

Grid-Hybrid Inverter
SPM 8000-10000TL-HU2
User Manual

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1 Information on this Manual

1.1 Overview

This manual is intended to introduce the SPM 8000-10000TL-HU2 Inverters manufactured by Shenzhen Growatt New Energy Co, Ltd. (hereinafter referred to as Growatt) in terms of the installation, operation, commissioning, maintenance and troubleshooting. Please read this manual carefully before using the product, and keep it in a place that is easily accessible to installation, operation and maintenance personnel. The content is continually reviewed and amended as necessary. Growatt reserves the right to make changes to the material at any time and without notice.

1.2 Intended Audience

Only qualified electrical technicians are allowed to install SPM 8000-10000TL-HU2 inverters. Reading through this manual and observing all the precautions, qualified electrical technicians will be able to properly install, troubleshoot and configure the SPM 8000-10000TL-HU2 inverters. lf any questions arise during installation, you can visit en.growatt.com and leave a message.

1.3 Safety Instructions

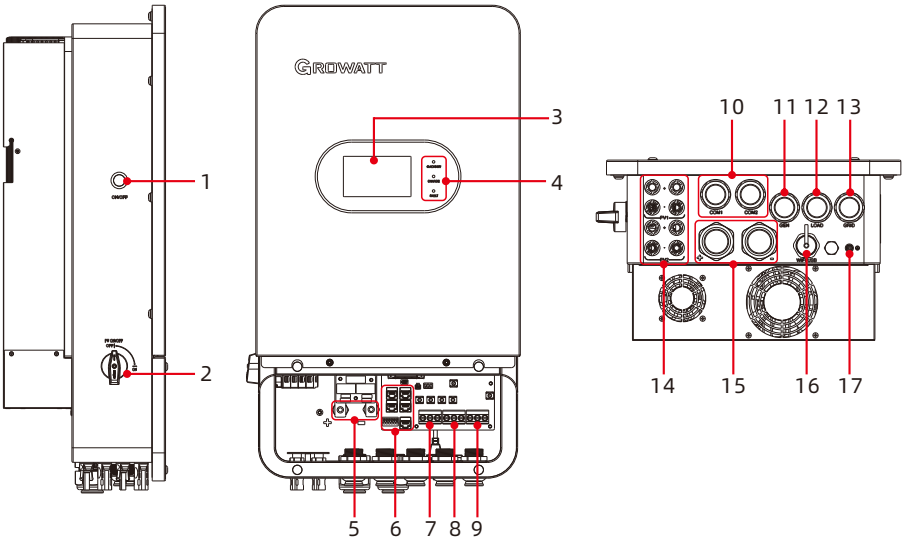
1. Please read this manual carefully before installation. Damages caused by failure to follow the instructions in the manual are beyond the warranty scope.
2. Only qualified and trained electrical technicians are allowed to perform operations on the Storage inverter.
3. During installation, please do not touch other parts inside the equipment except wiring terminals.
4. Ensure that all electrical connections comply with local electrical standards.
5. For maintenance, please contact designated local installation and maintenance personnel.
6. Before operating the inverter in the on-grid mode, ensure that you have obtained any permission needed from the local electricity grid network operator.

 **DANGER**	**a.** Electrical installation, repairs and conversions may only be carried out by electrically qualified persons **b.** DO NOT connect the grid to the Load Output Breaker. **c.** DO NOT reverse the polarity of batteries. Damage will occur. **d.** The components in the inverter are live. Touching live components can result in serious injury or death. **e.** Only qualified personnel are permitted to open the inverter. **f.** Beware of high PV voltage. Please turn off the DC switch of PV Panel output before and during the installation to avoid electric shock. **g.** Beware of high grid voltage. Please turn off the AC switch at

 **DANGER**	the grid connection before and during the installation to avoid electric shock. **h.** Beware of large current of the battery output. Please turn off the battery module before and during the installation to avoid electric shock.
 **WARNING**	**a.** Make all electrical connections (e.g. conductor termination, fuses, PE, connection, etc.) in accordance with prevailing regulations. When working with the inverter powered on, adhere to all prevailing safety regulations to minimize risk of accidents. **b.** Systems with inverters typically require additional control (e.g. switches, disconnects) or protective devices (e.g. fusing circuit breakers) depending upon the prevailing safety rules. **c.** All terminals/breakers including battery, MPPT, and AC breaker inputs should only have one conductor connecting to them. **d.** Anytime the inverter has been disconnected from the power network, use extreme caution as some components can retain charge sufficient to create a shock hazard; to minimize occurrence of such conditions, comply with all corresponding safety symbols and markings present on the unit and in this manual. **e.** Ensure all covers and doors are closed and secure during operation. All operations regarding transport, installation and start-up, including maintenance must be operated by qualified, trained personnel and in compliance with all prevailing codes and regulations. **f.** Although designed to meet all safety requirements, some parts and surfaces of Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the PV-Inverter or nearby surfaces while Inverter is operating.
 **NOTICE**	**a.** Please carefully read this manual before any work is carried out on this inverter, the installation, please keep this manual carefully stored and easy to access at any time. **b.** The qualified personnel should have had training in the installation and commissioning of the electrical system as well as dealing with hazards, also they should have the knowledge of the manual and other related documents. As the installer or operator they are required to be familiar with local regulations and directives.

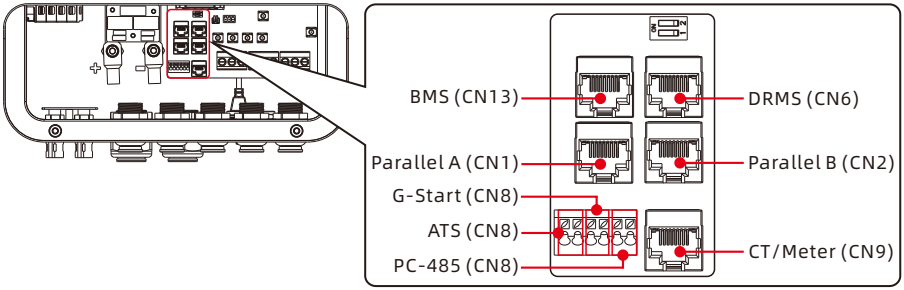
2 Product Introduction

2.1 Product Overview



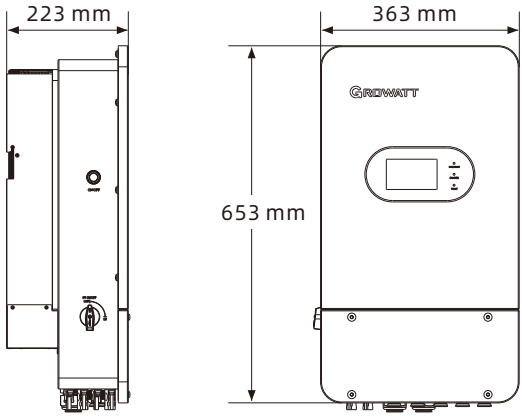
No.	Description	No.	Description
1	ON/OFF Bottom	10	Communication Port
2	PV Switch	11	Generator Port
3	LCD Display	12	Load Port
4	LED Indicator	13	Grid Port
5	Battery Terminal	14	PV Input Terminal
6	Communication Interface	15	Battery Input Port
7	Generator Terminal Block	16	USB Port
8	Load Terminal Block	17	External Grounding Terminal
9	Grid Terminal Block		

2.2 Function Port Definition



Item	Description
BMS (CN13)	RS 485 (1B,2A), CAN (4H,5L) port for battery communication.
DRMS (CN6)	Demand Response Modes (DRMs) are a mandatory requirement for inverters sold in Australia.
Parallel A (CN1)	Parallel communication port 1 (CAN interface).
Parallel B (CN2)	Parallel communication port 2 (CAN interface).
G-Start (CN8)	G-start nominal open circuit. If the user wants to start the generator, G-start nominally closes the port.
ATS (CN8)	230V output port when inverter is on.
PC-485 (CN8)	Upper Computer Port.
CT/Meter (CN9)	Grid side measurement.

2.3 Product Dimensions



2.4 Product Features

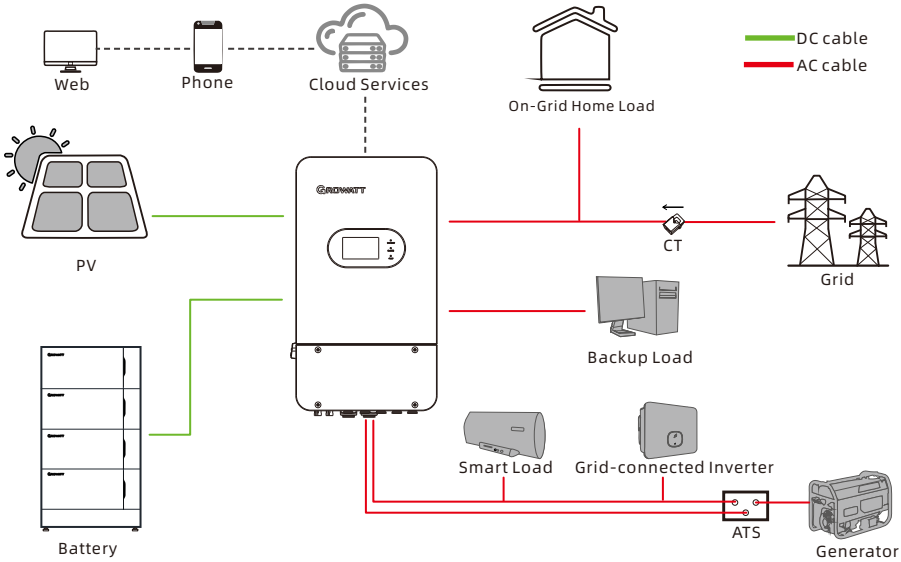
- Supports 220/230/240Vac Single Phase, 220/380Vac, 230/400Vac, 240/420Vac Three Phase System.
- Self-consumption and export to the grid.
- Configurable battery charging current/voltage based by touch screen setting.
- Configurable AC/Solar/Generator Charger priority by touch screen setting.
- Hybrid inverter Support for connecting to generator.
- AC power loss restart.
- Time of use function.
- Smart battery charger design for optimized battery performance.
- Supporting WiFi/4G/Bluetooth/LAN monitoring and build-in 2 strings of MPPT.
- Smart settable three stages MPPT charging for optimized battery performance.
- Overload/Over temperature/Short circuit protection.
- Programmable supply priority for battery or grid.
- Programmable multiple operation modes: On Grid Mode, Export Limit to Backup Load Mode, Export Limit to Home Load.

2.5 Basic System Architecture

The following illustration shows basic application of this inverter.
It also includes following devices to have a complete running system.

-Generator or Utility
-PV modules

Consult with your system integrator for other possible system architectures depending on your requirements.
This inverter can power all kinds of appliances in home or office environment, including motor type appliances such as refrigerator and air conditioner.

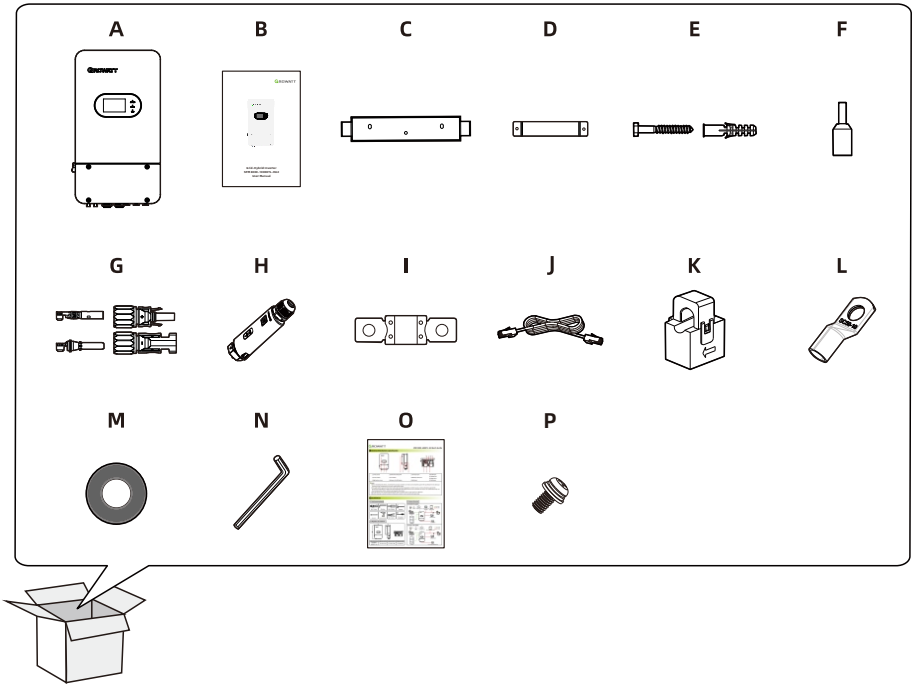


3 Installation

3.1 Packing List

Check the equipment before installation. Please make sure nothing is damaged in the package. You should receive the following items:

Packing List					
Item	**Description**	**Qty**	**Item**	**Description**	**Qty**
A	Hybrid inverter	1	I	Spare Fuse	4
B	User manual	1	J	Parallel communication cable	1
C	Mounting bracket	1	K	CT	1
D	Support bracket	1	L	Battery terminal	2
E	Expansion bolt	3	M	Magnetic ring	1
F	Tubular terminal	9	N	L-type Hexagon wrench	1
G	MC4 connector	4	O	Quick guide	1
H	Monitoring equipment	1	P	M4 screw	2



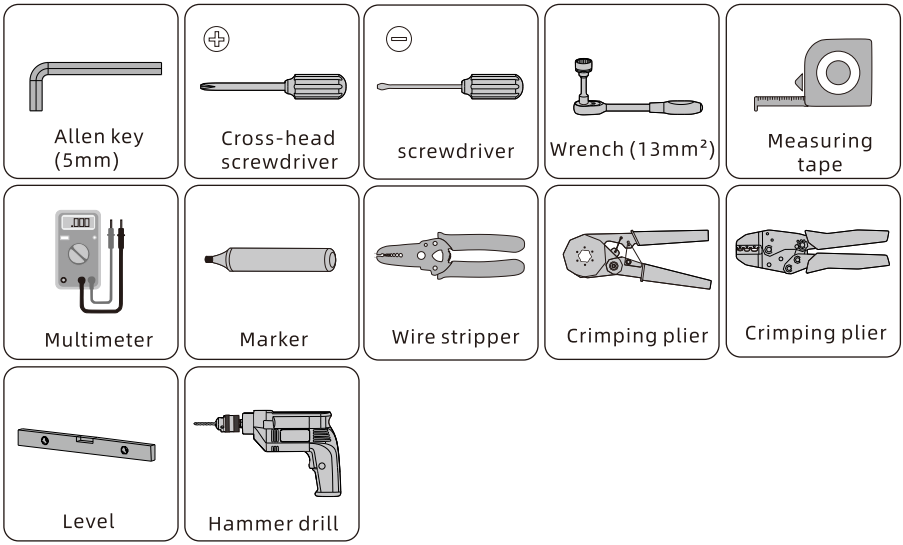
3.2 Mounting Instructions

Installation Precaution

This hybrid inverter is designed for outdoor use (IP65), please make sure the installation site meets below conditions:

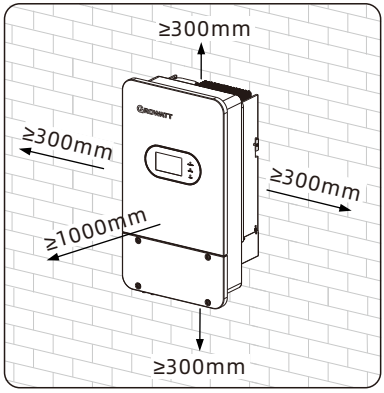
- Not in direct sunlight.
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television Antenna or antenna cable.
- Not higher than altitude of about 2000 meters above sea level.
- Not in environment of precipitation or humidity (>95%).

Tool Recommendation



Considering the following before selecting where to install:

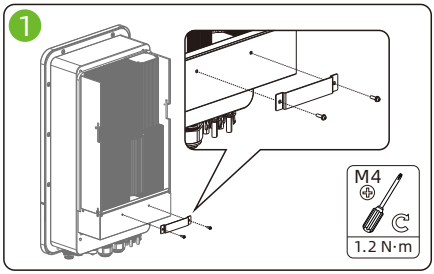
- Please select a vertical wall with load-bearing capacity for installation, suitable for installation on concrete or other non-flammable surfaces.
- Install this inverter at eye level in order to allow touch screen display to be read at all times.
- The ambient temperature should be between -25~60℃ to ensure optimal operation.
- Keep the inverter at a distance from other objects and surfaces as shown below.
- For proper air circulation to dissipate heat, allow a clearance of approx.300 mm to the side and approx. 300 mm above and below the unit. And 1000mm to the front.

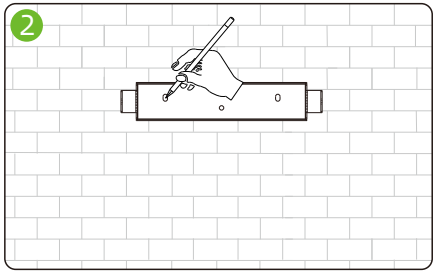


Mounting the inverter

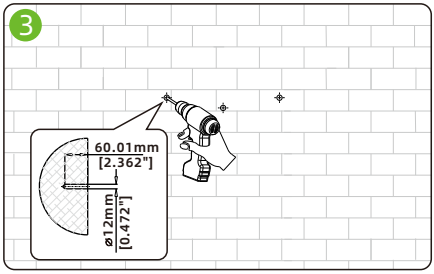
This inverter is heavy. Take care when removing it from the package.

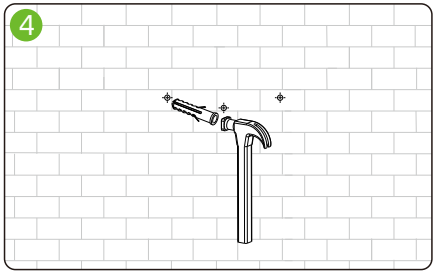
1. Install the support bracket.
2. Level the mounting bracket and mark hole positions on the wall.



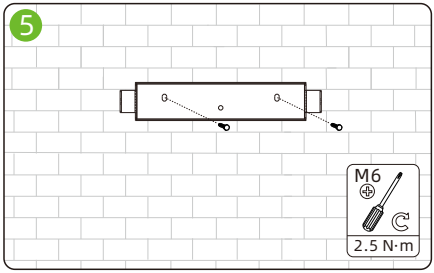


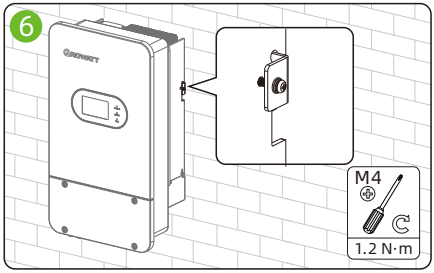
3. Drill holes on the marked position.
4. Drive the plastic expansion tubes into the holes.





5. Secure the mounting bracket to the wall firmly with the self-tapping screws.
6. Mount the inverter onto the mounting bracket and tighten the safety screw on the right side of the inverter.





3.3 Battery Connection

For safe operation and compliance, a separate DC over-current protector or disconnect device is required between the battery and the inverter. In some applications, switching devices may not be required but over-current protectors are still required.

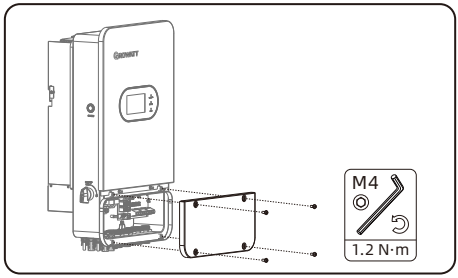
Model	Wire Size
SPM 8000-10000TL-HU2	00AWG*1 or 2AWG*2 or 4AWG*3

WARNING	**All wiring must be performed by a professional person. Connecting the battery with a suitable cable is important for safe and efficient operation of the system. To reduce the risk of injury, refer to chart for recommended cables.**

Remove the cover

Loosen the screws and remove the sealed cover.

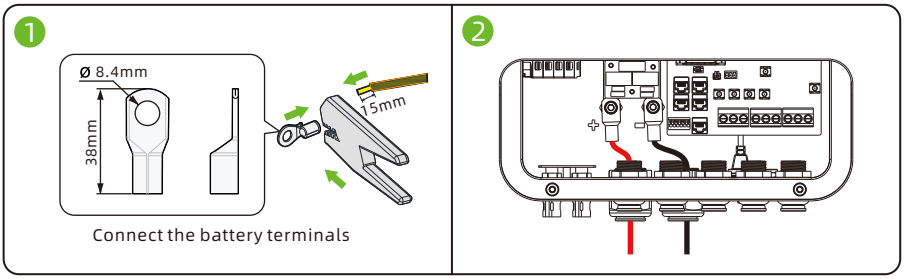
(After finishing all internal wiring, arrange the cables, and align the sealed cover with the holes, then tighten the screws to install the cover.)



Please follow below steps to implement battery connection:

1. Please choose a suitable battery cable with correct connector which fits into the battery terminals.
2. Use a phillips screwdriver to unscrew the bolts and fit the battery connectors in, then fasten the bolt by the screwdriver, make sure the bolts are tightened in clockwise direction.

Make sure polarity at both the battery and inverter is correctly connected.



Connect the battery terminals

3.4 Grid/Backup Load/GEN Connection

Before connecting to grid, please install a separate AC breaker between inverter and grid. Also, it is recommended to install an AC breaker between backup load and inverter. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current.

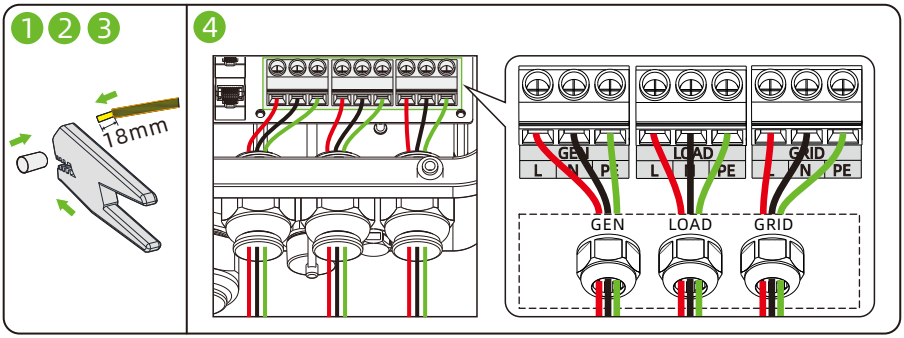
There are three terminal blocks with "Grid" "Load" and "GEN" markings. Please do not disconnect input and output connectors.

Model	Wire Size
SPM 8000-10000TL-HU2	8 AWG

WARNING	**All wiring must be performed by a qualified personnel. It is very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable as below.**

Please follow below steps to implement AC input/output connection:

1. Before making grid, load and gen port connection, be sure to turn off AC breaker first.
2. Remove insulation sleeve 10 mm for positive and negative conductors.
3. Use crimping pliers to press the 10AWG cable onto the attached tubular terminal to form a square.
4. Install the AC conduit to the AC grid output opening (Grid, GEN, Load). Use appropriate conduit fittings and bond where necessary. Terminate the AC conductors to the appropriate terminal, and then tighten the screws.



NOTICE	**Be sure that AC power source is disconnected before attempting to wire it to the unit.**

Appliances such as air conditioner are required at least 2-3 minutes to restart because it is required to have enough time to balance refrigerant gas inside of circuit. If a power shortage occurs and recovers in short time, it will cause damage to your connected appliances.
To prevent this kind of damage, please check manufacturer of air conditioner if it is equipped with time-delay function before installation. Otherwise, this inverter will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

3.5 PV Connection

Before connecting to PV modules, please install a separate DC circuit breaker between inverter and PV modules. It is very important for system safety and efficient operation to use appropriate cable for PV module connection.
To reduce risk of injury, please use the proper recommended cable size as below.

Model	Wire Size
SPM 8000-10000TL-HU2	10 AWG

WARNING	**To avoid any malfunction, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using PV modules, please be sure no grounding. It is requested to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.**

3.5.1 PV Module Selection

When selecting proper PV modules, please be sure to consider below parameters:

1. Open circuit Voltage (Voc) of PV modules should not exceed max PV array open circuit voltage of inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than min start voltage.

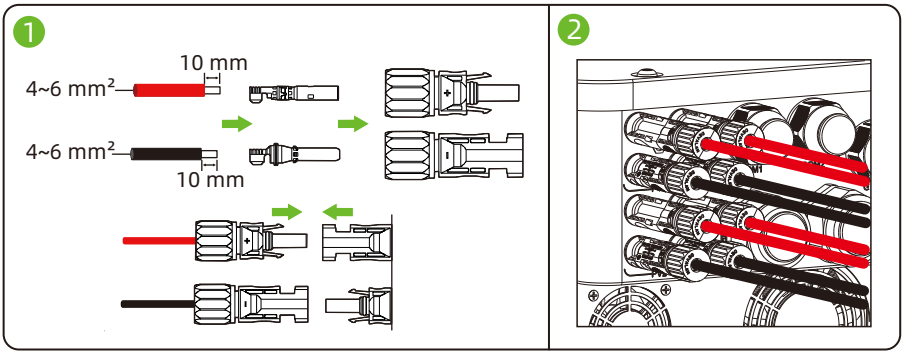
Inverter Model	SPM 8000-10000TL-HU2
PV Input Voltage	370V (70V-550V)
PV Array MPPT Voltage Range	80V-525V
No. of MPPT Trackers	2
No. of Strings per MPPT Tracker	2+2

3.5.2 PV Module Wire Connection

Please follow below steps to implement PV module connection:

1. Remove insulation sleeve 10 mm for positive and negative conductors and use a crimping tool to secure the wire to the terminal. Then insert the wire and terminal into the connector, and tighten the nut.
2. Insert the positive and negative connectors into the PV+/PV- ports until a "click" sound is heard.

Note: Make sure the wires are securely connected.



3.6 Meter or CT Connection

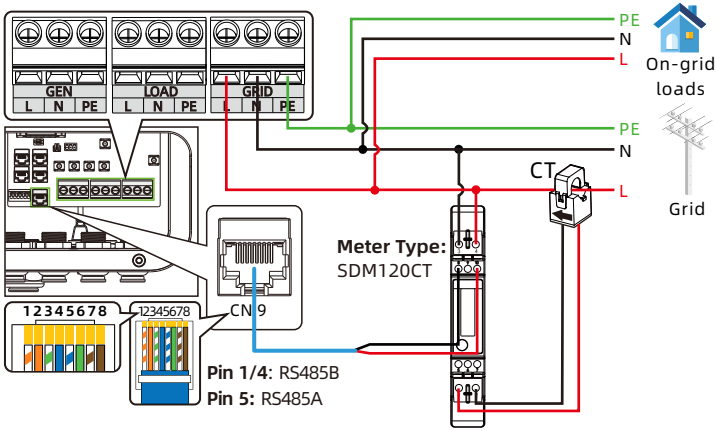
The external electric meter or CT connection is essential for enabling anti-reverse power flow and accurately monitoring load consumption. CT connection uses a Network cable interface, and the CT installation direction can be set on the screen.

Model	Compatible Meter
SPM 8000-10000TL-HU2	SDM120CT; SDM230-Modbus; SDM630MCT; DSU666;DTSU666

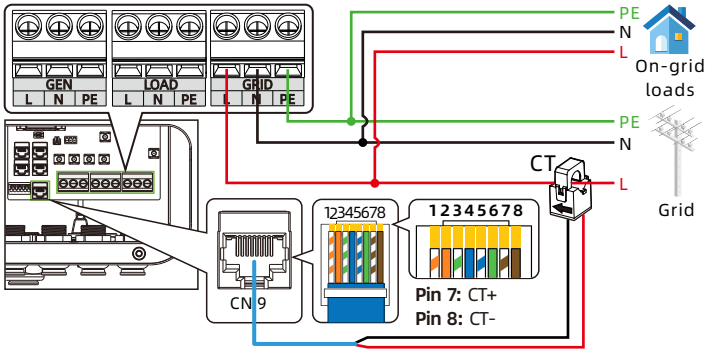
CN9 Port Definition

1	2	3	4	5	6	7	8
RS485B	/	/	RS485B	RS485A	/	CT+	CT-

Meter Connection



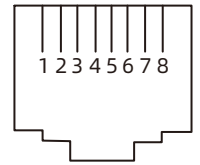
CT Connection

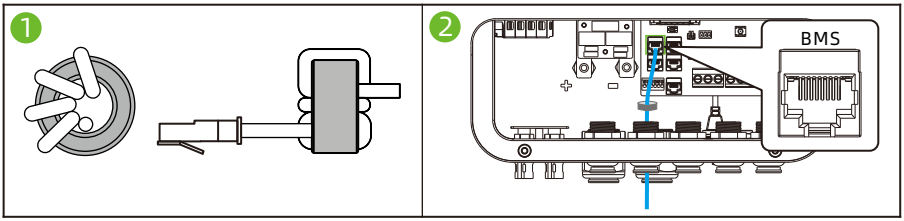


3.7 BMS Communication Connection

1. Pass the BMS communication cable through the magnetic ring and wrap it around the magnetic ring four times. Additionally, the magnet ring must be placed inside the inverter case.
2. Please use the BMS communication cable provided by the corresponding battery manufacturer.

NO.	BMS	NO.	BMS
1	RS485B	5	CAN-L
2	RS485A	6	GND
3	/	7	/
4	CAN-H	8	/





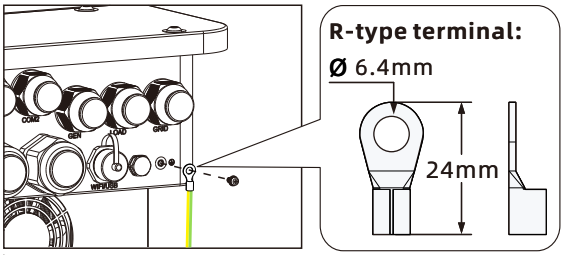
3.8 Earth Connection

Ground cable shall be connected to ground plate on grid side this prevents electric shock, if the original protective conductor fails.

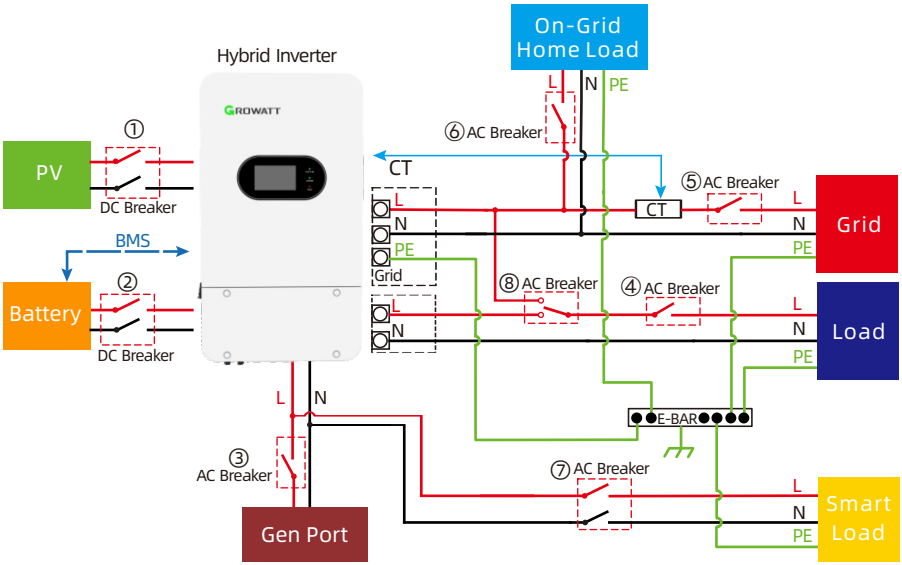
Model	Wire Size
SPM 8000-10000TL-HU2	12 AWG

Make sure the inverter metal housing is grounded.

⏚ → Ground (yellow-green)



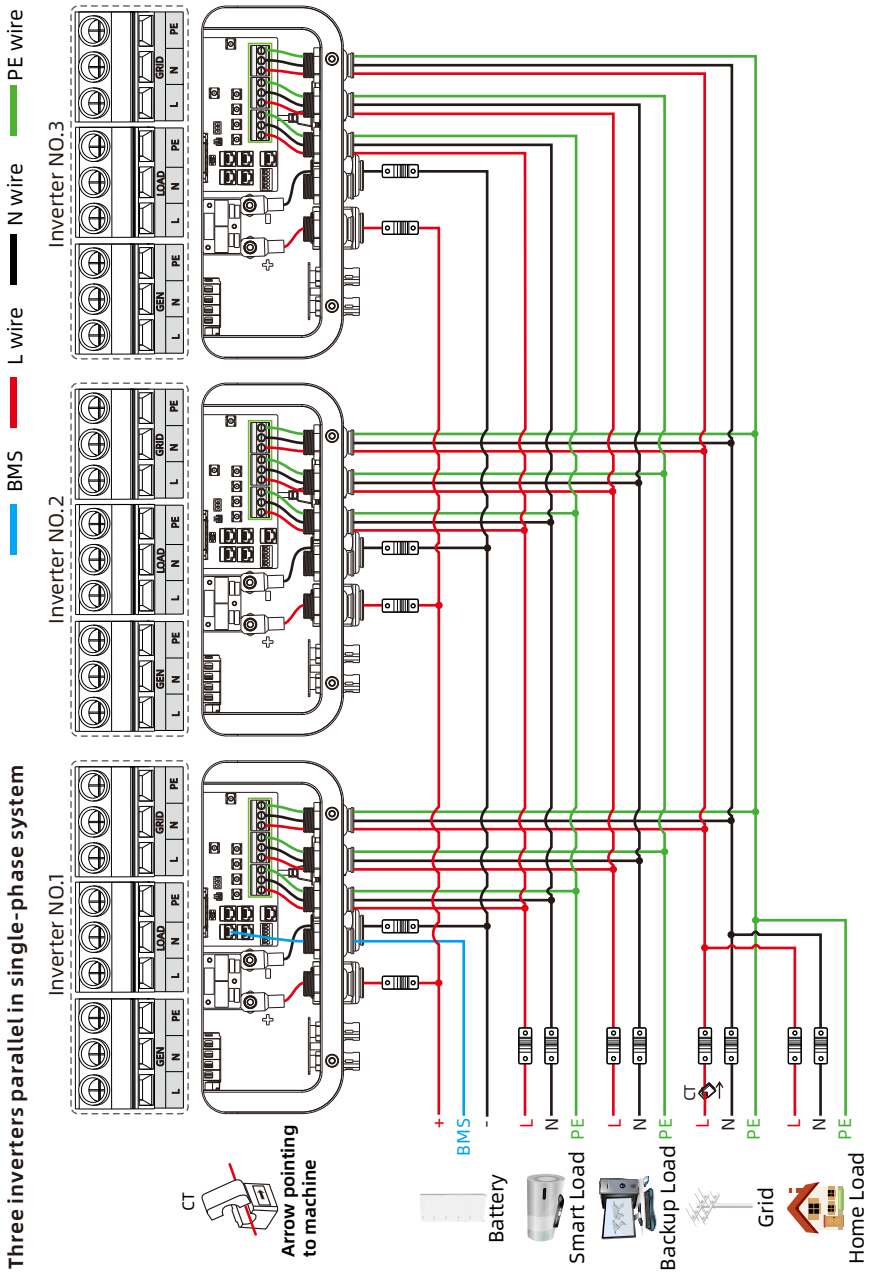
3.9 Wiring System for Inverter



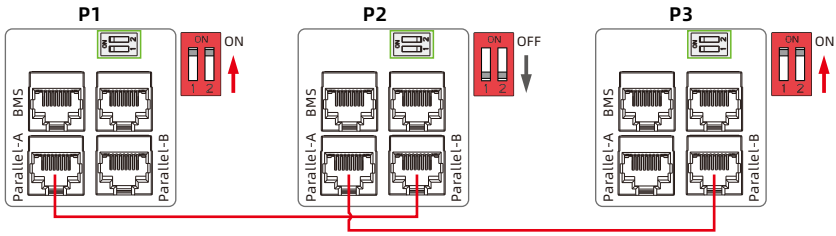
Breakers selection recommendation for both DC and AC.

Inverter Model	SPM 8000TL-HU2	SPM 10000TL-HU2
PV Breaker (①)	600V/40A	
Battery Breaker (②)	80V/250A	
GEN Breaker (③)	230V/63A	
Load Breaker (④⑦)		
Grid Port Breaker (⑤⑥)		
AC Breaker (⑧)		

3.10 Single Phase 230Vac Parallel Connection



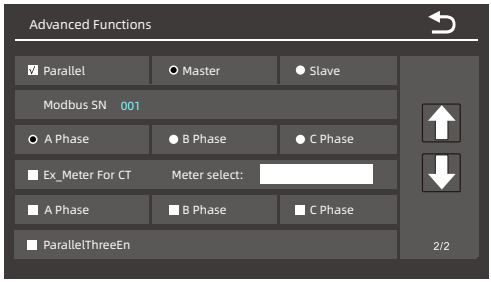
Communication Connection



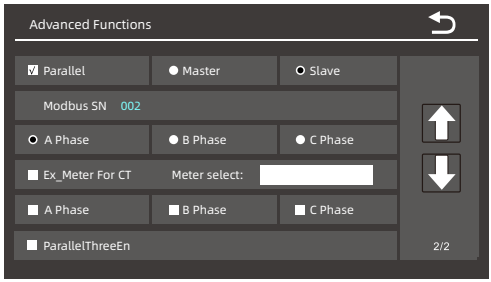
Modbus SN: This feature is currently not being used.
Ensure that the switches of the first and last inverters are in the ON position.
CT: Install the CT on the live wire. The CT or smart meter has to be connected to the master inverter.
Tip: Up to 6 inverters can be connected in parallel. (single-phase/three-phase)

LCD Setting

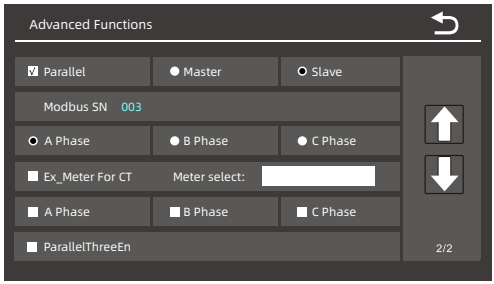
Inverter NO.1



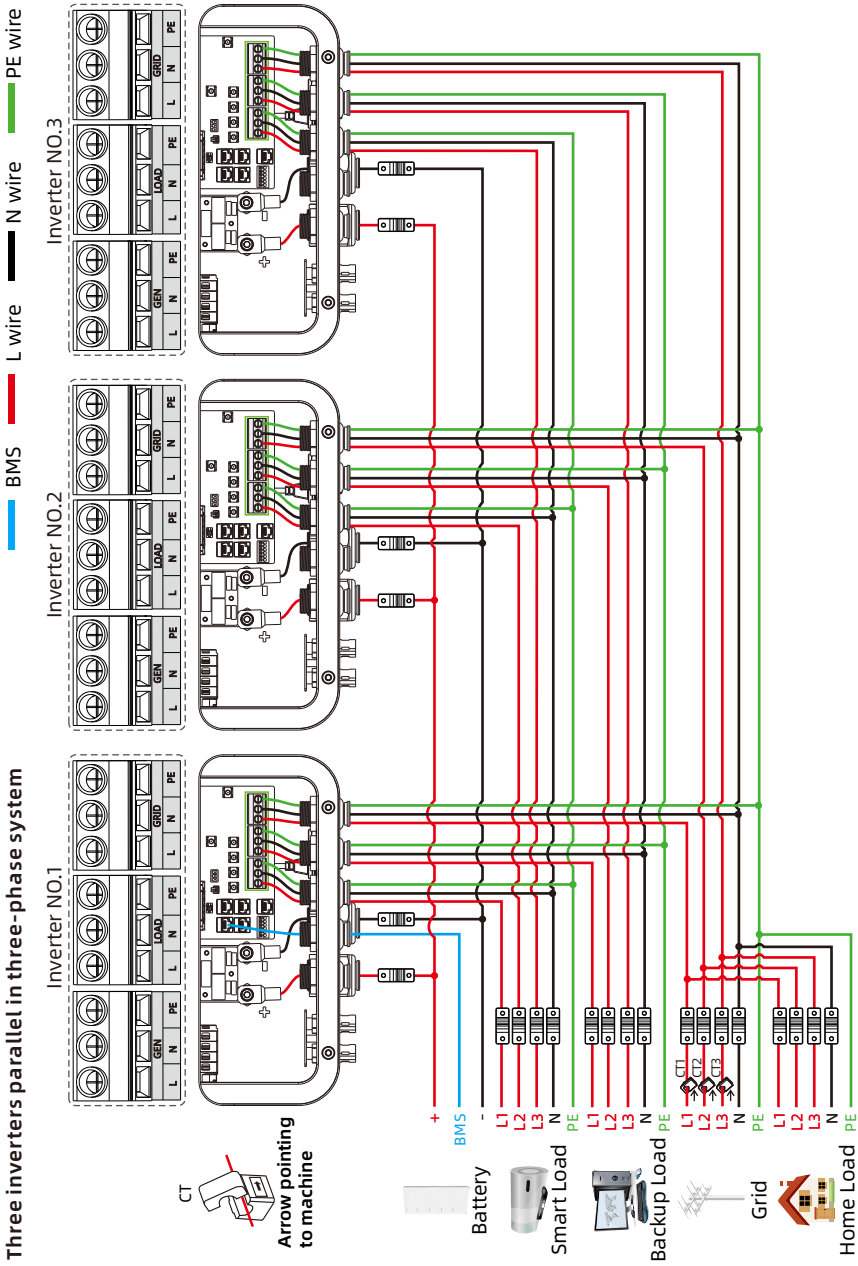
Inverter NO.2



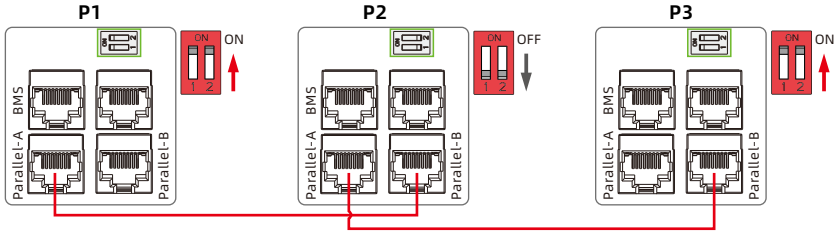
Inverter NO.3



3.11 3Pcs Parallel Connection for 230/400Vac Three Phase



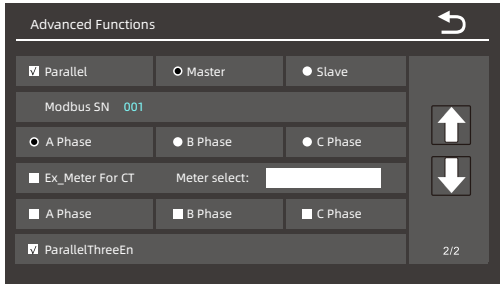
Communication Connection



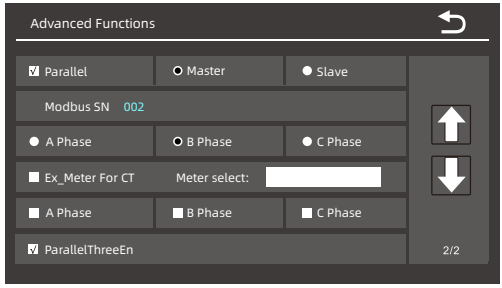
Modbus SN: This feature is currently not being used.
Ensure that the switches of the first and last inverters are in the ON position.
CT1: Connect CT/Meter Port (CN9) of L1 (Inverter NO.1).
CT2: Connect CT/Meter Port (CN9) of L2 (Inverter NO.2).
CT3: Connect CT/Meter Port (CN9) of L3 (Inverter NO.3).

LCD Setting

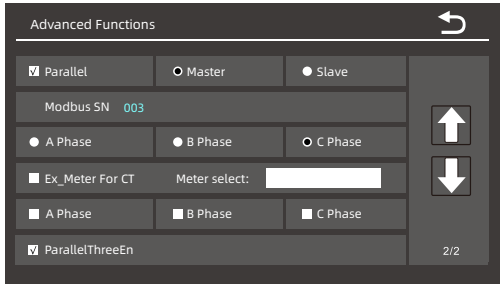
Inverter NO.1



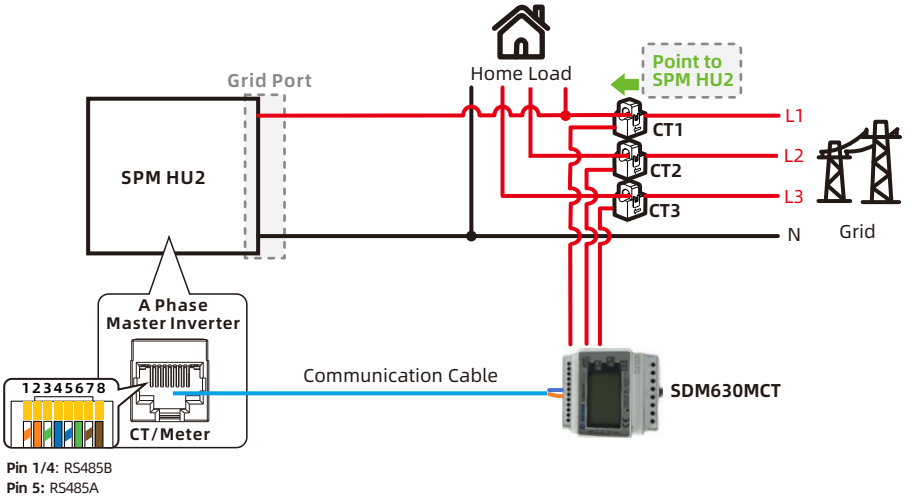
Inverter NO.2



Inverter NO.3



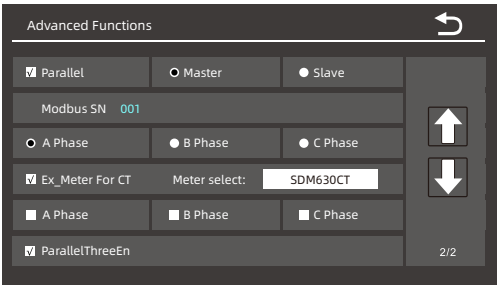
SDM630MCT for Grid Side Sampling



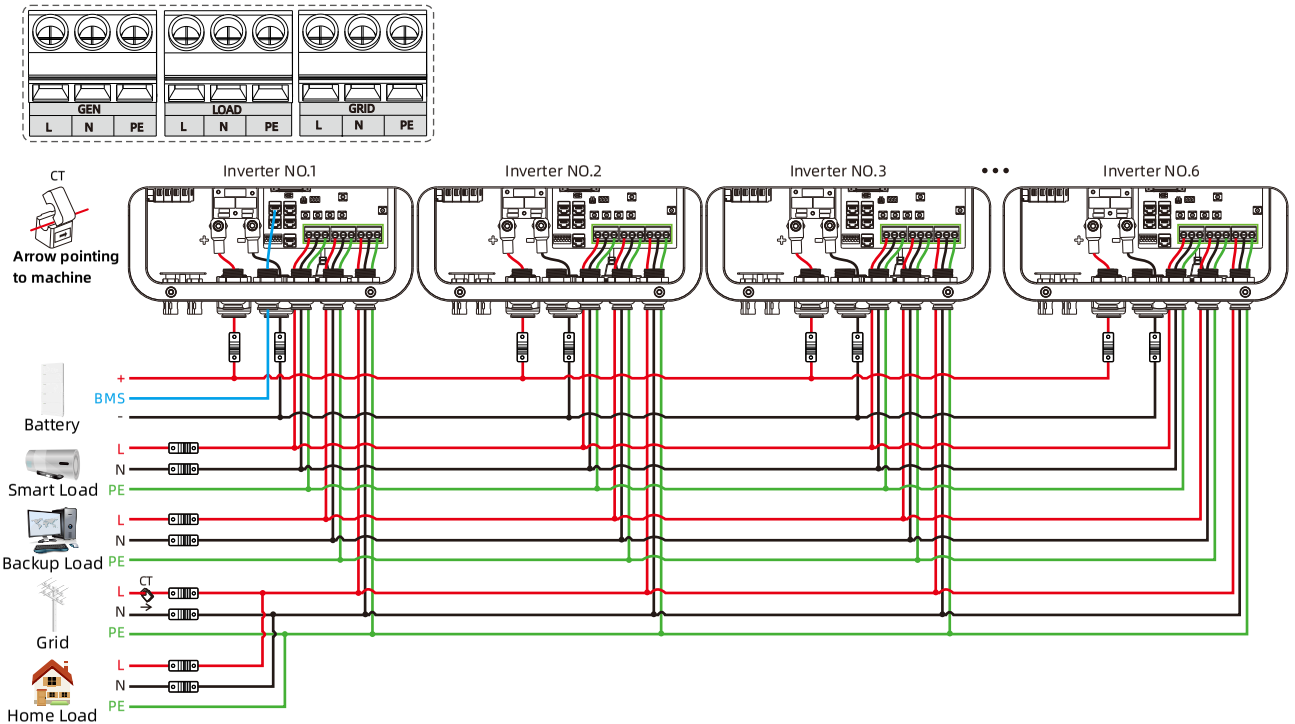
Pin 1/4: RS485B
Pin 5: RS485A

LCD Setting

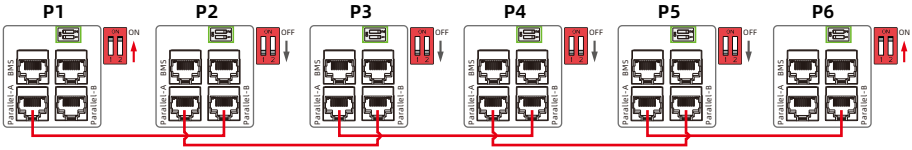
Setp 1: Enable EX_Meter For CT.
Setp 2: Select Meter SDM630CT from the drop list.



Six inverters parallel in single-phase system



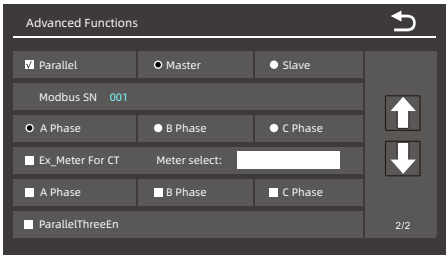
Communication Connection



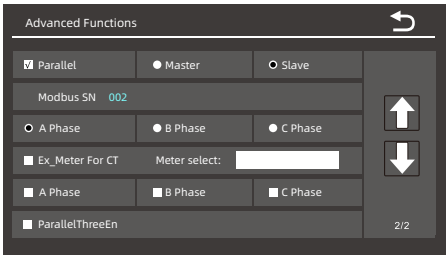
Modbus SN: This feature is currently not being used.
Ensure that the switches of the first and last inverters are in the ON position.
CT1: Connect CT/Meter Port (CN9) of L (Inverter NO.1).

LCD Setting

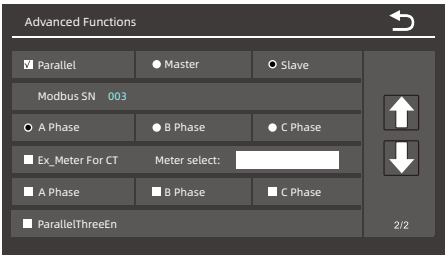
Inverter NO.1



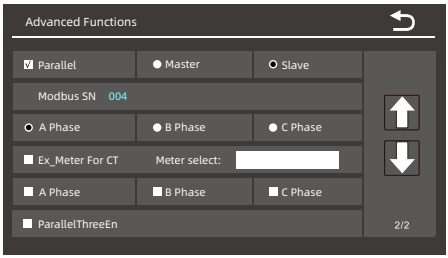
Inverter NO.2



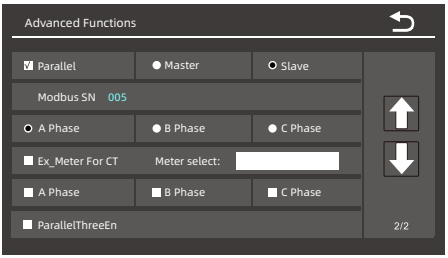
Inverter NO.3



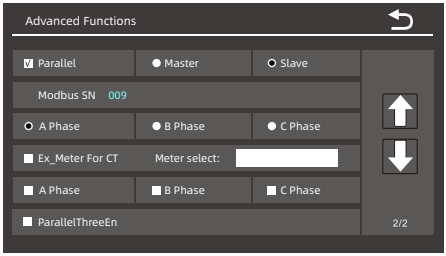
Inverter NO.4



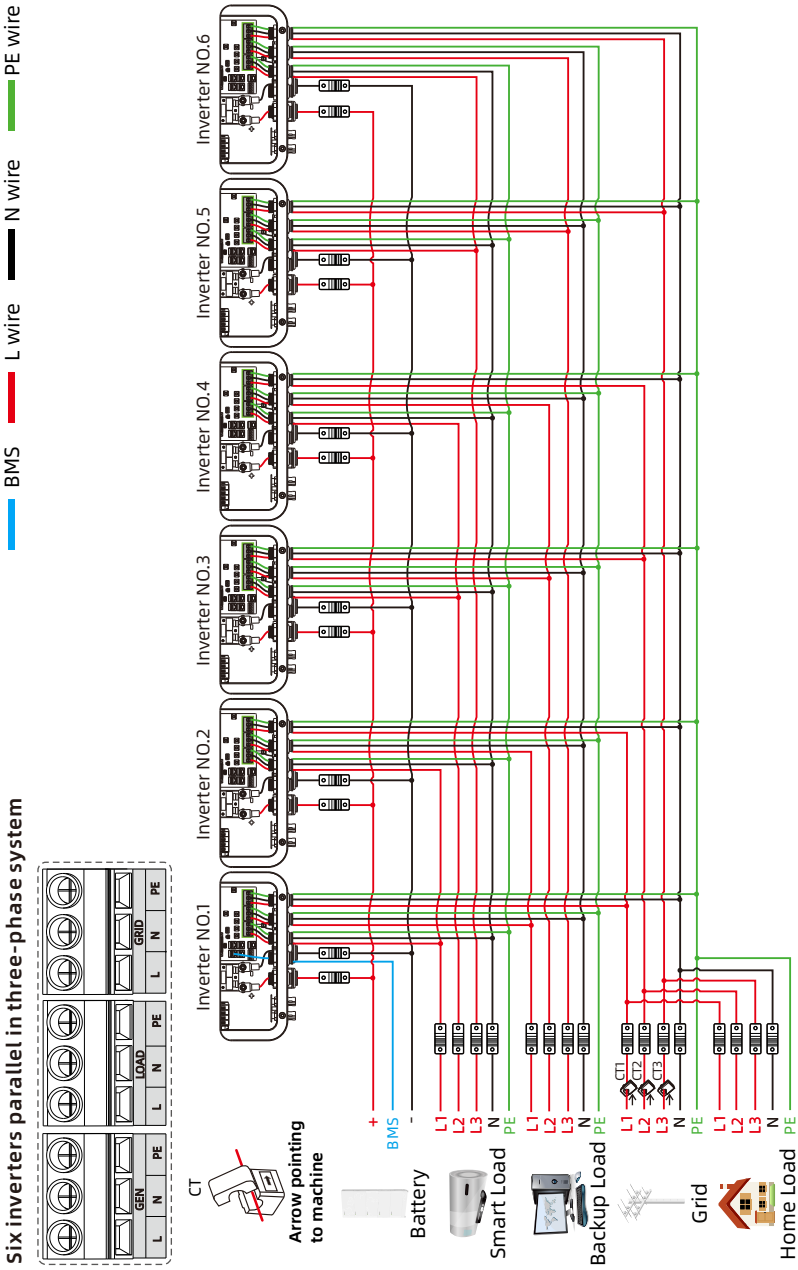
Inverter NO.5



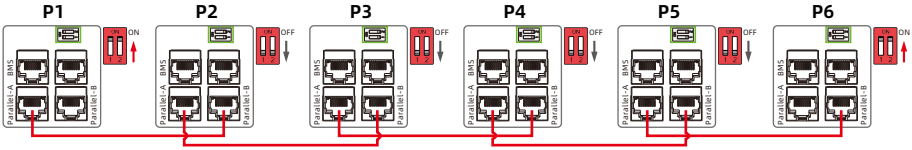
Inverter NO.6



3.13 6Pcs Parallel Connection for 230/400Vac Three Phase



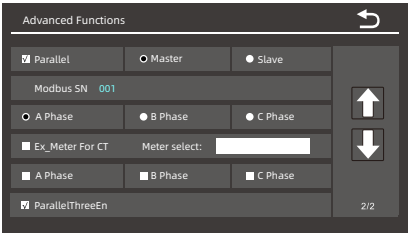
Communication Connection



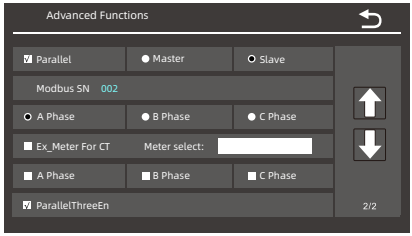
Modbus SN: This feature is currently not being used.
Ensure that the switches of the first and last inverters are in the ON position.
CT1: Connect CT/Meter Port (CN9) of L1 (Inverter NO.1).
CT2: Connect CT/Meter Port (CN9) of L2 (Inverter NO.3).
CT3: Connect CT/Meter Port (CN9) of L3 (Inverter NO.5).

LCD Setting

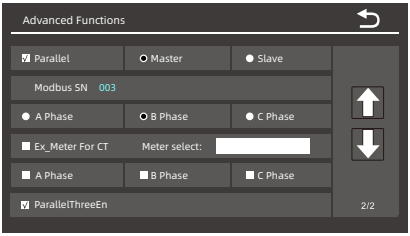
Inverter NO.1



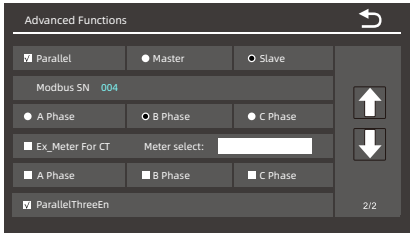
Inverter NO.2



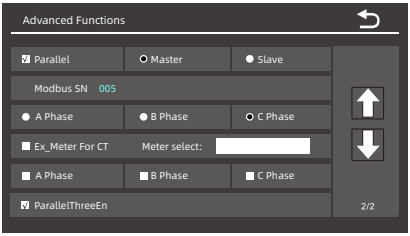
Inverter NO.3



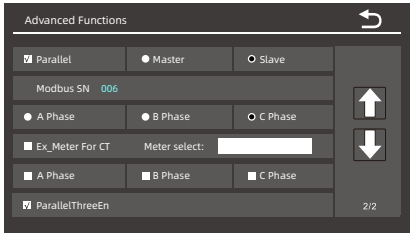
Inverter NO.4



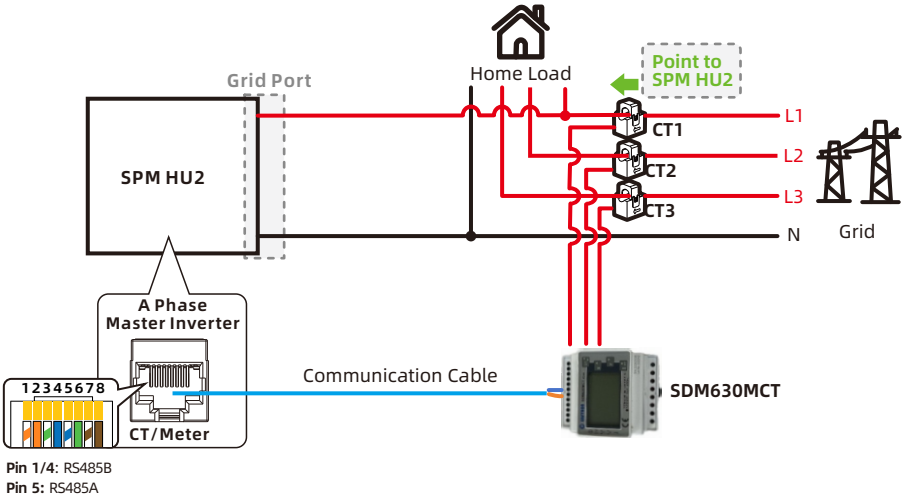
Inverter NO.5



Inverter NO.6



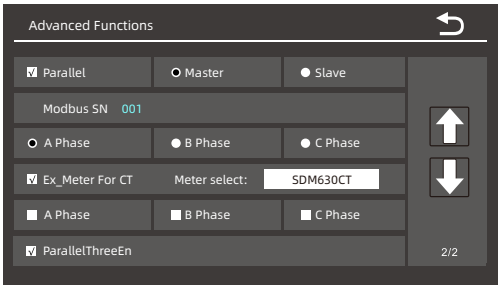
SDM630MCT for Grid Side Sampling



Pin 1/4: RS485B
Pin 5: RS485A

LCD Setting

Setp 1: Enable EX_Meter For CT.
Setp 2: Select Meter SDM630CT from the drop list.



4 Operations on the ShineTools APP

4.1 Overview

ShineTools is a smart APP that could realize the inverter system local commissioning function via the smart phone. It communicates with the inverter through internal Bluetooth or data logger to realize real-time status monitoring, alarm query, parameter configuration, intelligent diagnosis and other routine maintenance functions, is a convenient local configuration platform.

- Real-time status monitoring: Captures the real-time status of inverters and data loggers.
- Alarm query: There are easy-to-operate alarm function and flexible alarm display mechanism could help obtain fault location information quickly, and convenience for customers to take countermeasures timely, improve the efficiency of operation and maintenance.
- Parameter configuration: Simple and safe parameter configuration, and one-stop unified configuration can be realized through the data logger.

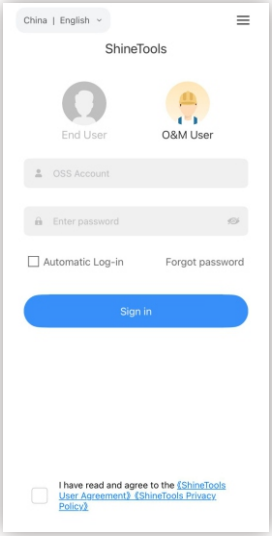
4.2 APP Download

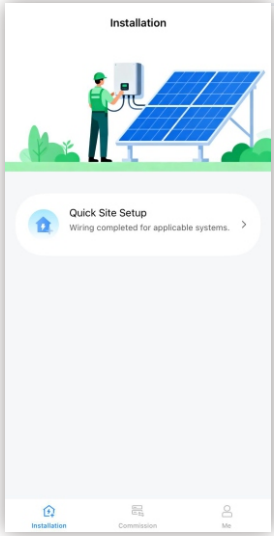
Scan the QR code or search for "ShineTools" in Google Play or Apple Store to download and install the APP. How to install an external collector, please scan the QR code on the back of the instruction manual to view.

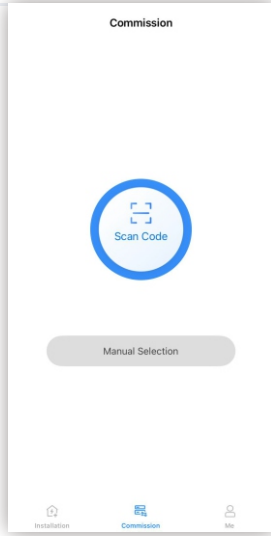
4.3 Login

Start the APP.

- Choose the end user or O&M account.
- Enter the account and password and log in. End user password is oss + current date.(example April 16, 2024 is oss20240416).

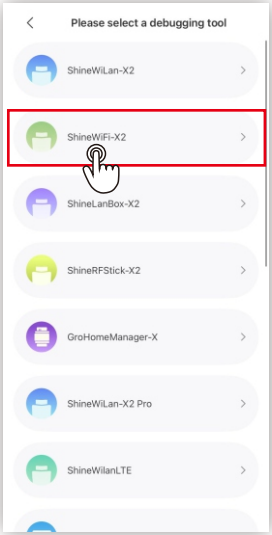


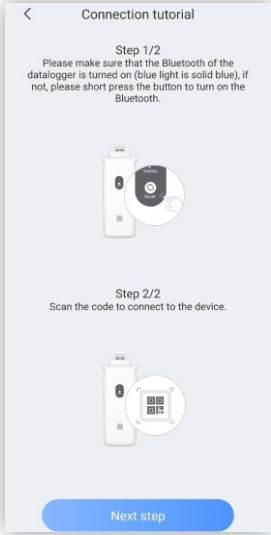


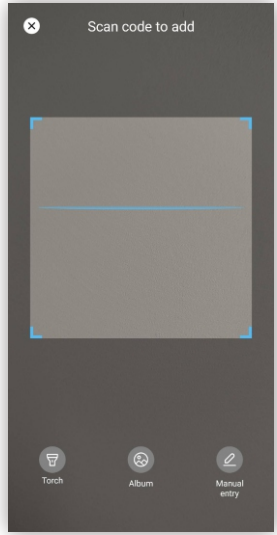


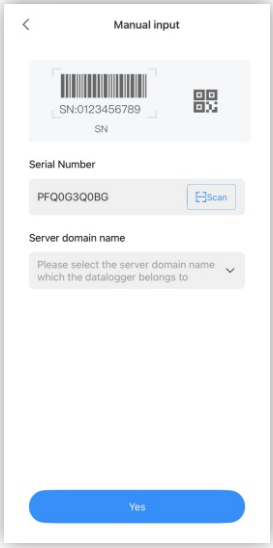
4.4 Direct WiFi/Bluetooth Commissioning Tool

-Select the “ShineWiFi-X2”.
-Turn on the datalogger by following the Connection Tutorial, then tap Next.
-Scan the device serial number barcode on the right side of the inverter to configure Bluetooth. You can also configure Bluetooth by manually entering the device serial number.
-Enter the Local Commissioning interface.











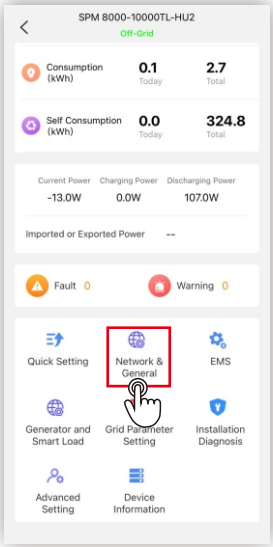
4.5 Commissioning of SPM 8000-10000TL-HU2

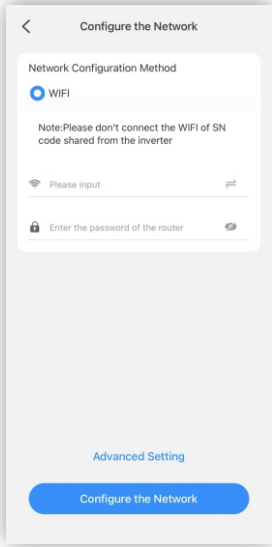
Network & General > WiFi Configuration > Configure the Network

-Choose the network configuration method-WiFi.

-Select/fill network, enter the password, and select the server address.

-Click to connect to the network.

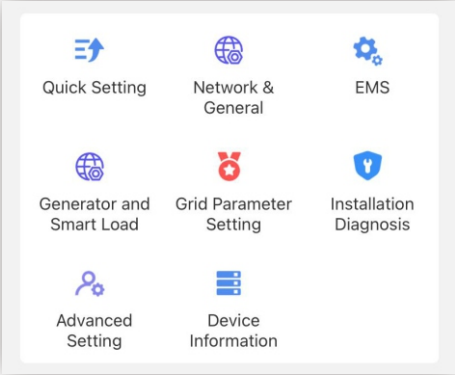




Tips:
The router name and password cannot contain space characters. Only support English input mode characters.
1. Supported punctuation: . , ? ! : @ ; + = # / ( ) _ - ` ^ * & . $ < > [ ] { }.
2. Unsupported punctuation: ... € ' % ¥ \ .

4.6 Parameter Setting

(For details, please refer to the setting items displayed on the App.)



5 Operations on the ShinePhone APP

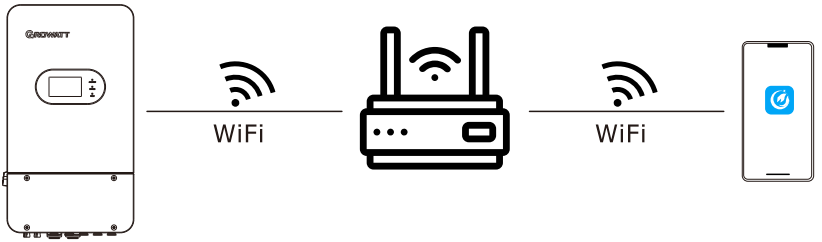
5.1 Overview

The ShinePhone APP is a mobile phone app that locally communicates with the SPM 8000-10000TL-HU2, over WiFi to allow for real-time status monitoring, system mode management, performing routine maintenance, and commissioning. After the PV or Power Grid side of the SPM 8000-10000TL-HU2 is energized, the APP can connect to the inverter in either of the following ways:

1. The mobile phone is directly connected to the Bluetooth inside the SPM 8000-10000TL-HU2 for local tools.



2. The mobile phone is connected to the SPM 8000-10000TL-HU2 inverter through the router. Notice: Do not use this method for the first time. If you need to use this method for remote monitoring and setup, make sure the inverter is connected to the network via the ShineTools
(Please refer to 4.5 for the network connection).



5.2 APP Download

There are three ways to download the ShinePhone APP.

5.2.1 Scan the QR code

Scanning the QR code, then download the APP.

5.2.2 APP Store

Search for ShinePhone from one of the following app stores in the following list, download the installation package, and install the ShinePhone app by following the in instructions.

-Google Play (Android)
-App store (iOS)

5.2.3 Website

Log in to our monitoring website https://server.growatt.com to download.
After the app is installed, the ShinePhone icon is displayed on the home screen.



5.3 APP Introduction

5.3.1 Multiple Languages Supported

ShinePhone supports multiple languages. APP language automatically switches according to the user's mobile language.

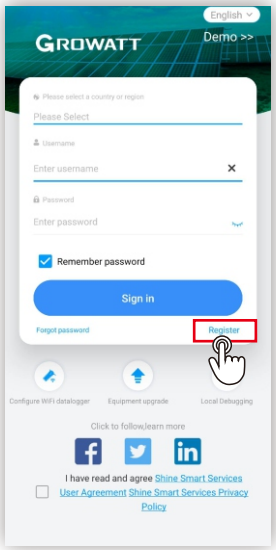
5.3.2 Local Tool

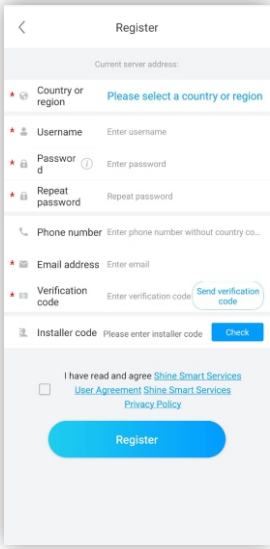
You can choose to configure the local debugging tool by clicking the tool below the login interface. Use the debugging tool for real-time device control and for device monitoring.

5.3.3 Login to ShinePhone

Connecting to the inverter Collector to allow for real-time status monitoring, system mode management, performing routine maintenance, and commissioning. It's also the first step in remote network configuration.

-Open the ShinePhone app to register an account, log in to your account after registration is complete
-You can switch the App language through the upper right corner.
-Select country and religion.
-Enter username and password.
-Click "Remember Password" to save your password.
-Click to log in to the homepage.

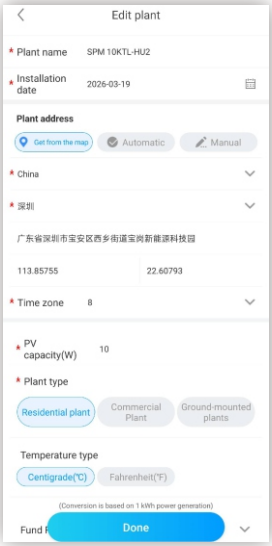


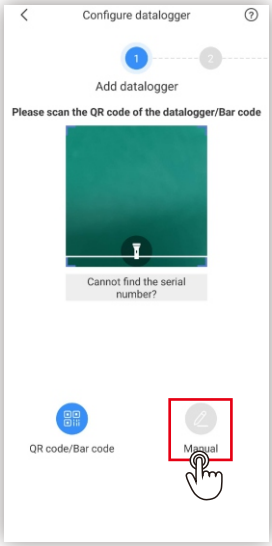


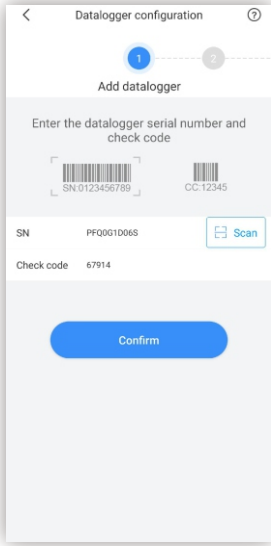
5.3.4 Add Power Station and Collector

-Create a power station after logging in to the homepage (Note: Items marked * are required. Please fill it out correctly.)

-You can add the collector to the plant by scanning the QR code on the collector at the bottom of the inverter, or manually output the "SN" code of the collector (ZGQxxxxxxx).

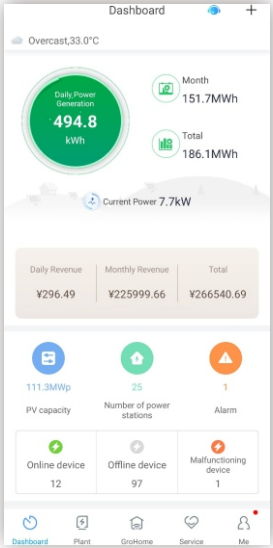




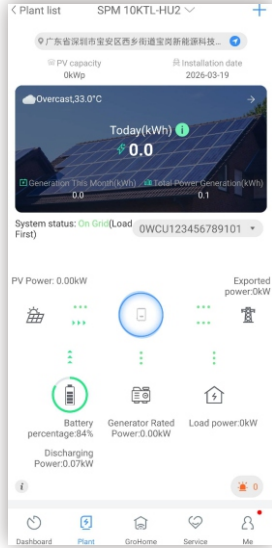


5.3.5 Main Interface Display and Power Station List

- After successfully creating a power station and adding a collector, it will automatically jump to the APP main interface.
- Click “Plant” in the lower tab bar to jump to the plant list interface, and click the corresponding plant to view the generation, power and the other parameters of each inverter under each plant.



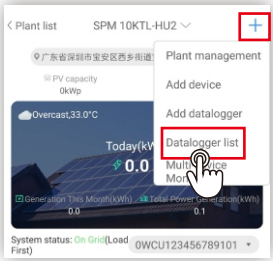


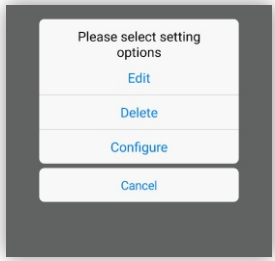


5.3.6 Details and Parameter Settings in the Power Station

- If you need to add, view, delete the datalogger or add a plant, please click the “+” in the upper right corner.

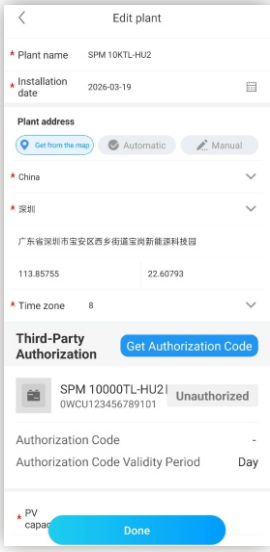
Note: If the datalogger needs to change the account monitoring, you need to delete the datalogger under the original account, then add the datalogger under the new account.



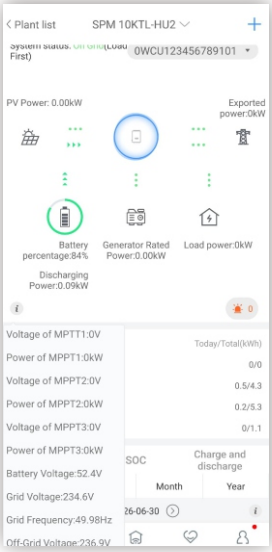


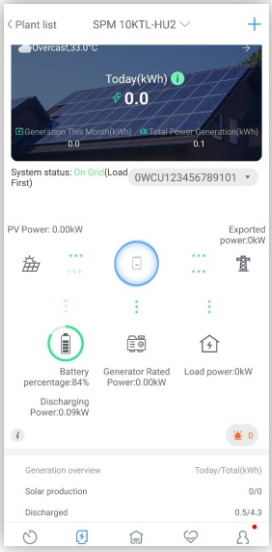
- Click "→" to modify the power station details (for example: power station name, photovoltaic components, etc.)

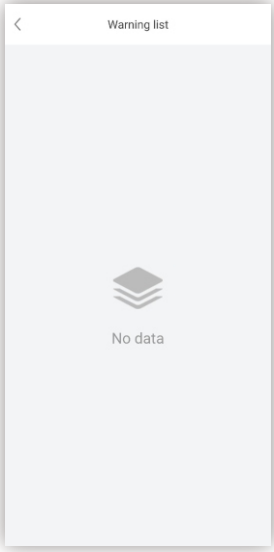




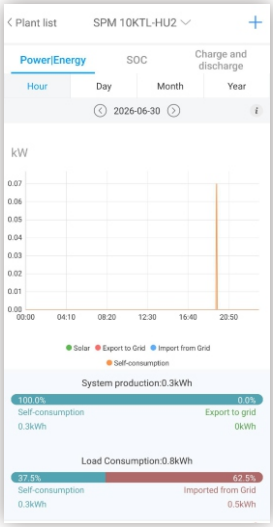
- Click "!" to quickly view the current working data of the inverter (Solar voltage/Battery voltage/ Grid voltage/Grid frequency/Output voltage/Output frequency).
- Click the fault icon in the lower right corner to display the current machine fault information details.



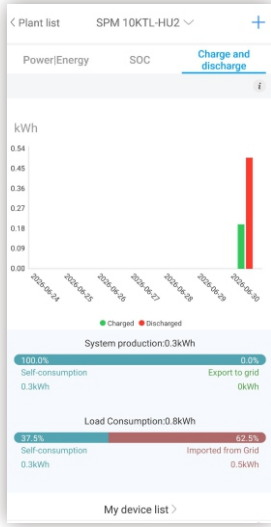




- Drag the screen down to see the energy trend graph. This interface can view the current power, SOC usage (only in lithium battery mode) and battery charge and discharge energy. You can also view the daily, monthly, and annual photovoltaic output/feed into the grid/load consumption/grid power withdrawal/self-consumption cumulative electricity.

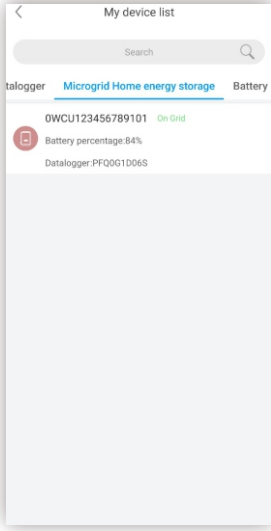


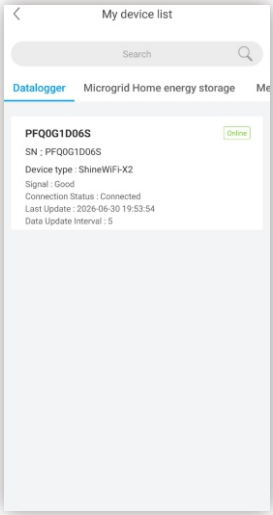


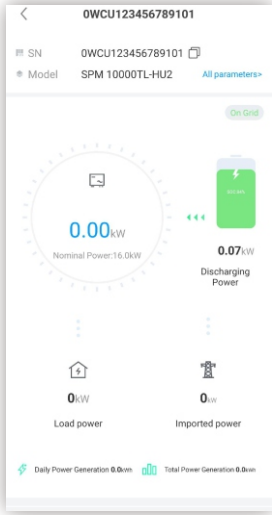


- In the My device list at the bottom of the interface, you can view the status (signal strength, refresh time, etc.) of all collectors added to the power station.-You can also enter the detailed parameter reading and control interface of the inverter according to the device serial number.

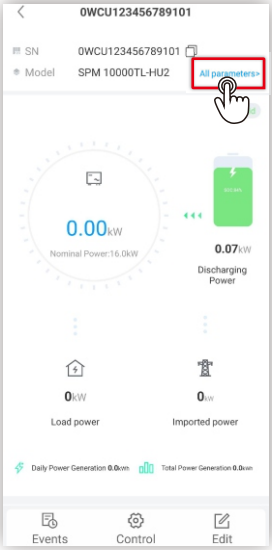


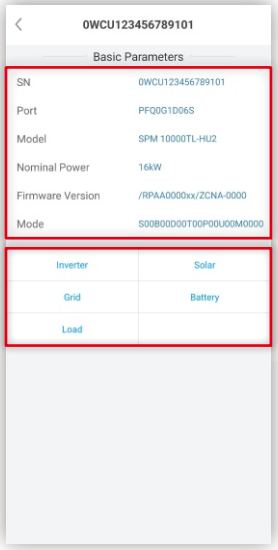


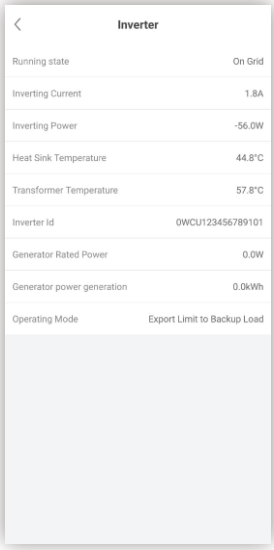




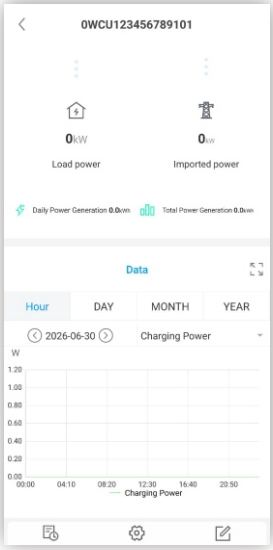
- This interface can display the real-time status of the data, and you can also view the detailed parameters of the inverter, solar energy, grid, battery, and load under the working status of the device, as well as the basic parameters of the device itself (For example:serial number, model, firmware version...).

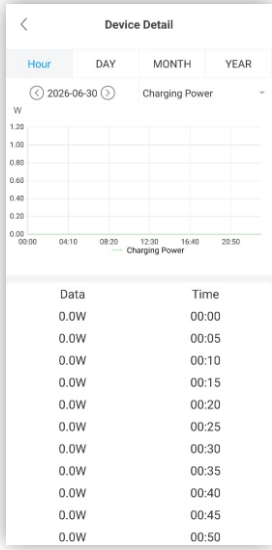




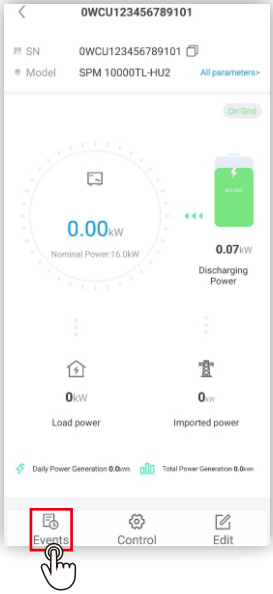


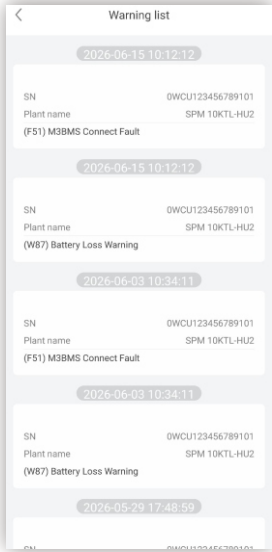
- Energy trend graphs can also be found here. For more details, we can click on the icon in the upper right corner to view it.



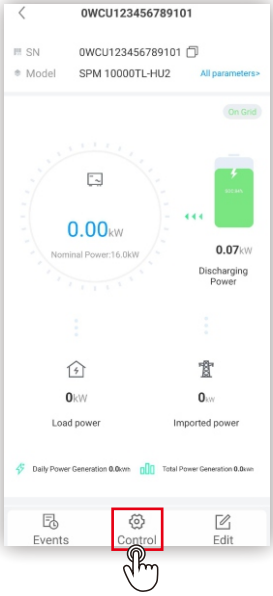


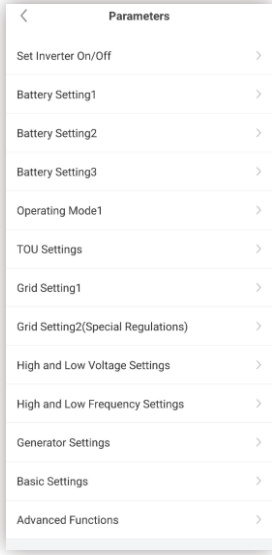
- In the log at the bottom of the interface, you can view the device's historical fault records and fault details.



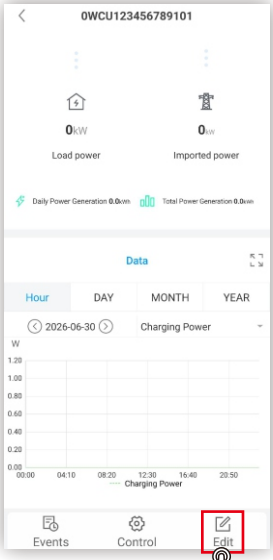


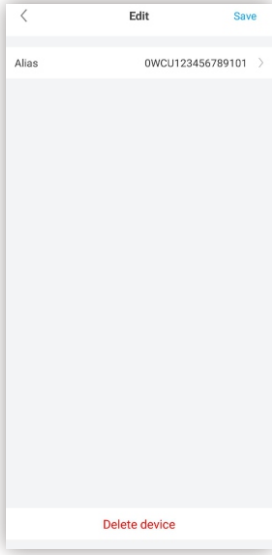
- Equipment control interface: Users can turn on and off the machine on the equipment control interface. Set the maximum charging current, maximum discharge current, inversion time, grid voltage upper limit, grid voltage Lower limit etc. The password is: growatt + current date. (Notice: Do not change parameters at will as this may cause your inverter to malfunction.)





- Device editing page: Users can edit device aliases and delete devices.





Operation 6

6.1 Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press On/Off button (located on the left side of the case) to turn on the unit. Either the grid or PV is connected, the screen will light up even when no battery is connected. in this condition, the system can still work normally when switch on the ON/OFF button and select "No Battery Mode".

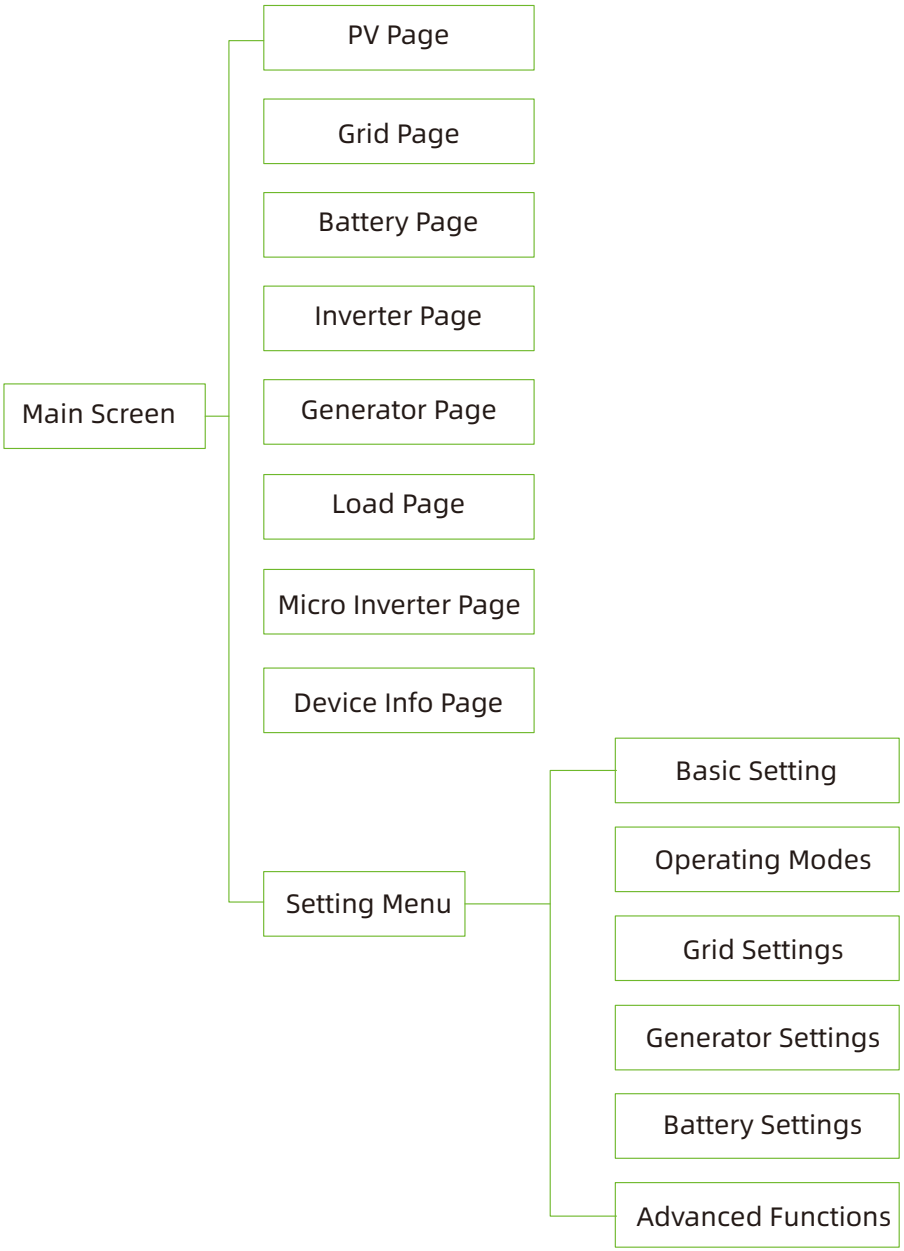
6.2 Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators and a touch screen display, indicating the operating status and input/output power information.

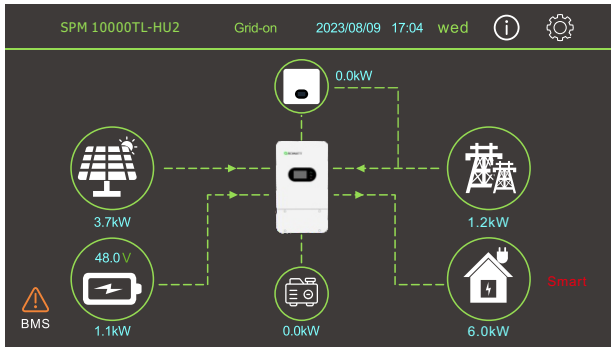
LED Indicator			Messages
AC/INV	GREEN	Light	Powered by AC
		Flashing	Powered by DC
CHARGE	GREEN	Light	Full battery
		Flashing	Charging
FAULT	RED	Light	Error
		Flashing	Warning

7 Main Screen

7.1 Touch Screen Operation Flow Chart



7.2 Main Screen

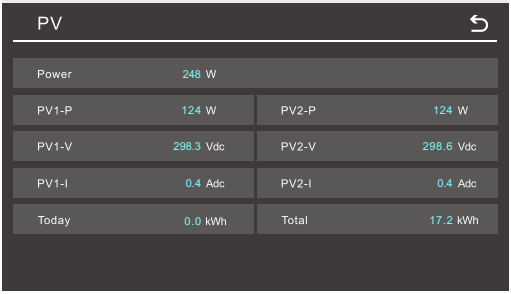


Icon	Description
	PV
	Battery: Battery Power, Charge (negative), Discharge (positive)
	Inverter
	Generator
	Micro Inverter
	Setting Menu
	device Info Page
	Grid: Grid Power, Export (negative), Import (positive)
	Load
Smart	Smart Load
BMS	BMS communication error

1. The “Grid-on” in the above of the home screen indicates that the system is Normal operation. If "Fault: F17-64 or Alarm: W01-W96" appears in the upper left corner of the screen, a communication error or other error has occurred in the inverter. F17-F64 faults and W01-W96 alarms, detailed information can be found in the exclamation mark in the upper right corner of the main screen.
2. At the top of the screen is the time.
3. When the mains power is detected (i.e., Grid icon lights up) and the status is neither "Grid-on" nor "Bypass", the grid connection countdown will be displayed in the upper right corner of the main screen.

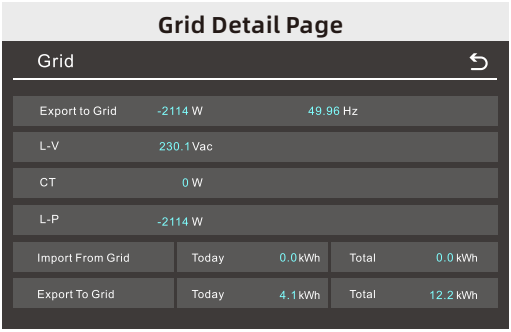
4. Setting Menu Icon, press this set button, you can enter into the system setup screen which including Basic Settings, Operating Modes, Grid Settings, Generator Settings, Battery Settings and Advanced Functions.
5. The main screen shows the info including Solar, Grid, Load, Battery, Generator and Micro Inverter. It also displays the energy flow direction by arrow.
   -PV power, Load power, Generator Power and Micro Inverter Power always keep positive.
   -Grid power negative means sell to grid, positive means get from grid.
   -Battery power negative means charge, positive means discharge.
6. When there is an abnormal BMS communication, a BMS alarm icon will appear in the bottom left corner of the screen, After this alarm occurs, the Lithium battery mode automatically switches to lead-acid battery mode, but cannot be charged.
7. When the Smart blinks, the Smart Load port (GEN port) has no output, and when the Smart is always on, the Smart Load port (GEN port) has output. (If you do not use Smart Load, you can turn off the enable option in Generator Setting, so that the Smart icon will not be displayed.)

PV Detail Page

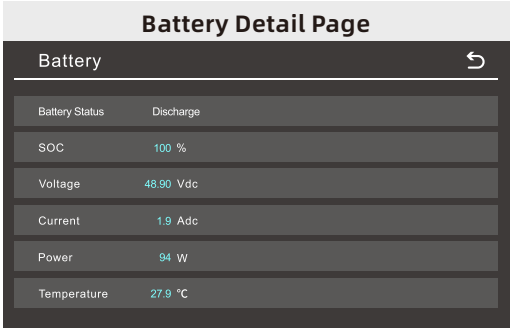


Solar Panel Generation.
Power, Voltage, Current for each MPPT.
Solar panel energy for Day and Total.

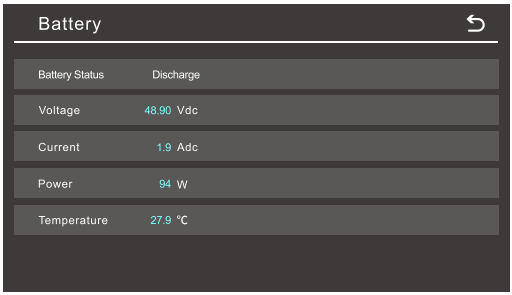
Grid Detail Page



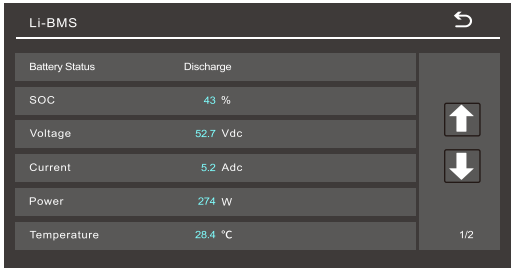
By clicking on the Grid icon, you can access the grid details screen. In this screen, you can see the current status of the grid (Stand-by, Import From Grid and Export To Grid), which includes power and frequency.
L-V: Grid voltage.
CT: External current sensor grid power.
L-P: Internal current sensor grid power.
Import From Grid: Today and total grid output power.
Export To Grid: Grid power sold today and in total.

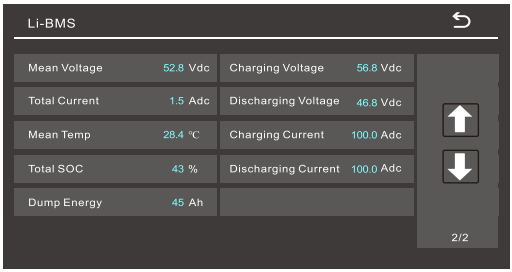


The image above shows the display screen when using % to measure the remaining power of the battery and make settings.



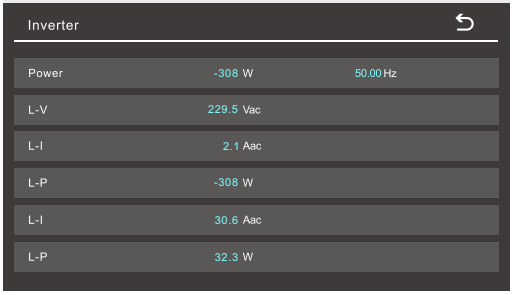
The image above shows the display screen when using voltage to measure the remaining power of the battery and make settings





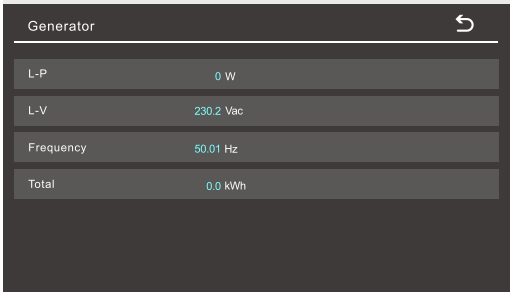
If you use Lithium Battery, you can enter 1-2 page.

Inverter Detail Page

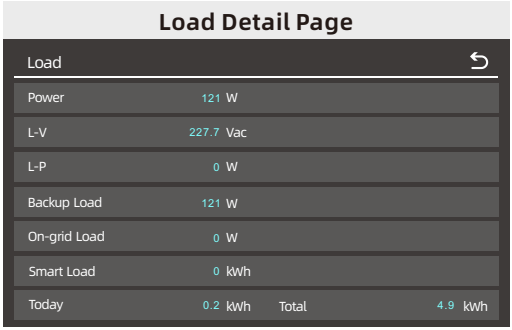


Inverter Generation Power and Frequency. Voltage, Current, Power for each phase.
AC-Temp: Temperature of AC module.
DC-Temp: Temperature of DC-DC module.

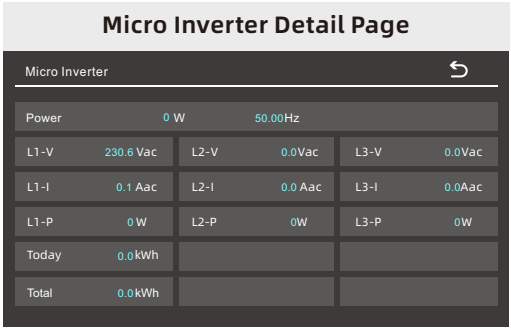
Generator Detail Page



Generator Power, Voltage and Frequency.
Generator exportation for Total.

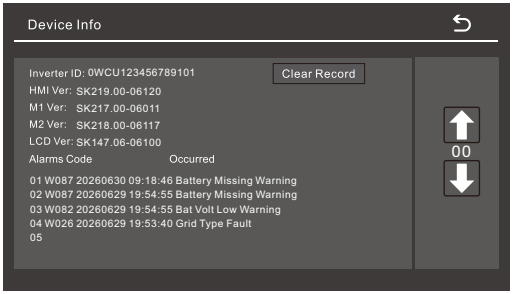


In this screen, you can see the voltage, power, daily consumption and total consumption of the load.



Micro Inverter Power, Voltage Current and Frequency.
Micro Inverter exportation for Today and Total.

7.3 Device Info.



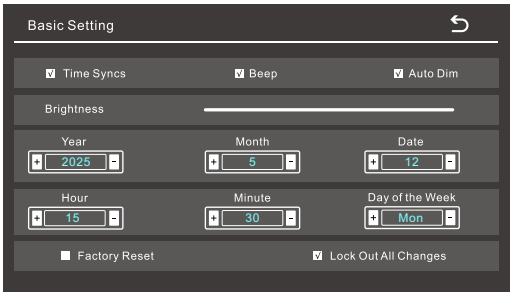
Inverter ID: This is the ID of the inverter.
HMI/M1/M2 Ver: This is the software version number of the inverter.
LCD Ver: LCD Version.
Clear Record : Clear error alarm messages.

7.4 Setting Menu



This is Setting menu detail page.

7.5 Basic Setting





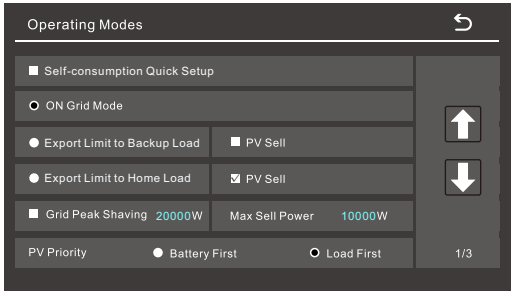
Factory Reset: Reset all parameters of the inverter.

Lock Out All Changes:

Enable this menu for setting parameters that require locking and can not be set up. Before performing a successful factory reset and locking the systems, to keep all changes you need to type in a password to enable the setting.

The password for factory settings is 9999.

7.6 Operating Modes



Self-consumption Quick Setup:

This setting is checked by default, and the value of some Settings will change after checking. You can reset these parameters according to the actual use case, which helps you quickly complete the inverter setup.

Operating Modes	PV Sell	PV Priority	Time of use	Grid Charge
Export Limit to Home Load	On	Load First	On	On

On Grid Mode:

The inverter will sell any excess power produced by the solar panels back to the grid. If you enable the "time of use" function, the battery energy can also be sold into grid. The PV energy will be used to power the load and charge the battery and then excess energy will flow to grid. Under this mode, the supply priority differs between backup load and on-grid load. Specifically, when 'Load First' is selected under PV Priority, PV power will preferentially supply the backup load, and any surplus PV energy will be used to charge the battery.

Power source priority for the load is as follows:

1. Solar Panels. 2. Grid. 3. Battery.

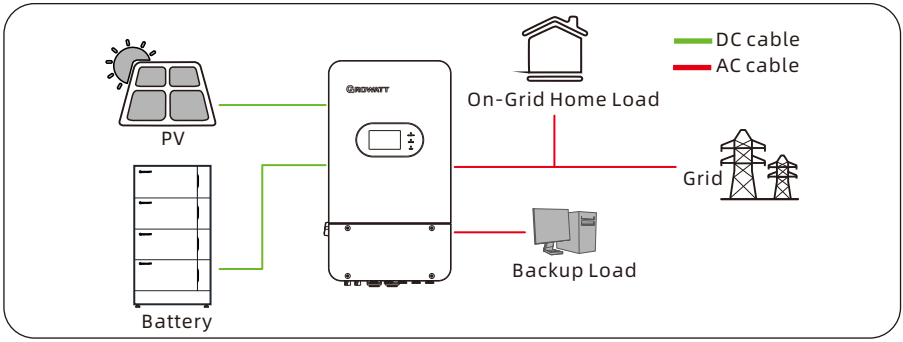
General description:

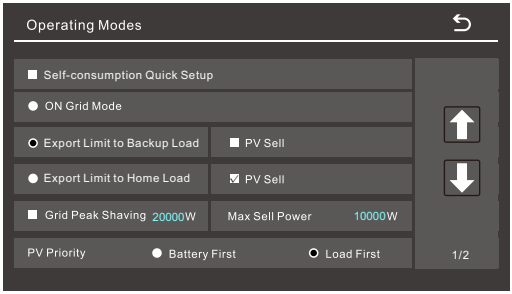
a. The inverter will measure all power export to the "GRID" terminal as sell power.

b. External CT/Meter not required for this system work mode.

c. Enable "ON Grid Mode", and set the "Max Sell Power" (W).

(How to install and set the CT/Meter, please refer to 3.6 and 7.10)





Export Limit to Backup Load:

Hybrid inverter will only provide power to the backup load connected.

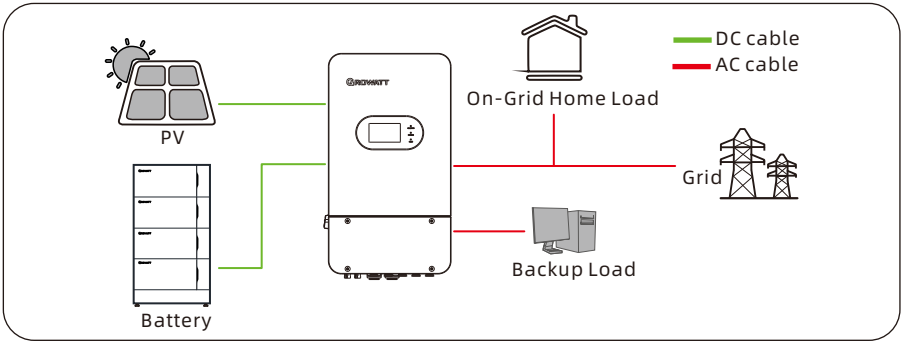
The hybrid inverter will neither provide power to the home load nor sell power to grid. The built-in meter will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load and charge the battery. Enable "PV Sell", it can sell electricity to the power grid.

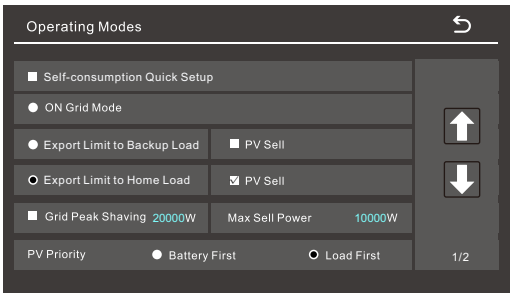
General description (not select "PV Sell"):

a. The inverter will only cover the loads connected to the "Backup LOAD" terminal.

b. This work mode will not provide power to the "GRID" terminal.

c. This system work mode is recommended for off-grid applications.





Export Limit to Home Load:

Hybrid inverter will not only provide power to the backup load connected but also provide to the home load connected. If PV power is insufficient, it will take grid energy as supplement unless TOU or grid peak shaving is set. The hybrid inverter will not sell power to grid. In this mode, a meter is needed.

The installation method of the meter please refer to chapter 3.6 Meter or CT Connection. The external meter will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load, charge battery and home load.

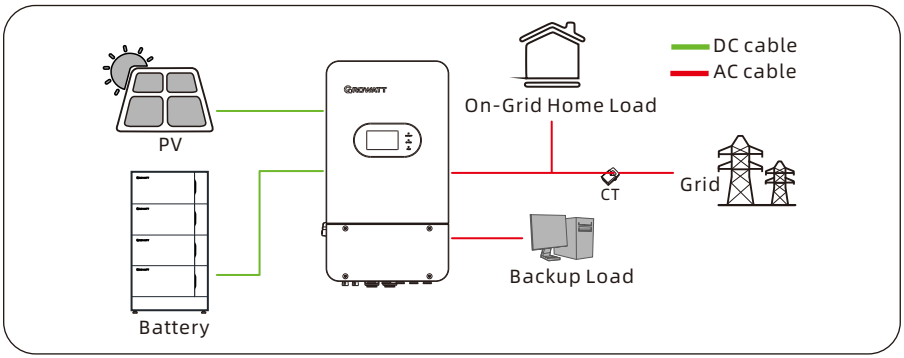
Enable "PV Sell", it can sell electricity to the power grid.

General description not select "PV Sell" :

a. Power is delivered to the whole home without selling the excess solar back to the grid.

b. External CT/Meter required for this system work mode. (How to install and set the CT/Meter, please refer to 3.6 and 7.10)

c. Enable "Grid Peak-Shaving" and set "Peak-shaving power(W)" which is used to set the maximum power that the inverter will draw from its grid power.



PV Sell: "PV sell" is for Export Limit to Backup Load Mode or Export Limit to Home Load Mode: When this item is selected,the surplus energy can be sold back to grid. PV Power source priority usage is as follows: load consumption and charge battery and feed into grid.

Max Sell Power: The maximum power allowed to be exported to the grid.

PV Priority: PV Power source priority.

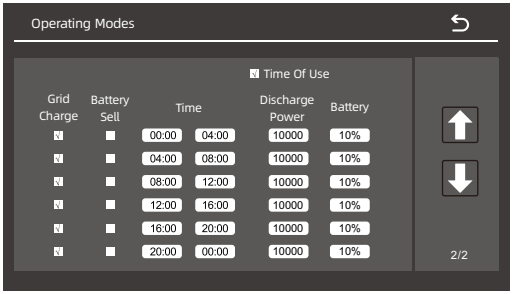
Battery First: PV power is firstly used to charge the battery and then used to power the load. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

Load First: PV power is firstly used to power the load and then used to charge the battery. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

Grid Peak Shaving:

when it is selected, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and battery as supplement, if still can't meet the load requirement, grid power will increase to meet the load needs.

Under this working condition, only "Load First" can be selected. (This function can only take effect in Export Limit to Home Load mode). The minimum setting value is 1000W.



Time Of Use:

It is used to program when to use grid or generator to charge the battery, and when to discharge the battery to power the load.

Only tick "Time Of Use" then the follow items (Grid Charge, Battery Sell, Time, Discharge Power, Battery) will take effect. Using this mode, the inverter is allowed to discharge the battery to the grid or charge the battery within a specific time frame.

General description:

a. During the setting hours the system will discharge the batteries to deliver power or charge the batteries from the external AC power. All time intervals are automatically enabled.

b. Enable "Time of Use" function and set the Forced discharge time to discharge the batteries to deliver power.

Note: when in ON Grid Mode and click time of use, the battery power can be sold into grid.

Grid Charge: Utilize grid to charge the battery in a time period.

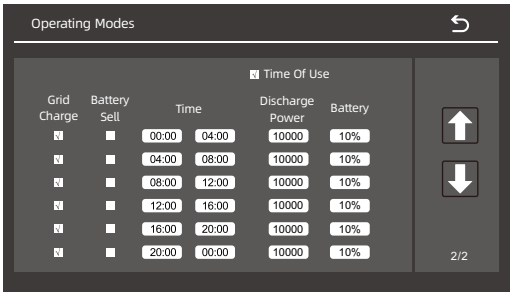
Battery Sell: Export Limit to Home Load mode, the battery is allowed to sell electricity.

Time: The time displayed on the inverter, range of 00:00-23:59.

Discharge Power: Max discharge power of battery allowed.

Battery (V or SOC %):

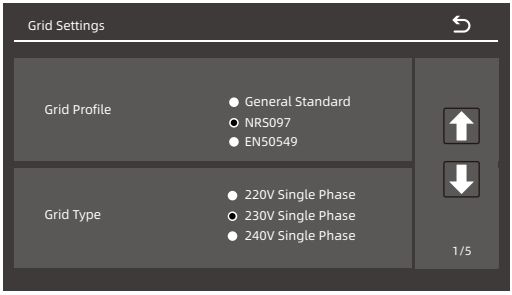
Battery SOC % or voltage at when the action is to happen. The default setting range is 44 to 54V or 10% to 100%. This setting needs to be greater than the LBCO alarm in the battery settings.



For example: During 00:00-04:00, when battery SOC is lower than 10% it will use grid to charge the battery until battery SOC reaches 80%.
During 04:00-09:00, when battery SOC is higher than 10%,hybrid inverter will discharge the battery until the SOC reaches 80%.

Battery: The default setting range is 10% to 100%.

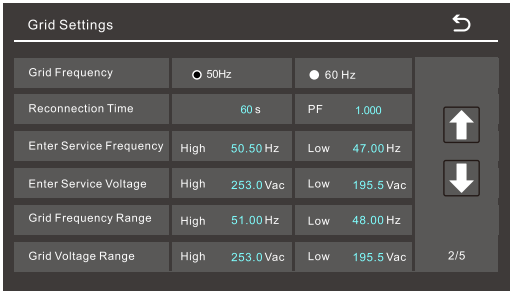
7.7 Grid Settings



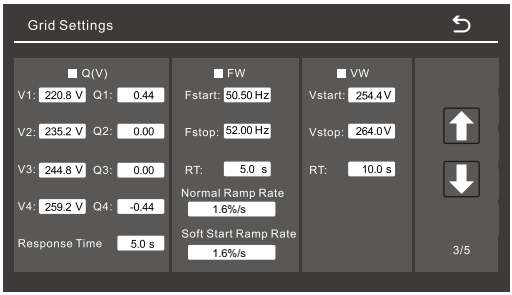
The password for entering this Page is 1234.

Grid Profile: Please follow the local grid code and then choose the corresponding grid standard.

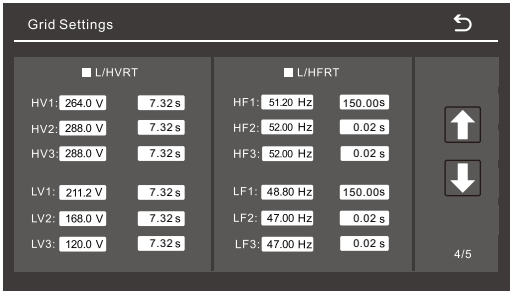
Grid Type: Set the Grid Type.



Grid Frequency: Set the grid frequency.
Reconnection time:
The waiting time period for the inverter to connect the grid again.
PF: This is used to adjust the inverter's reactive power.
Enter Service Frequency/Voltage: Grid-connected voltage frequency range.
Grid Frequency/Voltage Range: Grid voltage frequency protection range

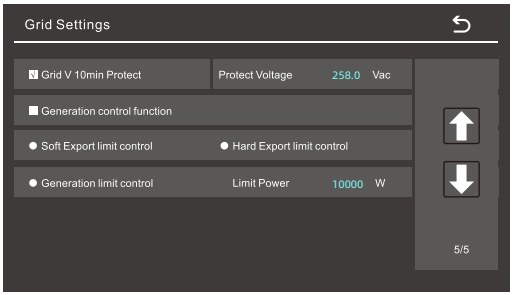


Q(V): It adjusts the inverter reactive power according to the set grid voltage. This function adjusts inverter output (active and reactive) power when grid voltage changes.
FW: This series inverter is able to adjust inverter output power according to grid frequency.
VW: It adjusts the inverter active power according to the set grid voltage.



HV1: Level 1 overvoltage protection point.
HV2: Level 2 overvoltage protection point.
HV3: Untapped.
LV1: Level 1 undervoltage protection point.
LV2: Level 2 undervoltage protection point.
LV3: Untapped.

HF1: Level 1 over frequency protection point.
HF2: Level 2 over frequency protection point.
HF3: Untapped.
LF1: Level 1 under frequency protection point.
LF2: Level 2 under frequency protection point.
LF3: Untapped.
14.64s: Trip time.



Grid V 10min Protect:
When the average voltage of the mains power exceeds the set protection value for 10 minutes, the inverter will be disconnected from gird for protection.

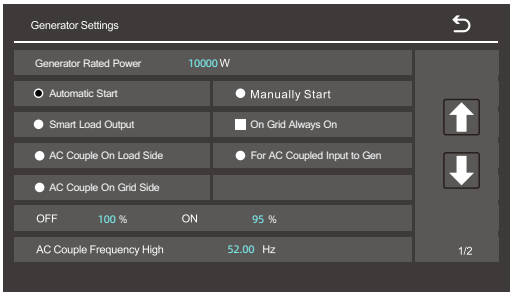
Soft Export limit control:
When the soft limit is exceeded, the apparent power of the inverter will decrease to less than the soft limit 15 seconds.

Hard Export limit control:
If the soft limit does not limit the mains power to below the limit 15 seconds, the hard limit will provide offline within 5 seconds.

Generation limit control:

Set the power limit according to the local grid requirements, use an electricity meter to detect the mains power and adjust the selling power of the inverter within 15 seconds.

7.8 Generator Settings



Generator Rated Power: Allowed Max. power from diesel generator.

Automatic Start:

In this mode, the inverter will automatically turn on the generator when the Recharge value is lower than the Battery Settings-Page 2.When the grid is present or the Maximum Run Time set on the Generator Setting-Page 2 is reached, the generator will be turned off. When using this function, make sure that the generator has an automatic start (ATS) function.

Manually Start:

When this function is checked, the generator will be forced to start. When using this function, make sure that the generator has the automatic start (ATS) function.

Smart load Enable:

Check this mode, when the battery SOC reaches 90%, the smart load turns on and the red "Smart Load" text on the main page remains constantly lit until the SOC is below 60% and the red "Smart Load" text on the main page flashes. If not checked, the smart load will not turn on and the red "Smart Load" text on the main page will not be displayed.

ON Grid Always On:

Using this mode, the Smart Load is always on. If ON Grid Always On is no setting, when battery SOC reaches 90%, Smart Load is on until SOC is lower than 60%.

For AC Coupled Input to Gen:

Allows other PV inverter to be connected to the generator port. In this mode, the OFF value represents the voltage/SOC when the AC Couple function is turned off, and the ON value represents the voltage/SOC when the AC Couple function is turned on.

AC Couple Frequency high:

It represents the highest frequency that the inverter can increase when the AC Couple function is turned on. It is recommended to be the same as the first-order grid-off frequency specified in the current grid regulations.

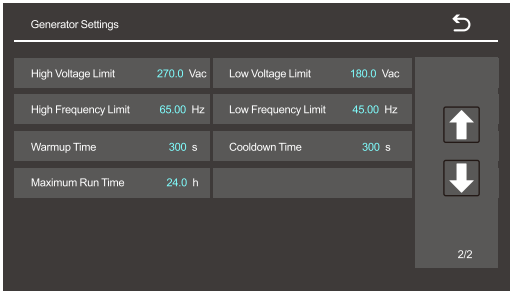
AC Couple on Load Side: Reserved.

AC Couple On Grid Side:

In this mode, AC COUPLE is allowed on the grid side. When using this mode, a DDSU666 (single-phase 2CT)/DTSU666 (three-phase 6CT) meter and "Export Limit to Home Load" mode must be used. Refer to the meter's wiring manual for detailed wiring instructions.

The following are some precautions when using the AC couple function:

1. When charging with micro-inverter (not connected to the grid), try not to supplying load, because the frequency fluctuates. When over-frequency is cut off, the machine inverter is in a high-frequency state.
2. The selling power increase rate of micro-inverter must be ≤1%/s. If it is still unstable, it can be set to the recommended value: 0.3%/s to ensure relatively stable charging, rather than micro-inverter switching back and forth.
3. The AC Couple Frequency high value of SPM 8000-10000TL-HU2 series models must be greater than or equal to the micro-inverter over-frequency protection value. The micro-inverter over-frequency protection value is recommended to be equal to the AC COUPLE High Fre value of the energy storage machine.
4. The first-order over-frequency grid exit time of micro-inverter must be ≥10s.
5. Make sure that the corresponding grid regulations have an over-frequency derating function. For example, IEEE1547-2003 does not have an over-frequency derating function and cannot be used!
6. The over-frequency load reduction response time of micro-inverter is recommended to be set to 1s. If it is too long, charging will be unstable and disconnected frequently.
7. The maximum power of a single inverter is 6kW, and the maximum power of a parallel inverter is N*6kW. The diesel engine ports can be connected in a combined or separate manner. The total power of the micro-inverter cannot exceed the limit value. If it exceeds the limit, the inverter may be damaged.



High/Low Voltage Limit: Generator-connected voltage range.
High/Low Frequency Limit: Generator-connected frequency range.
Warmup Time:

After startup, the amount of time the generator runs(no-load) before the inverter is connected to the generator. The setting range is between 10 and 600s.

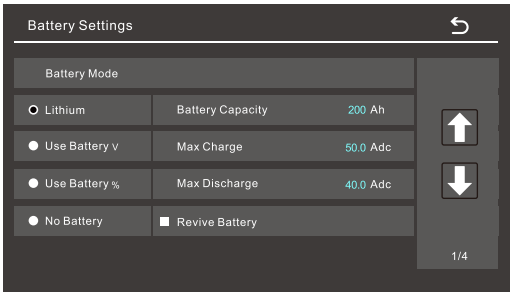
Cooldown Time:

The amount of time the generator runs (no load after the shutdown command is issued before the generator is actually shut down. The setting range is between 10 and 600s.

Maximum Run Time:

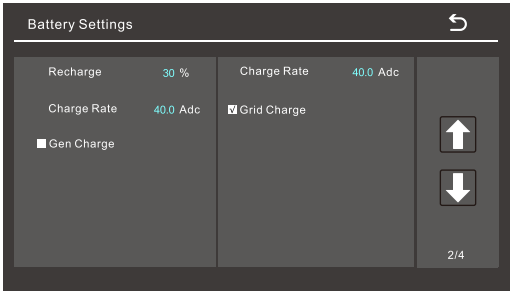
When automatically started, the cumulative time allowed for continuous operation of the generator within 24 hours. The generator can be operated manually for any length of time.

7.9 Battery Settings

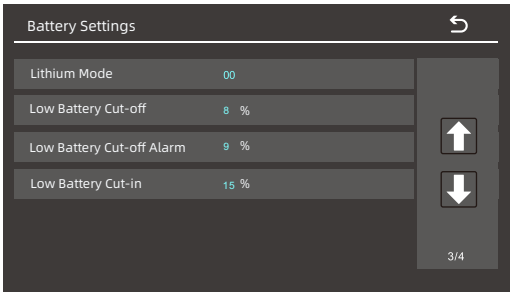


Lithium: Choose Lithium for Battery Mode if lithium battery is used.
Battery Capacity: Enter the size of the battery bank connected to the system.
Use Battery V: When using lead-acid battery, choose Use Battery V if you want to use voltage as the unit of actual battery capacity and do the setup.
Use Battery %: When using lead-acid battery, choose Use Battery %, if you want to use percentage as the unit of actual battery capacity and do the setup.

Max Charge/Discharge: Set the max charge/discharge rate for the batteries.
No Battery: Tick this item if no battery is connected to the system.
Revive Battery: If lithium battery is used but the inverter and the battery are incompatible in communication, please enable the Revive Battery function to wake up the battery. If the lithium battery is compatible with the inverter in communication, then the inverter is able to wake the lithium battery when PV or grid is connected whether the Revive Battery function is enabled or not.



Recharge (Left) : When there is a blackout and Automatic Start for generator is enabled the generator will automatically start and charge the battery if the actual battery capacity is lower than the Recharge value.
Charge Rate=40Adc: The maximum generator charging current.
Charge Rate (Left): Current of generator charging current.
Gen Charge: Enable this to allow generator to charge the battery.
Charge Rate (Right): Current of grid charging the battery.
Charge Rate=40Adc: The maximum grid charging current.
Grid Charge: Enable this to allow grid to charge the battery.



Lithium Mode: The communication protocol used between the inverter and lithium battery. Please set this according to the Appendix I at the end of user manual.

Low Battery Cut-off:

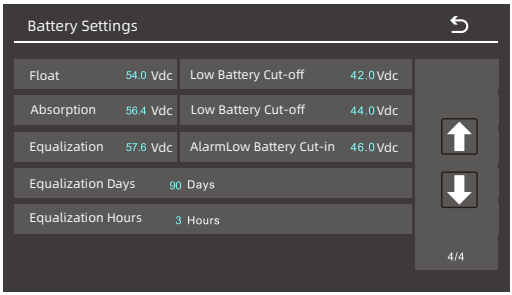
The default value is 8%. The minimum value that can be set is 5%. The set value must match Low Battery Cut-off<Low Battery Cut-off alarm < Low Battery Cut-in, otherwise the setting will not be successful. The inverter will shut off its AC output if the actual battery capacity is lower than this value. The backup load can still be powered by the grid.

Low Battery Cut-off Alarm:

The inverter will send alarm if the actual battery value reaches this value. The default value is 9%. The minimum value can be set is 9%. The set value must match Low Battery Cut-off<Low Battery Cut-off alarm< Low Battery Cut-in, otherwise the setting will not be successful.

Low Battery Cut-in:

The inverter AC output will resume if actual battery capacity reaches this value. The default value is 15%. The minimum value can be set is 15%. The set value must match Low Battery Cut-off <Low Battery Cut-off alarm< Low Battery Cut-in, otherwise the setting will not be successful.



Float, Absorption, Equalization are three stages of charging the battery.

Low Battery Cut-off 42Vdc:

The inverter will shutdown if the voltage below this value.

Low Battery Cut-off Alarm 44Vdc:

The inverter will alarm if the voltage below this value.

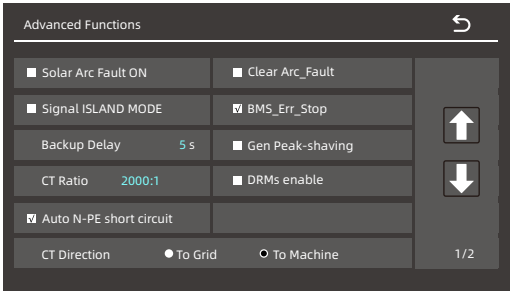
Low Battery Cut-in 46Vdc:

After the battery low voltage alarm, the alarm information above 46V is cleared. This is for professional installers, you can keep it if you do not know.

Recommended battery settings:

Battery Type	Absorption	Float	Equalization
AGM(or PCC)	14.4V (57.6V)	13.5V (53.6V)	14.4 (57.6V)
Gel	14.1V (56.4V)	13.5V (54.0V)	
Wet	14.7V (59.0V)	13.7V (55.0V)	14.7 (59.0V)
Lithium	Follow its BMS voltage parameters		

7.10 Advanced Functions



The password for entering this Page is 7777.

Solar Arc Fault ON: This is AFCI function.

Clear Arc Fault: Clear AFCI error messages.

Signal ISLAND MODE:

when the inverter connects grid, the ATS port will output 240Vac and it is used to cuts off Earth-Neutral (load port N line) bond via connect external relay. When the inverter disconnects from the grid, ATS port voltage will be 0 and the Earth-Neutral bond keeps on, More details, please refer to above picture.

BMS_Err_Stop:

When the Battery Mode is Lithium

a) enable this function, the inverter will disconnect its output and send BMS error if the battery communication is abnormal. The output will be resumed after the communication is restored.

b) disable this function, the Battery Mode will be changed to Use Bat V if the battery communication is abnormal, and the battery can only be discharged, not be charged.

Backup Delay: Reserved.

Gen Peak-shaving: Reserved.

CT Ratio:

The inverter support 4 ratios: 1500:1, 2000:1, 2500:1 and 3000:1 . The CT Ratio of the CTs in the accessory bag is 2000:1.

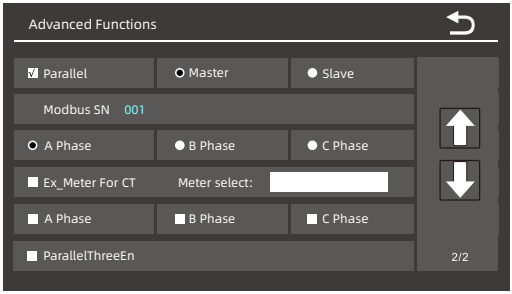
DRMs enable:

This is DRMs function enable setting. This function is available only in Australia.

Auto N-PE short circuit:

When this option is enabled, the machine will internally close the N-PE relay when disconnected from the grid and disconnect it when connected to the grid. N-PE relay: When closed, it connects the N of the LOAD and PE lines.

CT direction: Selection of CT direction.



Parallel: This is the inverter's parallel function interface setting.
Ex_Meter For CT: This is the Meter setting for the inverter. To use the meter, you need to enable this option and select the correct meter model.
ParallelThreeEn: This model enables the three-phase function of the group by setting specific grid regulations. This setting is not applicable.
Modbus SN: If use smart meter to do the grid side sampling, please select the meter that is being used.
Meter Select: Selection of electric meter.

Maintenance 8

8.1 Troubleshooting

Error codes are divided into Warning codes and fault codes.
Warning codes identify the current statues of the inverter(Max), it does not affect the normal running of the inverter. When a numeric warning appears on the Main Screen, it can usually be cleared through orderly shutdown/re-set or self-corrective action performed by the inverter. Fault codes identify the possible equipment failure,incorrect setting or configuration of the inverter, all attempts to clear the fault code must be performed by qualified personnel. Typically, error codes can be cleared.
Some of error code as table shows below.

Auditing routine	Error Code	Description	Solutions
About PV	W81	PV Energy Low Warning	1. Check whether the PV voltage is too low. 2. If alarm message still exists, contact manufacturer.
	W83	PV Voltage Over Warning	1. Check whether the PV voltage is greater than 550V. 2. If alarm message still exists, contact manufacturer.
	W84	PV Current Over Warning	If there is an alarm message, please contact the manufacturer.
	W89	PV Over Load	1. Check whether the single-channel PV power exceeds 10KW. 2. If alarm message still exists, contact manufacturer.
	F33	PV Current Over	1. Close the PV isolation switch to check whether the actual PV current is consistent with the display. 2. Reduce the number of load connections in off-grid mode. 3. If the fault persists, contact the manufacturer.
	F40	PV Voltage Over	1. Check whether the actual PV voltage is consistent with the Main Screen. 2. Check whether the PV string voltage (Voc) is higher than the maximum input voltage of the inverter. If yes, adjust the number of PV modules in series to reduce the PV series voltage. 3. If the fault persists, contact the manufacturer.

Auditing routine	Error Code	Description	Solutions
About PV	F56	PV ISO Fault	1. Check whether the connection between the PV module and the inverter is firm and correct. 2. Check whether the PE cable of the inverter is grounded. 3.If the fault persists, contact the manufacturer.
	F97	PV Reverse Polarity Fault	1. Check if the PV polarity is reversed. If yes, please swap the polarity. 2. If the fault persists, contact the manufacturer.
About Grid、Generator	W68	Grid Relay Warning	1. Restart the inverter. 2. If alarm message still exists, contact manufacturer.
	W71	Gen Overload warning	1. Check whether the generator power exceeds 11 kW. 2. If alarm message still exists, contact manufacturer.
	F97	PV Reverse Polarity Fault	1. Check if the PV polarity is reversed. If yes, please swap the polarity. 2. If the fault persists, contact the manufacturer.
	W141	LN Reverse Polarity warning	1. Check if the LN polarity is reversed. If yes, please swap the polarity. 2. If the fault persists, contact the manufacturer.
	F26	Grid Type Fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	F28	Gen Overload Fault	1. Check whether the generator power exceeds 11 kW. 2. If the fault persists, contact the manufacturer.
About inverter	W01	Fan lock warning	1. Check fan wiring after shutdown. 2. If alarm message still exists, contact manufacturer.
	W02	Meter Connect warning	1. Check meter wiring after shutdown. 2. If alarm message still exists, contact manufacturer.
	W03	LCD Connect warning	1. Check LCD wiring after shutdown. 2. If alarm message still exists, contact manufacturer.

Auditing routine	Error Code	Description	Solutions
About inverter	W04	USB Connect warning	1. Check USB wiring after shutdown. 2. If alarm message still exists, contact manufacturer.
	W10	RSD Stop Press Alarm	1. Check if the emergency stop button is pressed. 2. If alarm message still exists, contact manufacturer.
	W11	M3 Update Alarm	1. Check if the machine is in the process of upgrading. 2. If alarm message still exists, contact manufacturer.
	W12	MDSP update Alarm	
	W13	SDSP update Alarm	
	W67	Inverter Relay Warning	1. Restart the inverter. 2. If alarm message still exists, contact manufacturer.
	W70	GFCI Warning	1. Please charge for 10 minutes before inverter. 2. If alarm message still exists, contact manufacturer.
	W73	MDSP-METER Connect warning	1. Check meter wiring after shutdown. 2. If alarm message still exists, contact manufacturer.
	W80	CT Warning	1. Please check the wiring of the current transformer. 2. If alarm message still exists, contact manufacturer.
	W85	Mos Temperature Over	If there is an alarm message, please contact the manufacturer.
	W86	Transfer Temperature Over	If there is an alarm message, please contact the manufacturer.
	W90	Insulation Low	1. After shutdown, check if the panel shell is reliably grounded. 2. If alarm message still exists, contact manufacturer.

Auditing routine	Error Code	Description	Solutions
About inverter	W93	PE abnormal Warning	1. After shutdown, check if the PE line is reliably grounded. 2. If alarm message still exists, contact manufacturer.
	F18	Inverter Over Current Fault	1. Check if the load is within the power range. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	F19	MSDSP Connect Fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	F24	Inverter Voltage Fault	1. Test if the actual output inverter voltage is consistent. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	F25	Relay Fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	F27	GFCI Fault	
	F34	Bus Voltage Over	1. Restart the inverter 2-3 times. 2. If the fault persists, contact the manufacturer.
	F41	Heat Sink High Temperature Failure	1. Check that the inverter is not installed in a place where the sun shines, and ensure that the inverter is installed in a cool and ventilated place. 2. Check whether the working temperature is too high, and make sure that the inverter is installed vertically. 3. Turn off the inverter for 10 minutes, then restart the inverter. 4. If the fault persists, contact the manufacturer.
	F42	Transfer Temperature Over	
	F45	BUS Start Error	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	F49	M3_MDSP Connect Fault	1. Shut down and check whether the communication line is firmly connected. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.

Auditing routine	Error Code	Description	Solutions
About inverter	F50	M3_SDSP Connect Fault	1. Shut down and check whether the communication line is firmly connected. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	F52	RSD Check Fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	F53	Version Different	
About Load	W65	Output Short Warning	1. Output is short circuited. 2. Shut down and restart to check whether the machine can work normally. 3. If alarm message still exists, contact manufacturer.
	W66	Output Overload Warning	1. Check whether the output is short-circuited. 2. Shut down and restart to check whether the machine can work normally. 3. If alarm message still exists, contact manufacturer.
	F20	DC Weight High	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	F21	Output Short	1. Check if the load is short circuited. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	F22	Output Over Load	1. Check if the load is within the power range. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	F23	Output Over Current	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
About Battery	W14	BMS Update Alarm	1. Check if the machine is in the process of upgrading. 2. If alarm message still exists, contact manufacturer.

Auditing routine	Error Code	Description	Solutions
About Battery	W15	BMS alarm	If alarm message still exists, contact manufacturer.
	W16	BMS update parameter alarm	1. Please set the 'Lithium Mode' to 01 in the Battery Settings on the LCD, then proceed with the battery upgrade. 2. If alarm message still exists, contact manufacturer.
	W69	Bat Energy Warning	1. Please charge for 10 minutes before inverter. 2. If alarm message still exists, contact manufacturer.
	W82	Bat Volt Low Warning	1. Check if the battery voltage is too low. 2. If alarm message still exists, contact manufacturer.
	W87	Battery Loss Warning	1. There is no electric voltage at the input end of the machine battery. 2. After confirming that the battery voltage is normal, turn on the machine to check whether it can work normally. 3. If alarm message still exists, contact manufacturer.
	F36	Battery Voltage Over	1. Check whether the actual connected battery voltage is consistent with the display. 2. If the battery voltage is too low, use PV power or grid power to charge the battery. If the battery voltage is too high, please connect to a battery within the required range. 3. If the fault persists, contact the manufacturer.
	F37	Bat Charge Current Over	1. Check whether the actual battery current is consistent with the display. 2. Restart the inverter. 3. If the fault persists, contact the manufacturer.
	F38	Bat DisCharge Current Over	

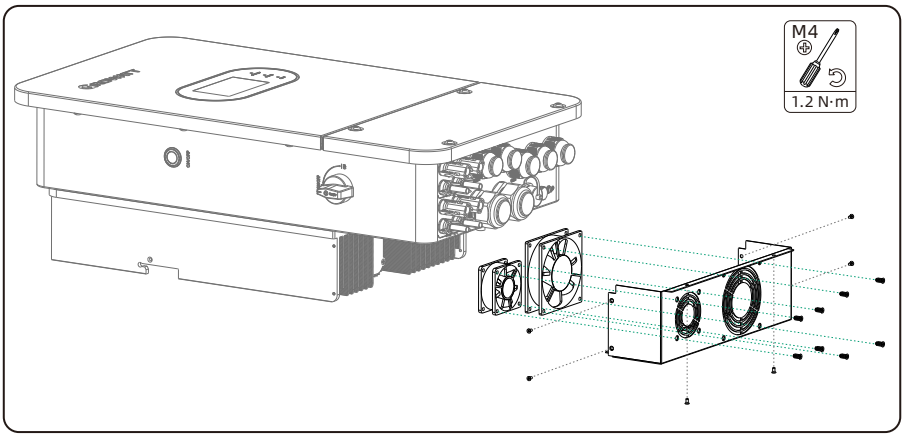
Auditing routine	Error Code	Description	Solutions
About Battery	F51	M3_BMS connect fault	1. Shut down and check whether the communication line is firmly connected. 2. Restart the invert. 3. If the fault persists, contact the manufacturer.
	F57	BMS Fault	1. Restart the inverter. 2. If the fault persists, contact the manufacturer.
	F58	Battery Mode Fault	
About Parallel	W05	Grid Different	1. After shutting down the inverter, check if the grid power supply cables are correctly connected. 2. If the warn persists, contact the manufacturer.
	W06	Grid Phase Error	1. After disconnecting the grid power supply from the inverter, check whether the grid connection phase sequence matches the parallel operation settings on the Main Screen. 2. Restart the inverter. 3. If the warn persists, contact the manufacturer.
	W07	Op Phase Loss	1. Check if the parallel operation parameters settings on the inverter's LCD interface are correct. 2. Restart the inverter. 3. If error message still exists, contact manufacturer.
	W08	Parallel Version Different	If the warn still exists, please contact us for help.
	W09	Capacity Different	If the warn still exists, please contact us for help.
	F29	Parallel Setting Fault	1. Check if the master-slave settings in the parallel operation settings on the LCD interface of the inverter are correct . 2. Restart the inverter. 3. If error message still exists, contact manufacturer.

Auditing routine	Error Code	Description	Solutions
About Parallel	F30	Parallel M-AC Phase Order	1. After disconnecting the grid power supply connected to the inverter, check whether the grid connection phase sequence matches the parallel operation settings. 2. Restart the inverter. 3. If error message still exists, contact manufacturer.
	F31	Parallel CN-AC Phase Order	1. Restart the inverter. 2. If error message still exists, contact manufacturer.
	F54	Can Fault	1. After shutting down the inverter, check if the parallel communication cables are securely and correctly connected. 2. Restart the inverter. 3. If error message still exists, contact manufacturer.
	F55	Host Loss	1. Restart the inverter. 2. If error message still exists, contact manufacturer.
	F59	Parallel BMS Connect Error	1. Connect the BMS communication cable to the 'Master Phase A' port of the inverter. 2. Restart the inverter. 3. If error message still exists, contact manufacturer.

8.2 Fan Replacement

Please check and clean the fans regularly. The recommended period is 6 months. Please replace the fan following up the below diagram if there is problem with the fans.

1. Turn off the system and wait for more than 5 minutes before disassembling the machine.
2. Loosen the screws to remove the shell and fans.
3. Replace the fans, then reinstall the shell and fans.



8.3 Decommissioning

8.3.1 Preparation

1. Prepare safety gloves, a cross-head screwdriver, socket wrench, and other tools.
2. Power off the system.
3. If the battery system is powered on, press the power button once to turn it off. Before performing maintenance on the battery, ensure to turn off the circuit breaker and confirm again that the battery system is powered off. Follow the installation and wiring procedures described above.
4. Turn off the circuit breaker that connects the inverter to the grid.
5. Turn off the PV-side isolation switch.
6. Ensure that the inverter is completely powered off, with the LCD screen turned off.
7. Disconnect the wires in the system.

8.3.2 Remove the inverter

1. Power off the system. After powering off the inverter, do not open the cover until 5 minutes later as residual voltage exists, and it takes about 20 minutes for the inverter to cool down.
2. Disconnect all cables connected to the inverter.
3. Remove screws securing the inverter.
4. Remove the inverter.

8.3.3 Pack the inverter

Please handle the inverter and the battery with care during transportation. Keep them level and try to keep the batteries at approximately 50% SOC (State of Charge) during handling.

8.3.4 Dispose of the inverter

Do not dispose of the inverter together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.



Data Sheet 9

Model / Specifications	SPM 8000TL-HU2	SPM 10000TL-HU2
PV Input Data		
Max Recommended PV Power	12800W	16000W
DC/AC Ratio	1.6	
PV Input Voltage(V)	370V(70V-550V)	
MPPT Range(V)	80V-525V	
Start-up Voltage(V)	77V	
PV Input Current(A)	32A	
No. of MPPT Trackers	2	
No. of PV strings per MPP trackers	2	
Battery Data		
Battery Type	Lithium battery/Lead-acid battery	
Nominal Voltage(V)	48V	
Battery Voltage Range(V)	40-60V	
Max Charging Current(A)	170A	210A
Max Discharging Current(A)	170A	210A
Output Data(On Grid)		
Rated Voltage	220/230/240Va.c.(single phase)	
Continuous Power Output(W)	8000W	10000W
Nominal Output Current(A)	34.8A	43.5A
Power Factor	0.8 leading to 0.8 lagging	
Output Frequency	50/60Hz	
Grid Type	Single phase	
THDI	<3%	

Model / Specifications	SPM 8000TL-HU2	SPM 10000TL-HU2
Backup Power(Off Grid)		
Rated Voltage	220/230/240Va.c.(single phase)	
AC Nominal Output Power(W)	8000W	10000W
Peak Power(grid off)	2 times of rated power, 10s	
AC Output Rated Current(A)	34.8A	43.5A
Output Frequency	50/60Hz	
Switch Time	<10ms	
Max. AC Current(A)	50A	
AC MAX Output Power(KW)	11kW	
Efficiency		
Max Efficiency	97.60%	
Max Euro Efficiency	96.50%	
MPPT Efficiency	99.90%	
Protection		
PV Switch	Yes	
BAT reverse protection	Yes	
Output over current	Yes	
AC short- circuit	Yes	
PV Input Lightning	Yes	
Anti- islanding	Yes	
Insulation Resistance	Yes	
Residual Current	Yes	
Surge Protection	DC Type II / AC Type II	

Model / Specifications	SPM 8000TL-HU2	SPM 10000TL-HU2
Certifications and Standards		
Compliance	EN50549, NRS097,CE, IEC 62116, IEC 61683, IEC 61727, IEC 60068	
General Data		
Operating Temperature	-25~60℃ , >45℃ Derating	
Cooling	Smart cooling	
Noise(dB)	<60 dB	
Communication with BMS	RS485; CAN	
Weight(kg)	27	
Size(mm)	363H*653W*223D	
Protection Level	IP65	
Installation Style	Wall-mounted	
Warranty	5 years	

Appendix

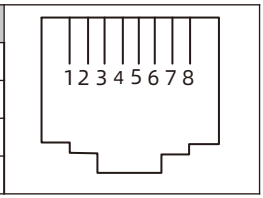
- **Approved battery brand from Growatt.**

Brand	Model	RS485 or CAN	Inverter Setup
GROWATT	ALP 5.0L-E2	CAN	01
	AXE 5.0L-C1	CAN	05
	HOPE 5.5L-A1	RS485	00
		CAN	01
Enersys	OGHB 1548-Li	CAN	02
TOPBAND	TB48100F-T110AD	RS485	03
PYLON	US2000B/ US3000/ US2000C/ US3000C/ UP5000/ US5000/ Force L1/ Force L2	CAN	04
Dyness	DYNESS LV	RS485	00
Raystech	RT5427	CAN	01

Please check the complete battery matching list on the official website, official website link:
https://community.growatt.com/upload/file/Growatt_Approved_LV_Battery_List.pdfraw=Growatt_Approved_LV_Battery_List.pdf

- **Definition of RJ45 Port Pin for BMS.**

NO.	BMS	NO.	BMS
1	RS485B	5	CAN-L
2	RS485A	6	GND
3	/	7	/
4	CAN-H	8	/



- **CT installation recommendation**

CT model	CT ratio	CT aperture	Property	Recommendation system
100A	2000:1	17mm	Standard configuration	single-phase system 3PCS three-phase parallel systems
200A	5000:1	37mm	Purchase from Growatt	2-3PCS single-phase parallel systems 6PCS three-phase parallel systems
500A	12500:1	37mm	Purchase from Growatt	4-6PCS split-phase parallel systems

● Meter installation recommendation

CT Type	Property	Recommendation system
TPM-CT-E_EU (250A CT)	Purchase from Growatt	3-6PCS three-phase parallel systems
SPM-CT-E (100A)		Single-phase parallel systems
SPM-CT-E (200A)		2PCS single-phase parallel systems
SPM-CT-E (500A)		3-6PCS three-phase parallel systems

● Monitoring Equipment Configuration Guide

Download the configuration guide.

Datalogger	
ShineWiFi-X2	

Download Manual

Growatt New Energy

Shenzhen Growatt New Energy Co., Ltd.

Room 101, Building 1, Smart Green Energy Industrial Park,
Buildings 1 to 7, No. 291 Yunchang Road, Sanwei Community,
Hangcheng Subdistrict, Bao'an District, Shenzhen, Guangdong, China

E service@growatt.com
W en.growatt.com

For local customer support, please visit https://en.growatt.com/support/contact

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