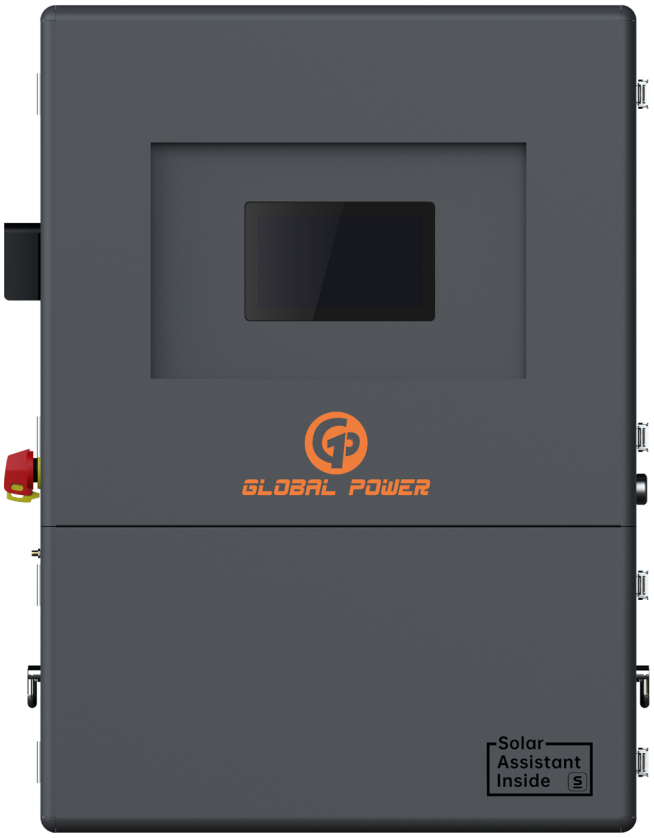
GP16K22PV-US-GE

Hybrid PV Inverter



VERSION 26.0.1 | INFORMATION SUBJECT TO CHANGE WITHOUT NOTICE.
MODEL #. GP16K22PV-US-GE

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1. Introduction

1-1. System Overview

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

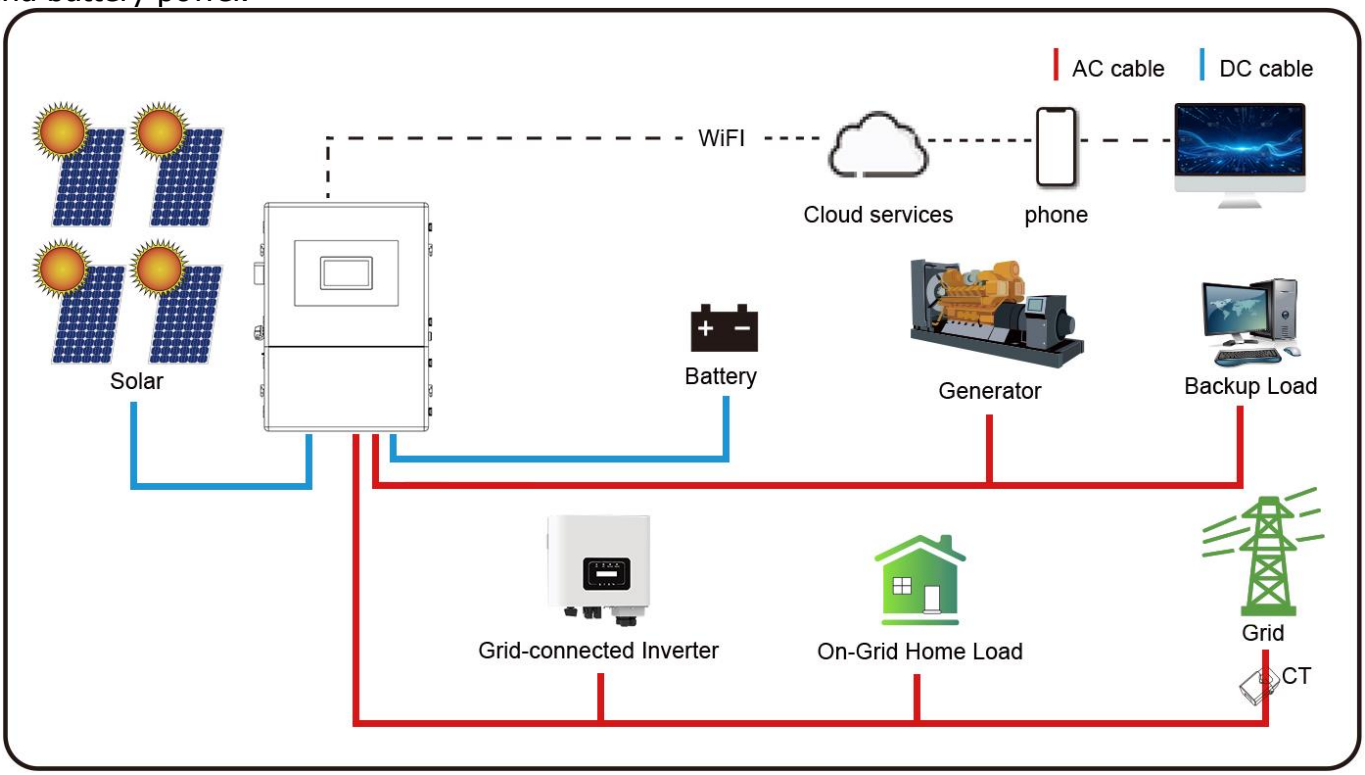


Figure 1 Basic Hybrid PV System Overview

Depending on different power situations, this hybrid inverter is designed to generate continuous power from PV solar modules (solar panels), batteries, and the utility. When the MPP input voltage of PV modules is within acceptable range (see specification for the details), this inverter can generate power to feed the grid (utility) and charge the battery. This inverter is only compatible with PV module types of single crystalline and polycrystalline. Do not connect any PV array types other than these two PV modules to the inverter. Do not connect the positive or negative terminal of the solar panel to the ground. See Figure 1 for a simple diagram of a typical solar system with this hybrid inverter.

1-2. Product Specifications

Model	GP16K22PV-US-GE
RATED POWER	**16000 W**
PV INPUT (DC)	
Max. DC Power	22000 W
Nominal DC Voltage	360 VDC
Max. DC Voltage	500 VDC
Working DC Voltage Range	120 VDC ~ 450 VDC
Start-up Voltage / Initial Feeding Voltage	125 VDC
MPP Voltage Range	150 VDC ~ 450 VDC
Max. DC Power MPPT range	270 ~ 450Vdc (±10Vdc)
Max. DC Input current / per string	26Amp
Isc PV (absolute Max.)	26A
Max. inverter back feed current to the array	0 A
AC INPUT	
AC Start-up Voltage	85 VAC per phase
Auto Restart Voltage	90 VAC per phase
Acceptable Input Voltage Range	90 - 140 VAC per phase
Nominal Frequency	60 Hz
Max. AC Input current (Phase 1)	200 Amp Max Continuous AC Passthrough (grid to load)
Max. AC Input current (Phase 2)	200 Amp Max Continuous AC Passthrough (grid to load)
GRID OUTPUT (AC)	
Nominal Output Voltage	120 VAC (P-N) / 208 VAC (P-P)/ 240 VAC(P-P)
Nominal output frequency	60Hz
Max. feeding power	16000W
Max. output current per Phase	66.7A
Power Factor Range	0.9 lead – 0.9 lag
BATTERY MODE OUTPUT (AC)	
Nominal Output Voltage	120 VAC (P-N) / 208 VAC (P-P)/ 240 VAC(P-P)
Output Frequency	60Hz
Output Waveform	Pure sine wave
Nominal Output Power per Phase	8000VA/8000W
BATTERY & CHARGER (Lead-acid/Li-ion)	
DC Voltage Range	42 – 60 VDC
Nominal DC Voltage	48 VDC
Max. Battery Discharging Current	300 A
Max. Charging Current	250 A
Max. AC Charging Current	250 A
Absorption charger voltage	56.0 VDC (± 0.5 VDC)
Floating charger voltage	54.0 VDC (± 0.5 VDC)
Battery overcharge protection loss point	62.0 VDC (± 0.5 VDC)
GENERAL	
PHYSICAL	
Dimension, D X W X H (mm)	277.5 x 575 x 800

Net Weight (kgs)	76
INTERACE	
Communication Port	RS232,USB,BMS, WIFI, Modbus
ENVIRONMENT	
Protective Class	I
Ingress Protection Rating	IP 65
Humidity	0 ~ 90% RH (No condensing)
Operating Temperature	-25 to 60°C (Power derating above 45°C)
Altitude	Max. 2000m

2. Important Safety Warnings

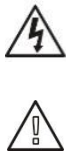
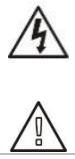
Before using the inverter, please read all instructions and cautionary markings on the unit and this manual. Store the manual where it can be accessed easily.

This manual is for qualified personnel. The tasks described in this manual may be performed by qualified personnel only.

Symbols used in Equipment Markings	
	Refer to the operating instructions
	Caution! Risk of danger
	Caution! Risk of electric shock
	Caution! Risk of electric shock. Energy storage timed discharge for 5 minutes.
	Caution! Hot surface
Conventions used in this Document	
WARNING!	Warnings identify conditions or practices that could result in personal injury;
CAUTION!	Cautions identify conditions or practices that could result in damaged to the unit or other equipment connected.

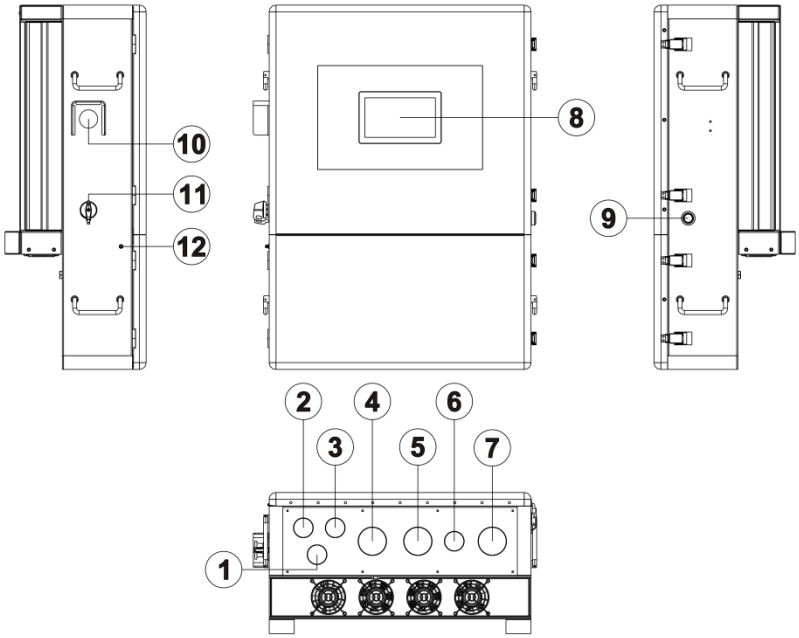
General Precautions

	**WARNING!** Before installing and using this inverter, read all instructions and cautionary markings on the inverter and all appropriate sections of this guide.
	**WARNING!** Normally grounded conductors may be ungrounded and energized when a ground fault is indicated.
	**WARNING!** This inverter is heavy. It should be lifted by at least two people.
	**CAUTION!** Authorized service personnel should reduce the risk of electrical shock by disconnecting AC, DC and battery power from the inverter before attempting any maintenance, cleaning or working on any circuits connected to the inverter. Turning off controls will not reduce this risk. Internal capacitors can remain charged for 5 minutes after disconnecting all sources of power.

	**CAUTION!** Do not disassemble this inverter yourself. It contains no user-serviceable parts. Attempt to service this inverter yourself may cause a risk of electrical shock or fire and will void the warranty from the manufacturer.
	**CAUTION!** To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that the wire is not undersized. Do not operate the Inverter with damaged or substandard wiring.
	**CAUTION!** Under high temperature environment, the cover of this inverter could be hot enough to cause skin burns if accidentally touched. Ensure that this inverter is away from normal traffic areas.
	**CAUTION!** Use only recommended accessories from installer. Otherwise, not-qualified tools may cause a risk of fire, electric shock, or injury to persons.
	**CAUTION!** To reduce risk of fire hazard, do not cover or obstruct the cooling fan.
	**CAUTION!** Do not operate the Inverter if it hasss received a sharp blow, been dropped, or otherwise damaged in any way. If the Inverter is damaged, please call for an RMA (Return Material Authorization).
	**CAUTION!** AC breaker, DC switch and Battery circuit breaker are used as disconnect devices and these disconnect devices shall be easily accessible.
	**WARNING!** Risk of Voltage Backfeed. Before working on this circuit, isolate inverter/Uninterruptible Power System (UPS); then check for Hazardous Voltage between all terminals including the protective earth.

3. Unpacking & Overview

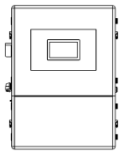
3-1. Product Overview



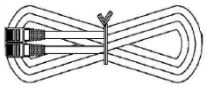
①. PV Connectors
②. Communication ports(Please check section 11 for Communication details)
③. Parallel communication ports
④. Grid connectors
⑤. Load AC output connectors
⑥. Generator input connectors
⑦. Battery connectors
⑧. LCD panel (Please check section 12 for LCD operation details)
⑨. Cold start button
⑩. Emergency stop
⑪. PV switch
⑫. Wi-Fi antenna base

3-2. Packing List

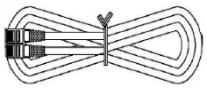
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

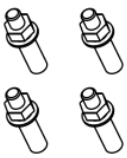

Inverter unit


RS-232 cable


Parallel cable

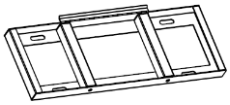
Share current wires


BMS & BAT cable


Wall mounting screws


Wall mounting fastener


Wall mounting fastener (M4) screws


Wall mounting bracket


Wi-Fi antenna


Antenna base sheath

Manual

4. Installation

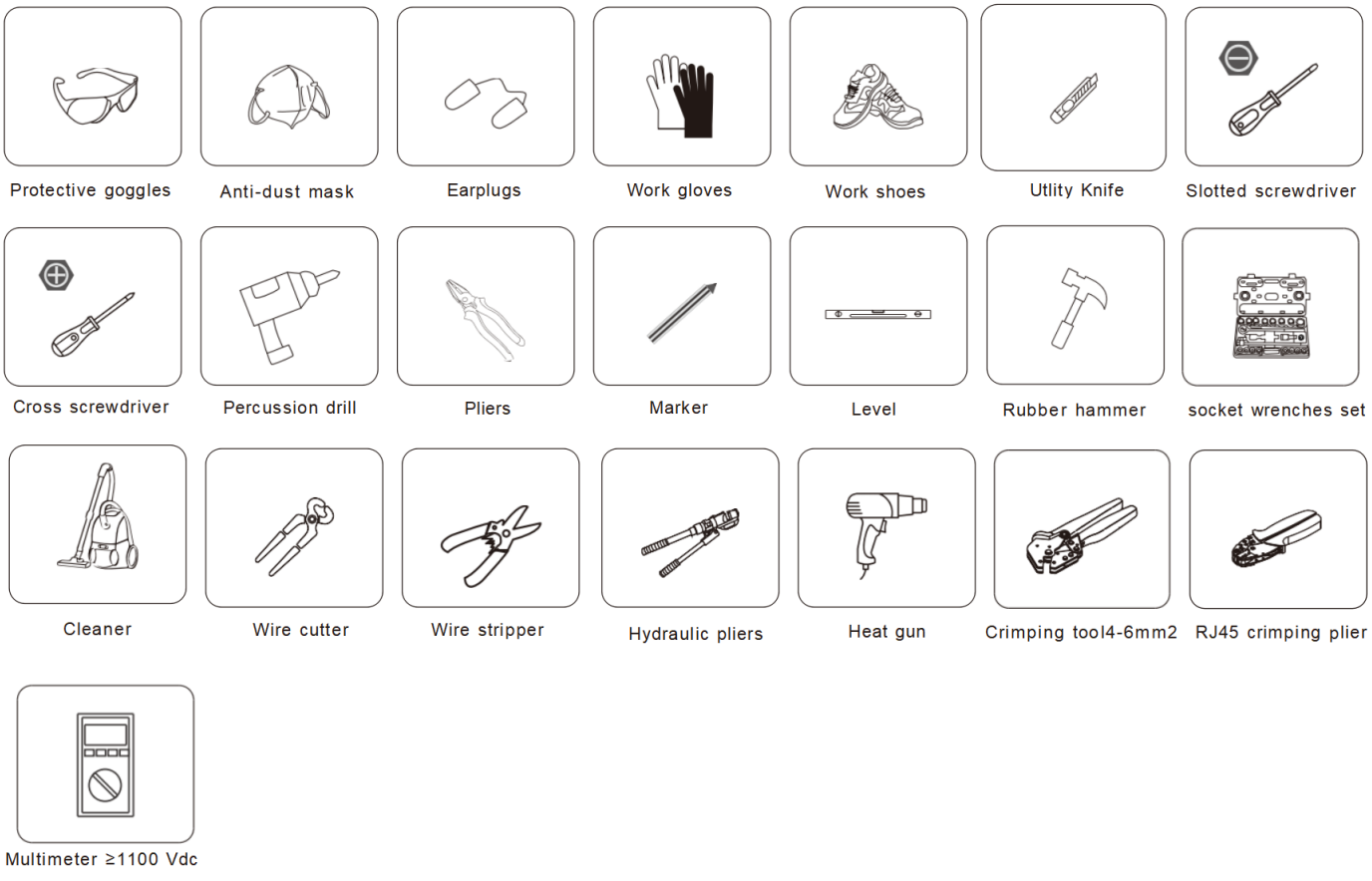
4-1. Recommended cable wire

Connectors		Cable Size				
		cross-section (mm2)	AWG no	Terminal	Number	breaker
Grid	L1/L2	53	1/0	M8	2	200A/300V
	N/Ground	21	4	M6	3	
Generator		21	4	M6	3	
Load	L1/L2	53	1/0	M8	2	
	N/Ground	21	4	M6	3	
PV(solar)		4	11		16	500VDC/30A
Battery		42	1	M8	4	

The reference tightening torque is 5 Nm for M6 Terminal and 12 Nm for M8 Terminal.

NOTE 1: The over voltage category of the AC input is category III. It should be connected to the power distribution.
NOTE 2: The over voltage category of the PV input is category II.
NOTE 3: Please install a separate breaker between the inverter and the grid. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current.
NOTE 4: Please install a separate breaker between the inverter and the PV. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current.
NOTE 5: The over voltage category of the battery input is category II.

4-2. Recommended tool

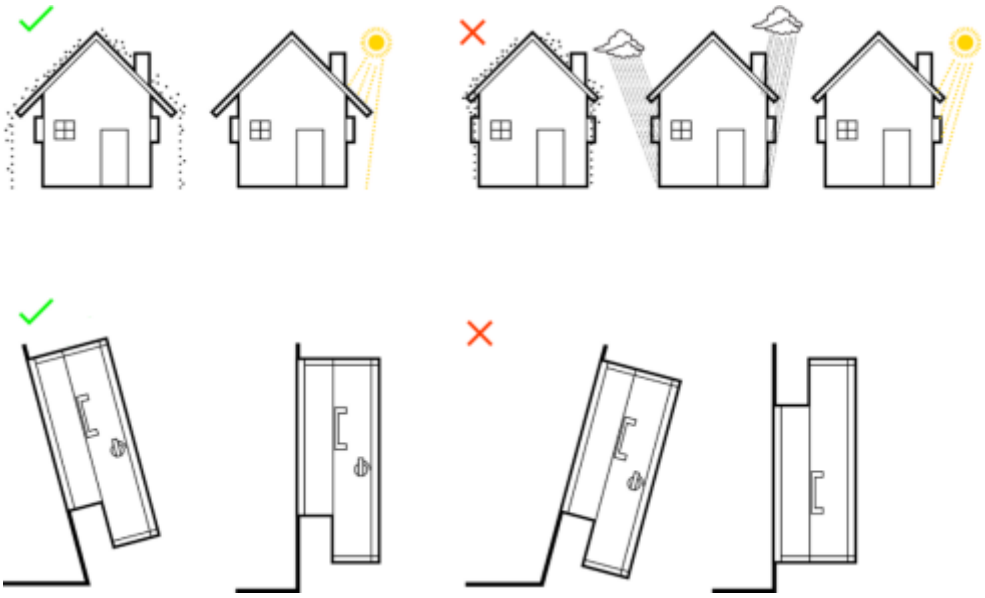


4-3. Precautions

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

- Not in direct sunlight
- Not exposed during rain or snow
- 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, and snow laying up during installation and operation.



4-4. Selecting the Mounting Location

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

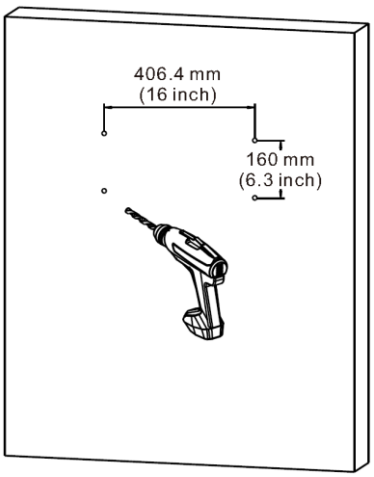
⚠ **WARNING! FIRE HAZARD. ONLY SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE.**

4-5. Mounting Unit

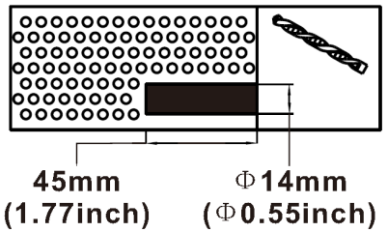
⚠ **WARNING! Remember that this inverter is heavy! Please be careful when lifting it out from the package.**

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

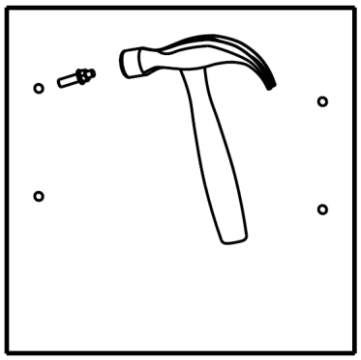
1. Fix four wall mounting screws as below chart (width: 406.4mm, height: 160mm). The reference tightening torque is 35 N.m.



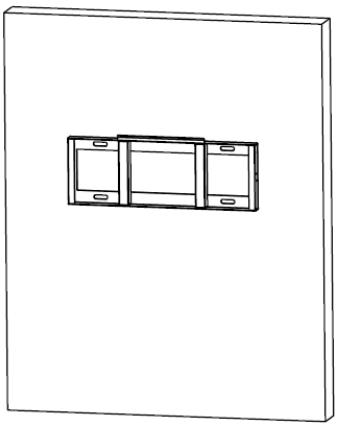
2. Drill a hole with a depth of 45mm at the mark with a drill of Φ14mm.



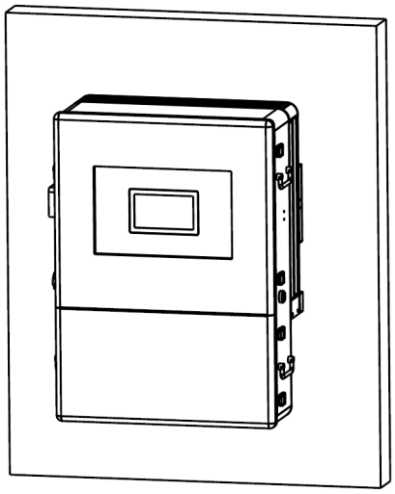
3. Please expand the bolt with a hammer into the hole in the wall and install the nut (including the elastic flat pad). Do not tighten the nut.



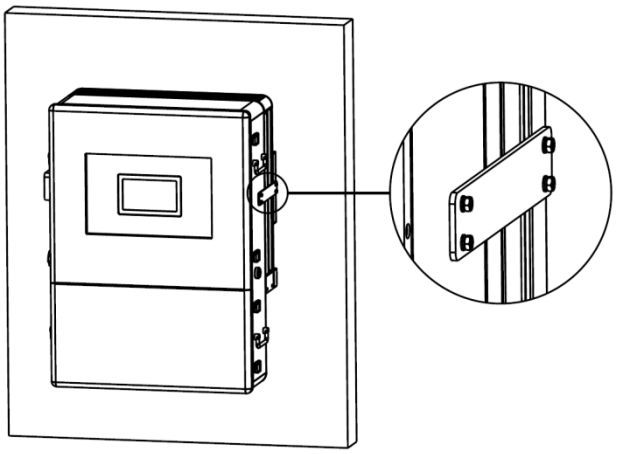
4. Please hang the wall mounting bracket on the expansion bolt and tighten the nut with a wrench. Check if the bracket is firmly secured.



5. Hang the inverter on the wall mounting bracket.



6. Use supplied M 4 screws to fix the wall mounting fastener and the inverter. Then, check if the inverter is firmly secured.

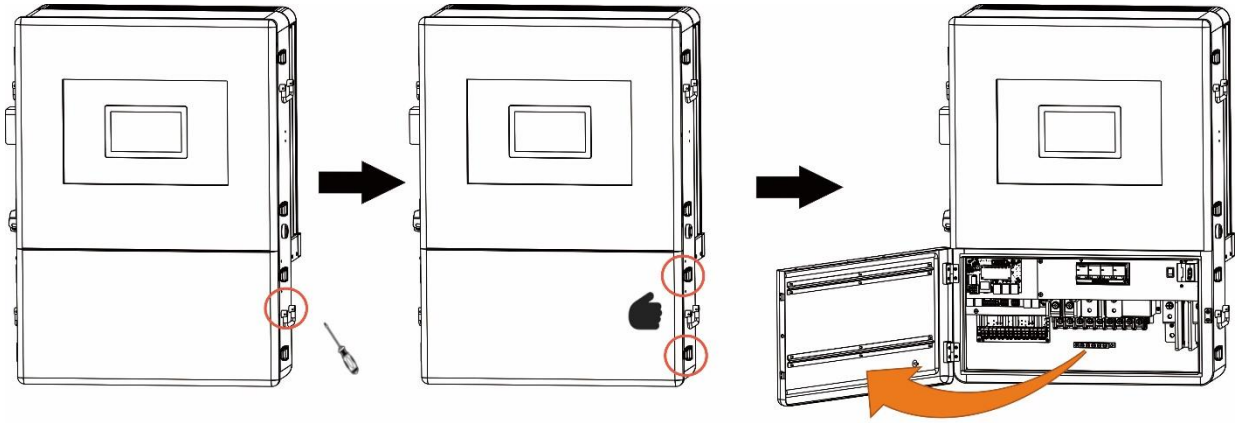


5. Cable box

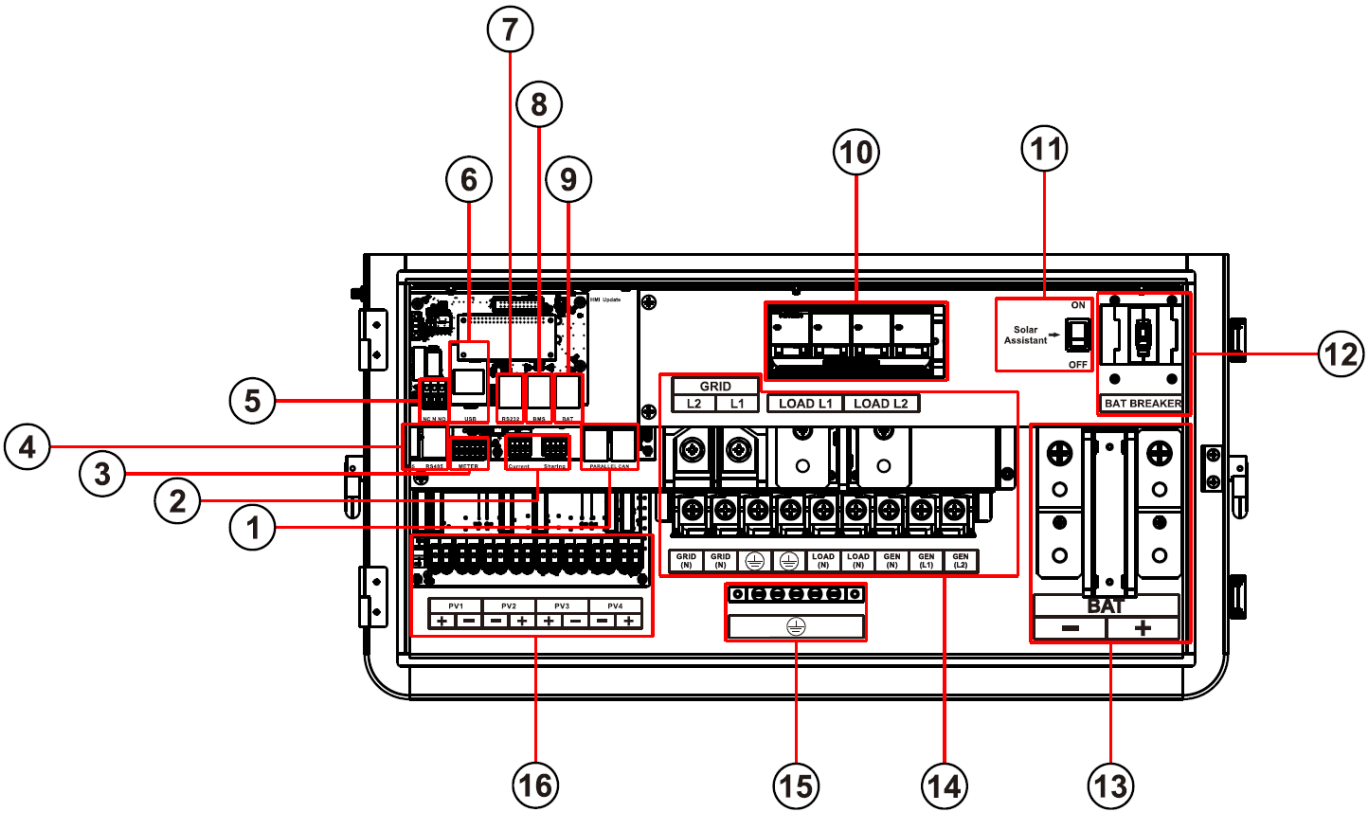
WARNING! Be sure that the power source is disconnected before attempting to hard wire it to the unit.

⚠ **WARNING! System safety and efficient operation need to use appropriate cable for grid (utility) connection. To reduce the risk of injury, please use the proper recommended cable size.**

Before connecting all wires, be sure to open wiring cover by removing the screw and releasing buckles. Refer to chart below for the details.



Overview of the cable box



① . Parallel can
② . Current sharing port
③ . Meter/CT
④ . RS485
⑤ . Dry contact
⑥ . USB & WIFI
⑦ . RS232
⑧ . BMS
⑨ . BAT
⑩ . Load Breaker
⑪ . PI Zero Switch
⑫ . Battery Breaker
⑬ . Battery Terminals
⑭ . AC Terminals
⑮ . Grounding Aluminum Busbar
⑯ . PV Terminals

6. Grid (Utility) Connection (AC Input)

6-1. Preparation

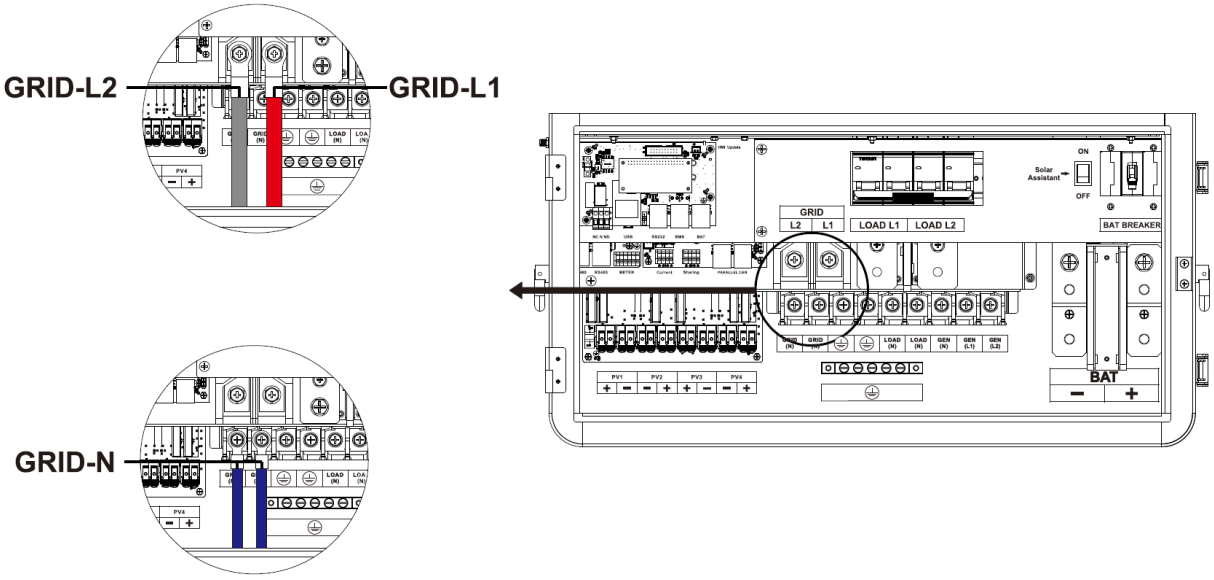
1. Crimp terminal onto the one end of a cable.
2. Before connecting to the grid, please install a separate AC breaker between the inverter and the grid. This will ensure the inverter can be securely disconnected during maintenance and fully protected from overcurrent.

6-2. Connecting to the AC Utility

Please follow the below steps to implement an AC input connection:

1. Before making an AC input connection, be sure to open the DC protector or disconnector first.
2. Be sure to connect the PE protective conductor (⏚) first.
3. Insert AC input wires according to the polarities indicated on the terminal block and tighten the terminal screws.

   ⏚→**Ground (yellow-green)**
   L1→LINE (black)
   L2→LINE (brown)
   N→Neutral (blue)



> ⚠ **WARNING! Be sure that AC power source is disconnected before attempting to hardwire it to the unit.**

7. Generator Connection (AC Input)

7-1. Preparation

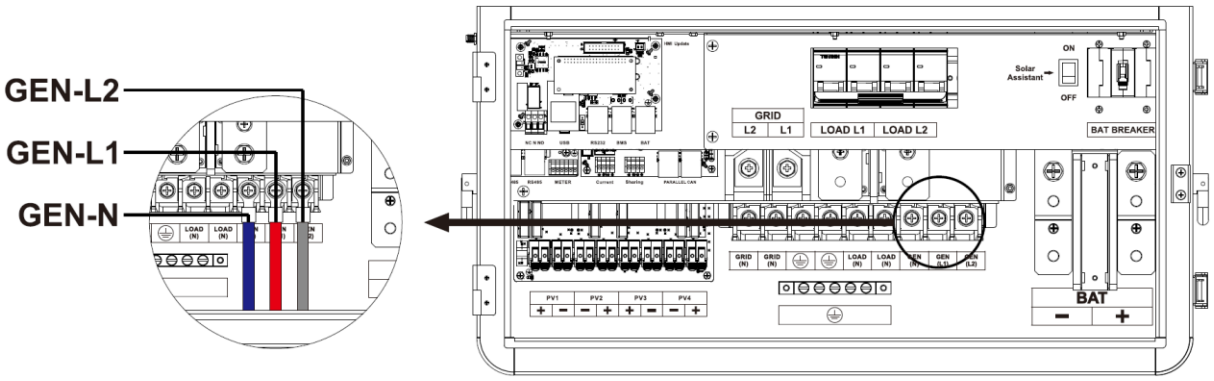
1. Crimp terminal onto the one end of a cable.
2. Before connecting to the generator, please install a separate AC breaker between the inverter and the generator. This will ensure the inverter can be securely disconnected during maintenance and fully protected from overcurrent.

7-2. Connecting to the Generator Input

Please follow the below steps to implement the generator input connection:

1. Before making an AC input connection, be sure to open the DC protector or disconnector first.
2. Be sure to connect the PE protective conductor (⏚) first.
3. Insert AC input wires according to the polarities indicated on the terminal block and tighten the terminal screws.

⏚→**Ground (yellow-green)**
L1→LINE (black)
L2→LINE (brown)
N→Neutral (blue)



> ⚠ **WARNING! Be sure that the generator power source is disconnected before attempting to hardwire it to the unit.**

8. PV Module Connection (DC Input)

8-1. Preparation

CAUTION! Before connecting to the PV modules, please separately install a DC circuit.

> ⚠ **WARNING! Because this inverter is non-isolated, only two types of PV modules are acceptable: single crystalline and poly crystalline with class A-rated. To avoid any malfunction, do not connect any PV modules with the possibility of leakage current to the inverter. For example, grounded PV modules will cause leakage current to the inverter.**

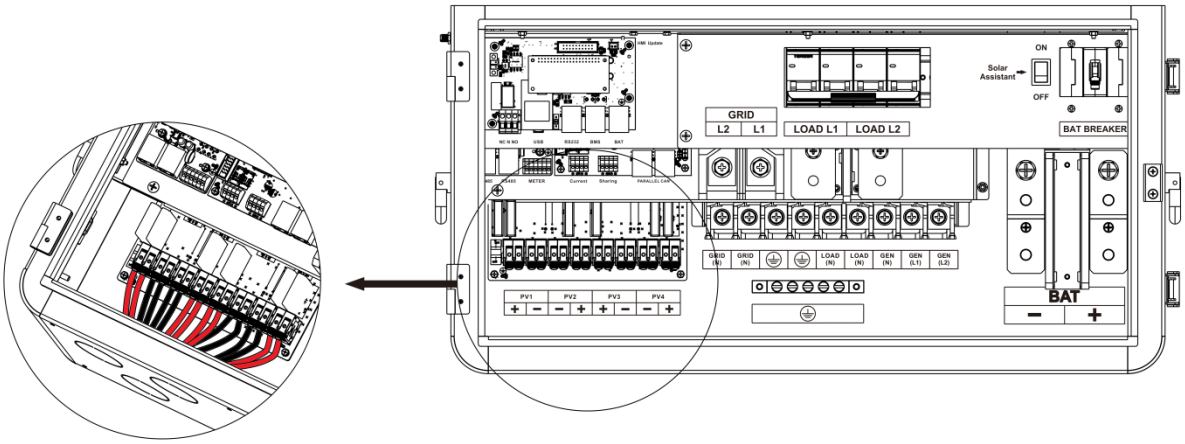
> ⚠ **CAUTION:** It's requested to have PV junction box with surge protection. Otherwise, it will cause inverter damage when lightning occurs on the PV modules.

Please follow below steps to implement PV module connection:

Step 1: Check the input voltage of PV array modules. The acceptable input voltage of the inverter is 120VDC - 500VDC. This system is applied with two strings of PV array. Please make sure that the maximum current load of each PV input connector is 26A.

> ⚠ **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: Remove insulation sleev e 10 mm for positive and negative conductors.
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.



CAUTION: Never directly touch terminals of the inverter. It will cause lethal electric shock.

CAUTION: Do NOT touch the inverter to avoid electric shock. When PV modules are exposed to sunlight, it may generate DC voltage to the inverter.

8-2. Recommended Panel Configuration

Specifications	Solar panel			
Nominal Max. Power (Pmax) (W)	430	455	520	535
Opt. Operating Voltage (Vmp) (V)	40.3	41.3	41.6	41.9
Opt. Operating Current (Imp) (A)	10.68	11.02	12.5	12.77
Open Circuit Voltage (Voc) (V)	48.3	49.3	49.14	49.44
Short Circuit Current (Isc) (A)	11.37	11.66	13.23	13.5
For per tracker 5.5KW input recommendation				
Numbers in series of per strings	7	7	6	6
Numbers of strings in per tracker	2	2	2	2
Max. input voltage of MPPT (V)	338.1	345.1	294.8	296.6
Input power of per tracker	6020	6370	6240	6420
Minimum input recommendation				
Numbers in series of per strings	5	5	5	5
Numbers of strings in per tracker	1	1	1	1
Max. input voltage of MPPT(V)	241.5	246.5	245.7	247.2
Input power of per tracker	2150	2275	2600	2675

9. Battery Connection

NOTE: The over voltage category of the battery input is category II.

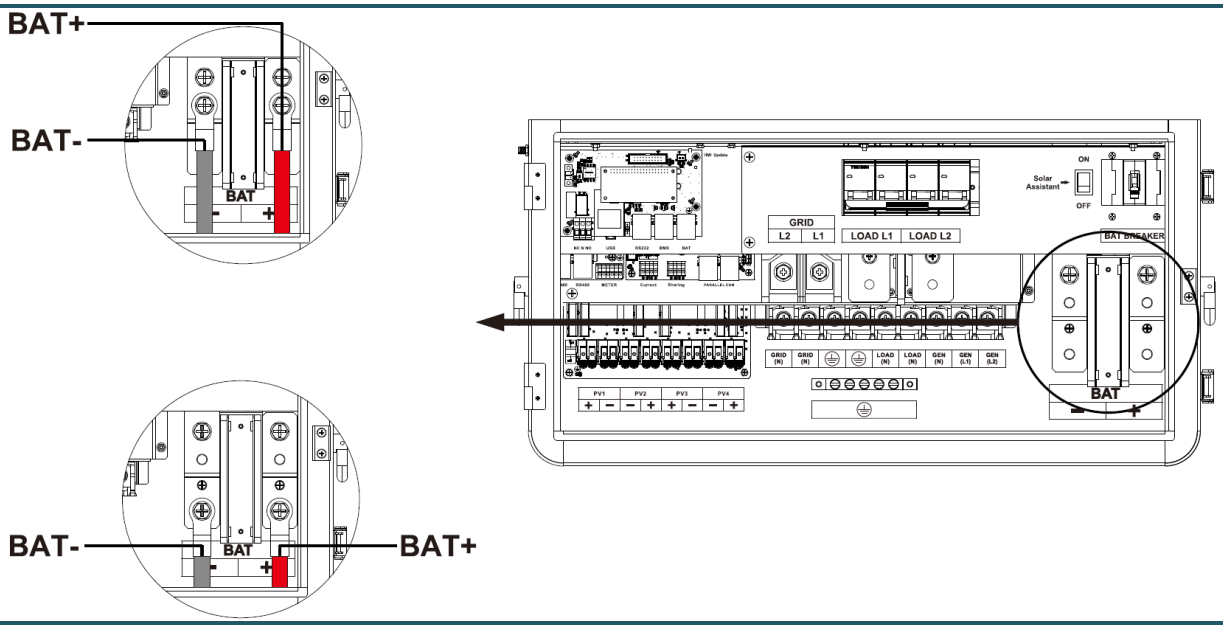
9-1. Preparation

1. Crimp terminal onto the one end of a cable.
2. Inverter is a 48V nominal system. DO NOT connect the inverter to any other battery configuration. If using 12V batteries, it MUST NOT exceed four (4) batteries in series. The inverter can work with any battery types as long as it remains within the range of 43V to 60V.
3. This inverter is only built-in 2 battery terminals. If using 3 or more batteries, it is necessary to use external busbars for (+) and (-) connections.

9-2. Connecting to the battery

1. Battery breakers must be OFF when wiring. If there is no internal breaker inside of batteries, maintain the necessary safety measures when handling.
2. Insert battery wires according to the polarities indicated on the terminal block and tighten the terminal screws. Make sure the polarity at both the battery and the inverter/charge is correctly connected.

> ⚠ **WARNING! Be sure the length of all battery cables are the same. Otherwise, there will be a voltage difference between inverter and battery and cause parallel inverters to not work.**



> ⚠ **WARNING! Wrong connections will damage the unit permanently.**

10. Load Connection (AC Output)

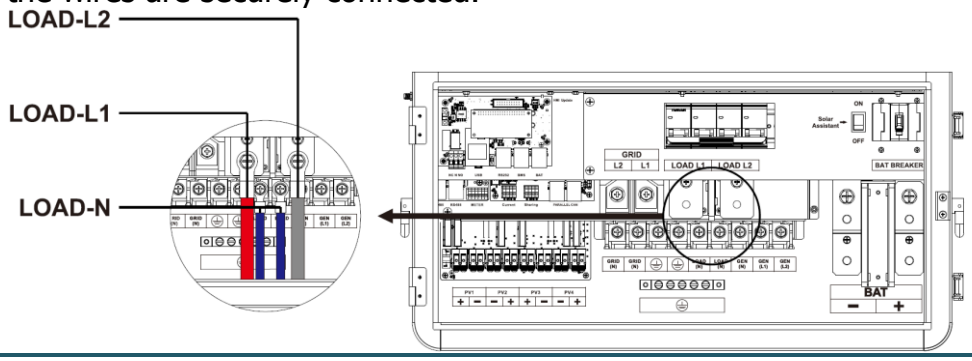
⚠	**CAUTION:** To prevent further supply to the load via the inverter during any mode of operation, an additional disconnection device should be placed on in the building wiring installation.
⚠	**WARNING! It's very important for system safety and efficient operation to use the appropriate cable for AC connection. To reduce the risk of injury, please use the recommended cable size.**

10-1. Preparation

1. Crimp terminal onto the one end of a cable.
2. Turn off inverter.
3. To prevent further supply to the load via the inverter during any mode of operation, an additional disconnection device should be placed on in the building wiring installation.

10-2. Connecting to the AC output

1. Before making an AC input connection, be sure to open the protector or disconnector first.
2. Be sure to connect the PE protective conductor (⏚) first.
3. Insert AC output wires according to the polarities indicated on the terminal block and tighten the terminal screws.
   ⏚→**Ground (yellow-green)**
   L1→LINE (black)
   L2→LINE (brown)
   N→Neutral (blue)
4. Make sure the wires are securely connected.

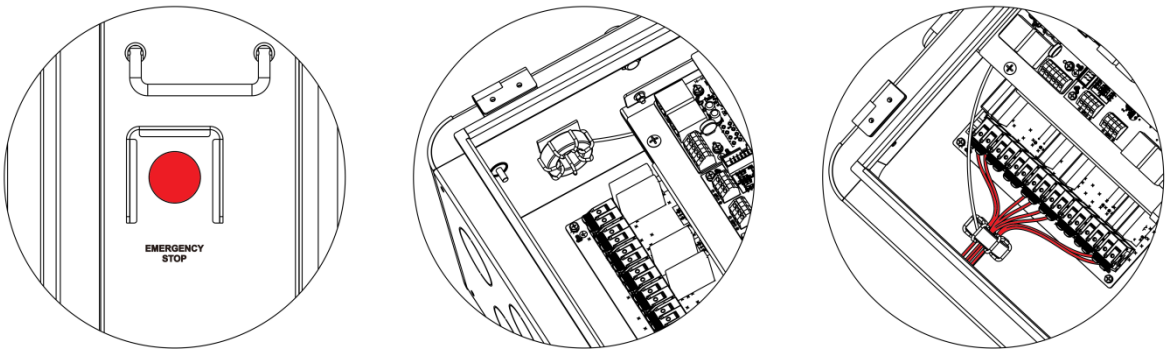


⚠	**CAUTION:** Do NOT connect the utility to "AC Output Connector (Load connector)". **CAUTION:** Be sure to connect L terminal of load to L terminal of AC Output Connector (Load connector)" and N terminal of load to N terminal of AC Output Connector (Load connector)". The G terminal of AC Output Connector is connected to grounding of the load. Do NOT mis connect. **CAUTION:** Appliances such as air conditioners require at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a pow er shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check the manufacturer of the air conditioner if it's equipped with a time delay function before installation. Otherwise, this inverter/charger will trigger an overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

11. Rapid Shutdown (RSD)

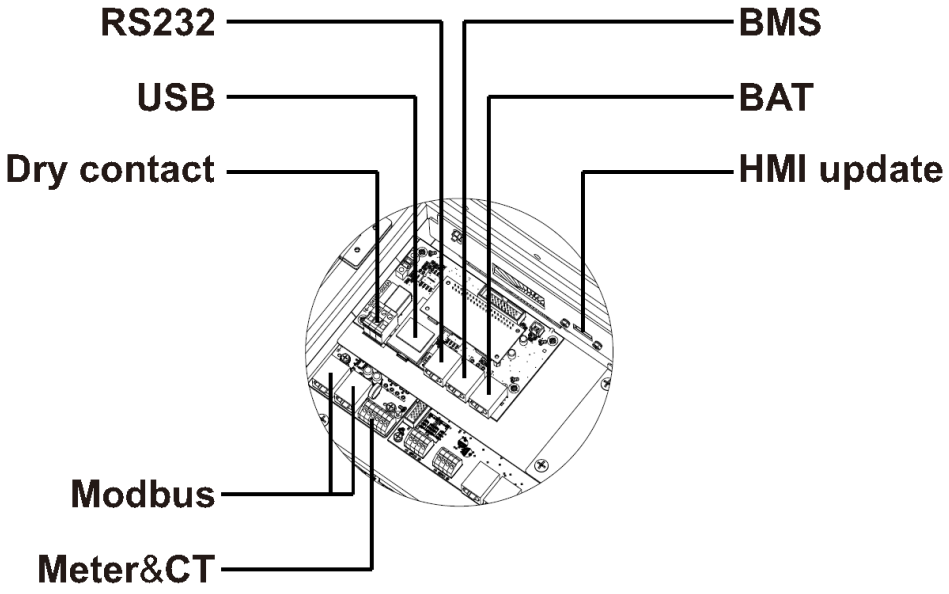
The emergency stop pins of the inverter are an ordinarily close contact that triggers rapid shutdown (RSD) when opened. RSD will cut 12Vdc power supply of the Transmitters will disconnect and stop all AC outputs. Any RSD Transmitters that will then shut down all solar panels when the emergency stop button is pressed.

- For parallel systems: When any inverter triggers the RSD signal, it will initiate rapid shutdown on all paralleled inverters.
- The transmitters of AP Smart is pre-installed inside the inverter. Users need to manually pass the PV+ through the magnetic ring.



12. Communication Port

The inverter is equipped with several communication ports to communicate with a PC with the corresponding software. Follow the below procedure to connect the communication wiring and install the software.



12-1. HMI Version Update

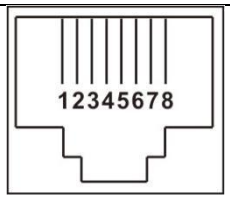
This port enables easy HMI firmware updates via USB drive.

12-2. Wi-Fi Connection

This unit is equipped with a Wi-Fi transmitter. Wi-Fi transmitter can enable wireless communication between inverter and monitoring platform. Users can access and control the monitored inverter with downloaded APP. Please check WiFi operation guide for the details.

12-3. Pin Assignment for RS-232 Communication Port

PIN #	Definition	PIN #	Definition
PIN 1	RS232TX	PIN 5	NC
PIN 2	RS232RX	PIN 6	NC
PIN 3	NC	PIN 7	NC
PIN 4	8~12V	PIN 8	GND



12-4. Pin Assignment for BMS Communication Port

PIN #	Definition	PIN #	Definition
PIN 1	NC	PIN 5	RS485A
PIN 2	NC	PIN 6	CANH
PIN 3	RS485B	PIN 7	CANL
PIN 4	NC	PIN 8	NC

12-5. Pin Assignment for Modbus Communication Port

PIN #	Definition	PIN #	Definition
PIN 1	NC	PIN 5	RS485B
PIN 2	NC	PIN 6	NC
PIN 3	NC	PIN 7	NC
PIN 4	RS485A	PIN 8	NC

12-6. Dry Contact Signal

There is one dry contact available on the bottom panel. It could be used to remote control external generator.

> ⚠ **CAUTION:** The application of the dry contact should not exceed the electric parameter shown as below. Otherwise, the internal relay will be damaged.

Electric Parameter

Parameter	Symbol	Max.	Unit
Relay DC voltage	Vdc	30	V
Relay DC current	Idc	1	A

Function Description

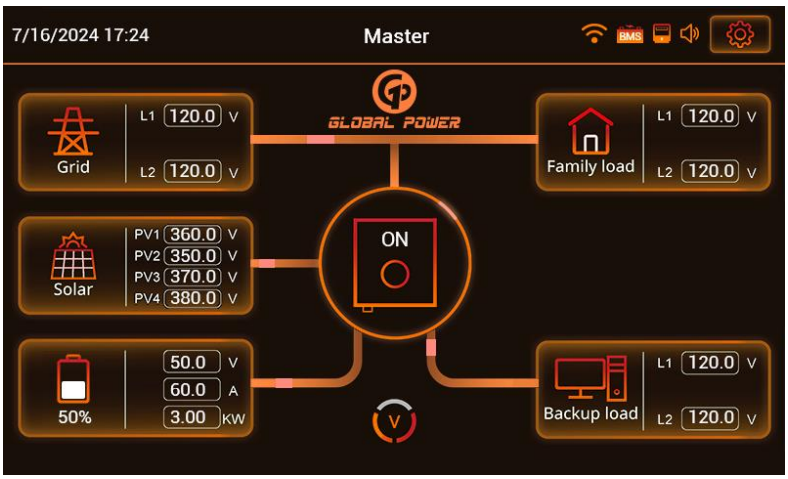
Unit Status	Condition	Dry contact port: 	
		NO&C	NC&C
Power Off	The unit is off and no output is powered.	Open	Close
Power On	The inverter works normally.	Close	Open
	Warning "battery low voltage" is removed. ● Battery voltage is higher than "battery re-discharge voltage when the grid is unavailable" when BMS is not connected. ● Battery SOC is lower than "battery re-discharge SOC when the grid is unavailable"	Close	Open

	when BMS is connected.		
	One of the following conditions: 1.A low-battery alarm exists. ● Battery voltage lower than "battery cut-off discharge voltage when the grid is unavailable" +2V when BMS doesn't connect. ● Battery SOC lower than "battery cut-off discharge SOC when the grid is unavailable" +10% when BMS is connected. 2.The inverter is in fault mode. 3.Communication between DSP and communication board is lost.	Open	Close

13. Operation

Before inverter operation, the user can set up the operation mode either by HMI LCD . Please follow the steps below to set up.

13-1. LCD Display



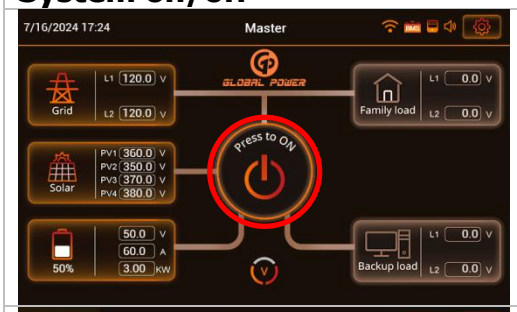
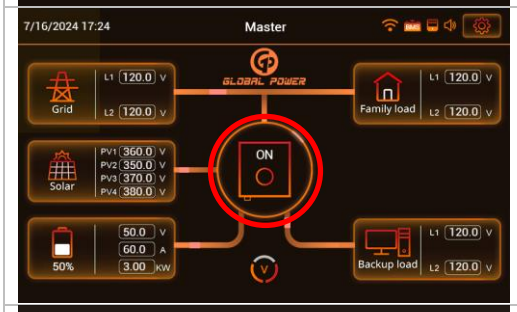
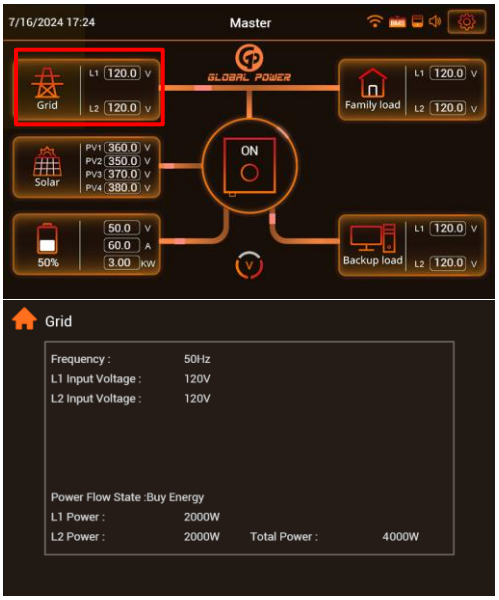
1. The information displayed at the top of the screen is as follows.

- 7/16/2024 17:24 **Time :** Inverter time is used for TOU (Time-of-Use) and system turn on/off.
- Master **Parallel status:** Single/Master/ Slave.
- **WIFI icon:** Once connected to Wi-Fi, the icon will appear highlighted.
- **BMS icon:** When BMS is connected, the icon will become highlighted.
- **Meter icon:** When Meter is connected or the external CT is enabled, the icon will become highlighted.
- **System settings icon:** Press this setting button to access the system settings menu including general setting, output setting, batter setting, system operation mode setting, grid setting, generator setting, and function setting.

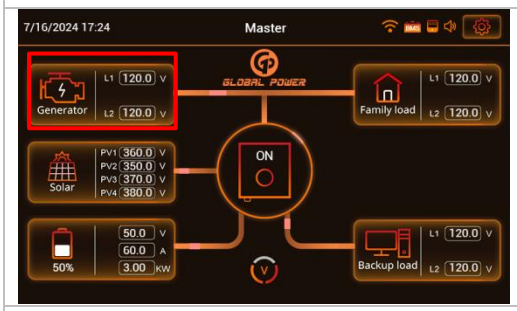
2. The main screen will be divided into the following 6 sections to display the energy flow situation and related data. It uses animations to show the direction of energy flow and clearly indicates the working status of the inverter.

- **Grid/Generator:** indicates grid/generator voltage and grid/generator power in turn.
- **PV(Solar):** indicates PV voltage, PV current and PV power in turn.
- **Battery:** indicates the battery voltage, SOC, current and power in turn.
- **Family load:** indicates output voltage.
- **Backup load:** indicates output voltage, current, and power in turn.
- **System on/off status**

13-2. Main Screen Display and Function Description

Display	Function description
System on/off	
	As shown, this page indicates that inverter is turned off.
	As shown, this page indicates that inverter is turned on.
	No matter it shows "Press to ON" or "ON" icon, simply press it to enter the system turn on/off screen. 1. Control the switch of the inverter. 2. Press ▲▼ to browse inverter information, including the serial number, parallel status, operating mode, DSP version, MCU version, remote version, LCD version, and TP Version. 3. Press "Event" to show even page. 4. Press "Fault" to show Fault code page. 5. Press "⌂" to Back to home screen.
Grid Information	
	When connected to the grid, the grid icon will be highlighted. **Grid icon** indicates grid voltage and power in turn. Click the grid icon to display the detailed parameters of the grid.

Generator Information

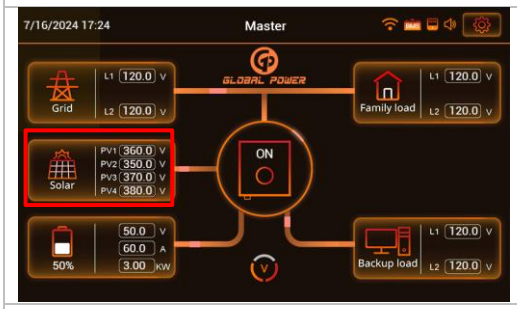


When connected to the generator without connecting to the Grid, the Generator icon will be highlighted.

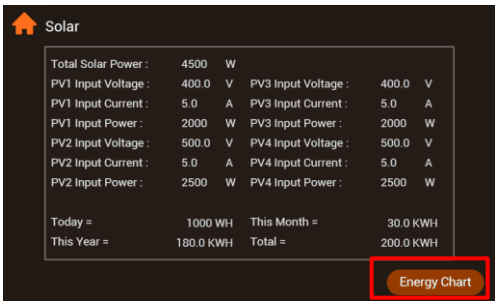
Generator icon indicates grid voltage and power in turn.

(When both the Grid and the Generator are connected, the Grid icon will be displayed.)

PV Information

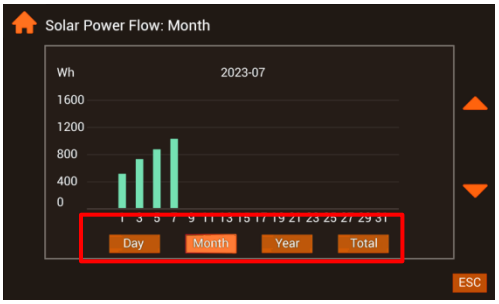


Solar icon indicates PV voltage, PV current and PV power in turn.
Press the solar icon to browse the detailed parameters of the solar.



Solar detail page:
This page indicates total solar power, PV1~PV4 voltage, current, and power.
And this page also shows Solar Panel energy generated today/ this month/ this year/ Solar Panel energy generated totally.

Press "Energy Chart" to view the energy in statistical chart.

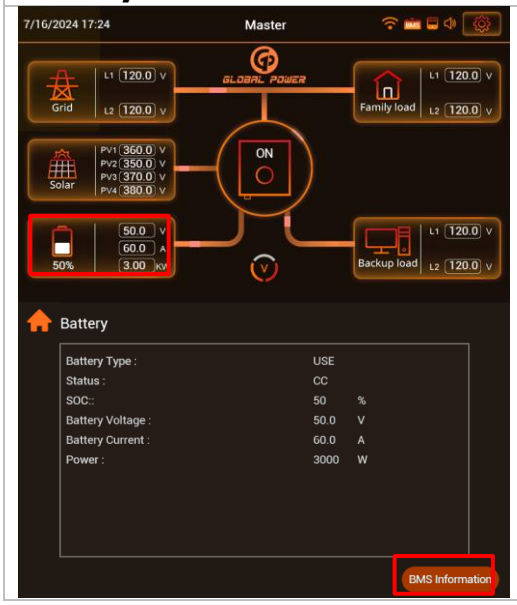


Solar Power Flow page:

Solar power statistic chart for daily, monthly, yearly and total amount can be displayed by pressing corresponding icon.

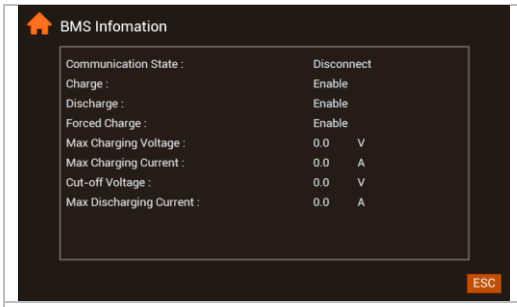
Press "ESC" icon to back to previous page.

Battery Information



Battery icon indicates the battery voltage, SOC, current and power in turn.

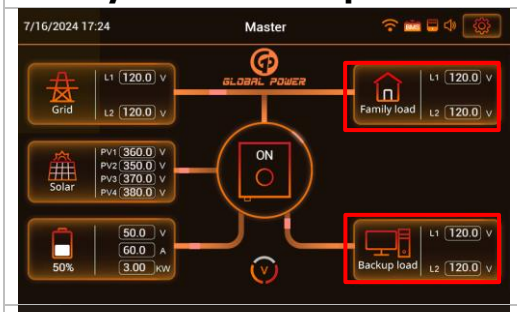
Battery detail page
This page indicates the battery Type, status, SOC, voltage, current and power.



If lithium battery is used, press "BMS Information" to check lithium battery information.

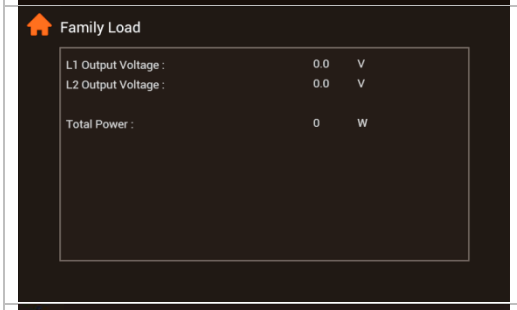
Press "  " icon to return to main screen.
Press "ESC" icon to back to previous page.

Family load & Backup load Information



The load information on the main screen includes two types:

1. Family load icon: indicates output voltage.
2. Backup load icon: indicates output voltage, current, and power in turn.



Family load page

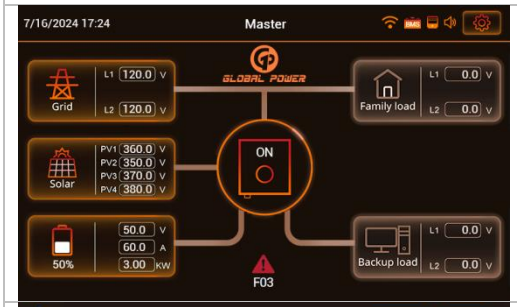
This page displays family load information, showing output voltage for each phase and total power.

Backup load page

This page displays backup load information, including voltage, frequency, percent, current, active power, and apparent power.

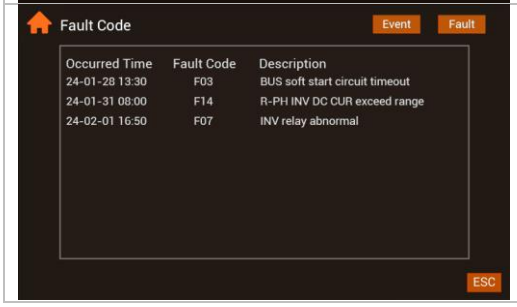
Press  to back to home screen.

Fault /Event code information

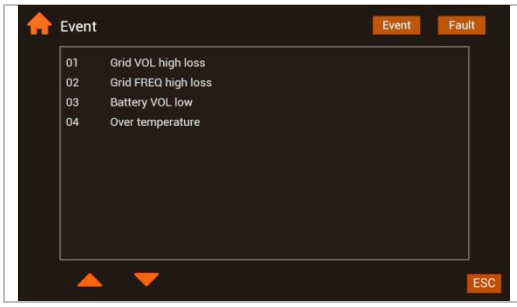


Fault code detail page

If a fault icon is displayed in home screen, tap it to view the inverter's details of fault code.



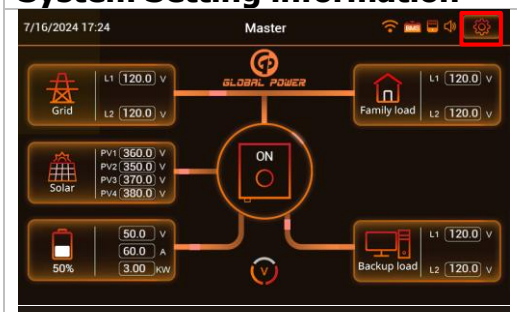
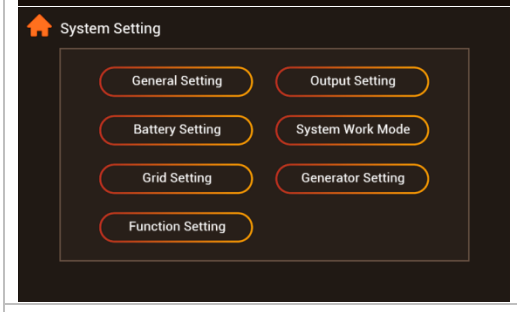
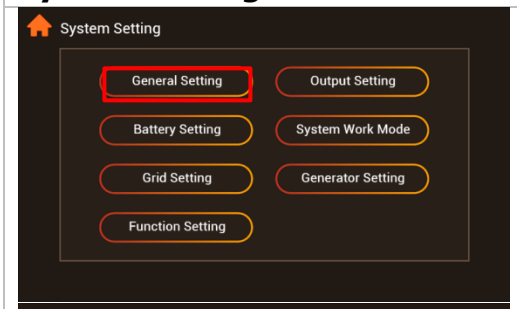
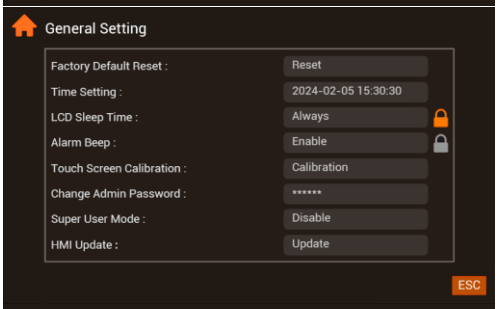
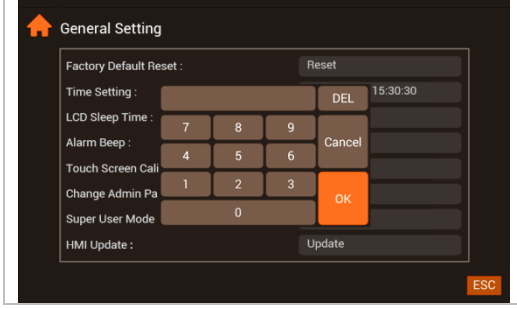
This page shows the fault time, code, and description. Tap the "Event" icon (on either the Fault Code or Inverter page) to view inverter event information.

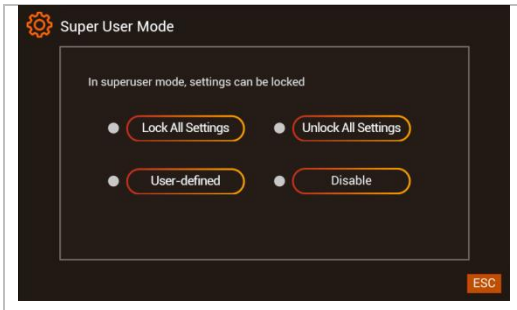


Press "Fault code" to check the fault code.

Press  to back to home screen.

13-3. LCD Setting

Program Description	Function description
System Setting information	
 	Press  icon to enter the system setting menu. System Setting detail page ● General Setting ● Output Setting ● Battery Setting ● System Work Mode ● Grid Setting ● Generator Setting ● Function Setting Press  to back to home screen.
System Setting → General Setting	
  	**Factory Default Reset:** Resets all inverter parameters to factory defaults. **Time Setting:** Sets the system time. **LCD Sleep Time:** ● Always On ● 30 seconds ● 1 minute ● Never **Alarm Control:** ● Enable ● Disable Touchscreen Calibration: Calibrates the touchscreen. Change Admin Password: Changes the password to access Super User Mode setting. Default setting is "0000". **Super User Mode:** ● Lock All Setting: The lock status of all settings has changed to locked. ● Unlock All Setting: The lock status of all settings has changed to unlocked. ● User-defined:The lock status of all settings remains unchanged. Selecting any of the above three settings will enable



the superuser mode.As a Super User, simply click "🔒" or "🔓" to change the lock status of the setting item.

🔒 : This setting is locked,it can't change.

🔓 : This setting is unlocked,it can change.

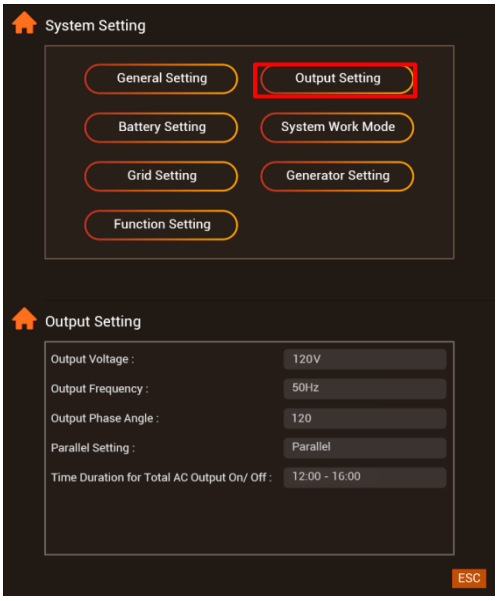
- Disable: It's default setting.Selecting this option will exit the superuser mode.

🔒 :It will display,the setting item can't change.

🔓 :It will not be displayed,the setting item can change.

HMI Update: When you have a new HMI FW, you can initiate the FW update through this option.

System Setting → Output Setting



Output voltage:

- 110Vac
- 120Vac

Output frequency: The frequency is fixed at 60Hz.

Output Phase Angle:

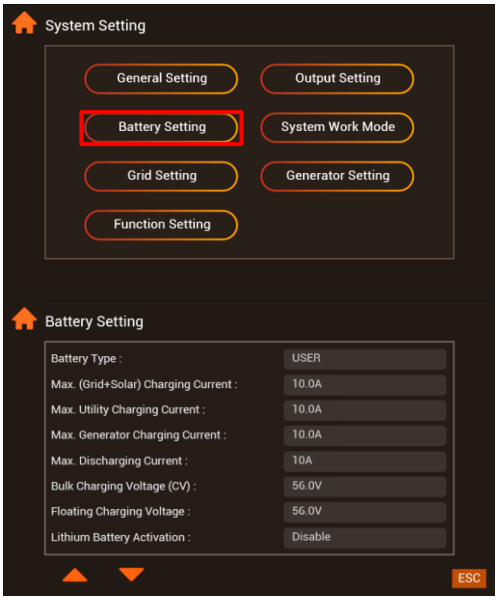
- 120°
- 180°

Parallel Setting:

- Single
- Parallel

Time Duration for Total AC Output on/off: It's to set up the AC output on/off at regular intervals. If "12:00-16:00" is setting, it means AC output on is during 12:00-16:00 every day. Outside of this period, the inverter's AC output is off. The inverter must be manually turned on through "system on/off" setting in LCD while the AC output is set to "OFF".

System Setting → Battery Setting



Battery Type

Battery type: "USER" is applying to lead-acid batteries. The others are lithium battery protocols that need to be selected based on the battery.

Max(AC+Solar) Charging Current:
The setting range is from 10A to 250A.

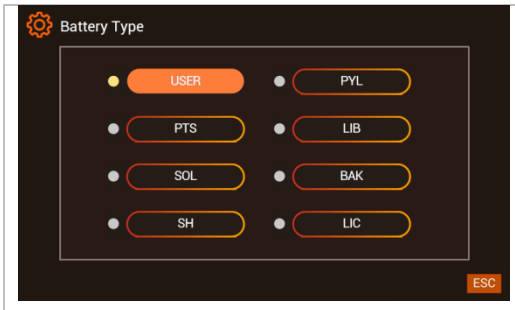
Max. Utility Charging Current:
The setting range is from 10A to 250A.

Max. Generator Charging Current:
The setting range is 10A to 250A.

Max. Discharging Current
The setting range is from 10A to 300A.

Bulk Charge(CV) Voltage:
The setting range is from 48.0V to 60.0V.

Floating Voltage：
The setting range is from 48.0V to 60.0V.



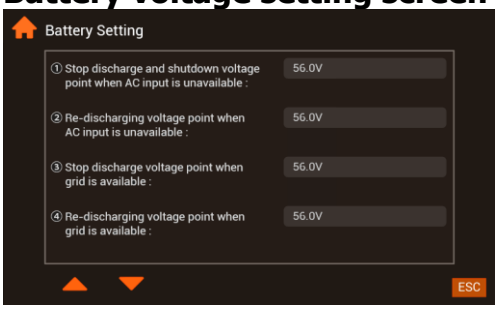
Activate Lithium BAT When Power On:

- Disable
- Enable. If "enabled" selected, the inverter will automatically activate battery terminal when the inverter shuts down due to running out battery power at night.

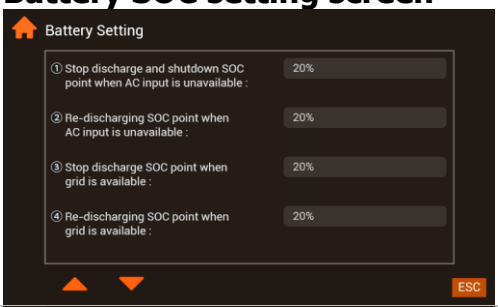
Battery low cut off and Re-discharging setting：

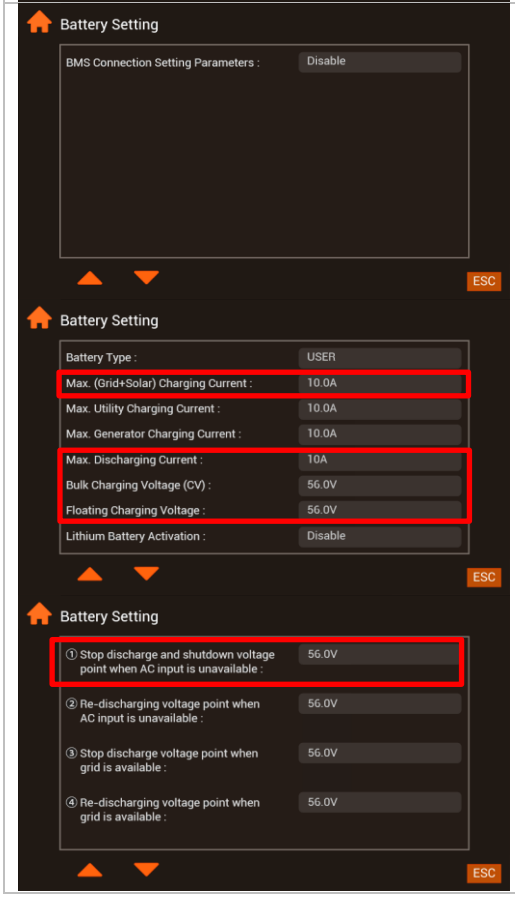
① ② ③ ④: Customize battery low cut off voltage/SOC and Re-discharging voltage/SOC.

Battery voltage setting screen



Battery SOC setting screen

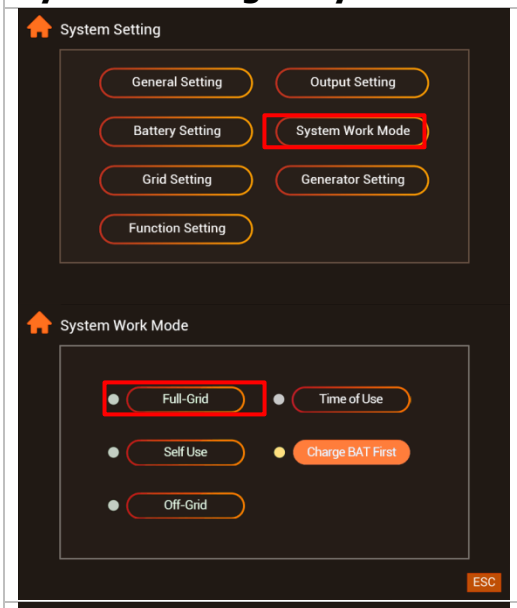




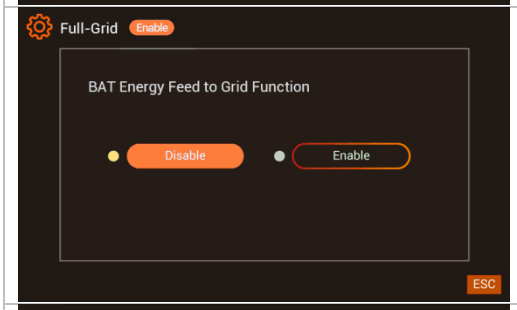
BMS Connection setting parameters:

- **Enable:** If "enabled" is selected, five settings (Max. (grid+solar) charging current, Max. discharging current, Bulk charging voltage, Floating charging voltage, Stop discharge and shutdown voltage point) will be modified by BMS connection from battery.
- **Disable:** If "Disable" is selected, it will choose the lower setting from the user original setting and the parameter value detected from the BMS connection.

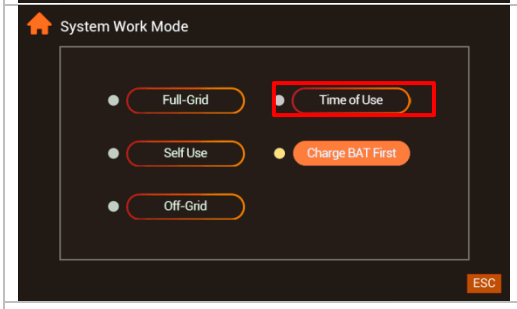
System Setting → System Work Mode



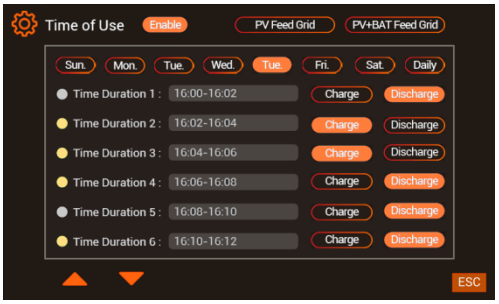
Full-Grid Mode:
All PV energy will supply to the load and feed-in to the grid, and if there is remaining PV power, the battery will be charged.



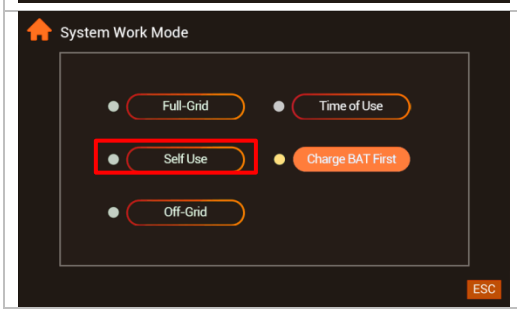
This mode becomes active when the "Enable" indicator is illuminated. To activate it, press "Enable" if it is not already lit. When the 'BAT Energy Feed to Grid Function' is enabled, the battery will supply power to the grid when PV energy is insufficient.



TOU (Time of Use) mode:
The battery discharge to load or AC charging duration can be customized by the user.

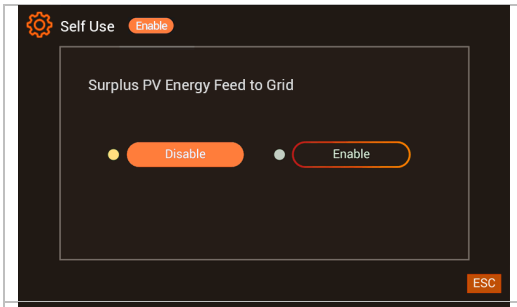


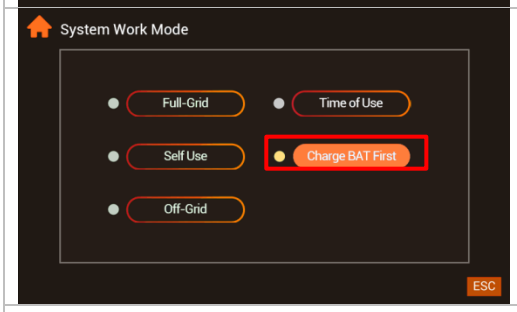
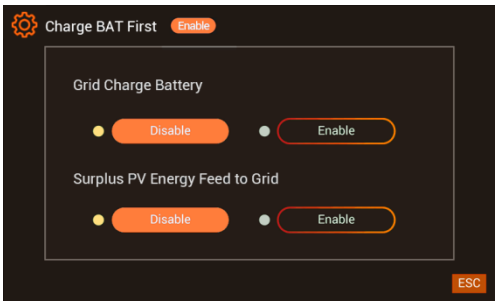
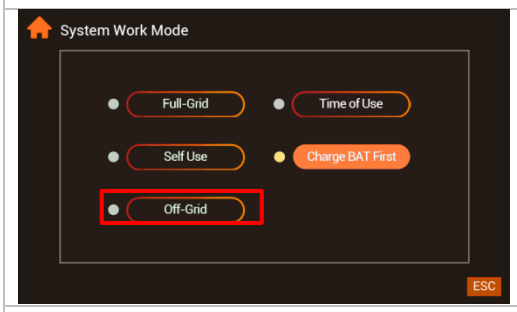
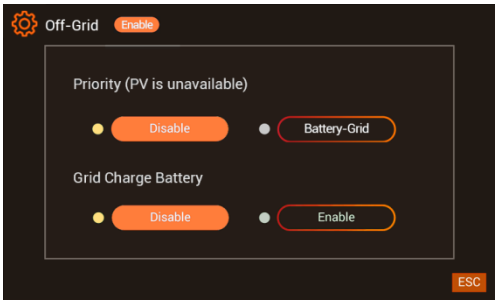
The mode is active when 'Enable' icon is lit up. Press 'Enable' icon to activate it if it is off. When 'Feed Grid' is illuminated, excess PV energy is supplied to the grid.
The daily schedule supports six configurable periods. Each period can be set for either battery discharge to the load or AC charging. When periods overlap, AC charging is prioritized. Pressing 'Daily' replicates the day's schedule across all days.



Self-Use mode:
The duration for battery discharge to the load or for AC charging can be customized.

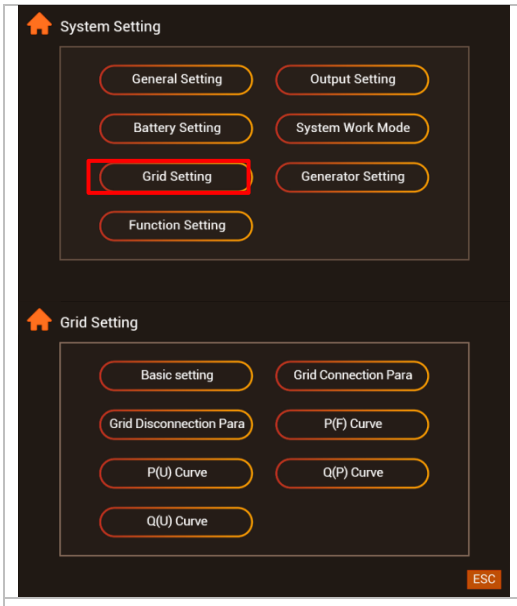
* For instructions on operating and using the meter, please refer to Appendix II and the corresponding manual.

<table>
<tr><td> 
</td><td>The mode is active when "Enable" is lit; press "Enable" to activate it if it's off.

Surplus PV Energy Feed to Grid
Excess PV energy is supplied to the grid only when this function is enabled.</td></tr>
<tr><td> 
</td><td>Charge BAT(Battery) First:
If selected, all PV energy will only charge the battery. If there is remaining PV power, it will supply power to the load.</td></tr>
<tr><td> 
</td><td>The mode is active when "Enable" is lit; click "Enable" to activate it if it's off.
Grid charge battery:
● Enable: If PV power is sufficient, the grid will charge the battery and supply power to the load.
● Disable: The system prioritizes utilizing PV power to first charge the battery, and subsequently to power the connected load. If the PV power is insufficient to meet the load's demand, the system automatically draws power from the grid to supply the load; under these circumstances, grid power is never used to charge the battery.
Surplus PV Energy Feed to Grid:
With this function enabled, excess PV energy is fed back to the grid.</td></tr>
<tr><td> 
</td><td>Off-Grid:
In Off-Grid mode, the inverter the inverter is configured to completely block the export of energy back to the grid.</td></tr>
<tr><td> 
</td><td>The mode is active when "Enable" is lit; press "Enable" to activate it if it's off.

Priority (PV is unavailable):
It is the load energy source priority.
When PV is normal, it will be solar-battery-grid.

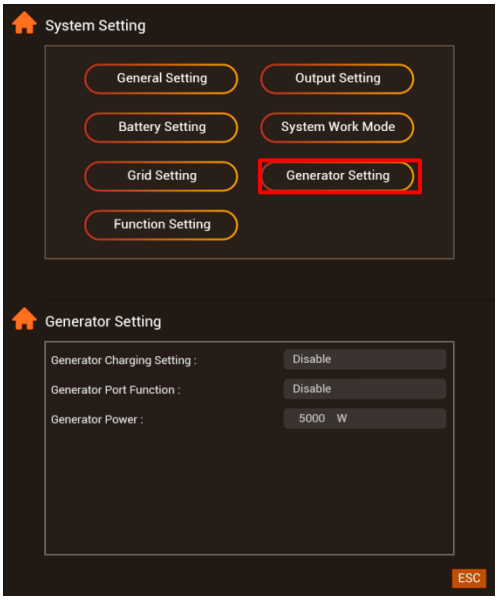
Grid charge battery:
If “Enable” is selected, the battery should be charged from the grid in the event of PV power loss.</td></tr>
<tr><td colspan="2">System Setting → Grid Setting</td></tr>
</table>



Grid Setting page
This page allows you to configure grid-related parameters, including mandatory settings required for regulatory compliance.

CAUTION!
This interface is only allowed to be modified by technicians. Incorrect settings could result in system malfunction or failure.

System Setting → Generator Setting

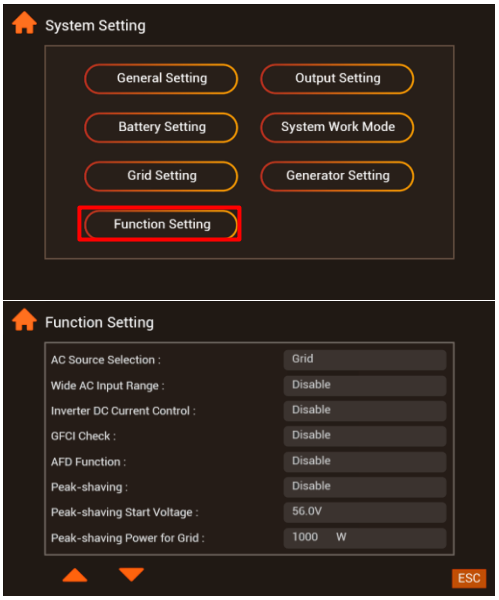


Generator Port Function
- **Disable:** The port will not be used.
- **Enable:** If selected, the inverter will use the generator as power source.

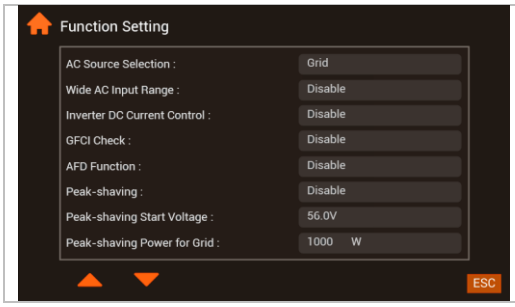
Generator Charging Setting
- **Disable:** If selected, the generator will NOT charge the battery.
- **Enable:** If selected, the generator will charge the battery. The charging power will be dynamically adjusted according to the load power, maintaining the generator power at the setting value.

Generator power:
Setting the maximum generator power. If ”peak shaving power function” is enabled under Function Setting menu, it will keep the generator power at setting value.

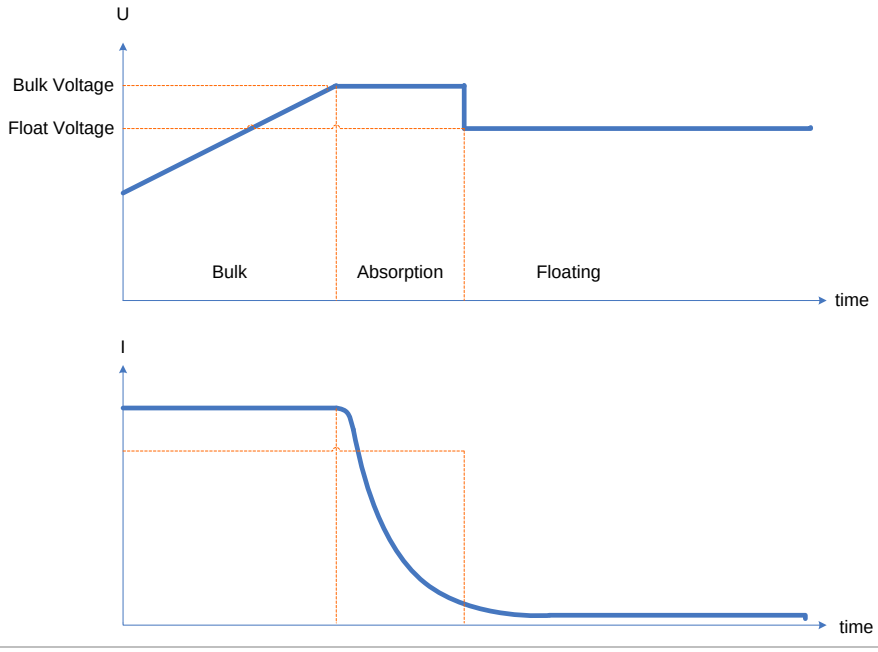
System Setting → Function Setting



AC Source Selection: Grid, Generator
Wide AC Input Range: Enable, Disable
Inverter DC Current Control: Enable, Disable
GFCI Check: Enable, disable
AFD Function: Enable, disable
Peak-shaving: Enable, disable
Peak-shaving start voltage/SOC:
When the battery is in the allowable discharge condition and the voltage/SOC is lower than this point, it will enter the peak-saving mode.
Peak-shaving Power for grid: The maximum power under the peak-saving mode while the grid exists.
Peripheral: It is only available for self-use mode. If you are using the meter, you can select "none". If you are using CT, you need to choose the corresponding specification.
Modbus ID: It’s to define inverter itself with RS485 monitoring. It’s requested to define each inverter with

	unique ID. The setting range is from 1 to 255.

14. Charging Management

Charging Parameter	Default Value	Note
Charging current	60A	It can be adjusted via software from 1Amp to 250Amp.
Floating charging voltage (default)	54.0 Vdc	It can be adjusted via software from 48Vac to 60Vdc.
Max. absorption charging voltage (default)	56.0 Vdc	It can be adjusted via software from 48Vac to 60Vdc.
Battery overcharge protection	62.0 Vdc	
Charging process based on default setting. **3 stages:** **First –CC:** max. charging voltage increases to 56V; **Second-CV:** charging voltage will maintain at 56V until charging current is down to 12 Amp; **Third-Float:** go to floating charging at 54V.		

This inverter can connect to battery types of sealed lead acid battery, vented battery, gel battery and lithium battery. The detail installation and maintenance explanations of the external battery pack are provided in the manufacturer's external battery pack of manual.
If using sealed lead acid battery, please set up the max. charging current according to below formula:

The Max. charging current = Battery capacity (Ah) x 0.2

For example, if you are using 300 Ah battery, then, Max. charging current is 300 x 0.2=60 (A). Please use at least 50Ah battery because the settable minimum value of charging current is 10A. If using AGM/Gel or other types of battery, please consult with installer for the details.

15. Maintenance & Cleaning

Check the following points to ensure proper operation of whole solar system at regular intervals.

- Ensure all connectors of this inverter are cleaned all the time.
- Before cleaning the solar panels, be sure to turn off PV DC breakers.
- Clean the solar panels, during the cool time of the day, whenever it is visibly dirty.
- Periodically inspect the system to make sure that all wires and supports are securely fastened in place.

> ⚠ **WARNING! There are no user-replaceable parts inside of the inverter. Do not attempt to service the unit yourself.**

Battery Maintenance

- Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- When replacing batteries, replace them with the same type and number of batteries or battery packs.
- The following precautions should be observed when working on batteries:
  a) Remove watches, rings, or other metal objects.
  b) Use tools with insulated handles.
  c) Wear rubber gloves and boots.
  d) Do not lay tools or metal parts on top of batteries.
  e) Disconnect charging source prior to connecting or disconnecting battery terminals.
  f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

> **CAUTION!** A battery can present a risk of electrical shock and high short-circuit current.
> ⚠ **CAUTION!** Do not dispose of batteries in a fire. The batteries may explode.
> **CAUTION!** Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

16. Trouble Shooting

When there is no information displayed in the HMI, please check if PV module/battery/grid connection is correctly connected.
NOTE: The warning and fault information can be recorded by remote monitoring software.

16-1. Event List

There are 20 situations defined as warnings. We can check the warning code on the "Main screen-Inverter Menu-Event" page. If there are several codes, it will display in sequences. Please contact your installer when you can't handle the warning situations.

Event	Description
Line voltage high loss	Grid voltage is too high.
Line voltage low loss	Grid voltage is too low.
Line frequency high loss	Grid frequency is too high.
Line frequency low loss	Grid frequency is too low.
Island detect	Island operation is detected.
Line waveform loss	The waveform of grid is not suitable for inverter.
Line phase loss	The phase of grid is not in right sequence.
Overload	Load exceeds rating value.
Over temperature	The temperature is too high inside.
Batter voltage low	Battery discharges to low alarm point.
Battery under-voltage when grid is loss	Battery discharges to shutdown point.
Battery open	Battery is unconnected or too low.
Battery under-voltage when grid is OK	Battery stops discharging when the grid is OK.
Solar over voltage	PV voltage is too high.
Rapid shutdown trigger	Rapid shutdown trigger

16-2. Fault Reference Codes

When a fault occurs, an error icon will be displayed, and the buzzer will sound continuously. See below for fault codes for reference.

Situation			Solution
Fault Code	**Fault Event**	**Possible Cause**	
01	Bus voltage over	Surge	1. Restart the inverter. 2. If the error message still remains, please contact your installer.
02	BUS voltage under	PV or battery disconnect suddenly	1. Restart the inverter 2. If the error message still remains, please contact your installer.
03	BUS soft start time out	Internal components failed.	Please contact your installer.
04	INV soft start time out	Internal components failed.	Please contact your installer.
05	INV over current	Surge	1. Restart the inverter. 2. If the error message still remains, please

			contact your installer.
06	Over temperature	Internal temperature is too high.	1. Check the ambient temperature and fans. 2. If the error message still remains, please contact your installer.
07	Relay fault	Internal components failed.	Please contact your installer.
08	CT sensor fault	Internal components failed.	Please contact your installer.
09	Solar input power abnormal	1. Solar input power is too much. 2. Solar input driver damaged.	1. Please check if solar input power 2. Please contact your installer.
11	Solar over current	Surge	1. Restart the inverter. 2. If the error message still remains, please contact your installer.
12	GFCI fault	Leakage current exceeds the limit.	1. Check the wire and panels which may cause the leakage. 2. If the error message still remains, please contact your installer.
13	PV ISO fault	The resistance between PV and ground is too low.	
14	INV DC current over	Utility fluctuates.	1. Restart the inverter. 2. If the error message still remains, please contact your installer.
16	GFCI sensor fault	GFCI sensor failed.	Please contact your installer.
22	Battery high voltage fault	Battery voltage exceeds the limit.	1. Check the battery voltage. 2. If the error message still remains, please contact your installer.
23	Overload	The inverter is loaded with more than 110% load and time is up.	Reduced the connected load by switching off some equipment.
26	INV short	Output short circuited.	Check if wiring is connected well and remove abnormal load.
32	DC/DC over current	Internal components failed.	1. Restart the inverter. 2. If the error message still remains, please contact your installer.
33	INV voltage low	Internal components failed.	Please contact your installer.
34	INV voltage high	Internal components failed.	Please contact your installer.
38	Short circuit on PV input	Short circuited on PV input	Please contact your installer.
39	AFD sensor fault	AFD command is loss	Check AFD board
40	AFD fault	AFD is checked	Check solar panels
47	inverter phase short circuit	Short circuited on phase	Check if all wiring is connected well and remove abnormal loads.
60	Power feedback protection	Power feedback	1. Restart the inverter 2. Check the output voltage of each inverter 3. Check the parallel connection

71	Different parallel versions in parallel systems	Different parallel versions in parallel systems	Please contact your installer.
72	Current sharing error in parallel system	Current sharing error in parallel system	Please check if the current sharing line is connected correctly
80	CAN loss	Parallel Can communication failure	Please check if the parallel communication line is connected correctly
81	Parallel host Line Loss	Parallel host Line Loss	Please check if the mains connection of the host is normal
82	Parallel host synchronization signal loss	Parallel host synchronization signal loss	Please check if the parallel communication line is connected correctly
88	Bus Balance Over current	Bus Balance overcurrent	Please contact your installer.
89	Balance line damage	Balance line damage	Please contact your installer.

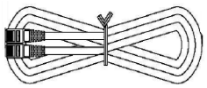
Appendix I: Parallel Installation Guide

Introduction

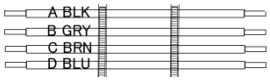
This inverter can be used in parallel with Max. 6 units.

Parallel cable

You will find the following items in the package:

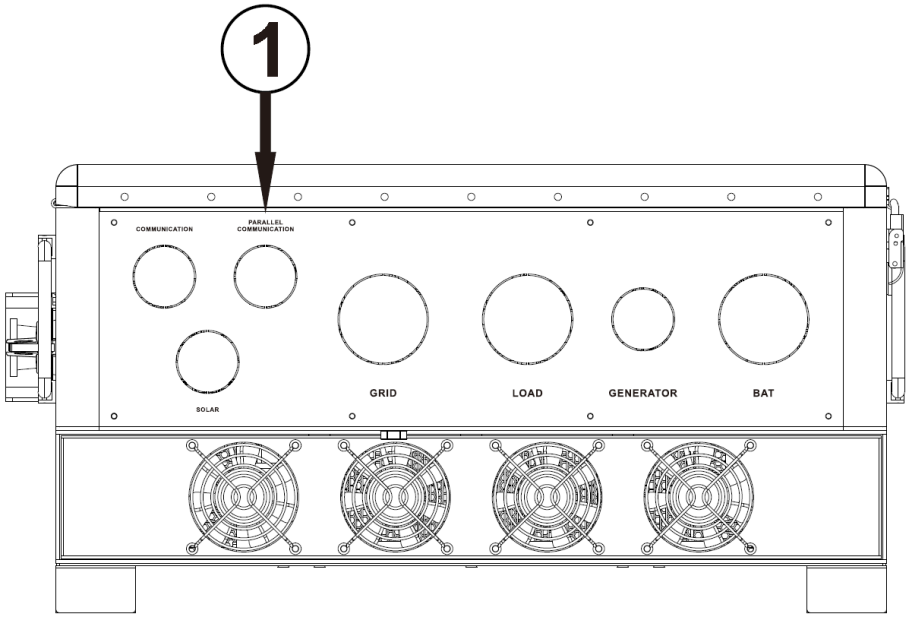


Parallel communication cable



Current sharing wires

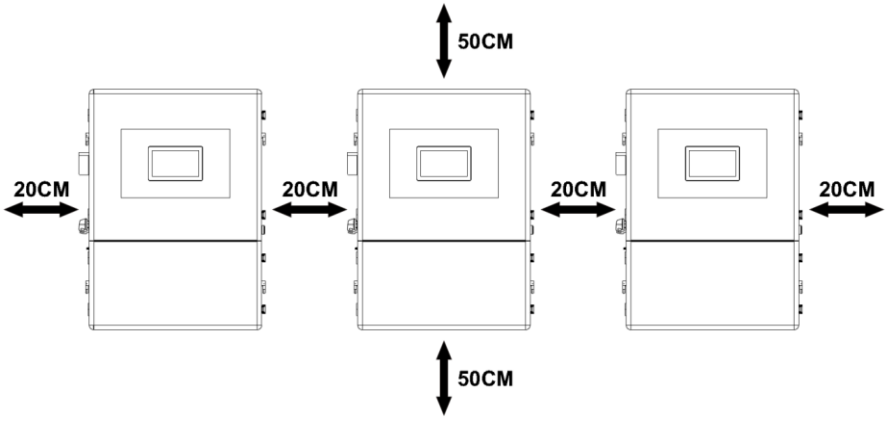
Overview



1. Parallel communication port

Mounting the Unit

When installing multiple units, please follow below chart.



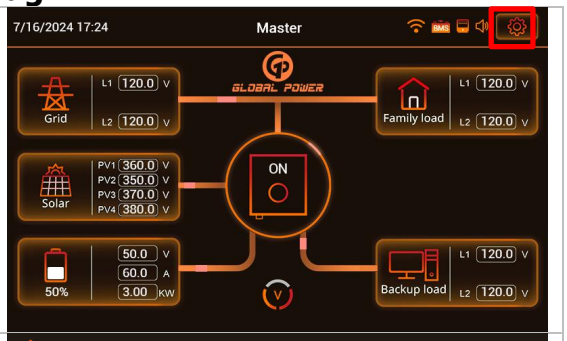
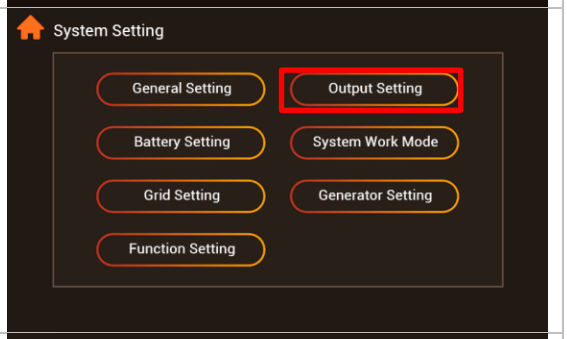
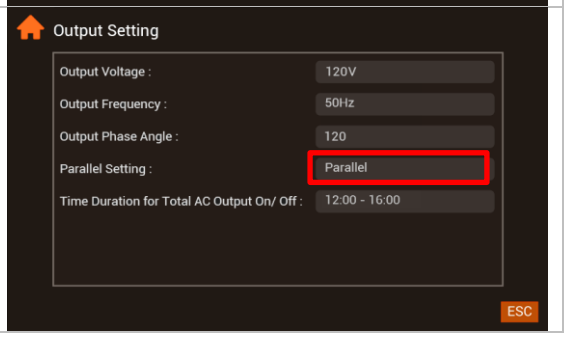
NOTE: For proper air circulation to dissipate heat, it's necessary to allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit. Be sure to install each unit in the same level.

CAUTION! Please follow the battery charging current and voltage from battery spec to choose the suitable battery. The wrong charging parameters will reduce the battery lifecycle sharply.
CAUTION! Each inverter should connect to PV modules separately.

Parallel Function Setting and LCD Display

Parallel functionality is configurable via HMI.

Parallel Function Setting Through HMI

Step 1	
Step 2	
Step 3	

Commissioning

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 wire of each unit is connected together.

Step 2: Power on each unit and set "enable parallel for output" on software or HMI.
Step 3: Confirm that all inverters are displaying normally (one is the "master" and the others are" slave"). If it is not normal, please check the parallel communication cable.
Step 4: If the system is not powered on using a battery, please turn off all units.
Step 5: Turn on each inverter by battery, and press the power-on button to confirm that all inverters are in battery mode.
Step 6: Please switch on all breakers of Line wires in AC input side.
Step 7: Please switch on all breakers of Line wires in PV side.
Step 8: Please switch on all breakers of Line wires in load side. If a fault code appears, please check the wiring.
Step 9: If there is no fault, the parallel system is completely installed.

Appendix II: Self-use-mode Operation Guide

With a meter/CT connected, the solar inverter can be easily integrated into the existing household system. It's to arrange self-consumption via a meter to control power generation and battery charging of the inverter.

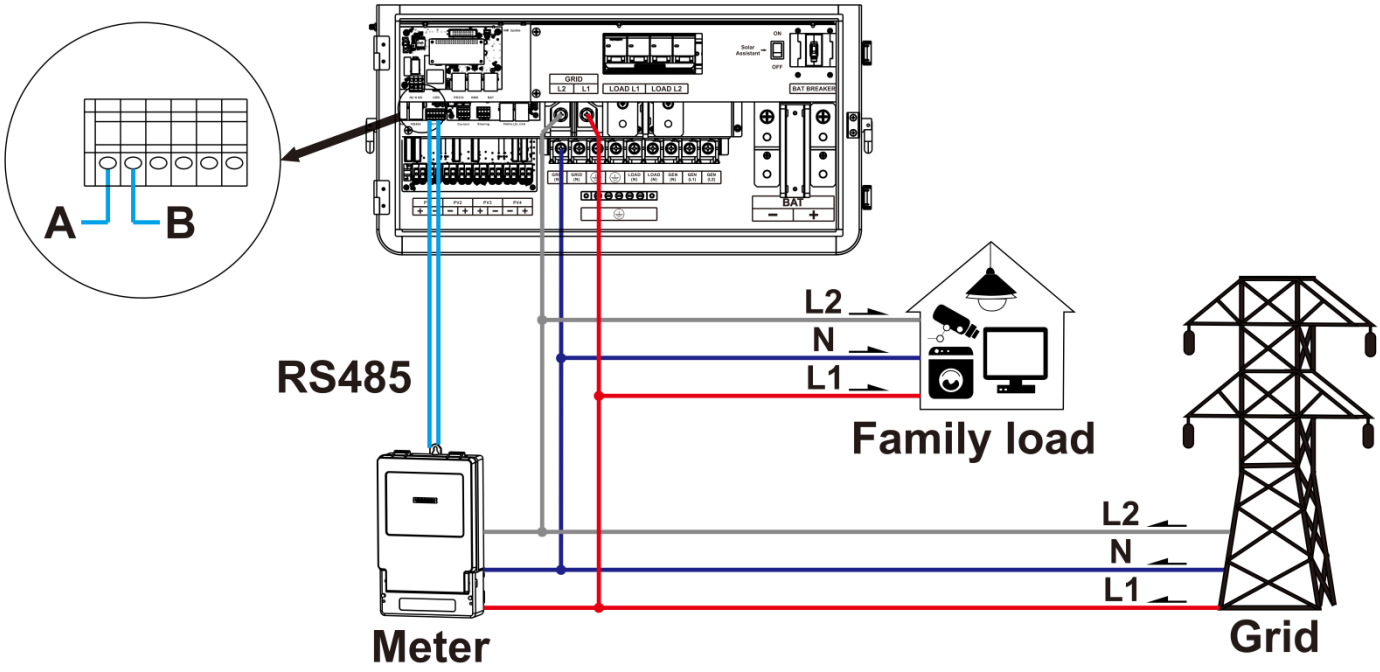
Install the connection

Power off the inverter and connect the meter according to the wiring diagram below.

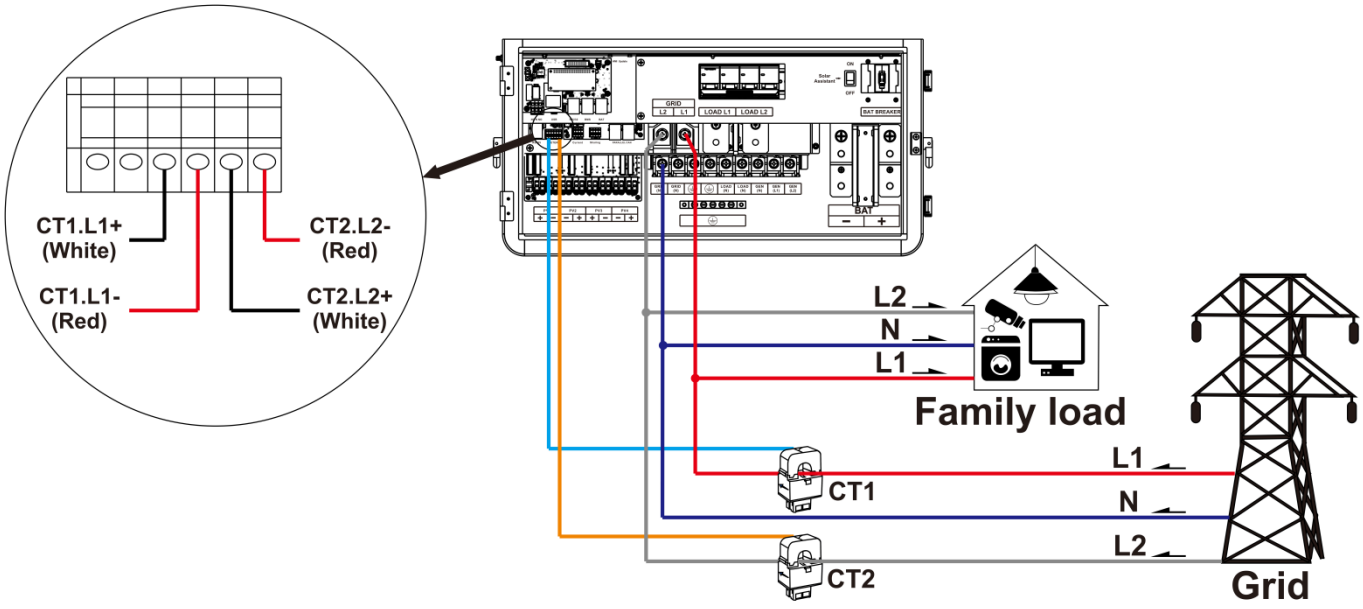
Note：If the system is more than one inverter connected in parallel, please follow the parallel operation instructions to complete the parallel system. One system only need connected one meter or CT.

For self-use, if your load is connected to the grid side, there are two options available for selection:

1.The RS485 communication line of the meter is connected to the communication board if you select meter ,as shown in the following figure.

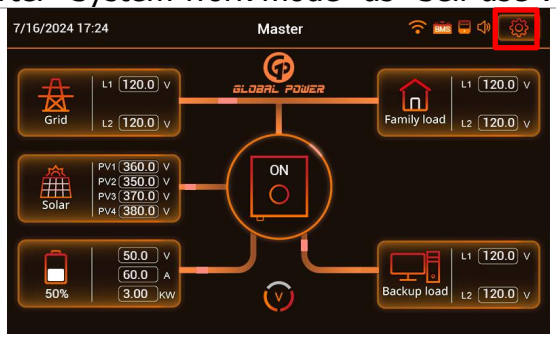
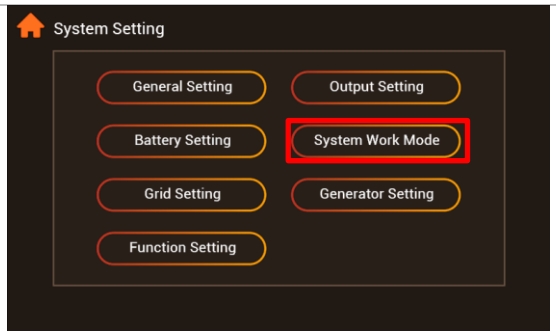
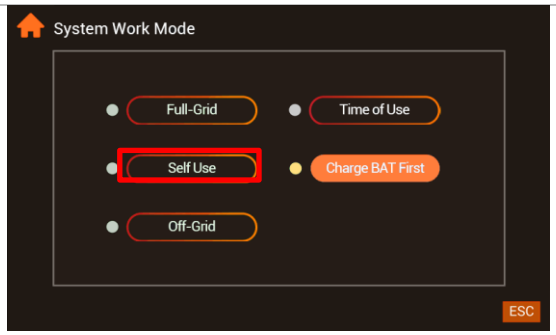
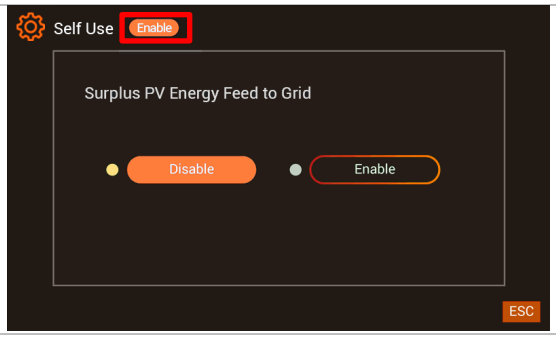


2.The line of the CT is connected to the communication board if you sleet CT, as shown in the following figure.

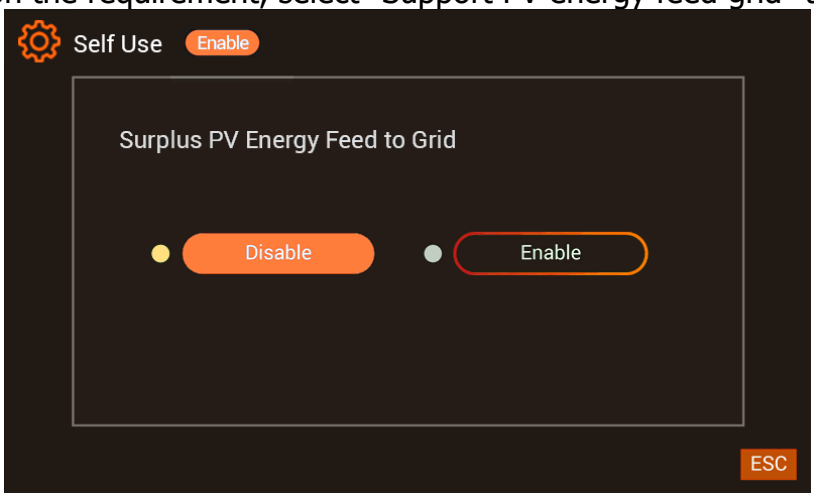


Inverter configuration

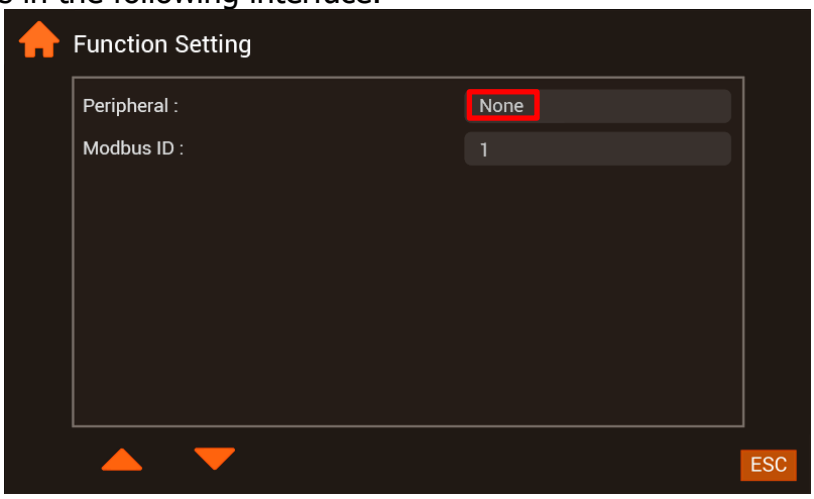
1. Please set each inverter "System work mode" as "Self use".

Step 1	
Step 2	
Step 3	
Step 4	

2. Depending on the requirement, select "Support PV energy feed grid" to enable or disable.



3. If you no family load, please ignore this step. If you choose CT, please set the CT specifications in the following interface.

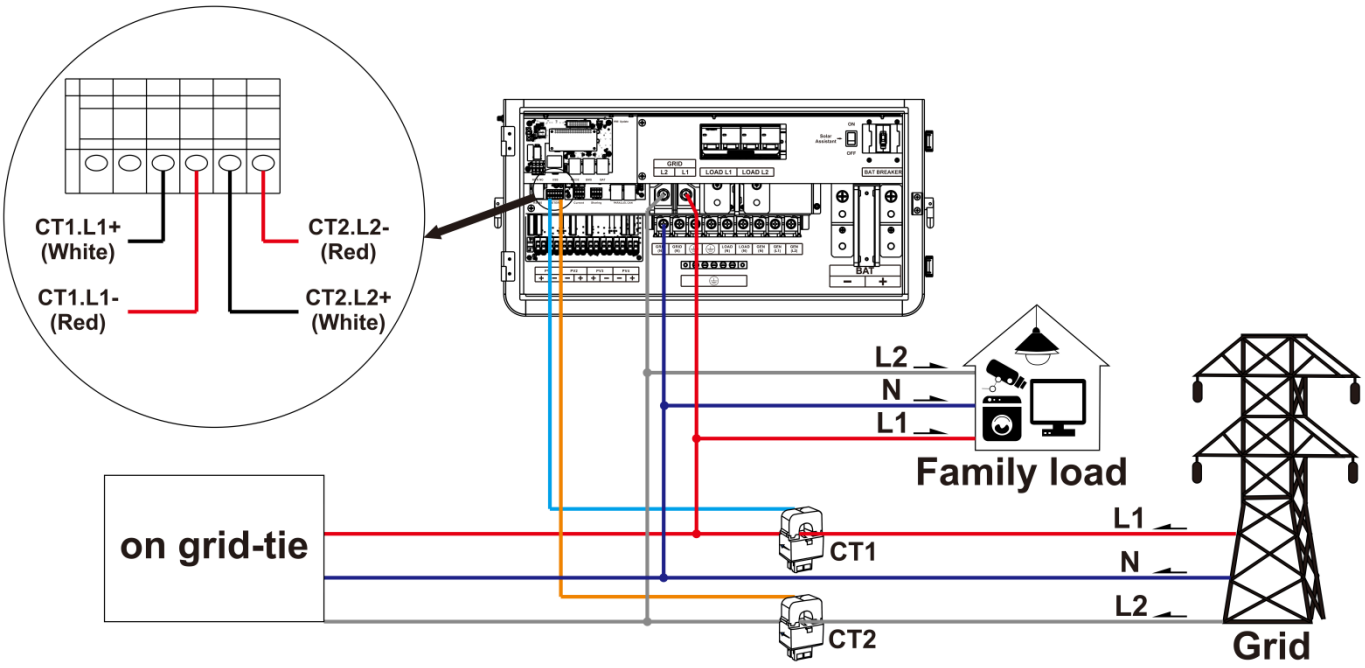


For the selection of settings and the configuration of CT, we have the following suggestions for your reference.

parallel number	current/power	CT Spec (Range/Scale)	setting(Peripheral)
1	63A/15KW	100A 1000:1	100A
2-3	188A/45KW	200A 2000:1	200A
4	250A/60KW	300A 3000:1	300A
5-6	375A/90KW	400A 4000:1	400A
	more than	500A 5000:1	500A

Appendix III: AC Coupling Wiring and Operation

The composition architecture of the AC coupling system is as follows. It is an application of self-generation and self-use. The electrical energy generated by the photovoltaic inverter will be fed back to the grid. The WP LV 15KW will detect the power on the grid side through the meter or CT, store as much energy as possible in the battery, and the remaining energy will be fed back to the grid. In the event of a power outage in the grid, the WP LV 15KW will quickly disconnect from the grid to prevent the islanding effect, and simultaneously simulate the grid waveform to ensure that the backup load can continue to operate.



Appendix IV: The Wi-Fi Operation Guide

Brief Introduction

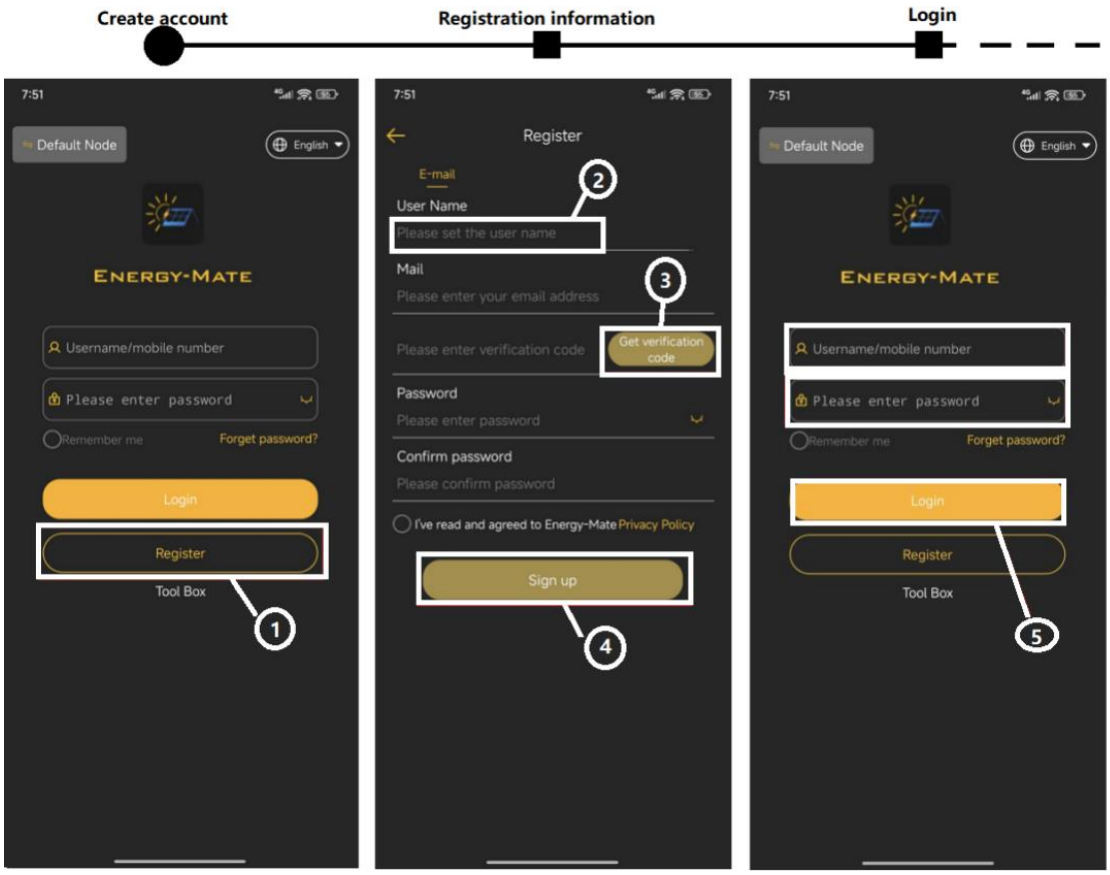
"Energy-Mate" is an intelligent software developed specifically for remote management and monitoring of inverters, aiming to provide users with comprehensive, real-time operating status monitoring and remote control of inverters.

Download Methods

The download method for Android users is to search for "Energy-Mate" on Google Play or scan the QR code to download; The download method for iOS users is to search for "Energy-Mate" on the App Store or scan the QR code to download.

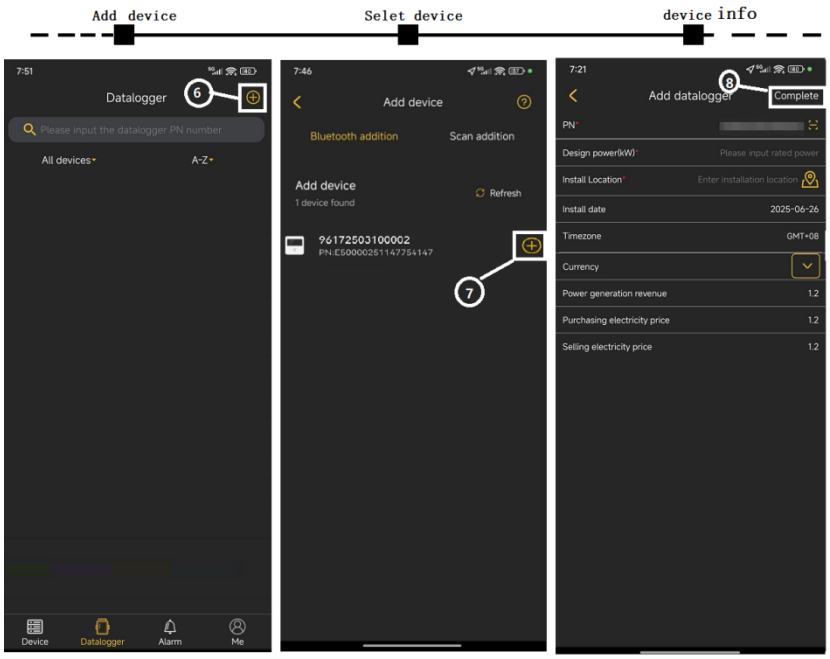
Energy-Mate

Registration account and Login



Add Datalogger

Enter the "Datalogger" list interface and click the icon in the upper right corner.
After scanning the nearby Bluetooth, find the SN number of the device.

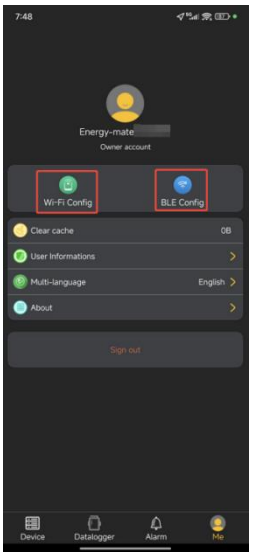
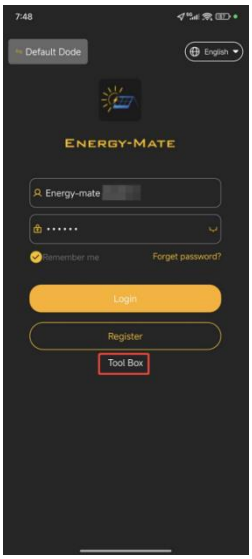
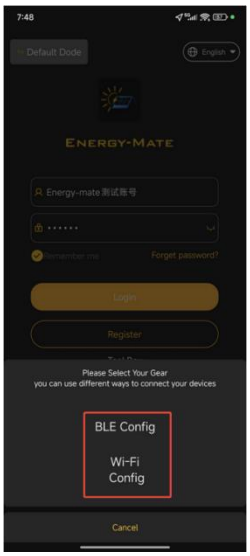


Note: find the SN number of the device for the "select device"

Datalogger Distribution Network

The APP supports two types of networking modes, and users can choose according to their Datalogger models:

- Use with Bluetooth module: Bluetooth networking
- Use without Bluetooth module: Wi-Fi networking

Configure interface 1	Configure interface 2
	 

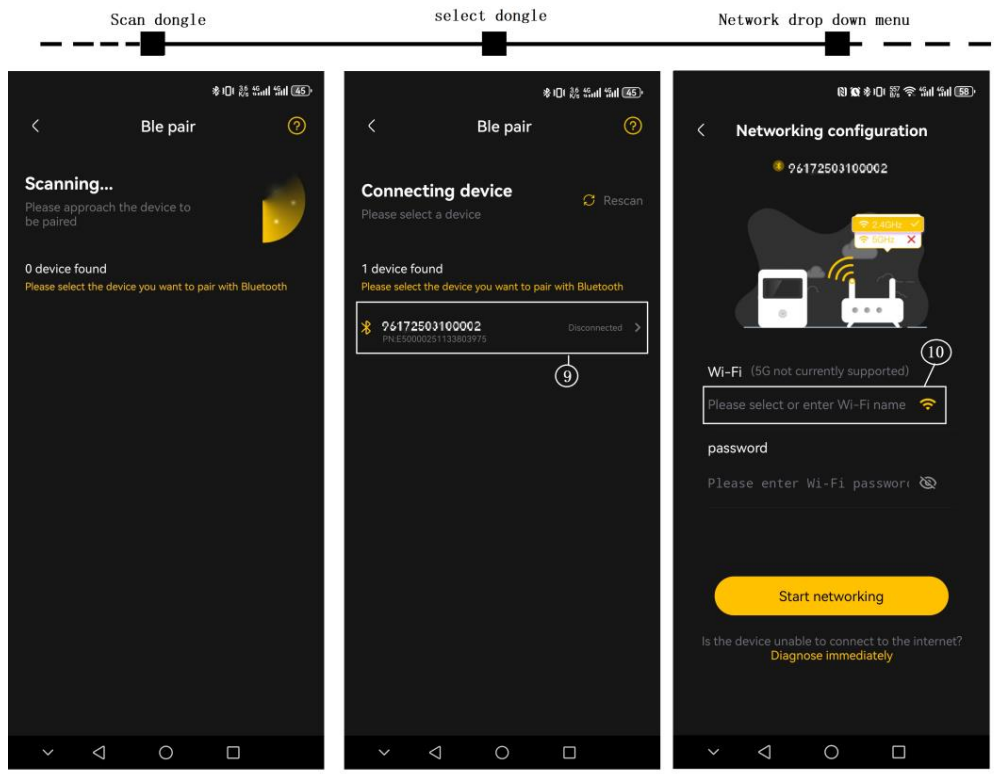
Note: You can choose Configure interface 2 for network distribution without registering an account.

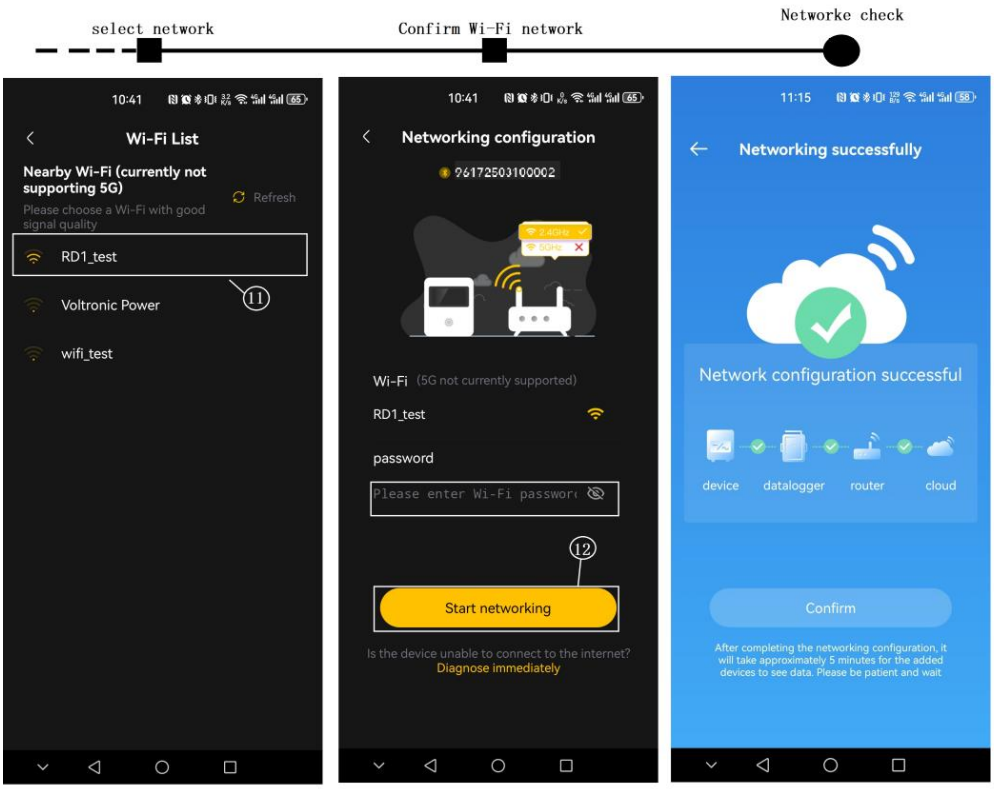
1. the router does not support 5G band. Please use the router with 2.4G band.
2. Make sure the router password is correct.
3. Check the distribution network results.
4. If the network is successfully configured, you can see the device data in about 5 minutes.
5. If the network configuration fails, troubleshoot the problem according to the actual page repair suggestions.

Bluetooth distribution network

● Bluetooth pairing (Bluetooth networking): The APP scans the nearby Bluetooth device (make sure your phone is turned on "Bluetooth"), and then selects the Bluetooth device with the name PN number and clicks to connect.

● Enter the name and password of the router you want to connect to, or click the signal icon to view the best router in your nearby network for connection.

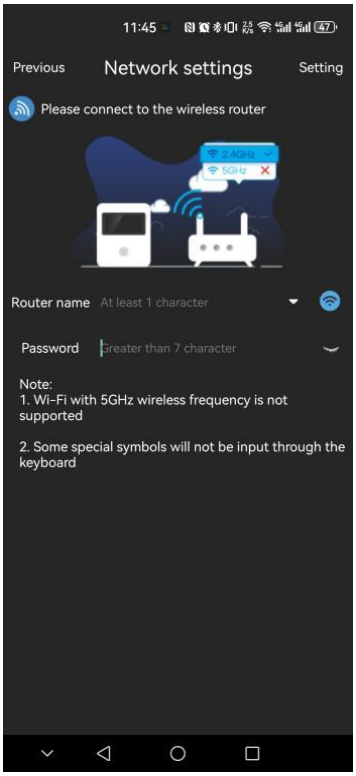


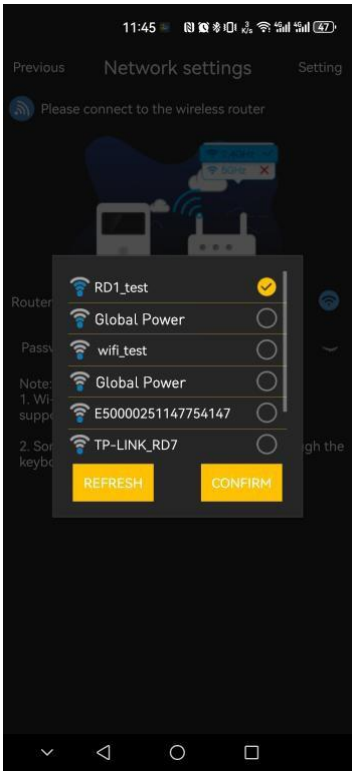


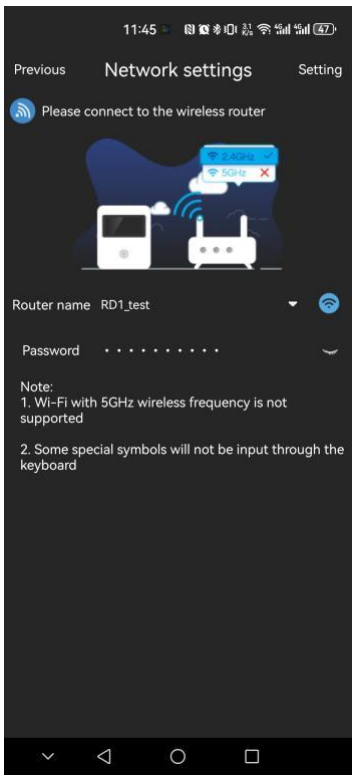
Wi-Fi distribution network

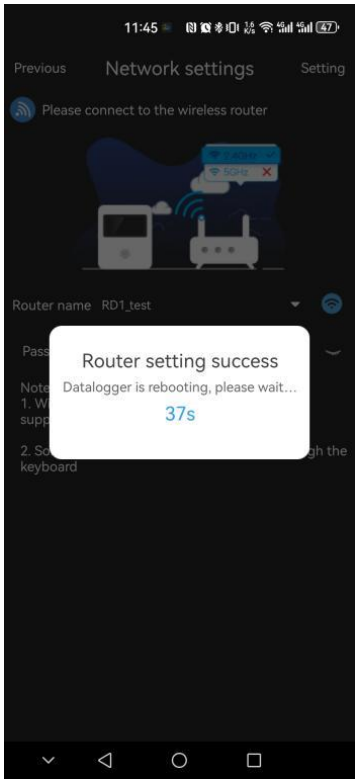
1. On your Smart Phone or Computer go to: Settings → Wi-Fi → Select the E50##### network → Password= 12345678
2. Open the APP →Me→ Wi-Fi config →Network settings
3. Select Home network and input personal credentials.
4. Click "setting" to save your information.
5. On your Smart Phone or Computer go to: Settings → Wi-Fi → Select the E50##### network → Password= 12345678
6. Click "Diagnose" to check the network connection.

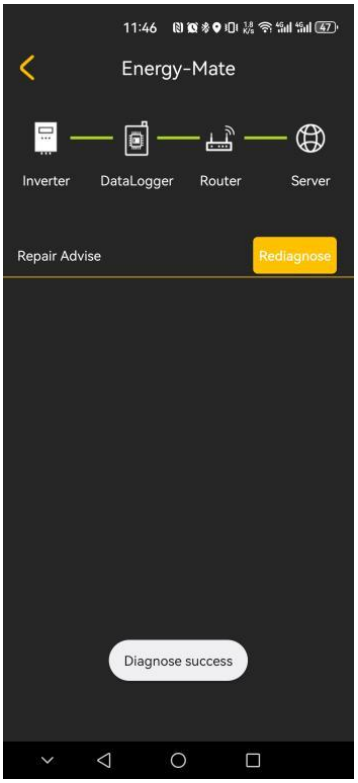

11:45
Energy-Mate
E50000251133803975
Connect ready
Please choose a Wi-Fi datalogger and connect
Wi-Fi datalogger list
Please enter the Wi-Fi list interface of the mobile phone to select the datalogger to be connected, click on the system connection
Network settings
Diagnose
Connect
System info
System settings


11:45
Previous
Network settings
Setting
Please connect to the wireless router
Router name At least 1 character
Password Greater than 7 character
Note:
1. Wi-Fi with 5GHz wireless frequency is not supported
2. Some special symbols will not be input through the keyboard


11:45
Previous
Network settings
Setting
Please connect to the wireless router
RD1_test
Global Power
wifi_test
Global Power
E50000251147754147
TP-LINK_RD7
REFRESH
CONFIRM


11:45
Previous
Network settings
Setting
Please connect to the wireless router
Router name RD1_test
Password
Note:
1. Wi-Fi with 5GHz wireless frequency is not supported
2. Some special symbols will not be input through the keyboard


11:45
Previous
Network settings
Setting
Please connect to the wireless router
Router name RD1_test
Router setting success
Datalogger is rebooting, please wait...
37s

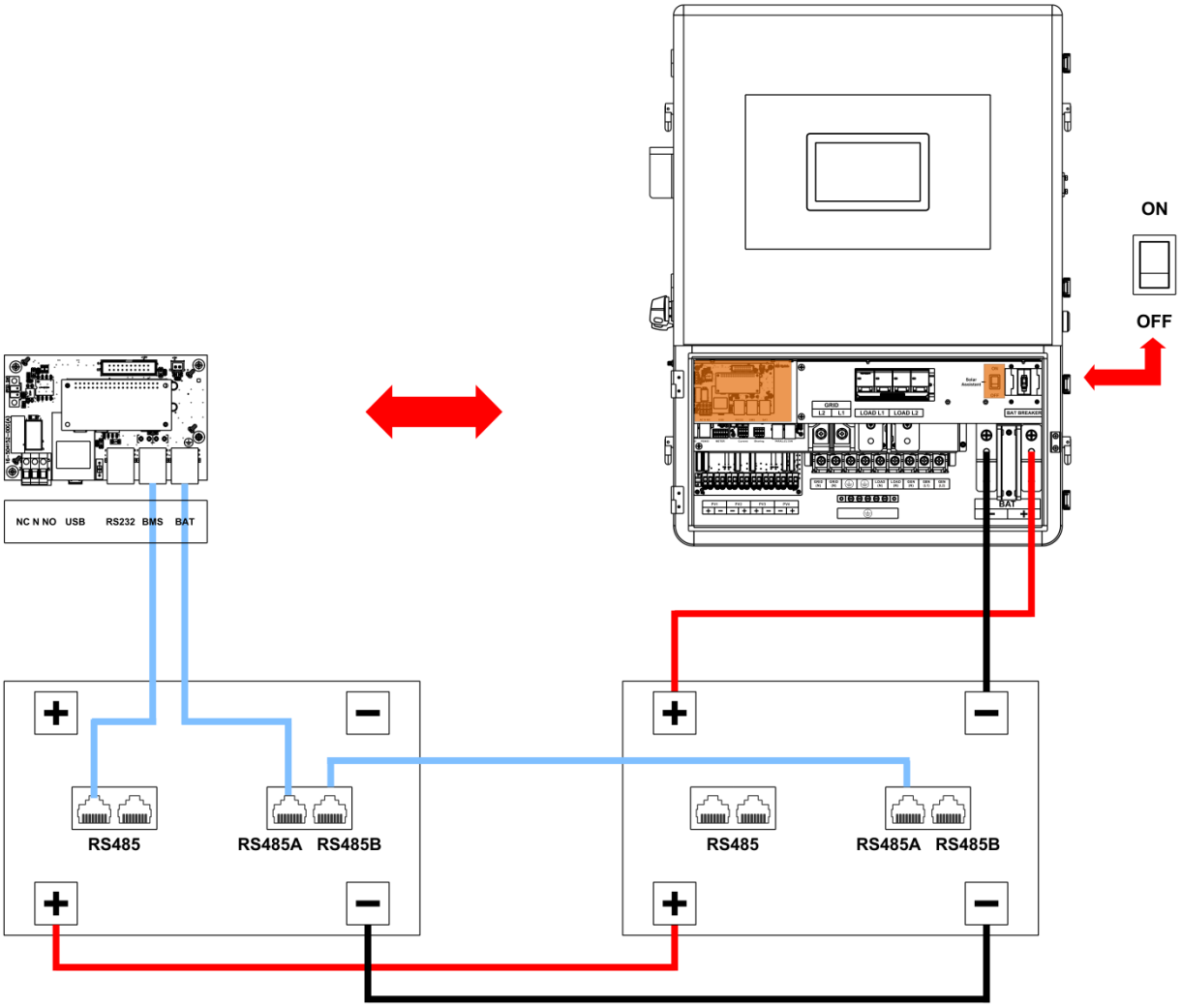

11:46
Energy-Mate
Inverter
DataLogger
Router
Server
Repair Advise
Rediagnose
Diagnose success

Appendix V: Solar Assistant Operation Guide

SolarAssistant is software that is integrated into the inverter system via a Raspberry PI which can monitor and control the inverter and the battery packs. The application can be accessed from a web browser or the Android/iPhone app via local network or the internet.

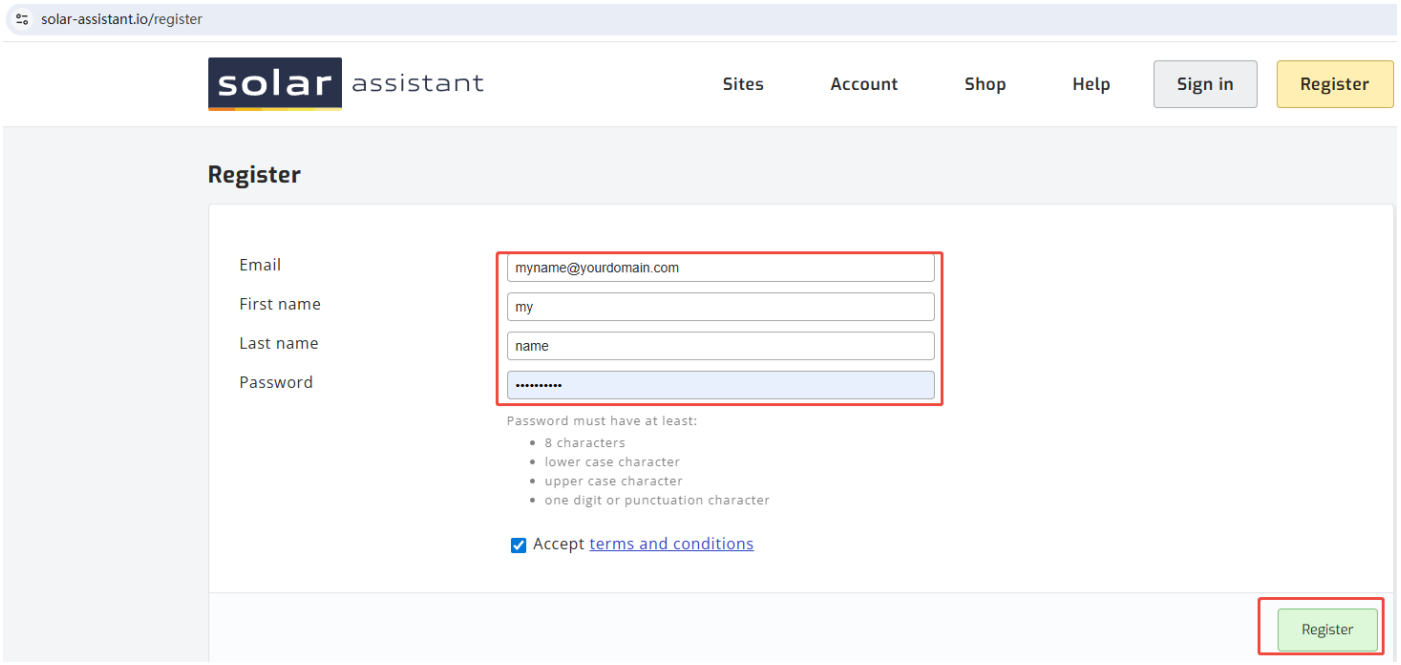
System hardware Connection

1. Use the enclosed BMS communication cable to connect the BMS port to the RS485 port of the Battery, this connection will enable the inverter to read the battery SOC and perform operation mechanisms based on SOC control.
2. Use the enclosed BAT communication cable to connect the BAT port to the RS485A port of the 1st battery in a paralleled battery packs group, follow the battery manual instruction to make sure that all the battery packs are paralleled correctly with correct DIP switches allocated on each battery, this connection will enable the Solar Assistant to read the detailed information of each battery packs on Solar Assistant website.
3. Turn on the Power switch of the Solar Assistant.



Register as a Solar Assistant user.

Go to https://solar-assistant.io/register , Fill the required personal information,click"Register" to complete user registration. After register, sign in.



Internet connection

Connect to WiFi access point

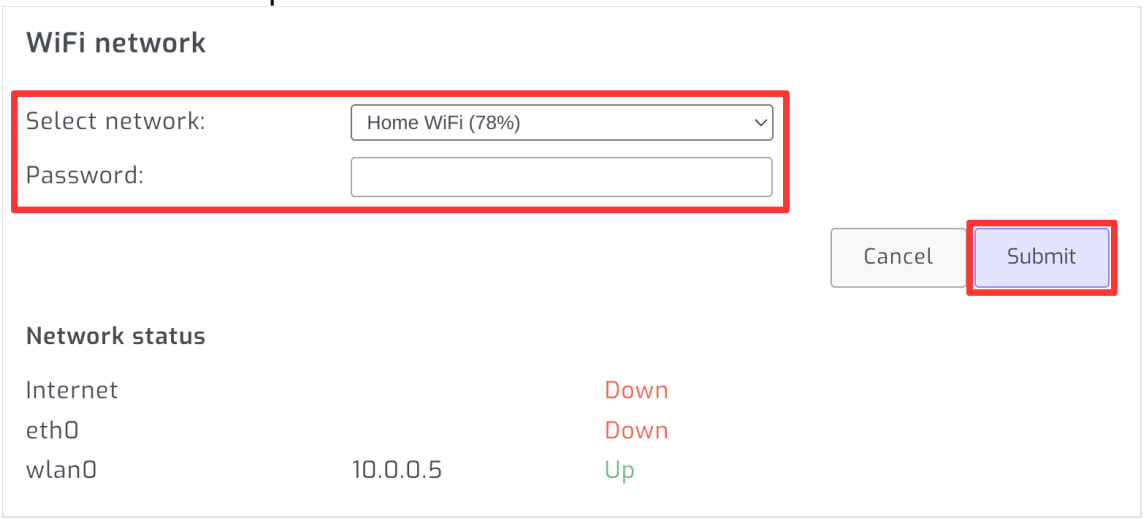
The device will start a WiFi access point. Use your laptop, tablet or mobile phone to connect to it:
SSID: **SolarAssistant**
Password: **solar123**

Open the URL below: http://10.0.0.5

NB: If you are using your mobile phone or tablet you will need to **turn off your mobile data** to ensure it is using WiFI instead of mobile data.

Give the device your WiFi credentials

Once you have the device web page open, you will be taken to the configuration page. Enter your Wifi SSID and password and click submit.



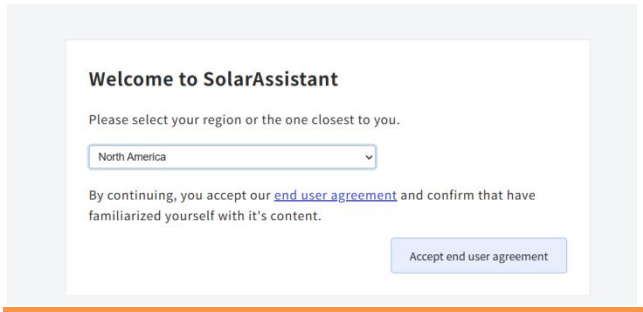
Switch your WiFi over to the same network the device is trying to connect to.

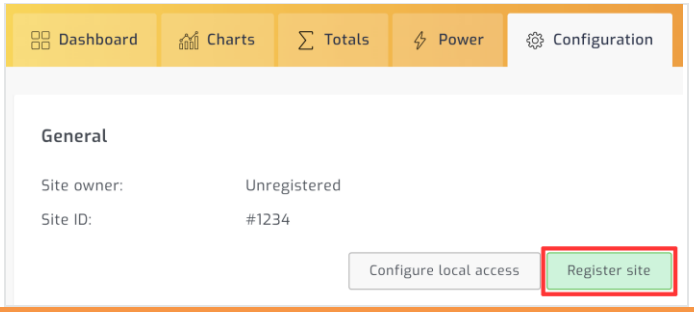
Find device on local network

Open https://solar-assistant.io/sites/local to find your device on your local network.

NB: If the device failed to connect to your WiFi network, it will start the WiFi access point again. Go back to step **1. Connect to WiFi access point.**

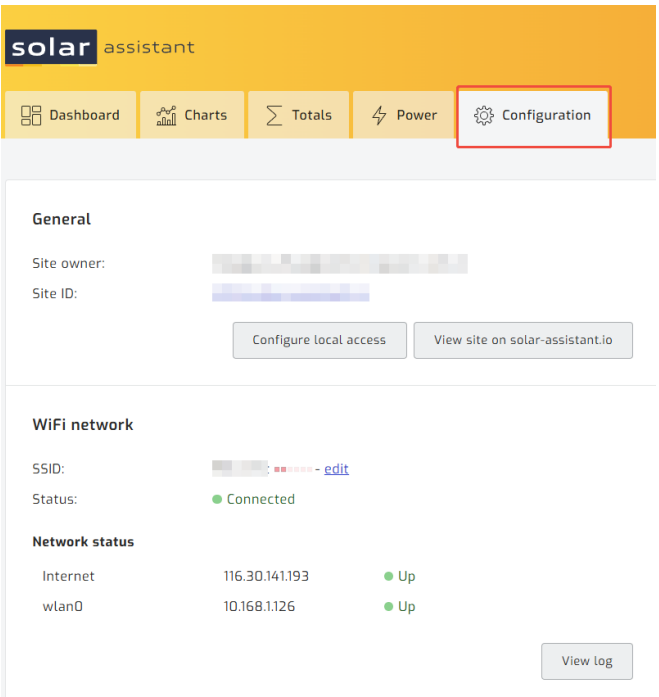
Select your region and register your site.
By registering your site you can easily access it remotely.

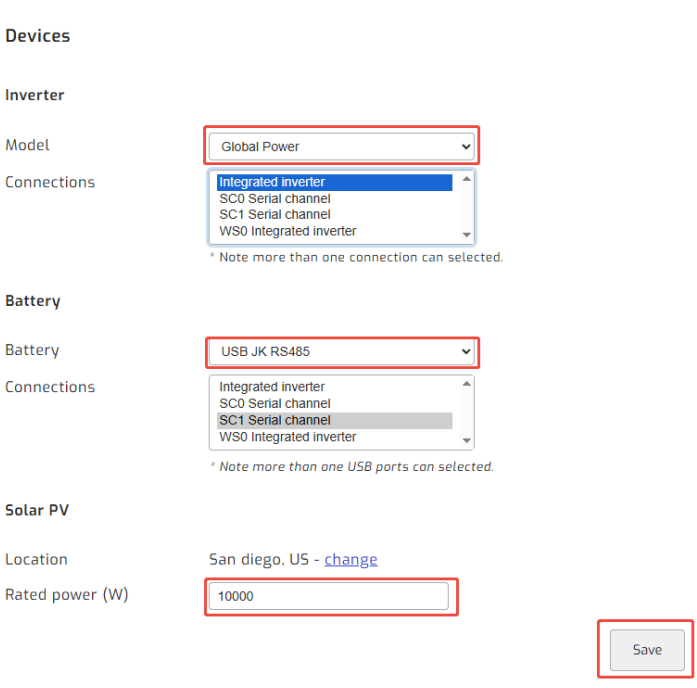




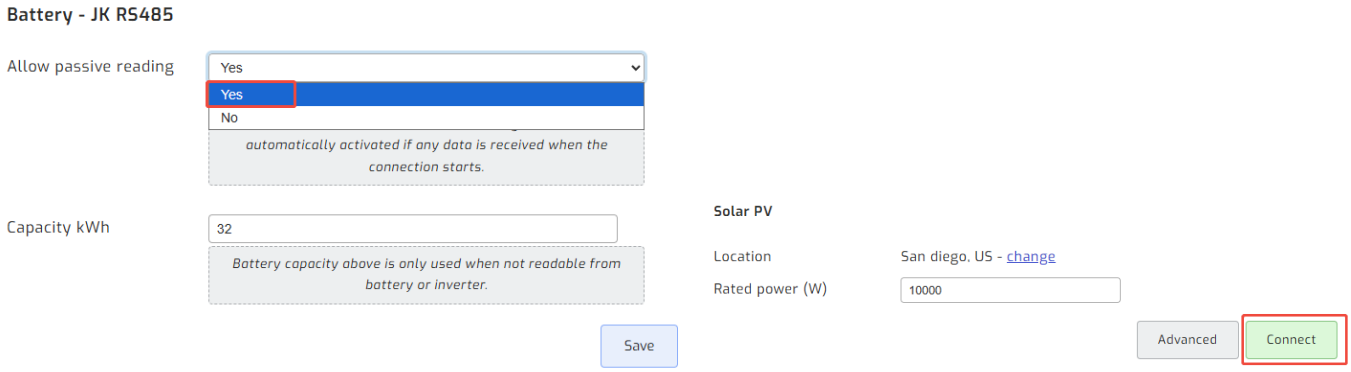
Configure the devices.

Click the **Configuration"** tab to configure inverter and battery, and PV power. For Inverter, Select Model as **"Global Power"**, Connection as **"Integrated Inverter"**, For Battery, Select the right battery type(Consult the battery seller), select Battery Connection as **"SC1 Serial Channel".**

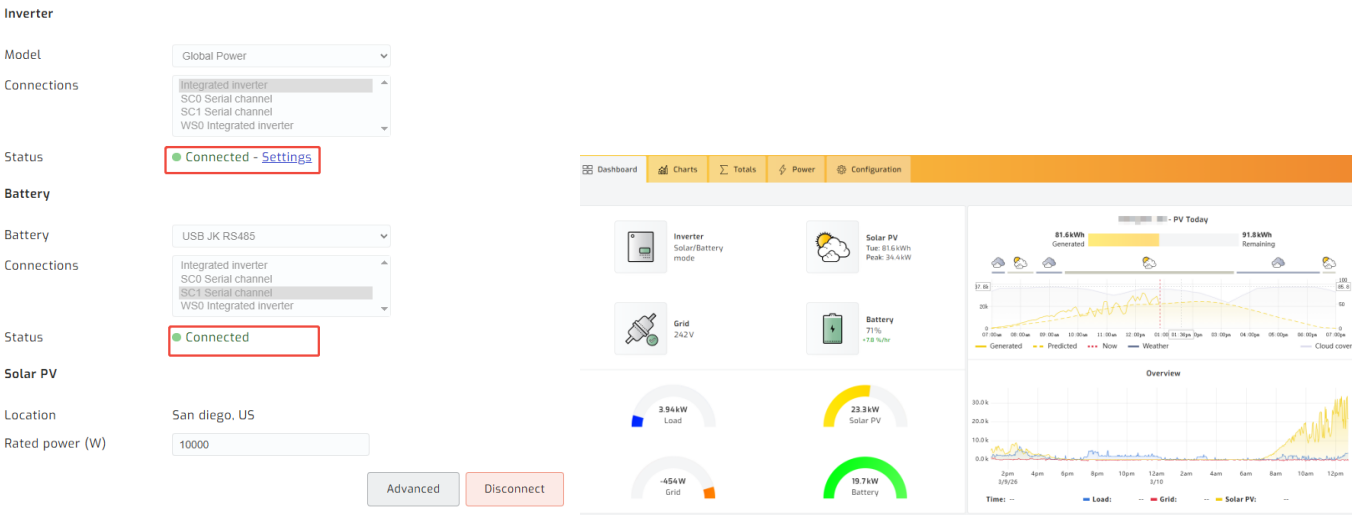




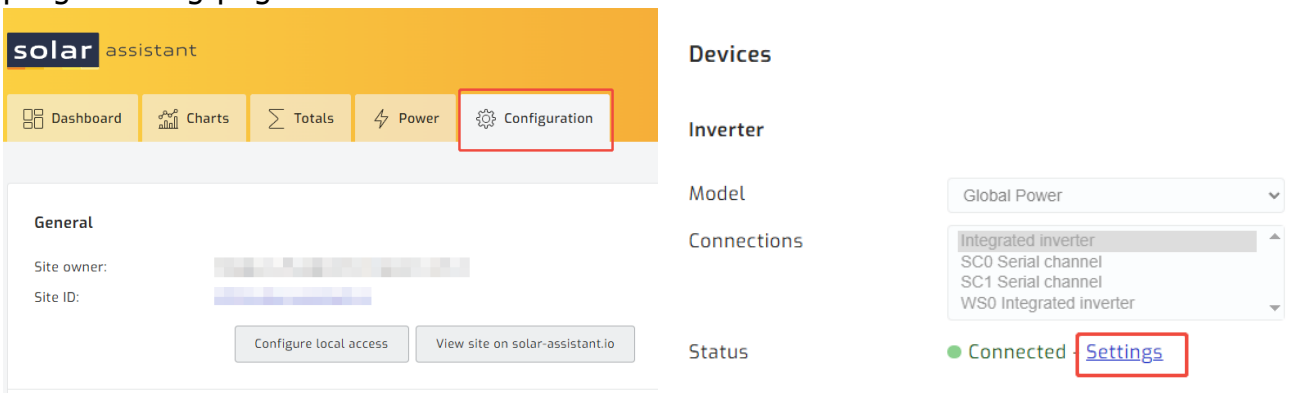
You can also click "Advance" button to enter advance setting of the PV,Grid,Battery, Battery Capacity,etc. **Make sure to select Yes for "Allow passive reading".** Save the setting and click the green "Connect" button to complete the basic configuration.



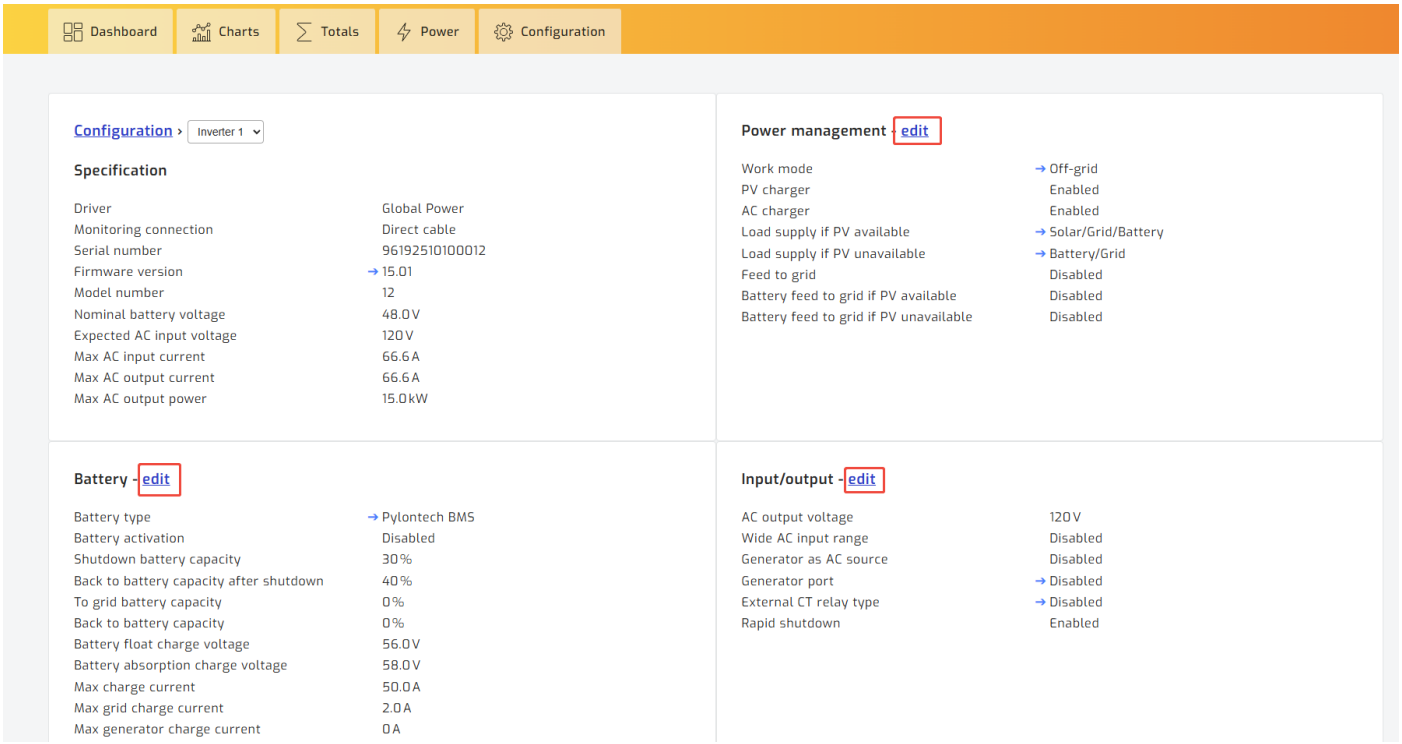
Once both the Inverter and the Battery are connected successfully, a green dot and green Connected sign will show after Status. Now you can click the "Dashboard" tab to view the status of the whole system.



The inverter daily frequently used settings such as inverter work mode, Charger, Grid export switch, Battery BMS type, Battery charger, Battery SOC control etc are programmable on the Solar assistant. To program, Click the **Configuration tab,** scroll down to **Devices-inverter,** click the **"Settings"** next to **Status ·Connected** to enter programming page.



Click**"edit"** of each parameter section to program your desired setting.

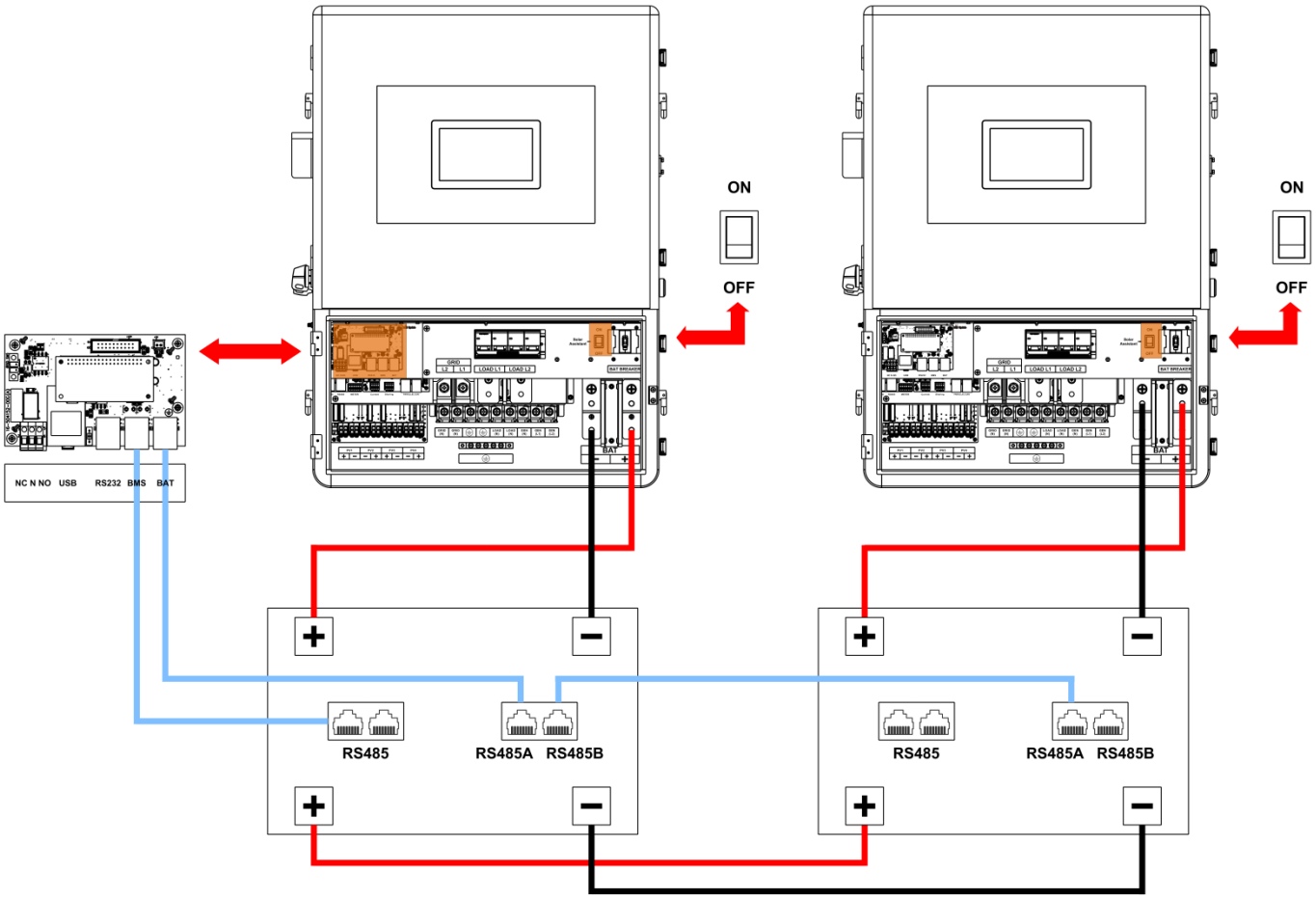


Paring of multiple Inverters

If you have multiple inverters connected in parallel, Follow the follow diagram to connect the Solar assistant with the battery packs.
Use the enclosed BMS communication cable to connect the BMS port on the master inverter to the RS485 port of the Battery, this connection will enable the inverter to read the battery SOC and perform operation mechanisms based on SOC control.

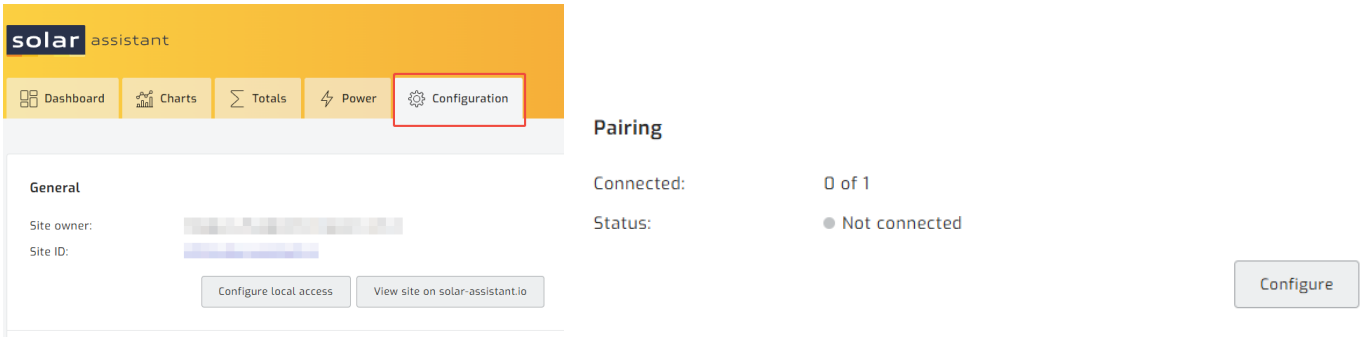
Use the enclosed BAT communication cable to connect the BAT port on the master inverter to the RS485A port of the 1st battery in a paralleled battery packs group, follow the battery manual instruction to make sure that all the battery packs are paralleled correctly with correct DIP switches allocated on each battery, this connection will enable the Solar Assistant to read the detailed information of each battery packs on Solar Assistant website.

Turn on the Power switch of the Solar Assistant in all inverters.

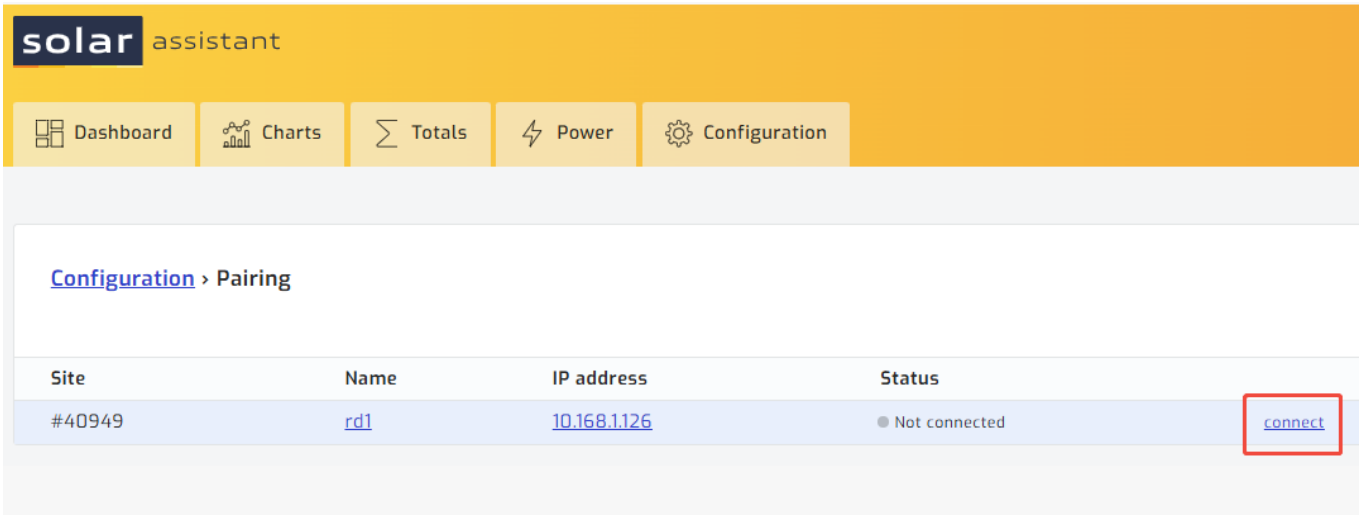


Follow the guide before to configure the Solar assistant for the master inverter firstly.

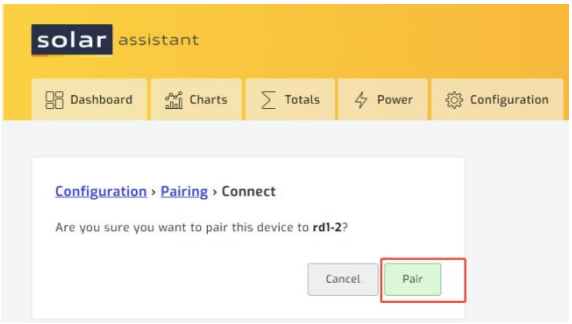
Click the **Configuration tab,** scroll down to **Pairing,** click **"Configure"**



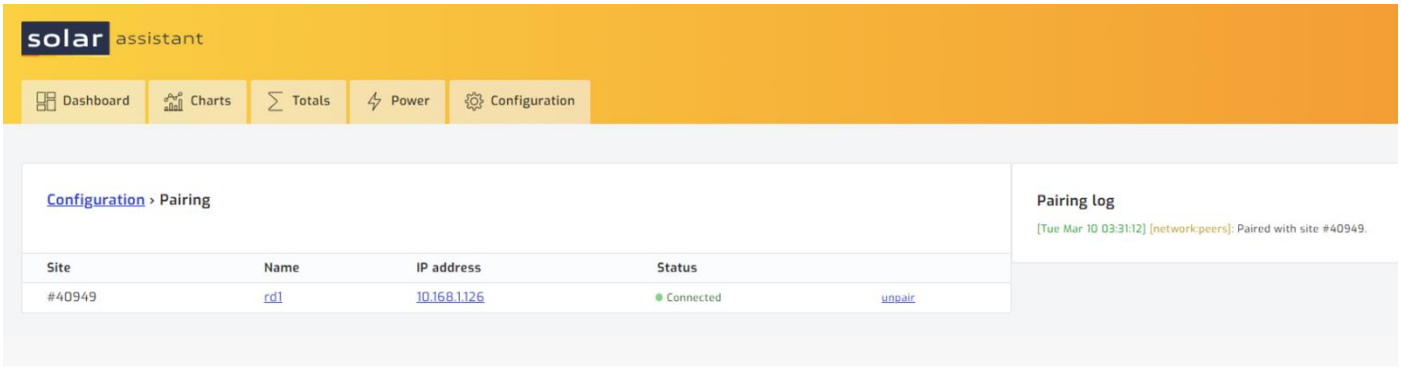
The rest sites will list up, Click **"connect".**



Click **"Pair"** in the pop up window of "Are you sure you want to pair this device to **XXX site**?" to complete the pairing.



The status will update as "connected" and Paring log will display at the right side of the window.



Appendix VI: Wiring Diagrams

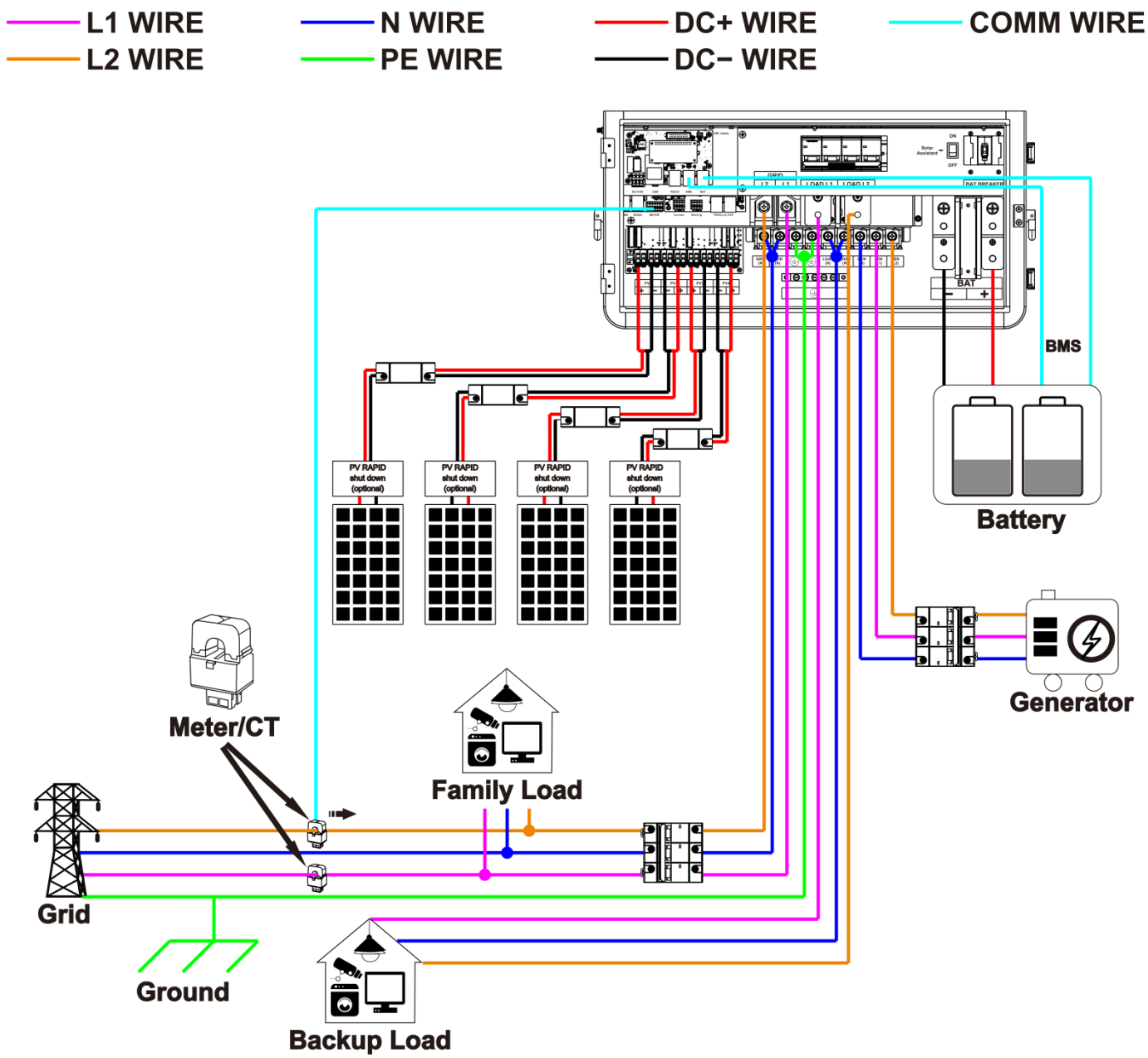
Notice:

1. These Wiring Diagrams are examples of common use-cases for inverters. Wiring Diagrams should always be drawn to meet local electrical code and authorized jurisdiction requirements.

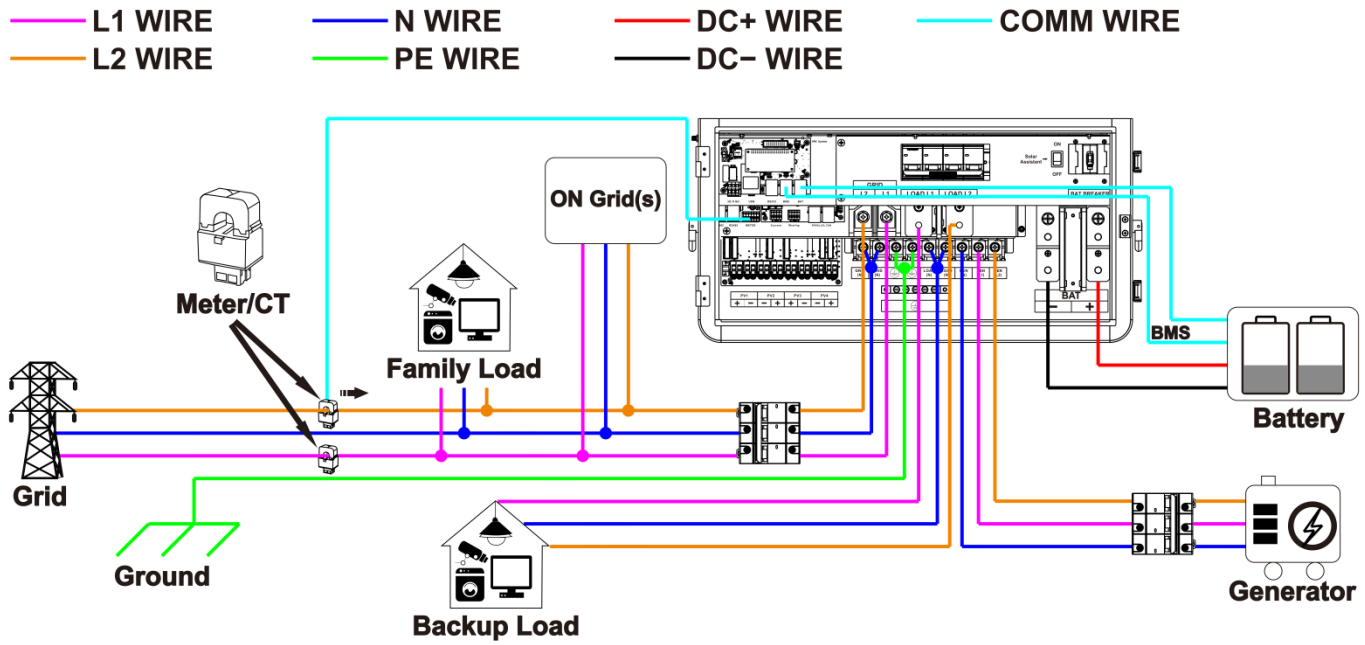
2. Before powering up Parallel System installs, see Appendix I: Parallel Installation Guide.

3. The PV components are independently connected. A Wiring Diagram will be displayed on one inverter, and the PV components of the other inverters will refer to this wiring diagram.

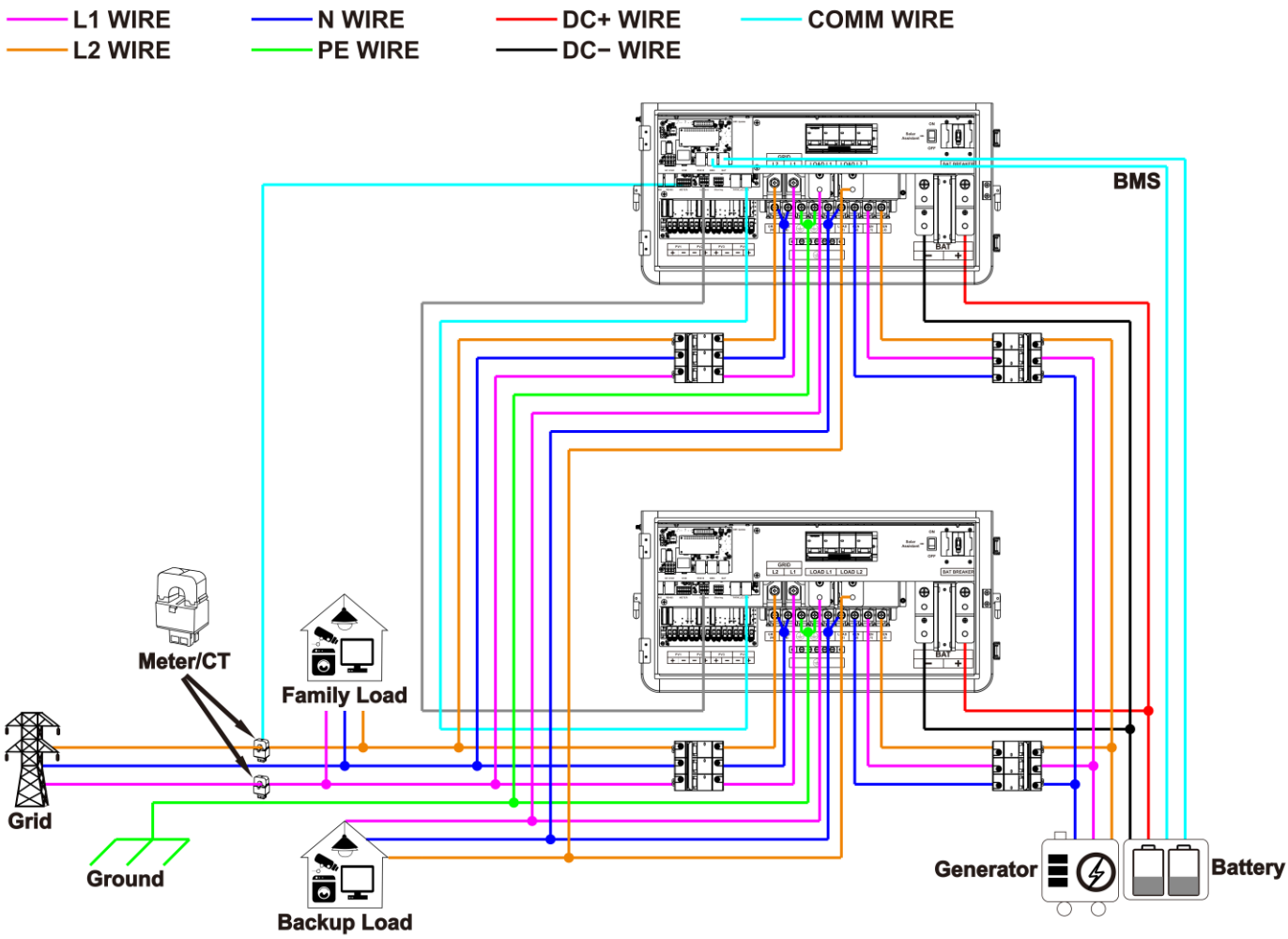
Inverters x1 Standard Wiring Diagrams 120V/240V



Inverters x1 Grid-side AC Coupling Standard Wiring Diagrams 120V/240V



Inverters x2 Standard Wiring Diagrams 120V/240V



Inverters x3 Standard Wiring Diagrams 120V/240V