

User Manual



Hybrid WP 6KW PLUS INVERTER / CHARGER

Version: 1.0

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ABOUT THIS MANUAL

Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

SAFETY INSTRUCTIONS



WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. **CAUTION** --To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
3. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. **CAUTION** – Only qualified personnel can install this device with battery.
6. **NEVER** charge a frozen battery.
7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
10. Fuses are provided as over-current protection for the battery supply.
11. GROUNDING INSTRUCTIONS -This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
12. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.

INTRODUCTION

This is a hybrid inverter. It includes the functions of an inverter, solar charger, and battery charger. The inverter uses a LCD touch screen, which is simpler and more user-friendly for viewing or setting up. It supports two inputs (Grid&Generator) and two outputs (Backload&Smart Load) to adapt to different applications.

This hybrid PV inverter can provide power to connected loads by utilizing PV power, utility power and battery power.

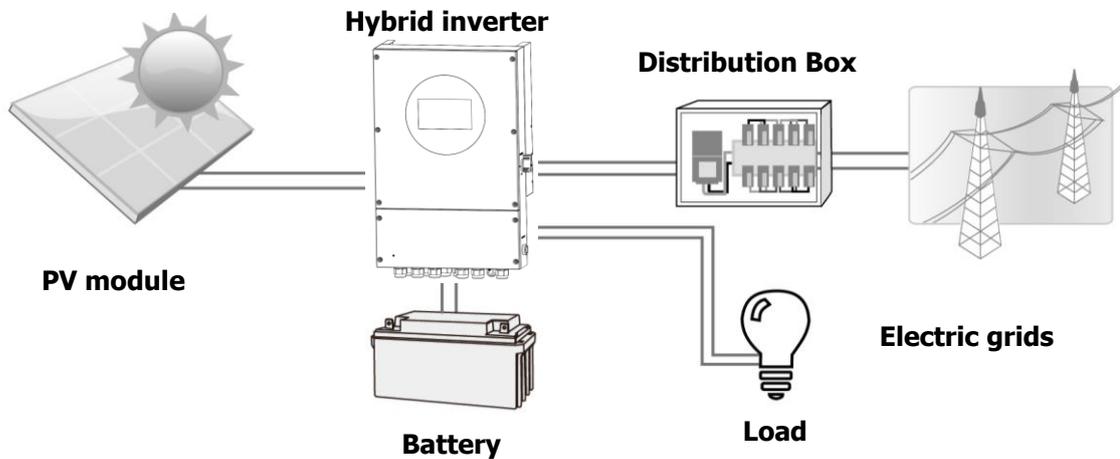
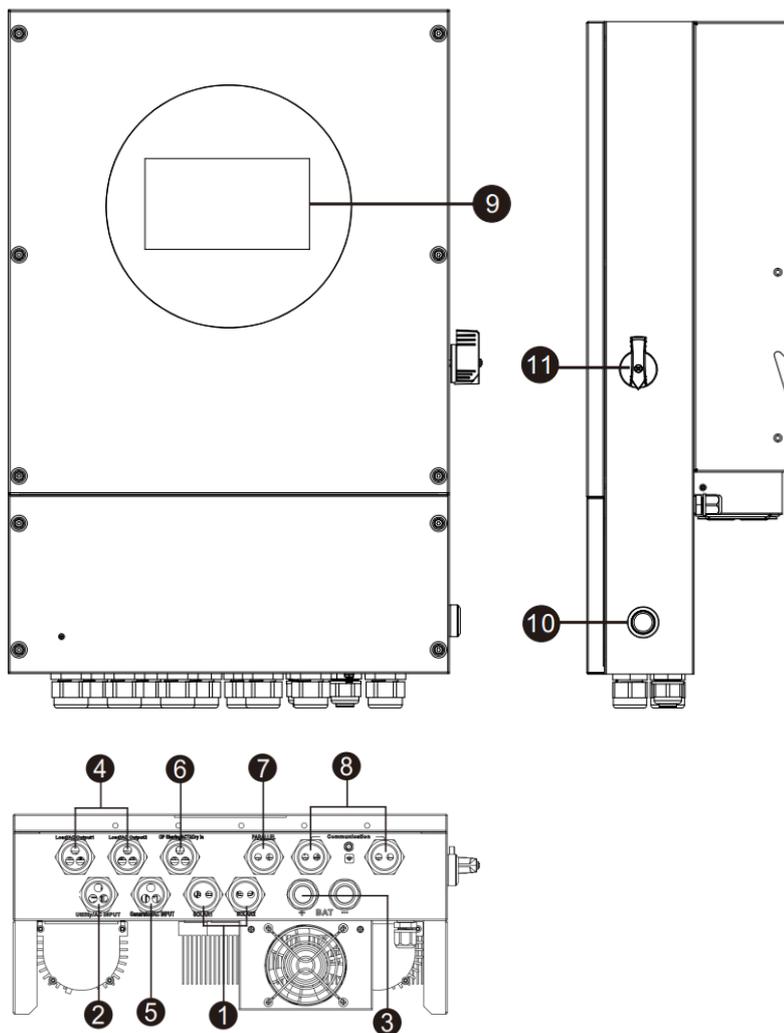


Figure 1 Basic hybrid PV System Overview

Depending on different power situations, this hybrid inverter is designed to generate continuous power from PV solar modules (solar panels), battery, and the utility. When MPP input voltage of PV modules is within acceptable range (see specification for the details), this inverter is able to generate power to feed the grid (utility) and charge battery. **Never connect the positive and negative terminals of the solar panel to the ground.** See Figure 1 for a simple diagram of a typical solar system with this hybrid inverter.

Product Overview



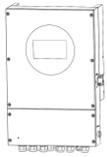
NOTE: For parallel model installation and operation, please check separate parallel installation guide for the details.

1. PV connectors
2. AC Grid connectors
3. Battery connectors
4. AC output connectors
5. AC Generator connectors
6. Sharing current ports & external sensor ports
7. Parallel communication ports
8. Dry contact/USB/RS-232/BMS communication ports
9. LCD display
10. Cold start button
11. PV switch

INSTALLATION

Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:



Inverter unit



Software CD



Manual



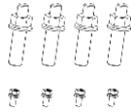
RS-232 cable



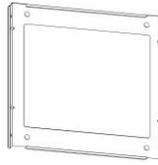
Parallel communication cable



Current sharing cable



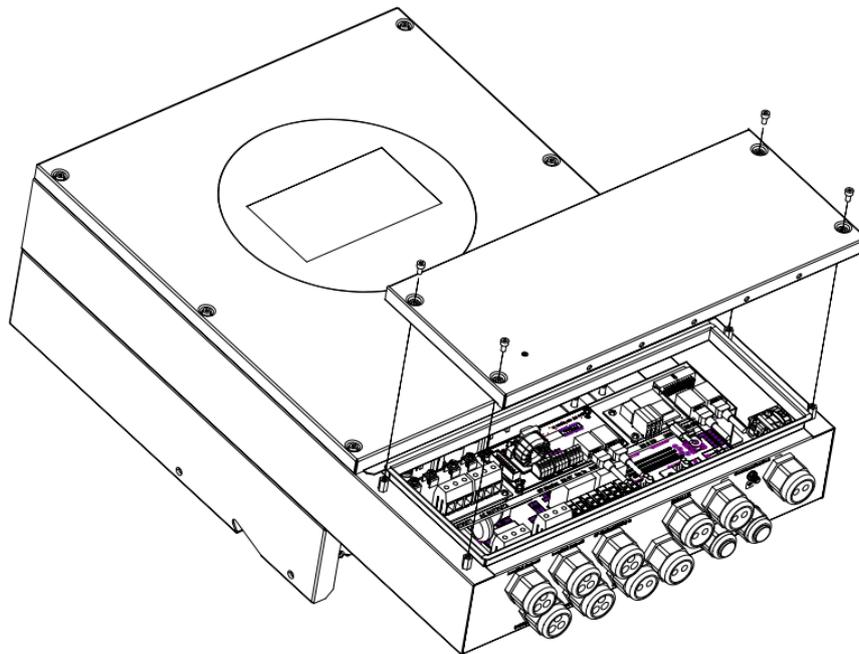
Fixing screws



Mounting plate

Preparation

Before connecting all wirings, please take off bottom cover by removing four screws as shown below.



Installing the Unit

Preparation

This hybrid inverter is designed for indoor or outdoor use (IP66), 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%).

Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation.

Select the Mounting Place

- Please select a vertical wall with load-bearing capacity for installation, appropriate for installation on concrete or other non-flammable surfaces.
- The ambient temperature should be between $-25\sim 60^{\circ}\text{C}$ to ensure optimal operation.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and have enough space for removing wires.
- For proper air ventilation to dissipate heat, allow a clearance of approx. 50cm to the side and approx. 50cm above and below the unit. And 100cm toward the front

Mounting the Unit

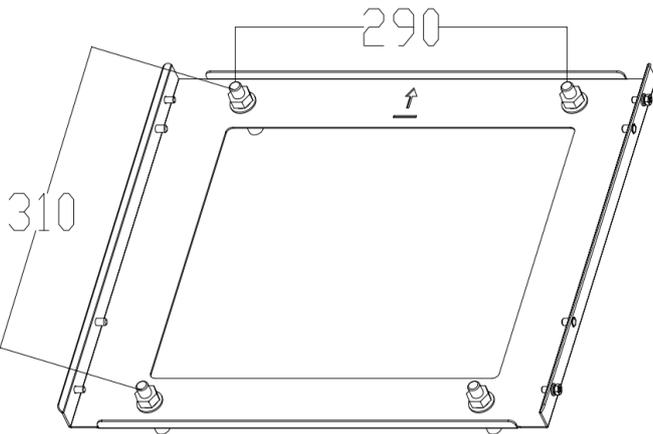
WARNING!! Remember that this inverter is heavy! Please be careful when lifting out from the package.

Installation to the wall should be implemented with the proper screws. After that, the device should be bolted on securely.

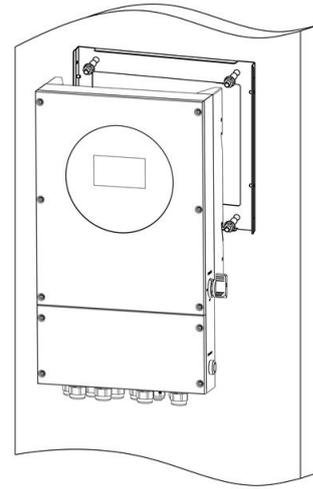
The inverter only can be used in a CLOSED ELECTRICAL OPERATING AREA. Only service person can enter this area.

WARNING!! FIRE HAZARD.
SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

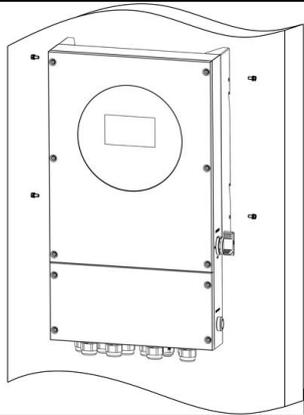
1. Put the mounting plate against the wall. Fix the mounting plate with the supplied four screws as shown in the chart. The reference tightening torque is 35 N.m.



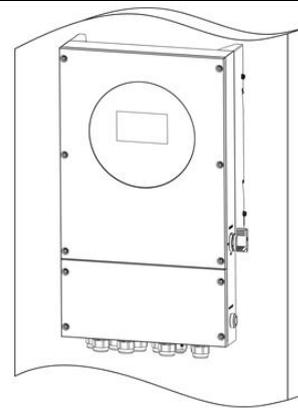
2. Raise the inverter and place it over the mounting plate.



3. Fix the inverter in position by screwing the supplied four screws (M5*4) located on the two sides of the inverter.



4. Check if the inverter is firmly secured.



AC Input/Output Connection

CAUTION!! Before connecting to AC input power source, please install a **separate** AC breaker between inverter and AC input power source. The recommended spec of AC breaker is 50A. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input.

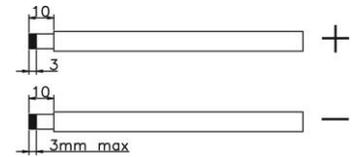
CAUTION!! There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

WARNING! All wiring must be performed by a qualified personnel.

WARNING! It's 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 size as below.

Suggested cable requirement for AC wires

| Model | Gauge | Torque Value |
|-------|--------|--------------|
| 6KW | 10 AWG | 1.2Nm |



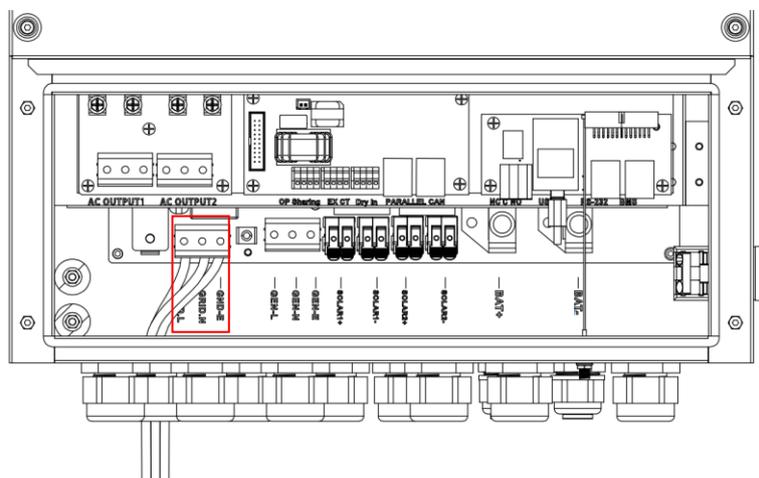
Please follow below steps to implement AC input/output connection:

1. Before making AC input/output connection, be sure to open DC protector or disconnecter first.
2. Remove insulation sleeve 10-11mm for six conductors.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor (⊕) first.

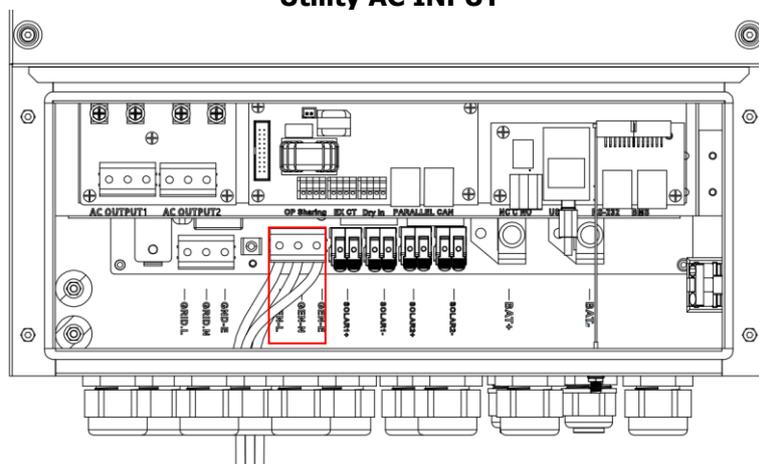
⊕ → **Ground (yellow-green)**

L → **LINE (brown or black)**

N → **Neutral (blue)**



Utility AC INPUT



Generator AC INPUT

**WARNING:**

Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

4. This inverter is equipped with dual-output. There are two outputs: AC output 1 and AC output 2. It's set up through LCD program or monitoring software to turn on and off the second output. Refer to "LCD setting" section for the details.

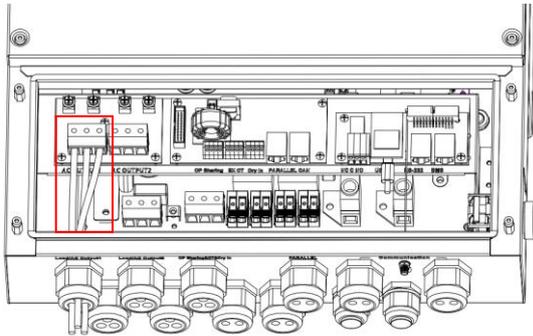
Insert AC output wires according to polarities indicated on terminal block and tighten terminal screws. Be sure to connect PE protective conductor (⊕) first.



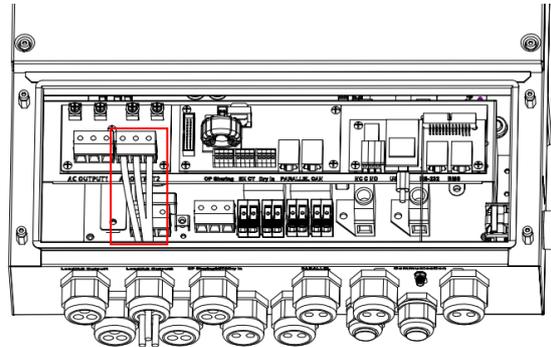
→ **Ground (yellow-green)**

L → **LINE (brown or black)**

N → **Neutral (blue)**



AC Output 1



AC Output 2

5. Make sure the wires are securely connected.

CAUTION: Important

Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.

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

The working logic of the generator

The generator is mainly used to substitute the Utility power to ensure the normal operation of the inverter. Divided into the following two conditions:

- (1) Connect to the generator and Utility when the Utility is normal:

The inverter will close the Grid relay, and at this time, the utility will provide power to load, charge battery or feed the grid. In this case, the generator relay will be open.

- (2) Connect to the generator when the Utility is abnormal or lost:

The inverter will close the generator relay, and at this time, the generator will provide power to load. The generator does not charge the battery by default, and if it needs to be charged, it needs to enable "LCD Setting-Generator Setting", "Generator Charging Setting". In this case, the grid relay will be open.

NOTE 1: After the generator is connected, the inverter will automatically turn off the grid-connected function to protect the generator.

NOTE 2: Only when the inverter is set to single-machine mode, the generator will be connected.

PV Connection

CAUTION: Before connecting to PV modules, please install **separately** a DC circuit breaker between inverter and PV modules.

WARNING! All wiring must be performed by a qualified personnel.

WARNING: Please switch off the inverter before you connect PV modules. Otherwise, it will damage the inverter.

WARNING! It's 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 | Typical Amperage | Cable Size | Torque |
|-------|------------------|------------|--------|
| 6KW | 21A | 8AWG | / |

PV Module Selection:

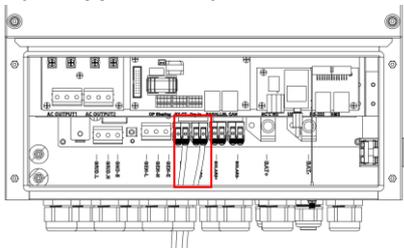
When selecting proper PV modules, please be sure to consider below parameters:

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

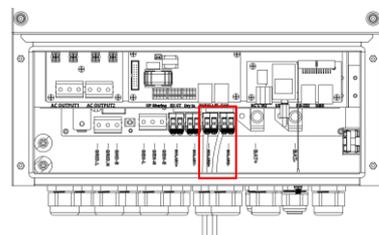
| Solar Charging Mode | |
|------------------------------------|------------|
| Max. PV Array Open Circuit Voltage | 500 Vdc |
| PV Array MPPT Voltage Range | 120~450Vdc |
| MPP Number | 2 |

Please follow below steps to implement PV module connection:

1. Remove insulation sleeve **12 mm** for positive and negative conductors.
2. Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of PV input connector. Connect negative pole (-) of connection cable to negative pole (-) of PV input connector.



Solar 1



Solar 2

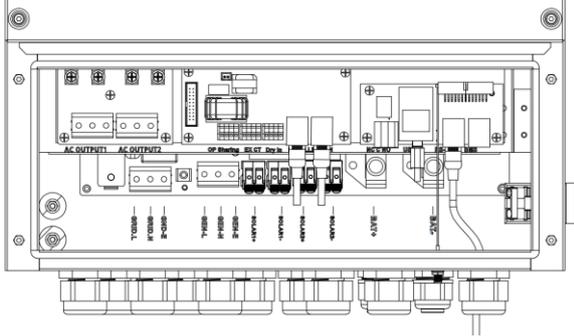
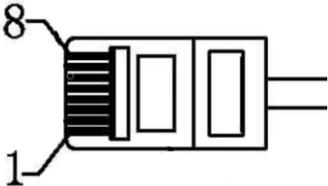
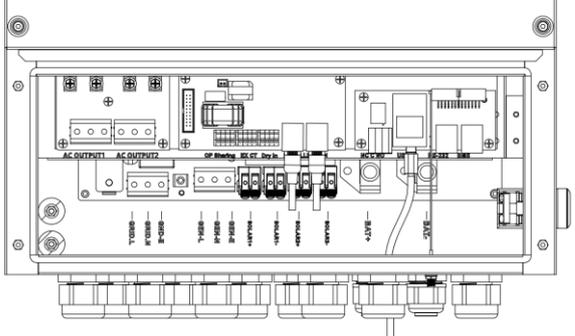
Recommended PV module Configuration

| PV Module Spec. | Total solar input power | Solar1 input | Solar2 input | Q'ty of modules |
|---|-------------------------|---|---|-----------------|
| (reference) - 585Wp - Vmp: 43.79Vdc - Imp: 13.36A - Voc: 51.89Vdc - Isc: 14.25A | 6000W | 5 pieces in series | 5 pieces in series | 10 PCS |
| | 7000W | 6 pieces in series | 6 pieces in series | 12 PCS |
| | 8000W | 7 pieces in series | 7 pieces in series | 14 PCS |
| | 9000W | 8 pieces in series | 8 pieces in series | 16 PCS |
| | 10000W | 9 pieces in series | 9 pieces in series | 18 PCS |
| | 11000W | 6 pieces in series 2 strings in parallel | 6 pieces in series 2 strings in parallel | 24 PCS |
| | 12000W | 7 pieces in series 2 strings in parallel | 7 pieces in series 2 strings in parallel | 28 PCS |

| PV Module Spec. | Total solar input power | Solar1 input | Solar2 input | Q'ty of modules |
|---|-------------------------|---|---|-----------------|
| (reference) - 630Wp - Vmp: 44.78Vdc - Imp: 14.07A - Voc: 53.02Vdc - Isc: 15.07A | 6000W | 5 pieces in series | 5 pieces in series | 10 PCS |
| | 7000W | 6 pieces in series | 6 pieces in series | 12 PCS |
| | 8000W | 7 pieces in series | 7 pieces in series | 14 PCS |
| | 9000W | 8 pieces in series | 7 pieces in series | 15 PCS |
| | 10000W | 9 pieces in series | 9 pieces in series | 18 PCS |
| | 11000W | 6 pieces in series 2 strings in parallel | 6 pieces in series 2 strings in parallel | 24 PCS |
| | 12000W | 7 pieces in series 2 strings in parallel | 7 pieces in series 2 strings in parallel | 28 PCS |

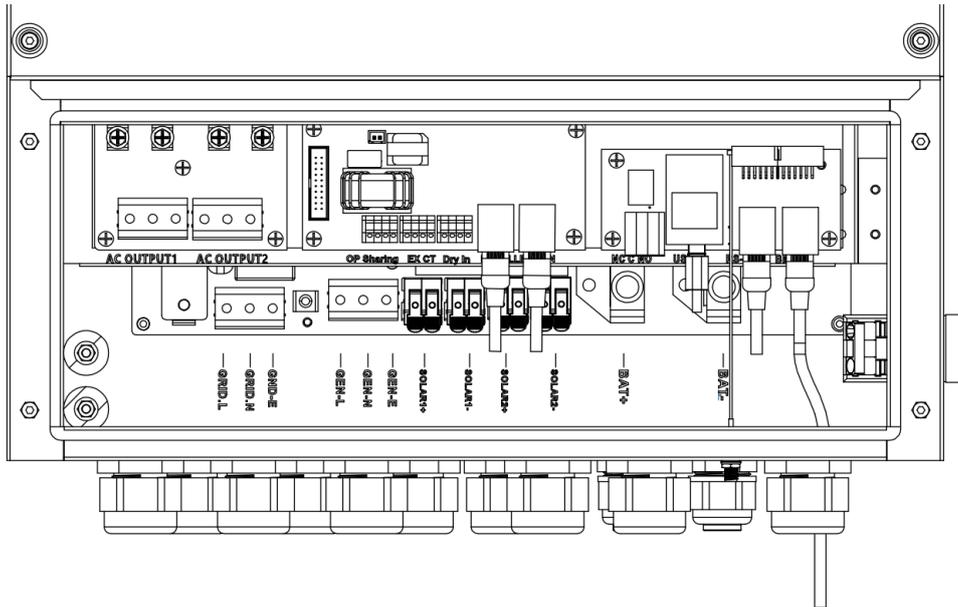
Communication Connection

Please use the supplied communication cable to connect to the inverter and PC. Follow the procedure below to connect the communication wiring. Insert the bundled CD into a computer and follow the on-screen instructions to install the monitoring software. For the detailed software operation, please check the user manual of the software inside of a CD.

| | |
|--|--|
| <p>For RS232 port, you should use a RJ45 cable as follows: PIN1: TXD, PIN2:RXD, PIN4:12V, PIN8:GND</p> | <p>For the USB port, you should use a USB cable as follows:</p> |
|  <p>The RJ45 line sequence is as follows:</p>  |  |

BMS Communication

For BMS port, you should use a RJ45 cable as follows:



It is recommended to purchase a special communication cable if you are connecting to Lithium-ion battery banks. Please use a RJ45 cable to connect BMS communication port as shown in below:

| PIN Assignment | |
|----------------|---------|
| PIN 3 | RS485-B |
| PIN 5 | RS485-A |
| PIN 8 | GND |

For more information, please refer to Appendix II: BMS Communication Installation.

Dry Contact Signal

There is one dry contact (3A/250VAC) available on the rear panel. This dry contact is used to start or stop the generator, which can be set in the **Setting ->Generator Settings** on the HMI (page 20).

| Unit Status | Condition | Dry contact port:  | |
|-------------|---|---|---------------|
| | | NC & C | NO & C |
| Power Off | Unit is off and no output is powered. | Close | Open |
| Power On | Output is powered from Utility.(Utility available) | Close | Open |
| | Generator Settings→ Generator ON votage/SOC | When Battery voltage /SOC < Generator ON votage/SOC | Open Close |
| | Generator Settings→ Generator OFF votage/SOC | When Battery voltage /SOC > Generator OFF votage/SOC | Close Open |

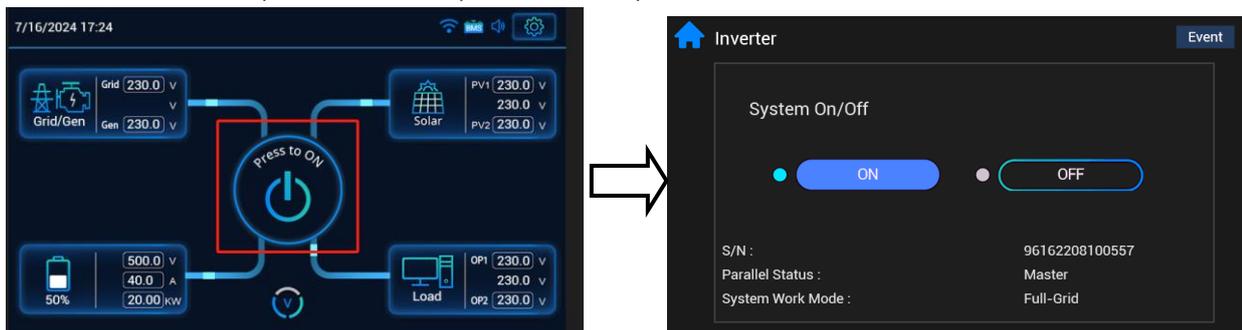
OPERATION

LCD Display Icons

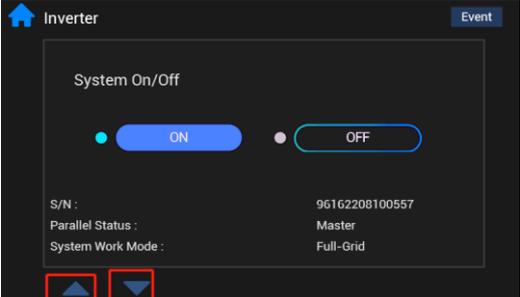
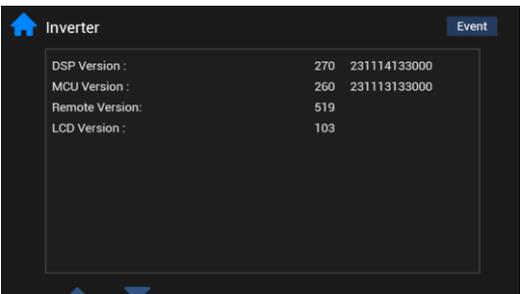
The LCD is touchscreen, The main interface display screen is as follows:



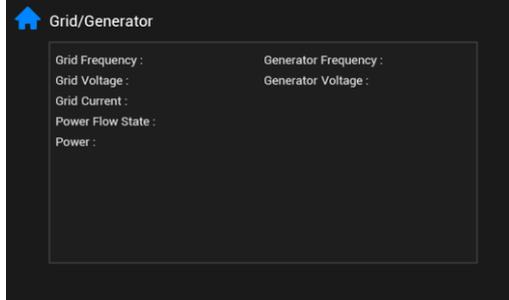
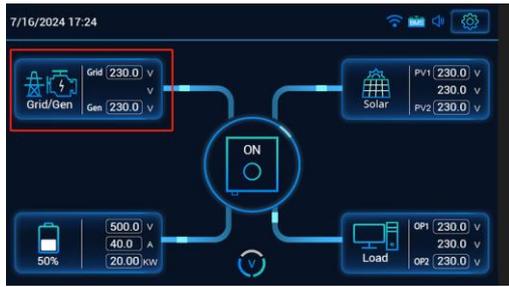
1. This top displays the time, WIFI status, BMS, and alarm sound.
2. System settings icon, press this setting button to enter the system settings screen including general setting, output setting, battery setting, advanced setting, grid setting, and generator setting.
3. The main screen shows information including inverter solar, grid/ Generator, battery, and load. It also displays the direction of energy flow through arrows, clearly showing the inverter's working status.
4. Touch "Press to ON" to enter the system turn-on/off screen. This page can also display information such as inverter serial number, version number, event records, etc



5. Press  key to Back to home screen.

| Icon | Function description |
|---|--|
| System on/off, Fault information and Configuration procedures | |
|  | <p>The top of the screen indicates the time of the local month, day and year.</p> |
|  | <p>Touch the "ON" icon to enter another interface to control the switch of the inverter and query the software version and machine status (including the serial number, parallel status, operating mode, DSP version, MCU version, remote version, and LCD version, TP Version of the inverter).</p> |
|  | <p>Touch "▲" or "▼" check the machine S/N number, parallel status, system working status, software version number.</p> <p>Touch "System On/Off" to control the inverter switch.</p> |
|  | <p>Touch "Event" to view the alarms and error records.</p> |

Grid&Generator Information

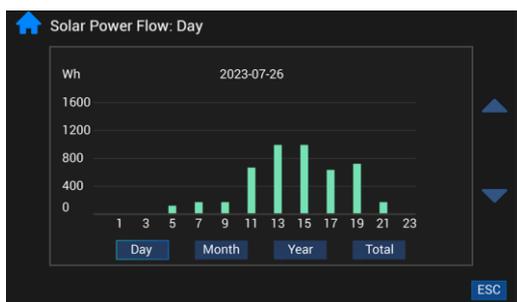
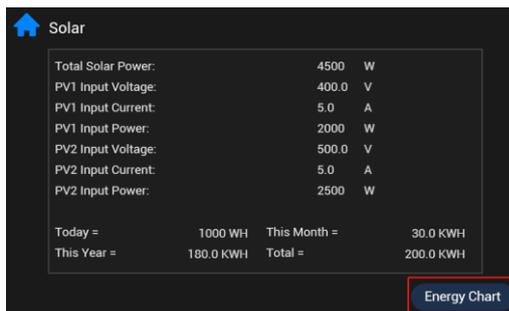


Grid/Generator icon:

Cycle display of AC input voltage (grid and generator), current, and power.

When you touch this icon, it display detailed grid and generator information. It includes grid frequency, voltage, current, power flow state ,power, Generator frequency and generator voltage.

Pv Information



Cycle display of the "PV1&PV2" voltage, current and power.

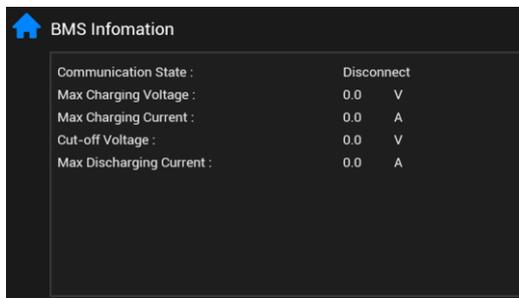
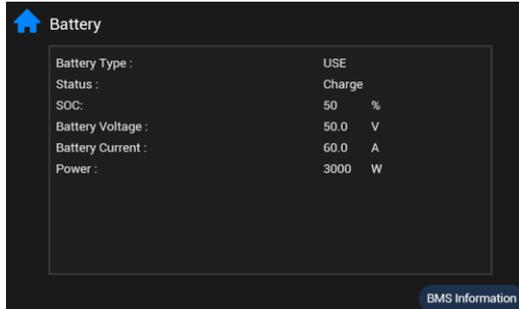
When you touch this icon, it display detailed PV information. It includes total PV power, PV1/PV2 voltage and current power, daily power generation, monthly power generation, annual power generation, total power generation will be displayed.

When you touch the "Energy Chart" you will enter the "Solar Power Flow page"

Solar power curve for daily, monthly, yearly and total can be checked on the LCD, we can also view more detailed power generation through the monitoring system.

Press "ESC" icon to back to previous page..

Battery Information



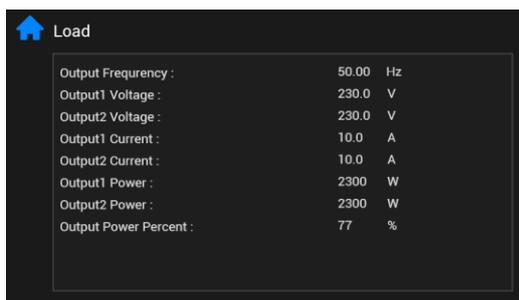
Cycle display the "Battery" voltage (SOC) ,current and power.

Battery detail page

1. This page indicates the battery Type, statue, SOC, voltage, current and power.
2. If you use lithium battery, you can press "BMS Information" to check lithium battery information.

When you touch "BMS Information" it will display the communication status, maximum charge voltage, maximum discharge current, cut-off voltage point, maximum discharge current point.

Load Information



Cycle display the output 1 & 2 voltage, power and output current.

When you touch this icon, it will display the "OP1/OP2" frequency, battery current, power, and output percentage.

LCD Setting

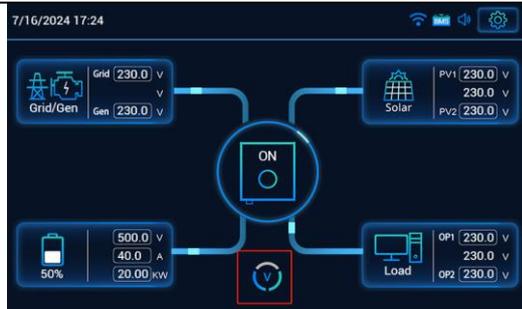


System settings icon, press this setting button to enter the system settings screen Including general setting, output setting, batter setting , system operation Mode setting, Grid setting. See "LCD Setting" section for the details.

Operation Status Information



The red marked sections can respectively display the BMS, buzzer, and wifi status.



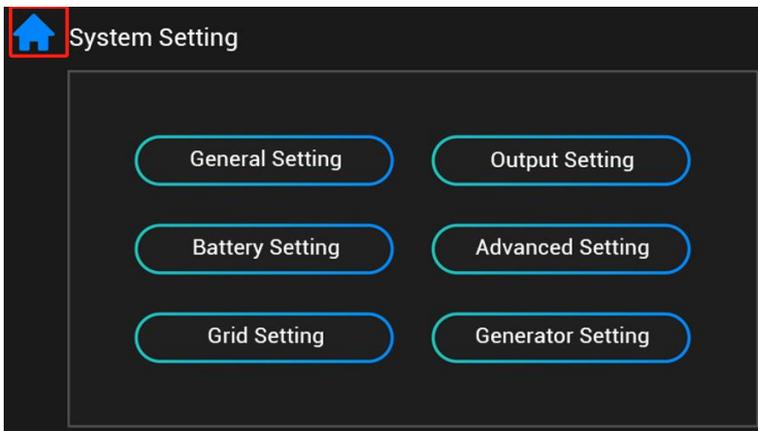
The red marked display sections indicate the measurement mode: "V" for voltage value, "I" for current value, and "P" for power value.

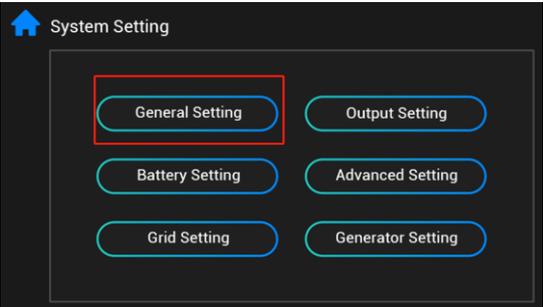
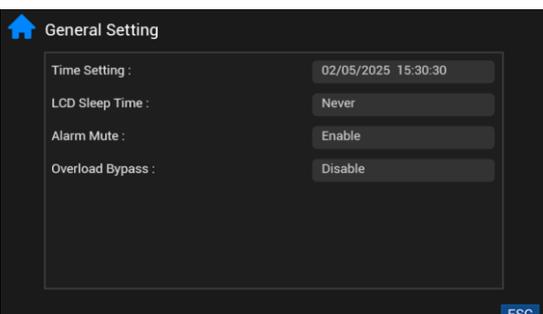
LCD Setting

The red marked section is for entering the settings interface, which includes **general setting, output setting, battery setting, advanced setting, grid setting, generator setting**

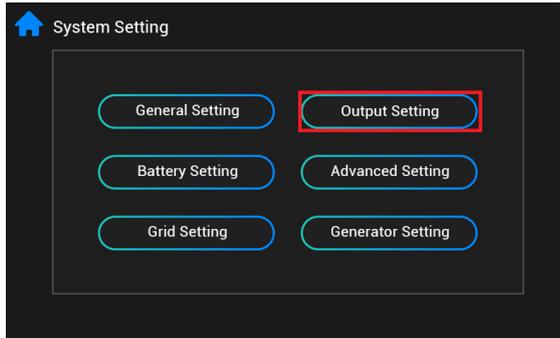


Press  key to Back to home screen.



| Program Description | Function description |
|--|--|
| General Setting | |
|   | <p>This is General Setting detail page Time Setting: Set system time. LCD Sleep Time: LCD sleep time can be set always/30 seconds/ 1 minute /never. Alarm control: Can set enable or disable alarms. Overload Bypass: Can set enable or disable bypass overload</p> <p>Touch "ESC" to return to the previous screen, and touch  to return to the homepage screen</p> |

Output Setting



This is Output Setting detail page.

Output voltage: The output Voltage can be set 220/ 230/ 240 V

Output frequency: The frequency can be set 50/ 60 Hz

AC Output mode: You can modify this parameter to set it to single mode or parallel mode. For more details please see "AC Output mode" setting section.

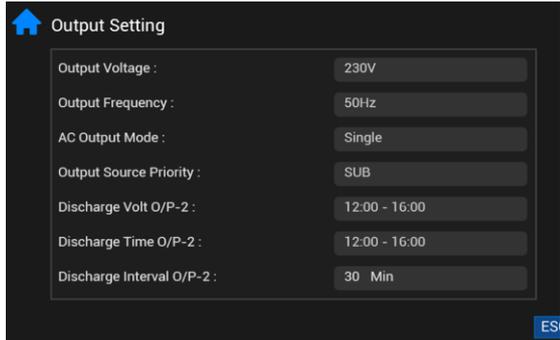
Output source priority: You can modify "SUB" or "SBU".

Time Duration for Total AC Output On/off: You can control the output1/2 Working time.

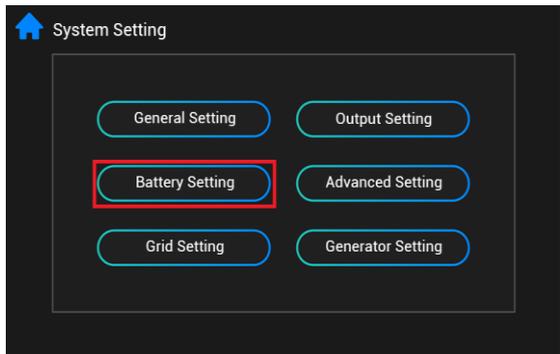
Time Duration for O/P-2 On/Off: You can control the start and end time of Output 2

Discharging Period for O/P-2: You can control the output2 Working time.

Touch "ESC" to return to the previous screen, and touch "Home" to return to the home screen



Battery Setting



This is Battery Setting detail page

Battery type: "Use" means lead-acid battery, while others are lithium battery protocols.

Charging Source Priority:

It includes both regular **settings** and **scheduled settings**

Regular: Solar first , solar and Utility, Only solar

Schedule: You can customize the charging time period.

Max(Grid+ Solar) Charging Current: setting range is from 10A to 120A. Increment of each click is 10A.

Max. Utility Charging Current: setting range is from 2A to 120A.

Increment of each click is 10A.

Max. Discharging Current: You can set the maximum discharge current of the battery

CV Voltage: Setting range is from 48.0V to 60.0V. If the battery type is lithium battery, this parameter follows its BMS voltage parameter.

Floating Voltage: Setting range is from 48.0V to 60.0V If the battery type is lithium battery, this parameter follows its BMS voltage parameter.

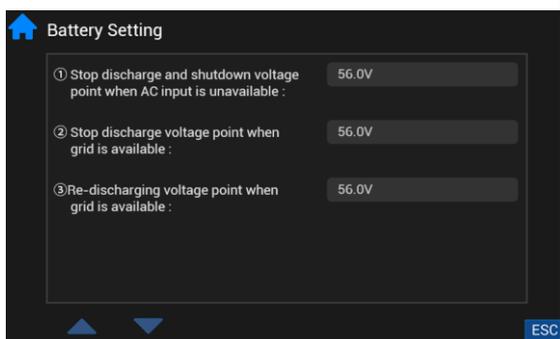
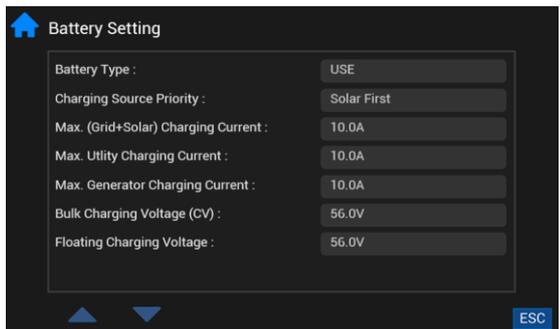
Activate Lithium BAT When Power On: Disable/Enable.

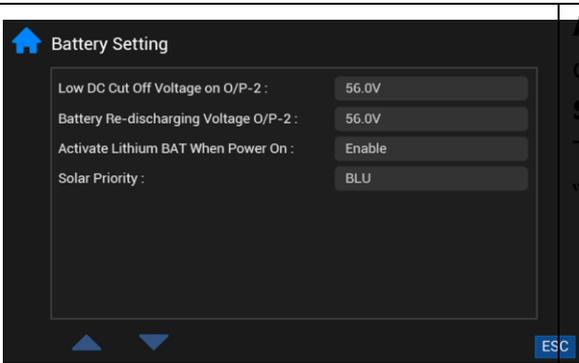
Battery low cut off and Re-discharging setting : ① ② ③

You can customize battery low cut off voltage/SOC and Re-discharging voltage/SOC.

Low DC Cut Off Voltage on O/P-2: Turn off the OP output when the battery voltage is below the set point.

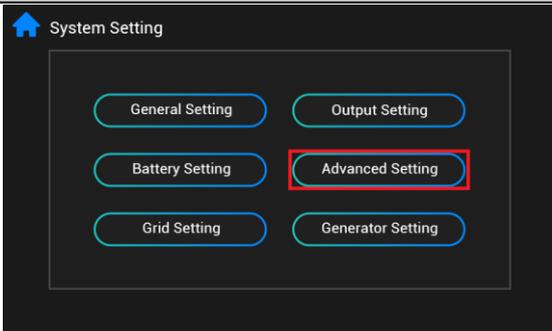
Battery Re-discharging Voltage O/P-2: Turn off the OP output when the battery voltage is higher than the set point.



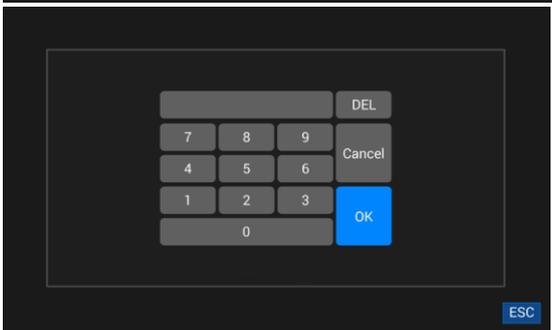


Activate Lithium BAT when Power on: Enabling this option will activate the lithium battery.
Solar Priority: PV energy distribution priority
 Touch "ESC" to return to the previous screen, and touch "🏠" to return to the home screen.

Advanced Setting



This is Advanced Setting detail page



You need to obtain the password from the vendor.

Erase All Data log: Clear generation

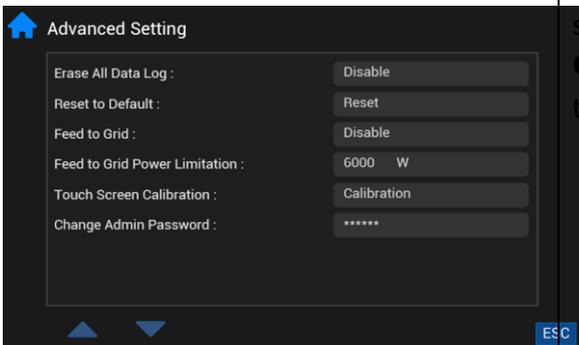
Reset to Default: If this option is enabled, the machine will go back to factory Settings.

Feed to Grid: If selected, solar energy is allowed to feed to the grid.

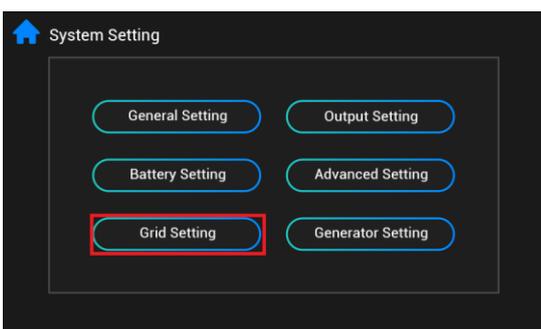
Feed to Grid Power Limitation: You can modify the grid-connected power in the 6000W range.

Touch Screen Calibration: You can calibrate the touch screen sensitivity.

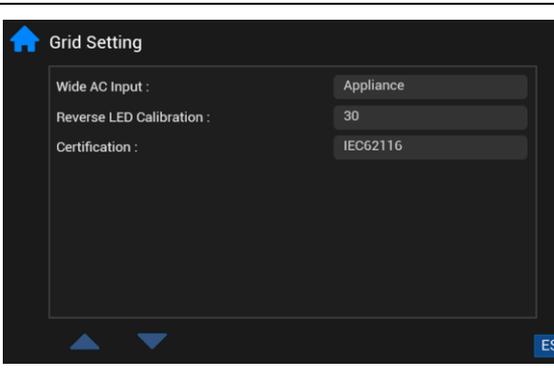
Change Admin Password: You can change the password to enter Advanced Setting.



Grid Setting



This is Grid Setting detail page



Wide AC Input:

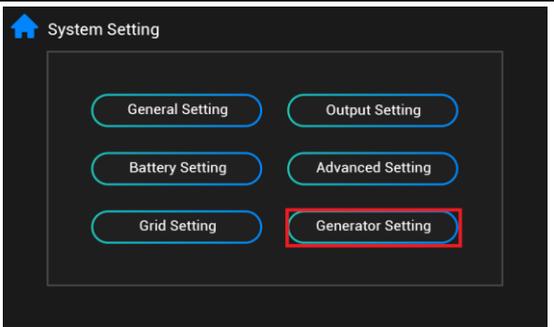
If APL selected, acceptable AC input voltage range will be within 90-280VAC.

If UPS selected, acceptable AC input voltage range will be within 170-280VAC.

Reverse LED Calibration: This will adjust the Grid power.

Certification: It only shows IEC62116. It's not allowed to change.

Generator Setting

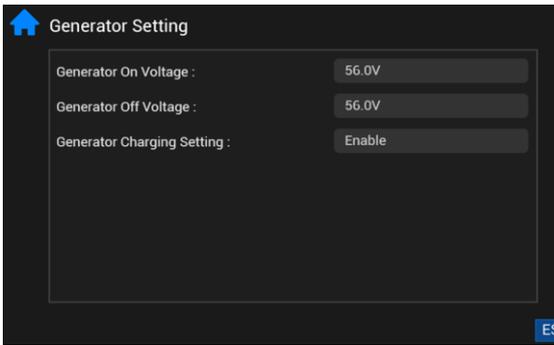


This is Generator Setting detail

Generator On Voltage: When the battery voltage/SOC is lower than this voltage, the dry contact will activate and start the generator.

Generator Off Voltage: When the battery voltage/SOC is higher than this voltage, the dry contact will activate and start the generator.

Generator Charging Setting: Enable this setup item generator to charge the battery



Please refer to "Dry Contact Signal" section for the details. Touch "ESC" to return to the previous screen, and touch  to return to the home screen.

Operating Mode Description

we can check the system status according to "System Work Mode", as shown below:



| System work mode | Behaviors | State description |
|--|---|---|
| Standby mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output. | No output power, solar or utility charger available | Battery is charged by PV energy. |
| | | No charging. |
| Line mode | Output power from utility. Charger is available | Utility charges battery and provides power to load. |
| | | PV energy, battery power and utility provide power to load. |
| | | PV energy and utility charge battery, and utility provides power to load. |
| | | PV energy charges battery, utility and PV energy provide power to the load. |
| | | PV energy charges battery, PV energy provides power to the load and feeds remaining energy to the grid. |
| Battery mode | Output power from battery or PV | PV energy and battery energy supply power to the load. |
| | | PV energy charges battery and provides power to the load. |
| | | Battery provides power to the load. |
| Only PV mode | Output power from PV | PV provides power to the load. |
| Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on. | No output, no charging. | No charging. |

Warning/Fault Event

we can check the Warning code and Fault event according to "Event", as shown below:



Warning Indicator

| Warning Code | Warning Event |
|--------------|--|
| 01 | Fan is locked |
| 02 | Over temperature |
| 03 | Battery over charged |
| 04 | Low battery |
| 07 | Overload |
| 10 | Inverter power derating |
| 32 | Communication lost between com. port and control board |

Faults Reference Code

| Fault Code | Fault Event |
|------------|------------------------------------|
| 01 | Fan is locked. |
| 02 | Over temperature |
| 03 | Battery voltage is too high. |
| 05 | Output is short circuited. |
| 06 | Output voltage is abnormal. |
| 07 | Overload time out. |
| 08 | Bus voltage is too high. |
| 09 | Bus soft start failure. |
| 10 | PV current is over. |
| 11 | PV voltage is over. |
| 12 | Charge current is over. |
| 13 | Battery Power Low |
| 19 | Battery Overcurrent |
| 21 | Phase error in three phases system |
| 51 | Over current or surge |
| 52 | Bus voltage is too low. |
| 53 | Inverter soft start failure. |
| 55 | Over DC offset in AC output |
| 57 | Current sensor failure. |
| 58 | Output voltage is too low. |

SPECIFICATIONS

| | |
|---------------------------------------|---|
| MODEL | 6KW |
| RATED OUPUT POWER | 6000W |
| PV INPUT (DC) | |
| Max. PV Power | 12000W |
| Max. PV Array Open Circuit Voltage | 500 VDC |
| MPPT Range @ Operating Voltage | 120 VDC~450 VDC |
| Max. PV Array Maximum Imp/per MPPT | 21A*2 |
| Max. Input Short-Circuit Current (A) | 30A |
| Number of MPPT Tracker | 2 |
| GRID-TIE OPERATION | |
| GRID OUTPUT (AC) | |
| Nominal Output Voltage | 220/230/240 VAC |
| Feed-in Grid Voltage Range | 195.5~253 VAC @India regulation 184 ~ 264.5 VAC @Germany regulation 184 ~ 264.5 VAC @South America regulation 195.5~253 VAC @ South Africa 182~260 VAC @ Pakistan |
| Feed-in Grid Frequency Range | 49~51Hz @India regulation 47.5~51.5Hz @Germany regulation 57~62Hz @South America 47~52Hz @ South Africa 45.1~54.9Hz @ Pakistan |
| Nominal Output Current | 26A |
| Power Factor Range | >0.99 |
| Maximum Conversion Efficiency (DC/AC) | 95% |
| OFF-GRID, HYBRID OPERATION | |
| GRID INPUT | |
| Acceptable Input Voltage Range | 90 - 300 VAC or 170 - 300 VAC |
| Frequency Range | 50 Hz/60 Hz (Auto sensing) |
| Transfer Time | < 10ms (for UPS) < 20ms (for home appliances) < 50ms (for parallel system operation) |
| Rating of AC Transfer Relay | 40A |
| GENERATOR INPUT | |
| Acceptable Input Voltage Range | 90 - 300 VAC |
| Frequency Range | 50 Hz/60 Hz (Auto sensing) |
| Rating of AC Transfer Relay | 40A |
| BATTERY MODE OUTPUT (AC) | |
| Nominal Output Voltage | 220/230/240 VAC |
| Output Waveform | Pure Sine Wave |
| Efficiency (DC to AC) | 93% |
| BATTERY & CHARGER | |
| Nominal DC Voltage | 48 VDC |
| Maximum Charging Current (from Grid) | 120A |
| Maximum Charging Current (from PV) | 120A |
| Maximum Discharging Current | 140A |
| GENERAL | |
| Dimension, D X W X H (mm) | 630 x 414 x 192 |
| Net Weight (kgs) | 32 |
| INTERFACE | |
| Parallel-able | Yes |
| External Safety Box (Optional) | Yes |
| Communication | USB or RS232 / RS 485 |
| ENVIRONMENT | |
| Humidity | 0 ~ 95% RH (No condensing) |
| Operating Temperature | -25°C to 50°C |

TROUBLE SHOOTING

| Problem | HMI/Buzzer | Explanation / Possible cause | What to do |
|---|--|---|--|
| Unit shuts down automatically during startup process. | HMI and buzzer will be active for 3 seconds and then complete off. | The battery voltage is too low (<1.91V/Cell) | 1. Re-charge battery. 2. Replace battery. |
| No response after power on. | No indication. | 1. The battery voltage is far too low. (<1.4V/Cell) 2. Battery polarity is connected reversed. | 1. Check if batteries and the wiring are connected well. 2. Re-charge battery. 3. Replace battery. |
| Mains exist but the unit works in battery mode. | HMI shows grid voltage is 0V | Input protector is tripped | Check if AC breaker is tripped and AC wiring is connected well. |
| When the unit is turned on, internal relay is switched on and off repeatedly. | HMI shows battery voltage is 0V | Battery is disconnected. | Check if battery wires are connected well. |
| Buzzer beeps continuously and HMI show the Fault icon | Overload error | The inverter is overload 110% and time is up. | Reduce the connected load by switching off some equipment. |
| | Output short circuited. | Output short circuited. | Check if wiring is connected well and remove abnormal load. |
| | Over Temperature | Internal temperature of inverter component is over 100°C. | Check whether the air flow of the unit is blocked or whether the ambient temperature is too high. |
| | Battery high voltage | Battery is over-charged. | Return to repair center. |
| | | The battery voltage is too high. | Check if spec and quantity of batteries are meet requirements. |
| | FAN lock | Fan fault | Replace the fan. |
| | Output abnormal | Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac) | 1. Reduce the connected load. 2. Return to repair center |
| | DC-DC overcurrent | DC/DC over current or surge. | Restart the unit, if the error happens again, please return to repair center. |
| | Inverter overcurrent | Over current or surge. | |
| | BUS low voltage | Bus voltage is too low. | |
| | Abnormal output voltage | Output voltage is unbalanced. | |
| | Solar high voltage | Solar input voltage is more than 550V. | Solar input voltage is more than 550V. |
| | Battery Low | The battery voltage is less than 30V | The battery voltage is less than 30V |
| Battery overcurrent | The battery is overdischarged | The discharge current of the battery needs to be reduced | |

Appendix I: Parallel function

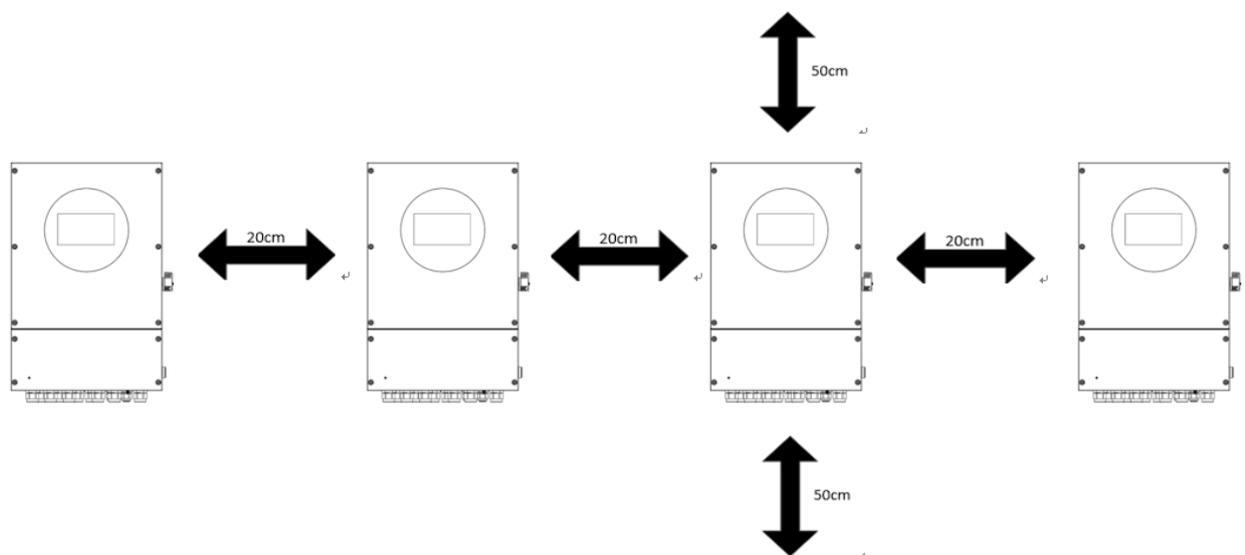
1. Introduction

This inverter can be used in parallel with two different operation modes.

1. Parallel operation in single phase with up to 9 units. The supported maximum output power for 6KW is 54KW/54KVA.
2. Maximum nine units work together to support three-phase equipment. Seven units support one phase maximum. For 6KW model, the supported maximum output power is 54KW/54KVA and one phase can be up to 42KW/42KVA.

2. Mounting the Unit

When installing multiple units, please follow below chart.



NOTE: For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit. Be sure to install each unit at the same level.

3. Wiring Connection

NOTICE: It's requested to connect to battery for parallel operation.

The cable size of each inverter is shown as below:

Recommended battery cable and terminal size for each inverter:

| AWG no. | Torque |
|---------|---------|
| 1*2AWG | 2~ 3 Nm |

WARNING: Be sure the length of all battery cables is the same. Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters not working.

Recommended AC input and output cable size for each inverter:

| AWG no. | Torque |
|---------|-----------|
| 10 AWG | 1.2~1.6Nm |

You need to connect the cables of each inverter together. Take the battery cables for example: You need to use a connector or bus-bar as a joint to connect the battery cables together, and then connect to the battery terminal. The cable size used from joint to battery should be X times cable size in the tables above. "X" indicates the number of inverters connected in parallel.

Regarding AC input and output, please also follow the same principle.

WARNING!! Make sure all output N wires of each inverter must be connected all the time. Otherwise, it will cause inverter fault in error code

CAUTION!! Please install the breaker at the battery and AC input side. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of battery or AC input. The recommended mounted location of the breakers is shown in the figures in 5-1 and 5-2.

Recommended breaker specification of battery for each inverter:

| |
|------------|
| 1 unit* |
| 140A/70VDC |

*If you want to use only one breaker at the battery side for the whole system, the rating of the breaker should be X times current of 1 unit. "X" indicates the number of inverters connected in parallel.

Recommended breaker specification of AC input with single phase:

| Model | 2 units | 3 units | 4 units | 5 units | 6 units | 7 units | 8 units | 9 units |
|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 6KW | 80A/ 230VAC | 120A/ 230VAC | 160A/ 230VAC | 200A/ 230VAC | 240A/ 230VAC | 280A/ 230VAC | 320A/ 230VAC | 360A/ 230VAC |

Note1: Also, you can use 50A for 6KW for only 1 unit and install one breaker at its AC input in each inverter.

Note2: Regarding three-phase system, you can use 4-pole breaker directly and the rating of the breaker should be compatible with the phase current limitation from the phase with maximum units

Recommended battery capacity

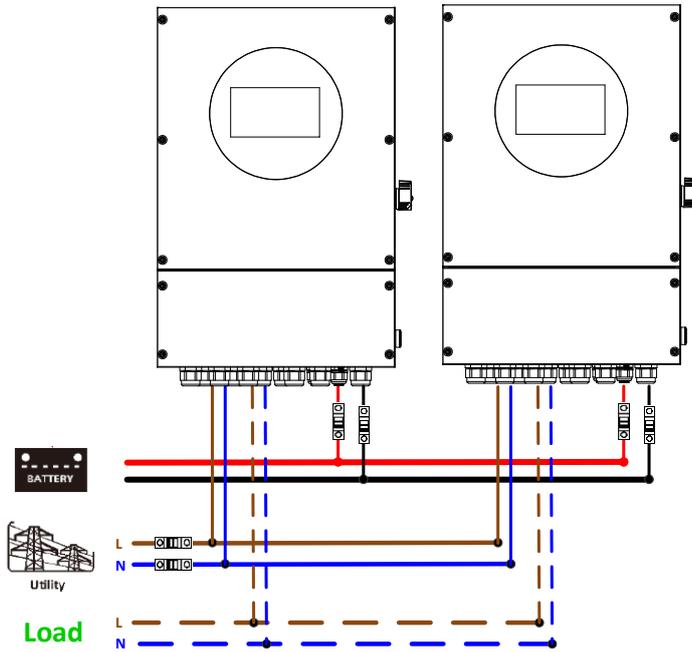
| Inverter parallel numbers | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------------------------|-------|-------|-------|--------|--------|--------|--------|--------|
| Battery Capacity for 6KW | 400AH | 600AH | 800AH | 1000AH | 1200AH | 1400AH | 1600AH | 1800AH |

WARNING! Be sure that all inverters will share the same battery bank. Otherwise, the inverters will transfer to fault mode.

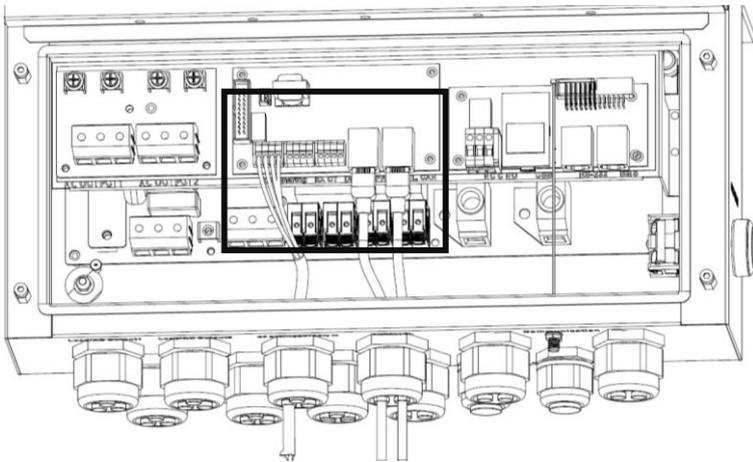
3-1. Parallel Operation in Single phase

Two inverters in parallel:

Power Connection

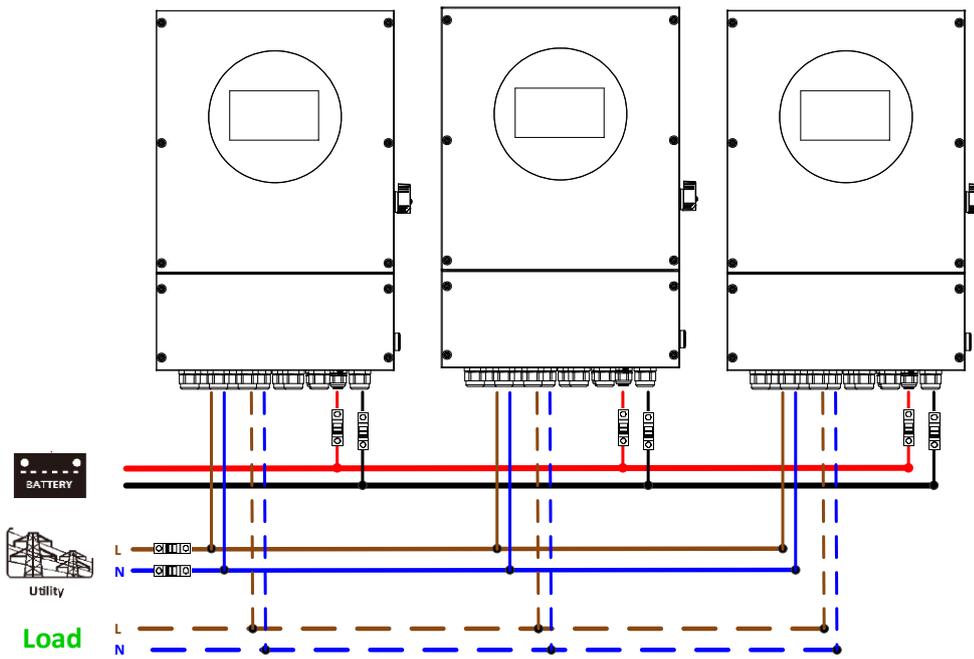


Communication Connection

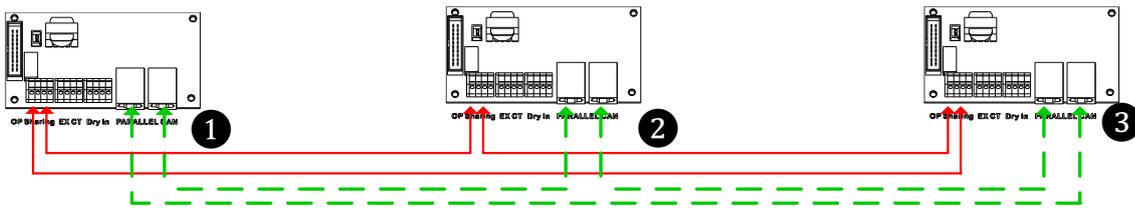


Three inverters in parallel:

Power Connection

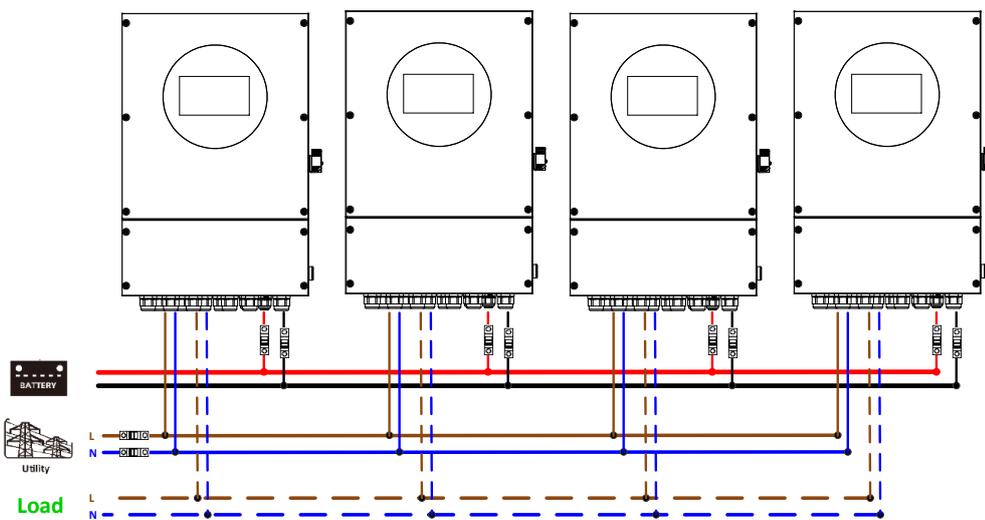


Communication Connection

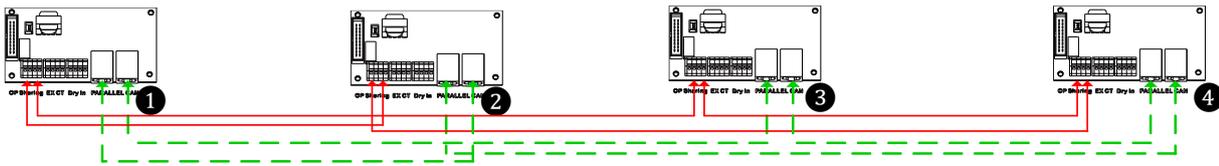


Four inverters in parallel:

Power Connection

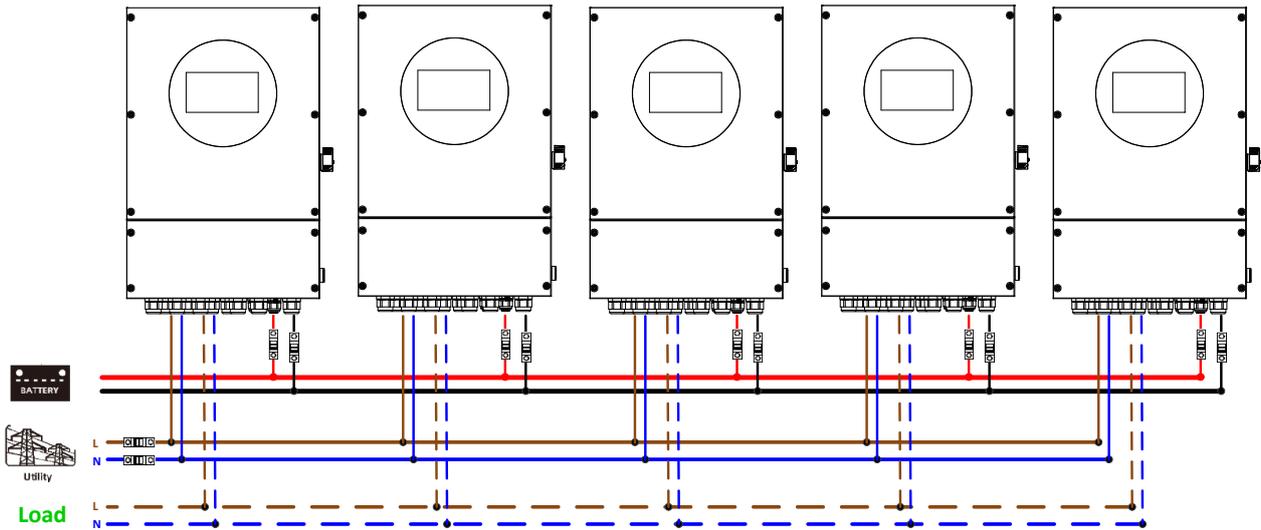


Communication Connection

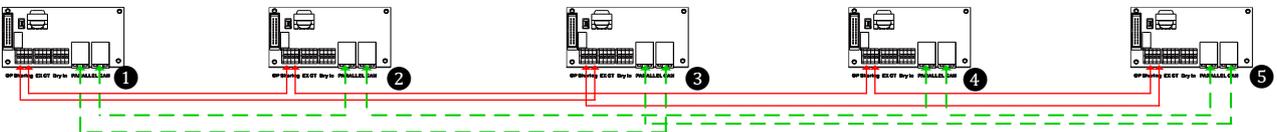


Five inverters in parallel:

Power Connection

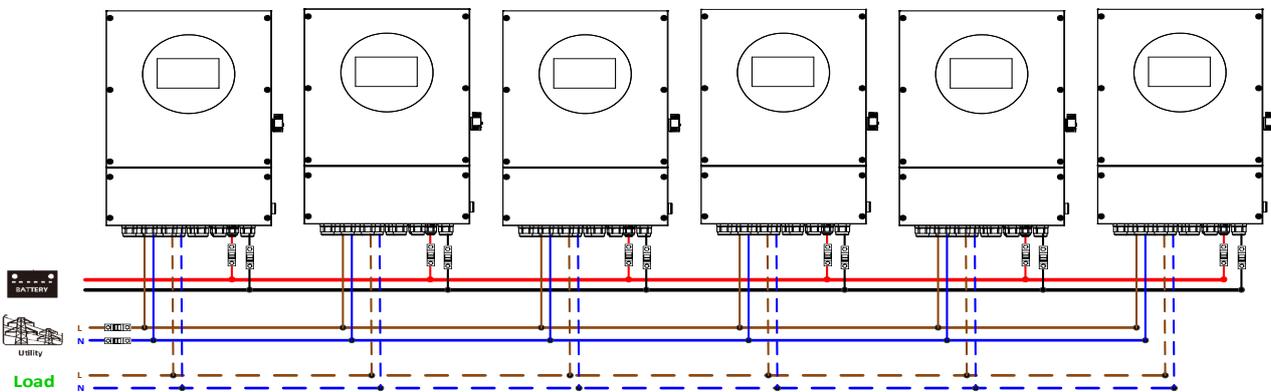


Communication Connection

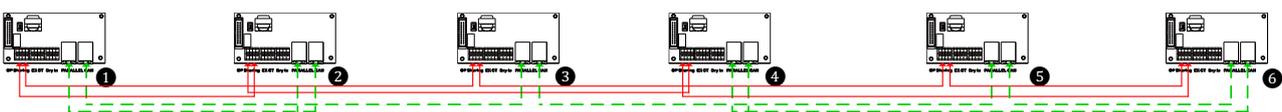


Six inverters in parallel:

Power Connection

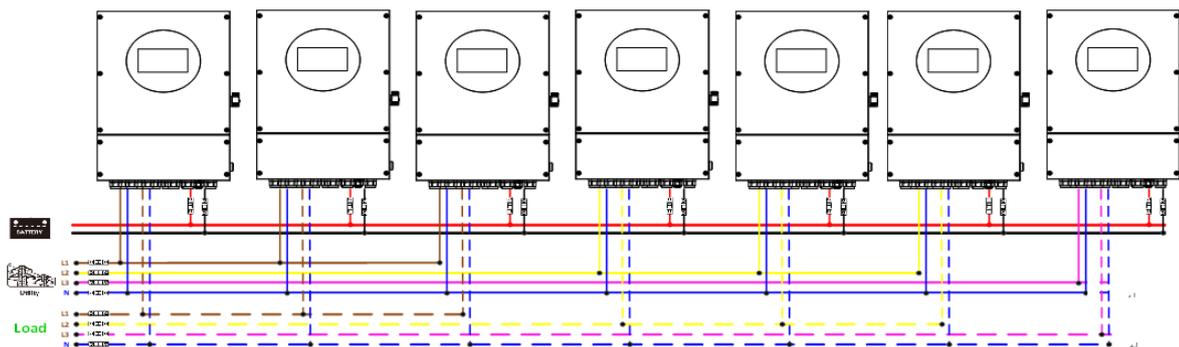


Communication Connection



Seven to nine inverters in parallel:

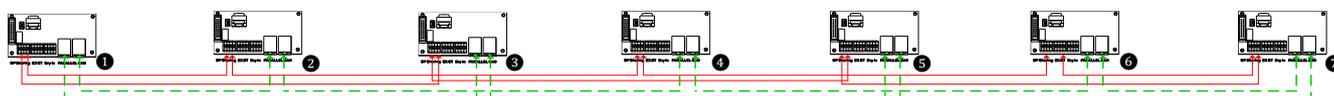
Power Connection



WARNING: When the number of parallel machines exceeds 6 PCS, add a magnetic ring to the output L cable. The magnetic ring is placed in the accessory bag of the inverter.

Communication Connection

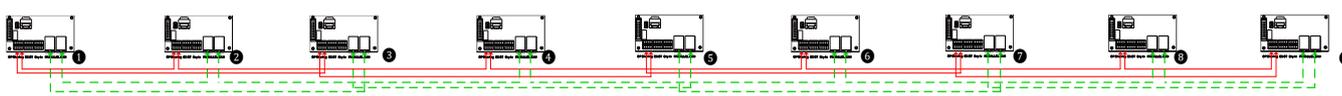
➤ Seven inverters in parallel



➤ Eight inverters in parallel



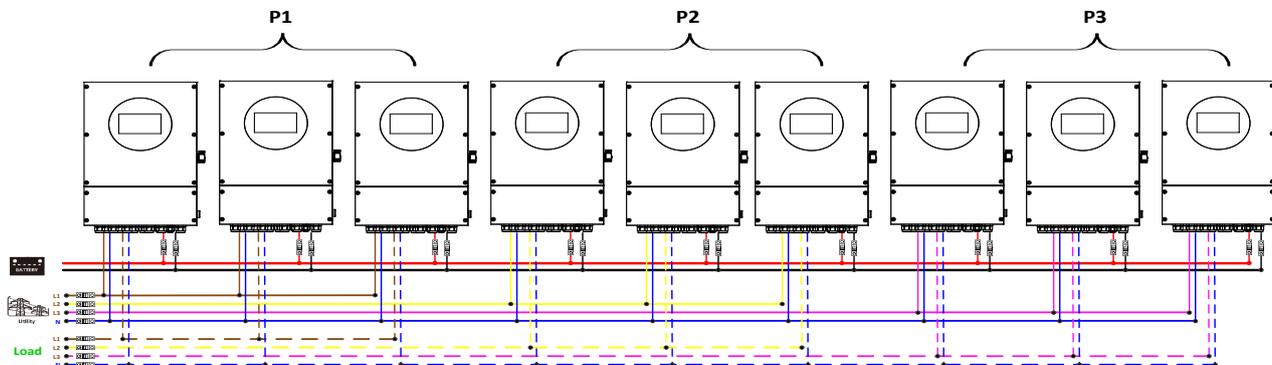
➤ Nine inverters in parallel



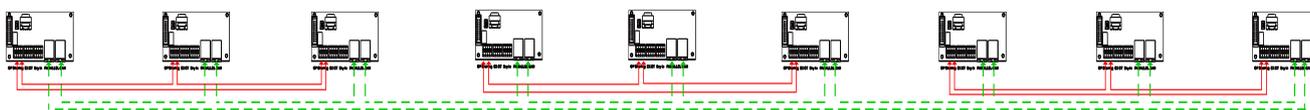
3-2. Support 3-phase equipment

Three inverters in each phase:

Power Connection

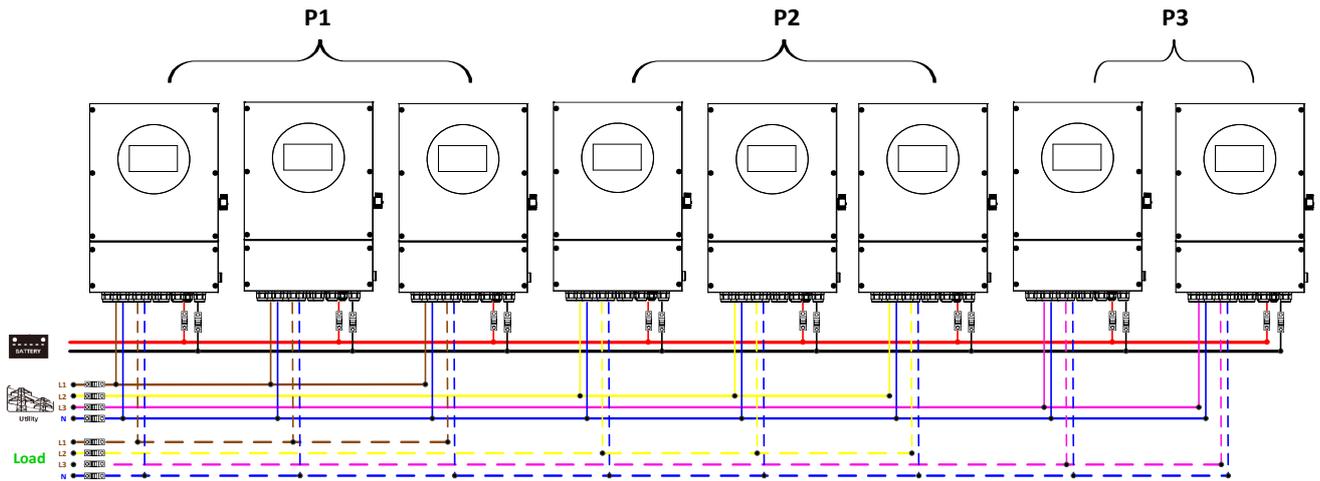


Communication Connection



Three inverters in one phase, three inverters in second phase and two inverter for the third phase:

Power Connection

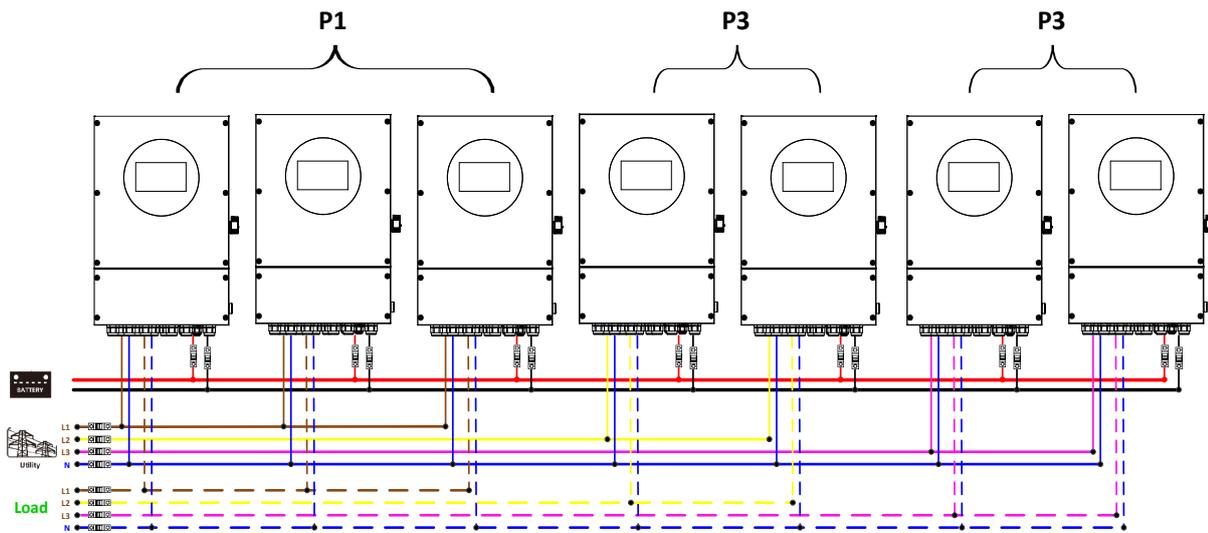


Communication Connection

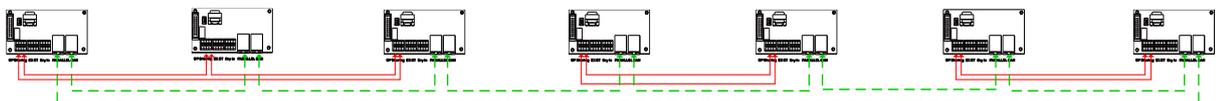


Three inverters in one phase, two inverters in second phase and two inverters for the third phase:

Power Connection

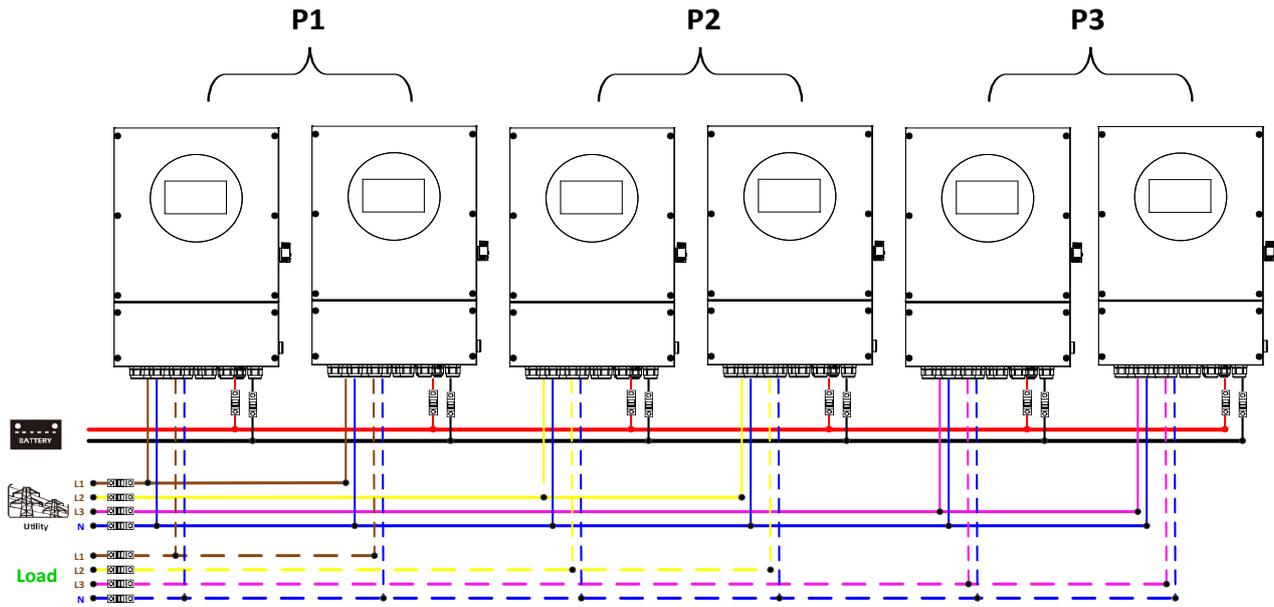


Communication Connection



Two inverters in each phase:

Power Connection

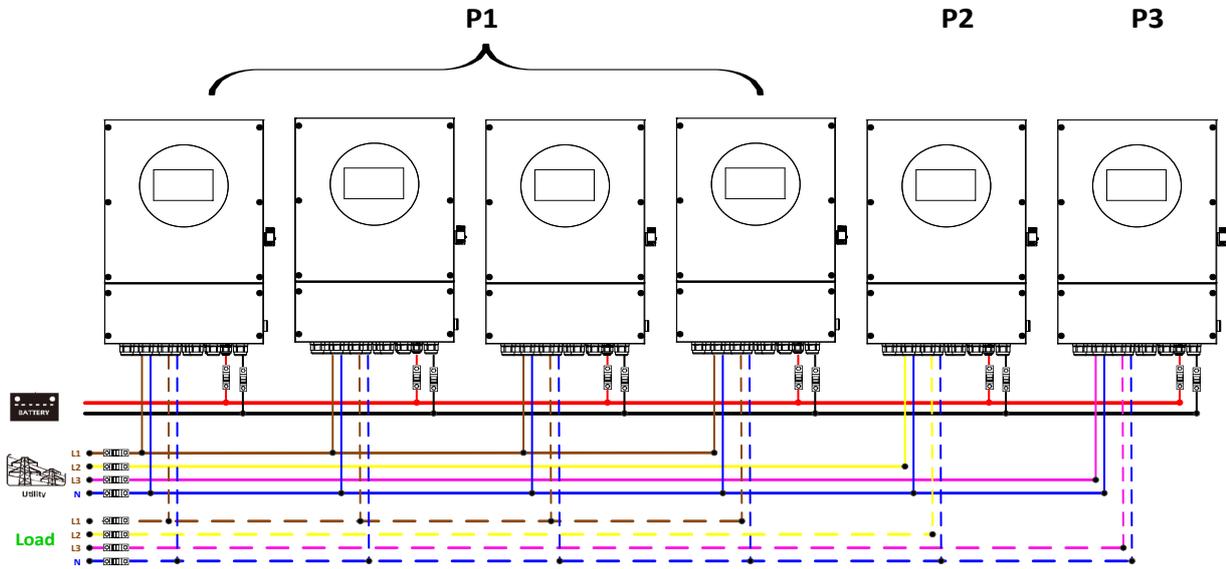


Communication Connection



Four inverters in one phase and one inverter for the other two phases:

Power Connection

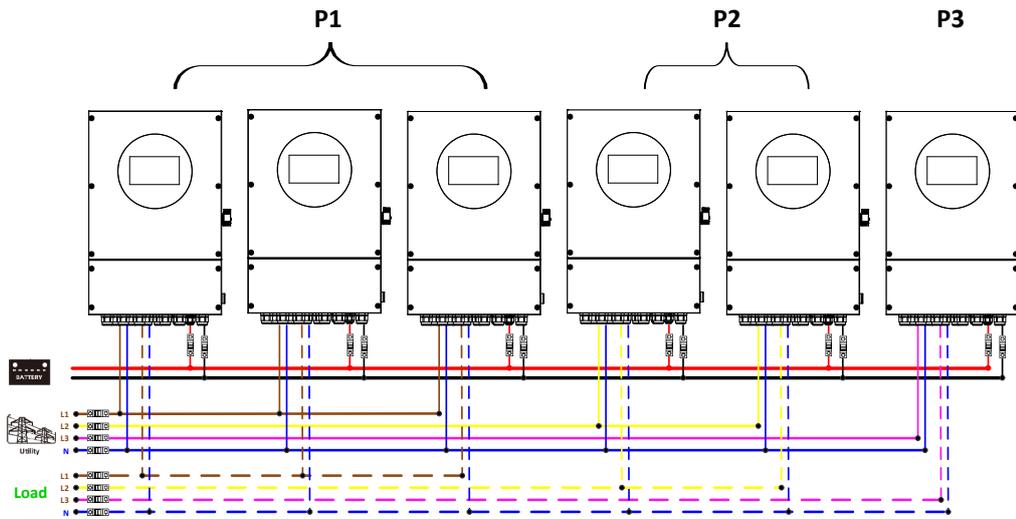


Communication Connection



Three inverters in one phase, two inverters in second phase and one inverter for the third phase:

Power Connection

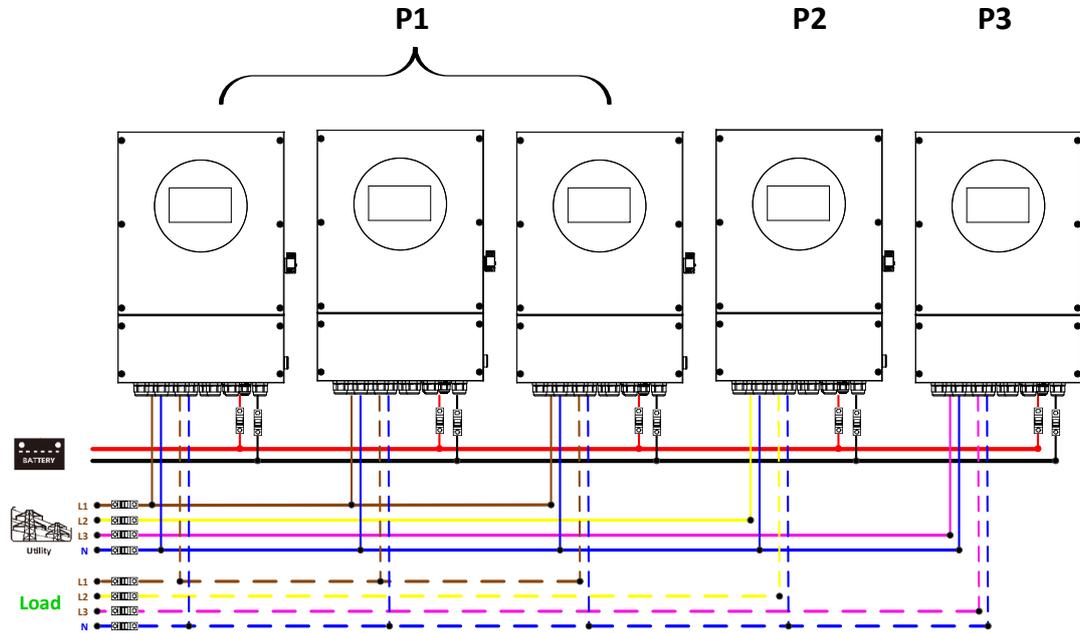


Communication Connection

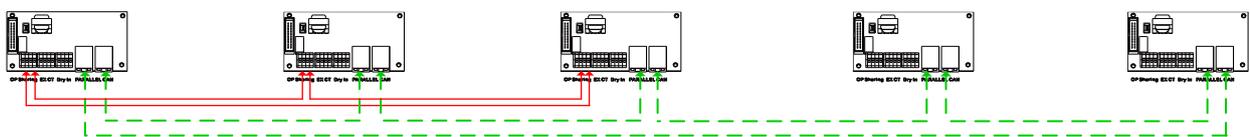


Three inverters in one phase and only one inverter for the remaining two phases:

Power Connection

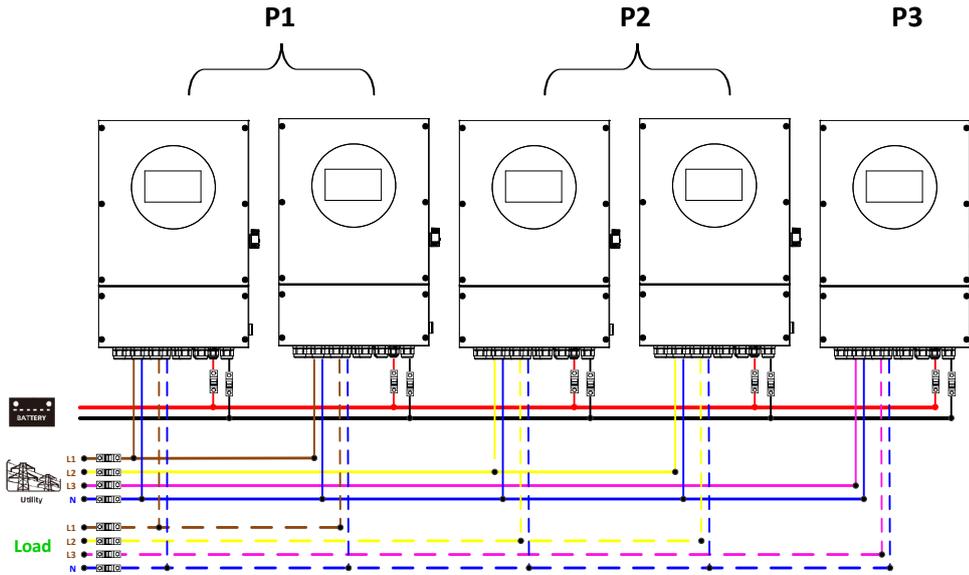


Communication Connection

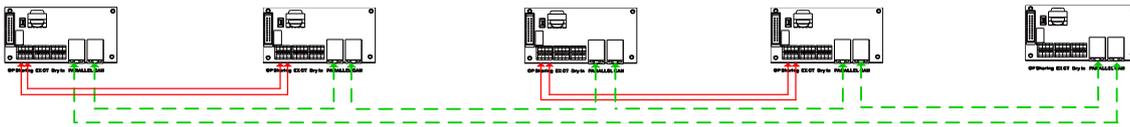


Two inverters in two phases and only one inverter for the remaining phase:

Power Connection

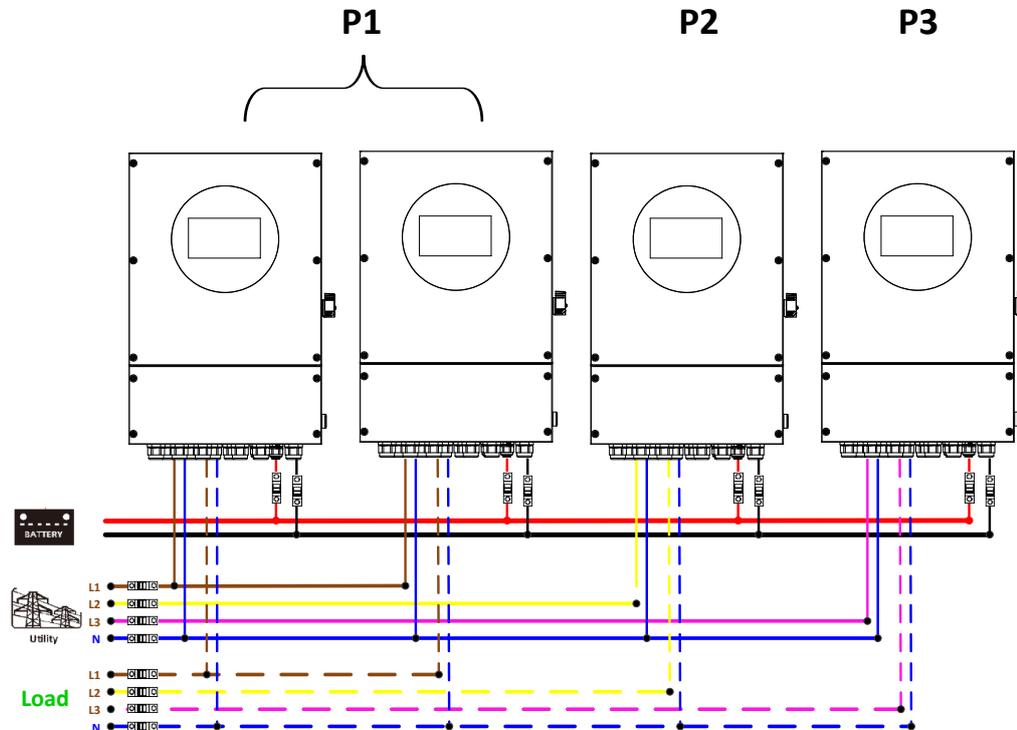


Communication Connection



Two inverters in one phase and only one inverter for the remaining phases:

Power Connection

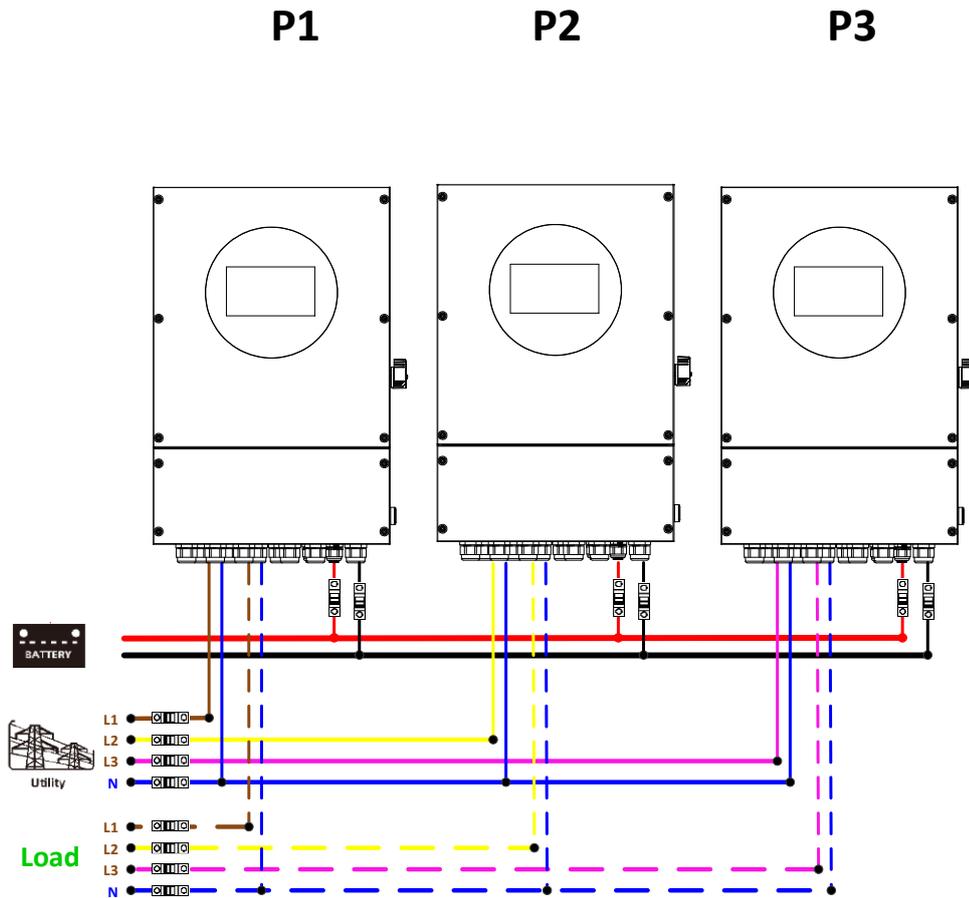


Communication Connection

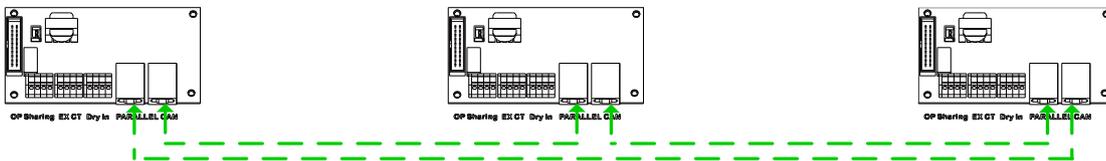


One inverter in each phase:

Power Connection



Communication Connection



WARNING: Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.

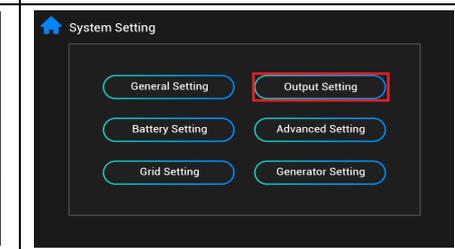
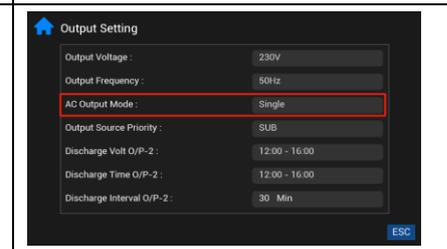
4. PV Connection

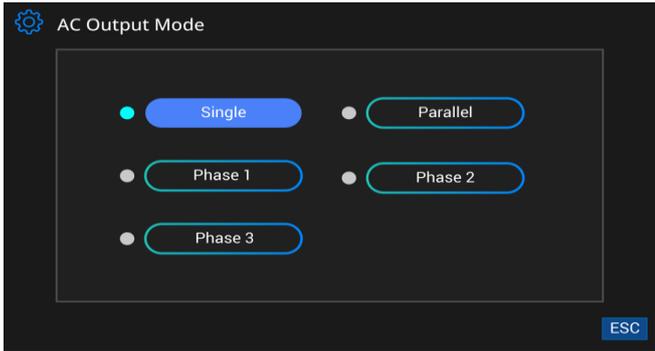
Please refer to user manual of single unit for PV Connection.

CAUTION: Each inverter should connect to PV modules separately.

6. LCD Setting and Display

Parallel mode can be set according to the steps: **Setting**→**Output setting**→**AC Output mode**

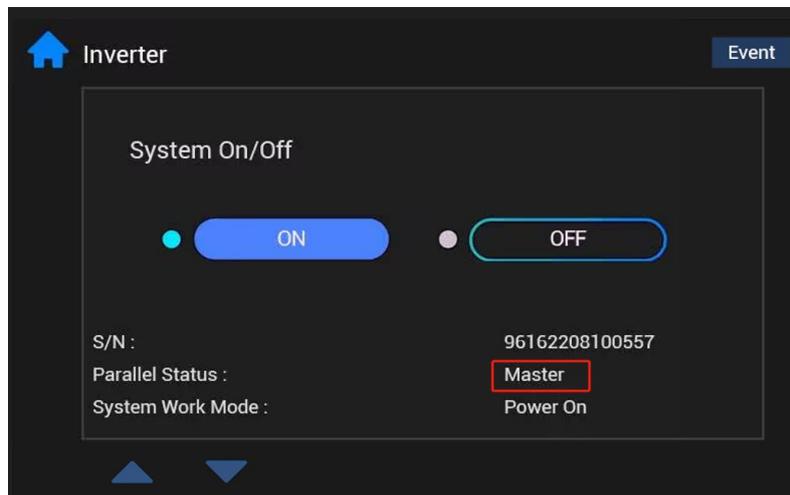
| Step 1: Press "setting" icon | Step 2: Press "Output setting" | Step 3: "AC Output mode" |
|---|--|---|
|  |  |  |

| Program | Description | Selectable option | |
|--|--|--|--|
| Output Setting | AC output mode *This setting is only available when the inverter is in standby mode (Switch off). |  | |
| | | Single | When the units are used in parallel with single phase, please select "Parallel" in program Output Setting AC output mode. |
| | | Parallel | It is required to have at least 3 inverters or maximum 9 inverters to support three-phase equipment. It's required to have at least one inverter in each phase or it's up to four inverters in one phase. Please refers to 5-2 for detailed information. |
| | | Phase 1 | Please select "Phase1" in program AC output mode for the inverters connected to L1 phase, "phase2" in program AC output mode for the inverters connected to L2 phase and "Phase3" in program AC output mode for the inverters connected to L3 phase. |
| | | Phase 2 | |
| Phase 3 | | | |
| <p>Be sure to connect share current cable to units which are on the same phase. Do NOT connect share current cable between units on different phases. Besides, power saving function will be automatically disabled.</p> | | | |

Code Reference:

| Parallel Status | Code | Description |
|---------------------|---------|---|
| Single | Single | Un-identified unit for master or slave |
| Parallel | Master | Master unit |
| | Slave | Slave unit |
| Set of three phases | Phase 1 | As a three-phase electric chess player L1 phase |
| | Phase 2 | As a three-phase electric chess player L2 phase |
| | Phase 3 | As a three-phase electric chess player L3 phase |

Query the status in the figure below



Commissioning

Parallel in single phase

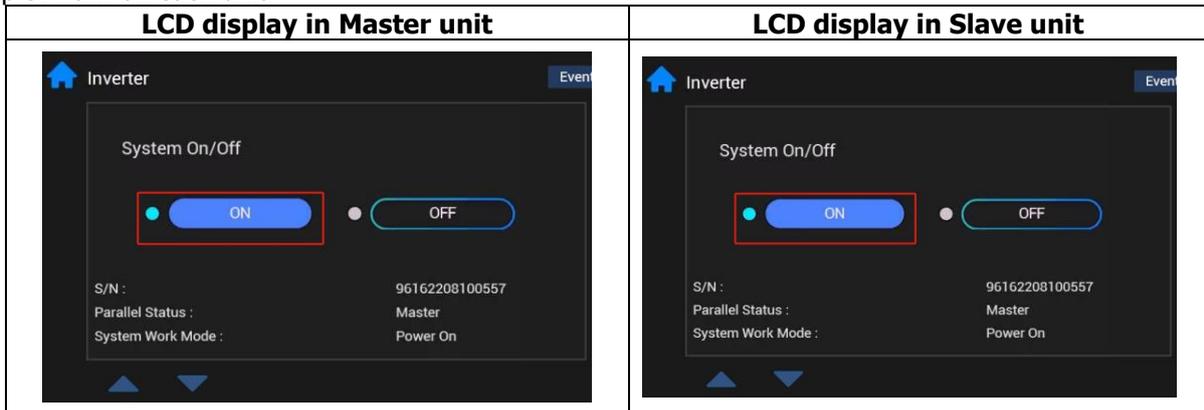
Step 1: Check the following requirements before commissioning:

- Correct wire connection
- Ensure all breakers in the Line wires of the load side are open and each Neutral wire of each unit is connected together.

Step 2: Turn on each unit and set "Parallel" in the LCD setting Output Setting of each unit. And then shut down all units.

NOET: It's necessary to turn off the switch when setting the LCD program. Otherwise, the setting can not be programmed.

Step 3: Turn on each unit.



NOTE: Master and slave units are randomly defined.

Step 4: Switch on all AC breakers of Line wires in AC input. It's better to have all inverters connect to utility at the same time. If not, it will display fault 82 in following-order inverters. However, these inverters will automatically restart. If detecting AC connection, they will work normally.

Step 5: If there is no more fault alarm, the parallel system is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

Support three-phase equipment

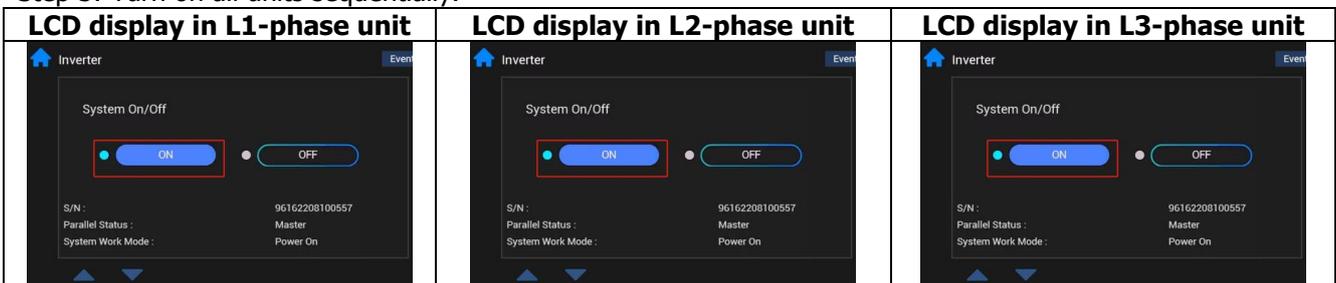
Step 1: Check the following requirements before commissioning:

- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

Step 2: Turn on all units and configure LCD Setting-Output Setting as Phase 1, Phase 2 and Phase 3 sequentially. And then shut down all units.

NOET: It's necessary to turn off switch when setting LCD program. Otherwise, the setting can not be programmed.

Step 3: Turn on all units sequentially.



Step 4: Switch on all AC breakers of Line wires in AC input. If AC connection is detected and three phases are matched with unit setting, they will work normally. Otherwise, the AC icon will flash and they will not work in line mode.

Step 5: If there is no more fault alarm, the system to support 3-phase equipment is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

NOET 1: To avoid overload occurring, before turning on breakers in load side, it's better to have whole system in operation first.

NOET 2: Transfer time for this operation exists. Power interruption may happen to critical devices, which cannot bear transfer time.

Trouble shooting

| Situation | | Solution |
|------------|--|---|
| Fault Code | Fault Event Description | |
| 60 | Current feedback into the inverter is detected. | <ol style="list-style-type: none"> 1. Restart the inverter. 2. Check if L/N cables are not connected reversely in all inverters. 3. For parallel system in single phase, make sure the sharing are connected in all inverters. For supporting three-phase system, make sure the sharing cables are connected in the inverters in the same phase, and disconnected in the inverters in different phases. 4. If the problem remains, please contact your installer. |
| 71 | The firmware version of each inverter is not the same. | <ol style="list-style-type: none"> 1. Update all inverter firmware to the same version. 2. Check the version of each inverter via LCD setting and make sure the CPU versions are same. If not, please contact your instraller to provide the firmware to update. 3. After updating, if the problem still remains, please contact your installer. |
| 72 | The output current of each inverter is different. | <ol style="list-style-type: none"> 1. Check if sharing cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer. |
| 80 | CAN data loss | <ol style="list-style-type: none"> 1. Check if communication cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer. |
| 81 | Host data loss | |
| 82 | Synchronization data loss | |
| 83 | The battery voltage of each inverter is not the same. | <ol style="list-style-type: none"> 1. Make sure all inverters share same groups of batteries together. 2. Remove all loads and disconnect AC input and PV input. Then, check battery voltage of all inverters. If the values from all inverters are close, please check if all battery cables are the same length and same material type. Otherwise, please contact your installer to provide SOP to calibrate battery voltage of each inverter. 3. If the problem still remains, please contact your installer. |
| 84 | AC input voltage and frequency are detected different. | <ol style="list-style-type: none"> 1. Check the utility wiring connction and restart the inverter. 2. Make sure utility starts up at same time. If there are breakers installed between utility and inverters, please be sure all breakers can be turned on AC input at same time. 3. If the problem remains, please contact your installer. |
| 85 | AC output current unbalance | <ol style="list-style-type: none"> 1. Restart the inverter. 2. Remove some excessive loads and re-check load information from LCD of inverters. If the values are different, please check if AC input and output cables are in the same length and material type. 3. If the problem remains, please contact your installer. |
| 86 | AC output mode setting is different. | <ol style="list-style-type: none"> 1. Switch off the inverter and check LCD "output setting". 2. For parallel system in single phase, make sure no Phase 1, Phase 2 or Phase 3 is set on "output setting". For supporting three-phase system, make sure no "Parallel" is set on "output setting". 3. If the problem remains, please contact your installer. |
| 87 | Single Machine exists in parallel system | <ol style="list-style-type: none"> 1. Check whether a single machine exists in parallel system. |

Appendix II: BMS Communication Installation

1. Introduction

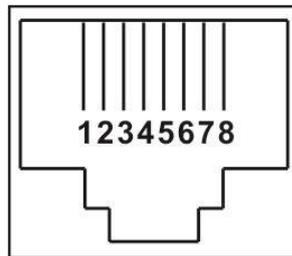
If connecting to lithium battery, it is recommended to purchase a custom-made RJ45 communication cable. Please check with your dealer or integrator for details.

This custom-made RJ45 communication cable delivers information and signal between lithium battery and the inverter. These information are listed below:

- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the lithium battery parameters.
- Have the inverter start or stop charging according to the status of lithium battery.

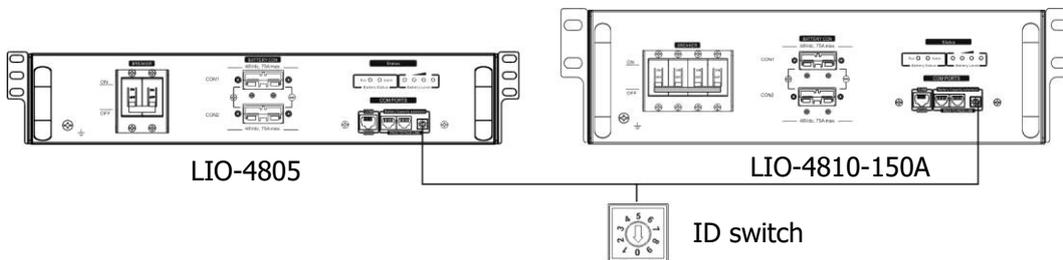
2. Pin Assignment for BMS Communication Port

| | Definition |
|-------|------------|
| PIN 1 | RS232TX |
| PIN 2 | RS232RX |
| PIN 3 | RS485B |
| PIN 4 | NC |
| PIN 5 | RS485A |
| PIN 6 | CANH |
| PIN 7 | CANL |
| PIN 8 | GND |

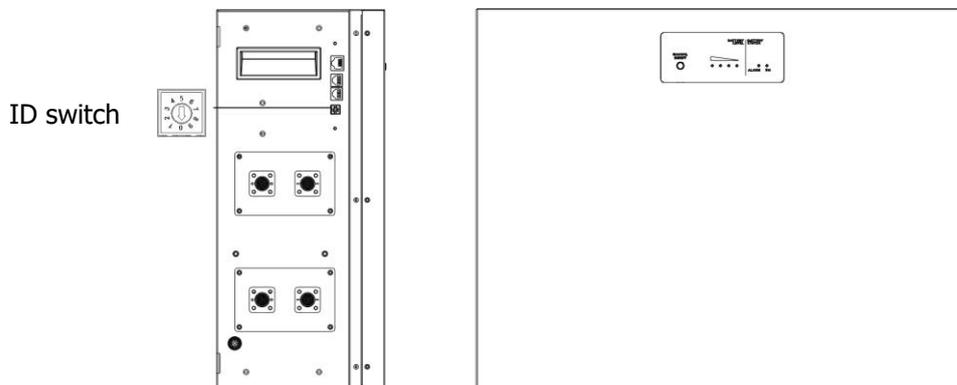


3. Lithium Battery Communication Configuration

LIO-4805/LIO-4810-150A

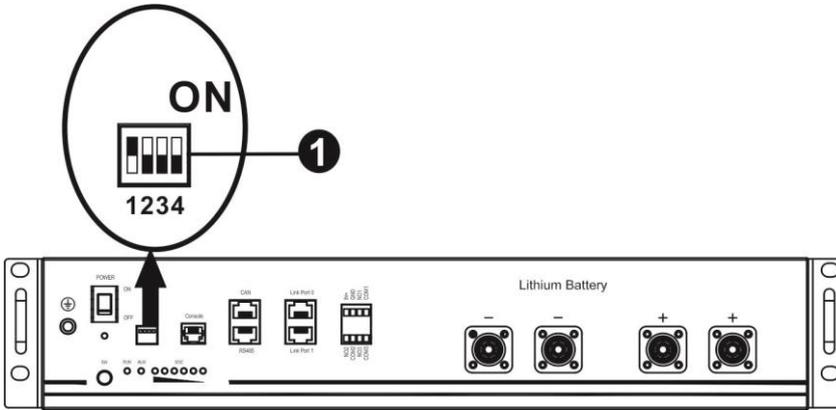


LIO-II 4810



ID Switch indicates the unique ID code for each battery module. It's required to assign a unique ID to each battery module for normal operation. We can set up the ID code for each battery module by rotating the PIN number on the ID switch. From number 0 to 9, the number can be random; no particular order. Maximum 10 battery modules can be operated in parallel.

PYLONTECH



Dip Switch: There are 4 Dip Switches that sets different baud rate and battery group address. If switch position is turned to the "OFF" position, it means "0". If switch position is turned to the "ON" position, it means "1".

Dip 1 is "ON" to represent the baud rate 9600.

Dip 2, 3 and 4 are to set up battery group address.

Dip switch 2, 3 and 4 on master battery (first battery) are to set up or change the group address.

NOTE: "1" is upper position and "0" is bottom position.

| Dip 1 | Dip 2 | Dip 3 | Dip 4 | Group address |
|--|-------|-------|-------|---|
| 1: RS485 baud rate=9600 Restart to take effect | 0 | 0 | 0 | Single group only. It's necessary to set up master battery with this setting and slave batteries are unrestricted. |
| | 1 | 0 | 0 | Multiple group condition. It's necessary to set up master battery on the first group with this setting and slave batteries are unrestricted. |
| | 0 | 1 | 0 | Multiple group condition. It's necessary to set up master battery on the second group with this setting and slave batteries are unrestricted. |
| | 1 | 1 | 0 | Multiple group condition. It's necessary to set up master battery on the third group with this setting and slave batteries are unrestricted. |
| | 0 | 0 | 1 | Multiple group condition. It's necessary to set up master battery on the forth group with this setting and slave batteries are unrestricted. |
| | 1 | 0 | 1 | Multiple group condition. It's necessary to set up master battery on the fifth group with this setting and slave batteries are unrestricted. |

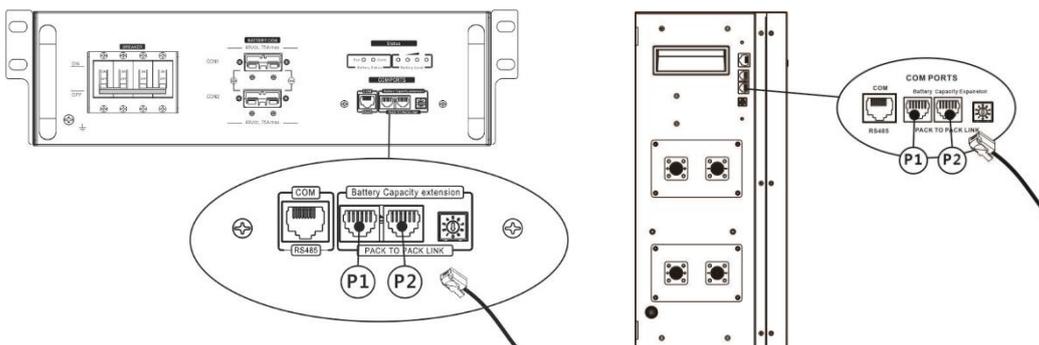
NOTE: The maximum groups of lithium battery is 5 and for maximum number for each group, please check with battery manufacturer.

4. Installation and Operation

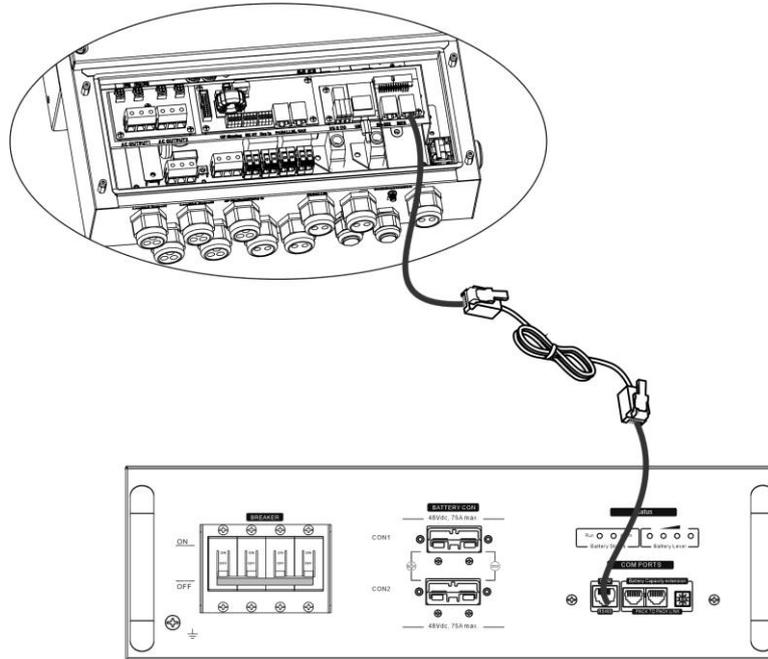
LIO-4805/LIO-4810-150A/ LIO II-4810

After ID no. is assigned for each battery module, please set up LCD panel in inverter and install the wiring connection as following steps.

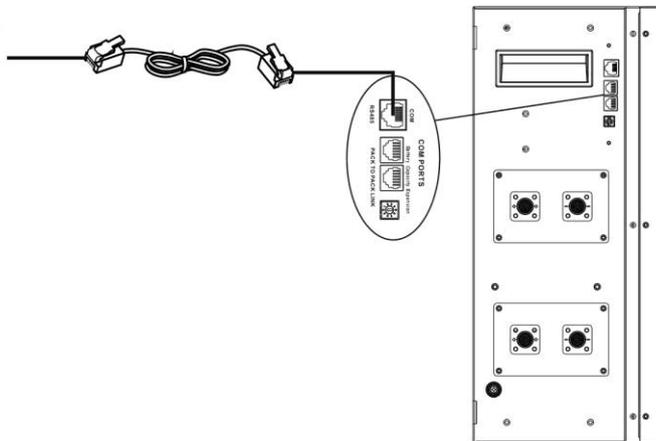
Step 1: Use supplied RJ11 signal cable to connect into the extension port (P1 or P2).



Step 2: Use supplied RJ45 cable (from battery module package) to connect inverter and Lithium battery.



BMS port of the inverter

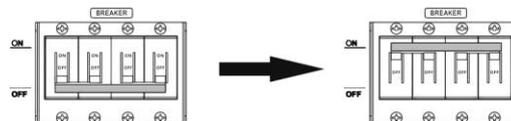


*** For multiple battery connection, please check battery manual for the details.**

Note for parallel system:

1. Only support common battery installation.
2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "LIB" in LCD program 5. Others should be "USE".

Step 3: Turn the breaker switch "ON". Now, the battery module is ready for DC output.

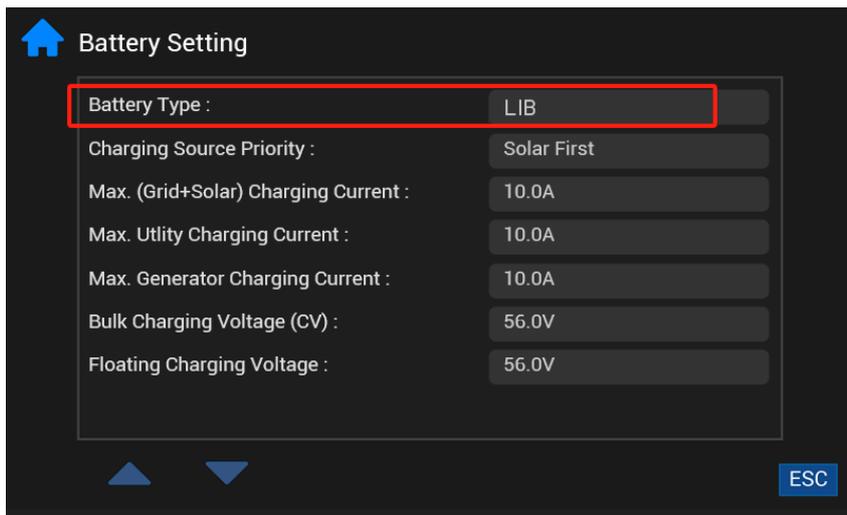


Step 4: Press Power on/off button on battery module for 5 secs, the battery module will start up.

*If the manual button cannot be approached, just simply turn on the inverter module. The battery module will be automatically turned on.

Step 5: Turn on the inverter.

Step 6. Be sure to select battery type as "LIB" in battery Setting.

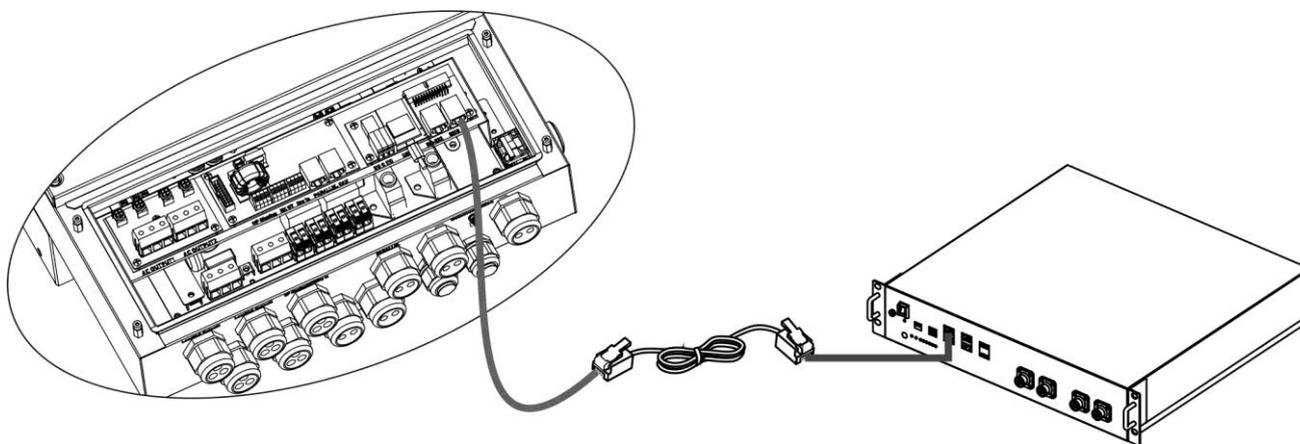


If communication between the inverter and battery is successful, the BMS icon  on LCD display will light on. Generally speaking, it will take longer than 1 minute to establish communication.

PYLONTECH

After configuration, please set up LCD panel in inverter and make wiring connection to Lithium battery as the following steps.

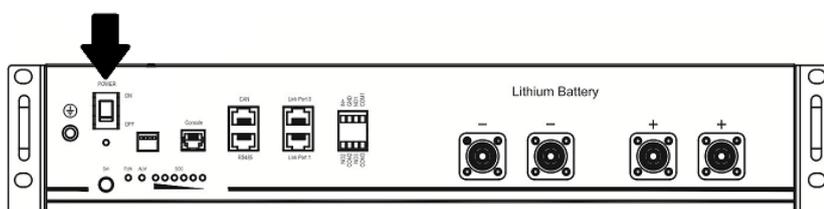
Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



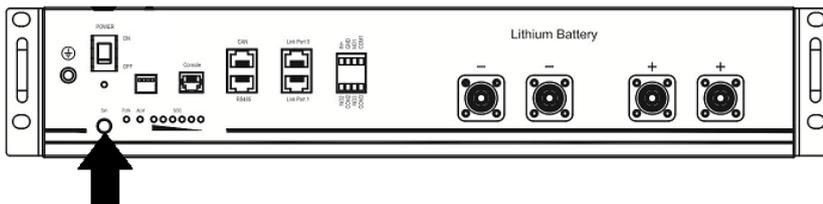
Note for parallel system:

- 3. Only support common battery installation.
- 4. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "PYL" in LCD program 5. Others should be "USE".

Step 2. Switch on Lithium battery.

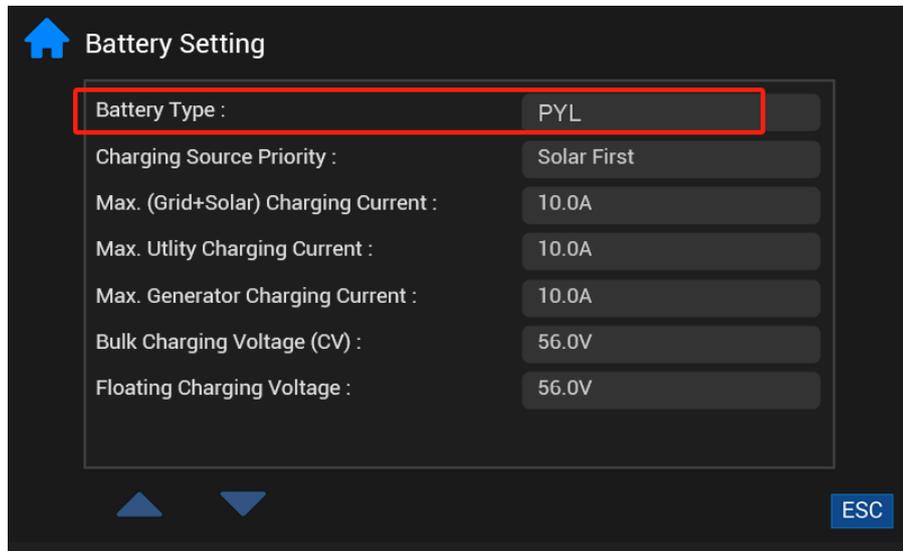


Step 3. Press more than three seconds to start Lithium battery, power output ready.



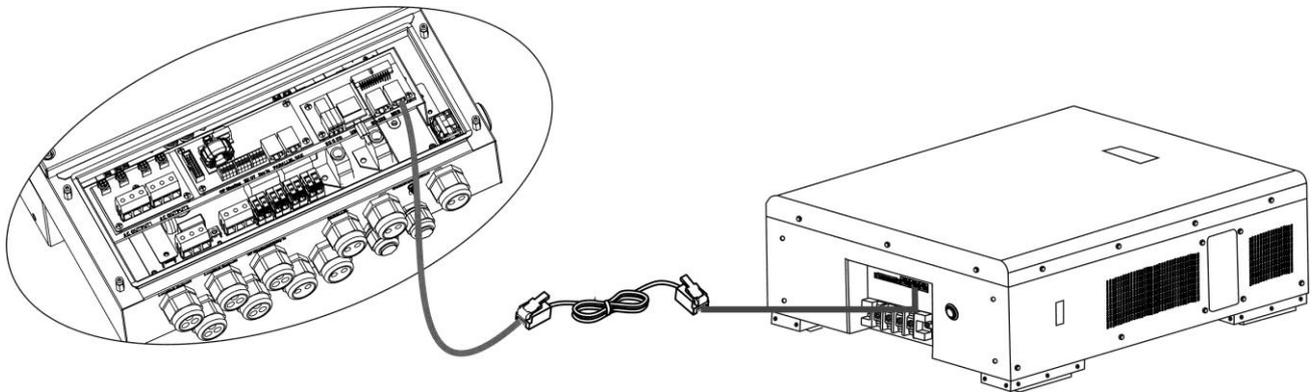
Step 4. Turn on the inverter.

Step 5. Be sure to select battery type as "PYL" in battery Setting.



WECO

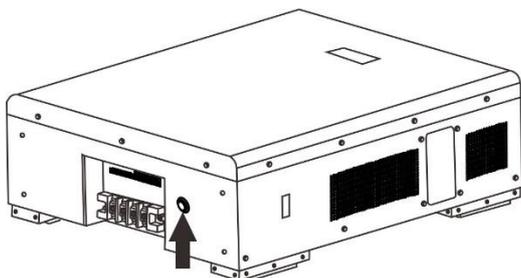
Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



Note for parallel system:

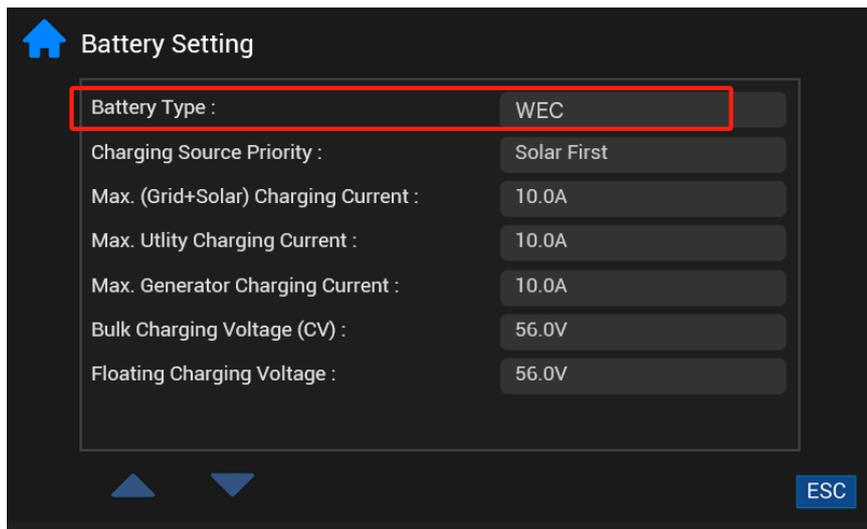
1. Only support common battery installation.
2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "WEC" in LCD program 5. Others should be "USE".

Step 2. Switch on Lithium battery.



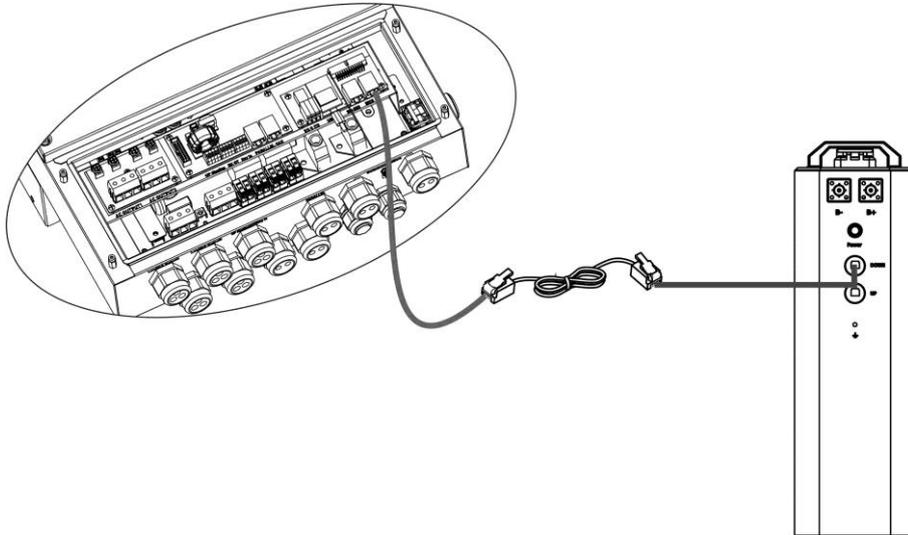
Step 3. Turn on the inverter.

Step 4. Be sure to select battery type as "WEC" in battery Setting.



SOLTARO

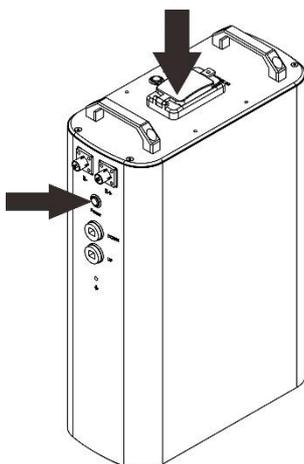
Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



Note for parallel system:

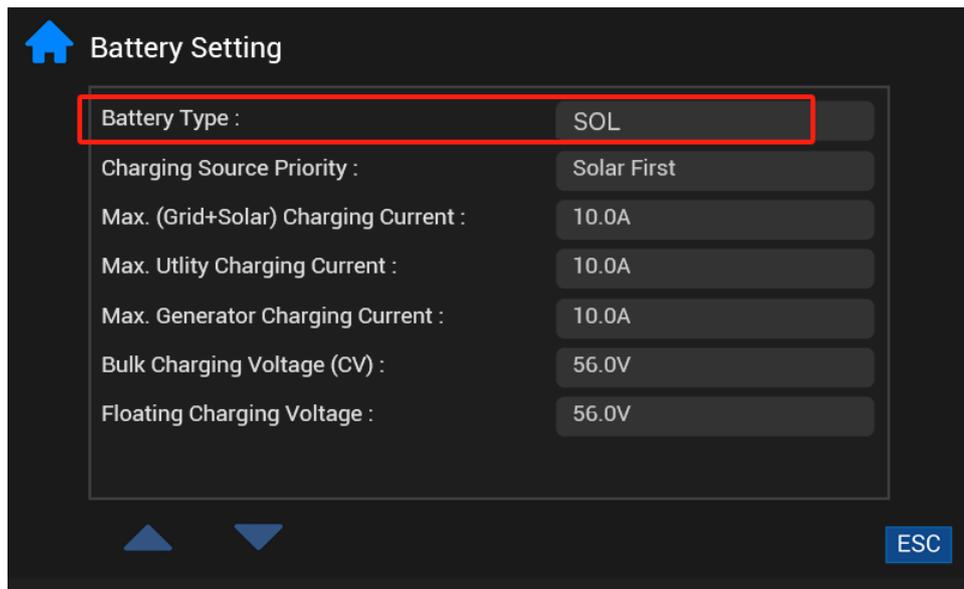
1. Only support common battery installation.
2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "SOL" in LCD program 5. Others should be "USE".

Step 2. Open DC isolator and switch on Lithium battery.



Step 3. Turn on the inverter.

Step 4. Be sure to select battery type as "SOL" in battery Setting.



Appendix III: The Wi-Fi Operation Guide

Introduction

Wi-Fi module can enable wireless communication between solar inverters and the monitoring platform. Users can remotely monitor and control their inverters when they combine the Wi-Fi module with Energy-Mate APP. The App uses the Wi-Fi chip to provide remote monitoring data services, which is beneficial for the daily data monitoring of the inverter, querying the real-time data in the device, sending commands from the device, and operating the device remotely. The app is available for both iOS and Android.

Energy-Mate App

Download and install APP

Please find "Energy-Mate" app from Apple® store or Google® Play Store. Install this app in your mobile phone.



Or scan the following QR code with your smart phone and download Energy-Mate App.



(Android system)



(iOS system)

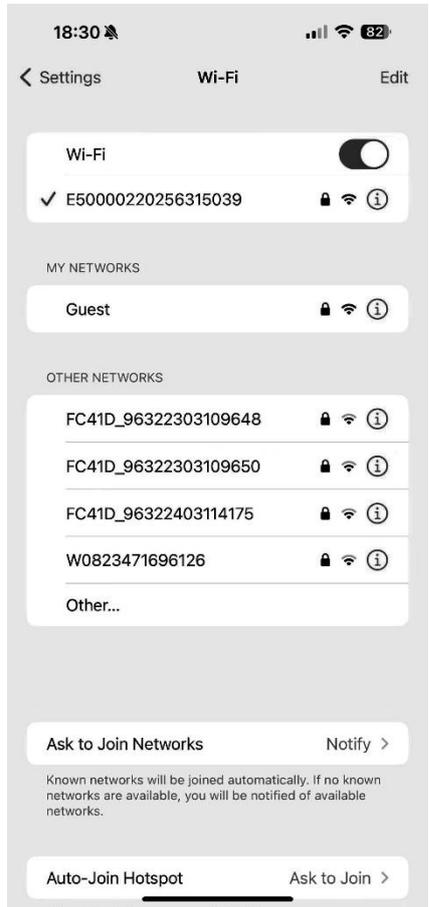
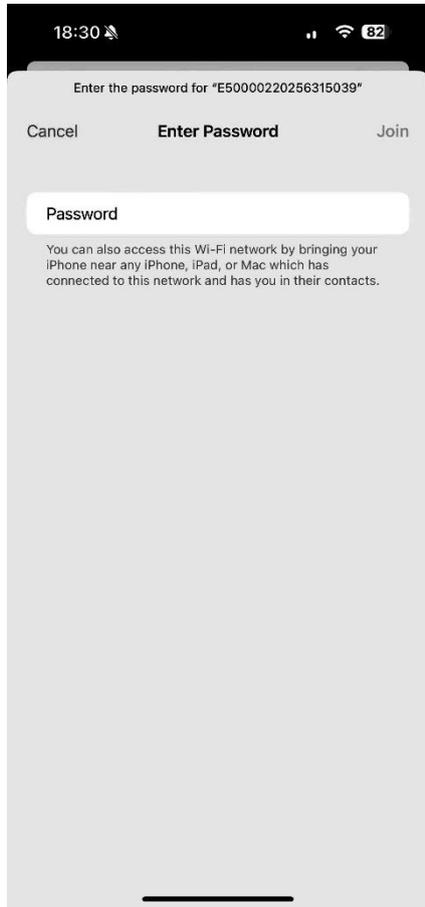
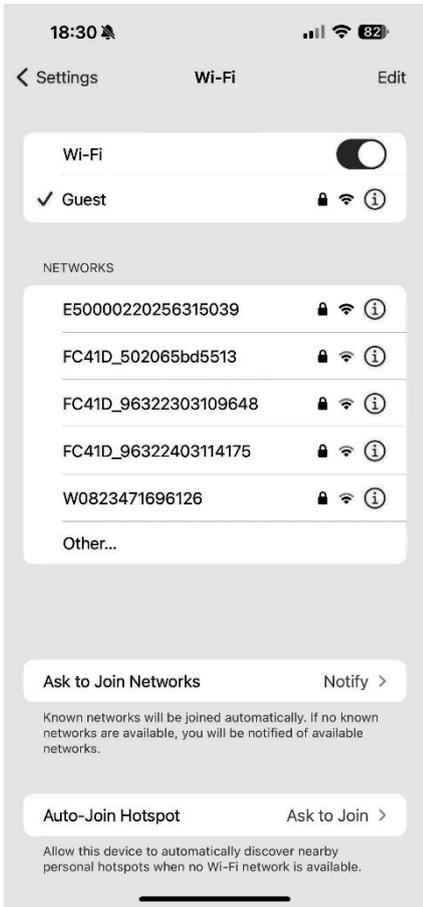
Initial Setup

You can choose local Wi-Fi or Bluetooth to configure the Wi-Fi module network through Energy-mate APP.

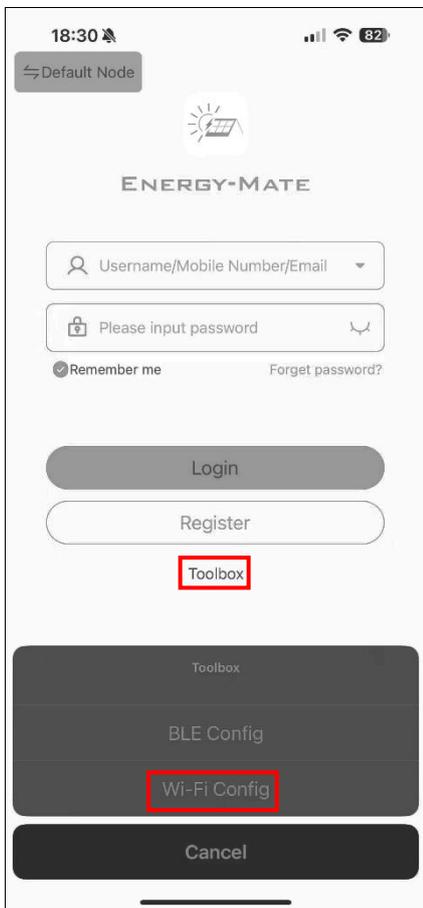
Local Wi-Fi Configuration

If you have configured the network through Bluetooth, please skip this section.

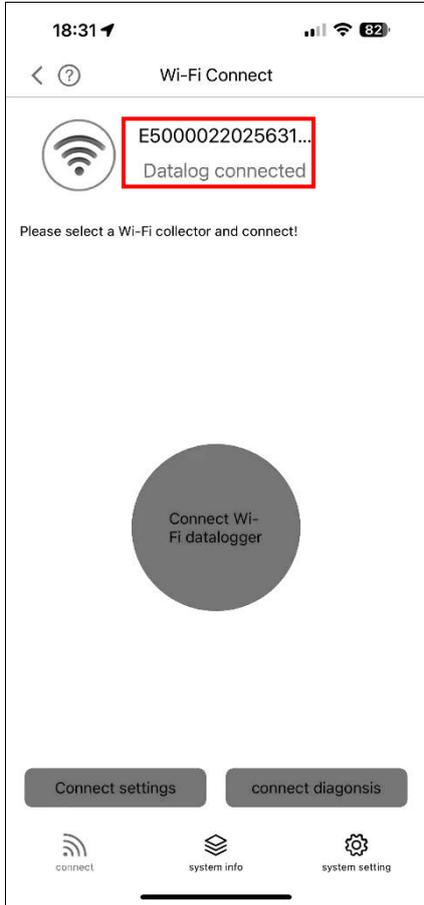
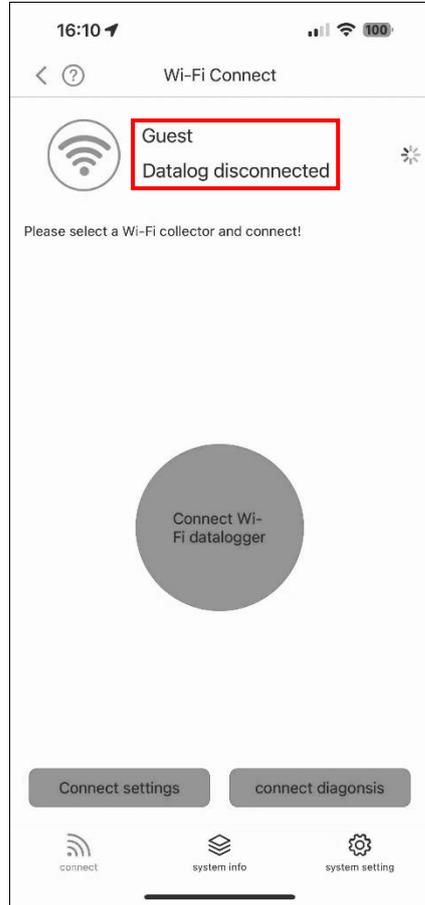
- Turn on the unit.
- Open the Wi-Fi settings from your smart phone.
- Connect your smart phone to the Wi-Fi module. The Wi-Fi module PN number is 18 digits.
- Default password for the Wi-Fi module is: 12345678.



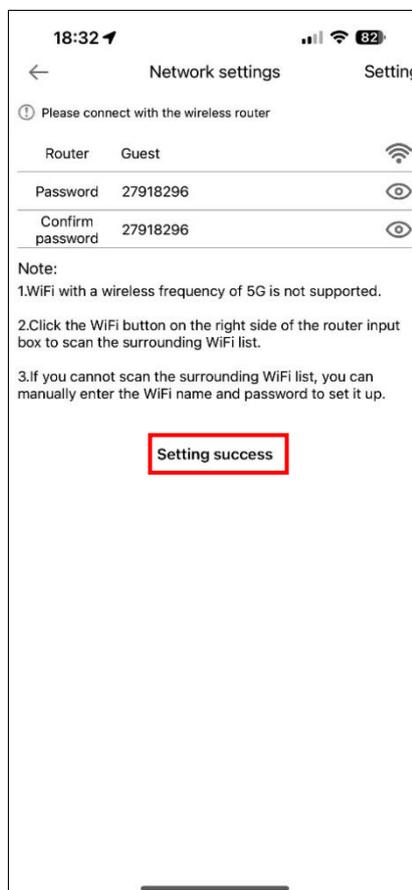
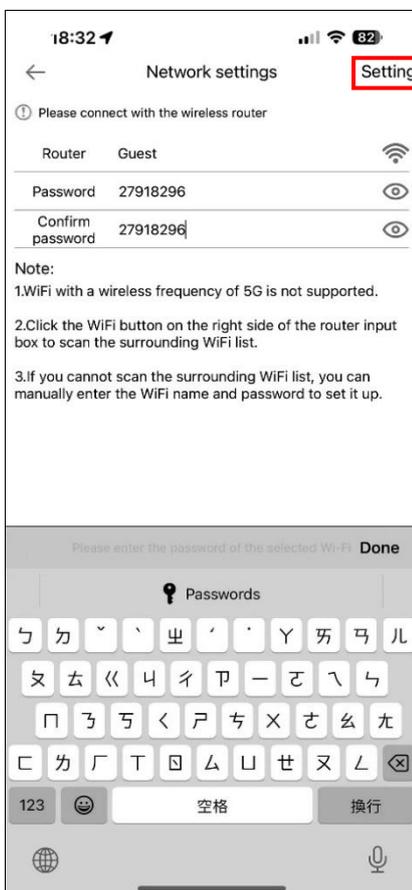
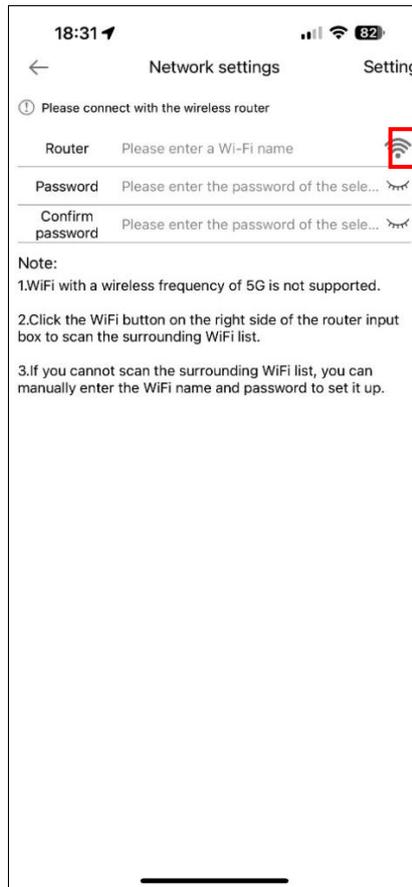
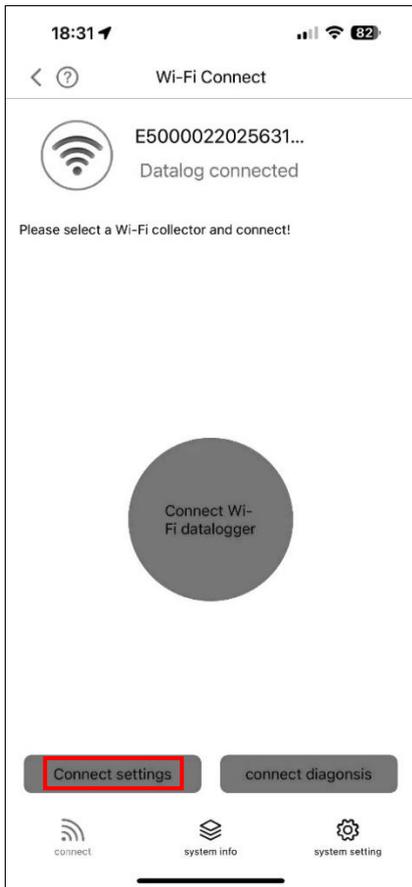
- Once the Wi-Fi connection is successful, click the Energy-Mate APP installed in the phone to enter the login page. Then, click the "Toolbox" and choose "Wi-Fi Config" to enter the Wi-Fi configuration page.



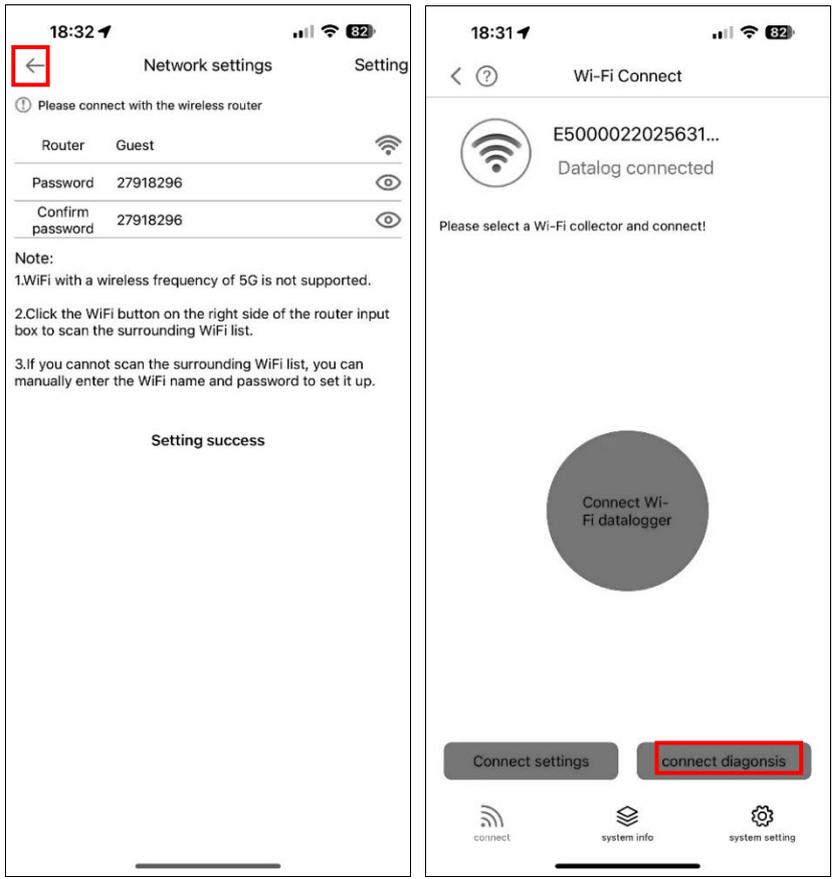
- After entering the Wi-Fi configuration page, please note that the connected Wi-Fi name **must** be the **same as your Wi-Fi module PN number**, and the status **must** be **connected**. If not, please return to the login page, connect your smart phone to the Wi-Fi module, and re-enter the Wi-Fi configuration page.

| The Wi-Fi module connection is successfully | The Wi-Fi module connection failed |
|--|--|
| <p>You can proceed to the next step to configure the network.</p>  | <p>Please return to the login page, connect your smart phone to the Wi-Fi module, and re-enter the Wi-Fi configuration page.</p>  |

- Click "Connect settings" to manually enter the router name or click  to choose the router name. Then, enter the router password and click the "Setting" to complete the setting. The Wi-Fi module only could connect the router at **2.4GHz**.

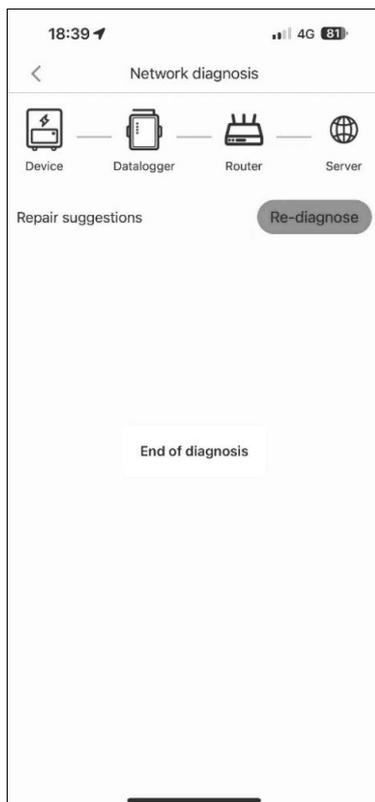


- Click  to return to the Wi-Fi configuration page. Click "Connect diagnosis" to check the connection status.



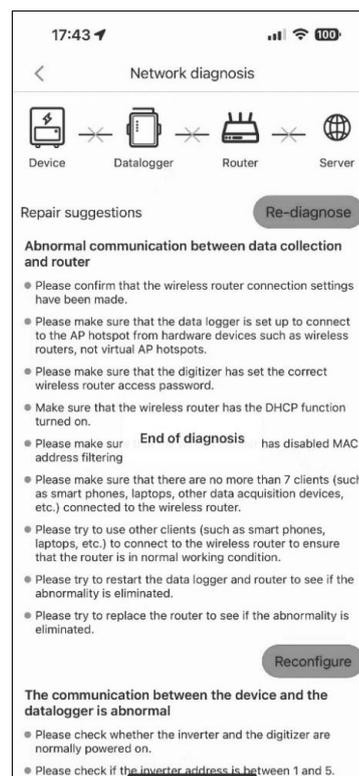
The configuration is **successfully**

Green lines between device, datalogger, router, and server.

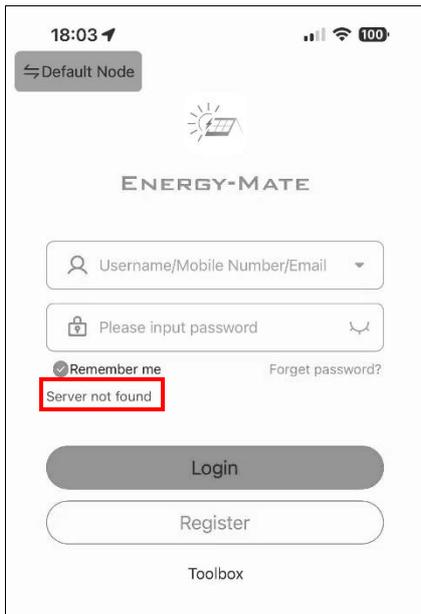


The configuration **failed**

Red crosses between device, datalogger, router, and server. Please refer to APP instructions to re-configure.



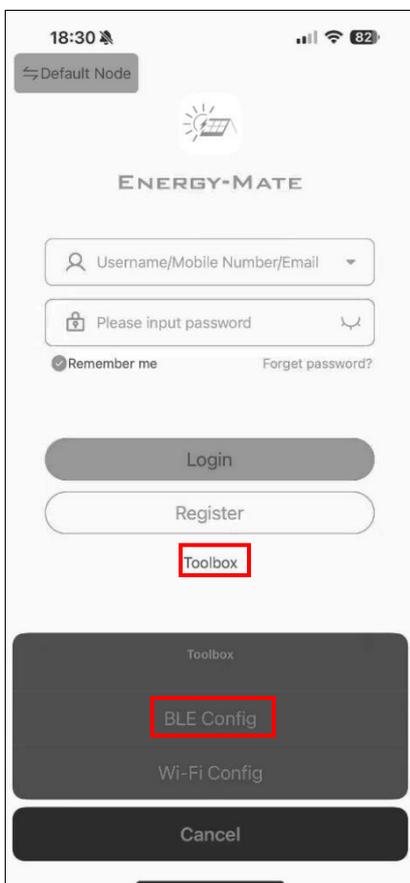
- After Wi-Fi configuration, please **forget** the Wi-Fi module of the Wi-Fi connection on the smartphone to avoid automatic connection and unable to access the network. The login page will prompt "Server not found".



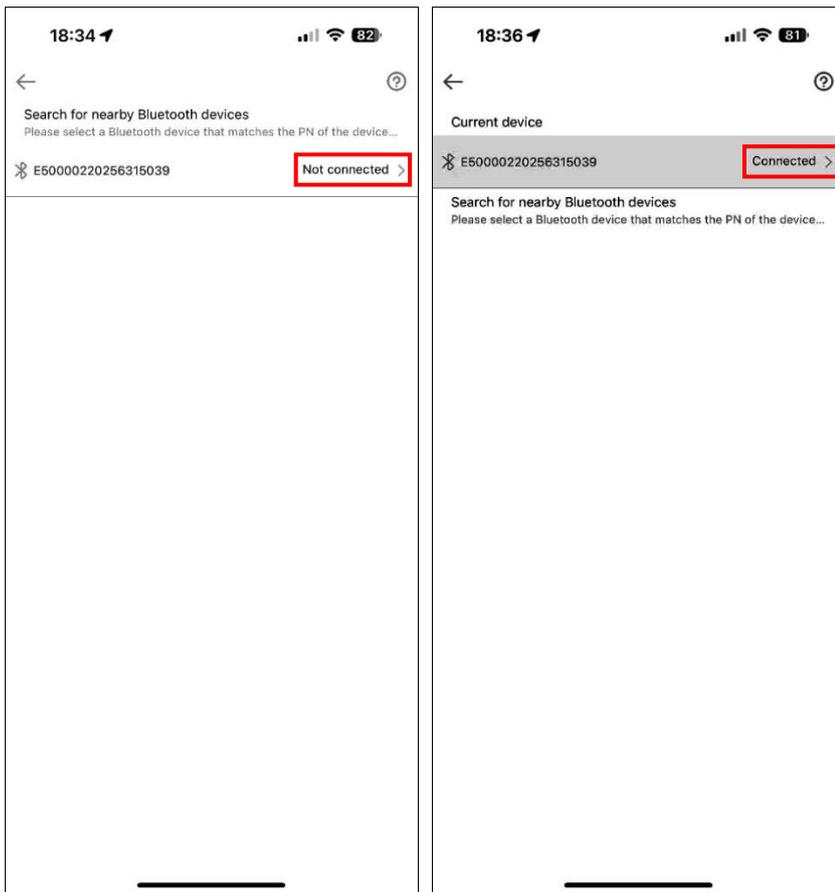
Bluetooth Configuration

If you have configured the network through Wi-Fi, please skip this section.

- Turn on the unit.
- Open the Bluetooth from your smart phone.
- Click the Energy-Mate APP installed in the phone to enter the login page. Then, click the "Toolbox" and choose "BLE Config" to enter the Bluetooth configuration page.

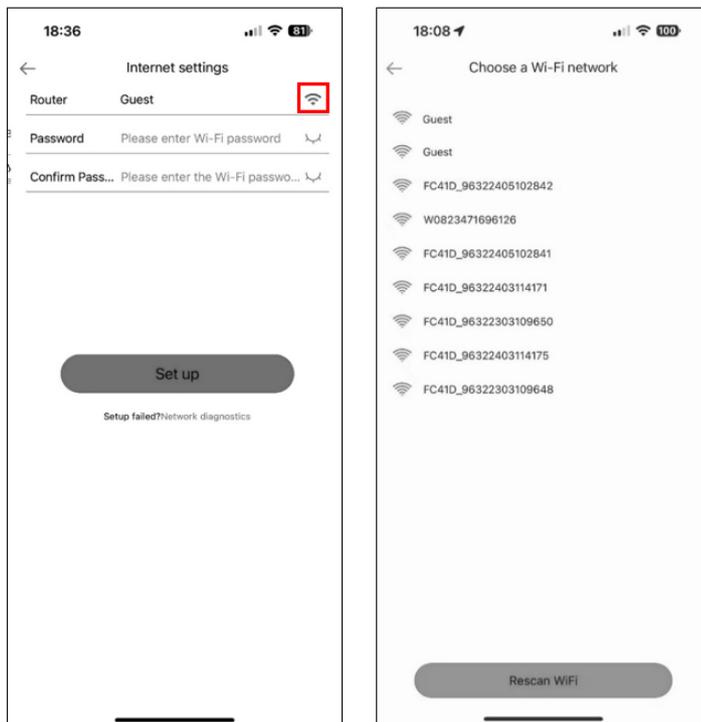


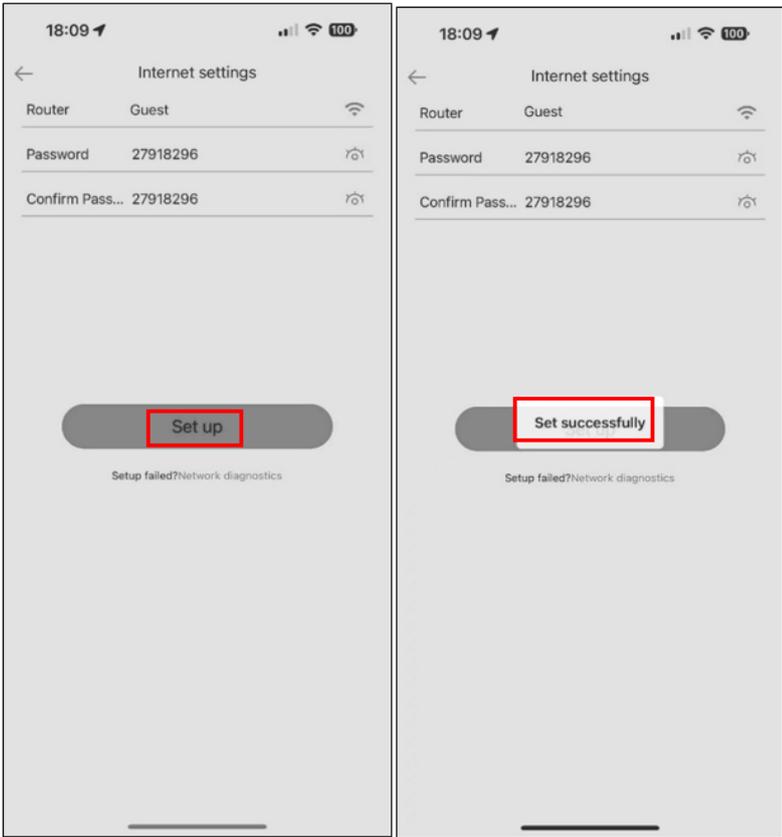
- Connect your smart phone to the Wi-Fi module through Bluetooth.



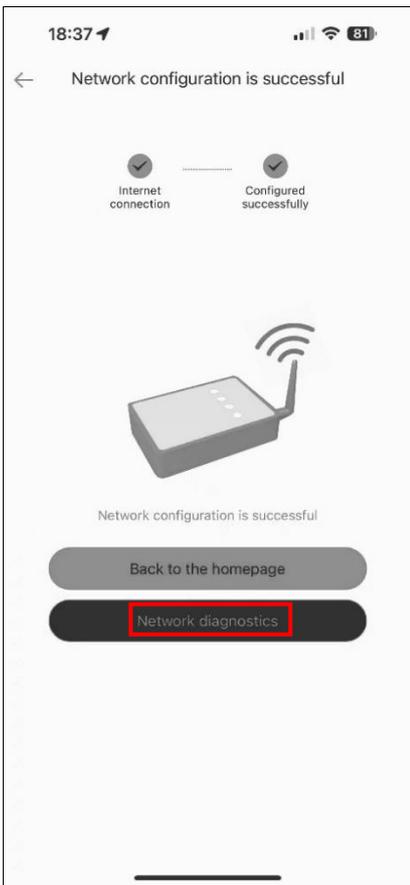
- Manually enter the router name or click  to choose the router name, enter the router password, and then click the "Setting" to complete the setting.

The Wi-Fi module only could connect the router at **2.4GHz**.



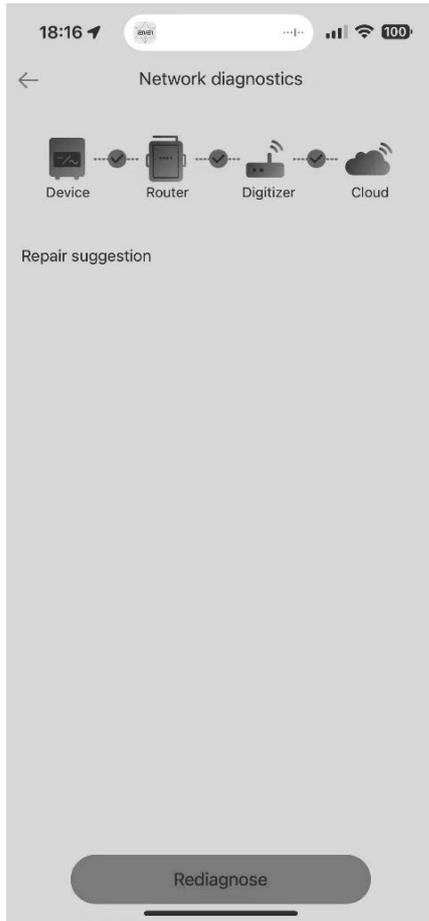


- Click "Network diagnosis" to check the connection status.



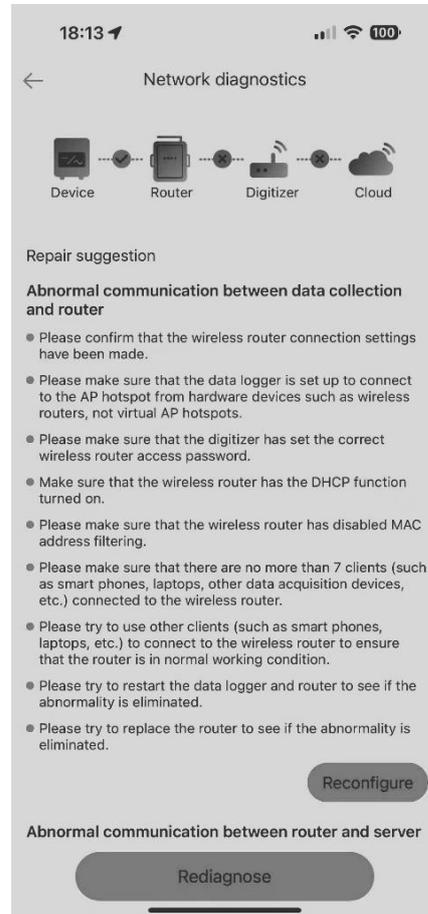
The configuration is **successfully**

Green lines between device, datalogger, router, and server.

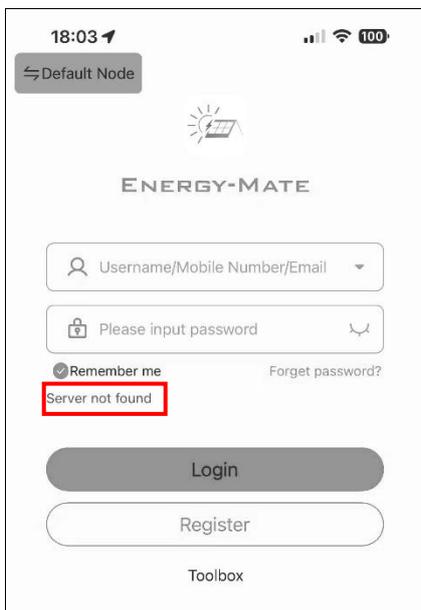


The configuration **failed**

Red crosses between device, datalogger, router, and server. Please refer to APP instructions to reconfigure.

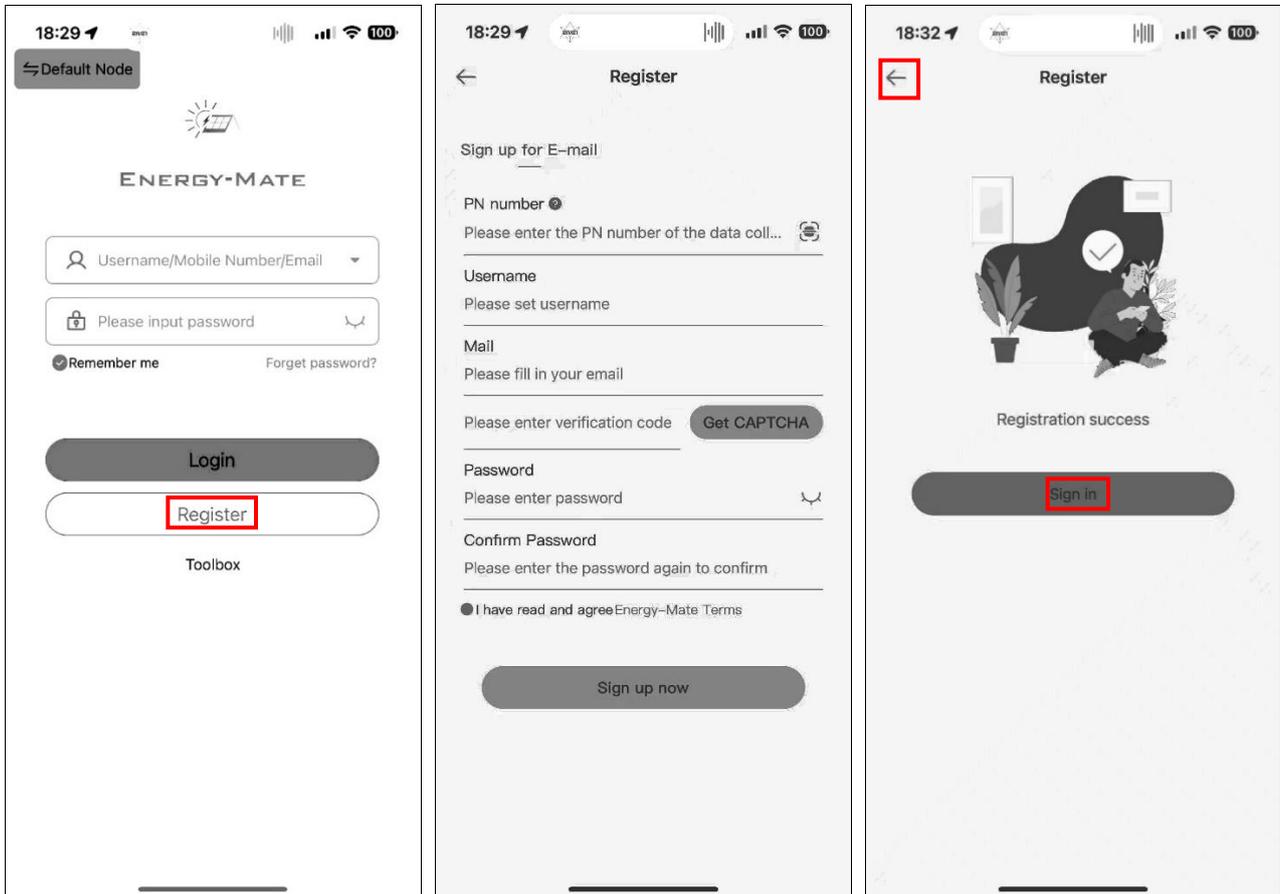


- After Bluetooth configuration, please **disconnect** the Wi-Fi module of the Bluetooth connection on the smartphone to avoid automatic connection and unable to access the network. The login page will prompt "Server not found".



Registration and login

- Connect your smart phone to the router.
- Registration at first time.
- Click the "Register" to enter registration page and fill in the information. Once registration is complete, click "Sign in" or click  to return to the home page. Then, enter the registered username and password to log in.

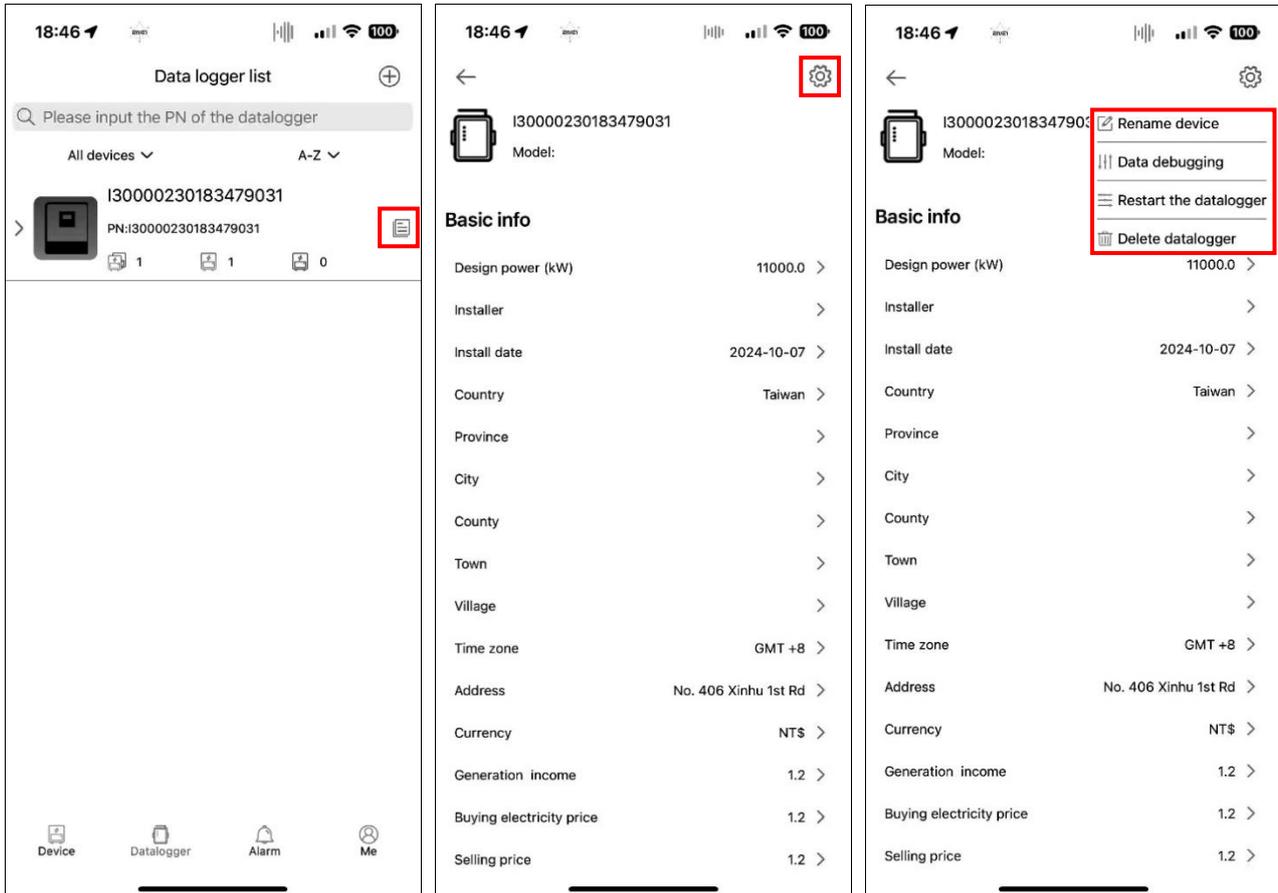


Datalogger

- After login, the default Home page will appear.
- Choose Datalogger page to see the Wi-Fi module list.
 - ◆ Gray icon means Wi-Fi module is offline. Please refer to 2-2 Initial Setup to choose local Wi-Fi or Bluetooth configure Wi-Fi module network.
 - ◆ Green icon means Wi-Fi module is online.

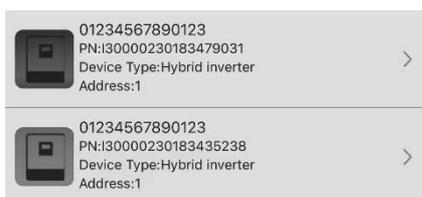
| | | | | |
|---|---|---|---|---|
|  | I30000230183435238 PN:I30000230183435238 |  0 |  0 |  0 |
|  | I30000230183479031 PN:I30000230183479031 |  1 |  1 |  0 |

- Click  to see the Wi-Fi module information.
- Click  to rename device, data debugging, restart the datalogger, and delete datalogger.
 - ◆ Rename device: rename the Wi-Fi module name.
 - ◆ Data debugging: send RS232 commands to the inverter in hexadecimal format.
 - ◆ Restart the datalogger: restart the Wi-Fi module.
 - ◆ Delete datalogger: delete the Wi-Fi module. The inverter information in the device page will **also be deleted**. Once deleted, you **can** add datalogger under another account.



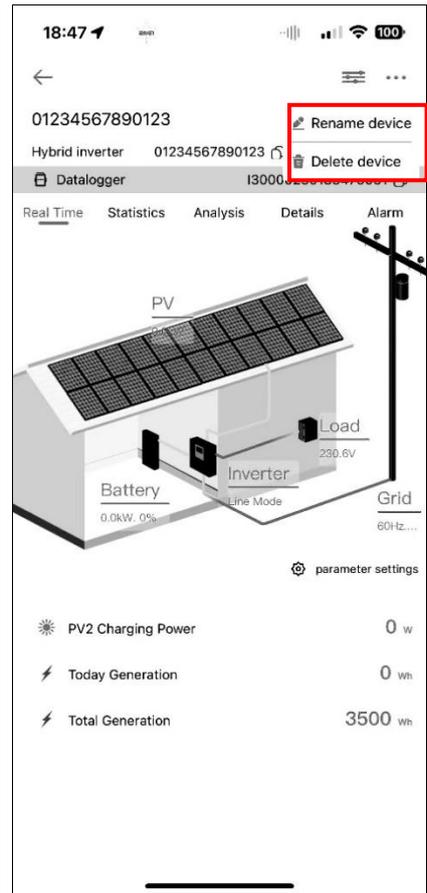
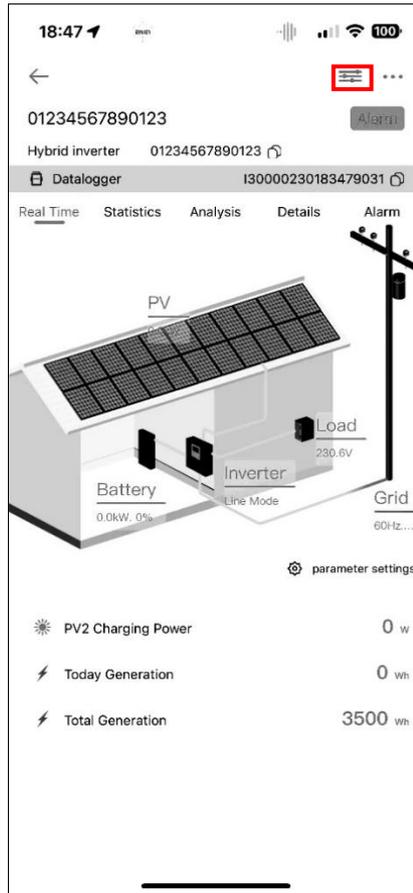
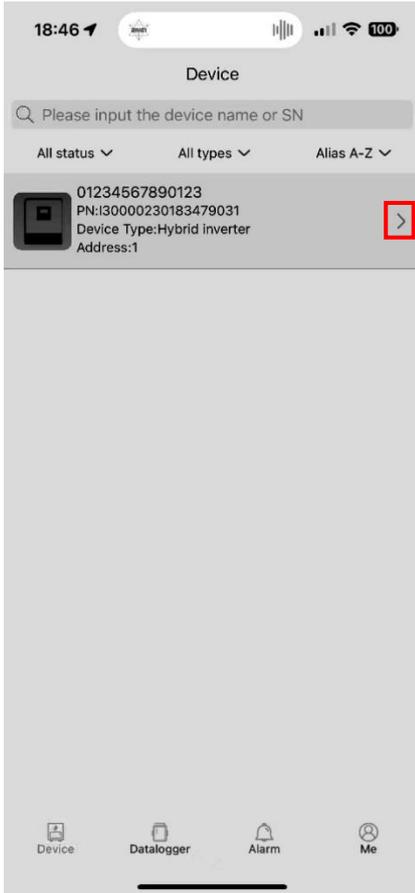
Device

- Choose Device page to see the inverter list.
 - ◆ Gray icon means inverter is offline.
 - ◆ Green icon means inverter is online and no warnings and faults.
 - ◆ Yellow icon means inverter is online and has a warning.
 - ◆ Red icon means inverter is online and has a fault.

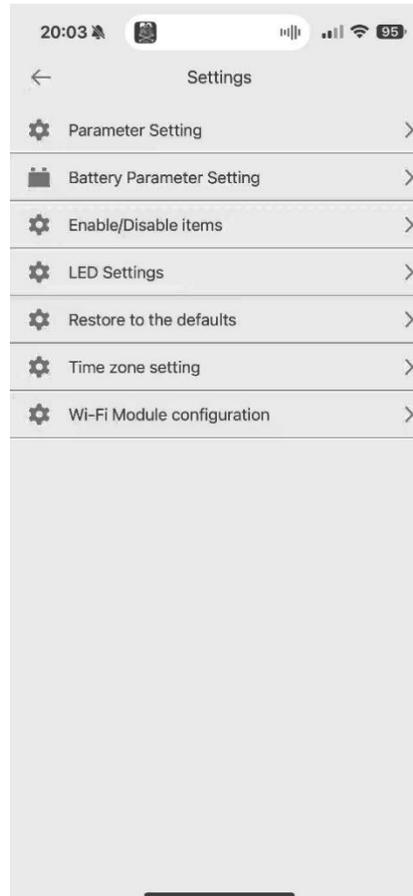
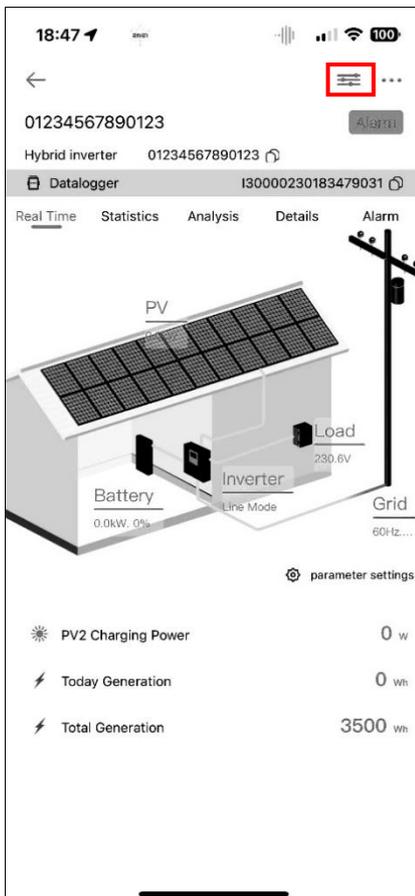


- Click  to see the inverter information.
- Click  to rename device and delete device.
 - ◆ Rename device: rename the inverter name.

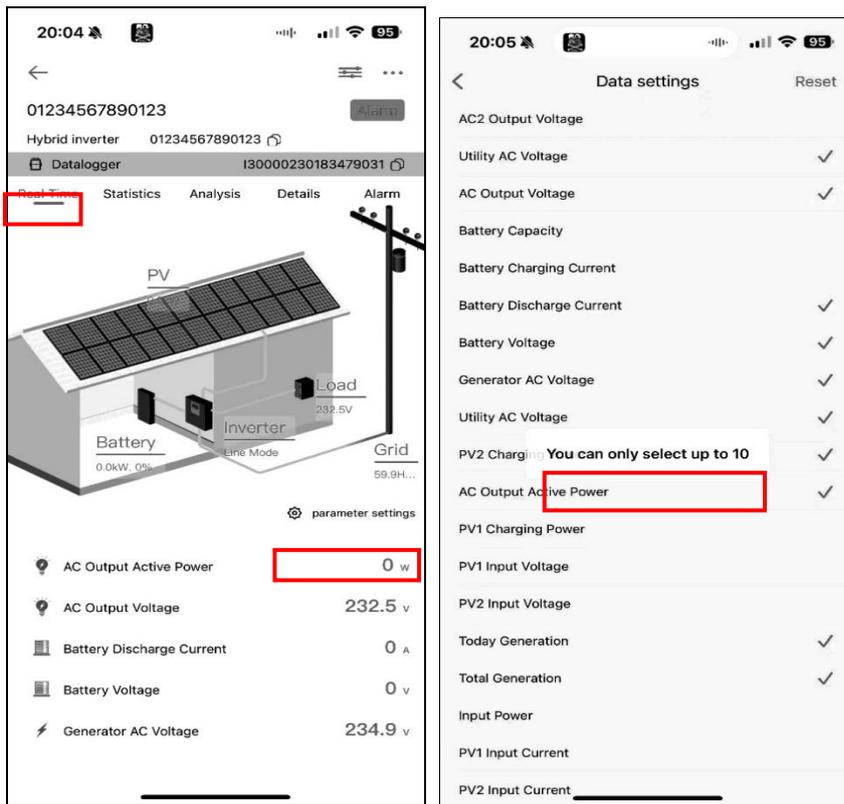
- ◆ Delete device: delete the inverter. The Wi-Fi module information in the datalogger page will **not be deleted**. Even if deleted, you **cannot** add Wi-Fi module under another account.



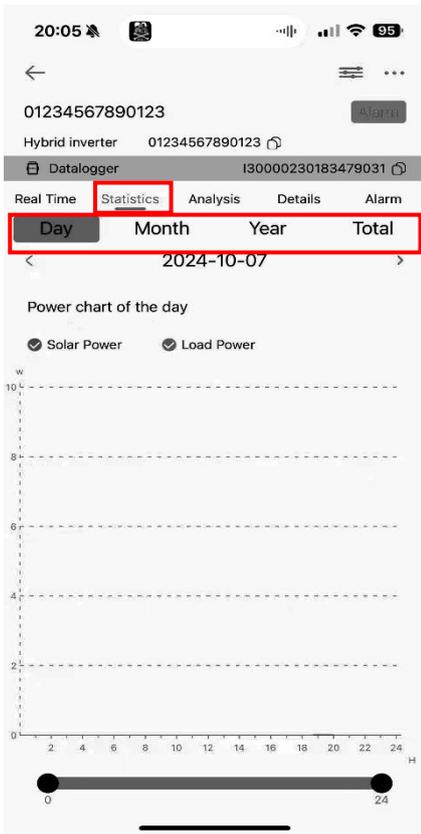
- Click  to enter setting parameters page. The setting items on the parameter page will be different based on different models.



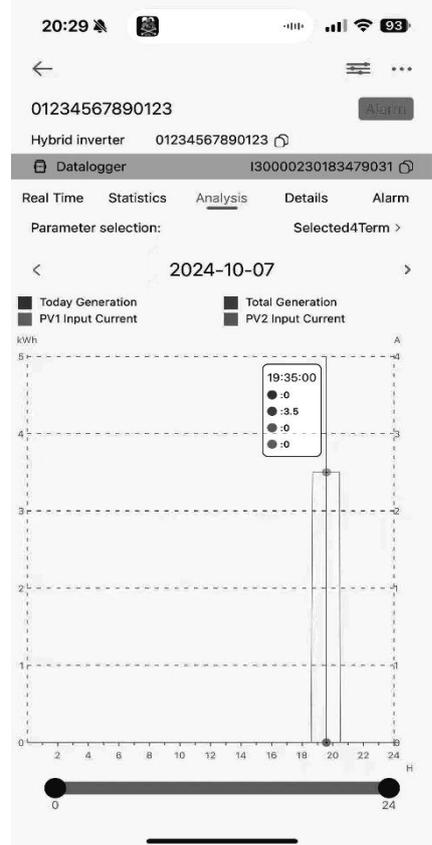
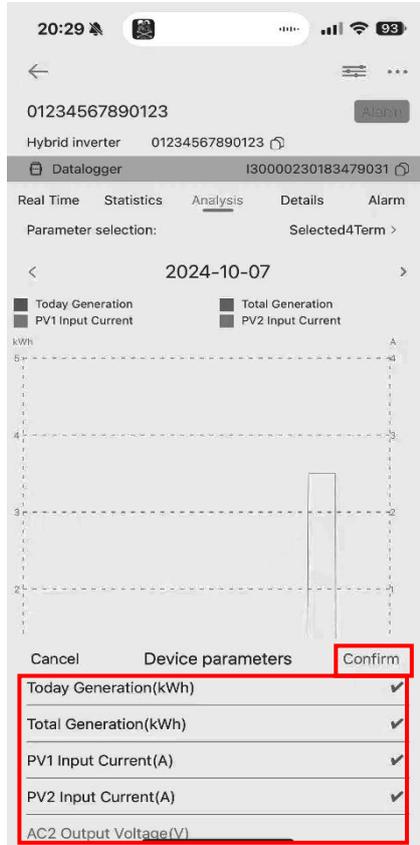
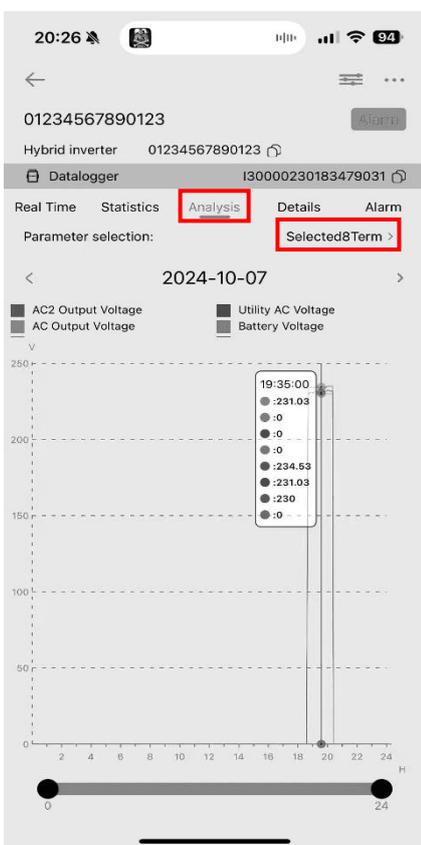
- Click "Real Time" to see the inverter real-time data. Click "parameter settings" to choose data you want to see on the real time page. You can choose up to **10 data**.



- Click "Statistics" to see the inverter solar power per hour, day, month and year.
 - Day: Click the button to query the hourly power generation data of the current day.
 - Month: Click the button to query the daily power generation data of the current month.
 - Year: Click the button to query the monthly power generation data of the current year.
 - Total: Click the button to query the annual power generation data.



- Click "Analysis" to see the inverter data per hour. Click "SelectedXTerm" to choose the data you want to compare. You can choose up to **2 different units** such as energy (kWh) and current (A).



- Click "Details" to see the inverter history.

20:06

01234567890123

Hybrid inverter 01234567890123

Datalogger I30000230183479031

Real Time Statistics Analysis **Details** Alarm

2024-10-07

| Timestamp | Data name | Data |
|-----------|--------------------------------|----------------|
| 20:02:03 | SN | 01234567890123 |
| | Main CPU Firmware Version | 00001.91 |
| 19:57:14 | Secondary CPU Firmware Version | 00097.03 |
| 19:52:24 | Input Relay CPU Version | 64.01 |
| 19:47:34 | Utility AC Voltage | 0.0V |
| 19:42:44 | Utility AC Frequency | 0.0Hz |
| 19:25:33 | Generator AC Voltage | 234.9V |
| 19:20:43 | Generator AC Frequency | 59.9Hz |
| 19:15:53 | PV1 Input Voltage | 0.0V |
| 19:11:03 | PV2 Input Voltage | 0.0V |
| 19:06:13 | PV1 Charging Power | 0W |
| 19:01:23 | PV2 Charging Power | 0W |
| 18:56:34 | Battery Voltage | 0.0V |
| 18:51:44 | Battery Capacity | 0% |
| 18:46:54 | Battery Charging Current | 0A |
| 18:45:55 | Battery Discharge Current | 0A |
| | AC Output Voltage | 232.5V |
| | AC Output Frequency | 59.9Hz |
| | AC Output Apparent Power | 0VA |
| | AC Output Active Power | 0W |
| | Output Load Percent | 0% |
| | Grid Rating Voltage | 230.0V |

- Click "Alarm" to see the inverter warning and fault.

19:38

01234567890123

Hybrid inverter 01234567890123

Datalogger I30000230183435238

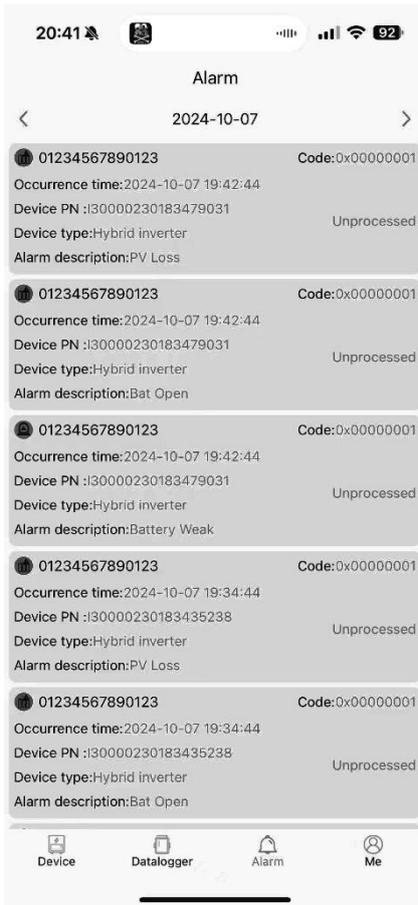
Real Time Statistics Analysis Details **Alarm**

All type All Status

| | | |
|---------------------------|-----------------------|--------------------------|
| Alarm PV Loss | Alarm code:0x00000001 | 2024-10-07 19:34:44 ~ -- |
| Alarm Bat Open | Alarm code:0x00000001 | 2024-10-07 19:34:44 ~ -- |
| Fault Battery Weak | Alarm code:0x00000001 | 2024-10-07 19:34:44 ~ -- |

Alarm

- Choose Alarm page to see the warning and fault list of all inverters.



Me

- Choose Me page to see account information and app version.
- Click "Username" to modify nick name and password, and check if the mail has been bound. If the mail is bound, you can retrieve password through mail.