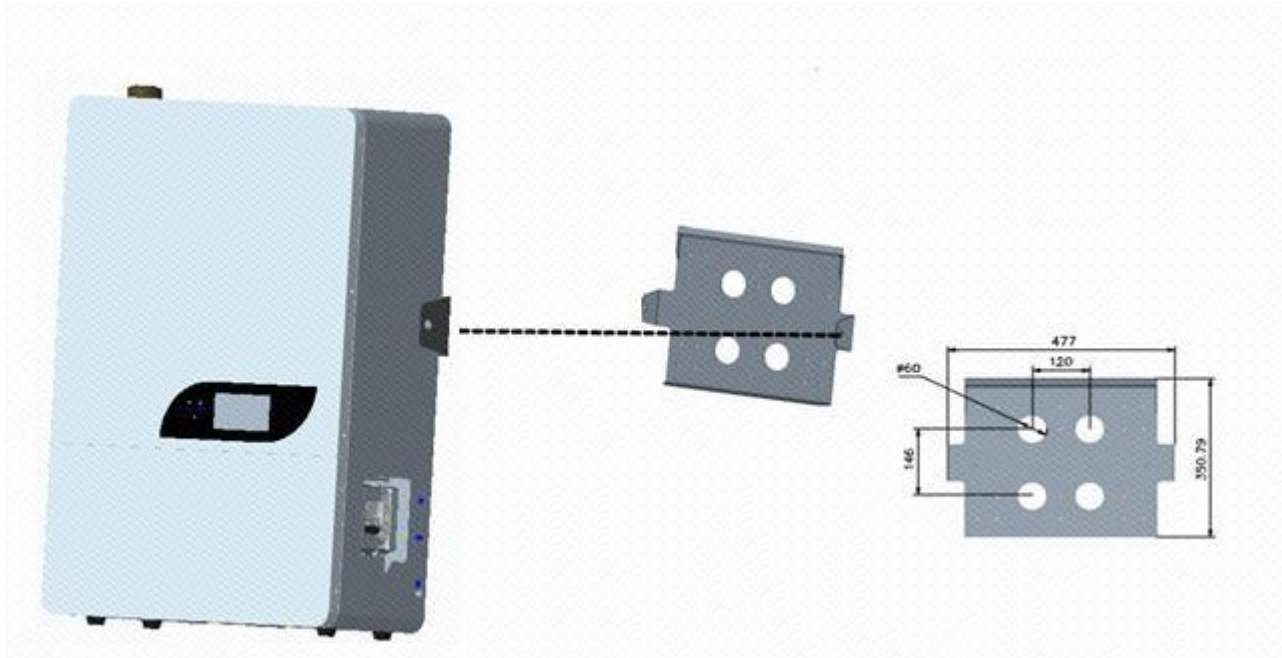
- This battery pack weighs about 61kg. To prevent personal injury, it is recommended to use proper lifting equipment during installation.
- If the user notices any deformation of the battery pack shell during installation, they should stop the installation process and contact us immediately.
- The total weight of the battery is about 61kg. Please ensure that the wall can withstand the weight of the battery before hanging it.
- The battery system should be installed in a cool and dry place, away from heat sources and direct sunlight, to avoid power output interruption or system failure due to over-temperature.
- Keep the battery system away from transformers and other strong electromagnetic fields to prevent abnormal communication and power supply control.
- Keep the battery system away from fire, flammable and explosive items.
- The system requires professional maintenance, so ensure that the installation site is away from children and pets.

## 4.2 Installation Steps

Please follow the flowchart below to install the battery system. For more details, please refer to the 1~3 item.



## 1. Structure Installation 1) Install wall mounting bracket



The MAPLELEAF POWERWALL series battery is designed to be wall-mounted during installation. The rack should be fixed onto the wall using anchor screws. For information on the weight and dimensions of the MAPLELEAF Lithium Battery, please refer to the product's data sheet.

## 2) Installation battery pack

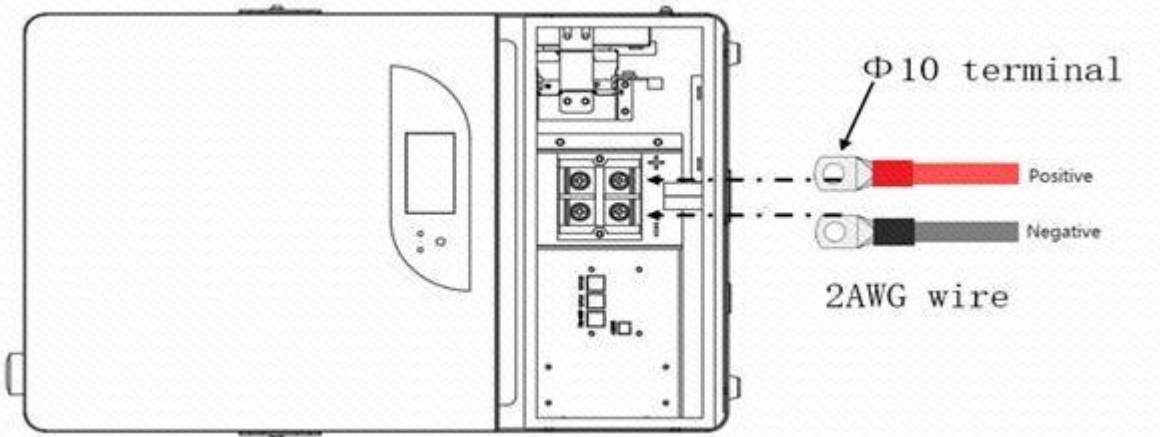
- a) a) Use two people to lift the battery out of the wooden case.
- b) Install the wall mounting bracket.
- c) Use lifting equipment to lift the battery box and align it with the mounting hole of the wall-mounted bracket. Clip it into place.
- d) Hang the battery pack onto the wall bracket.
- e) Secure the wall-mounted bracket and battery box using the designated screws.

## 2. Cable Connection

### 1) Connecting the battery

The battery terminals are located at the bottom of the front cover. Please ensure that the breaker on the right side of the rack is in the OFF position. Install the positive cable first and then the negative cable. Do not connect the positive and negative terminals to any metal mounting, fixture, or body part, and make sure they are not crossed. The recommended torque range for the terminals is 10.0 – 19.1 N·m (7.4 – 14.1 ft.lb).

The MAPLELEAF Lithium Batteries are equipped with two M10 threaded terminals with a lock washer and nut. Use 10mm ring terminals along with properly sized wiring cables to connect the battery to the inverter/charger. Connect the red wire to the “+” electrode for positive and the black wire to the “-” electrode for negative. Do not reverse polarity, as this will void the warranty.



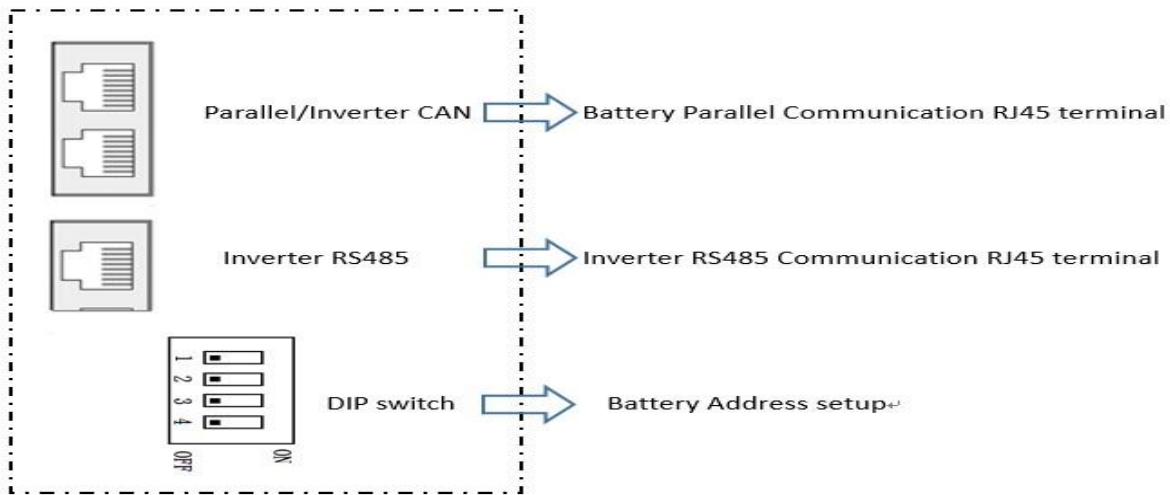
Top View



**NOTE!** Without exception, products experiencing terminal burn out will not covered under the warrant .

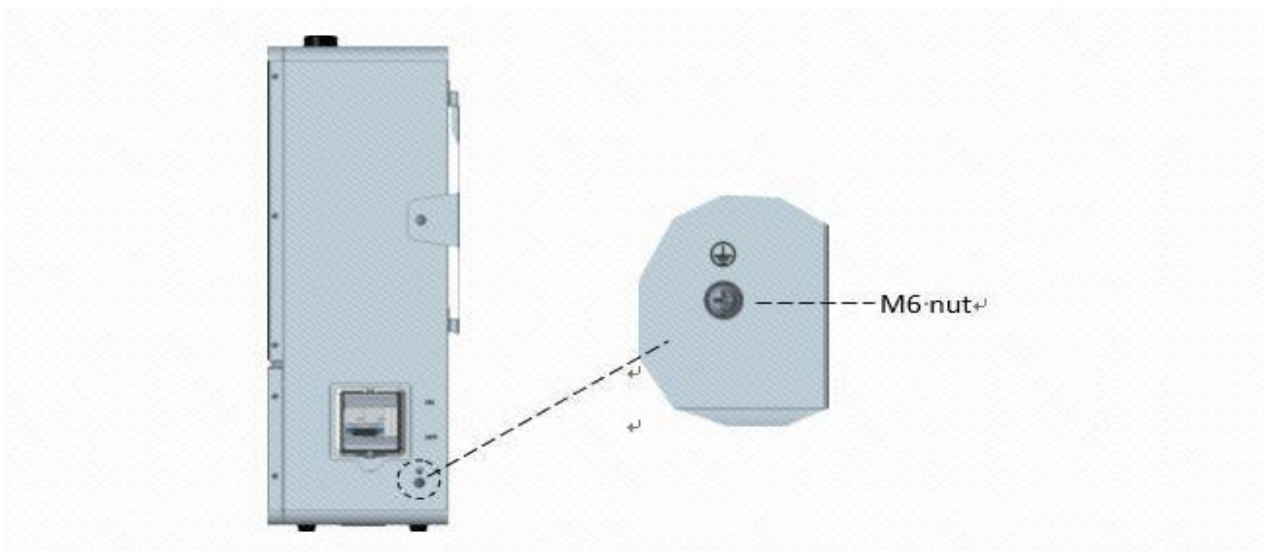
## 2) Communication Port

MAPLELEAF POWERWALL series battery has a self-managed Battery Management System (BMS). The Communication board has three ports which are designed to support Inverter RS 485 and CAN communication, battery parallel communication (see Parallel Connection). When batteries need to communicate in parallel, the user needs to set the battery address through the DIP switch, and the CAN communication port of the last battery needs to connect to the terminal resistor.



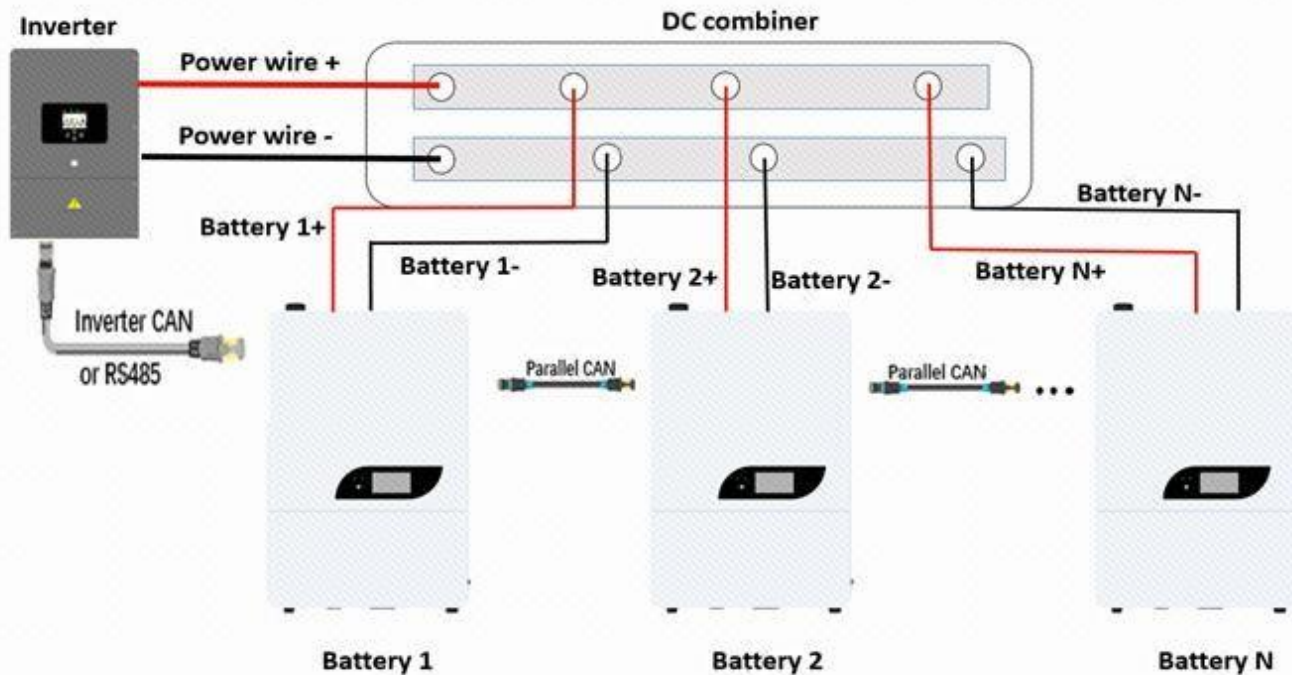
## 3) Grounding

Grounding the battery, if necessary. MAPLELEAF POWERWALL series battery has 1 grounding holes on the bottom of battery case.



#### 4) Parallel Connection

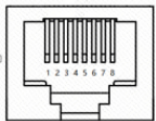
The following illustration shows how to connect multiple batteries in parallel.



Please follow the procedure to parallel POWERWALL series batteries:

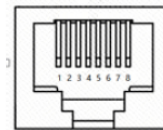
- 1) Prepare communication cable. Each unit comes with 1pcs RJ45 cable (for inter- battery Parallel CAN port). Cables for communicating with the inverter are provided by the customer. If the cable is missing, please make sure the cable you purchase on the market meets the following standards. Please note that a standard RS485 cable is used.

Communication cable Pin definition:

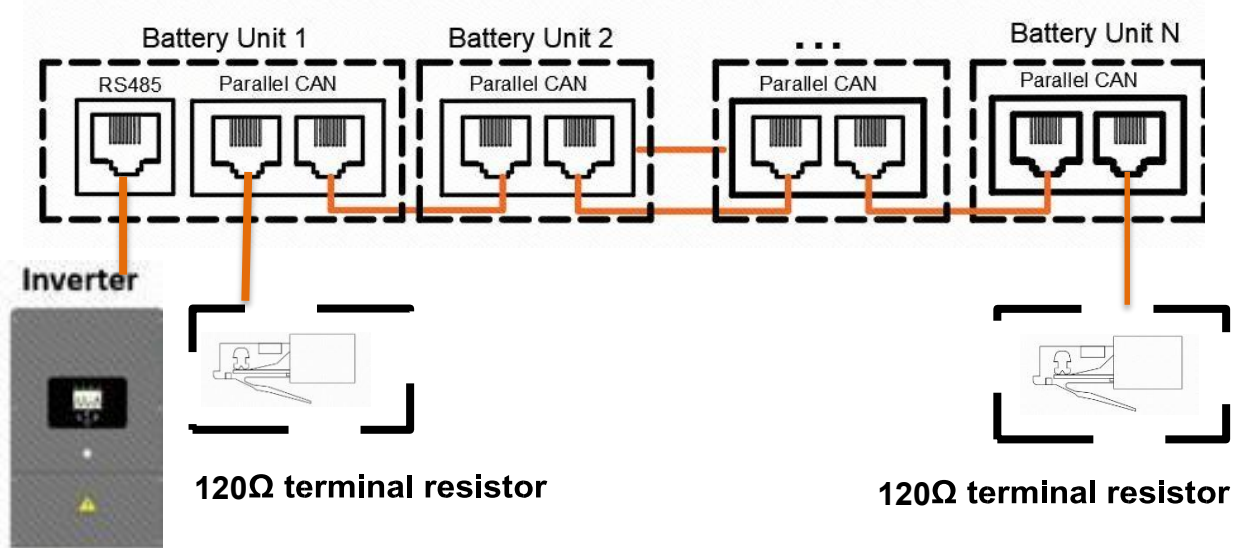


| Parallel & Inverter CAN Port |            |
|------------------------------|------------|
| Pin No.                      | Definition |
| 1                            | NC         |
| 2                            | NC         |
| 3                            | CANL       |
| 4                            | CANL       |
| 5                            | CANH       |
| 6                            | CANH       |
| 7                            | NC         |
| 8                            | NC         |

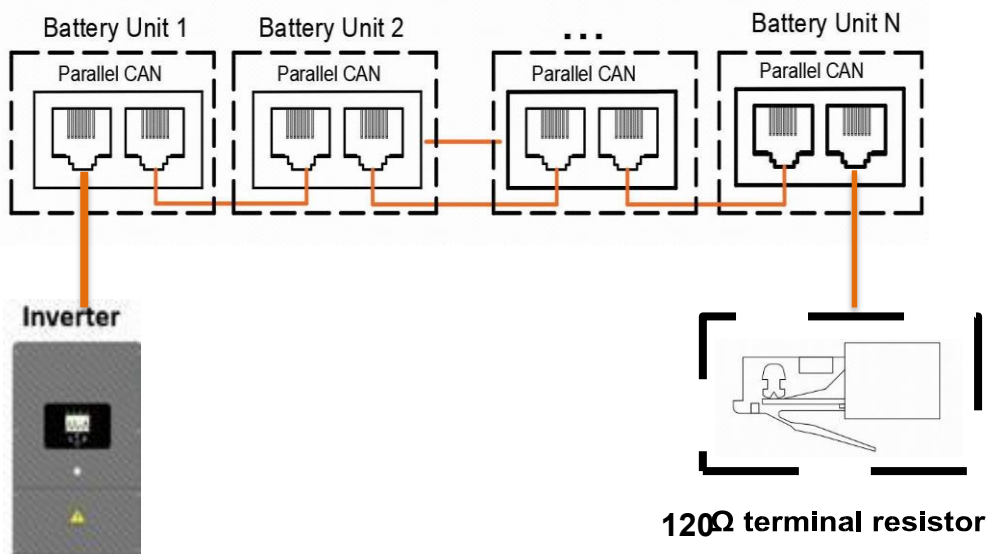
| Battery & Inverter RS485 Port |                  |
|-------------------------------|------------------|
| Pin No.                       | Definition       |
| 1                             | Inverter_RS485B  |
| 2                             | Inverter_RS485A  |
| 3                             | NC               |
| 4                             | NC               |
| 5                             | NC               |
| 6                             | NC               |
| 7                             | BMS debug_RS485A |
| 8                             | BMS debug_RS485B |



- 2) Confirm the Battery DC breaker is in the “OFF” position.
  - 3) Wire each battery’s Power bus to Inverter. And wire inverter’s cable to PV, Grid and Load.
  - 4) Use the RJ45 cables to connect the batteries’ Parallel CAN port, as illustrated in the chart below. Ensure that the communication port of the last terminal (N) is connected to 120Ω terminal resistor.
- a. The battery host communicates with the RS485 inverter.



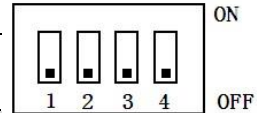
- b. The battery host communicates with the CAN inverter.



- 5) Press the button on the front of each battery for 3+seconds one by one, until all batteries wake up.
- 6) Set the address of the Dial Switch.



| Module number |                       | Dial Switch |     |     |     |
|---------------|-----------------------|-------------|-----|-----|-----|
|               |                       | #1          | #2  | #3  | #4  |
| 0             | Single module         | OFF         | OFF | OFF | OFF |
| 1             | Parallel mode(Master) | ON          | OFF | OFF | OFF |
| 2             | Parallel mode(Slave)  | OFF         | ON  | OFF | OFF |
| 3             | Parallel mode(Slave)  | ON          | ON  | OFF | OFF |
| 4             | Parallel mode(Slave)  | OFF         | OFF | ON  | OFF |
| 5             | Parallel mode(Slave)  | ON          | OFF | ON  | OFF |
| 6             | Parallel mode(Slave)  | OFF         | ON  | ON  | OFF |
| 7             | Parallel mode(Slave)  | ON          | ON  | ON  | OFF |
| 8             | Parallel mode(Slave)  | OFF         | OFF | OFF | ON  |
| 9             | Parallel mode(Slave)  | ON          | OFF | OFF | ON  |
| 10            | Parallel mode(Slave)  | OFF         | ON  | OFF | ON  |
| 11            | Parallel mode(Slave)  | ON          | ON  | OFF | ON  |
| 12            | Parallel mode(Slave)  | OFF         | OFF | ON  | ON  |
| 13            | Parallel mode(Slave)  | ON          | OFF | ON  | ON  |
| 14            | Parallel mode(Slave)  | OFF         | ON  | ON  | ON  |







**NOTE!**

- If used for single battery without parallel, must set Address as 0.
- When used for several batteries parallel, please set the master battery number as 1, and the other battery number as 2~14.

7) Touch the Upper computer to set Inverter as the following form.

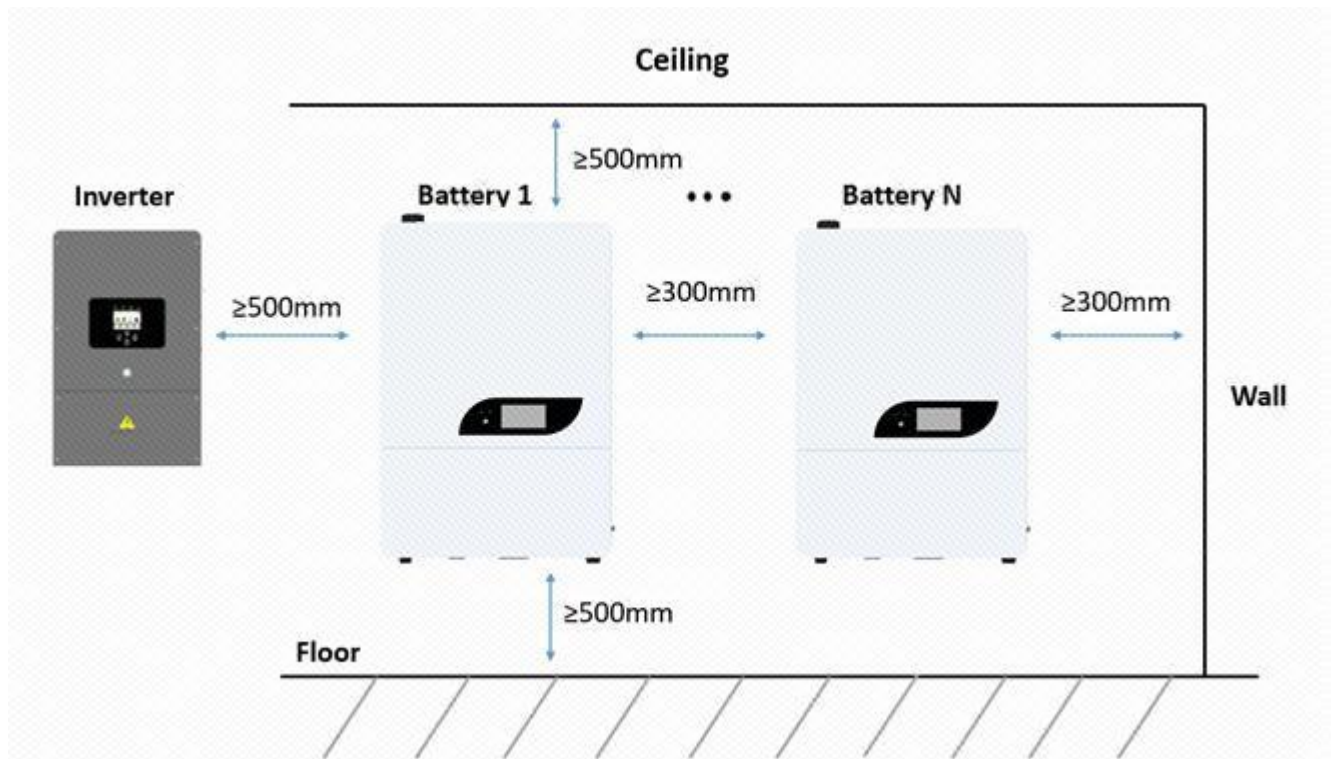
| Inverter Setup | Support Inverter Protocol             |
|----------------|---------------------------------------|
| 1              | Schneider Modbus, 19200bps            |
| 2              | Solark(Deye) Modbus , 9600bps         |
| 3              | Victron CANbus,250kbps                |
| 4              | UZ-CANbus,500kbps                     |
| 5              | Reserved                              |
| 6              | Growwat Modbus,9600bps                |
| 7              | Reserved                              |
| 8              | Voltronic/MapleLeaf Modbus<br>9600bps |
| 9              | (Deye)00-CANbus, 500kbps              |
| 10             | Solark CANbus,500kbps                 |
| 11             | SMA CANbus,500kbps                    |

- 8) Use RJ45 cable to connect the inverter CAN or RS485 port of master battery (which Battery ID set as 1) to inverter communication port.
- 9) Turn ON inverter’s breaker, then turn ON all batteries’ DC breaker, and then press the button of master battery (Battery ID 1) for 6+ seconds to turn off, at last press master battery’s button for 3+ seconds to start automatically parallel process as below:
- Master battery requests the lowest voltage battery of the whole bank to pre-charge and turn on relay, and request charge current from inverter.

- b) As the battery voltage increase by inverter, other battery join in to parallel one by one.
- c) After all normal batteries complete parallel, the parallel process end up, and recover normal request from inverter.

### 3. Wire the battery cables

For connecting multiple units: Maintain the recommended distance among battery units's side or wall- at least 12inches (300mm). And keep battery unit' side at lease 20inches (500mm) away from Inverter 、 ceiling or floor.



**CAUTION!** If paralleling the POWERWALL series batteries without connecting them via RJ45 cable(s), please make sure the voltage difference between the highest voltage and lowest voltage does not exceed 1.0 volts. A large current flow from the higher voltage battery to the lower voltage battery could potentially damage one or both batteries. Resulting damage to the battery will void the warranty.

## 4. System Commission

If you only install single POWERWALL series battery, please follow the below steps to start up:

- a) Check system connection cables for correct polarity.
- b) Put the battery's breaker on the "ON" position.
- c) Put inverter breaker in the "ON" position.
- d) Push the power button on the front of the unit for 3 seconds to turn on the battery LCD display.
- e)

## 5. Final Connection of the Installation

Final installation and operation guidelines will be dictated by your Electrician and Installer based on the overall properties of and procedures for the equipment in your installation and any code requirements that apply to your region. MAPLELEAF technicians and sales staff are available to provide any additional information on the MAPLELEAF Lithium Batteries as needed. Please be aware of the potential electrical hazards before interacting with any and all electrical or mechanical devices. Please take all necessary safety precautions in your projects and installations.

## 5. Operation

### 5.1 Operating Environment

See "2.2 Technical Parameter" Table on page 4

### 5.2 Charging



#### CAUTION!

- Never attempt to charge a battery without first reviewing and understanding the instructions for the charger being used. Only use a MAPLELEAF Approved Lithium Ferro Phosphate (LFP) charger if ancillary charging is required before installation, testing or troubleshooting. Failure to use a MAPLELEAF approved LFP charger will damage the battery and void the warranty. **Please follow the specification on MAPLELEAF Lithium Battery Datasheet.**

Please follow the following steps to use the charger to charge the battery:

- 1) Connect the charger leads to the battery;
- 2) Make sure that the charger lead, both at the charger and the battery side, connections are tight.
- 3) Turn on the breaker of battery;
- 4) Startup the battery by holding the power button of battery for about 3 seconds;
- 5) Turn the charger on.

### 5.3 Discharging

- Do not discharge battery below operating voltage.
- Do not discharge battery at rates greater than maximum continuous current.
- Do not operate in conditions that will exceed the internal operating temperatures of the battery.

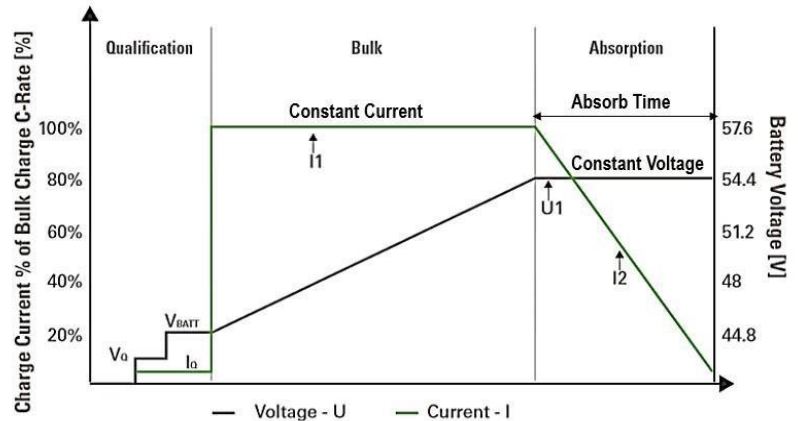
### 5.4 Parameter set up guide in Charger/Inverter

Before commissioning the energy storage system, the appropriate controller and inverter settings must be programmed per the manufacturer’s recommendations. Consult the manufacturer’s manuals and/or access technical support (Schneider, Sol-Ark, Victron, SMA, Growatt, Deye).

Although MAPLELEAF Lithium batteries can perform at very high rates and depths of discharge within a very wide temperature range, in order to achieve extended life cycles and to comply with the Warranty, the following guidelines should be followed:

#### 1. Understand Charge Stage

- Bulk Charge: Charge at Constant Current (CC) to Bulk/Absorb Voltage;
- Absorption Charge: Maintain Constant Bulk/Absorb Voltage (CV);
- Terminate when charge current drops below 0.05C;
- Unlike Lead Acid batteries, Lithium Ferro Phosphate batteries do not require Float Charge.



#### 2. Charger/Inverter configuration recommendation for best Performance

- Recommended operating parameters of charger/Inverters For 3,000 Cycles:

Operating temperature range: 32 F to 15.12 F (0 °C to 49°C)

- Recommended operating parameters of charger/Inverters For 6,000 Cycles:

Operating temperature range: 50 F to 110 F (10°C to 43°C)



**CAUTION! Do Not Operate MAPLELEAF Lithium Batteries at an average temperature exceeding 30 °C / 86 °F over the life of the battery.**

## 6. Protective circuit specification

### 6.1 BMS alarm & protection parameter

The Battery Management System (BMS) can monitor and optimized each single cell during charge & discharge, to protect the battery pack overcharge, over discharge, short circuit, etc. Overall, the BMS helps to ensure safe and accurate operation.

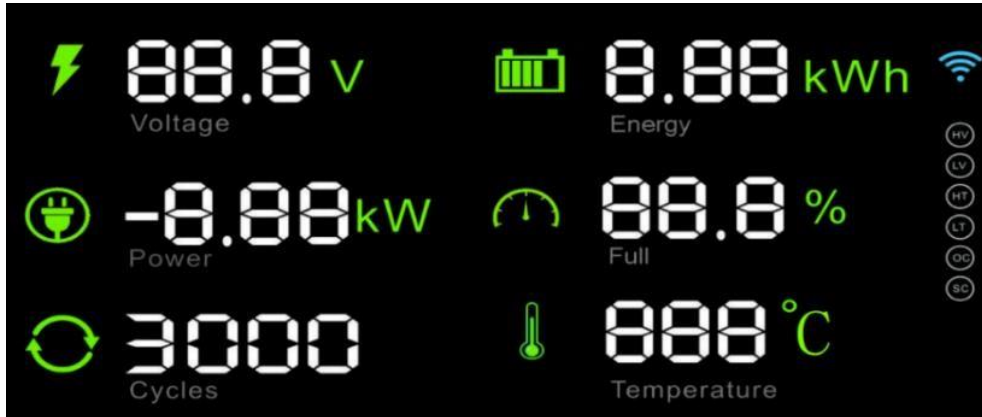
| Items                      |  |                           |  |
|----------------------------|--|---------------------------|--|
| Battery Alarm & Protection |  | Description               |  |
| <b>Over voltage</b>        | Over-voltage alarm for each cell           | 3.55±0.03V                |  |
|                            | Over-voltage protection for each cell      | 3.75±0.03V for 1±0.5s     |  |
|                            | Over-voltage release for each cell         | 3.35±0.03V                |  |
|                            | Over-voltage alarm for total voltage       | 57.2V±0.2V                |  |
|                            | Over-voltage protection for total voltage  | 58.4V±0.5V for 1±0.5s     |  |
|                            | Over-voltage release for total voltage     | 53.6V±0.5V                |  |
|                            | Over-voltage release method                | Under the release voltage |  |
| <b>Under voltage</b>       | Under-voltage for each cell                | 2.90±0.03V                |  |
|                            | Under-voltage protection for each cell     | 2.70±0.03V for 1±0.5s     |  |
|                            | Under-voltage release for each cell        | 3.15±0.03V                |  |
|                            | Under-voltage alarm for total voltage      | 46.4V±0.5V                |  |
|                            | Under-voltage protection for total voltage | 43.2V±0.5V for 1±0.5s     |  |
|                            | Under-voltage release for total voltage    | 50.4V±0.5V                |  |
|                            | Under-voltage release method               | Charge to recovery        |  |
| <b>Over current</b>        | Charge over current alarm                  | 135±5A                    |  |
|                            | Charge over current protection             | 120±5A                    |  |
|                            | Protection delay time                      | 5±1s                      |  |
|                            | Charge over current release method         | Auto release after 1 min  |  |
|                            | Discharge over current alarm               | 110±10A                   |  |
|                            | Discharge over current protection          | 120±10A                   |  |
|                            | Protection delay time                      | 5±1s                      |  |
|                            | Over current release method                | Auto release after 1min   |  |
|                            | Charge over temperature alarm              | 50±3°C                    |  |

|  |                                       |  |
|--|---------------------------------------|--|
| <b>Charge over temperature</b>           | Charge over temperature protection    | 55±3°C   |
|  | Charge over temperature release       | 45±3°C   |
|  | Discharge over temperature alarm      | 60±3°C   |
|  | Discharge over temperature protection | 65±3°C   |
| <b>Discharge over temperature</b>        | Discharge over temperature release    | 55±3°C   |
| <b>Charge low temperature protection</b> | Charge under temperature alarm        | 3±3°C  |
|  | Charge under temperature protection   | 0±3°C  |
|  | Charge under temperature release      | 5±3°C  |
| <b>SOC</b>                               | Low SOC Alarm                         | 10%  |
| <b>LCD</b>                               | Battery information display           | Voltage, Power, SOC, Cycles, Temperature, Residual energy, Errors alerts |
| <b>Monitor &amp; Communication</b>       |                                       |  |
| WIFI Monitoring                          |                                       | Available  |
| Communication                            |                                       | Can-bus, RS485 Optional  |
| Series & Parallel connection             |                                       | No series connection;<br>Support max. 14sets in parallel.                |







## 6.2 Battery Information Display



### LCD display:

Touch the power button and will automatically activate the LCD Screen.



### Supplementary instructions:

| Display   | Indicator           | Note   |
|---|---------------------|--|
|  | Battery voltage     |  |
|  | Residual energy     |  |
|  | Current power       | Negative value indicates discharging. Positive value indicates charging. |
|  | SOC                 | State of charge  |
|  | Cycle Numbers       |  |
|  | Battery temperature |  |

|  |                                 |   |
|--|---------------------------------|---|
|   | <p>WIFI mark</p>                | <p><b>OFF:</b> Not connect to router, or battery is configured to router, but router connection fails;<br/> <b>Rolling:</b> One-click configuration, in this mode user can check battery status through local connections, can also configure the battery to connect to router;<br/> <b>Flash:</b> user can check the battery status through local connections;<br/> <b>ON:</b> user can check the battery status through local connections;<br/> <b>ON:</b> Signal displays normally according to the signal strength, connect to router, and can check the battery status remotely.</p> |
|  | <p>Alarm or protection sign</p> | <p>System will activate related mark when alarm or protection: <b>HV:</b> High Voltage;<br/> <b>LV:</b> Low Voltage;<br/> <b>HT:</b> High Temperature;<br/> <b>LT:</b> Low Temperature;<br/> <b>OC:</b> (Charge &amp; Discharge)Over Current; <b>SC:</b> Short Circuit.</p>   |







## 7. Maintenance

### 7.1 Troubleshooting referring to error marks

When the battery falls beyond the prescribed range, it goes into fault state by turning on red LED “ALARM”. User can check the status from LCD screen of battery to determine in what state the battery is.



The possible error marks are as follows:

| Error signal  | Troubleshooting   |
|---|---|
| Battery High-Voltage                   | Reduce charging voltage or stop charging.   |
| Battery Low-voltage                    | Low power, please charge immediately.   |
| Battery High-temperature               | Stop charging or discharging until battery temperature fall below the recover temperature.  |
| Battery Low-temperature                | Stop charging or discharging until battery temperature rise above the recover temperature.  |
| Battery charge/discharge Over-Current  | Reduce the charging current or discharging power, and battery will auto release in 1minutes.  |
| Battery Short-Circuit                  | Check the external power wire of the battery, eliminate short-circuit connection.<br>Pay attention to the correct the start-up sequences. |
| SOC Light-bar flashing  | This means LCD screen & SOC light-bar lose connection with BMS. Please restart the battery by pressing the power button.                  |

## 7.2 Troubleshooting under other situations

If all above error marks are OFF on the display, and the green LED "RUN" is on, but user still can't use normally, please troubleshooting as next table:

| Description                             | Troubleshooting  |
|---|--|
| Battery module can't start the inverter | <ol style="list-style-type: none"> <li>1. Check power and communicate wire connection to inverter.</li> <li>2. Contact with inverter manufacturer.</li> </ol>  |
| Inverter can't charge the battery       | <ol style="list-style-type: none"> <li>1. Check power and communication wire connection to inverter.</li> <li>2. Check inverter specification, make sure its charge voltage is suitable for this type of battery referring "2.2 Technical Parameter".</li> </ol> |



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|  |  |
|--|--|
| When battery modules are connected in parallel, one of them does not output. | Check this module's voltage and current on LCD screen. If its voltage difference compared with others is more than 2V and there is a certain current, it means this module is equilibrating. This process may take several hours, please wait patiently.<br>If not, please check next:<br>1. Check the dial switch ;<br>2. Check the module communication cable. |
|--|--|

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**Note:** If the problem is still not solved after troubleshooting, please contact the manufacturer.

### 7.3 Other Chemical Reaction

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges, the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the discharge time is much shorter than the normal after full charged, even battery is charged correctly, and this may indicate it is time to change the battery.

## Contact US

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Maple Leaf Power Systems.

Web: [www.MapleLeafPowerSystems.com](http://www.MapleLeafPowerSystems.com).