

MOTOMA®

Power into the Future

USER MANUAL



INFINI V4 WP ELITE PRO 12KW SOLAR INVERTER

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

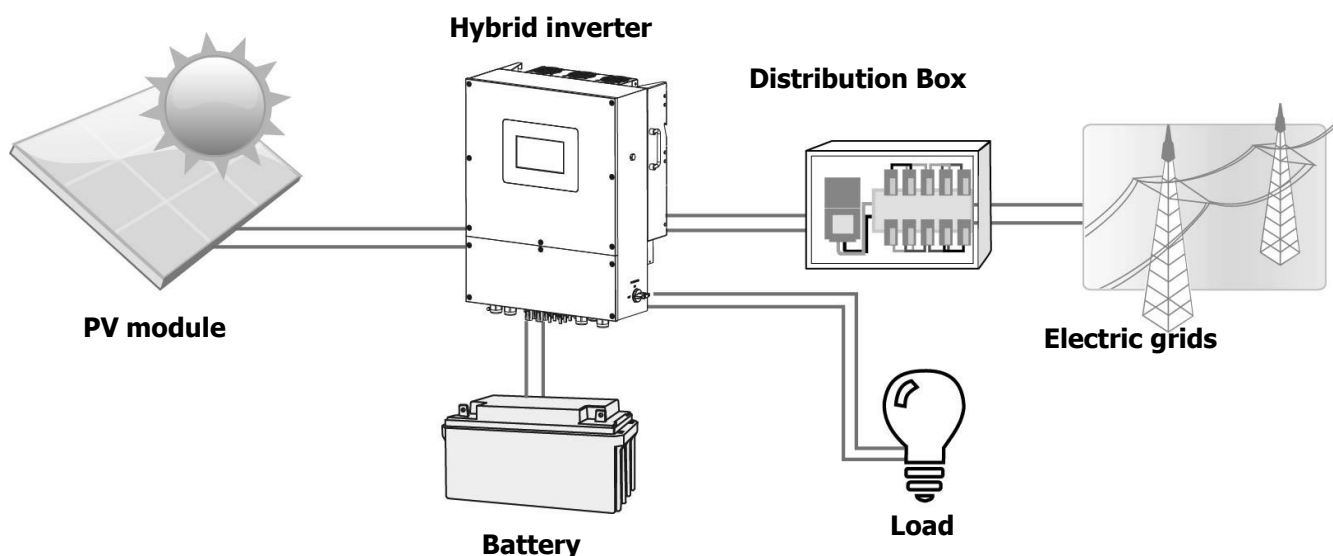
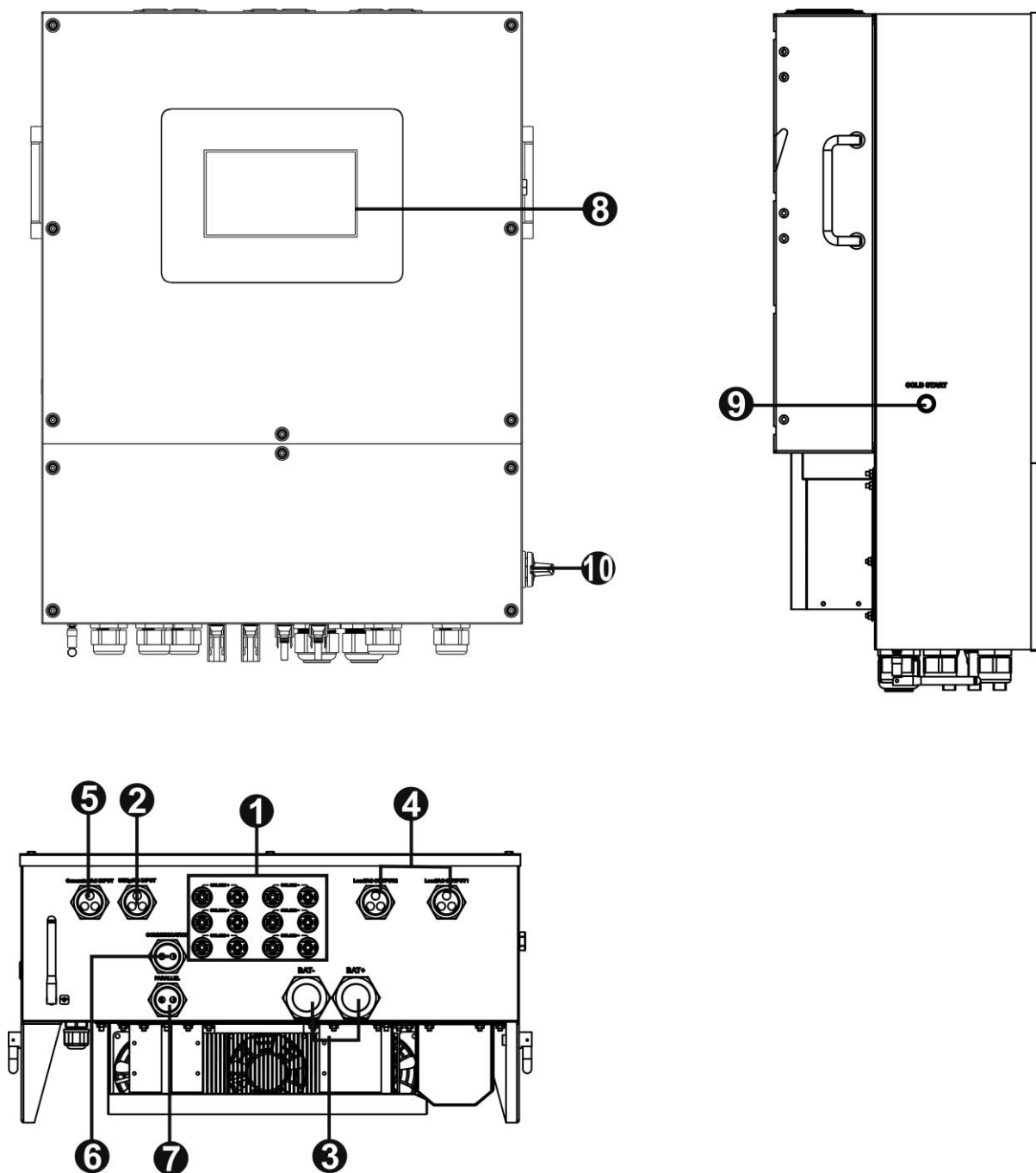


Figure 1 Basic hybrid PV System Overview

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



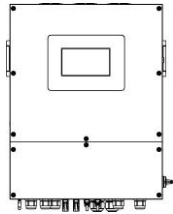
NOTE: For parallel model installation and operation, please check separate parallel installation guide for the details.

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



Manual



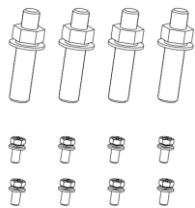
RS-232 cable



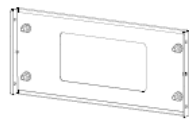
Parallel communication cable



Current sharing cable



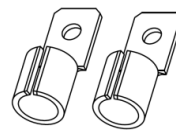
Mounting screws



Mounting plate



WiFi antenna



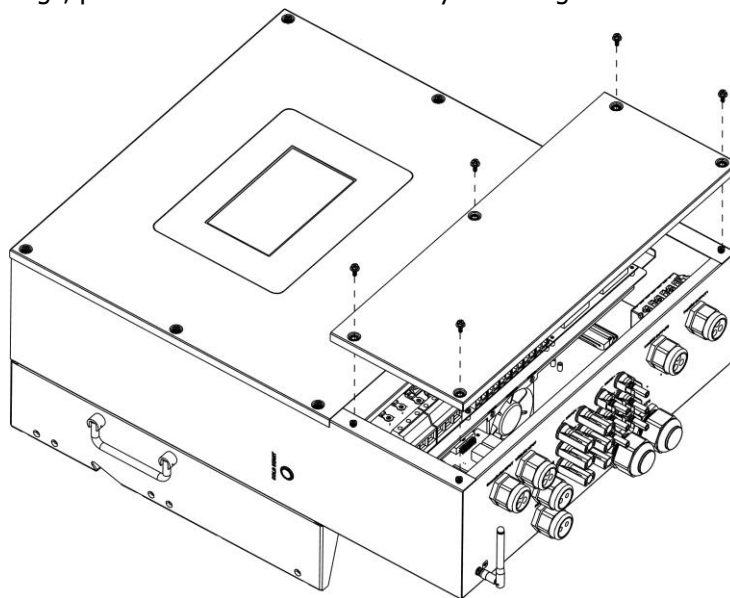
DC terminals



Hex Key

Preparation

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



Installing the Unit

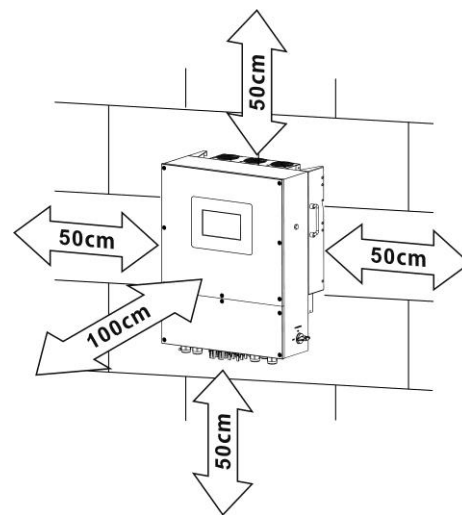
Preparation

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.
- 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 maintain at least 100cm of clearance in front.
- The inverter should be installed in a shaded, rain proof or protected location.



Mounting the Unit

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

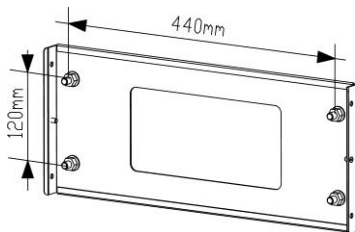
Installation to the wall should be implemented with the proper screws. After that, the device should be bolted on securely.

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

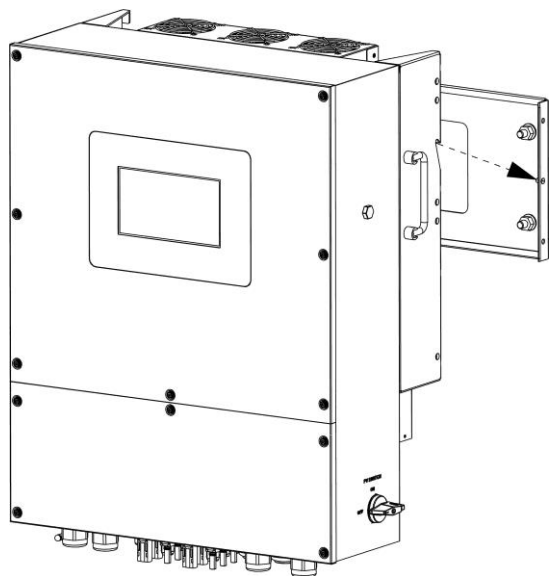
WARNING!! FIRE HAZARD.

SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

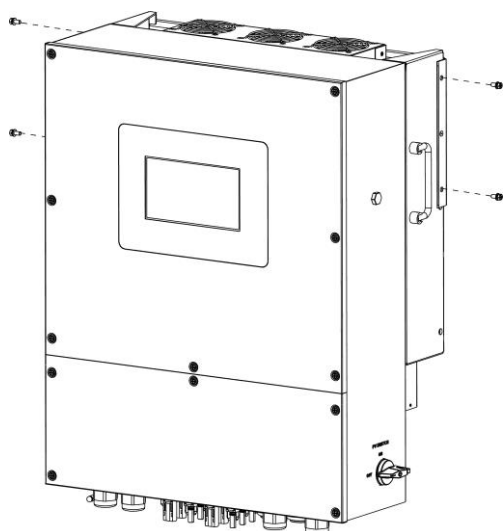
Step 1: Fix the following bracket to the wall using expansion screws.



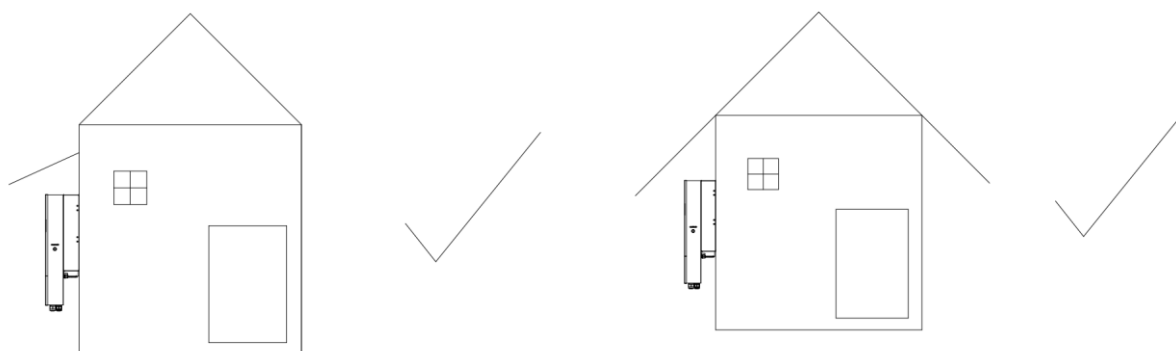
Step 2: Place the inverter on the support.



Step 3: Then, fix the remaining four positions with screws.



Step 4: The inverter should be installed in a shaded, rain proof or protected location.



Battery Connection

CAUTION: For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

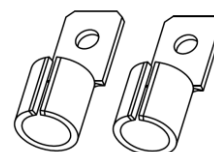
WARNING! All wiring must be performed by a qualified personnel.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below.

Recommended battery cable and terminal size:

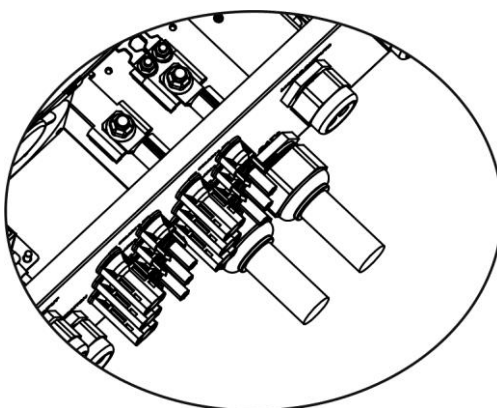
Typical Amperage	Wire Size	Torque Value
220A	1*1/0 AWG	5 Nm

Ring terminal:



Please follow the below steps to implement battery connection:

1. Assemble battery ring terminal based on recommended battery cable.
2. Fix two cable glands into positive and negative terminals on the inverter.
3. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the screws are tightened with torque of 5Nm. Make sure polarity at both the battery and the inverter/charge is correctly connected and ring terminals are tightly screwed to the battery terminals.



WARNING: Shock Hazard

Installation must be performed with care due to high battery voltage in series.



CAUTION!! Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur.

CAUTION!! Do not apply anti-oxidant substance on the terminals before terminals are connected tightly.

CAUTION!! Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

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.

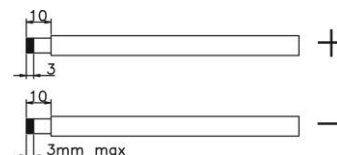
CAUTION!! There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

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

Gauge	Torque Value
8 AWG	1.2~ 1.6 Nm



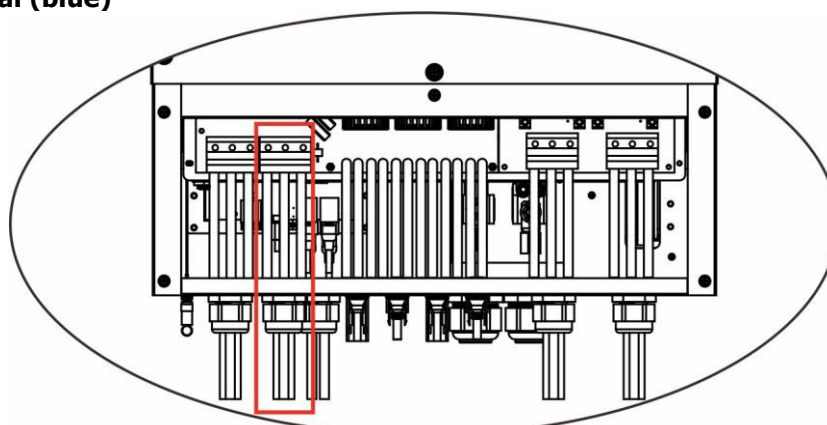
Please follow below steps to implement AC input/output connection:

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

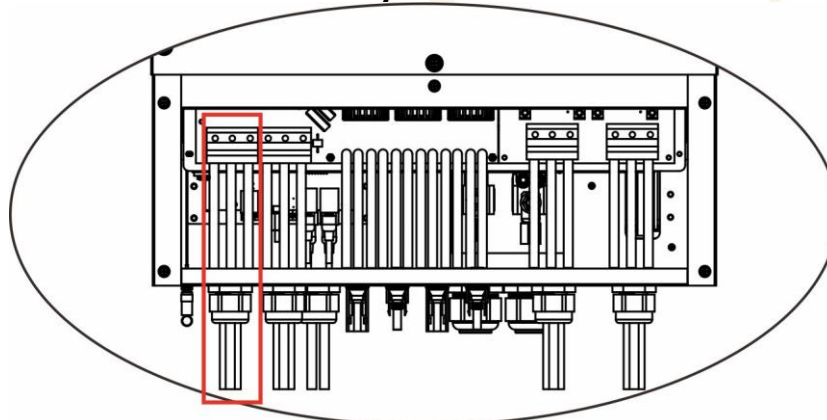
$\oplus$ → **Ground (yellow-green)**

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.

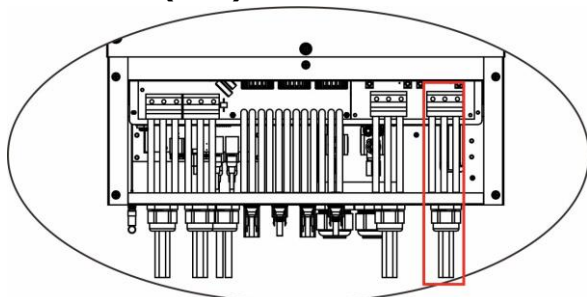
4. This inverter is equipped with dual-output. There are two outputs: AC output 1 and AC output 2. It's set up through LCD program or monitoring software to turn on and off the second output. Refer to "LCD setting" section for the details.

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

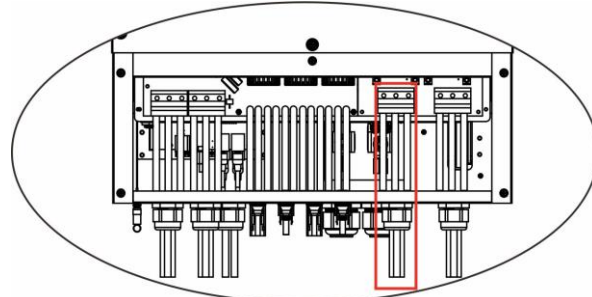
⊕→**Ground (yellow-green)**

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. There are two operation situations:

- (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 the 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 operation 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.

Step 1: Check the input voltage of PV array modules. The acceptable input voltage of the inverter is 120VDC - 450VDC. This system is applied with three strings of PV array.

Solar Charging Mode	
Max. PV Array Open Circuit Voltage	500 Vdc
PV Array MPPT Voltage Range	120~450Vdc
MPP Number	3

CAUTION: Exceeding the maximum input voltage can destroy the unit!! Check the system before wire connection.

Step 2: Disconnect the circuit breaker and switch off the DC switch.

Step 3: Assemble provided PV connectors with PV modules by the following below steps.

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.

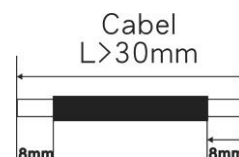
Typical Amperage	Cable Size	Torque
28A	10AWG	2.0~2.4Nm

Components for PV connectors and Tools:

Female connector housing	
Female terminal	
Male connector housing	
Male terminal	
Crimping tool and spanner	

Cable preparation and connector assembly process:

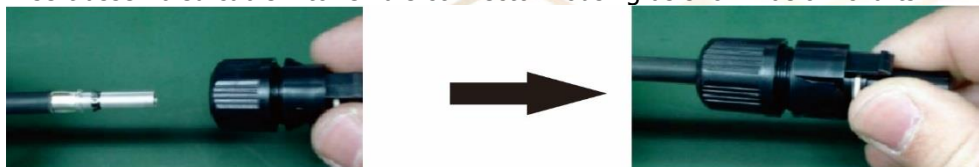
Strip one cable 8 mm on both end sides and be careful NOT to nick conductors.



Insert striped cable into female terminal and crimp female terminal as shown below charts.



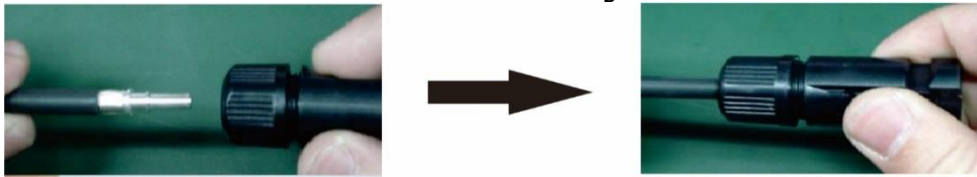
Insert assembled cable into female connector housing as shown below charts.



Insert striped cable into male terminal and crimp male terminal as shown below charts.



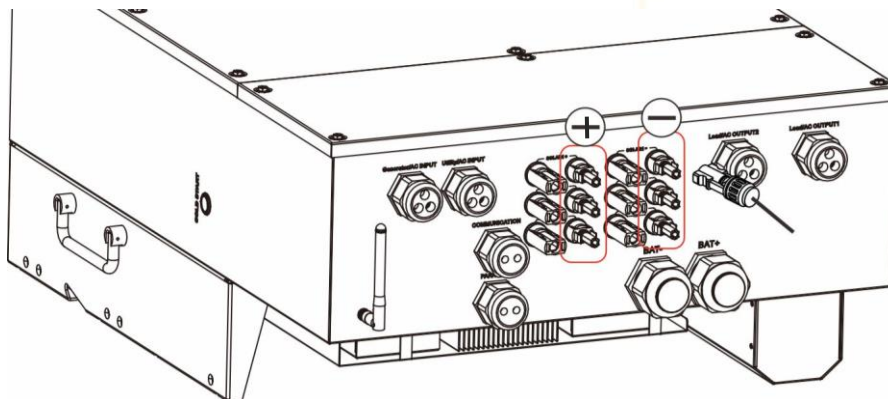
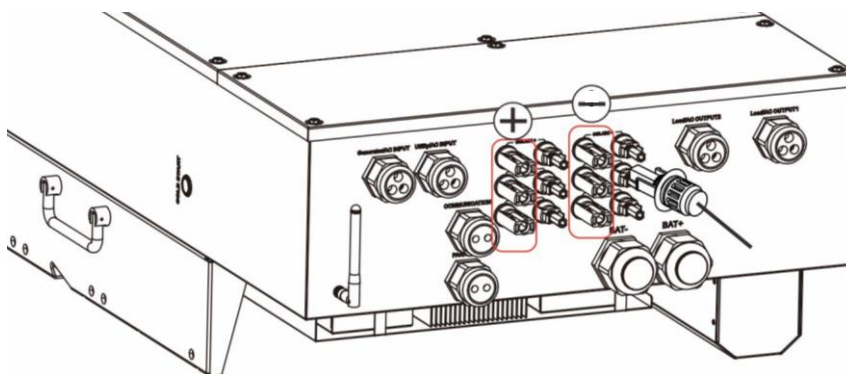
Insert assembled cable into male connector housing as shown below charts.



Then, use spanner to screw pressure dome tightly to female connector and male connector as shown below.



Step 4: 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.



Recommended PV Module Configuration

Solar Panel Spec				
Nominal Max. power (Pmax)(W)	450	454	615	620
Opt. Operating Voltage (Vmp) (V)	41.4	41.6	44.6	44.8
Opt. Operating Current (Imp) (A)	10.87	10.91	13.79	13.84
Open Circuit Voltage (Voc) (V)	48.9	49	52.4	52.6
Short Circuit Current (Isc) (A)	11.68	11.73	14.72	14.78
Solar Panel Configuration				
Numbers in series of MPPT1	9	9	7	7
Numbers of strings in MPPT1	2	2	2	2
Maximum input voltage of MPPT1 (V)	440.1	441	366.8	368.2
Input power of MPPT1 (W)	8100	8172	8610	8680
Numbers in series of MPPT2	9	9	7	7
Numbers of strings in MPPT2	2	2	2	2
Maximum input voltage of MPPT2 (V)	440.1	441	366.8	368.2
Input power of MPPT2 (W)	8100	8172	8610	8680
Numbers in series of MPPT 3	9	9	7	7
Numbers of strings in MPPT3	2	2	2	2
Maximum input voltage of MPPT3 (V)	440.1	441	366.8	368.2
Input power of MPPT3 (W)	8100	8172	8610	8680
Total input power (W)	16200	16344	17220	17360

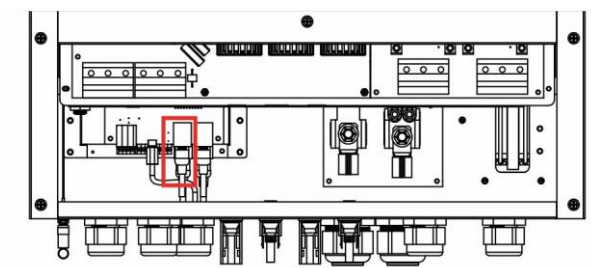
Communication Connection

Please use the supplied communication cable to connect to the inverter and PC. Follow the below procedure to connect communication wiring.

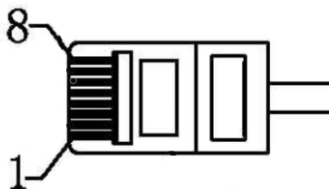
Serial Connection

For RS232 port, use a RJ45 cable for connection as follows:

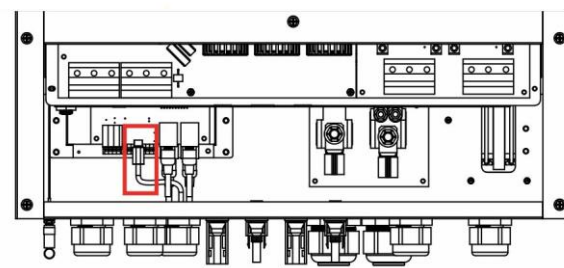
PIN1: TXD, PIN2:RXD, PIN4:12V, PIN8:GND



The RJ45 line sequence is as follows:

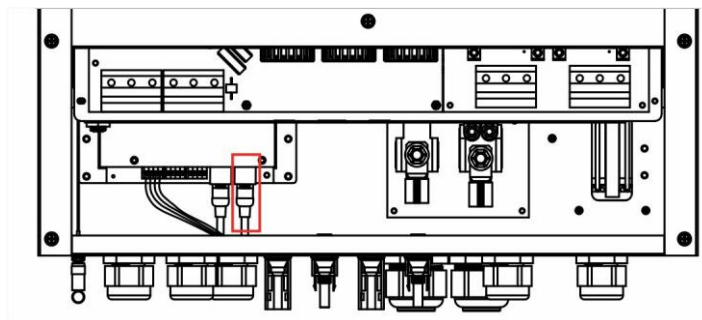


For USB port, use a USB cable for connection as follows:



BMS Communication

For BMS port, use a RJ45 cable to connect as follows:



It is recommended to purchase a special communication cable if connecting to Lithium-ion battery. Please use a RJ45 cable to connect BMS communication port and PIN assignment is listed as below table:

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 LCD.

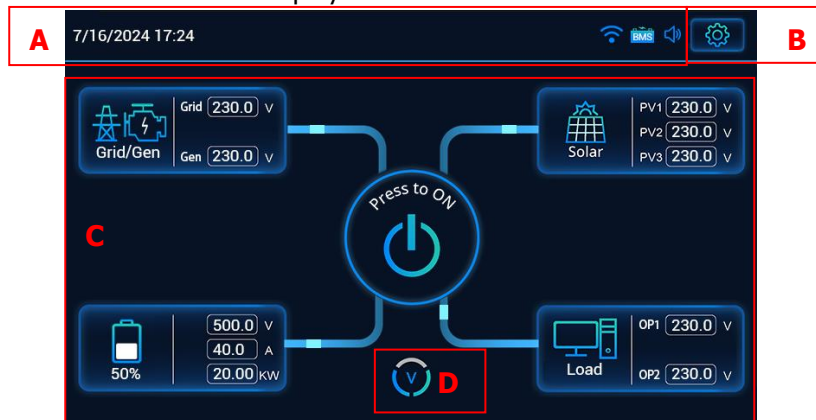
NOTE: Be sure to enable Dry Contact Setting in LCD setting. Otherwise, the dry contact state is consistent with the power off state.

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 when the Utility is available.		Close	Open
	Generator Settings→ Generator ON voltage/SOC	When Battery voltage /SCO < Generator ON voltage/SOC	Open	Close
	Generator Settings→ Generator OFF voltage/SOC	When Battery voltage /SCO > Generator OFF voltage/SOC	Close	Open

OPERATION

LCD Display Icons

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



A. It shows the time, WIFI status, BMS, and alarm sound.

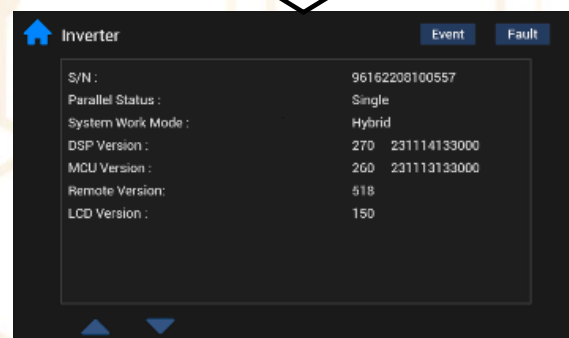
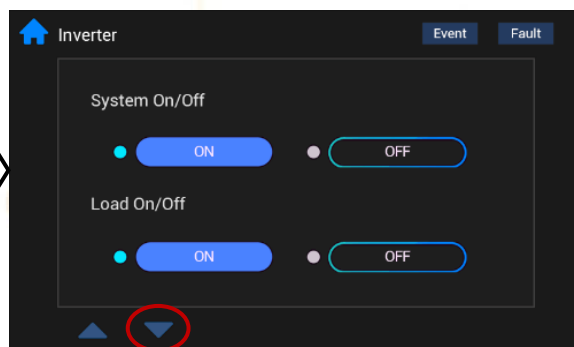
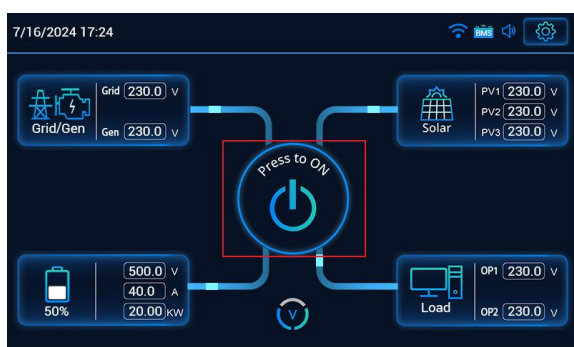
B. System setting icon. Press this icon to enter the system setting screen including general setting, output setting, battery setting, advanced setting, grid setting, and generator setting.

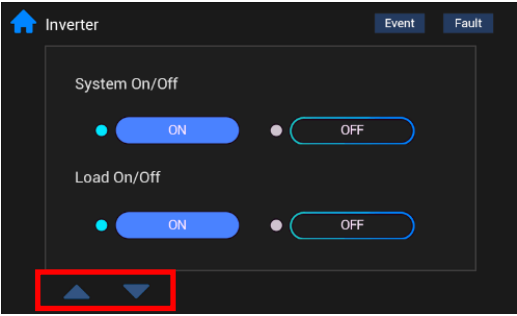
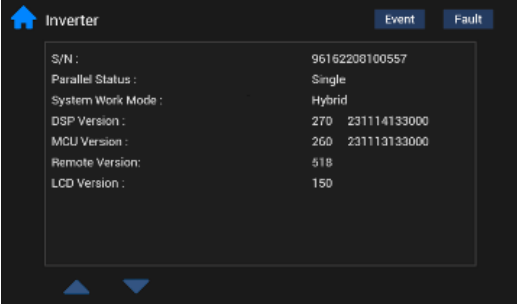
C. The main screen shows information including solar, grid/Generator, battery and load information. It also displays the direction of energy flow through flowing lines, clearly showing the working status of the inverter.

D. Touch to switch displayed information in main screen. "V" for voltage value, "I" for current value, and "P" for power value.

Touch "Press to ON" to enter the system turn on/off screen. This page can also display information such as inverter serial number, parallel status, working mode, hardware version number, firmware version number, etc.

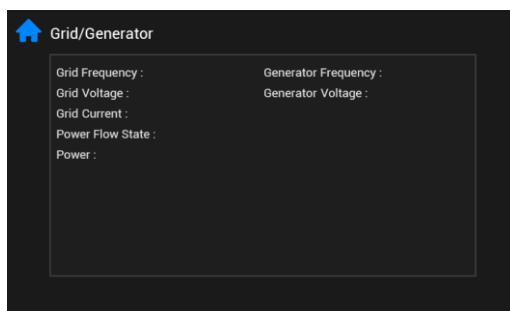
Click event icon to access event records. Press  key back to main screen.



Icon	Function description
System on/off, Fault information and Configuration procedures	
	The top of the screen indicates the time of the local month, day and year.
	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).
	Touch "▲" or "▼" check the machine S/N number, parallel status, system working mode and firmware/hardware version number. Touch "ON" or "OFF" to control the inverter switch.
	Touch "Event" to view the alarms and error records.

In main screen, click each icon to access detailed information.

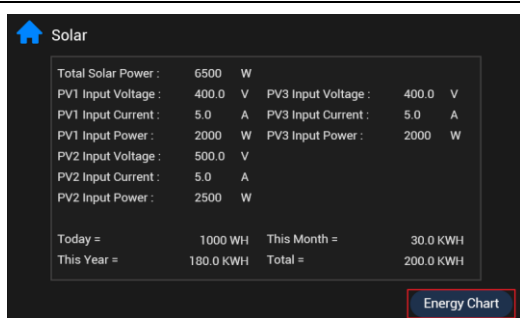
Grid & Generator Information



It will display AC input voltage (grid and generator), current, and power alternately.

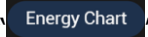
Touch  to enter the Grid/Generator page. It displays detailed grid and generator information. It includes grid frequency, voltage, current, power flow state, total AC power, generator frequency and generator voltage.

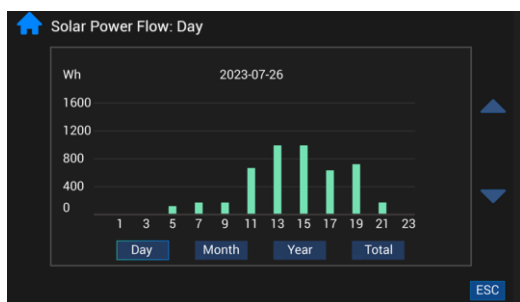
PV Information



It will display PV1/PV2/PV3 voltage, current and power alternately.

Touch  to enter PV information page. It displays detailed PV information including total solar power, PV1/PV2/PV3 input voltage, current, power, daily power generation, monthly power generation, annual power generation and total power generation.

Touch  to access power generation statistic page.



Daily, monthly, annual and total power generation will be displayed on this page.

Touch "Day" button to display daily power generation.

If it's in "Day" page, touch "▲" will show the energy data for the previous day.

Touch "▼" will show the energy data for the next day.

Touch "Month" button to display monthly power generation.

If it's in "Month" page, touch "▲" will show the energy data for the last month.

Touch "▼" will show the energy data for the next month.

Touch "Year" button to display yearly power generation.

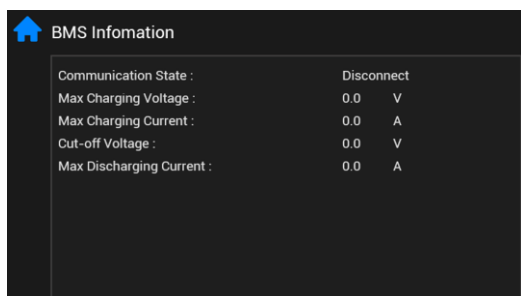
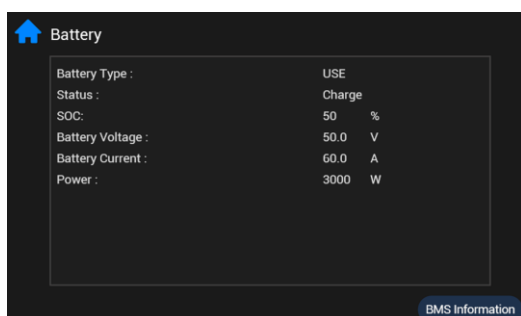
If it's in "Year" page, touch "▲" will show the energy data for the last year.

Touch "▼" will show the energy data for the next year.

Battery Information

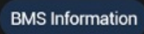


It will display battery voltage (or SOC), current and power alternately.



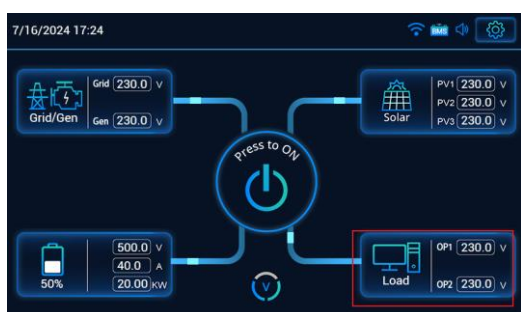
Touch "  " to enter the Battery page.

- ① Battery Type: AGM, FLD, USE, PYL, PTS, LIB, SOL, BAK, SH, LIC, CAN, BYD, WEC, MOT.
- ② Status: Charging or discharging
- ③ SOC: 0 – 100%
- ④ Battery Voltage: 35 – 60V
- ⑤ Battery Current: -220A ~ 220A. Negative numbers represent discharging current and positive numbers represent charging current.
- ⑥ Power: 0 ~ 12KW

Touch "  " icon to check battery BMS information.

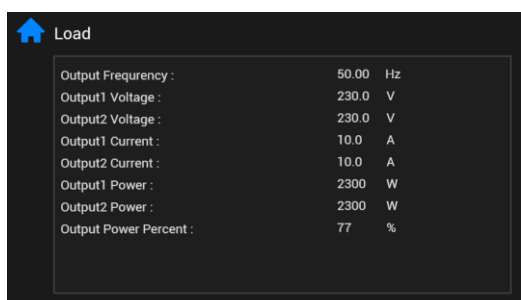
- ① Communication Status: Connect or disconnect
- ② Max Charging Voltage
- ③ Max Charging Current
- ④ Cut-off Voltage
- ⑤ Max Discharging Current

Load Information



It will display output 1 & 2 voltage, output 1 & 2 current and power alternately.

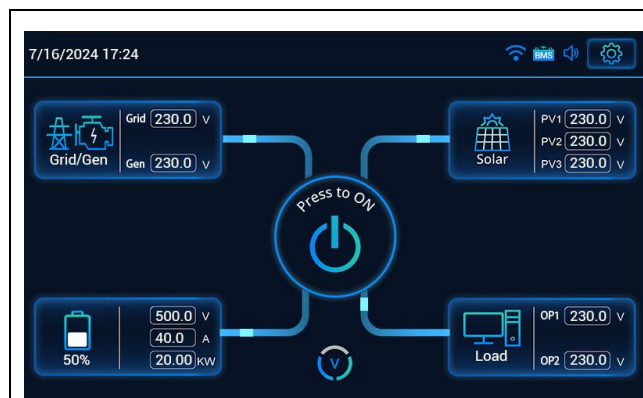
When you touch this icon, it will display the "OP1/OP2" frequency, battery current, power, and output percentage.



Touch "  " to enter the Load page.

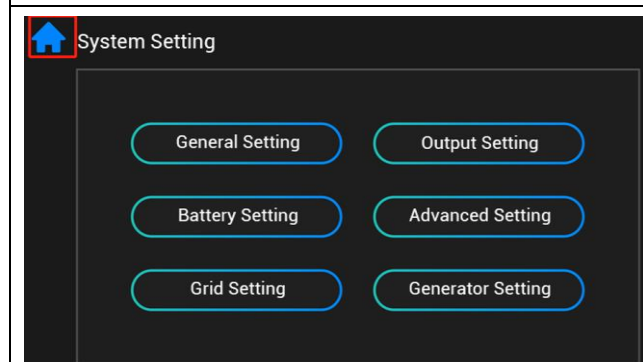
- Output Frequency
- Output 1 & 2 voltage
- Output 1 & 2 current
- Output 1 & 2 power
- Output power percentage

LCD Setting



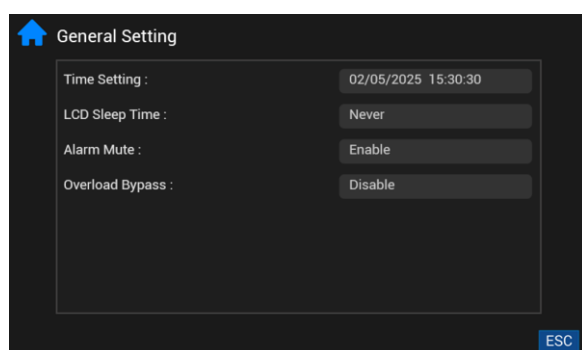
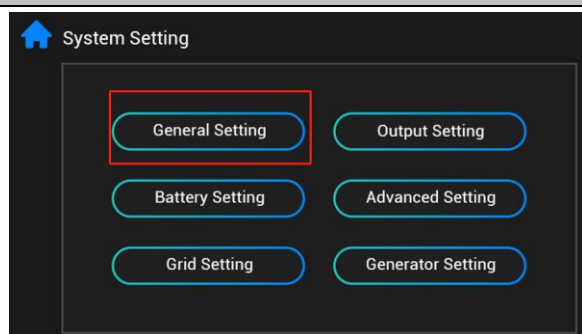
Touch "  " to enter the System Setting menu.

- General Setting
- Output Setting
- Battery Setting
- Advance Setting
- Grid Setting
- Generator Setting



Press  key back to main screen.

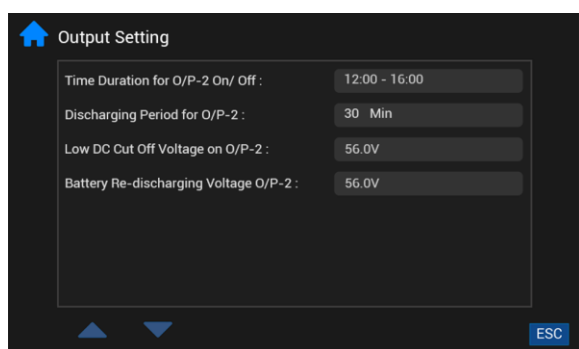
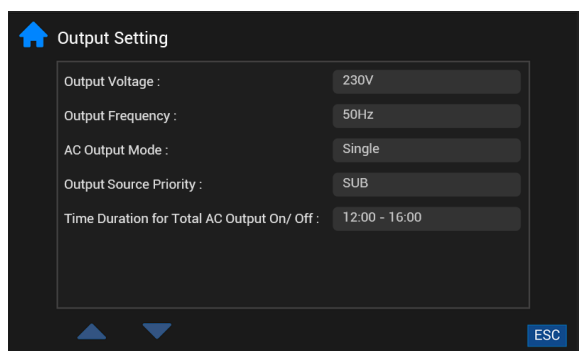
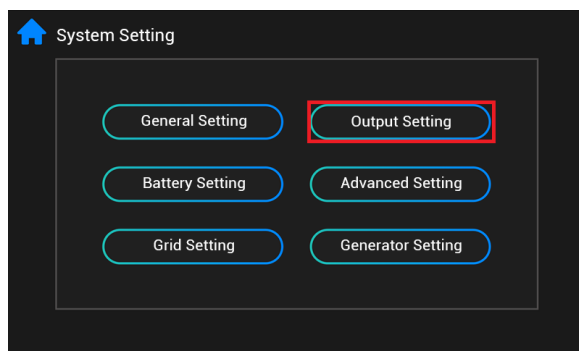
General Setting



- **Time Setting:** Set system time.
- **LCD Sleep Time:** LCD sleep time can be set Never/30s/1 min/5 min/10 min.
- **Alarm control:** Can set enable or disable alarms.
- **Overload Bypass:** Can set enable or disable bypass overload

Touch "ESC" to return to the previous screen, and touch "  " back to the main screen.

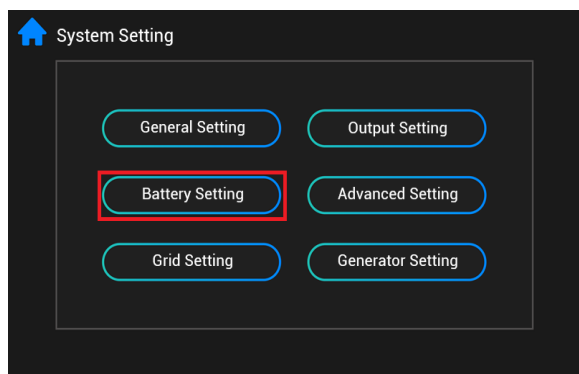
Output Setting



- **Output voltage:** 220, 230, 240 V
- **Output frequency:** 50 Hz, 60 Hz.
- **AC Output mode:** Single (default), Parallel. For more details, please refer to "AC Output mode" setting section.
- **Output source priority:** SUB, SBU
- **Time Duration for Total AC Output On/off:** To set working hours for the output 1 & output 2.
- **Time Duration for O/P-2 On/Off:** To set working hours for the output 2.
- **Discharging Period for O/P-2:** To set the time to allow battery discharged for output 2.
- **Low DC Cut Off Voltage on O/P-2:** Set shutdown point to turn off the output 2 when the battery voltage is lower than the setting value.
- **Battery Re-discharging Voltage O/P-2:** Set re-discharging voltage to allow output 2 supplied by battery when the battery voltage is higher than the setting value.

Touch "ESC" to return to the previous screen, and touch " " back to the main screen

Battery Setting



Battery type: AGM, FLD, USE, PTL, PTS, LIB, SOL, BAK, SH, LIC, CAN, BYD, WEC, MOT available options to choose. "USE" is selected when applying lead-acid battery. The remaining options are lithium battery protocols.

Charging Source Priority:

Solar first, solar and Utility, Only solar

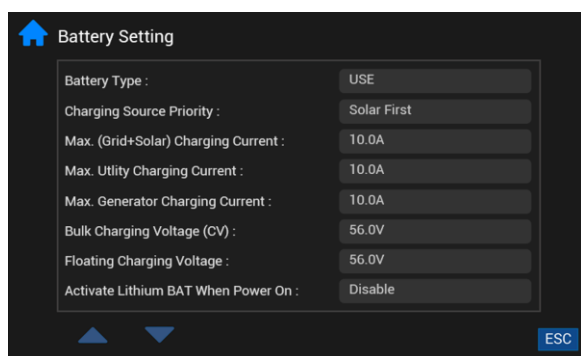
Max(Grid+ Solar) Charging Current: Setting range is from 10A to 220A.

Max. Utility Charging Current: Setting range is from 2A to 220A.

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.

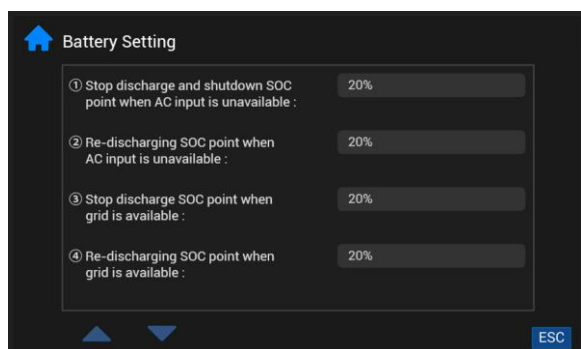
Floating Voltage: Setting range is from 48.0V to 60.0V. If the battery type is lithium battery, this parameter



Battery Setting

Battery Type :	USE
Charging Source Priority :	Solar First
Max. (Grid+Solar) Charging Current :	10.0A
Max. Utility Charging Current :	10.0A
Max. Generator Charging Current :	10.0A
Bulk Charging Voltage (CV) :	56.0V
Floating Charging Voltage :	56.0V
Activate Lithium BAT When Power On :	Disable

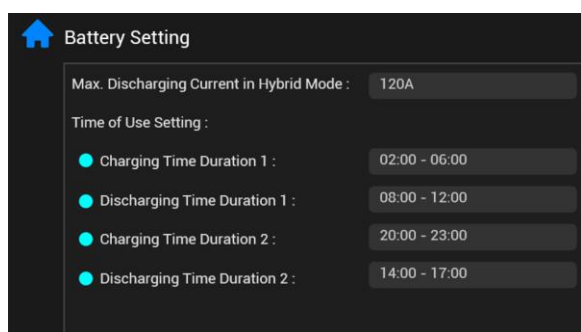
ESC



Battery Setting

① Stop discharge and shutdown SOC point when AC input is unavailable :	20%
② Re-discharging SOC point when AC input is unavailable :	20%
③ Stop discharge SOC point when grid is available :	20%
④ Re-discharging SOC point when grid is available :	20%

ESC



Battery Setting

Max. Discharging Current in Hybrid Mode :	120A
Time of Use Setting :	
Charging Time Duration 1 :	02:00 - 06:00
Discharging Time Duration 1 :	08:00 - 12:00
Charging Time Duration 2 :	20:00 - 23:00
Discharging Time Duration 2 :	14:00 - 17:00

follows its BMS voltage parameter.

Activate Lithium BAT when Power on: Enabling this option will activate the lithium battery.

Battery low cut off and Re-discharging setting :

① ② ③ ④

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

Max Discharging Current in hybrid Mode: When enabling the battery feed to grid function, this setting can set the maximum battery discharge current.

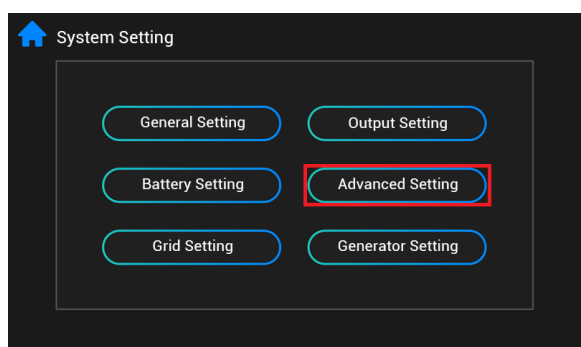
Time Of Use Setting:

It's to set up battery charging and discharging time periods.

Solar Priority: PV energy distribution priority

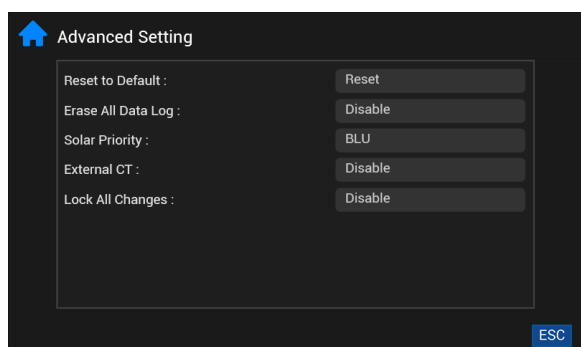
Touch "ESC" to return to the previous screen, and touch "" back to the main screen.

Advanced Setting



System Setting

General Setting	Output Setting
Battery Setting	Advanced Setting
Grid Setting	Generator Setting



Advanced Setting

Reset to Default :	Reset
Erase All Data Log :	Disable
Solar Priority :	BLU
External CT :	Disable
Lock All Changes :	Disable

ESC

Advanced Setting

Access to this menu requires a password. The default factory password is 0000.

Reset to Default: When enabled, all system parameters will restore to their original factory default settings.

Erase All Data log: Clear all energy generation data.

Solar Priority: Defines the primary allocation for solar energy.

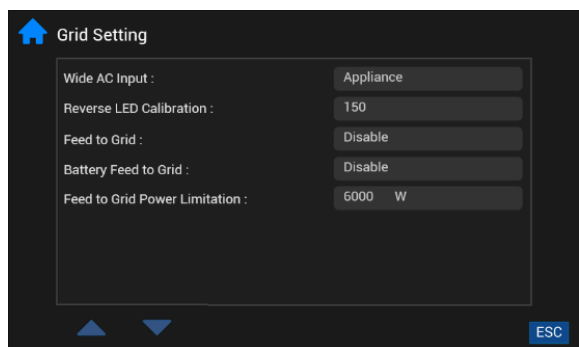
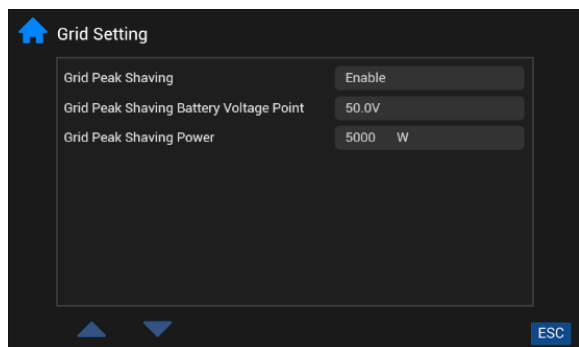
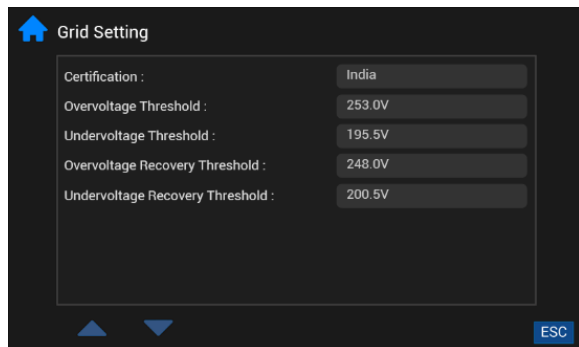
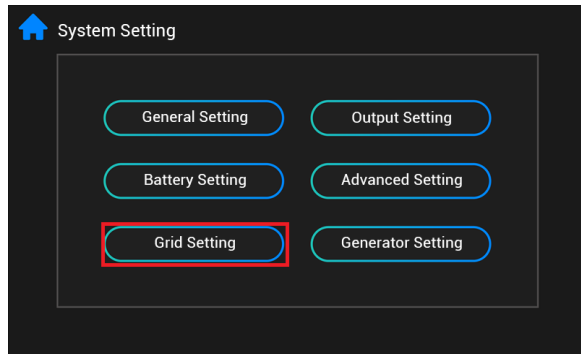
- BLU: Prioritizes solar energy for battery charging before supporting connected loads.
- LBU: Prioritizes solar energy for supporting loads; surplus energy is then used to charge the battery.

External CT: Enable this function when using an external Current Transformer (CT) to prevent energy from being exported to the utility grid (Zero Export). Default: Disabled.

Lock All Changes: When enabled, all critical settings

are locked to prevent unauthorized or accidental modifications.

Grid Setting



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

Grid Peak Shaving: When enabled, the Grid Peak Shaving function automatically regulates output to prevent system overloads. If load demand exceeds the pre-configured threshold, the inverter will reduce battery charging or initiate battery discharge to supplement the load.

Grid Peak Shaving Battery Voltage Point: Defines the minimum battery voltage required to trigger a recharge from the grid after the battery has been utilized to supplement peak load demand.

Grid Peak Shaving Power: Defines the maximum allowable Grid output (in Watts). The peak shaving function activates once this limit is reached.

Wide AC Input:

- **APL:** Configures a wide input range (90–280 VAC) suitable for general appliances.
- **UPS:** Configures a narrow, stable input range (170–280 VAC) optimized for sensitive electronic equipment.

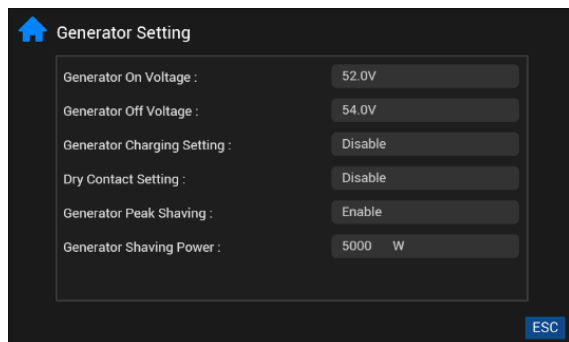
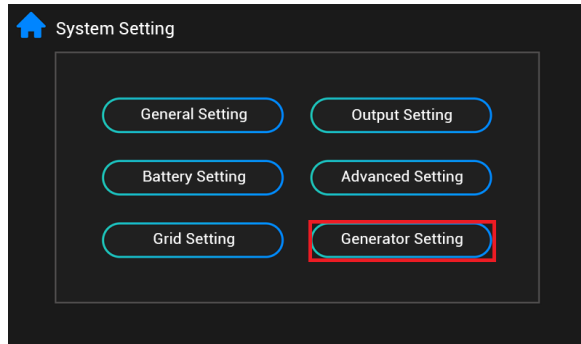
Reverse LED Calibration: Use this setting to calibrate the grid power readings if the sensor detects power flowing in the wrong direction.

Feed to Grid: When enabled, surplus solar (PV) energy is permitted to be exported back to the utility grid.

Battery Feed to Grid: When enabled, the system allows stored battery energy to be discharged into the grid.

Feed to Grid Power Limitation: Defines the maximum power limit for grid export. Selectable options include 6600W, 8600W, or 10600W.

Generator Setting



Generator On Voltage: When the battery voltage or State of Charge (SOC) drops below this set point, the dry contact will trigger to initiate the generator start sequence.

Generator Off Voltage: When the battery voltage or SOC exceeds this set point, the dry contact will trigger to initiate the generator.

Generator Charging Setting: Enable this setting to allow the generator to charge the battery.

Dry Contact Setting:

- **Disable:** If selected, the dry contact state is consistent with the Power Off state, not controlled by battery SOC.
- **Enable:** If selected, the dry contact state depends on the setting conditions of the generator ON voltage/SOC.

Please refer to "Dry Contact Signal" section for the details.

Generator Peak Shaving:

If enabled, it will automatically regulate generator output to prevent overload conditions. When load demand exceeds the pre-configured threshold, the inverter will reduce battery charging or initiate battery discharge to supplement the load.

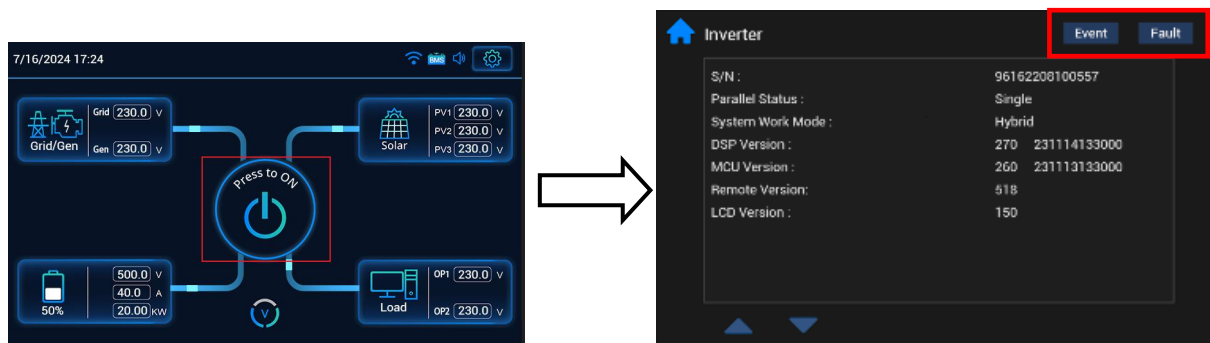
Generator Shaving Power:

Defines the maximum allowable generator output (in Watts). The peak shaving function activates once this limit is reached.

Touch "ESC" to return to the previous screen, and touch "" to return to the main screen.

Warning/Fault Event

Tap "Press to ON" to access the System On/Off interface. From there, select "Event" to view active warning codes or "Fault" to review the historical fault log.



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	12KW
RATED OUPUT POWER	12000W
PV INPUT (DC)	
Max. PV Power	24000W
Max. PV Array Open Circuit Voltage	500 VDC
MPPT Range @ Operating Voltage	120 VDC~450 VDC
Max. PV Array Maximum Imp/per MPPT	3 x 28A
Max. PV Array Maximum Isc/per MPPT	3 x 35A
Number of MPPT Tracker	3
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	52.2A
Power Factor Range	>0.99
Maximum Conversion Efficiency (DC/AC)	97%
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	90A
Rating of AC Breaker	70A
GENERATOR INPUT	
Acceptable Input Voltage Range	90 - 300 VAC
Frequency Range	50 Hz/60 Hz (Auto sensing)
Rating of AC Transfer Relay	60A
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)	220A
Maximum Charging Current (from PV)	220A
Maximum discharging Current	220A
GENERAL	
Dimension, D X W X H (mm)	630 x 494 x 167
Net Weight (kgs)	46
INTERFACE	
Parallel-able	Yes
External Safety Box (Optional)	Yes
Communication	USB or RS232 / RS 485/WIFI
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.	It shows grid voltage is 0V in HMI LCD.	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.	It shows battery voltage is 0V in HMI LCD.	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and it shows the Fault icon in HMI LCD.	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.
	Low battery	The battery voltage is less than 30V	The battery voltage is less than 30V
	Battery overcurrent	The battery is over-discharged	The discharge current of the battery needs to be reduced

Appendix I: Parallel function

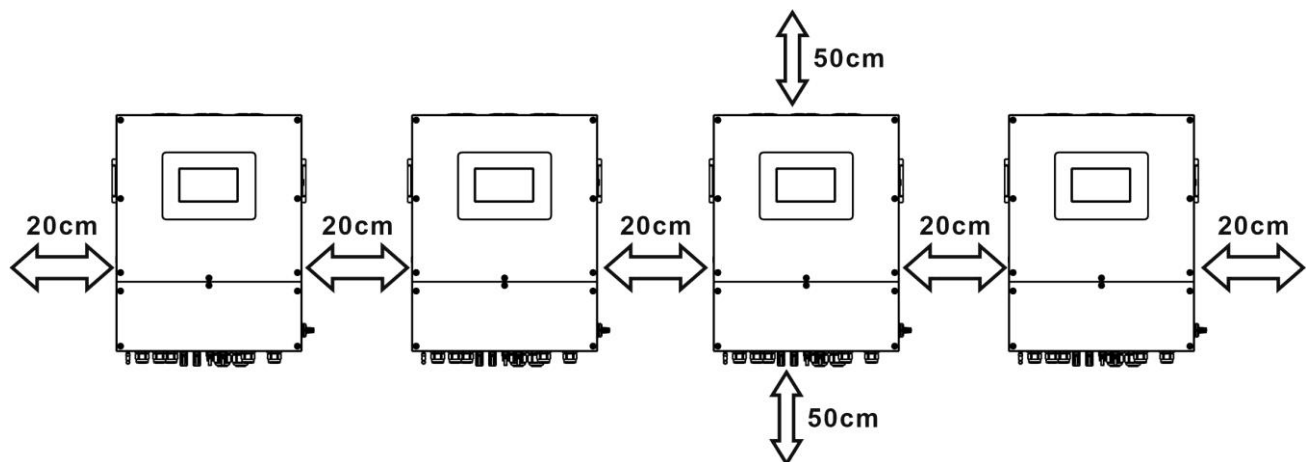
1. Introduction

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

1. Parallel operation in single phase with up to 9 units.
2. Maximum nine units work together to support three-phase equipment. Maximum seven units are operated in one phase.

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. 50 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*1/0 AWG	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
8 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 #72.

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*
220A/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:

Inverter QTY	2 units	3 units	4 units	5 units	6 units	7 units	8 units	9 units
Spec	120A 230VAC	180A 230VAC	240A 230VAC	300A 230VAC	360A 230VAC	420A 230VAC	480A 230VAC	540A 230VAC

Note 1: Also, you can use one unit of 60A and install one breaker at its AC input in each inverter.

Note 2: 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

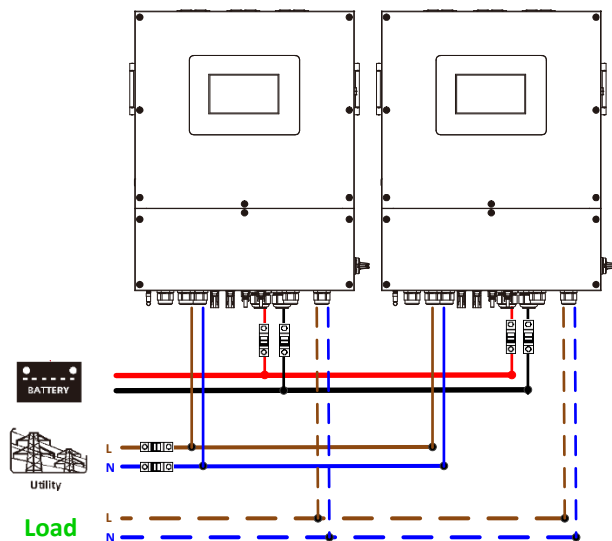
Inverter parallel numbers	2	3	4	5	6	7	8	9
Battery Capacity	400AH	600AH	800AH	1000AH	1200AH	1400AH	1600AH	1800AH

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

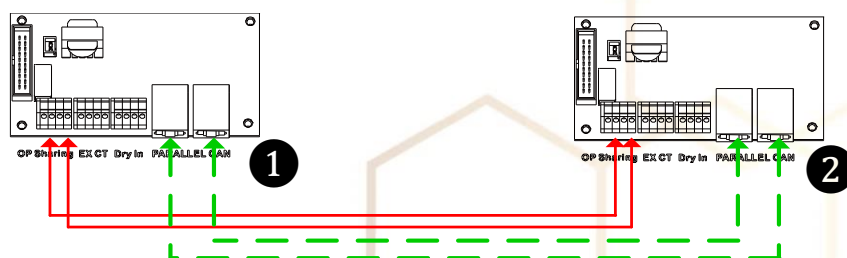
3-1. Parallel Operation in Single phase

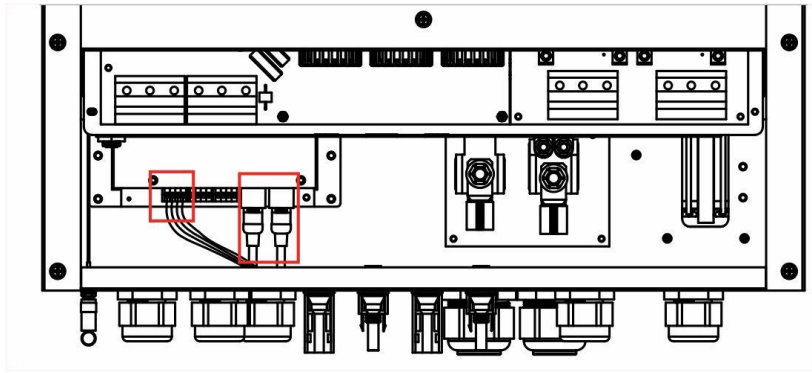
Two inverters in parallel:

Power Connection



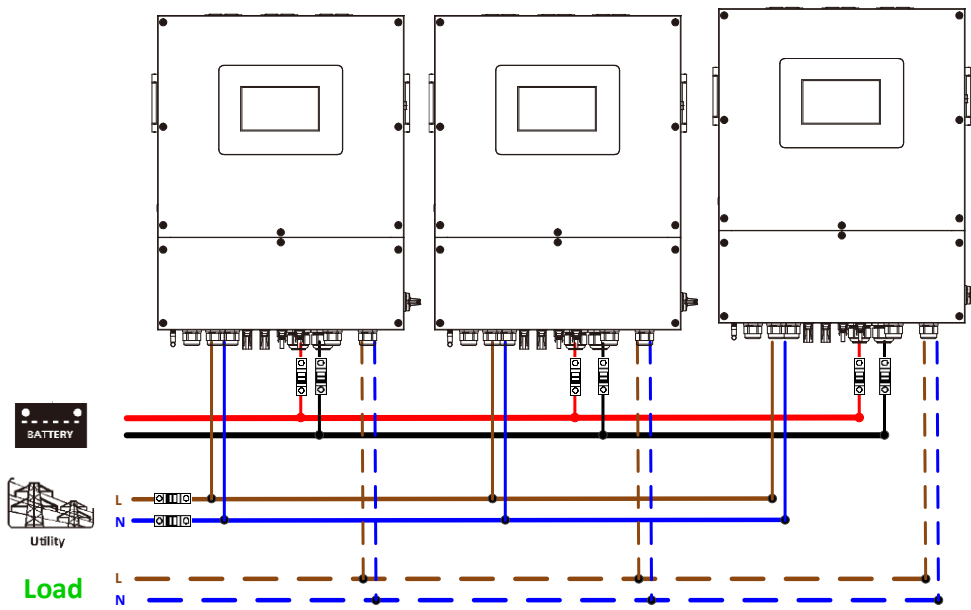
Communication Connection



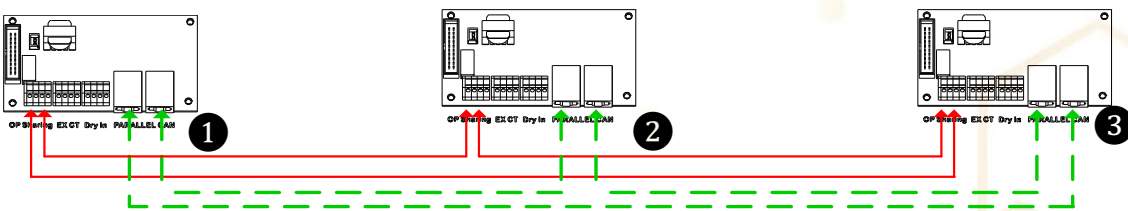


Three inverters in parallel:

Power Connection

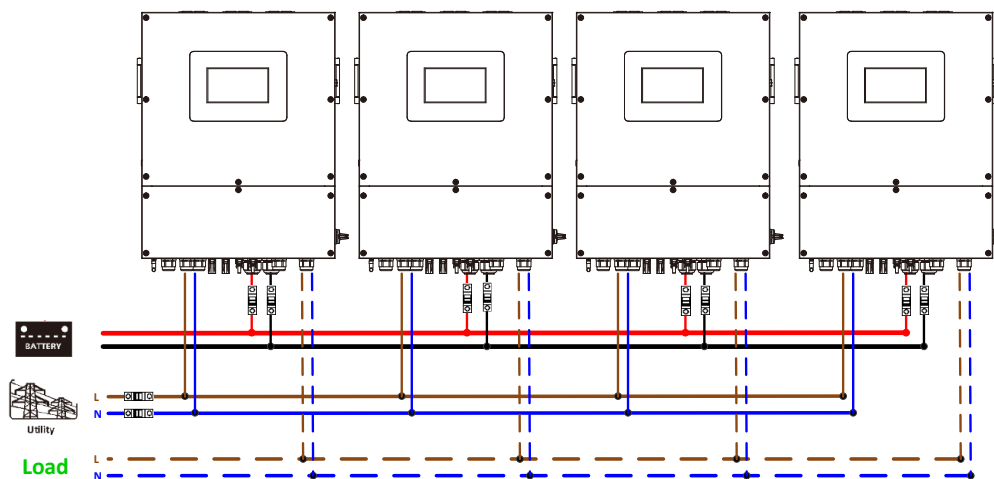


Communication Connection

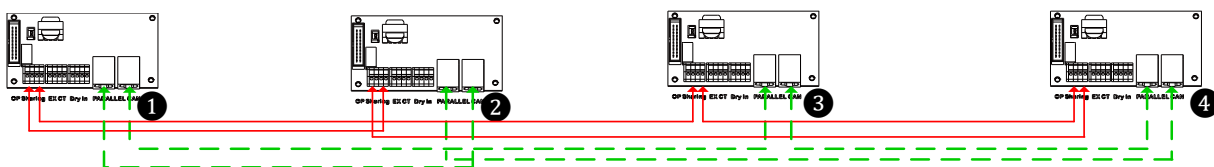


Four inverters in parallel:

Power Connection

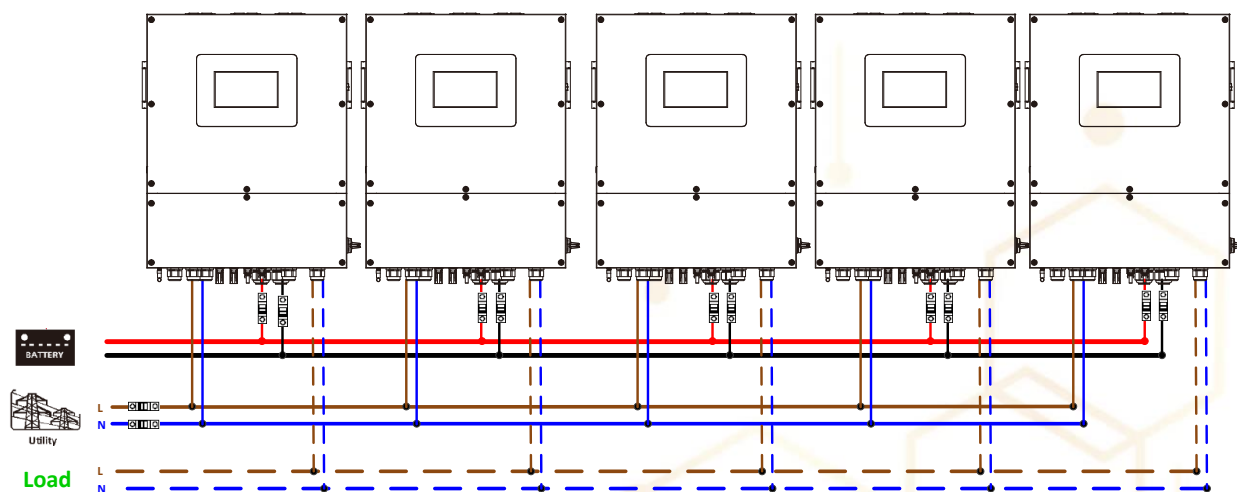


Communication Connection

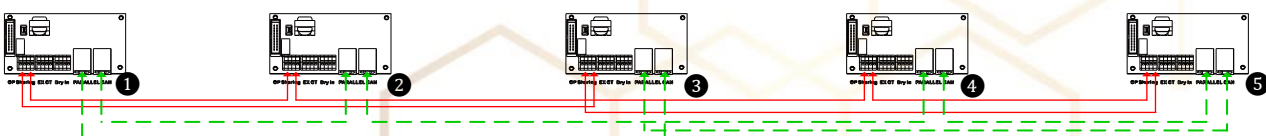


Five inverters in parallel:

Power Connection

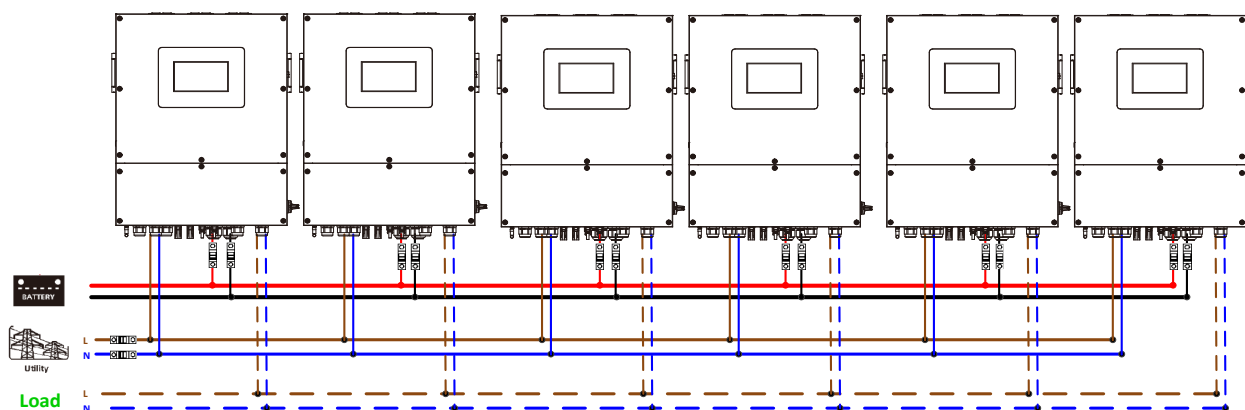


Communication Connection

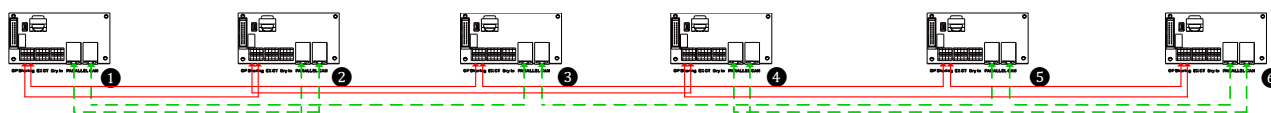


Six inverters in parallel:

Power Connection

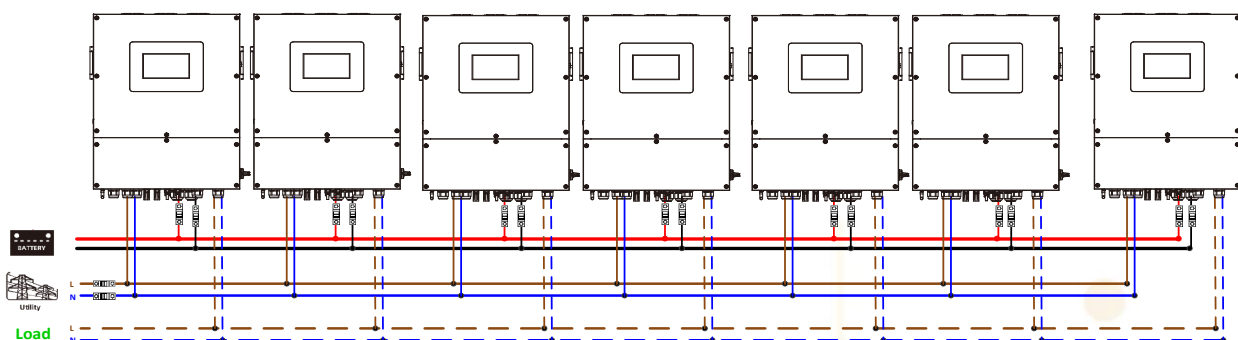


Communication Connection



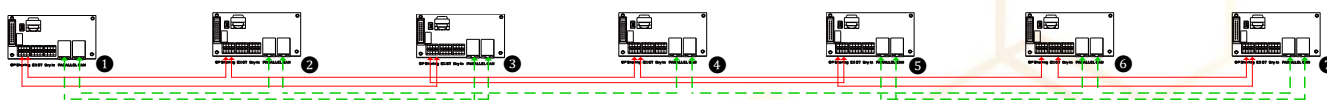
Seven to nine inverters in parallel:

Power Connection



Communication Connection

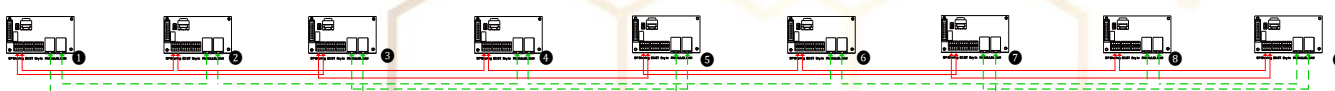
➤ Seven inverters in parallel



Eight inverters in parallel



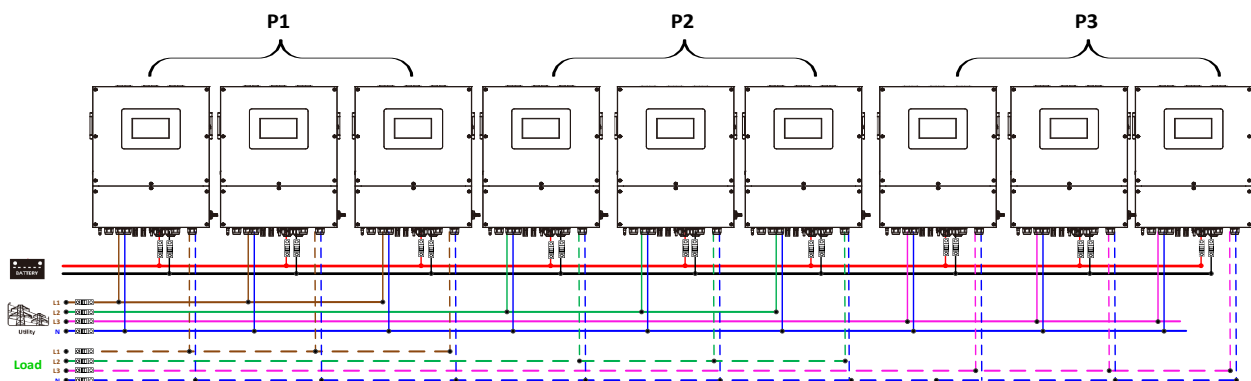
Nine inverters in parallel



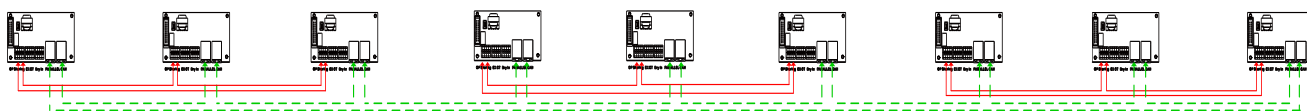
3-2. Support 3-phase equipment

Three inverters in each phase:

Power Connection

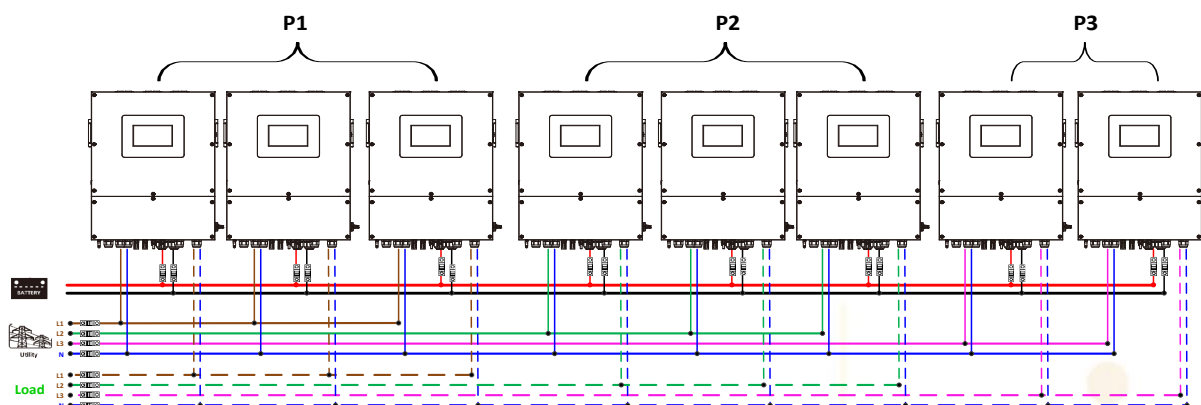


Communication Connection

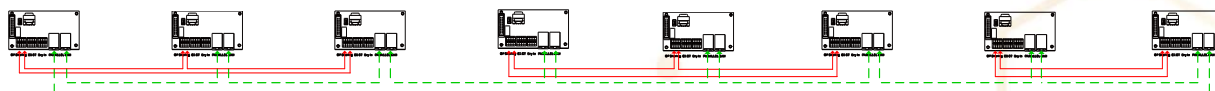


Three inverters in one phase, three inverters in second phase and two inverter for the third phase:

Power Connection

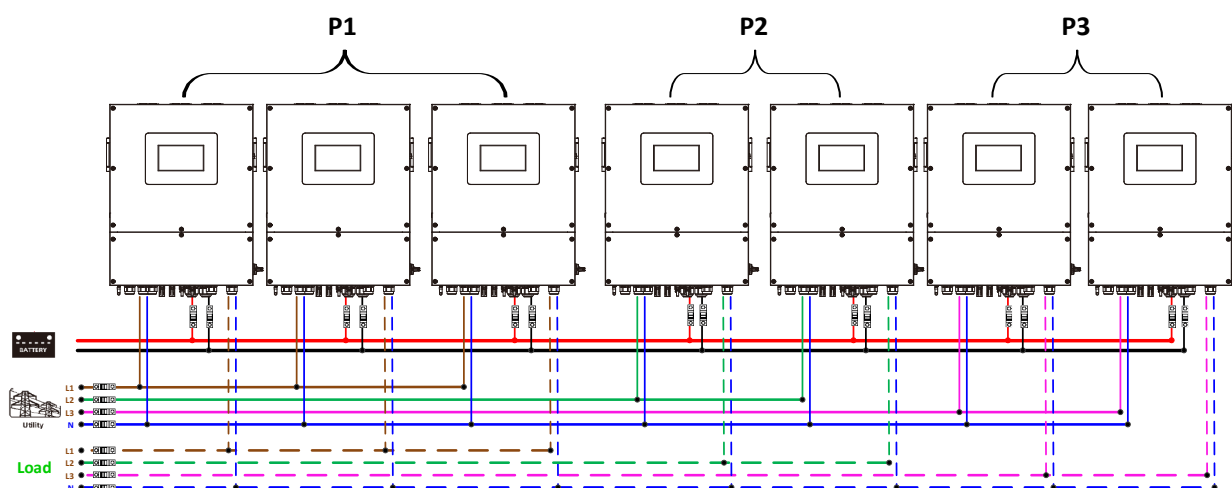


Communication Connection

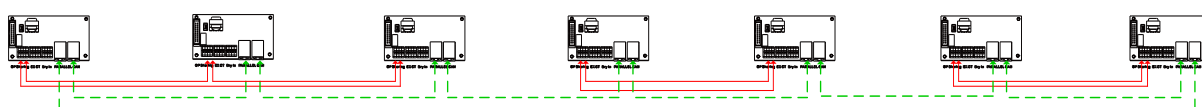


Three inverters in one phase, two inverters in second phase and two inverters for the third phase:

Power Connection

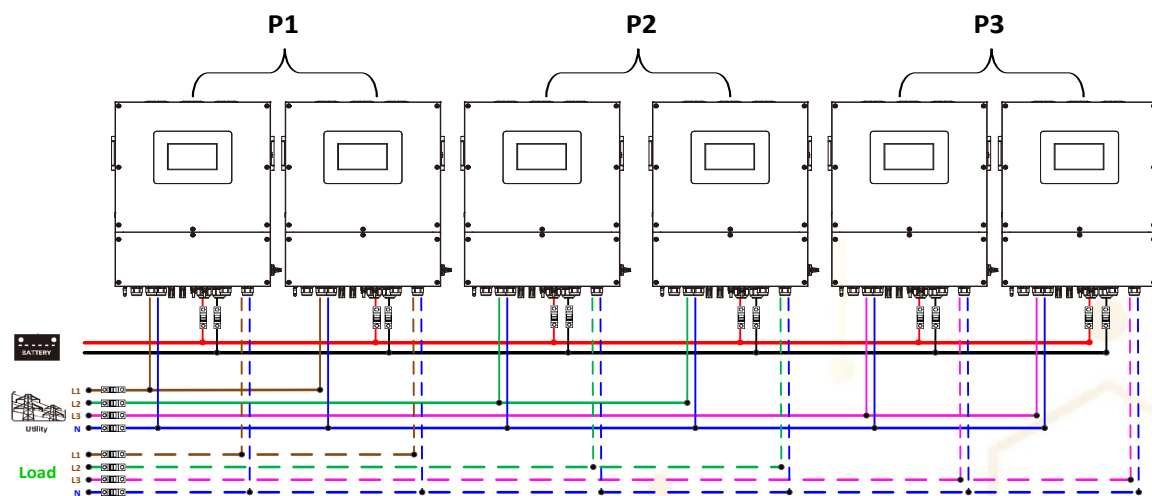


Communication Connection



Two inverters in each phase:

Power Connection

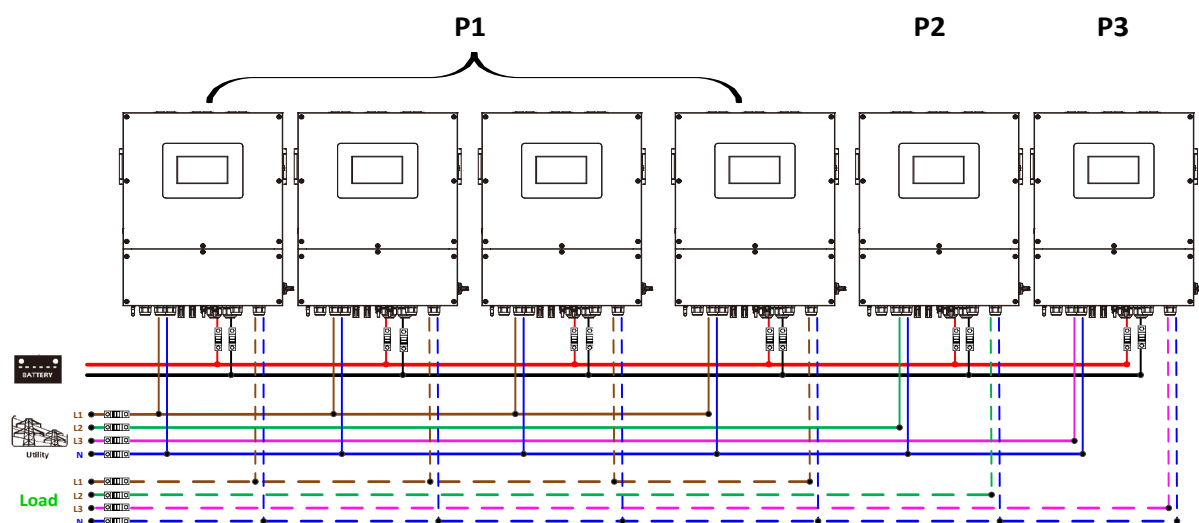


Communication Connection



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

Power Connection

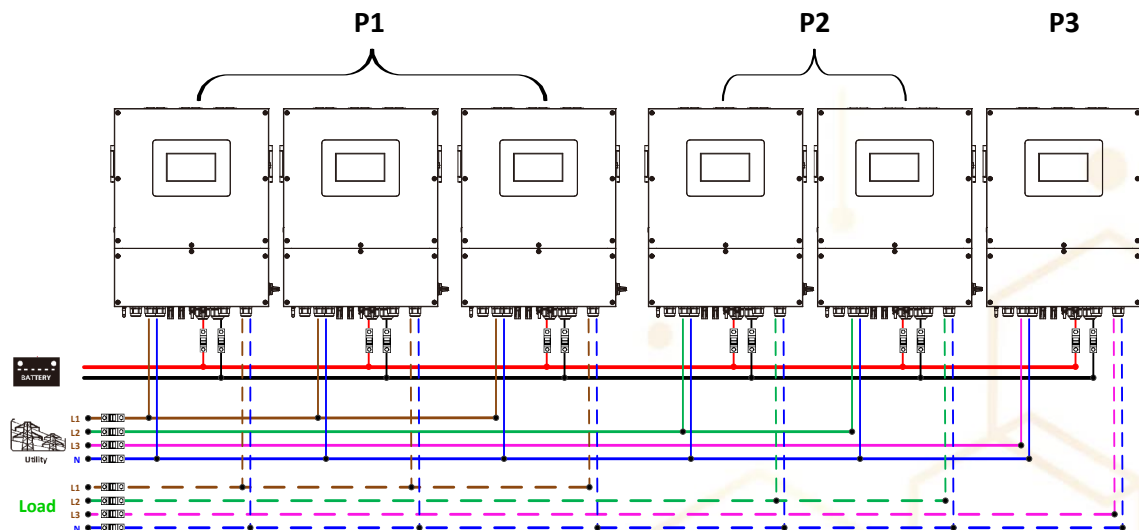


Communication Connection



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

Power Connection

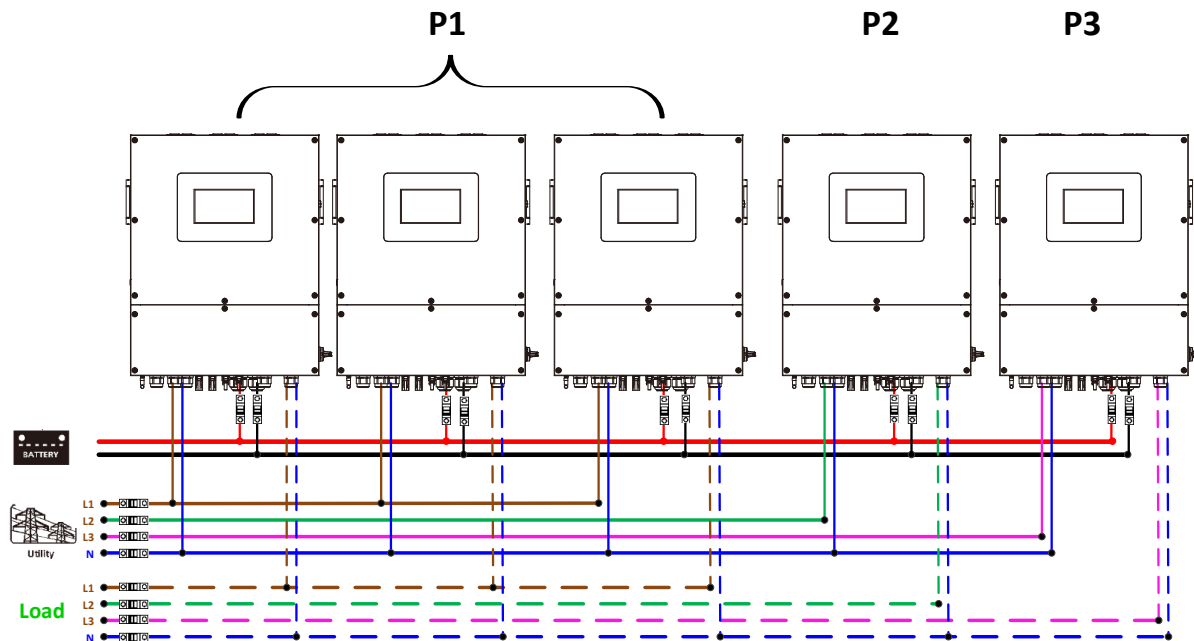


Communication Connection

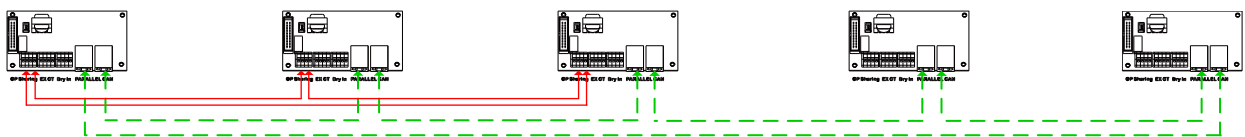


Three inverters in one phase and only one inverter for the remaining two phases:

Power Connection

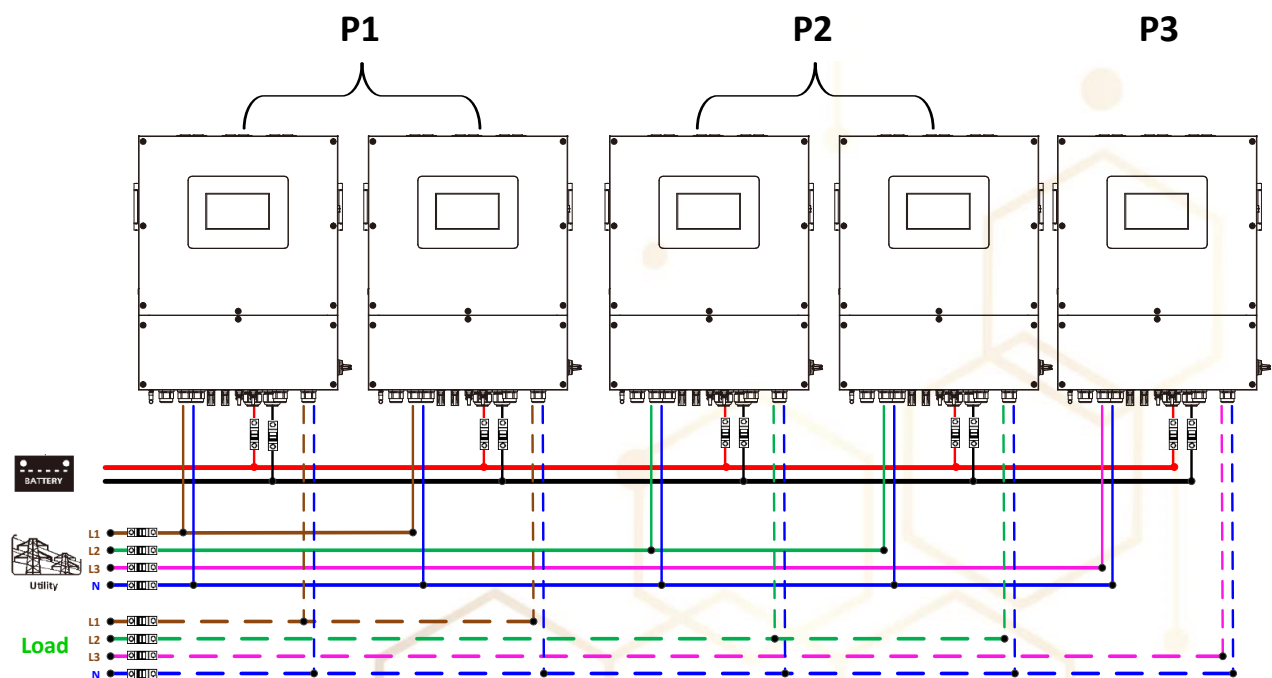


Communication Connection

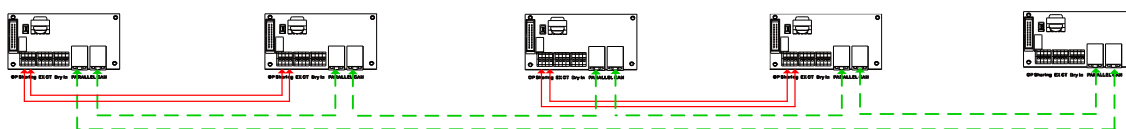


Two inverters in two phases and only one inverter for the remaining phase:

Power Connection

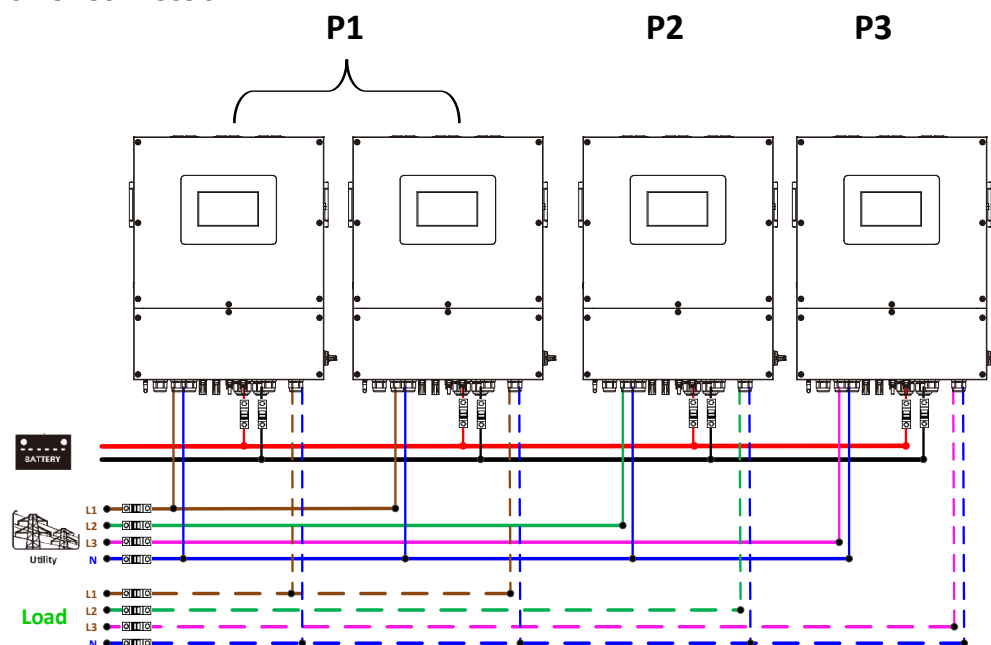


Communication Connection



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

Power Connection

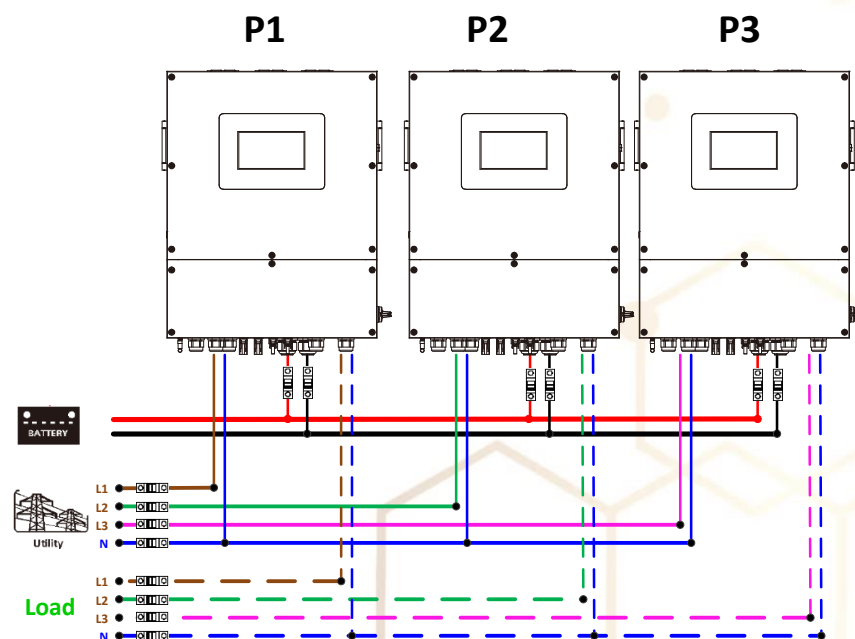


Communication Connection

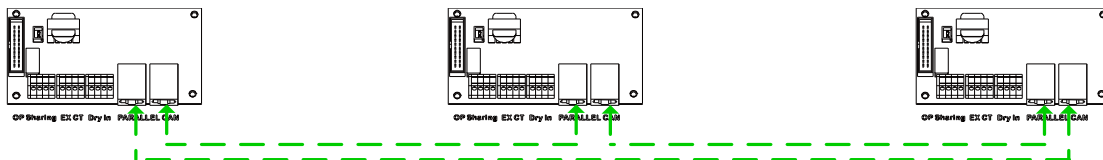


One inverter in each phase:

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

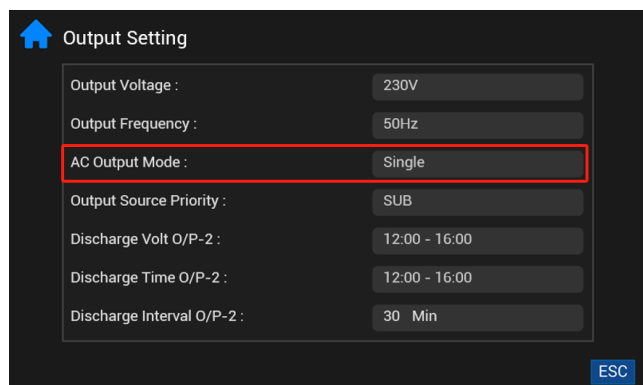
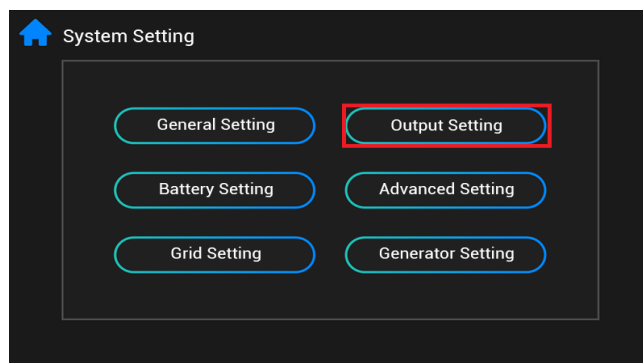
Please refer to user manual of single unit for PV Connection.

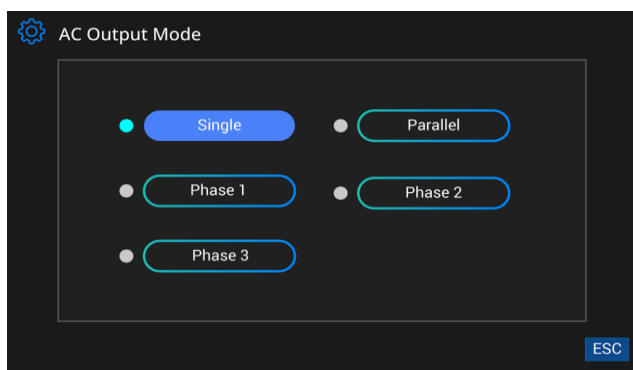
CAUTION: Each inverter should connect to PV modules separately.

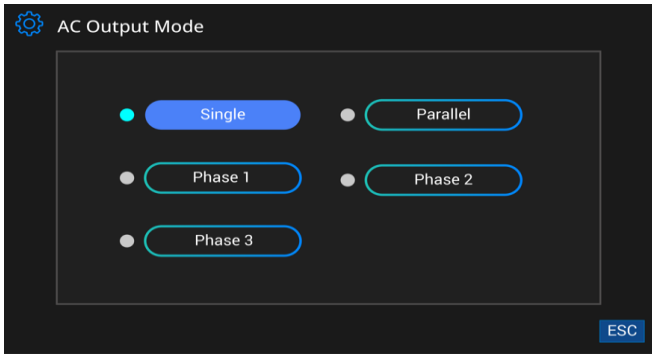
5. LCD Setting and Display

Parallel mode can be set according to the steps.

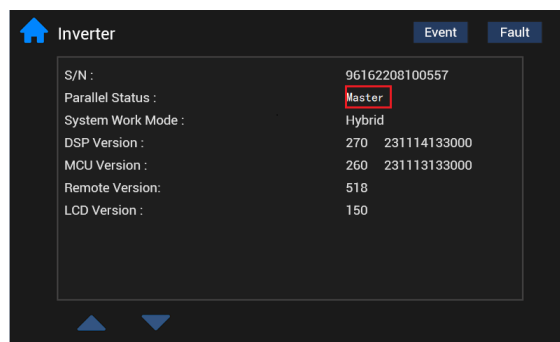
Setting-->Output setting→AC Output mode





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: "Phase 1" in program AC output mode for the inverters connected to L1 phase,
		Phase 2: "phase 2" in program AC output mode for the inverters connected to L2 phase and
		Phase 3: "Phase 3" in program AC output mode for the inverters connected to L3 phase.
		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.

Query the status in the figure below



6. Commissioning

Parallel in single phase

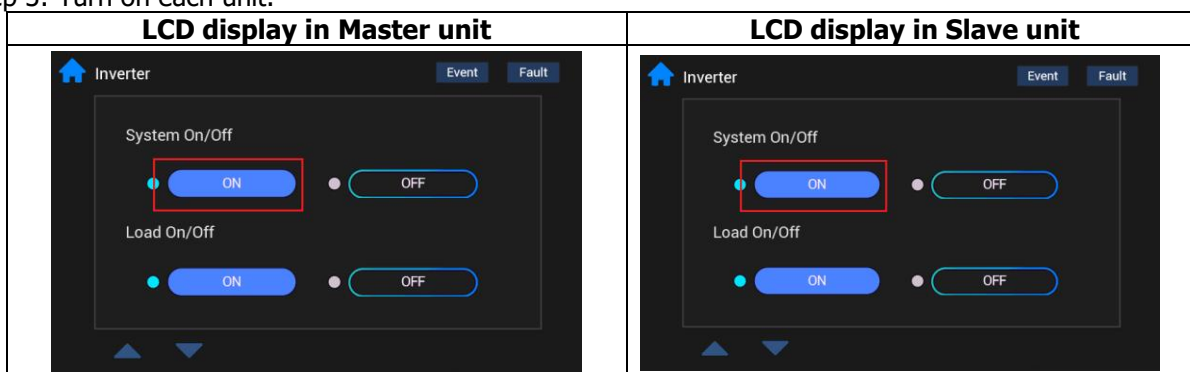
Step 1: Check the following requirements before commissioning:

- 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 each unit and set "Parallel" in LCD setting Output Setting of each unit. 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 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

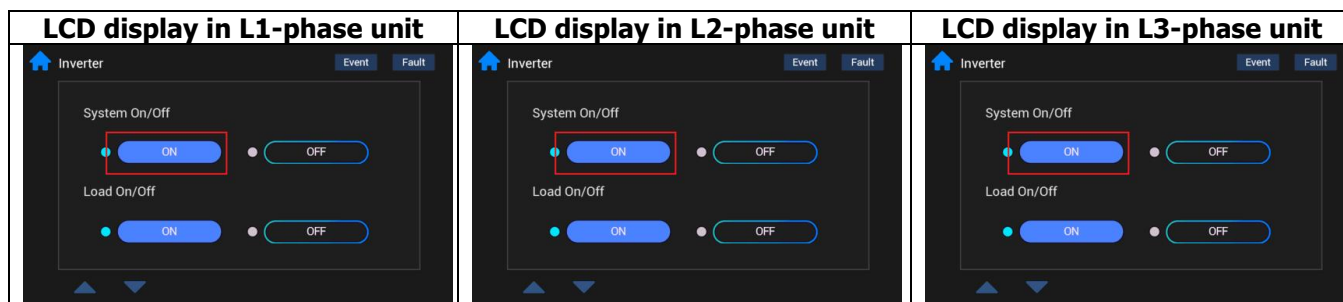
Step 1: Check the following requirements before commissioning:

- 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.

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

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

7. Trouble shooting

Situation		Solution
Fault Code	Fault Event Description	
60	Current feedback into the inverter is detected.	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.	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.	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	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.	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.	1. Check the utility wiring connection 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	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.	1. Switch off the inverter and check LCD setting #28. 2. For parallel system in single phase, make sure no 3P1, 3P2 or 3P3 is set on #28. For supporting three-phase system, make sure no "PAL" is set on #28. 3. If the problem remains, please contact your installer.
87	Single Machine exists in parallel system	1. Check whether a single machine exists in parallel system.

Appendix II: BMS Communication Installation

1. Introduction

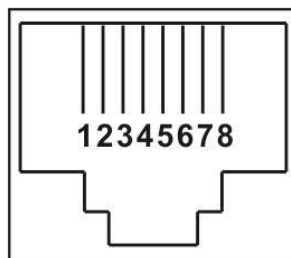
If connecting to lithium battery, it is recommended to purchase a custom-made RJ45 communication cable. Please check with your dealer or integrator for details.

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.

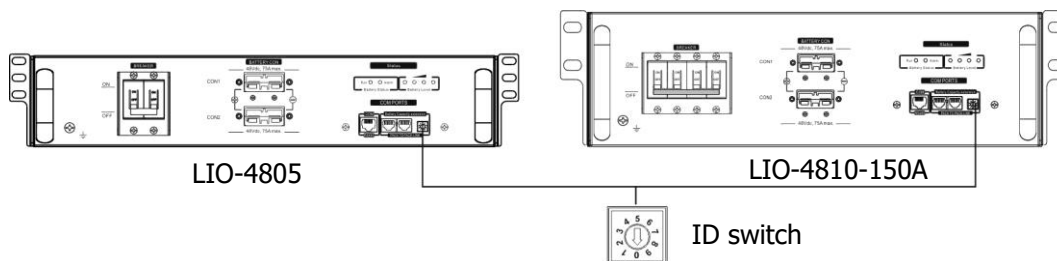
2. Pin Assignment for BMS Communication Port

	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

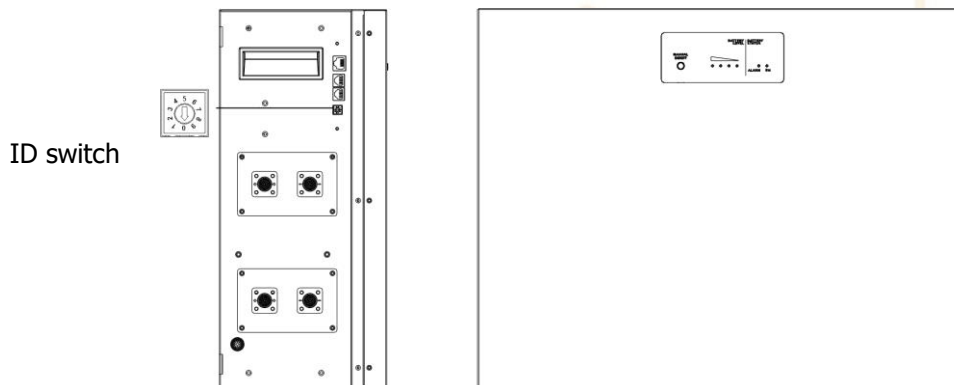


3. Lithium Battery Communication Configuration

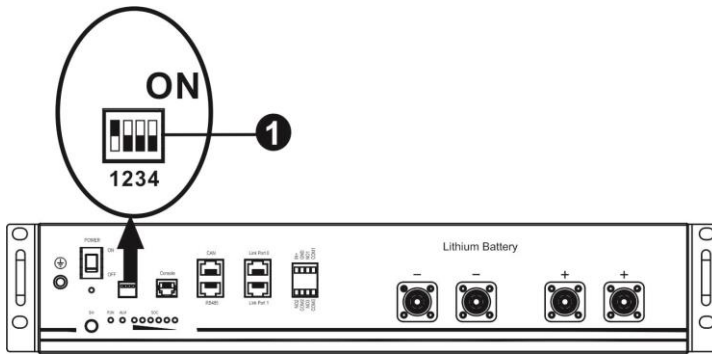
LIO-4805/LIO-4810-150A



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.



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.

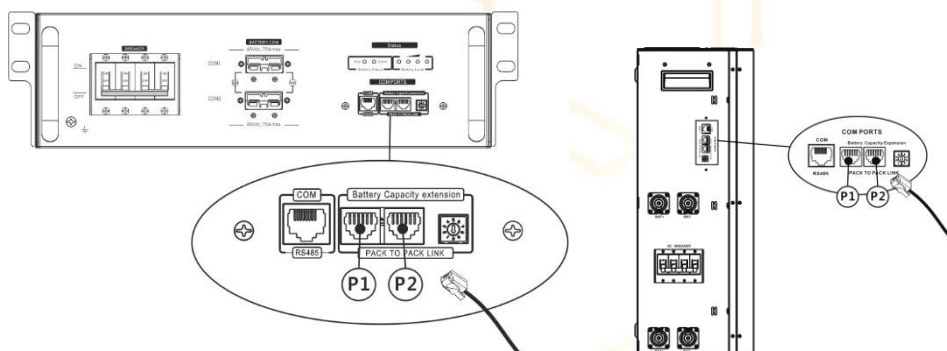
NOTE: The maximum groups of lithium battery is 5 and for maximum number for each group, please check with battery manufacturer.

4. Installation and Operation

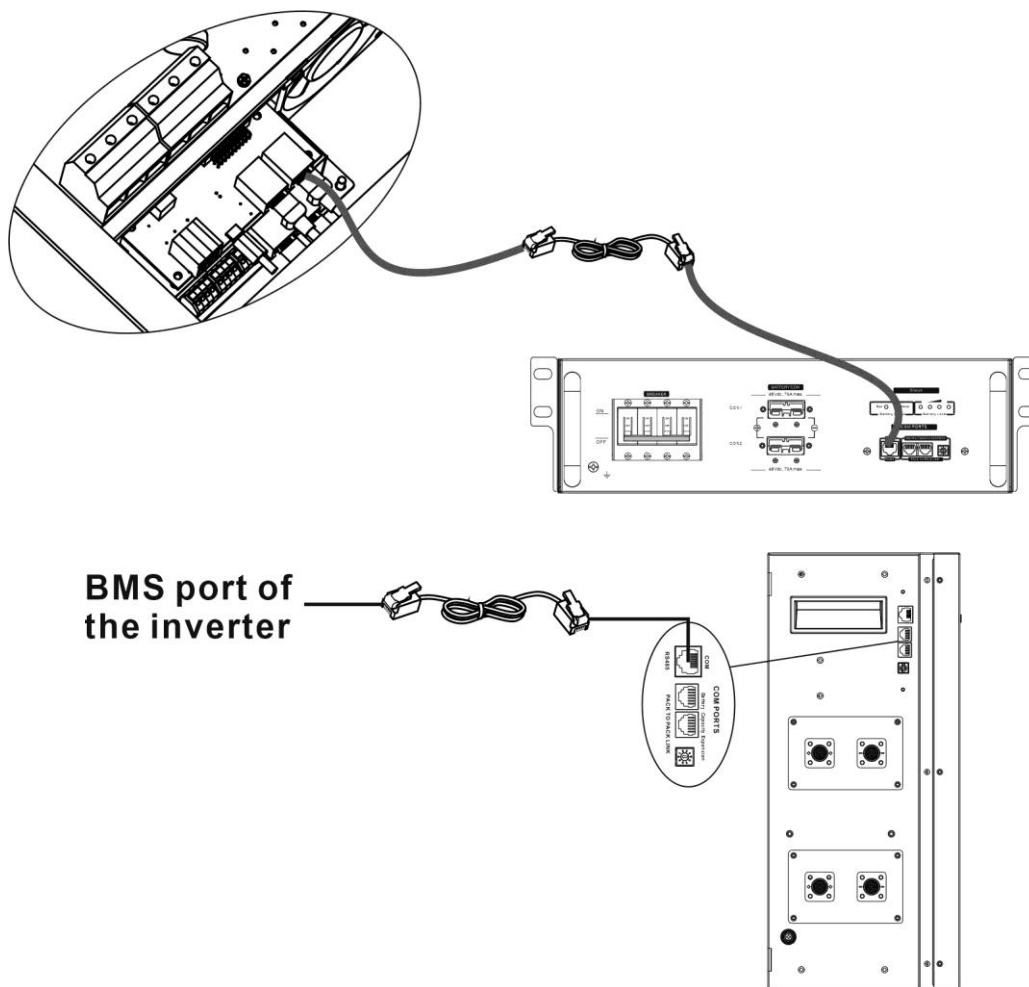
LIO-4805/LIO-4810-150A/ESS LIO-I 4810

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.

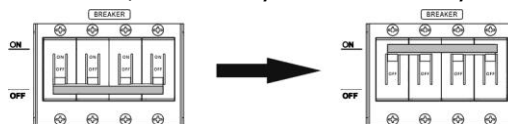


*** For multiple battery connection, please check battery manual for the details.**

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.

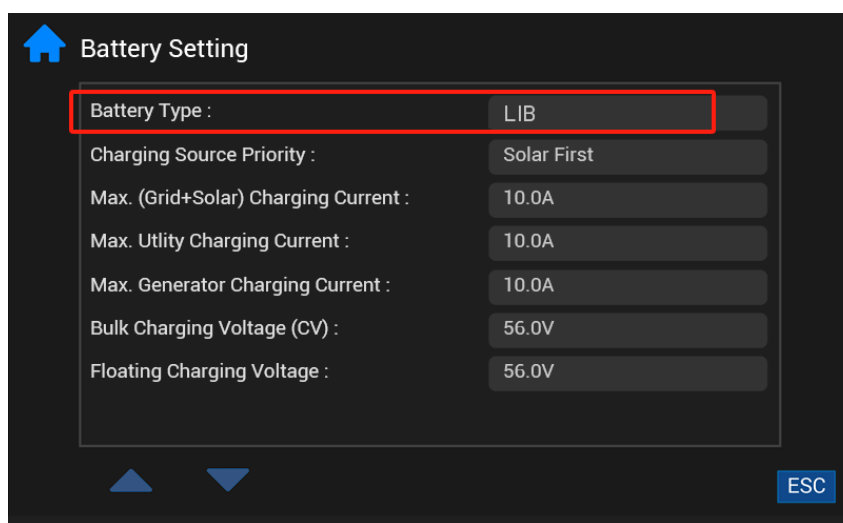


Step 4: Press Power on/off button on battery module for 5 secs, the battery module will start up.

*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.

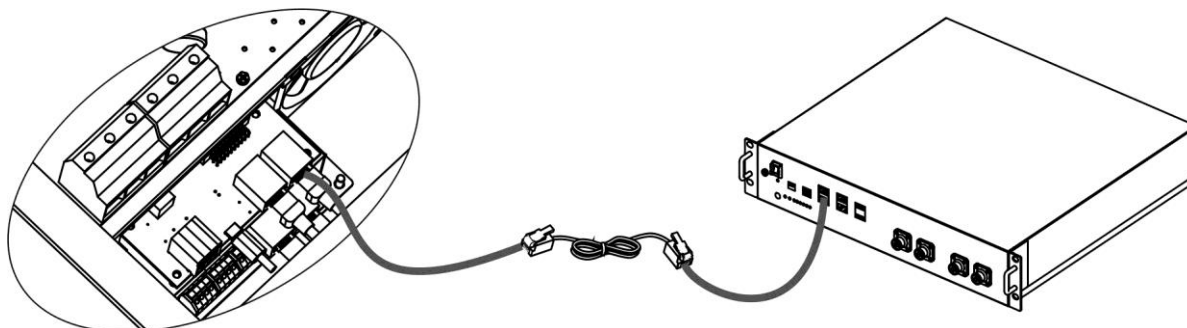


If communication between the inverter and battery is successful, the BMS icon  on LCD display will light on. Generally speaking, it will take longer than 1 minute to establish communication.

PYLONTECH

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

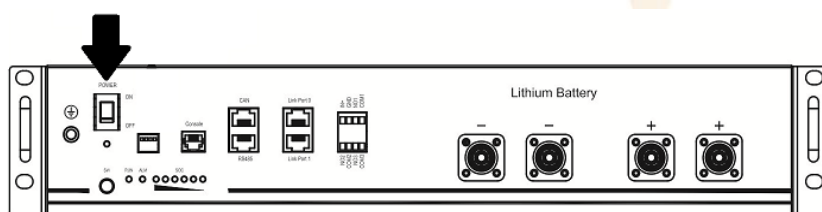
Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



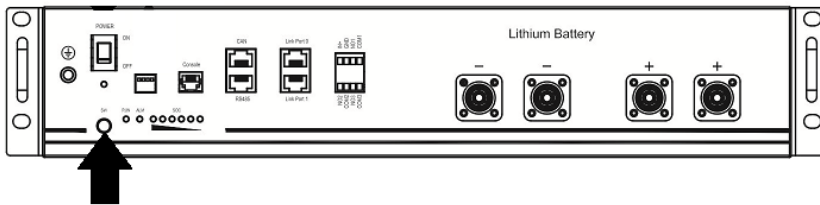
Note for parallel system:

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.

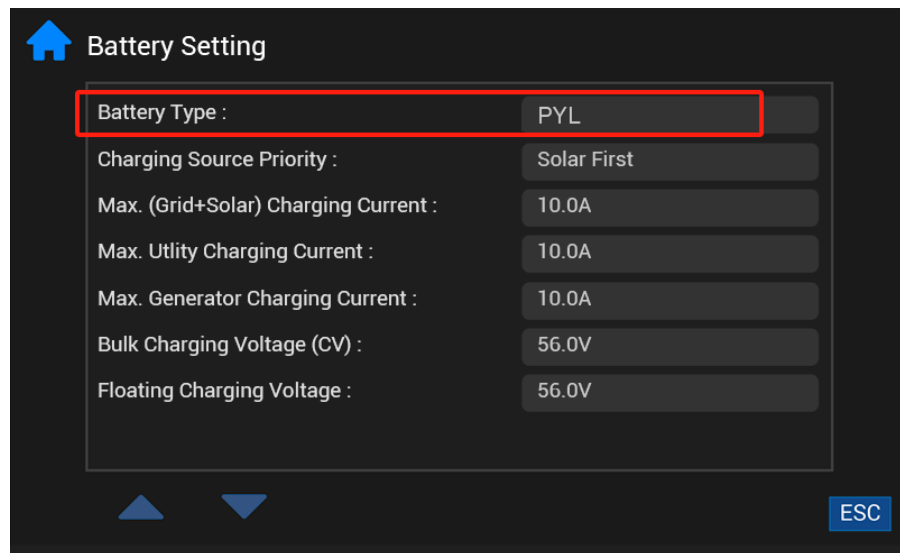


Step 3. Press more than three seconds to start Lithium battery, power output ready.



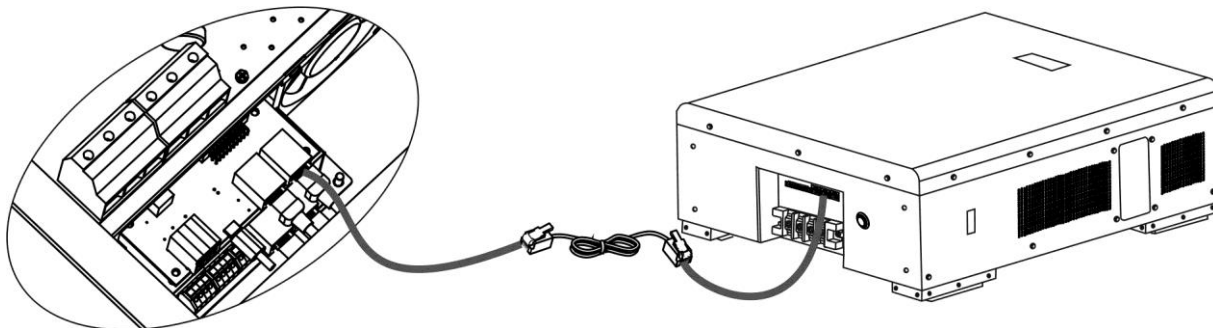
Step 4. Turn on the inverter.

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



WECO

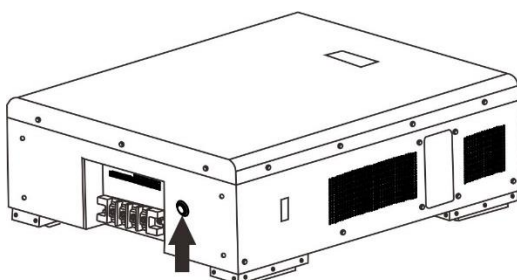
Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



Note for parallel system:

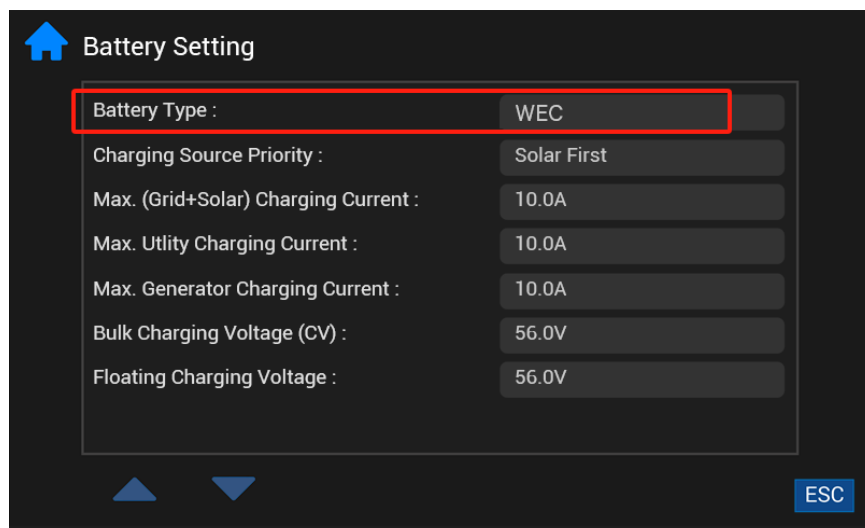
1. Only support common battery installation.
2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "WEC" in LCD program 5. Others should be "USE".

Step 2. Switch on Lithium battery.



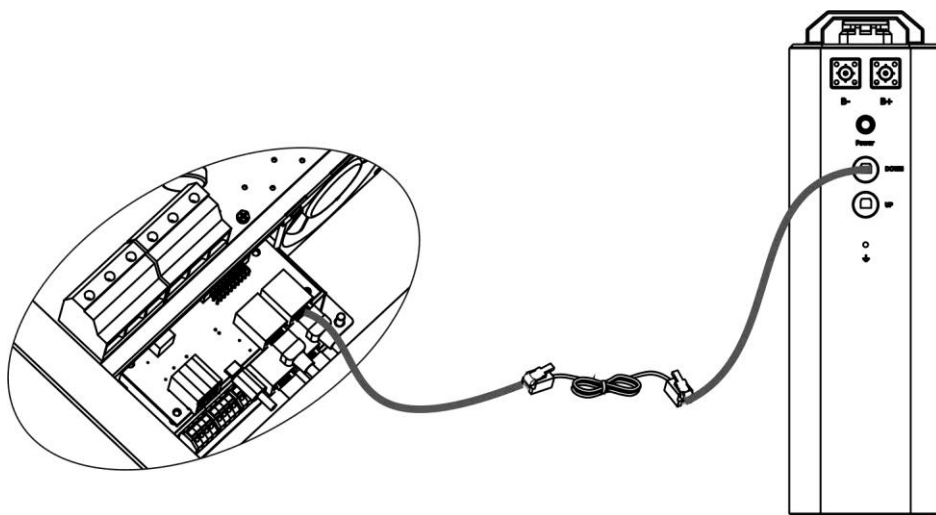
Step 3. Turn on the inverter.

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



SOLTARO

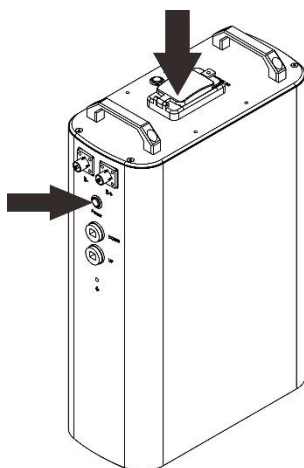
Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



Note for parallel system:

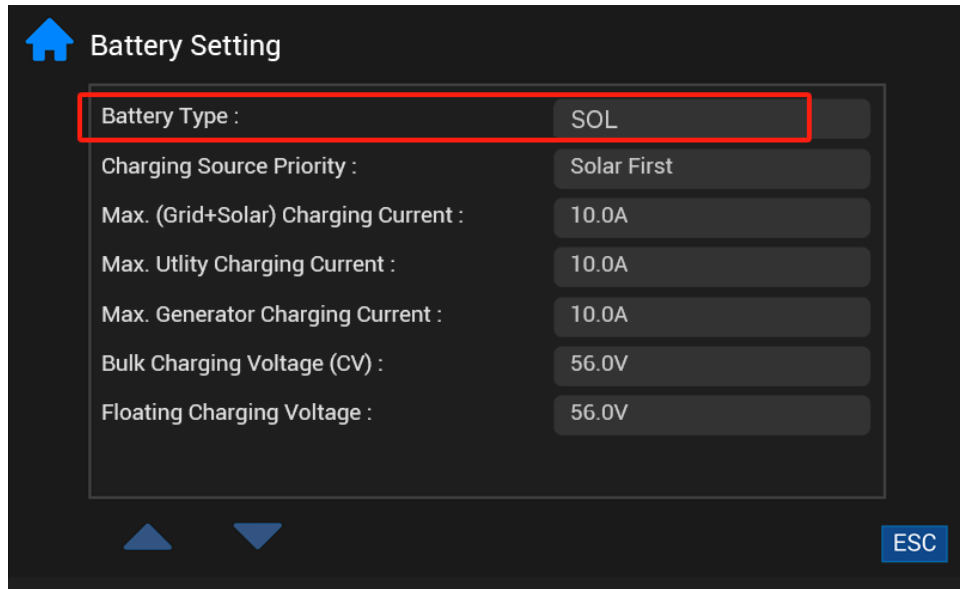
1. Only support common battery installation.
2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "SOL" in LCD program 5. Others should be "USE".

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.



The screenshot shows a 'Battery Setting' menu with a blue house icon at the top left. The menu contains several settings, each with a label and a value in a dark grey box. The 'Battery Type' setting is highlighted with a red rectangle and shows the value 'SOL'. Below it are 'Charging Source Priority' (Solar First), 'Max. (Grid+Solar) Charging Current' (10.0A), 'Max. Utility Charging Current' (10.0A), 'Max. Generator Charging Current' (10.0A), 'Bulk Charging Voltage (CV)' (56.0V), and 'Floating Charging Voltage' (56.0V). At the bottom left are blue up and down arrow icons, and at the bottom right is a blue 'ESC' button.

Setting	Value
Battery Type :	SOL
Charging Source Priority :	Solar First
Max. (Grid+Solar) Charging Current :	10.0A
Max. Utility Charging Current :	10.0A
Max. Generator Charging Current :	10.0A
Bulk Charging Voltage (CV) :	56.0V
Floating Charging Voltage :	56.0V

Appendix II: The Wi-Fi Operation Guide in Remote-Panel (Option)

1.Introduction

MOTOMA is an energy storage system monitoring APP provided by Shenzhen Motoma Power Co., Ltd.The APP displays the current running status and data changes of the energy storage system in real time incharts, energy flow charts, lists and other ways.

The main features of the software are:

- The current running status and detailed data of the energy storage system are displayed in real time by charts, energy flow charts, and lists.
- Real-time data and historical data can be queried in time to master the operation status of the energy storage system anytime and anywhere.
- The Chinese and English interfaces are free to switch with the operating system language of the handheld device.



2.“MOTOMA” App

2-1. Download and install APP

Operating system requirement for your smart phone.

🍏 iOS system supports iOS 9.0 and above

🤖 Android system supports Android 5.0 and above

Please scan the following QR code with your smart phone and download "**MOTOMA**" App.



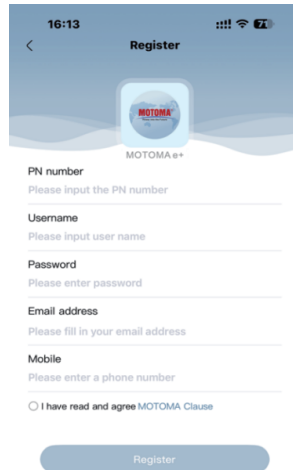
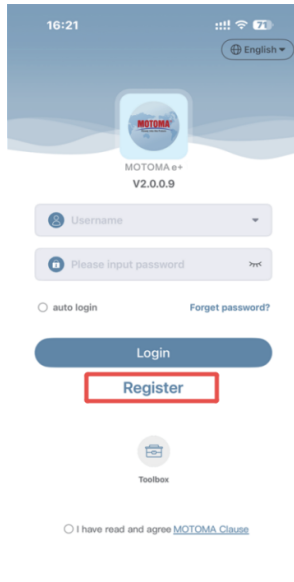
Apple users choose to download from the APP Store
Android users choose to download from Local Server



2-2. Initial Setup

Step 1: Registration at first time

After the installation, please tap the shortcut icon  to access this APP on your mobile screen. In the screen, tap "Register" to access "User Registration" page. You can register by entering PN number, user name, pass- word, email address, and mobile phone number. After the registration is successful, you can return to the login page to log in.

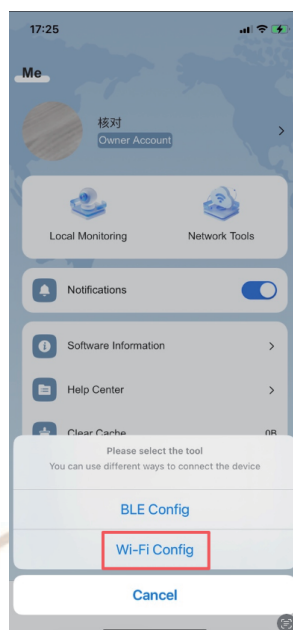
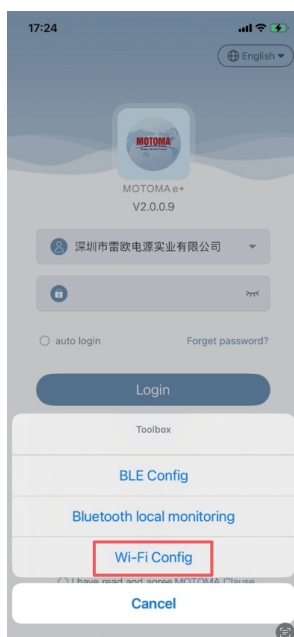


2-3. Equipment Distribution Network

• Network access

Entry 1: Login Page-toolbox-Wi-Fi Config"

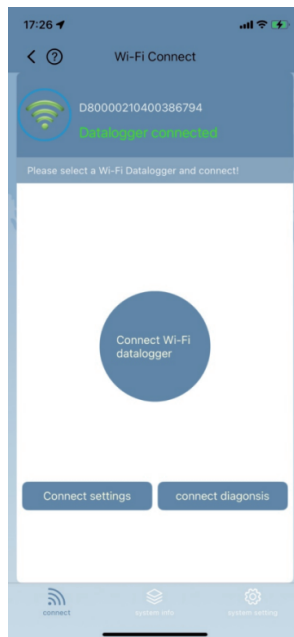
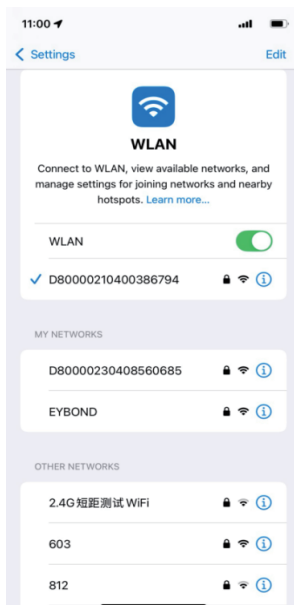
Entry 2: Click "my" interface " → " Wi-Fi Config"



• Wi-Fi network distribution process

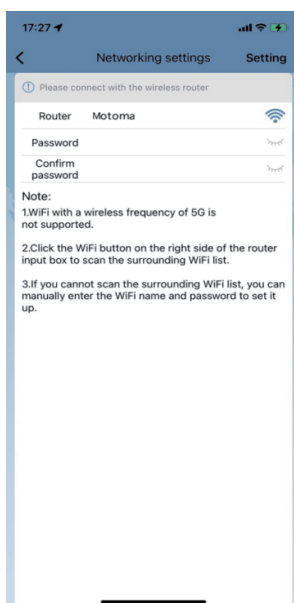
Step 1: connect the device

Open the "Wi-Fi" in the "Settings" of the mobile phone, connect the digital collector PN that needs to be allocated to the network, open the optical treasure APP, click the "toolbox", select the Wi-Fi distribution network to enter the distribution network page, click the "networking settings" to select the Wi-Fi and enter the password to connect. the original password is: 12345678



Step 2: configure a network for the device

Enter the router name and password.



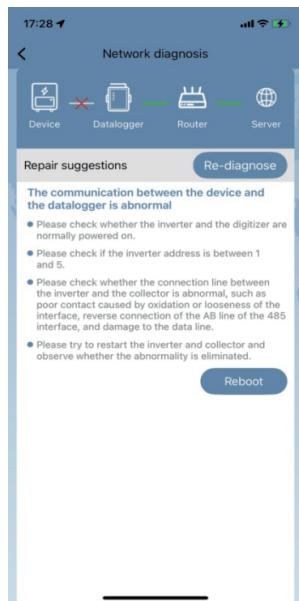
Note:

1. Please ensure that the signal connected to the network is good and the network is unblocked.
2. Make sure that the router password is correct.

Step 3: view the distribution results

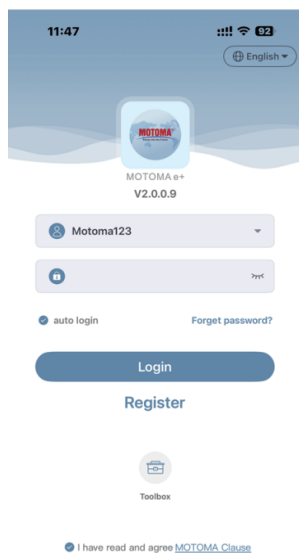
If the network configuration is successful, the datalogger restarts.

After about 5 minutes, you can see the device data.



2-4. Login

After finishing the registration and local Wi-Fi configuration, enter registered name and password to login. Note: Tick "auto login" for your login convenience afterwards.



3. APP Main Function

3-1. Device

Device List

Displays all devices under the account, and displays the status and basic parameters of the devices.



Add device

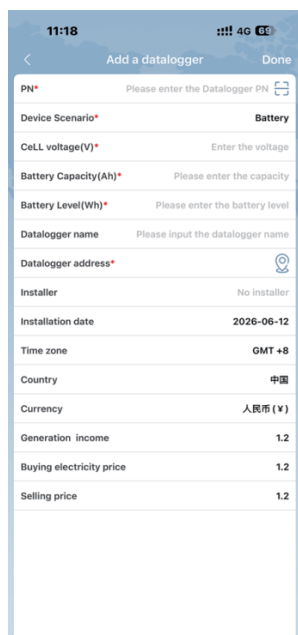
Step 1: Entry

On the devices page, we can Click the “+” to add device.



Step 2: Add a device

Complete the device information to add the device successfully.



Add a datalogger	
PN*	Please enter the Datalogger PN
Device Scenario*	Battery
Cell voltage(V)*	Enter the voltage
Battery Capacity(Ah)*	Please enter the capacity
Battery Level(Wh)*	Please enter the battery level
Datalogger name	Please input the datalogger name
Datalogger address*	
Installer	No installer
Installation date	2026-06-12
Time zone	GMT +8
Country	中国
Currency	人民币 (¥)
Generation income	1.2
Buying electricity price	1.2
Selling price	1.2

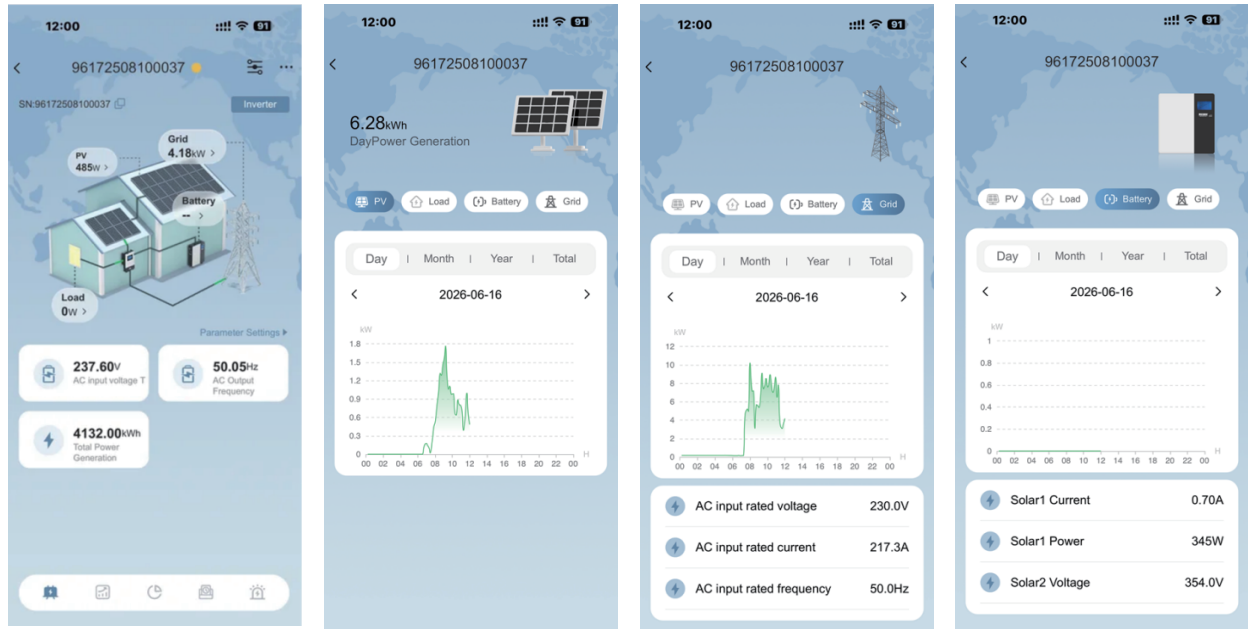
Step 3: Add successfully

After the device is added, if the device does not have a network, data cannot be migrated to the cloud. If it is a WiFi device, you need to configure a network for the device.

Device Details

1. Energy flow diagram

You can view the energy status and parameters of the equipment. Click the solar inverter, power grid, and battery icons to view the relevant parameters of the equipment.



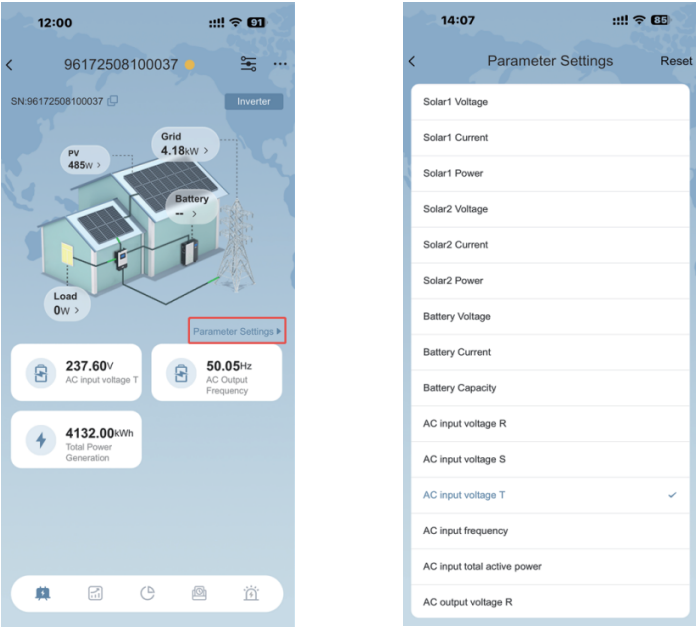
2. Data charts

You can view the area diagram of the power generation and load power of the equipment, and the column diagram of the monthly, annual and total power generation.



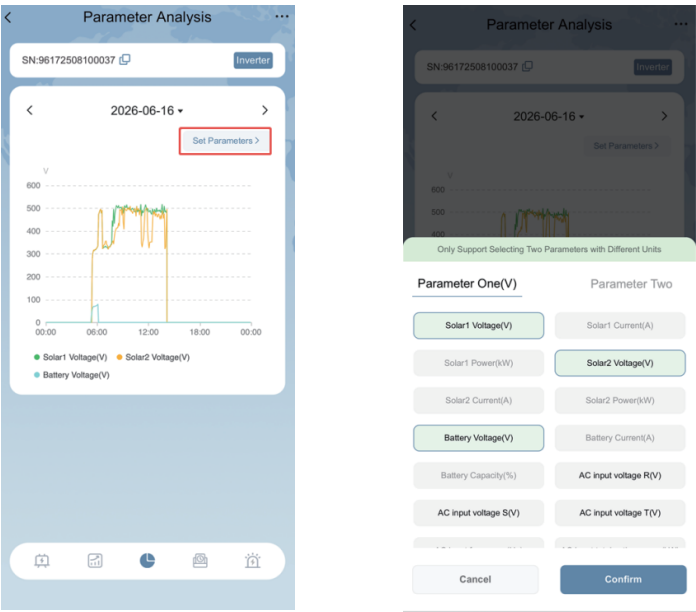
3.Parameter settings

You We can enter the "Parameter Settings" interface to select the parameter data we need to view, as shown in the figure below.



4.Parameter Analysis

You can select a parameter of the device for analysis.



5.Data details

You can view the data details recorded by the device every five minutes.



The screenshot displays the SolarEdge Inverter app interface. At the top, the serial number SN-96172508100037 is shown. The main visual is a 3D diagram of a solar system with two PV panels (485W each), a Grid connection (4.18kW), a Battery, and a Load (0W). A power line tower is also visible. Below the diagram, there are four data cards: 1. AC Input voltage T: 237.60V. 2. AC Output Frequency: 50.05Hz. 3. Total Power Generation: 4132.00kWh. 4. A 'Parameter Settings' link. At the bottom, there is a navigation bar with icons for Home, System, History, and Settings.

SN-96172508100037

Grid 4.18kW >

Battery -- >

PV 485W >

Load 0W >

Parameter Settings >

237.60V
AC Input voltage T

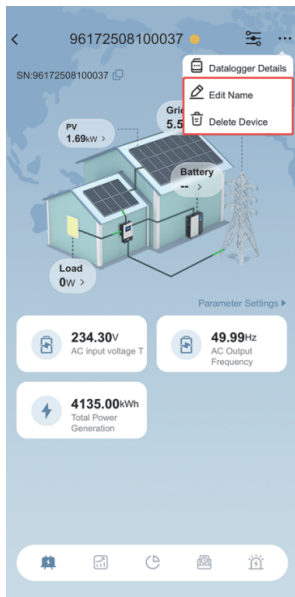
50.05Hz
AC Output Frequency

4132.00kWh
Total Power Generation



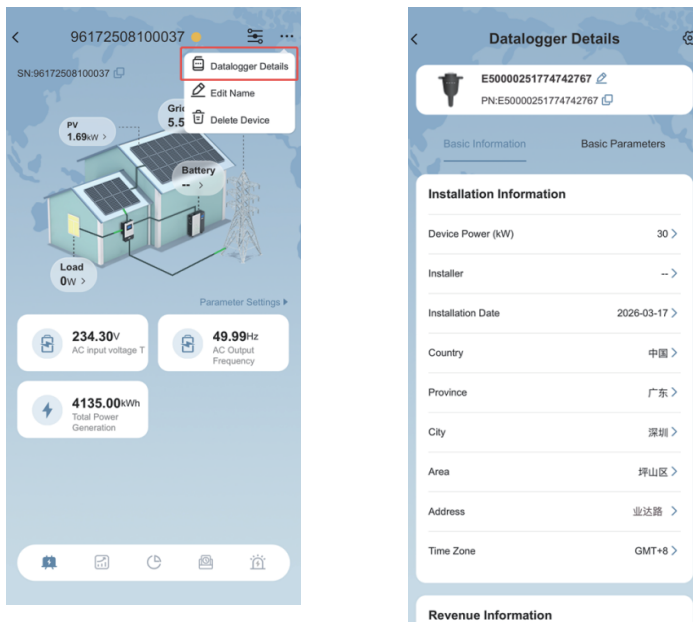
7.Delete the device

After a device is deleted, the device is not displayed in the device list.



8.View the number of collectors

You can view the information of the Digital Collector and Digital Collector connected to the device.



9. Datalogger details

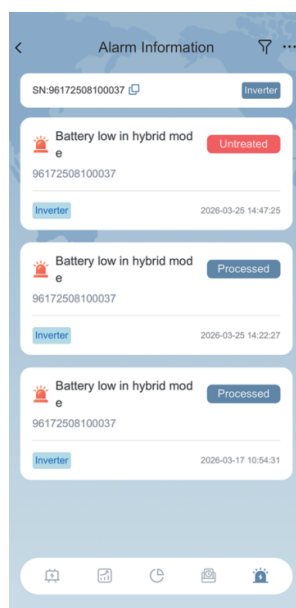
You can view the information of the data logger and perform operations such as restarting, debugging, and deleting the data logger.



3-2. Alarm

Alarm List

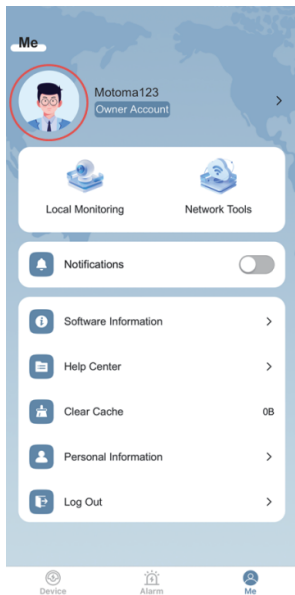
Displays all Alarm information under the current account. You can filter alarm information by date, alarm status, and alarm type.



3-3. Me

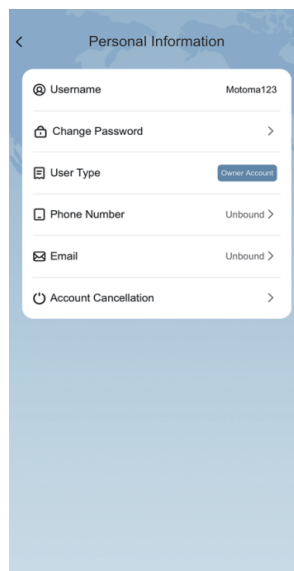
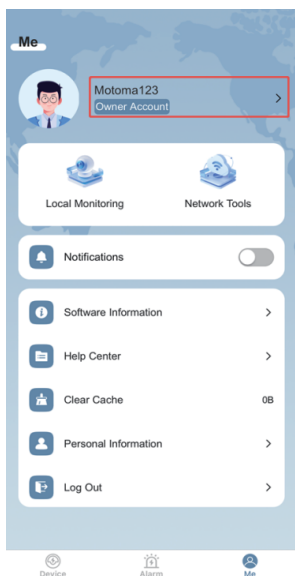
Change Avatar

Click the avatar to select a mobile phone photo or a photo to change the avatar.



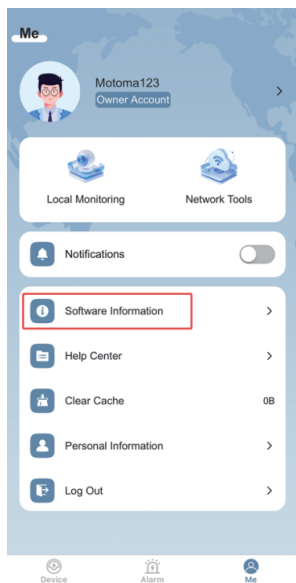
Username

You can click the user name to enter the personal information page. You can modify personal information such as nicknames and passwords.



Version Update

After a new version is released, click Update to go to the mall to update the APP.



Clear Cache

Click Clear cache to clear the APP cache.

