USER MANUAL

1.5K/3K/4K/6K
INVERTER / CHARGER

Version: 1.0

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ABOUT THIS MANUAL

Purpose

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

Scope

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

SAFETY INSTRUCTIONS

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

1. Before operating the unit, carefully read all instructions and warning labels on the device, the batteries, and all relevant sections of this manual.
2. **WARNING!** To minimize the risk of injury, only charge deep-cycle lead-acid rechargeable batteries. Using other battery types may cause them to burst, leading to personal injury and damage.
3. Do not open or take apart the unit. If service or repairs are needed, bring it to a qualified service center. Improper reassembly could result in electric shock or fire hazards.
4. To avoid electric shock, disconnect all wiring before performing any maintenance or cleaning. Simply turning off the unit does not eliminate this risk.
5. **WARNING!** Installation of this battery-powered device should only be performed by trained professionals.
6. NEVER charge a battery that is frozen.
7. For optimal performance of this inverter/charger, ensure you select the correct cable size according to the specified requirements. Proper operation depends on this.
8. Exercise extreme caution when using metal tools near batteries. Dropping a tool could cause sparks or short circuits, potentially leading to explosions.
9. Always follow the installation instructions carefully when disconnecting AC or DC terminals. Refer to the INSTALLATION section of this manual for detailed guidance.
10. Fuses are included to protect the battery supply from overcurrent conditions.
11. GROUNDING INSTRUCTIONS – This inverter/charger must be connected to a permanently grounded wiring system. Make sure to comply with all local codes and regulations during installation.
12. NEVER short-circuit the AC output and DC input. Do NOT connect the unit to the mains power if the DC input is shorted.
13. **WARNING!** Only qualified service personnel should service this device. If problems persist after consulting the troubleshooting guide, return the inverter/charger to your local dealer or service center for repair.
14. **WARNING!** Since this inverter is non-isolated, only three types of photovoltaic (PV) modules are compatible: single crystalline, class A-rated polycrystalline, and CIGS modules. To prevent malfunctions, do not connect PV modules that may cause current leakage to the inverter. For example, grounded PV modules can cause leakage currents. When using CIGS modules, ensure they are NOT grounded.
15. **CAUTION!** A PV junction box with surge protection must be used. Failure to do so may result in damage to the inverter if lightning strikes the PV modules.

INTRODUCTION

This device is a multifunctional inverter that integrates the capabilities of an inverter, solar charger, and battery charger, providing continuous power backup in one unit. It features a detailed LCD along with user-friendly buttons that allow easy configuration of settings like battery charging current, priority between AC or solar charging, and acceptable input voltage tailored to various applications.

Features

- Pure sine wave inverter
- Wide PV input range
- Built-in BMS communication port
- Built-in Wi-Fi with APP for remote monitoring
- Inverter running without battery
- Configurable input voltage range for home appliances and personal computers via LCD setting
- Configurable battery charging current based on applications via LCD setting
- Configurable AC/Solar Charger priority via LCD setting
- Compatible to mains voltage or generator power
- Overload/ Over temperature/ short circuit protection
- Smart battery charger design for optimized battery performance
- Optional external CT sensor to guarantee 100% self-consumption application

Basic System Architecture

The diagram below depicts a simple application for this unit. To have a fully operational system, the following components are also needed:

- Generator or utility power supply
- PV modules

Please consult your system integrator for alternative system configurations based on your specific needs.

This inverter is capable of powering a range of household or office devices, including motor-driven appliances like tube lights, fans, refrigerators, and air conditioners.

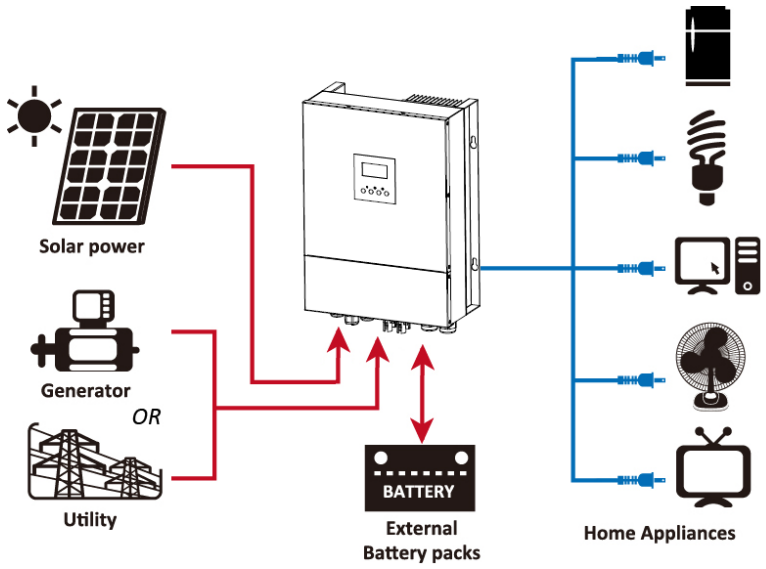
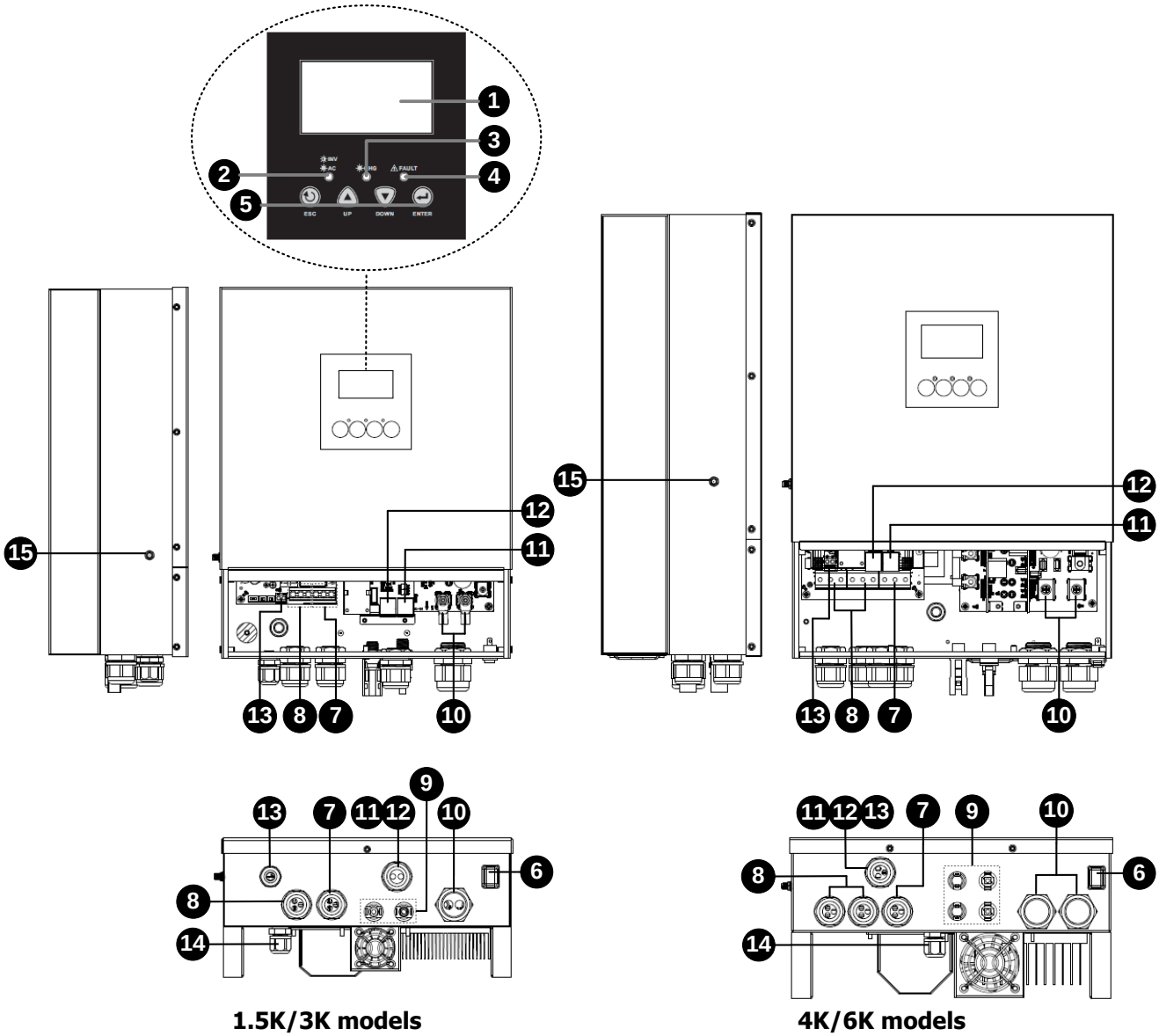


Figure 1 Solar Power System

Product Overview



1. LCD display
2. Status indicator
3. Charging indicator
4. Fault indicator
5. Function keys
6. Power on/off switch
7. AC input connectors
8. AC output connectors
9. PV connectors
10. Battery input
11. RS-232 communication port
12. BMS communication port
13. External CT
14. Cooling fan connector
15. Wi-Fi antenna

INSTALLATION

Unpacking and Inspection

Before installing, please check the unit carefully. Make sure that nothing inside the package is damaged. The package should contain the following items:

Inverter unit

Manual

RS-232 cable

M6x60 screws x 4pcs

Wi-Fi Antenna

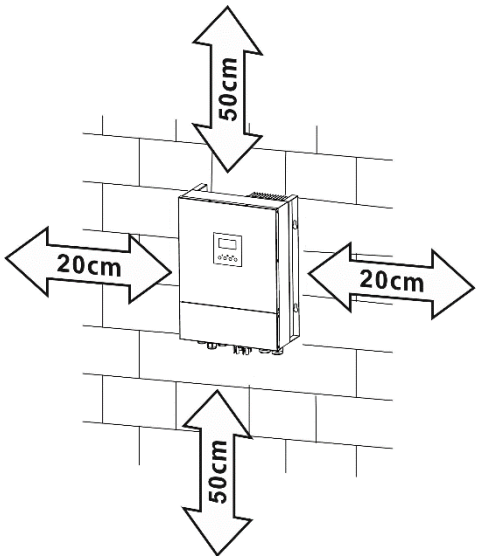
PV Connectors (1 set for 1.5K/3K, 2 sets for 4K/6K)

Optional External CT

Mounting the Unit

Consider the following points before selecting where to install:

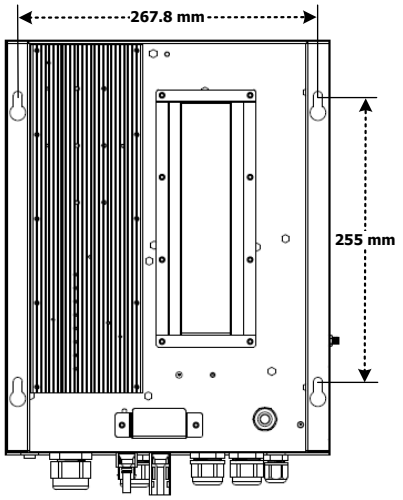
- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install this inverter at eye level in order to allow the LCD display to be always read.
- For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.
- The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- The recommended installation position is to be adhered to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



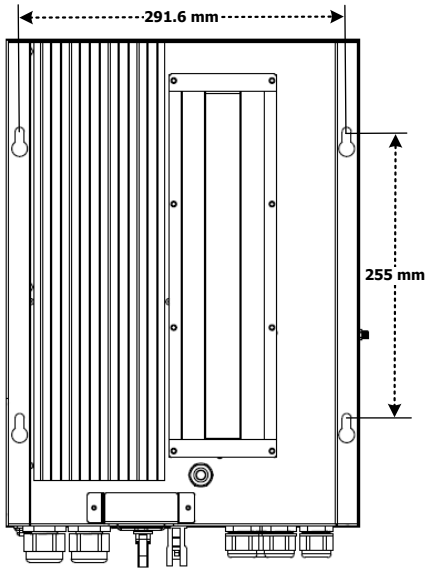
SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

Please follow below steps to install the inverter on the wall.

Step 1: Please drill holes at the four locations marked in the following diagrams.



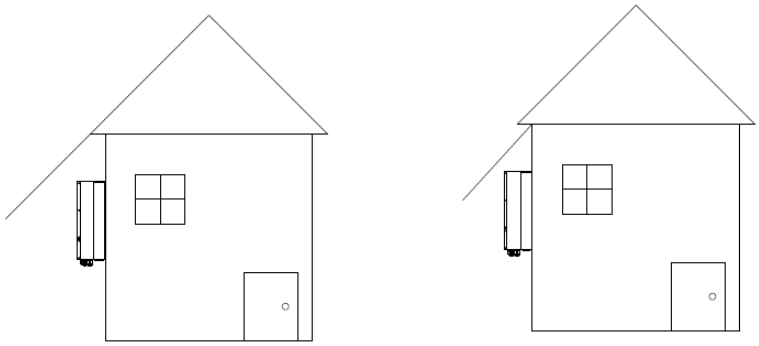
1.5K/3K models



4K/6K models

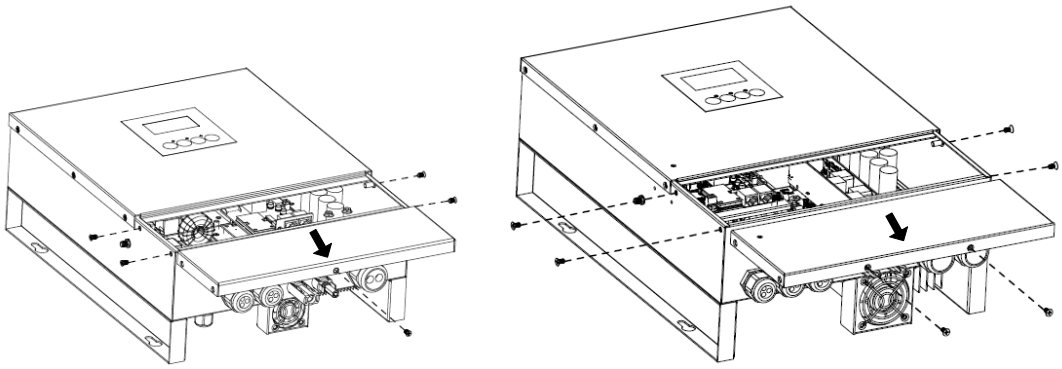
Step 2: Install the inverter by screwing two mounting screws on the top first, then fix the remaining two mounting holes with screws.

Step 3: The inverter should be installed in a shaded, rain proof or protected location like below.



Preparation

Please take off wiring cover by removing the screws as shown below.



1.5K/3K models 4K/6K models

Battery Connection

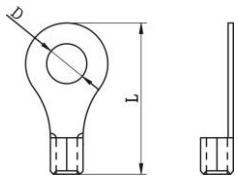
This model can be operated without battery connection. Connect to battery if necessary.

CAUTION! To ensure safe operation and meet regulatory requirements, it is recommended to install a dedicated DC over-current protection device or disconnect switch between the battery and the inverter. While a disconnect device may not be necessary in certain cases, over-current protection is always required. Please consult the typical current values in the table below to determine the appropriate fuse or breaker size.

WARNING! Trained professionals should carry out all electrical wiring.

WARNING! For safe and effective system performance, it is essential to use the correct cables for connecting the battery. To minimize the risk of injury, please use the specified cable and terminal sizes as indicated below.

Ring terminal:

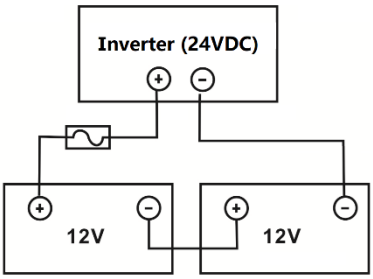


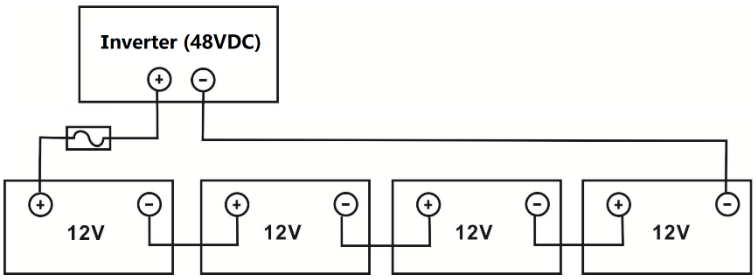
Recommended battery cable size:

Model	Wire Size	Cable (mm^2)	Dimensions for Ring Terminal		Torque value (max)
			D (mm)	L (mm)	
1.5K/3K	1 x 6AWG	16	4.3	29.2	2 Nm
4K	1 x 4AWG	25	6.4	33.2	5 Nm
6K	1 x 2AWG	38	6.4	39.2	

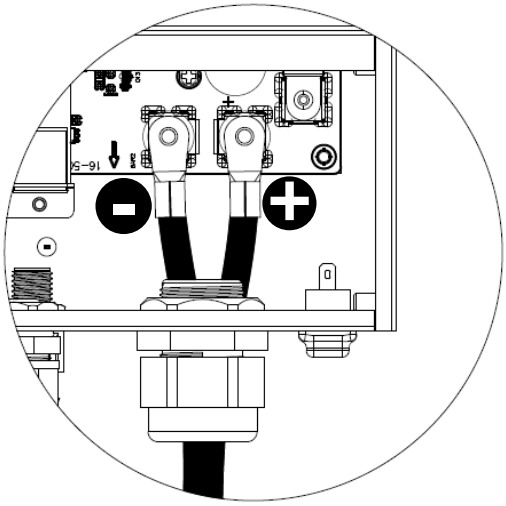
Please follow below steps to implement battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal size.
2. The 1.5K model is compatible with a 24VDC system, while the 3K, 4K, and 6K models support a 48VDC system. Please connect all battery packs according to the chart below. It is recommended to use batteries with a minimum capacity of 100Ah for the 1.5K, 3K, and 4K models, and at least 200Ah capacity batteries for the 6K model.

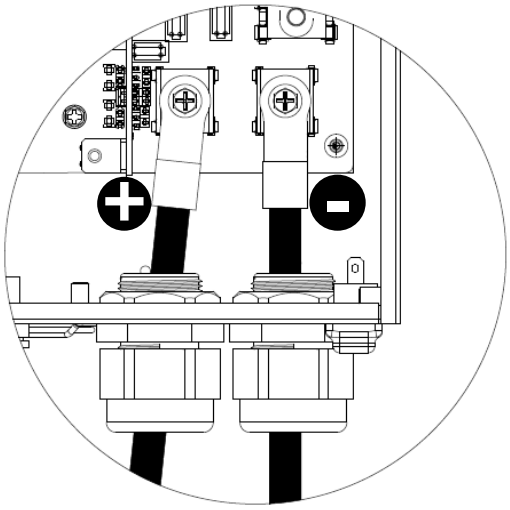




3. Attach two cable glands to the positive and negative terminals.
4. Firmly insert the ring terminal of the battery cable into the inverter's battery connector, ensuring that the nuts and screws are securely tightened. Use the battery cable size to determine the appropriate torque value. Verify that the polarity is correctly matched on both the battery and the inverter, and that the ring terminals are tightly fastened to the battery terminals.



1.5K/3K models



4K/6K models

⚠	**WARNING!** Risk of Electric Shock Installation should be carried out carefully because of the high voltage from batteries connected in series.
⚠	**CAUTION!** Do not insert any material between the flat surface of the inverter terminal and the ring terminal, as this may cause overheating. **CAUTION!** Do not apply any anti-oxidant substances to the terminals before securely tightening the connections. **CAUTION!** Before completing the final DC connection or closing the DC breaker/disconnector, ensure that the positive (+) terminal is connected to the positive (+) terminal and the negative (-) terminal is connected to the negative (-) terminal.

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. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. Please refer to the AC input current value indicated on the inverter's product label when selecting the recommended AC breaker specification.

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

WARNING! All wiring must be performed by qualified personnel.

WARNING! System safety and efficient operation require to use appropriate cable for the AC input connection. To reduce the risk of injury, please use the proper recommended cable size as below.

Suggested cable requirement for AC wires

Model	Gauge	Cable (mm^2)	Torque Value
1.5K	16 AWG	1.5	0.6 Nm
3K	14 AWG	2.5	0.6 Nm
4K	12 AWG	4	1.2 Nm
6K	10 AWG	6	1.2 Nm

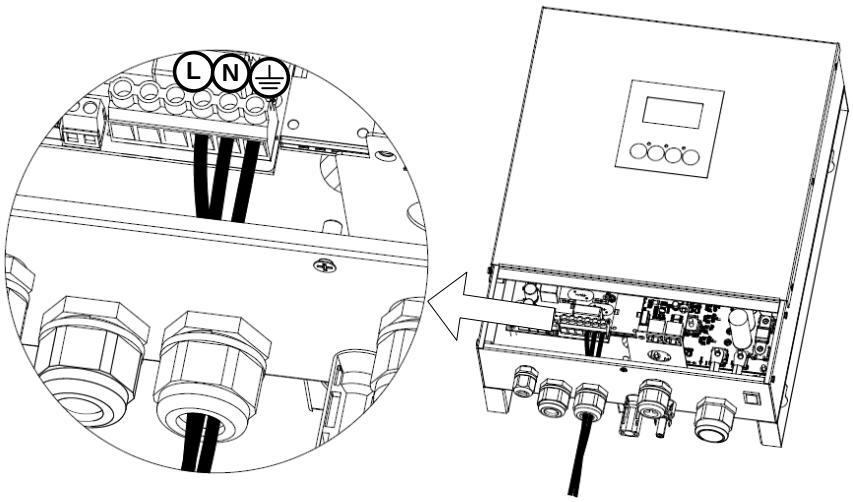
Please follow below steps to implement AC input/output connection:

1. Before making AC input/output connection, be sure to open DC protector or disconnector first.
2. Remove insulation sleeve 6mm±1 for five conductors of 1.5K/3K models. Remove insulation sleeve 8mm±1 for seven conductors of 4K/6K models. And shorten phase L and neutral conductor N 3 mm.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws.
4. Be sure to connect PE protective conductor (⏚) first.

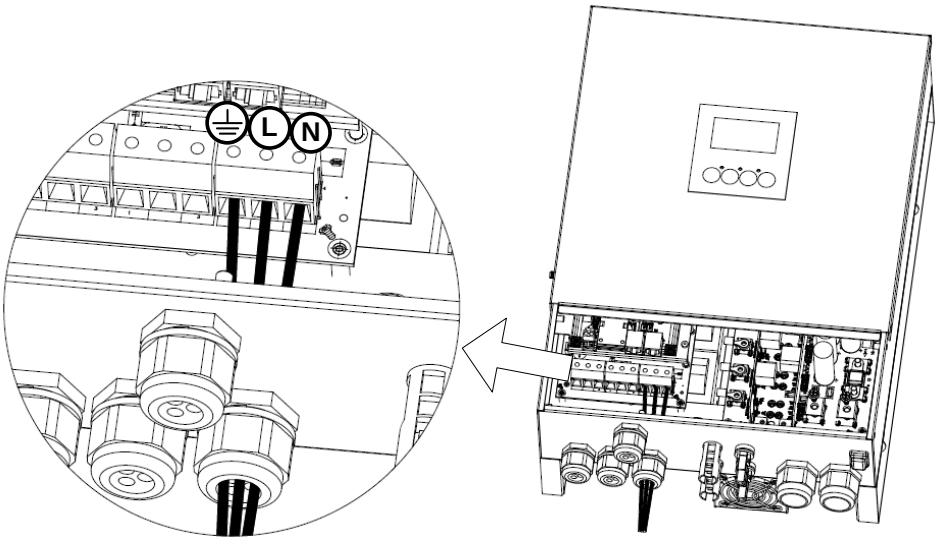
   ⏚→**Ground (yellow-green)**

   L→LINE (brown or black)

   N→Neutral (blue)



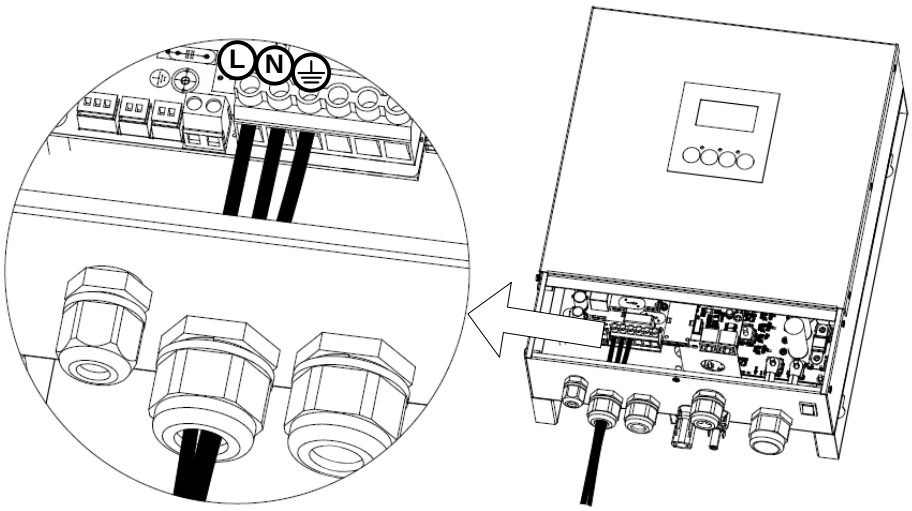
1.5K/3K models



4K/6K models

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

5. Then, 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)

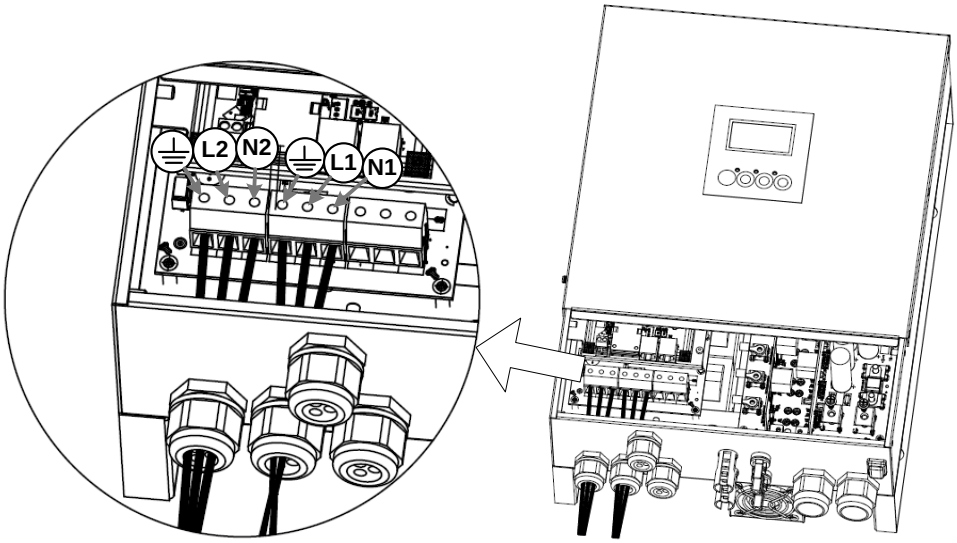


1.5K/3K models

The 4K/6K models feature dual outputs. The output port includes four terminals (L1/N1, L2/N2). You can enable or disable the second output using the LCD settings or monitoring software. For more information, see the "LCD setting" section. Connect the AC output wires following the polarity markings on the terminal block and securely tighten the terminal screws.

Be sure to connect PE protective conductor (⏚**)** first.

⏚→**Ground (yellow-green)**
L1→LINE (brown or black)
N1→Neutral (blue)
L2→LINE (brown or black)
N2→Neutral (blue)



4K/6K models

6. Make sure the wires are securely connected.

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.

PV Connection

Note 1: Use a 600VDC/30A circuit breaker for each string.
Note 2: The PV input has an overvoltage category of II.

Kindly adhere to the following guidelines to connect the PV modules:

WARNING! Since this inverter is non-isolated, it is compatible only with three types of PV modules: single crystalline, polycrystalline with class A rating, and CIGS modules. To prevent any malfunction, do not connect PV modules that may have current leakage to the inverter. For instance, grounded PV modules can cause current leakage to the inverter. When using CIGS modules, ensure they are not grounded.
CAUTION! A PV junction box with surge protection must be used. Failure to do so may result in damage to the inverter if lightning strikes the PV modules.

Step 1: Verify the input voltage of the PV array modules. Models with 1.5K and 3K capacity use a single string of PV arrays, while 4K and 6K models use two strings of PV arrays. Ensure that the maximum current for each PV input connector does not exceed 18A.

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

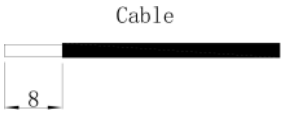
Step 2: Disconnect the circuit breaker and switch off the DC switch.
Step 3: Assemble the provided PV connectors with PV modules by the following steps.

Components for PV connectors and Tools:

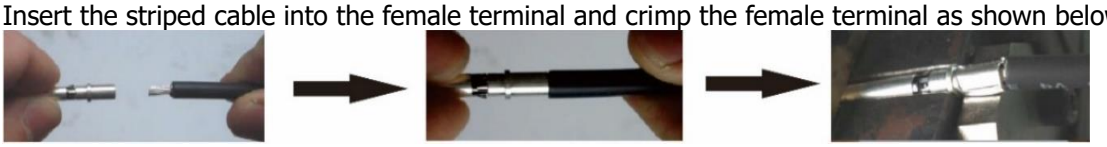
Female connector housing	
Female terminal	
Male connector housing	
Male terminal	
Crimping tool and spanner	

Cable preparation and connector assembly process:

Strip two cables 8 mm on one side and be careful NOT to nick conductors.



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



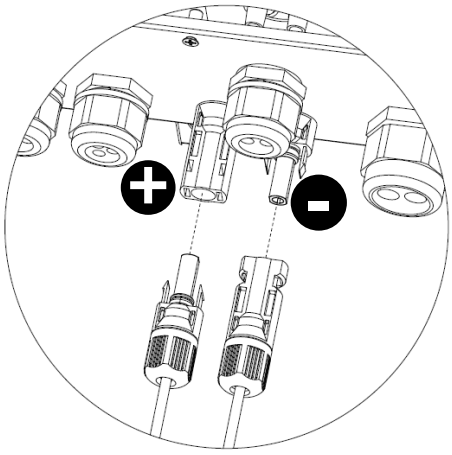
Insert the assembled cable into the female connector housing as shown below.

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

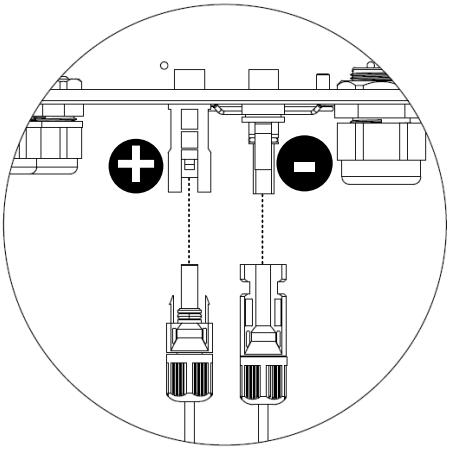
Insert the assembled cable into the male connector housing as shown below.

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

Step 4: Check correct polarity of connection cable from the PV modules and the PV input connectors. Then, connect the positive pole (+) of the connection cable to the positive pole (+) of the PV input connector. Connect the negative pole (-) of the connection cable to the negative pole (-) of the PV input connector.



1.5K/3K models



4K/6K models

WARNING! For safety and efficiency, it's very important to use appropriate cables for PV module connection. To reduce the risk of injury, please use the proper cable size as recommended below.

Wire Size	Cable (mm^2)
1 x 12AWG	4

CAUTION! Never directly touch the terminals of inverter. It might cause lethal electric shock.

Recommended Panel Configuration

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

1. Open circuit Voltage (Voc) of PV modules not to exceed the maximum PV array open circuit voltage of the inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than the start-up voltage.

INVERTER MODEL	1.5K	3K	4K	6K
Max. PV Array Power	2400W	3600W	7000W (3500W x 2)	9600W (4800W x 2)
Max. PV Array Open Circuit Voltage	500Vdc			
PV Array MPPT Voltage Range	60~450Vdc	90~450Vdc		
Max. PV Input Current	18A x 1		18A x 2	

Take **600Wp** PV module as an example, the recommended configurations are listed as below table.

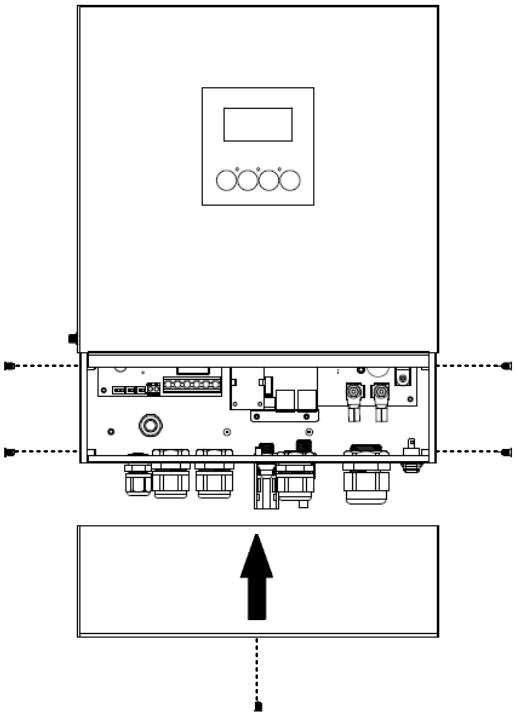
Solar Panel Spec. (reference) - 600Wp - Vmp: 45.30Vdc - Imp: 13.25A - Voc: 53.50Vdc - Isc: 14.03A	**For 1.5K model:**			
	Solar Input (Min in series: 2pcs, Max. in series: 5pcs)		**Q'ty of panels**	**Total input power**
	2pcs in serial		2pcs	1200W
	3pcs in serial		3pcs	1800W
	4pcs in serial		4pcs	2400W
	5pcs in serial		5pcs	2400W
	For 3K model:			
	Solar Input (Min in series: 3pcs, Max. in series: 9pcs)		**Q'ty of panels**	**Total input power**
	3pcs in serial		3pcs	1800W
	4pcs in serial		4pcs	2400W
	5pcs in serial		5pcs	3000W
	6pcs in serial		6pcs	3600W
	7pcs~9pcs in serial		7pcs~9pcs	3600W
	For 4K model:			
	Solar Input 1	**Solar Input 2**	**Q'ty of panels**	**Total input power**
	(Min in series: 3pcs per input, Max. in series: 9pcs per input)			
	3pcs in series	x	3pcs	1800W
	x	3pcs in series	3pcs	1800W
	6pcs in series	x	6pcs	3500W
	7pcs~9pcs in serial	x	7pcs~9pcs	3500W
	3pcs in series	3pcs in series	6pcs	3600W
	4pcs in series	4pcs in series	8pcs	4800W
	5pcs in series	5pcs in series	10pcs	6000W
	6pcs in series	6pcs in series	12pcs	7000W
	7pcs~9pcs in serial	7pcs~9pcs in serial	14pcs~18pcs	7000W
	For 6K model:			
	Solar Input 1	**Solar Input 2**	**Q'ty of panels**	**Total input power**
	(Min in series: 3pcs per input, Max. in series: 9pcs per input)			
	3pcs in series	x	3pcs	1800W
	x	3pcs in series	3pcs	1800W
	6pcs in series	x	6pcs	3600W
	8pcs in series	x	8pcs	4800W
	9pcs in series	x	9pcs	4800W
	4pcs in series	4pcs in series	8pcs	4800W
	6pcs in series	6pcs in series	12pcs	7000W
	8pcs in series	8pcs in series	16pcs	9600W
	9pcs in series	9pcs in series	18pcs	9600W

Take **660Wp** PV module as an example, the recommended configurations are listed as below table.

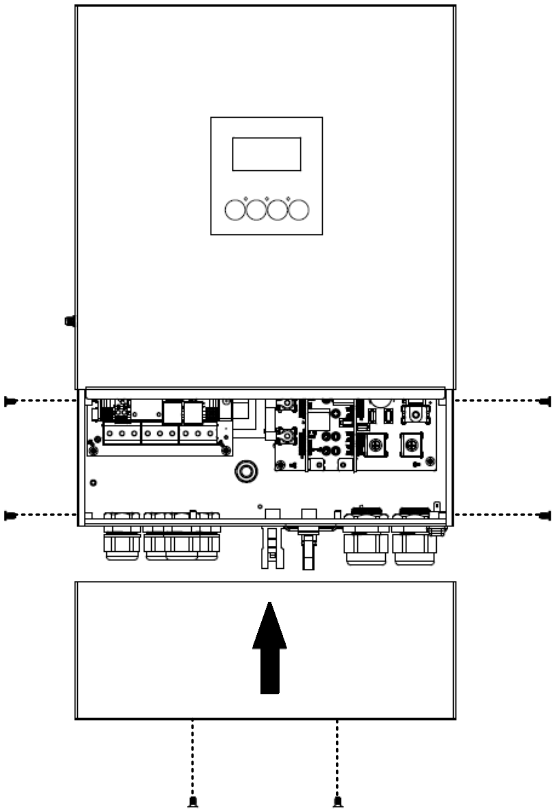
Solar Panel Spec. (reference) - 660Wp - Vmp: 37.80Vdc - Imp: 17.46A - Voc: 45.60Vdc - Isc: 18.55A	**For 1.5K model:**			
	Solar Input (Min in series: 2pcs, Max. in series: 6pcs)		**Q'ty of panels**	**Total input power**
	2 pcs in serial		2pcs	1320W
	3pcs in serial		3pcs	1980W
	4pcs in serial		4pcs	2400W
	5pcs~6pcs in serial		5pcs~6pcs	2400W
	For 3K model:			
	Solar Input (Min in series: 3pcs, Max. in series: 10pcs)		**Q'ty of panels**	**Total input power**
	3pcs in serial		3pcs	1980W
	4pcs in serial		4pcs	2640W
	5pcs in serial		5pcs	3300W
	6pcs in serial		6pcs	3600W
	7pcs~10pcs in serial		7pcs~10pcs	3600W
	For 4K model:			
	Solar Input 1	**Solar Input 2**	**Q'ty of panels**	**Total input power**
	(Min in series: 3pcs per input, Max. in series: 10pcs per input)			
	3pcs in series	x	3pcs	1980W
	x	3pcs in series	3pcs	1980W
	6pcs in series	x	6pcs	3500W
	7pcs~10pcs in serial	x	7pcs~10pcs	3500W
	3pcs in series	3pcs in series	6pcs	3960W
	4pcs in series	4pcs in series	8pcs	5280W
	5pcs in series	5pcs in series	10pcs	6600W
	6pcs in series	6pcs in series	12pcs	7000W
	7pcs~10pcs in serial	7pcs~10pcs in serial	14pcs~20pcs	7000W
	For 6K model:			
	Solar Input 1	**Solar Input 2**	**Q'ty of panels**	**Total input power**
	(Min in series: 3pcs per input, Max. in series: 10pcs per input)			
	3pcs in series	x	3pcs	1980W
	x	3pcs in series	3pcs	1980W
	6pcs in series	x	6pcs	3960W
	8pcs in series	x	8pcs	4800W
	9pcs~10pcs in serial	x	9pcs~10pcs	4800W
	4pcs in series	4pcs in series	8pcs	5280W
	6pcs in series	6pcs in series	12pcs	7920W
	8pcs in series	8pcs in series	16pcs	9600W
	9pcs~10pcs in serial	9pcs~10pcs in serial	18pcs~20pcs	9600W

Final Assembly

Once all the wiring is connected, please reattach the bottom cover by securing it with screws as illustrated below.



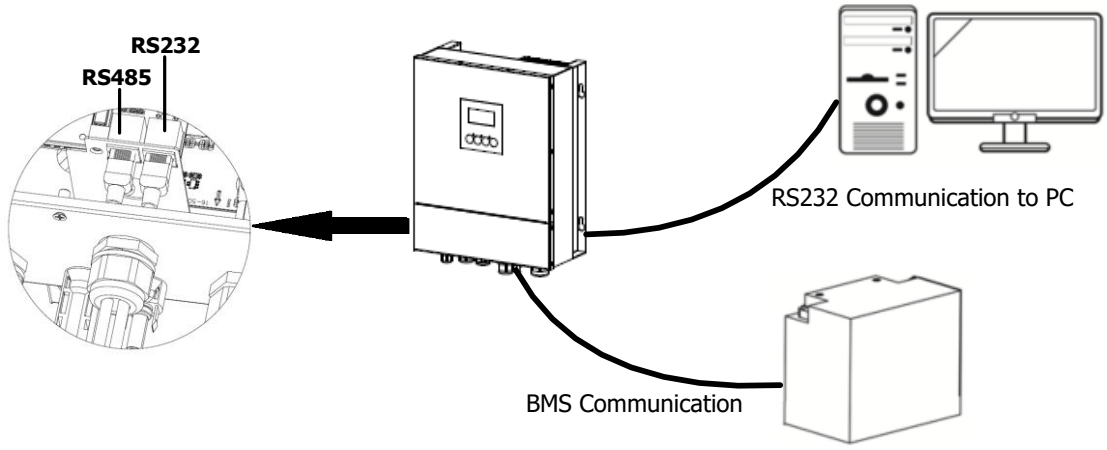
1.5K/3K models



4K/6K models

Communication Connection

Connect all communication wiring as illustrated below.



Serial Connection

This unit includes a communication port for connecting to a PC with the appropriate software. Use the provided communication cable to link the inverter and the PC. For detailed instructions on using the software, please reach out to the distributor to download the software and the related user manual.

Wi-Fi Connection

This unit includes a Wi-Fi transmitter that allows wireless communication between off-grid inverters and the monitoring platform. Users can access and manage the monitored inverter through a downloadable app. The "i.Solar" app is available on the Apple® Store and Google® Play Store. All data logs and settings are stored in iCloud. For easy installation and use, please see Appendix II - The Wi-Fi Operation Guide for more information.

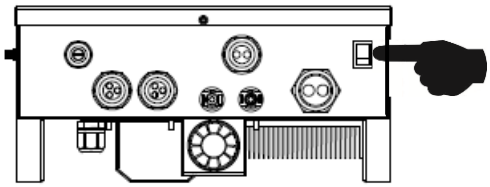
BMS Communication

When connecting to a Lithium-ion battery pack, please consult the battery supplier to obtain the appropriate communication cable. For more information, see Appendix I - BMS Communication Installation.

OPERATION

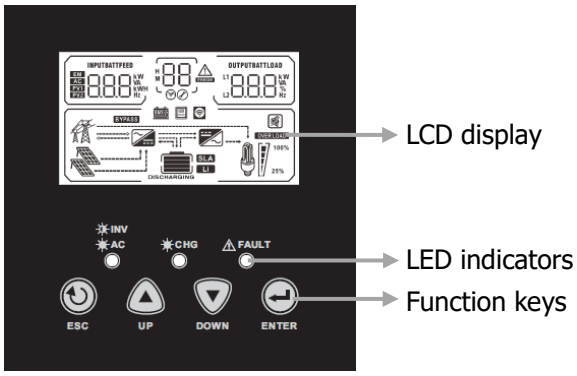
Power ON/OFF

After correctly installing the unit and securely connecting the batteries, just press the On/Off switch to power on the device.



Operation and Display Panel

The operation and display panel, illustrated in the chart below, is located on the front of the inverter. It features three indicator lights, four function buttons, and an LCD screen that shows the operating status as well as input and output power details.



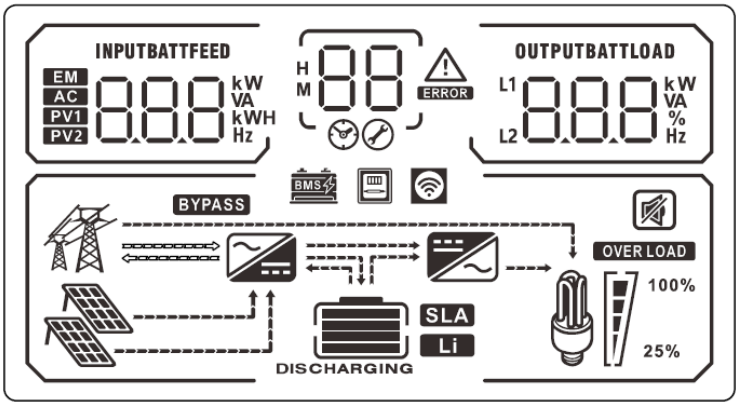
LED Indicator

LED Indicator			Messages
INV AC	Green	Solid On	Output is powered by utility in Line mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	Green	Solid On	Battery is fully charged.
		Flashing	Battery is charging.
FAULT	Red	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

Function Keys

Function Key		Description
	ESC	To exit setting mode
▲	UP	To go to previous selection
▼	DOWN	To go to next selection
↵	ENTER	To confirm the selection in setting mode or enter setting mode

LCD Display Icons



Icon	Function description
Input Source Information	
AC	Indicates the AC input.
PV1	Indicates the PV input information of Tracker 1
PV2	Indicates the PV input information of Tracker 2
INPUTBATTFEED 888 kW VA kWH Hz	Indicate input voltage, input frequency, PV voltage, PV current, PV power, charger current, charger power and battery voltage.
Configuration Program and Fault Information	
88	Indicates the setting programs.
88 ERROR	Indicates the warning and fault codes. Warning: 88 flashing with warning code. Fault: 88 ERROR lighting with fault code.
Output Information	
OUTPUTBATTLOAD L1 L2 888 kW VA % Hz	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.
Battery Information	
DISCHARGING	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100%, charging or discharging status.

Battery in charging status, it will present battery charging status.

Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	0-24%	4 bars will flash in turns.
	25-49%	Bottom bar will be on and the other three bars will flash in turns.
	50-74%	Bottom two bars will be on and the other two bars will flash in turns.
	75-100%	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.

Battery in discharging status, it will present battery capacity.

Battery Capacity	0-24%	25-49%	50-74%	75-100%
LCD Display				

Load Information				
OVER LOAD	Indicates overload.			
100% 25%	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.			
	0%~24%	25%~49%	50%~74%	75%~100%
Mode Operation Information				
	Indicates unit connects to the mains.			
	Indicates unit connects to the PV panel.			
BYPASS	Indicates load is supplied by utility power.			
	Indicates the utility charger circuit is working.			
	Indicates the DC/AC inverter circuit is working.			
Mute Operation				
	Indicates unit alarm is disabled.			
Other Information				
BMS	Indicates BMS communication is established between the inverter and Lithium battery. It flashes while BMS is detected by inverter but communication can't be well established.			
	Indicates the unit is connected to an external energy meter.			
	Indicates the unit is successfully connected to Wi-Fi. The icon will not be shown if the Wi-Fi is not connected.			

LCD Setting

After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or "ESC" button to exit.

Setting Programs:

Program	Description	Selectable option	
00	Exit setting mode	Escape 00 ESC	
01	Output source priority: To set the priority for the power source load	Utility first (default) 01 UTI	Utility power is the primary source of power for the connected loads. Solar energy and battery power will only supply the loads in the event that utility power is unavailable.
		Solar first 01 SOL	Solar energy is the primary power source for the loads. If solar energy is insufficient to meet the total demand, utility power will simultaneously supplement the remaining power requirement.
		SBU priority 01 SbU	Solar energy is the primary power source for the connected loads. If solar energy is insufficient, the battery will simultaneously provide power to supplement the demand. Utility power will only supply the loads when the battery voltage drops to the low-level warning threshold or reaches the level configured in Program 12.
02	Maximum charging current: Used to set the combined charging current for both solar and utility chargers. (Maximum charging current = utility charging current + solar charging current)	1.5K/3K/4K default: 40A 02 40A	The charging current is adjustable within the following ranges: ● 1.5K and 3K models: 10A to 50A ● 4K model: 10A to 80A ● 6K model: 10A to 120A All models are adjustable in 10A increments.
		6K default: 60A 02 60A	
03	Range of AC input voltage	Appliances (default) 03 APL	When selected, the acceptable AC input voltage range is 90VAC to 280VAC.
		UPS 03 UPS	When selected, the acceptable AC input voltage range is 170VAC to 280VAC.

05	Type of battery	AGM (default) 05 AGn	Flooded 05 FLd
		User-Defined 05 USE	When "User-defined" is selected, the battery charge voltage and low DC cut-off voltage can be configured in Programs 26, 27, and 29.
		Pylontech battery 05 PYL	When selected, Programs 02, 26, 27, and 29 are configured automatically, eliminating the need for manual adjustment
		BYD battery 05 byd	When selected, Programs 02, 26, 27, and 29 are configured automatically, eliminating the need for manual adjustment.
		WECO battery 05 uEC	When selected, Programs 02, 26, 27, and 29 are configured automatically, eliminating the need for manual adjustment.
		Soltaro battery 05 SOL	When selected, Programs 02, 26, 27, and 29 are configured automatically, eliminating the need for manual adjustment.
		LIA-protocol compatible battery 05 LIA	Select "LIA" if using a lithium battery compatible with the CAN protocol. When selected, Programs 02, 26, 27, and 29 will be configured automatically, eliminating the need for manual adjustment.
		LIb-protocol compatible battery 05 LIb	Select "LIb" if using a lithium battery compatible with the RS485 protocol. When selected, Programs 02, 26, 27, and 29 will be configured automatically, eliminating the need for manual adjustment.
		3rd party Lithium battery 05 LIC	Select "LIC" if using a lithium battery type not listed above. When selected, Programs 02, 26, 27, and 29 will be configured automatically, eliminating the need for manual adjustment. Please consult your battery supplier for specific installation procedures.

06	Auto restart when overload occurs	Restart disable (default) 06 Lrd	Restart enables 06 LrE
07	Automatic restart when overheating happens	Restart disable (default) 07 trd	Restart enables 07 trE
09	Output frequency	50Hz (default) 09 50 Hz	60Hz 09 60 Hz
10	Output voltage	220V 10 220 V	230V (default) 10 230 V
		240V 10 240 V	
11	Maximum utility charging current Note: If the value set in program 02 is lower than the value in program 11, the inverter will use the charging current from program 02 for the utility charger.	40A (default) 11 40 A	The setting options include 2A, followed by a configurable range of: ● 1.5K and 3K models: 10A to 50A ● 4K model: 10A to 80A ● 6K model: 10A to 100A All ranges (excluding the 2A setting) are adjustable in 10A increments.
12	Setting voltage point back to utility source when selecting "SBU priority" or "Solar first" in program 01.	Available options in 1.5K model:	
		23.0V (default) 12 BATT 23.0 V	The adjustable range is from 22.0V to 25.5V, adjustable in 0.5V increments.
		Available options in 3K/4K/6K models:	
		46V (default) 12 BATT 46 V	The adjustable range is from 44.0V to 51.0V, adjustable in 1.0V increments.
		Available options when any lithium battery type is selected in Program 05.	
		SOC 10% (default for Lithium) 12 BATT 10 %	When any lithium battery type is selected in Program 05, the setting automatically switches to SOC (State of Charge). The adjustable range is from 5% to 95%.

13	Setting voltage point back to battery mode when selecting “SBU priority” or “Solar first” in program 01.	Available options in 1.5K model: The parameter can be set to "FUL" or configured within a range of 24.0V to 29.0V, adjustable in 0.5V increments.	
		Battery fully charged 13 BATT FUL	27V (default) 13 BATT 27.0 V
		Available options in 3K, 4K, and 6K models: The parameter can be set to "FUL" or configured within a range of 48.0V to 58.0V, adjustable in 1.0V increments.	
		Battery fully charged 13 BATT FUL	54V (default) 13 BATT 54 V
		Available option when any lithium battery type is selected in Program 05.	
		SOC 80% (default for Lithium) 13 BATT 80 %	When any lithium battery type is selected in Program 05, the setting automatically switches to SOC (State of Charge). The adjustable range is from 10% to 100%, in 5% increments.
16	Charger source priority: To configure the charger source priority	When this inverter/charger is functioning in Line, Standby, or Fault mode, the charger source can be set up as follows:	
		Solar first 16 CSO	Solar energy is the primary charging source. Utility power will only supplement battery charging when solar energy is unavailable.
		Solar and Utility (default) 16 SNU	The battery will be charged simultaneously by both solar energy and utility power.
		Only Solar 16 OSO	Solar energy will be the exclusive charging source, even when utility power is available.
		When the inverter/charger is operating in Battery mode, the battery is charged exclusively by solar energy. Charging will occur provided that sufficient solar power is available.	
18	Alarm control	Alarm on (default) 18 bON	Alarm off 18 bOF
19	Automatically revert to the default display screen	Return to default display screen (default) 19 ESP	When enabled, the LCD will automatically revert to the default screen (Input/Output Voltage) if no buttons are pressed for 1 minute, regardless of any manual display changes.

		Stay at latest screen 19 HEP	If chosen, the display will remain on the last screen the user switched to.
20	Backlight control	Backlight on (default) 20 LON	Backlight off 20 LOF
22	Beeps while primary source is interrupted	Alarm on (default) 22 AON	Alarm off 22 AOF
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 23 byd	Bypass enable 23 byE
25	Record Fault code	Record enable (default) 25 FEN	Record disable 25 FdS
26	Bulk charging voltage (C.V voltage)	1.5K default setting: 28.2V CU 26 BATT 28.2V	3K/4K/6K default setting: 56.4V CU 26 BATT 56.4V
		This program is configurable only when "User-defined" is selected in Program 05. The adjustable range is 25.0V to 31.0V for the 1.5K model, and 48.0V to 60.0V for the 3K, 4K, and 6K models, both adjustable in 0.1V increments.	
27	Floating charging voltage	1.5K default setting: 27.0V FLU 27 BATT 27.0V	3K/4K/6K default setting: 54.0V FLU 27 BATT 54.0V
		This program is configurable only when "User-defined" is selected in Program 05. The adjustable range is 25.0V to 31.0V for the 1.5K model, and 48.0V to 60.0V for the 3K, 4K, and 6K models, both adjustable in 0.1V increments.	
28	Maximum Battery Discharge Current NOTE: The maximum discharge current may be limited by the rated power in battery mode. When set to "Disable" (default), the unit operates at its maximum discharge capability without software-defined current protection. Users can configure this value based on specific battery requirements. If the discharge current	Available options in the 1.5K and 3K models: The parameter can be set to "Disable" or configured within a range of 30A to 70A, adjustable in 5A increments.	
		dIS (default) 28 dIS	70A 28 70A
		Available options in the 4K model: The parameter can be set to "Disable" or configured within a range of 30A to 100A, adjustable in 5A increments.	
		dIS (default) 28 dIS	100A 28 100A

	exceeds this threshold, the battery will cease discharging to protect the system.	Available options in the 6K model: The parameter can be set to "Disable" or configured within a range of 30A to 140A, adjustable in 5A increments.	
		dIS (default) 28 dIS	140A 28 140 A
29	Low DC cutoff voltage or state of charge (SOC) percentage	1.5K default setting: 21.0V CUt 29 BATT 21.0 V	3K/4K/6K default setting: 42.0V CUt 29 BATT 42.0 V
		This program is configurable only when "User-defined" is selected in Program 05. The adjustable range is 21.0V to 26.0V for the 1.5K model and 42.0V to 52.0V for the 3K, 4K, and 6K models, both adjustable in 0.1V increments. Once set, the low DC cut-off voltage remains constant, regardless of the connected load percentage.	
		Lithium battery default setting: SOC 5% CUt 29 BATT 5 % When any lithium battery type is selected in Program 05, the setting automatically switches to SOC (State of Charge). The adjustable range is 0% to 90%, with 1% increments.	
30	Battery equalization	Battery equalization 30 EEN	Battery equalization is turned off (default setting). 30 EdS
		This program is configurable only when "Flooded" or "User-Defined" is selected in Program 05.	
31	Battery equalization voltage	1.5K default setting: 29.2V EU 31 BATT 29.2 V	3K/4K/6K default setting: 58.4V EU 31 BATT 58.4 V
		The adjustable voltage range is 25.0V to 31.0V for the 1.5K model, and 48.0V to 60.0V for the 3K, 4K, and 6K models, both adjustable in 0.1V increments.	
33	Battery Equalization Duration	60min (default) 33 60	The adjustable range is from 5 to 900 minutes, configurable in 5-minute increments.
34	Battery Equalization Timeout	120min (default) 34 120	The adjustable range is from 5 to 900 minutes, configurable in 5-minute increments.
35	Battery Equalization Interval	30days (default) 35 30d	The setting range is from 0 to 90 days, adjustable in 1-day increments.
36	Manual Equalization Activation	Enable 36 AEN	Disable (default) 36 AdS

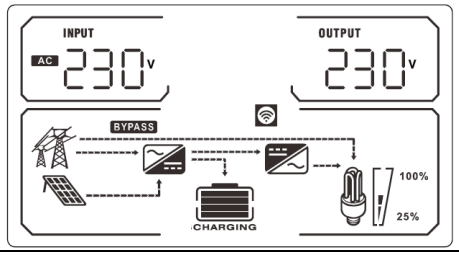
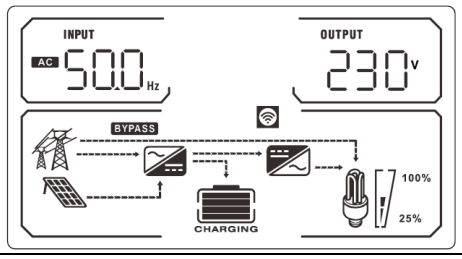
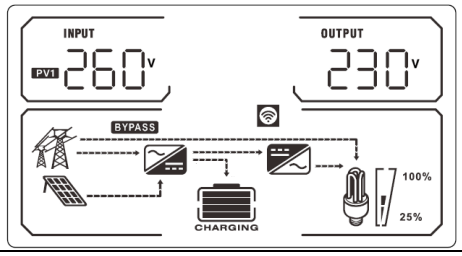
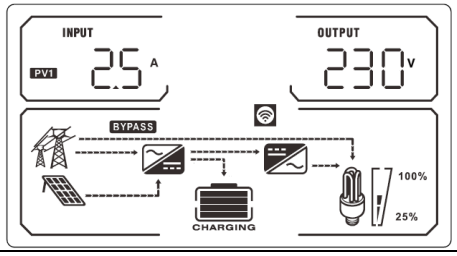
		This program is accessible only when the equalization function is enabled in Program 30. ● Enable: Immediately activates battery equalization; the LCD will display "Eq". ● Disable: Deactivates the current equalization process. The function will remain inactive until the next scheduled cycle, as defined in Program 35. During this period, the "Eq" icon will not be displayed.	
38	Configuration for feeding PV energy into the grid NOTE: To enable PV energy feed-in to the grid, ensure the external CT function is disabled. When the CT function is enabled, PV energy will be limited to self-consumption for household loads, and no excess energy will be exported to the grid.	Feed-in to grid is disabled (default setting) 38 Grd	Enable feed-in to the grid 38 GrE
39	External CT configuration NOTE: When the external CT sensor function is enabled, the system ensures 100% self-consumption, allowing PV energy to be used exclusively for household loads without exporting power to the grid.	CT function disable (default) 39 Crd	CT function enable 39 CrE
40	Feed-in to grid Power Limitation	1.5K default setting: 1.5KW 40 1.5 kW	3K default setting: 3.0KW 40 3.0 kW
		4K default setting: 4.0KW 40 4.0 kW	6K default setting: 6.0KW 40 6.0 kW
		The power feed-in to grid can be adjustable, the range is from 0W to the rated output power value, with 100W increments for each step.	
41	Feed-in to grid voltage range	FR1: 170~260V, 47.5~51.5Hz 41 Fr1	FR2: 170~265V, 47.5~51.5Hz 41 Fr2
		FR3: 170~270V, 47.5~51.5Hz 41 Fr3	FR4 (default): 170~280V, 47.5~51.5Hz 41 Fr4
		FR5: 170~260V, 57~62Hz 41 Fr5	FR6: 170~265V, 57~62Hz 41 Fr6
		FR7: 170~270V, 57~62Hz 41 Fr7	FR8: 170~280V, 57~62Hz 41 Fr8
42	AC Input Current Calibration *NOTE: This setting is used	1.5K default setting: 50 42 50	3K default setting: 0 42 0

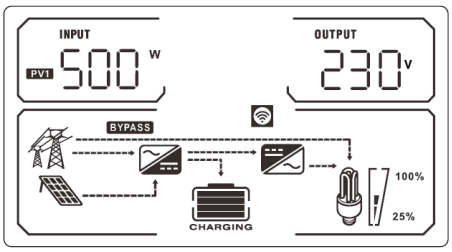
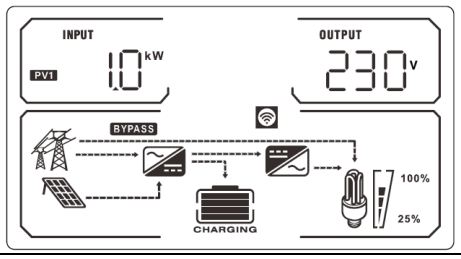
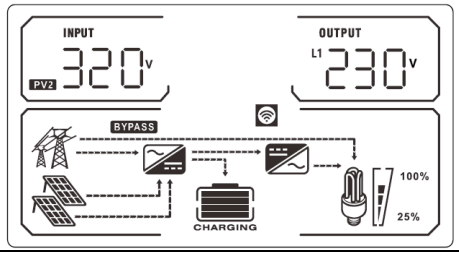
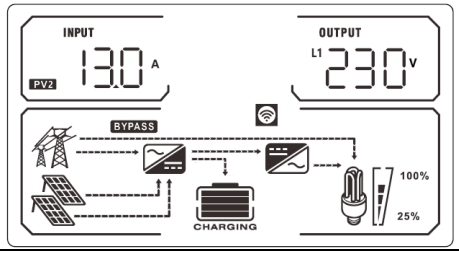
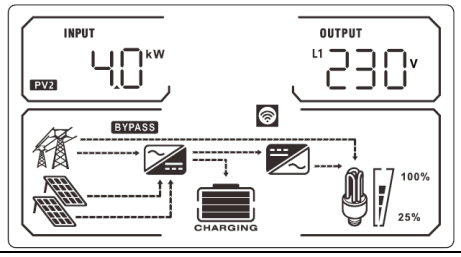
	to balance or calibrate the AC input current when external devices (such as transformers or energy meters) are connected.	4K/6K default setting: 120 42 120	
		If current deviation occurs due to these external components, it can be corrected using this parameter. The adjustment range is 0 to 250 in increments of 1.	
43	Power Limit for PV Energy in Line Mode NOTE: This setting prevents the PV system from generating more power than the load demand. It helps avoid unintended PV power export to the grid when an external device, such as a transformer or energy meter, is connected to the AC input.	1.5K/4K/6K default setting: 30W 43 30	3K default setting: 70W 43 70
		If a load detection error occurs due to external devices connected to the AC input, this setting can be used for compensation. The adjustable range is from 0 W to 250 W, with 10 W increments for each step.	
60	Low DC cutoff voltage or state of charge (SOC) percentage on the second output L2 (Applicable only for 4K/6K models)	default setting: 42.0V CoU 60 BATT 42.0	If "User-defined" is selected in Program 05, the adjustable voltage range is 42.0 V to 52.0 V. The voltage can be adjusted in 0.1 V increments. The low DC cut-off voltage will remain fixed at the configured value, regardless of the connected load percentage.
		Lithium battery default setting: SOC 5% CoU 60 BATT 5%	
		If any lithium battery type is selected in Program 05, this setting becomes configurable. The adjustable range is 0% to 90%, with 1% increments for each click.	
61	Configuring the discharge duration for the second output L2 (Applicable only to 4K/6K models)	Disable (default) 61 dd5	The setting can be Disabled, or configured from 0 to 990 minutes, with 5-minute increments for each click. * NOTE: If the battery discharge time reaches the value set in Program 61 and the function in Program 60 is not enabled, the system output will be automatically turned off.
63	L2 Output Recovery Threshold (Voltage or SOC): Configure the voltage level or State of Charge (SOC) at which the second output (L2) resumes operation. (Applicable to 4K/6K	default setting: 46.0V 63 BATT 46.0V	When "User-defined" is selected in Program 05, the voltage is adjustable from 43.0V to 60.0V in 0.1V increments. *NOTE: If the second output is disabled via Program 60, the L2 output will resume according to the settings in Program 63.

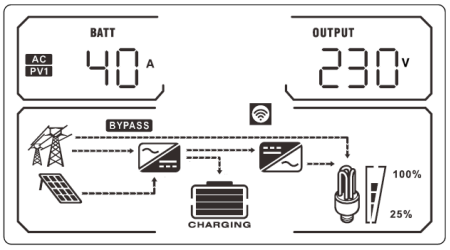
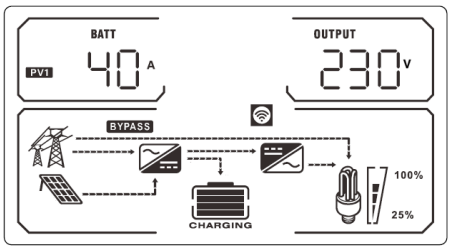
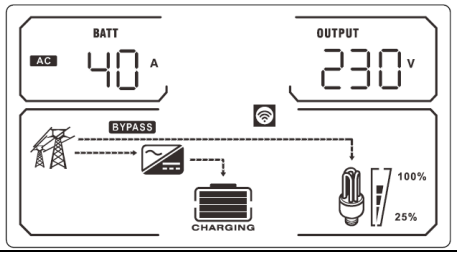
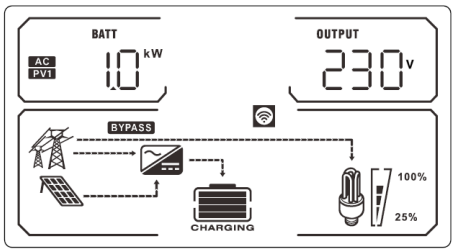
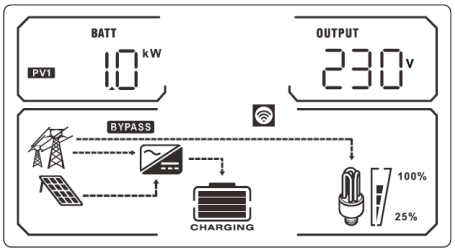
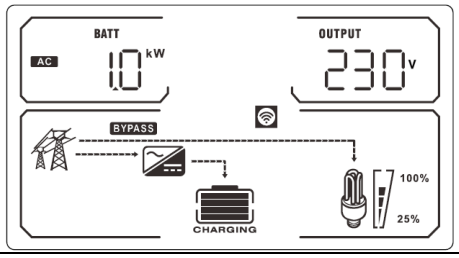
	models only)	SOC: 20% (default for lithium battery) 63 BATT 20%	When any lithium battery type is selected in Program 05, this parameter is displayed as a percentage of battery capacity. The value is adjustable from 5% to 100% in 5% increments. *NOTE: If the second output (L2) is disabled via Program 60, the L2 output will resume according to the settings in Program 63.
64	L2 Output Activation Delay (Line Mode/Charging): Configure the delay time for activating the second output (L2) when the inverter returns to Line mode or while the battery is charging. (Applicable to 4K/6K models only)	0 min (Default) 64 0	The setting range is from 0 to 990 minutes, adjustable in 5-minute increments. *NOTE: If the second output (L2) is interrupted due to the settings in Program 61, the L2 output will resume based on the configuration in Program 64.
95	Time setting - Minute	min 95 59 For minute setting, the range is from 00 to 59.	
96	Time setting - Hour	HOU 96 23 For hour setting, the range is from 00 to 23.	
97	Time setting - Day	dAY 97 31 For day setting, the range is from 00 to 31.	
98	Time setting - Month	nON 98 12 For month setting, the range is from 01 to 12.	
99	Time setting - Year	YEA 99 99 For year setting, the range is from 00 to 99.	

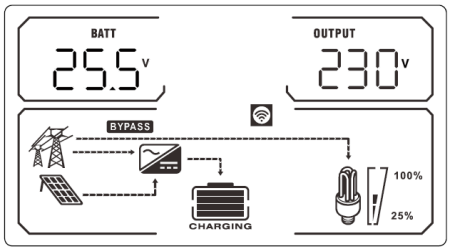
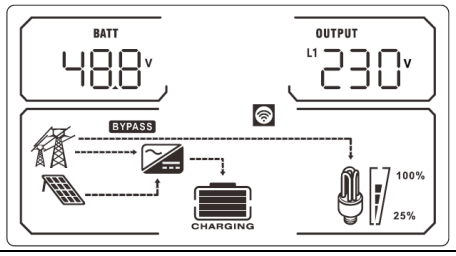
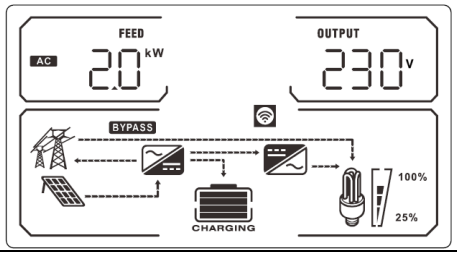
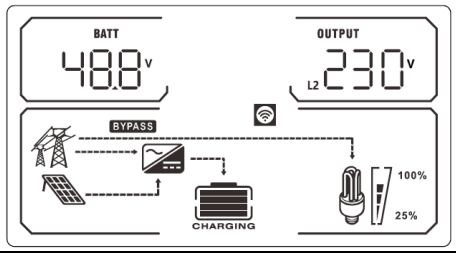
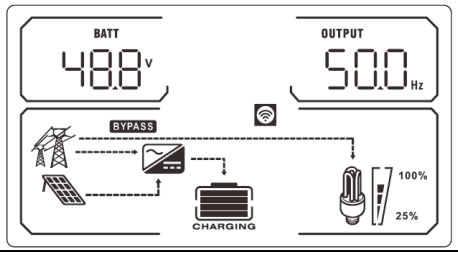
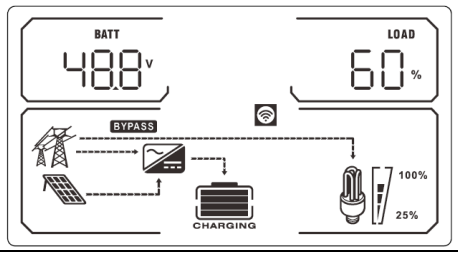
Display Setting

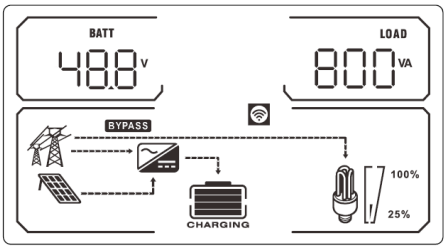
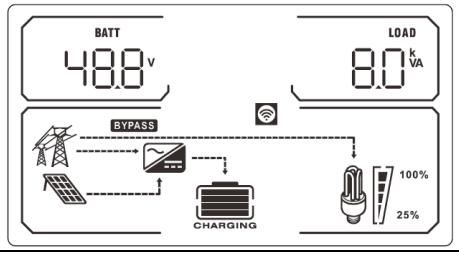
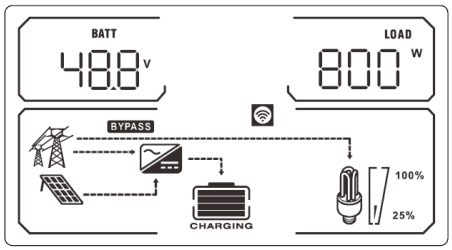
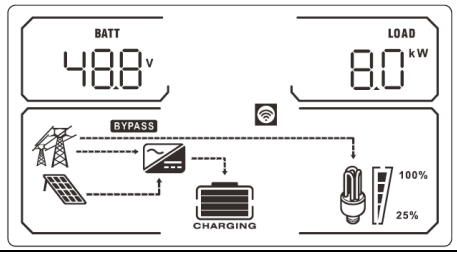
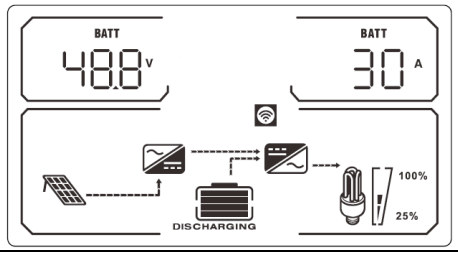
Pressing the "UP" or "DOWN" key will cycle through the LCD display information. The available information changes in the sequence shown in the table below.

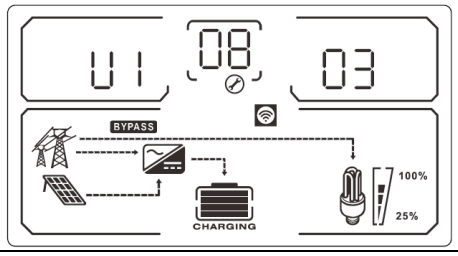
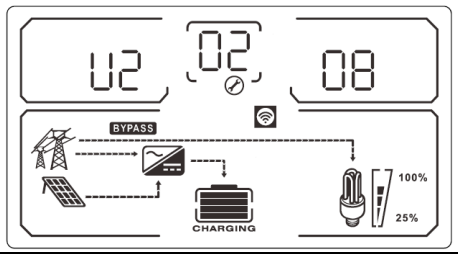
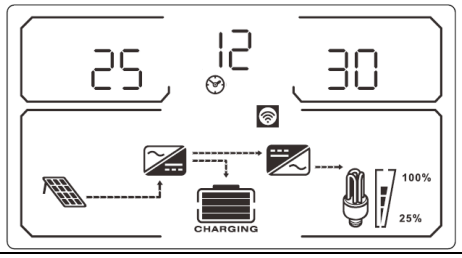
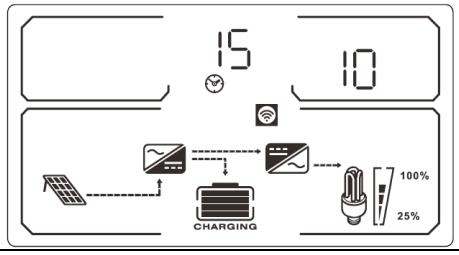
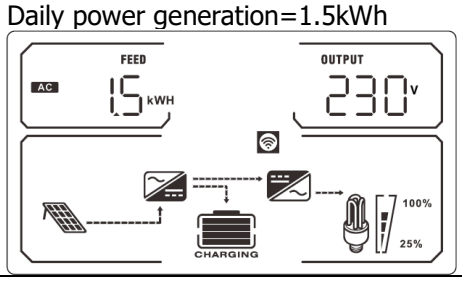
Selectable information	LCD display
Input Voltage / Output Voltage (Default Display Screen)	Input Voltage=230V, output voltage=230V 
Input frequency	Input frequency=50.0Hz 
PV1 voltage	PV1 voltage=260V 
PV1 current	PV1 current = 2.5A 

PV1 power	When the PV1 power is less than 1kW, it will be shown as xxxW, as illustrated in the chart below.  When the PV1 power goes beyond 1kW, it will be shown as x.xkW, as illustrated in the chart below. 
PV2 voltage (Applicable only to 4K and 6K models)	PV2 voltage=320V 
PV2 current (Applicable only to 4K and 6K models)	PV2 current = 13.0A 
PV2 power (Applicable only to 4K and 6K models)	PV2 power = 4.0kW 

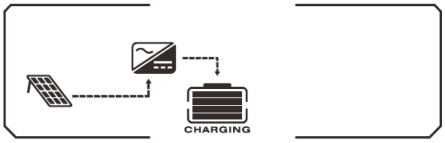
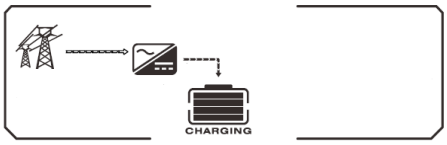
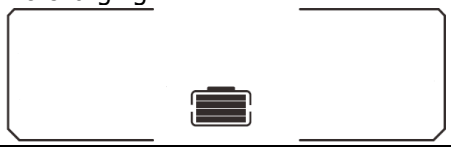
Charging current	AC and PV charging current=40A  PV charging current=40A  AC charging current=40A 
Charging power	AC and PV charging power=1.0kW  PV charging power=1.0kW  AC charging power=1.0kW 

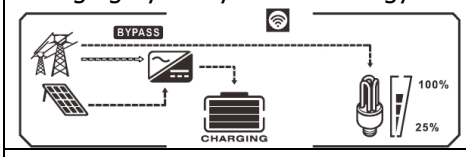
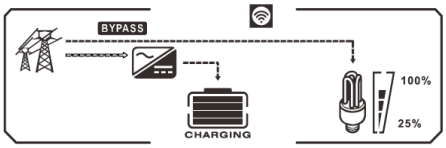
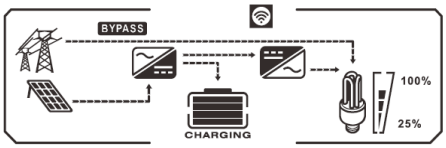
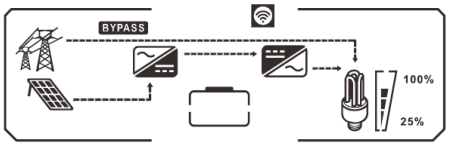
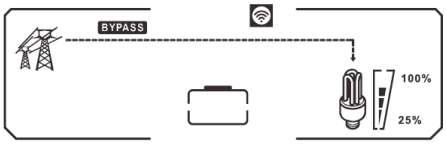
Battery voltage and output voltage	1.5K model: Battery voltage=25.5V, output voltage=230V  3K/4K/6K models: Battery voltage=48.8V, main output voltage=230V 
Feed-in to grid power (If PV energy feed-in to grid is enabled)	Feed-in grid power=2.0kW, main output voltage=230V 
Battery voltage and second output voltage (Applicable only to 4K and 6K models)	Battery voltage=48.8V, second output voltage=230V 
Output frequency	Output frequency=50Hz 
Load percentage	Load percent=60% 

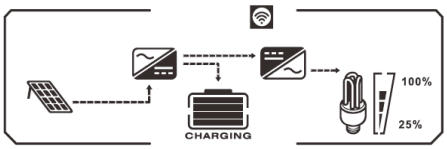
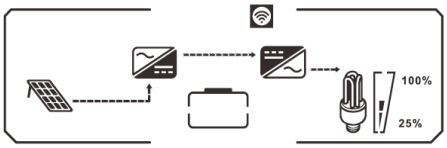
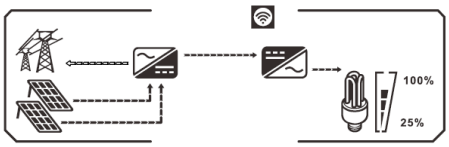
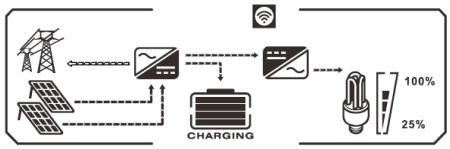
Load in VA	When the connected load is less than 1kVA, the load will be displayed in VA as xxxVA, as shown in the chart below  When the load exceeds 1kVA (≧1KVA), the load will be displayed in kVA with one decimal place, as shown in the chart below. 
Load in Watt	When the load is less than 1kW, the load will be displayed in watts (W) as shown in the chart below.  When the load is greater than or equal to 1kW (≧1KW), the load in watts will be displayed as x.xkW, as shown in the chart below. 
Battery voltage/DC discharging current	Battery voltage=48.8V, discharging current=30A 

Main CPU version checking	Main CPU version 00008.03 
Secondary CPU version checking	Secondary CPU version 00002.08 
Real-Time clock by Year/Month/Day	Real date=2025-12-30 
Real-Time clock by Hour/Minutes	Real time=15:10 
Daily power generation data	Daily power generation=1.5kWh 

Operating Mode Description

Operation mode	Description	LCD display
Standby Mode Note: *Standby mode means the inverter is not yet powered on, but it can still charge the battery without providing AC output.	The unit does not provide any output, but it is still capable of charging batteries.	Charging by utility and PV energy.
		Charging by utility.
		Charging by PV energy. 
		No charging.
Fault Mode Note: *Fault mode refers to errors that occur due to internal circuit faults or external factors such as overheating, output short circuits, and similar issues.	PV energy and utility power can be used to charge batteries.	Charging by utility and PV energy.
		Charging by utility. 
		Charging by PV energy.
		No charging. 

Operation mode	Description	LCD display
Line Mode	The unit will deliver power from the mains and simultaneously charge the battery when operating in line mode.	Charging by utility and PV energy. 
		Charging by utility. 
		If "solar first" is set as the output source priority and the solar energy alone cannot meet the load demand, both solar energy and the utility will supply the load while simultaneously charging the battery. 
		If "solar first" is set as the output source priority and there is no battery connected, the loads will be powered by solar energy and the utility. 
		Power from the utility. 

Operation mode	Description	LCD display
Battery Mode	The unit will deliver output power using both the battery and the PV power.	Power from battery and PV energy.
		PV energy will supply power to the loads and charge battery at the same time. 
		Power from battery only.
		Power from PV energy only. 
Grid-tie Mode (Available only when feeding PV energy into the grid is enabled)	PV energy feed-in to the grid.	PV energy feeds power to the grid when the battery is not connected. 
		PV energy charges the battery, supplies power to the load, and feeds any excess energy to the grid. 

Battery Equalization Description

A charge controller includes an equalization feature that counteracts the accumulation of harmful chemical effects, such as stratification, which occurs when the acid concentration is higher at the bottom of the battery than at the top. Equalization also aids in eliminating sulfate crystals that may have formed on the battery plates. If not addressed, this issue, known as sulfation, can decrease the battery's overall capacity. For this reason, it is advisable to perform equalization on the battery regularly.

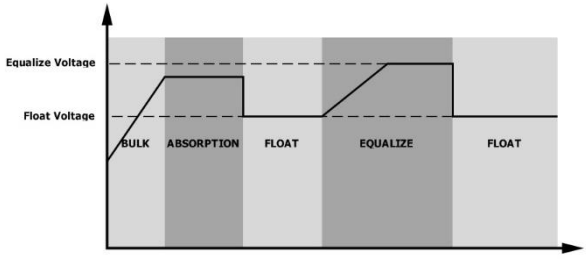
- **How to Use the Equalization Function**

First, activate the battery equalization feature in the monitoring LCD settings. After that, you can apply this function to a device using one of the following methods:

1. Set the equalization interval on the LCD
2. Start equalization immediately through the LCD

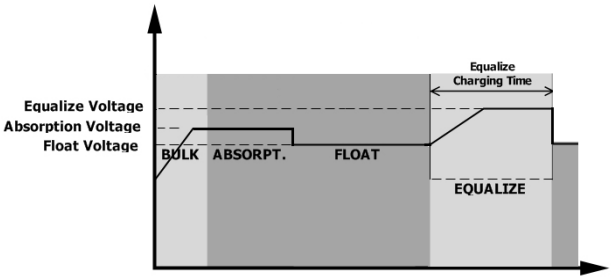
- **When to Equalize**

During the float stage, once the preset equalization interval (battery equalization cycle) is met, or if equalization is activated immediately, the controller will begin the Equalize stage.

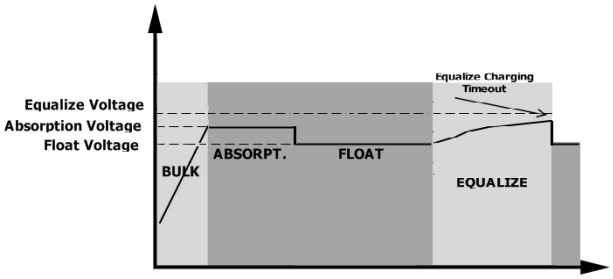


- **Equalize charging time and timeout.**

During the Equalize stage, the controller provides power to charge the battery fully until the battery voltage reaches the equalization voltage. After that, it uses constant-voltage regulation to keep the battery voltage steady at the equalization voltage. The battery stays in the Equalize stage until the preset equalization time is completed.



During the Equalize stage, if the battery equalization time expires, and the battery voltage has not reached the equalization voltage level, the charge controller will prolong the equalization period until the battery voltage reaches the required equalization voltage. However, if the battery voltage remains below the equalization voltage after the extended equalization timeout, the charge controller will end the equalization process and switch back to the float stage.



Fault Reference Code

Fault Code	Fault Event	Icon on
01	The fan remains locked when the inverter is turned off.	01 ERROR
02	The over-temperature sensor or NTC is not properly connected.	02 ERROR
03	The battery voltage is excessively high.	03 ERROR
04	The battery voltage is insufficient.	04 ERROR
05	The internal converter components detect a short circuit or overheating.	05 ERROR
06	The output voltage is excessively high.	06 ERROR
07	Timeout due to overload	07 ERROR
08	The voltage of the bus is excessively high.	08 ERROR
09	Bus soft start was unsuccessful.	09 ERROR
10	The photovoltaic current is excessively high.	10 ERROR
17	Battery discharge current over time elapsed.	17 ERROR
51	Excess current or power surge	51 ERROR
52	The voltage of the bus is insufficient.	52 ERROR
53	The inverter soft start did not work.	53 ERROR
55	DC voltage present in AC output	55 ERROR
57	The current sensor is malfunctioning.	57 ERROR
58	The output voltage is insufficient.	58 ERROR
59	The PV voltage exceeds the limit.	59 ERROR

Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	The fan remains locked when the inverter is running.	Beep three times every second	01 ⚠
02	Excessive heat	None	02 ⚠
03	The battery is excessively charged.	Beep once every second	03 ⚠
04	Battery is low	Beep once every second	04 ⚠
07	Excessive load	Beep once every 0.5 second	07 ⚠ OVER LOAD 100% 25%
10	Reduction of output power	Beep twice every 3 seconds	10 ⚠
15	PV power output is low.	Beep twice every 3 seconds	15 ⚠
16	Elevated AC input voltage (above 280VAC) during BUS soft start.	None	16 ⚠
17	Battery discharge current over time elapsed	Beep once every 0.5 second	17 ⚠
32	Communication breakdown between the inverter and the communication board.	None	32 ⚠
E9	Battery equalization	None	E9 ⚠
bP	Battery is not connected	None	bP ⚠

SPECIFICATIONS

Table 1 Line Mode Specifications

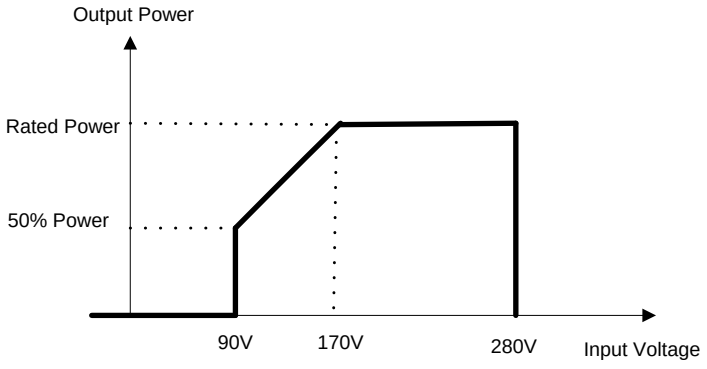
INVERTER MODEL	1.5K	3K	4K	6K
Input Voltage Waveform	Sinusoidal (utility or generator)			
Nominal Input Voltage	230Vac			
Low Loss Voltage	170Vac±7V (UPS); 90Vac±7V (Appliances)			
Low Loss Return Voltage	180Vac±7V (UPS); 100Vac±7V (Appliances)			
High Loss Voltage	280Vac±7V			
High Loss Return Voltage	270Vac±7V			
Max AC Input Voltage	300Vac			
Nominal Input Frequency	50Hz / 60Hz (Auto detection)			
Low Loss Frequency	40±1Hz			
Low Loss Return Frequency	42±1Hz			
High Loss Frequency	65±1Hz			
High Loss Return Frequency	63±1Hz			
Output Short Circuit Protection	Circuit Breaker			
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)			
Transfer Time	10ms typical (UPS); 20ms typical (Appliances)			
Output power derating: When the AC input voltage decreases to 170V, the output power will be reduced.				

Table 2 Inverter Mode Specifications

INVERTER MODEL	**1.5K**	**3K**	**4K**	**6K**
Rated Output Power	1.5KVA/1.5KW	3KVA/3KW with PV and battery, 2.5KW with battery only	4KVA/4KW	6KVA/6KW
AC Output No.	Single		Dual Outputs	
Output Voltage Waveform	Pure Sine Wave			
Output Voltage Regulation	230Vac±5%			
Output Frequency	50Hz			
Peak Efficiency	92%			
Overload Protection	5s@≥120% load; 30s@103%~120% load			
Surge Capacity	2* rated power for 5 seconds			
Nominal DC Input Voltage	24Vdc	48Vdc		
Cold Start Voltage	23.0Vdc	46.0Vdc		
Low DC Warning Voltage @ load < 50% @ load ≥ 50%	 23.0Vdc 22.0Vdc	 46.0Vdc 44.0Vdc		
Low DC Warning Return Voltage @ load < 50% @ load ≥ 50%	 23.5Vdc 23.0Vdc	 47.0Vdc 46.0Vdc		
Low DC Cut-off Voltage @ load < 50% @ load ≥ 50%	 21.5Vdc 21.0Vdc	 43.0Vdc 42.0Vdc		
High DC Recovery Voltage	31Vdc	60Vdc		
High DC Cut-off Voltage	32Vdc	61Vdc		
No Load Power Consumption	35W	40W	55W	65W

Table 3 Charge Mode Specifications

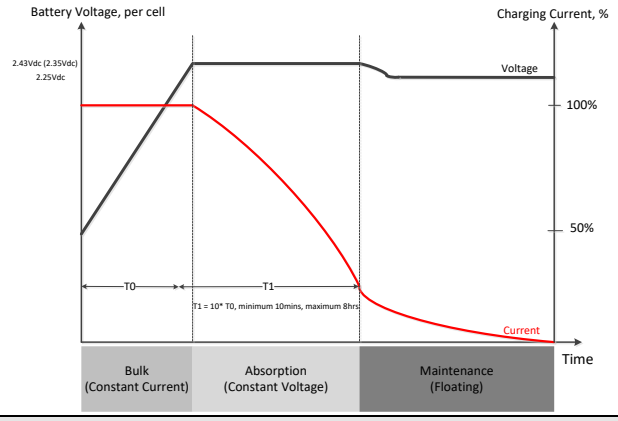
Utility Charging Mode					
INVERTER MODEL		**1.5K**	**3K**	**4K**	**6K**
Charging Algorithm		3-Step			
AC Charging Current (Max)		50Amp (@$V_{I/P}$=230Vac)		80Amp (@$V_{I/P}$=230Vac)	100Amp (@$V_{I/P}$=230Vac)
Bulk Charging Voltage	**Flooded Battery**	29.2Vdc	58.4Vdc		
	AGM / Gel Battery	28.2Vdc	56.4Vdc		
Floating Charging Voltage		27Vdc	54Vdc		
Charging Curve					
MPPT Solar Charging Mode					
INVERTER MODEL		**1.5K**	**3K**	**4K**	**6K**
Max. PV Array Power		2400W	3600W	7000W (3500W x 2)	9600W (4800W x 2)
Max. PV Input Current		18Amp x 1		18Amp x 2	
Nominal PV Voltage		240Vdc	320Vdc		
Start-up Voltage		70Vdc +/- 10Vdc	150Vdc +/- 10Vdc		
PV Array MPPT Voltage Range		60~450Vdc	90~450Vdc		
Max. PV Array Open Circuit Voltage		500Vdc			
Max Charging Current (AC charger plus solar charger)		50Amp		80Amp	120Amp

Table 4 General Specifications

INVERTER MODEL	**1.5K**	**3K**	**4K**	**6K**
Safety Certification	CE			
IP Protection	IP65			
Operating Temperature Range	-20°C to 50°C			
Storage temperature	-25°C~ 60°C			
Humidity	4% to 100% Relative Humidity (Non-condensing)			
Dimension (D*W*H), mm	137 x 290 x 370		156.5 x 315 x 435	
Net Weight, kg	8.9	9.5	13.6	15

TROUBLE SHOOTING

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
The unit powers off on its own during the startup sequence.	The LCD/LEDs and buzzer will be turned on for 3 seconds and then completely turned off.	The voltage of the battery is insufficient.	1. Recharge the battery. 2. Install a new battery.
No reaction after turning on.	No signs.	1. The battery voltage is significantly below the required level. 2. The internal fuse has blown.	1. Get in touch with the repair center to have the fuse replaced. 2. Recharge the battery. 3. Replace the battery.
The mains power is available, but the device is operating on battery power.	The LCD shows an input voltage of 0, and the green LED is blinking.	The input protector has been activated.	Verify whether the AC breaker has tripped and ensure that the AC wiring is properly connected.
	The green LED is blinking.	Insufficient quality of AC power. (Shore or Generator)	1. Verify whether the AC wires are excessively thin or too lengthy. 2. Confirm that the generator (if used) is functioning properly and that the input voltage range setting is accurate. (From UPS to Appliance)
	The green LED is blinking.	Set the output source priority to "Solar First."	Set the output source priority to Utility first.
When the unit is powered on, the internal relay continuously switches on and off.	The LCD screen and LEDs are blinking.	The battery has been disconnected.	Verify that the battery wires are properly connected.
The buzzer is sounding continuously, and the red LED remains lit.	Fault code 07	Overload error. The inverter is overloaded by 105% and the time has expired.	Lower the total power demand by turning off certain devices.
		If the PV input voltage exceeds the specified limit, the output power will be reduced. In this situation, if the connected load exceeds the reduced output power, it may result in an overload.	Decrease the number of photovoltaic modules connected in series or reduce the load connected.
	Fault code 17	Battery discharge current exceeded the time limit.	Lower the connected load and then restart the inverter.
	Fault code 05	The output was interrupted.	Verify that the wiring is properly connected and eliminate any abnormal loads.
		The internal converter component temperature is too high.	Verify if the unit's airflow is obstructed or if the surrounding temperature is excessively high.
	Fault code 02	Internal temperature of inverter component is over.	
	Fault code 03	The battery has been charged beyond its capacity.	Send back to the repair center.
		The voltage of the battery is excessively high.	Verify whether the specifications and quantity of the batteries meet the requirements.

	Fault code 01	Fan malfunction	Replace the fan.
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error happens again, please return to repair center.
	Fault code 52	Bus voltage is too low.	
	Fault code 55	Output voltage is unbalanced.	
	Fault code 59	PV input voltage is beyond the specification.	Reduce the number of PV modules in series.

Appendix I: BMS Communication Installation

1. Introduction

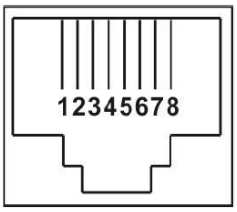
When connecting to a lithium battery, it is advisable to use a custom-made RJ45 communication cable. Please consult your dealer or integrator for more information.

This specially designed RJ45 communication cable transmits data and signals between the lithium battery and the inverter. The information exchanged includes:

- Adjusting the charging voltage, charging current, and battery discharge cut-off voltage based on the lithium battery specifications.
- Controlling the inverter to start or stop charging depending on the lithium battery's status.

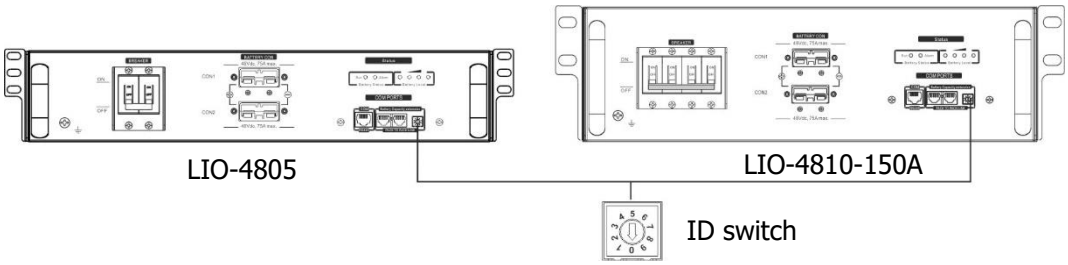
2. Pin Assignment for BMS Communication Port

	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

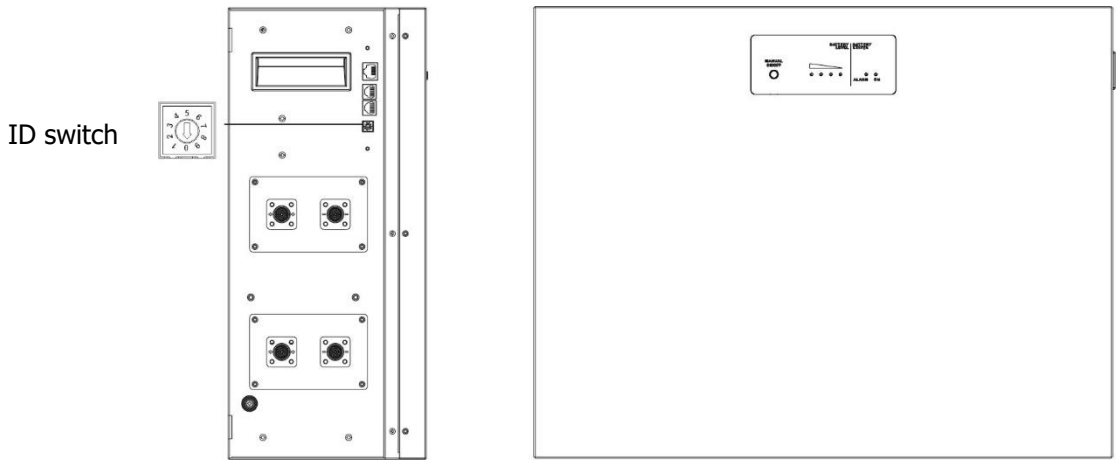


3. Lithium Battery Communication Configuration

LIO-4805/LIO-4810-150A

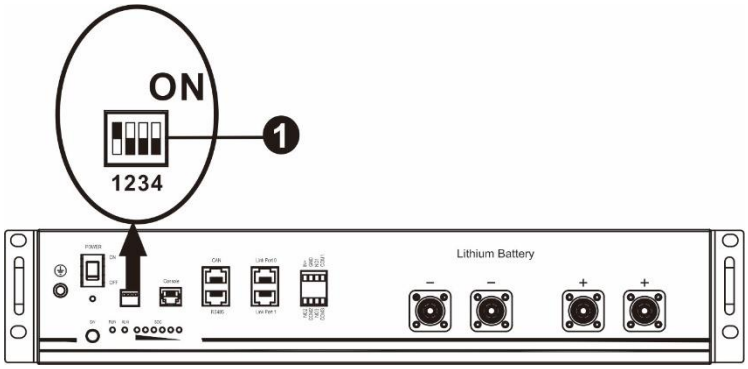


LIO II-4810



The ID Switch represents the unique identification code assigned to each battery module. To ensure proper functioning, each battery module must have a distinct ID. You can configure the ID code for each module by turning the PIN on the ID switch. The numbers range from 0 to 9 and can be assigned in any order. Up to 10 battery modules can operate simultaneously in parallel.

PYLONTECH



① Dip Switch: There are 4 dip switches used to configure different baud rates and battery group addresses.

When a switch is in the "OFF" position, it represents a "0," and when it is in the "ON" position, it represents a "1."

Dip switch 1 set to "ON" indicates a baud rate of 9600.

Dip switches 2, 3, and 4 are designated for the battery group address.

On the master battery (the first battery), dip switches 2, 3, and 4 are used to set or modify the group address.

NOTE: "1" is the upper position and "0" is the 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 required to set up a master battery with this setting, and slave batteries are unrestricted.
	1	0	0	Multiple group condition. It's required to set up the master battery on the first group with this setting, and slave batteries are unrestricted.
	0	1	0	Multiple group condition. It's required to set up the master battery on the second group with this setting, and the slave batteries are unrestricted.
	1	1	0	Multiple group condition. It's required to set up the master battery on the third group with this setting, and slave batteries are unrestricted.
	0	0	1	Multiple group condition. It's required to set up the master battery on the fourth group with this setting, and the slave batteries are unrestricted.
	1	0	1	Multiple group condition. It's required to set up the master battery on the fifth group with this setting, and slave batteries are unrestricted.

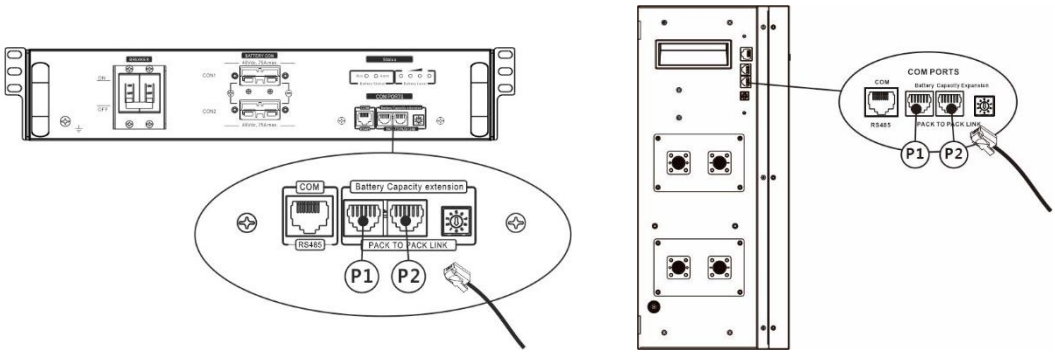
NOTE: The maximum number of lithium battery groups is 5, and for the maximum quantity allowed in each group, please consult the battery manufacturer.

4. Installation and Operation

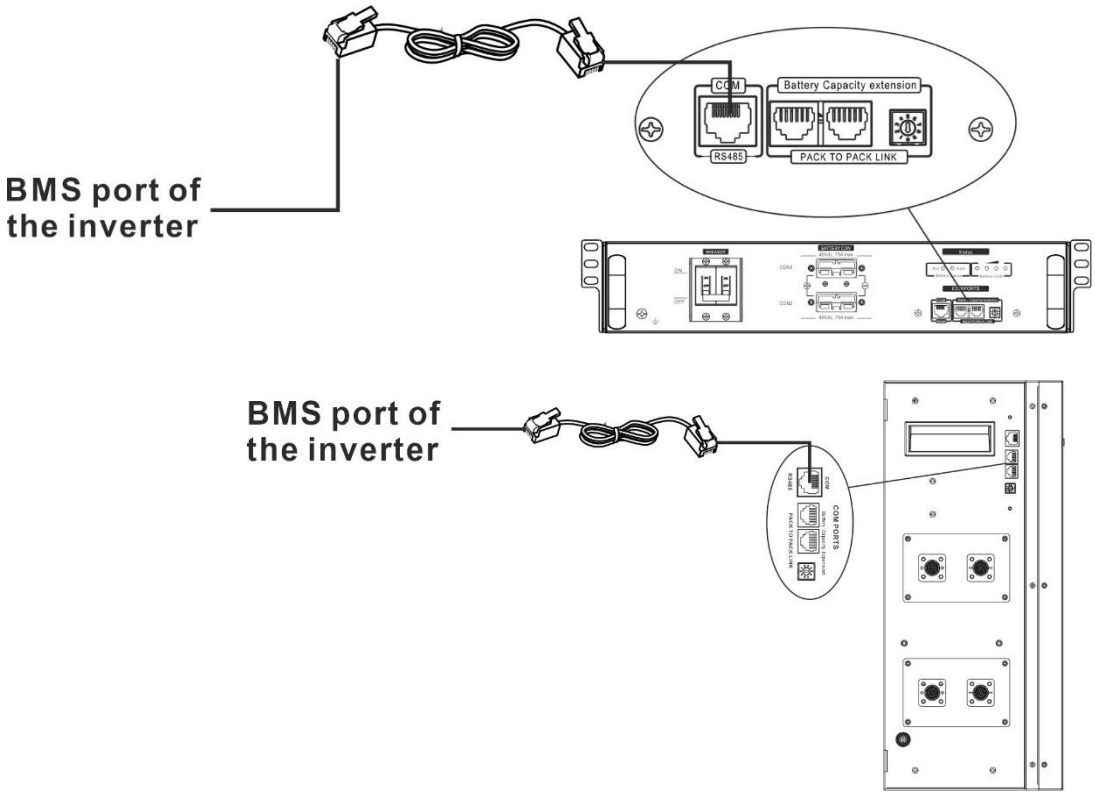
LIO-4805/LIO-4810-150A/ LIO II-4810

Once an ID number is assigned to each battery module, proceed to configure the LCD panel on the inverter and complete the wiring connections by following these steps:

Step 1: Connect the provided RJ11 signal cable to the extension port (P1 or P2).



Step 2: Connect the inverter and the lithium battery using the provided RJ45 cable included in the battery module package.



Note for parallel system:

1. Supports only standard battery installations.
2. Use a custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and a lithium battery. Just set the inverter's battery type to "LIB"; for others, set it to "USE".

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

Step 4: Hold down the Power on/off button on the battery module for 5 seconds to start it up.

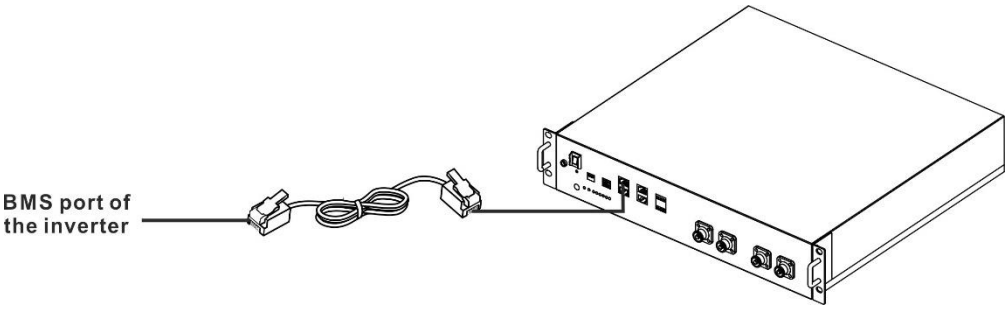
*If the manual button is not accessible, simply turn on the inverter module, and the battery module will power on automatically.

Step 5. Turn on the inverter.
Step 6: Be sure to select battery type as “LIB” in the LCD.

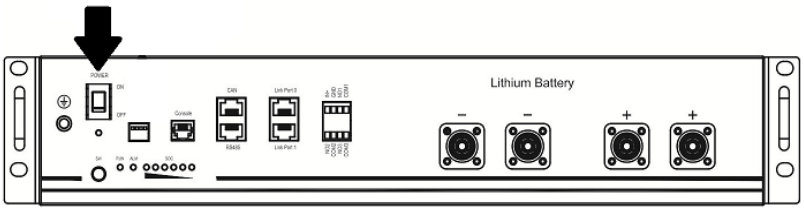
If the inverter and battery communicate successfully, the battery icon on the LCD screen will blink. Typically, it takes more than one minute to establish this communication.

PYLONTECH

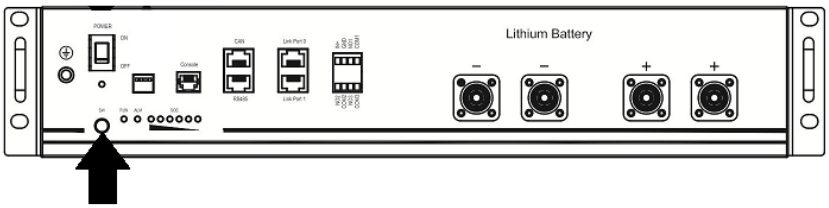
After completing the configuration, install the LCD panel along with the inverter and lithium battery by following these steps:
Step 1. Connect the inverter and lithium battery using a custom-made RJ45 cable.



Step 2. Turn on the lithium battery.



Step 3. Press and hold for more than three seconds to start the lithium battery. The output power will then be ready.

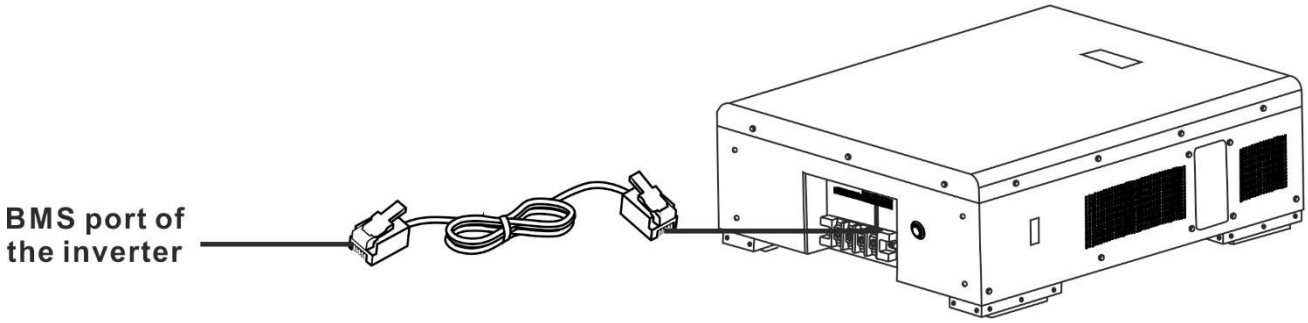


Step 4. Power on the inverter.
Step 5. Make sure to choose the battery type as “PYL” in LCD program 5.

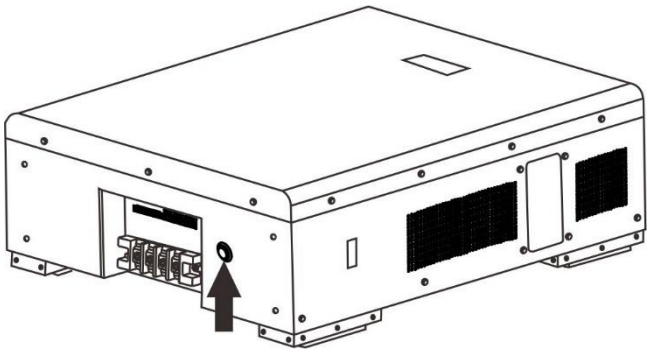
If the inverter and battery communicate successfully, the battery icon on the LCD screen will blink. Typically, it takes more than one minute to establish this communication.

WECO

Step 1. Connect the inverter and the lithium battery using a custom-made RJ45 cable.



Step 2. Turn on the lithium battery.



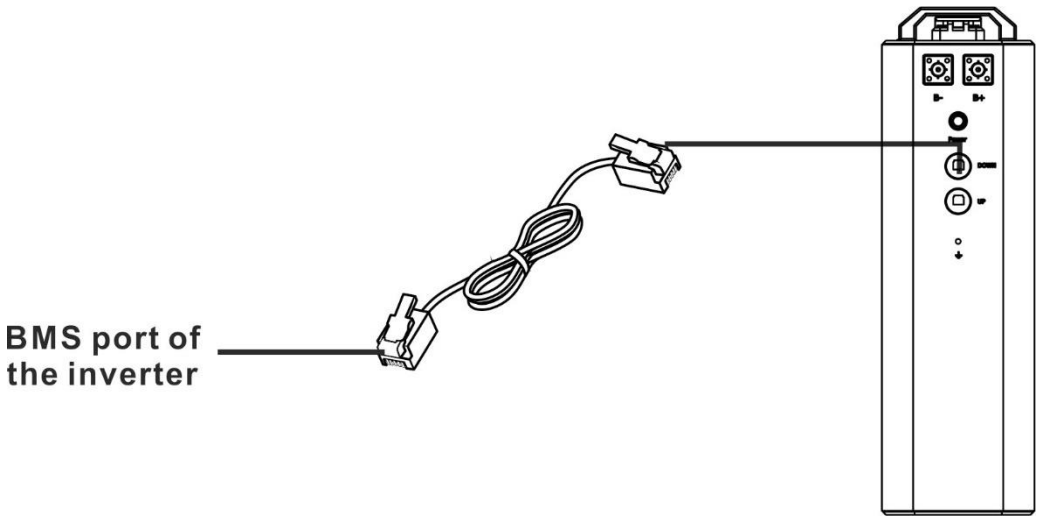
Step 3. Power on the inverter.

Step 4. Make sure to choose the battery type as "WEC" in LCD program 5.

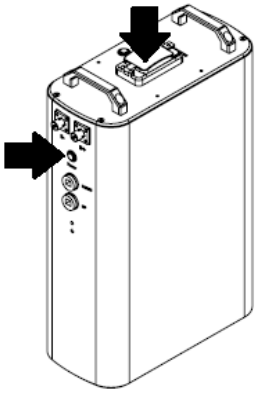
If the inverter and battery communicate successfully, the battery icon on the LCD display will start to flash. Typically, it takes more than one minute to establish this communication.

SOLTARO

Step 1. Connect the inverter and the lithium battery using a custom-made RJ45 cable.



Step 2. Open the DC isolator and turn on the lithium battery.



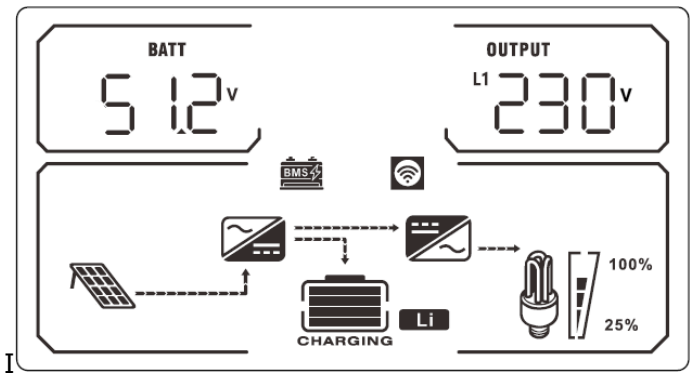
Step 3. Power on the inverter.

Step 4. Make sure to choose "SOL" as the battery type in LCD program 5.

If the inverter and battery communicate successfully, the battery icon on the LCD screen will start to flash. Typically, it takes more than one minute to establish this communication.

5. LCD Display Information

When the unit is powered by a lithium battery, the LCD will display a lithium battery icon Li. After the battery BMS communication is successfully connected, the icon will change accordingly. Press the "UP" or "DOWN" button to cycle through the LCD display and view battery voltage information as illustrated below.



Active Function

This function automatically activates the lithium battery during commissioning. Once the battery wiring and commissioning are successfully completed, if the battery is not detected, the inverter will automatically activate the battery as long as the inverter is powered on.

6. Code Reference

The relevant information code will appear on the LCD screen. Please refer to the inverter's LCD screen for operation details.

Code	Description
60 ⚠	If the battery is not permitted to charge or discharge after successful communication between the inverter and the battery, it will display code 60 to indicate that charging and discharging have been stopped.
61 ⚠	Communication Lost (applies only when the battery type is set to any lithium-ion battery): ● If no communication signal is detected within 3 minutes after the battery is connected, the buzzer will sound. After 10 minutes, the inverter will stop charging and discharging the lithium battery. ● If communication is lost after the inverter and battery have been successfully connected, the buzzer will beep immediately.
62 ⚠	The battery number has changed, likely due to a communication loss between the battery packs. Please inspect the cables connecting the batteries.
69 ⚠	If the battery status does not permit charging after successful communication between the inverter and the battery, code 69 will be displayed to halt the charging process.
70 ⚠	If the battery needs to be charged following successful communication between the inverter and the battery, it will display code 70 to indicate charging.
71 ⚠	If the battery is not permitted to discharge after successful communication between the inverter and the battery, it will display code 71 to indicate that discharging is stopped.

Appendix II: The Wi-Fi Operation Guide

1. Introduction

The Wi-Fi module facilitates wireless communication between solar inverters and the monitoring platform. Through the "i.Solar" APP users can conveniently monitor and control their inverters remotely. This application leverages the Wi-Fi chip to deliver remote monitoring data services, enabling routine data tracking of the inverter, real-time data retrieval from the device, command transmission to the device, and remote device operation. The application is compatible with both iOS and Android operating systems.

2. i.Solar App

2-1. Download and install APP

Please find "i.Solar" APP from Apple® store or Google® Play Store. Install this APP in your mobile phone.

Or scan the following QR code with your smart phone and download "i.Solar" APP

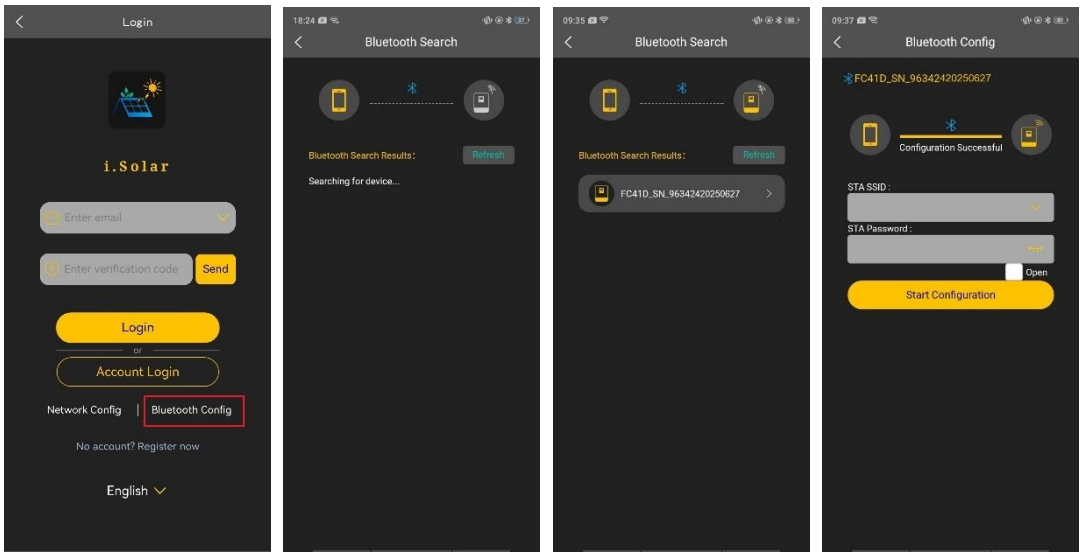
Android system

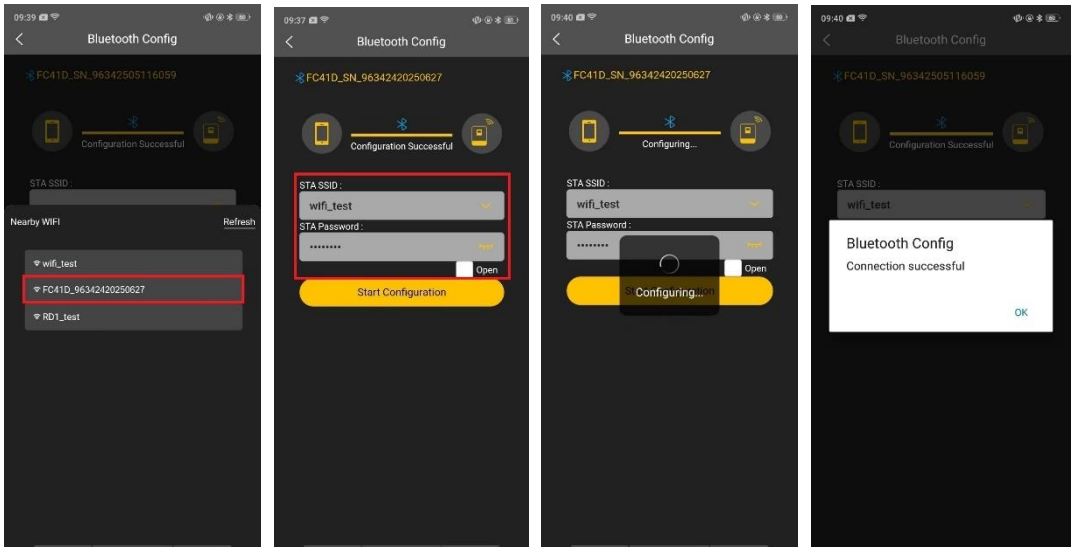
iOS system

2-2. Network Setting for Wi-Fi Module

Use the "i.Solar" app to set up the Wi-Fi module's network via Bluetooth or local Wi-Fi. It is recommended to connect your smartphone to the Wi-Fi module using Bluetooth. This example demonstrates the process on an Android device.

- Power on the unit.
- Open the Bluetooth settings on your smartphone.
- Launch the "i.Solar" app, select "Bluetooth config" on the login screen, then tap "refresh" to search for nearby devices and locate the Wi-Fi module whose name begins with "FC41D_".
- Tap the device name that matches.
- After successfully connecting to the Wi-Fi module, enter your router's name (STA SSID) and password (STA Password), then click "Start configuration" to verify the connection status.
- If you check the "Open" box highlighted in red, you only need to enter the router name (STA SSID) without providing the router password.

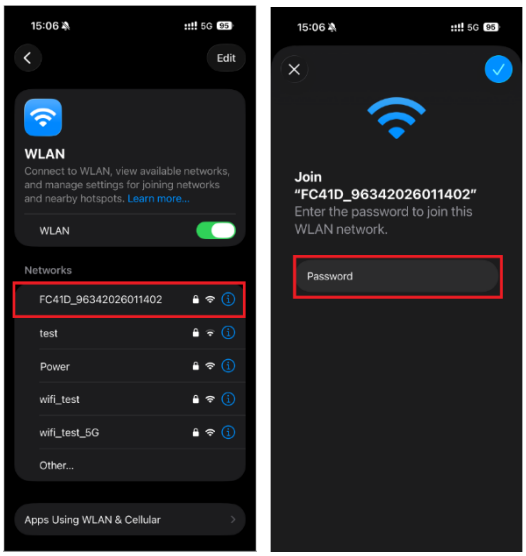




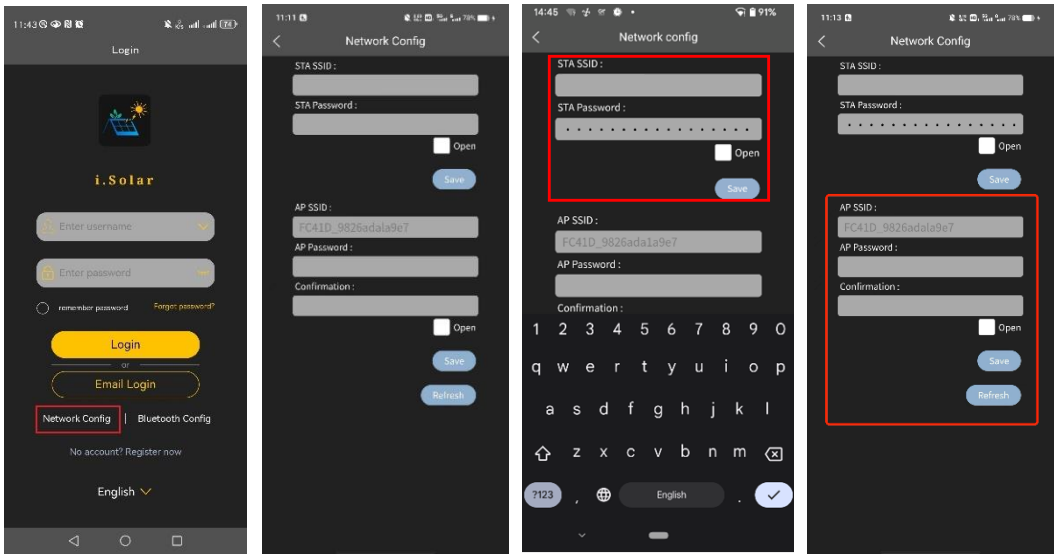
If you have set up the network using Bluetooth, you can skip the following steps.

Step 1: Access the Wi-Fi settings on your smartphone.

Step 2: Connect your smartphone to the Wi-Fi network that begins with "FC41D_". The default password for this Wi-Fi module is 12345678.



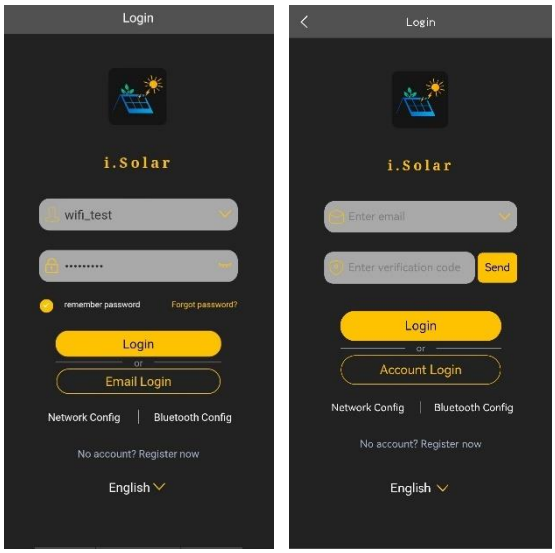
Step 3: Once the Wi-Fi connection is established, open the i.Solar App on your phone to access the login page. Then, tap the “Network Config” button to go to the Wi-Fi setup page.
Step 4: Input your router’s name (STA SSID) and password (STA Password), then press the "Save" button to finish the configuration.
If you select the “Open” option highlighted in red, you only need to enter the router name (STA SSID) without providing the password. After that, click "Save" to complete the setup.
Step 5: Enter the Wi-Fi name (AP SSID) and password (AP Password) for the Wi-Fi card, confirm the password, and then tap "Save" to finalize the Wi-Fi module settings.
If you check the “Open” option marked in red, you only need to enter the Wi-Fi name (AP SSID) without entering the password or confirmation. Click "Save" to complete the configuration.



2-3. Registration and Login

Go to the login page displayed below. Click on “No account? Register now” to navigate to the registration page. On the registration page, enter your username, nickname, email, verification code, and password in order, then re-enter the password to confirm it. Finally, click the “Register” button to finish creating your account.

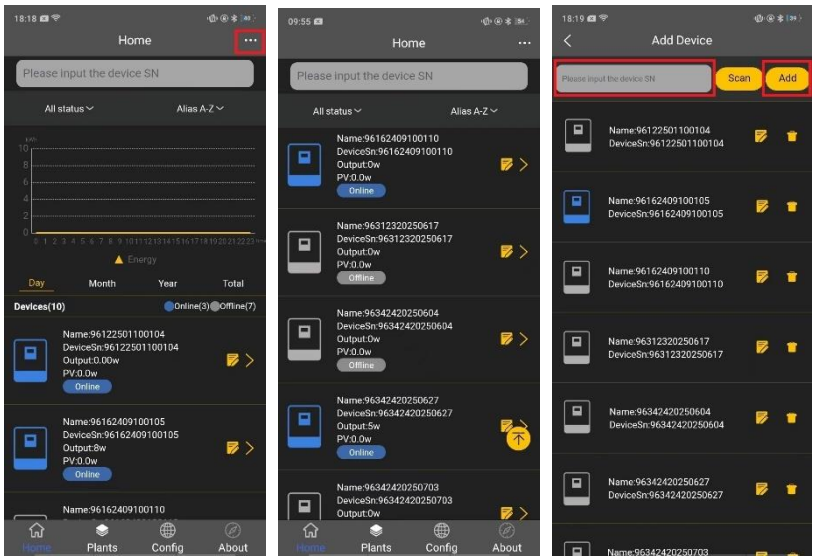
After completing registration, users have the option to log in using either their username or their email address.



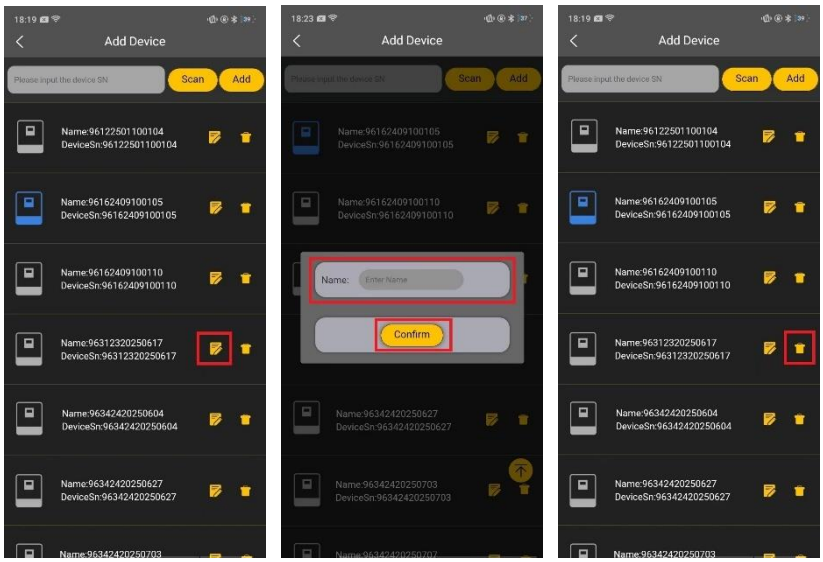
2-4. Home Page

Sign in to access the app. The default Home page will be displayed, showing the charts (as seen in the left screenshot). Use the 'Day', 'Month', and 'Year' buttons to view power generation data for those time periods. Select 'Total' to see the annual power generation data.

Tap the icon in the top right corner to go to the page where you can add, delete, or rename devices. To add a device, enter its serial number.

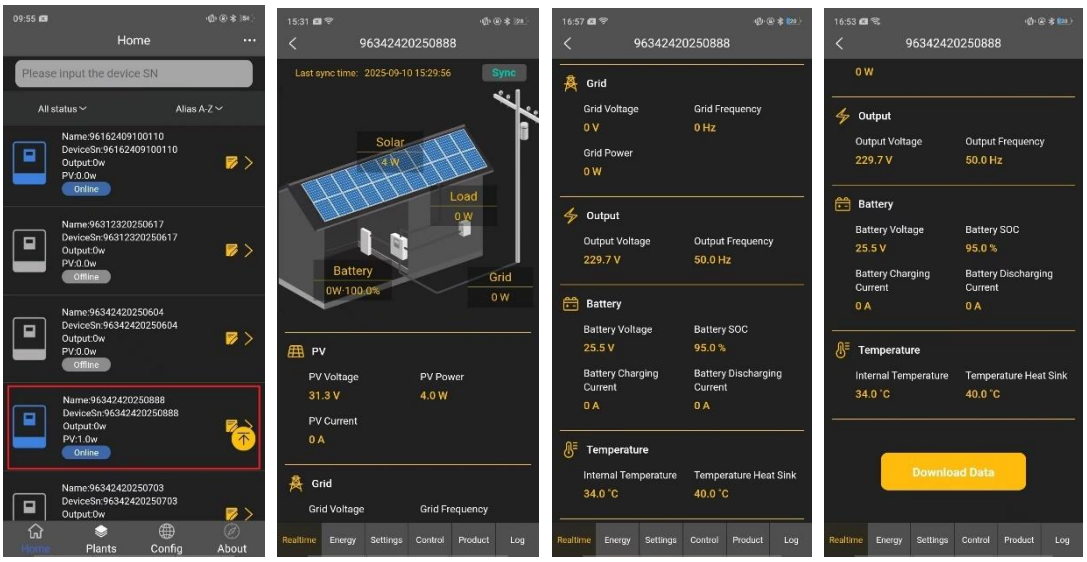


You can rename the devices using the button shown in the red box on the left screenshot, or delete them using the button highlighted in the red box on the right screenshot.

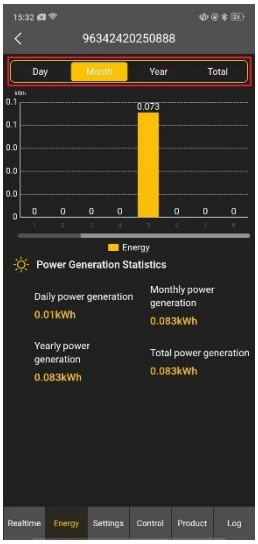


2-5. Real-time Data

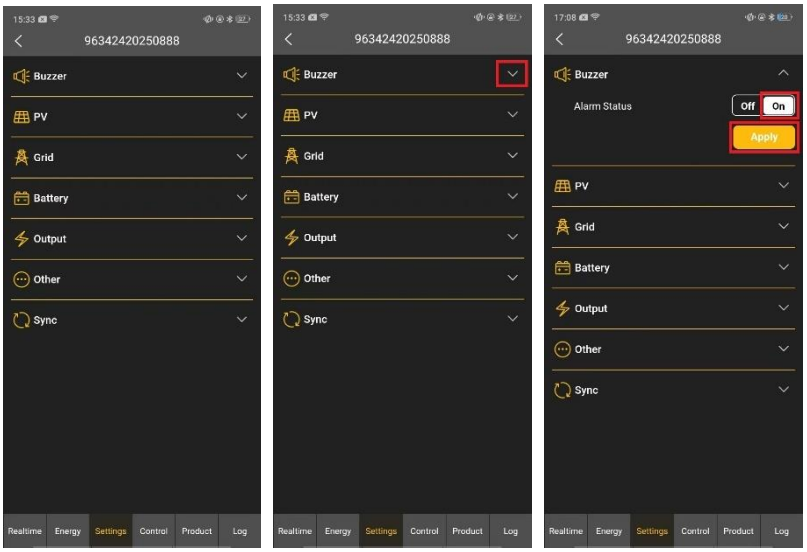
Press the device name in Home Page to enter the corresponding detailed real-time information page. **'Real-time'** displays solar, grid, load, and battery information. Press "Sync" can synchronize the status of the device. Pull down the page see more detailed information.



'Energy' displays the inverter solar power generation data. Press 'Day', 'Month', or 'Year' to query the hourly, daily, or monthly power generation data. Press 'Total' to query the annual power generation data.



'Settings' displays the setting items. Note that the setting items on this page will be different for different models. Tap on the dropdown icon to select the setting and click the "Apply" button to change the setting.

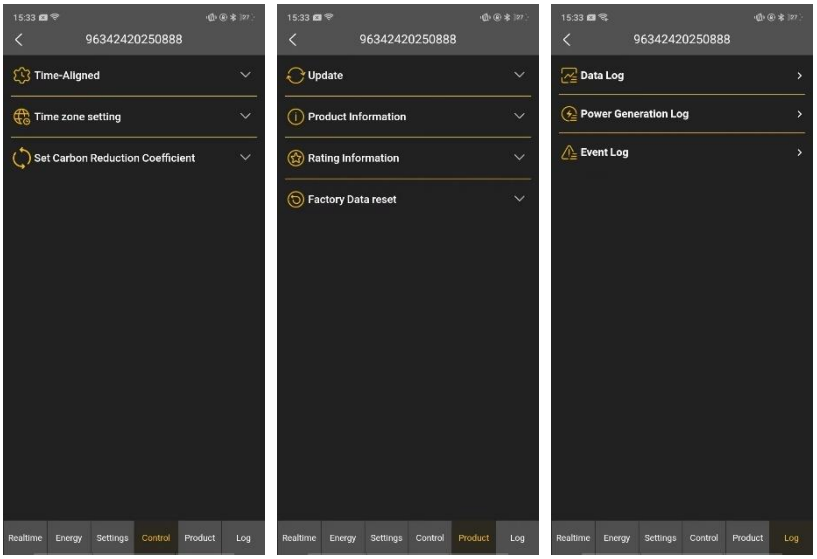


'**Control'** is reserved. (The control item is not support for all models)

'**Product**' displays the firmware update, product information, rating information and factory data reset.

NOTE⚠: The inverter output should be turned off during updating.

'**Log'** displays the data log, power generation log and event log.



2-6. Plants

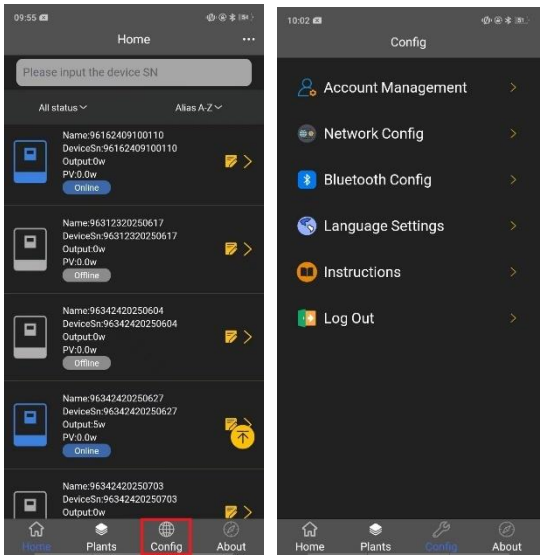
Click the "Plants" tab to enter plants page. User can create a power station name and add multiple devices by pressing the buttons highlighted by the red box, then view real-time data of the power station.

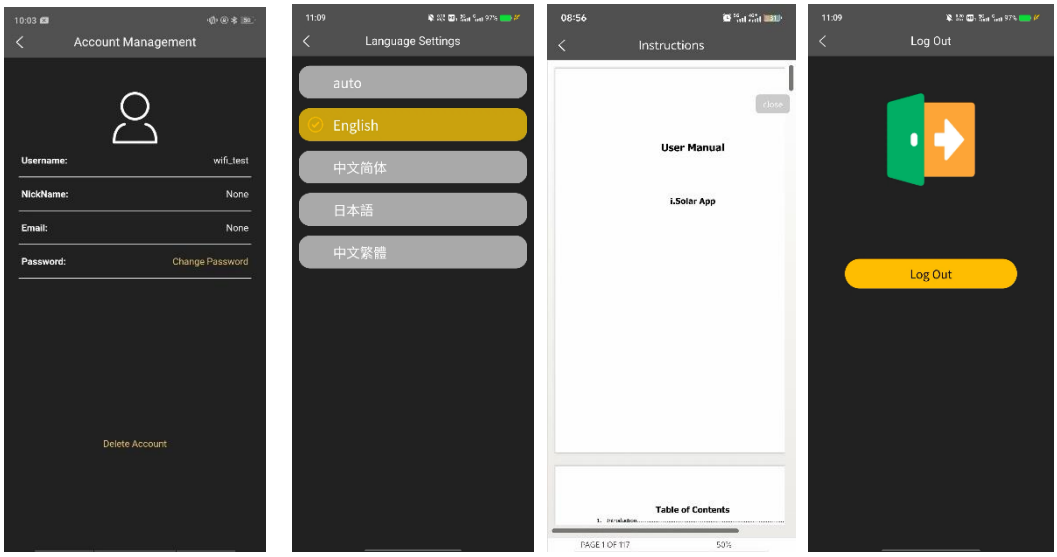
2-7. Configuration

Click the "Config" tab to enter setting screen for account management, network config, Bluetooth config, language Settings, instructions and log out. Network config and Bluetooth config refer to Section 2-2 for details, other setting pages are shown in the screenshot below.

Account management page can change password or delete account.

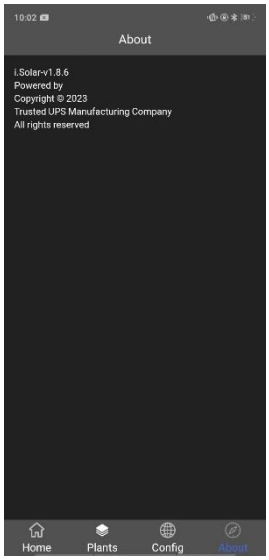
Through the "Instructions" entry, you can read the instructions for use of the "i.Solar" APP.





2-8. About

Click the 'About' tab to enter the about page, where you can view the information about the App.

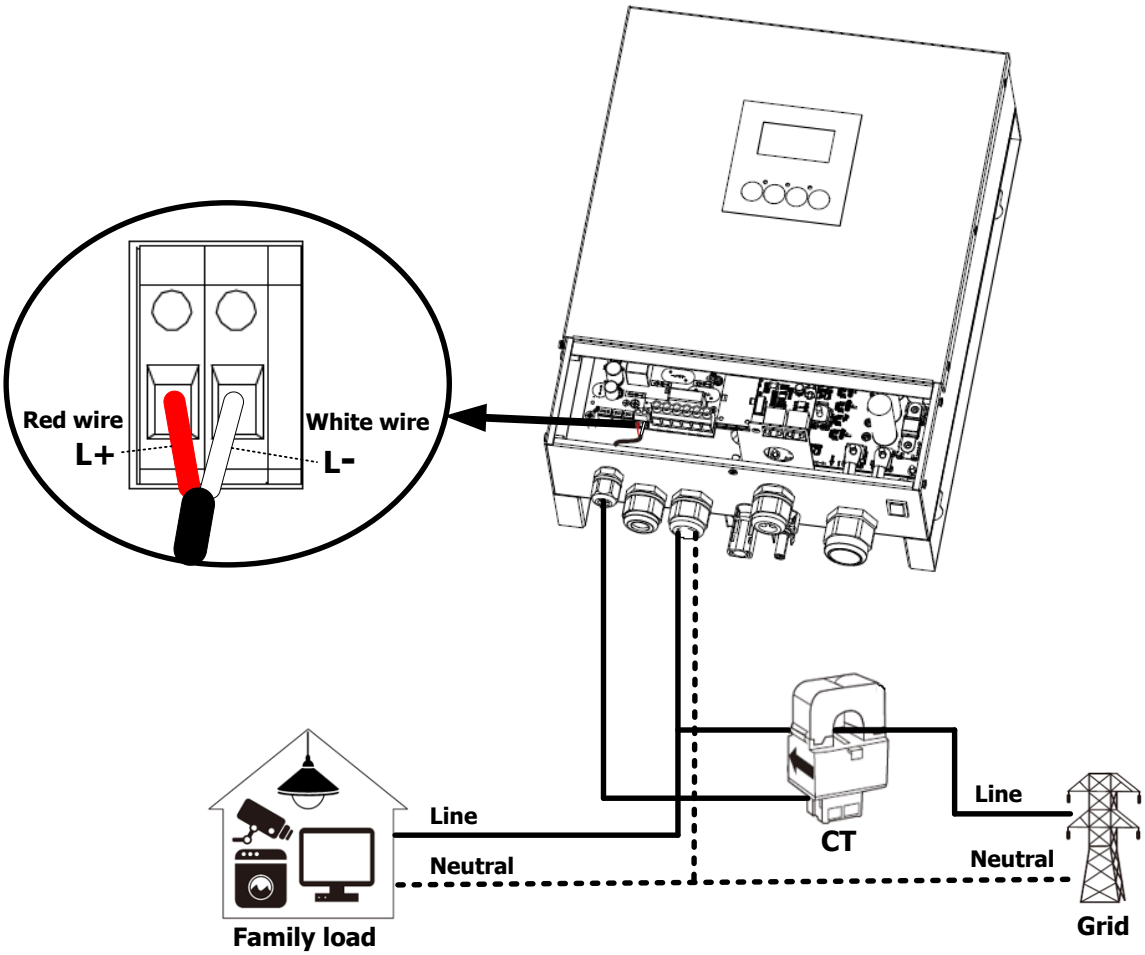


Appendix III: The Optional CT Operation Guide

When an external CT is connected, the solar inverter can be seamlessly integrated into the current household system. This setup allows for managing self-consumption by using the CT to regulate power generation and battery charging of the inverter.

Please follow the steps below to connect the CT:

Step 1. Turn off the inverter before making any connections. Loosen the screws on the inverter's CT terminal block and attach the external CT installed on the terminal block as illustrated in the diagram below. Note that the arrow indicating the direction of current flow on the CT must point towards the inverter, and the CT wires should be connected to the terminal block with the correct polarity: connect the red wire to "L+" and the white wire to "L-".



Connection diagram

Step 2. Power on the inverter.

Step 3. Access the LCD settings on the inverter with the CT sensor connected, and configure Program 39 CT function to "enable."