

PSE-DUAL-4KW USER MANUAL

SINGLE PHASE HYBRID INVERTER

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Thank you for choosing Primax Hybrid inverter. In order to ensure your safety and proper use, please read the manual in details before using. Thanks for your cooperation!

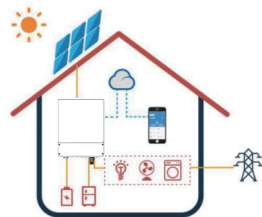
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Hybrid inverter series, also called hybrid or bidirectional solar inverters, apply to solar system with participation of PV, battery, loads and grid system for energy management.

The energy produced by PV system shall be used to optimize self-consumption, excess power charge battery and the rest power could be exported to the grid.

Battery shall discharge to support loads when PV power is insufficient to meet self-consumption. If battery power is not sufficient, the system will take power from grid to support loads.

Note: the introduction describes a general behavior of Hybrid inverter system. The operation mode can be adjusted on APP based on the system layout. Below are the general operation modes for system.



1.1 Safety & Warning

Please read and follow all the instructions and cautions on the inverter or user manual during installation, operation or maintenance, as any improper operation might cause personal or property damage.

• Symbols Explanation

	Caution! Failing to observe a warning indicated in this manual may result in injury.
	DANGER High voltage hazard. Disconnect all incoming power and turn off the product before working on it.
	Danger of hot surface! High-temperature hazard. Do not touch the product under operation to avoid being burnt.
	This side up! The package must always be transported, handled and stored in such away that the arrows always point upwards.
	Product should not be disposed as household waste. Do not dispose of the inverter as household waste. Discard the product in compliance with local laws and regulations .or send it back to the manufacturer.
	Grounding point.
	Read through the user manual before any operations.
	Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.
	Inverter will be touchable or operable after minimum 5 minutes of being turned off or totally disconnected, in case of any electrical shock or injury.

• Safety Warning

Any installation and operation on inverter must be performed by qualified electricians, in compliance with standards, wiring rules or requirements of local grid authorities or companies.

Before any wiring connection or electrical operation on inverter, all DC and AC power must be disconnected from inverter for at least 5 minutes to make sure inverter is totally isolated to avoid electric shock.

The temperature of inverter surface might exceed 60 C during working, so please make sure it is cooled down before touching it, and make sure the inverter is untouchable for children.

Do not open inverter cover or change any components without authorization, otherwise the warranty commitment for the inverter will be invalid.

Usage and operation of the inverter must follow instructions in this user manual, otherwise the protection design might be useless and warranty for the inverter will be invalid.

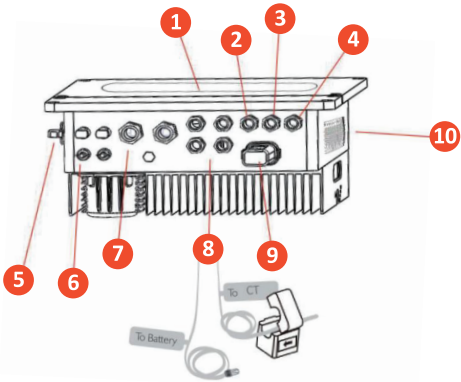
Appropriate methods must be adopted to protect inverter from static damage. Any damage caused by static is not warranted by manufacturer.

PV negative (PV-) on inverter side is not grounded as default design.

The total open-circuit voltage of PV string/array is lower than the maximum rated DC input voltage of the inverter. Any damage caused by PV over-voltage is beyond warranty.

Leakage protection switches are not recommended between the inverter and the grid.

1.2 Product Overview



1	LED panel
2	Gen /Back Up2
3	Back Up1
4	On-Grid
5	DC Switch (Optional)
6	PV Terminals
7	Battery Terminals
8	CT Communication Cable
9	Wi-Fi
10	Led Indicators

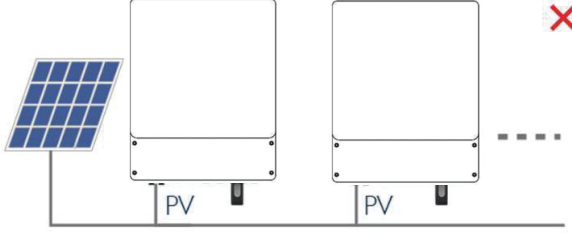
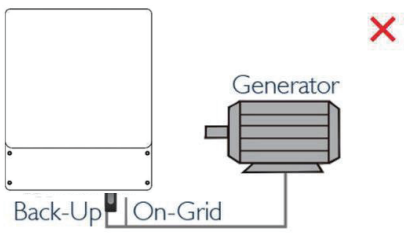
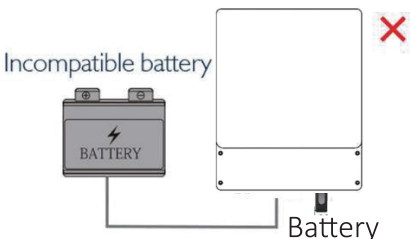
• Led Indicators

Indicator	Status	Explanation
 System		On = system is ready
		Blink = system is starting up
		Off = system is not operating
 Back-Up		On = back-up is ready /power available
		Blink=back-up is low
		Off = back-up is off/no power available

Indicator		Status	Explanation
 COM			On = bms and meter communication ok
			Blink1 = meter communication ok, bms communication fail
			Blink2 = bms communication ok, meter communication fail
			Off = bms and meter communication fail
 Fault			On = fault has occurred
			Blink = overload of back-up outputireduce load
			Off = no fault

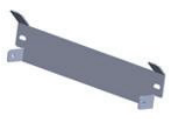
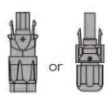
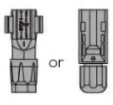
2.1 Unacceptable Installations

Please avoid the following installations, which will damage the system or the inverter.

	
BACK-UP SIDE CANNOT CONNECT TO GRID.	SINGLE PV STRING CANNOT CONNECT TO TWO OR MOREINVERTERS.
	
ON-GRID OR BACK-UP SIDE CANNOT CONNECT TO ANY AC GENERATOR.	CANNOT COMMUNICATE TO INCOMPATIBLE BATTERIES.

2.2 Packing List

On receiving the inverter, please check to make sure all the components as below are not missing or broken.

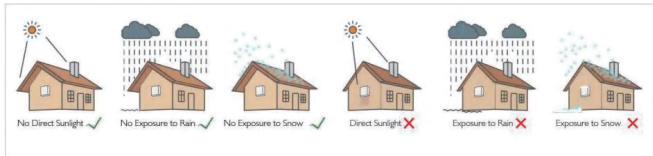
					
Inverter*1	Wall-mounted Bracket l*1	CT*1	Data Collector*1	Positive DC Plug*2	Negative DC Plug*2
					
Net cable*1	Battery terminal*2	Expansion Bolts*2	Hexagon head screw*2	Cold terminals*9	Hexagon head screw*2

2.3 Mounting

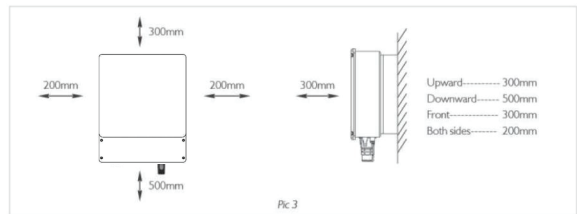
2.3.1 Select Mounting Location

For inverter's protection and convenient maintenance, mounting location for inverter should be selected carefully based on the following rules:

- Rule1. Inverter should be installed on a solid surface, where is suitable for inverter's dimensions and weight.
- Rule 2. Inverter installation should stand vertically or lie on a slope by max 15°.



- Rule 3. Ambient temperature should be lower than 60°C
- Rule 4. The installation of inverter should be protected under shelter from direct sunlight or bad weather like snow, rain, lightning etc.
- Rule 5. Inverter should be installed at eye level for convenient maintenance.
- Rule 6. Product label on inverter should be clearly visible after installation.
- Rule 7. Leave enough space around inverter following the values on pic 3.



Inverter cannot be installed near flammable, explosive or strong electro-magnetic equipment.

2.3.2 Mounting

The inverter is suitable for mounting on concrete or other non-combustible surface only.

	Step1: Please use the mounting bracket as a template to drill 2 holes on right positions (10mm in diameter, and 35mm in depth) Use expansion bolts in accessory box and fix the mounting bracket onto the wall tightly. NOTE: Bearing capacity of the wall must be higher than 20KG, otherwise may not be able to keep inverter from dropping.
	Step2: Carry the inverter by holding the heating sink on two sides and Place the inverter on the mounting bracket. NOTE: Make sure the heat sink on inverter is rightly joint with mounting bracket.
	Step3: Finally, screw fixation, both screws need to be fixed. Add anti-theft locks as needed. NOTE: Make sure the screws between the inverter and the fixing plate are fixed tightly shedding.
	Step4: Ground cable shall be connected to ground plate on grid side .

2.4 Electrical Wiring Connection

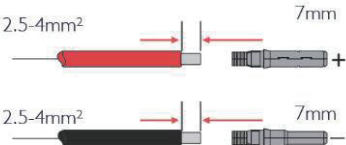
2.4.1 Pv Connection

Before connecting PV panels/strings to inverter, please make sure requirements are followed as below :

- The total short-circuit current of PV string must not exceed inverter's max DC current
- The minimum isolation resistance to ground of the PV string must exceed 33kΩ in case of any shock hazard
- PV strings could not connect to earth/grounding conductor
- Use the DC plugs in the accessory box

NOTE: There will be MC4 or Amphenol DC plugs in accessory box, the detailed connection as below:

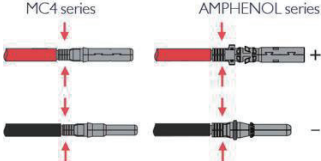
Step1: Prepare PV cables and DC plugs.



NOTE:

- Please use DC plugs and connectors in accessory box.
- PV cable should be standard, 2.5-4mm2 PV cable.

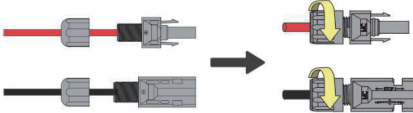
Step2: Connect PV cable to DC connectors.



NOTE:

- PV cable must be tightly crimped into the Connectors.
- For Amphenol connector, the limit buckle cannot be pressed.

Step3: Screw the cap on and plug onto inverter side.



NOTE:

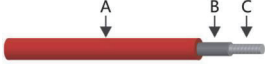
- There will be a click sound if connectors are inset correctly into DC plugs.



The polarity of PV strings or on the inverter cannot be connected by reverse, otherwise inverter could be damaged.

2.4.2 Battery Connection

For lithium battery (pack) the capacity should be50Ah or larger. Battery cable requirement as below.

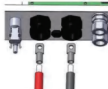
	Grade	Description	Value
	A	OD	10-12mm
	B	Isolation section	NA
	C	Conductor Core	16-25mm²

- **Battery wiring connection steps as below:**



Make sure battery switch is off and battery nominal voltage meet Hybrid inverter specification before connecting battery to inverter make sure inverter is totally isolated from PV and AC power.

Step1: Prepare battery cables and accessories and put battery power cable through battery cover.



NOTE:

- Please use accessories from box.
- Battery power cable should be 16-25mm².

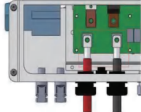
Step2: Make battery terminals.



NOTE:

- Strip cable coat, revealing 10mm length of metal core.
- Use special crimper to compress battery terminal tightly.

Step3: Screw the cap on and plug onto inverter side.



NOTE:

- Please make sure polarity (+/-) of battery are not reversed.

• **For lead-acid batteries**

Lead-Acid and other similar older-technology battery types require experienced and precisedesign, installation and maintenance to work effectively.

For lead-acid battery bank, the inconformity between battery cells might lead to battery cellover-charge or discharge, and further might damage battery cells and shorten battery bank life.

For this series inverters there is no temperature compensation, thus customers need dobattery settings based on the real working temperature of battery.

For lead-acid battery settings on App, please honestly refer to battery specifications and the actually battery work condition like work temperature and battery age. Unsuitable settings will lead to higher SOC deviation, weaker battery lifespan and further battery damage.

For lead-acid batteries, there is no communication with the inverter, and the SOC of the battery is not counted.

We will keep the right for explanation on all the settings suggested and all the problems happened on lead-acid batteries or the whole system. And we are not responsible for any damage caused by unsuitable settings, battery beyond warranty or battery quality etc.

• **Battery protection description**

Battery will act a protective charge/discharge current limitation under any condition as below:

- Battery SOC is lower than I-DOD
- Battery voltage lower than discharge voltage
- Battery over temperature protection
- Battery communication abnormal for lithium battery
- BMS limitation for lithium battery

When charge/discharge current limitation protection happens :

- Under on-grid mode, battery charge/discharge operation could be abnormal
- Under off-grid mode, Back-Up supply will shut down

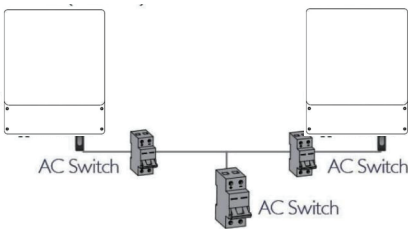
NOTE

Under off-grid mode, if Back-Up supply shuts off because of battery of low battery SOC PV power will all be used to charge battery till battery SOC reaches 10% (adjustable) ;

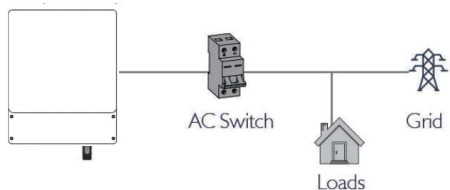
Under on-grid mode , battery is protected from over discharge by 40% less than SOC Protection, resume discharge by 50% more than SOC Protection; Battery is protected from over discharge by setting Cut-off Voltage, resume discharge by 52V (adjustable).

2.4.3 On-grid & Back-up Connection

An external AC switch (>32A) is needed for On-Grid connection to isolate from grid when necessary. Below are the require-ments on AC switch use:

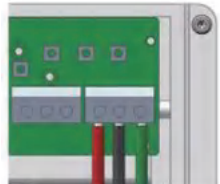
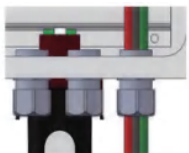


1. Use a separate AC switch for individual inverter.



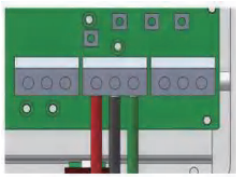
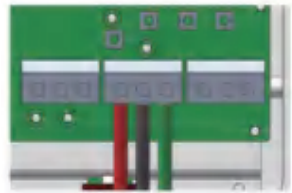
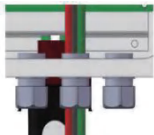
2. On AC side, the individual switch should be connected before loads (between inverter and loads).

• **On-Grid wiring connection process is as below:**

Step1: 1. Prepare the terminals and AC cables. 2. Put AC cable through terminal cover and screw the three cables tightly on the connectors.  4-6mm² Copper Conductor Material NOTE: • Please use the terminals in components box. • Make sure cable jacket is not locked with conductor.	Step2: Lock terminal cover and screw up the terminal cap  NOTE: • Make sure the terminal cover is rightly locked on to the terminal.  Make sure inverter is totally isolated from any DC or AC power before connecting AC Cable.
Step3: Connect the assembled AC terminals on to inverter.  NOTE: • Make sure it is connected to 'On-Grid' side (other side connected to public grid).	

• **Back-Up wiring connection process is as below:**

An external AC switch (>32A) is needed for Back-Up connection to be isolated when necessary.

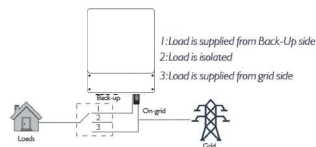
Step1: 1. Prepare the terminals and AC cables. 2. Put AC cable through terminal cover and screw the three cables tightly on the connectors.  4-6mm² Copper Conductor Material NOTE: • Please use the terminals in components box. • Make sure cable jacket is not locked with conductor.	Step2: Lock terminal cover and screw up the terminal cap  NOTE: • Make sure the terminal cover is rightly locked on to the terminal.  The absence of AC breaker on Back-Up side will lead to inverter damage if only electrical short-circuit happens on Back-Up side. And Back-Up function cannot turn off under on-grid condition.
Step3: Connect the assembled AC terminals on to inverter.  NOTE: • Make sure it is connected to 'back-up' side	

Intelligent management of back up

The inverter supports dual back up output in off-grid mode, and you can remotely adjust the energy regulation of each back up; connecting with lead-acid battery, it supports remote voltage regulation.

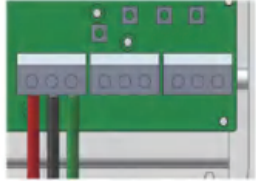
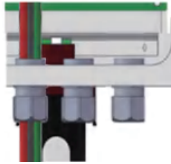
Declaration For Back-Up Overload Protection

Inverter will restart itself as overload protection happens. The preparation time for restarting will be longer and longer (max one hour) if overload protection repeats. Take following steps to restart inverter immediately: Decrease Back-Up load power within max limitation.



● GEN wiring connection process is as below:

An external AC switch (>32A) is needed for gen connection to be isolated when necessary.

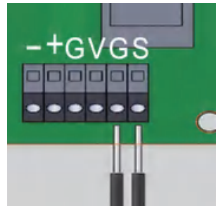
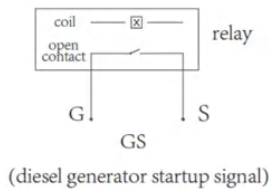
Step1: 1. Prepare the terminals and AC cables. 2. Put AC cable through terminal cover and screw the three cables tightly on the connectors.  4-6mm² Copper Conductor Material NOTE: • Please use the terminals in components box. • Make sure cable jacket is not locked with conductor.	Step2: Lock terminal cover and screw up the terminal cap  NOTE: • Make sure the terminal cover is rightly locked on to the terminal.  The absence of AC breaker on Back-Up side will lead to inverter damage if only electrical short-circuit happend on Back-Up side. And Back-Up funtion cannot turn off under on-grid condition.
Step3: Connect the assembled AC terminals on to inverter.  NOTE: • Make sure it is connected to 'back-up' side	

●GS Indications

GS: dry contact signal for startup the diesel generator.

When the "GEN signal" is active, the open contact (GS) will switch on (no voltage output).

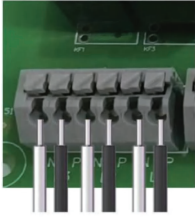
Note: When the Smart Load Output function is turned on, the GEN port can be used as an output port to connect to the load. Smart load output or generator input functions cannot be set simultaneously.



● Ct indications

Since this product is a split type transformer, please pay attention to the cleanliness of themagnetic core surface during installation. If there is dirt on the core surface, the accuracy of the product will be deteriorated.

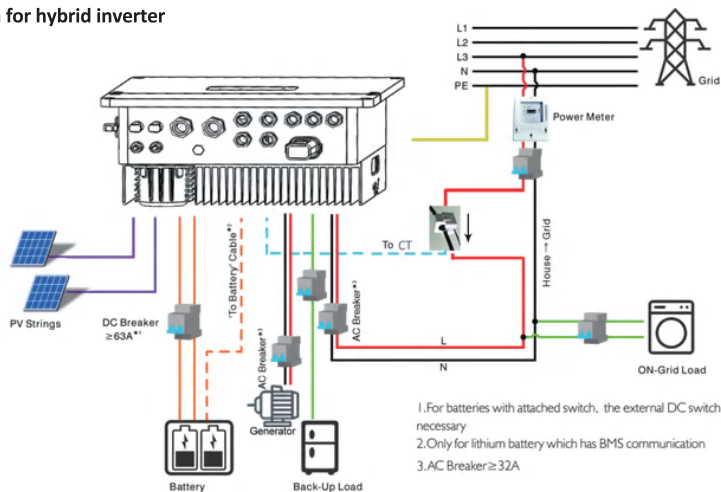
1. Before the transformer is connected to any equipment, please ensure that the circuit is powered off to prevent clicks.
2. Open CT, see figure 1.
3. Clip the CT on the cable under test. Make sure that the maximum current in the wiring does not exceed the maximum input current of the CT; The current flows in the direction of the arrow on the CT housing.
4. Fasten the CT again, the cable under test should be inside the CT window now (see figure 2)
5. Fix the CT on the cable under test with nylon cable ties to prevent the CT from sliding see figure 3)
6. Connect the CT output white wire to the positive terminal of the measuring device, and the CT output black wire to the negative terminal of the measuring device (see figure 4).
7. After checking that the circuit is correct, turn on the power and the CT starts to mea-sure the current in the circuit.

figure 1	figure 2	figure 3	figure 4
			

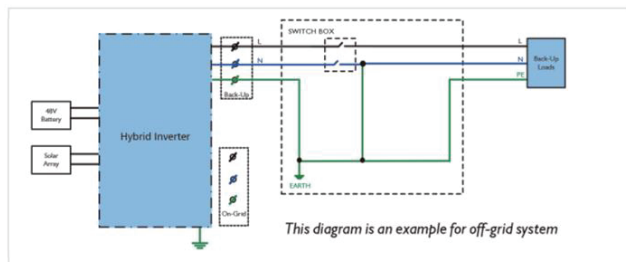
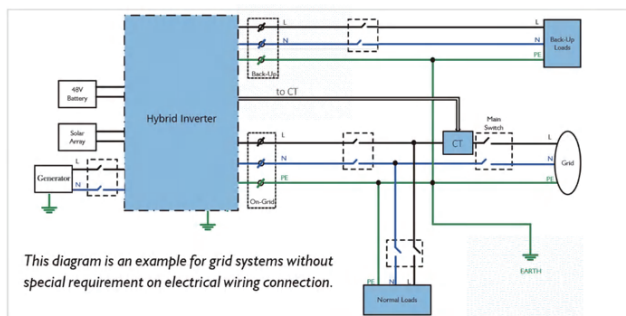


All work should be performed by trained and qualified operators using safe and suitable tools.

- **Wiring system for hybrid inverter**



- **System connection diagrams**



NOTE

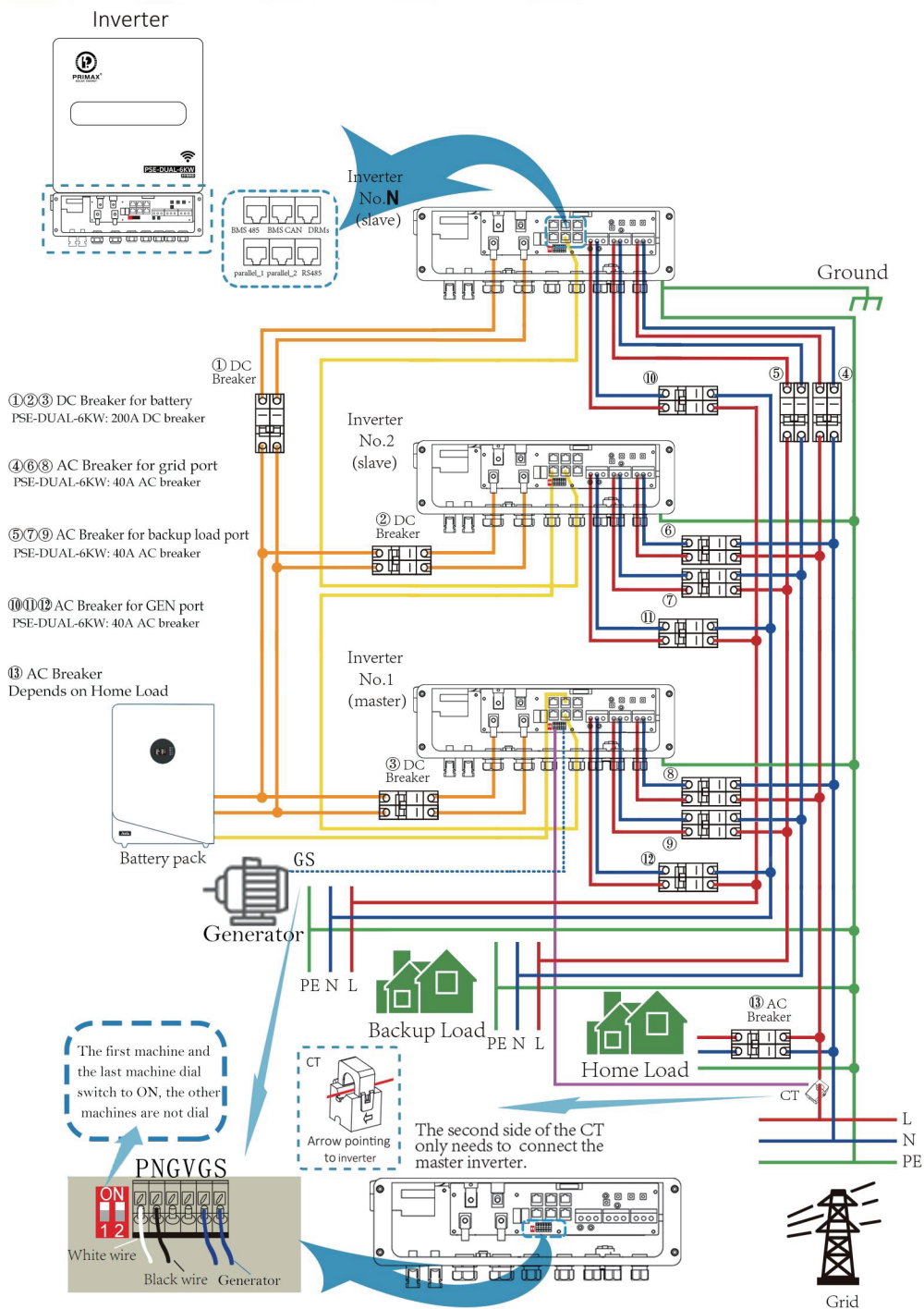
Meter communication cable (RJ45) is attached on the inverter "To Meter" cable, could be extended to max 100m, and must use standard RJ45 cable and plug as below:



Position	Colo	BMS(CAN)Function	BMS(485)Function	Meter Function
1	Orange&white	NC	485_B	NC
2	Orang	NC	485_A	NC
3	Green&white	NC	NC	485_BI
4	Blu	CAN_H	NC	NC
5	Blue&white	CAN_L	NC	NC
6	Gree	NC	NC	485_AI
7	Brown&white	NC	485_A	485_BI
8	Brown	NC	485_B	485_AI

2.5 Single Phase Parallel Connection Diagram

CAN L wire N wire PE wire CT wire



3.1 Smart SetApp Operation

During the initial installation, you can download and install the Smart Set app on your smartphone, allowing you to configure the installation of the hybrid inverter more easy.

- Edit system configuration to make the system work as customer needs
- Monitor and check performance of the hybrid system
- Wi-Fi configuration

Please download Smart SetApp



iphone :
Search "Smart Set App "in Apple Store



Android:
Search "Smart SetApp" in Google Play

NOTE: You must install in an uninterrupted Wi-Fi environment.

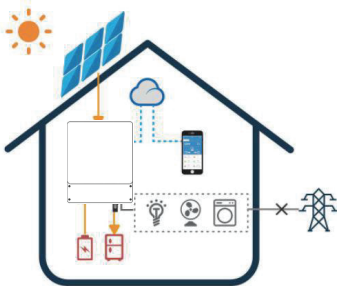
3.2 Initial Installation Setup

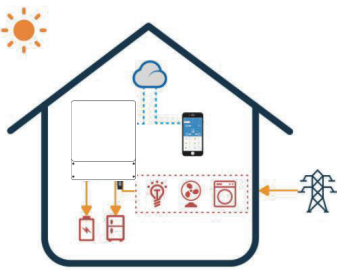


3.3 Operation Modes Introduction

Hybrid inverter system normally has the following work modes based on your configuration and layout conditions.

General mode	
Daytime	At night
In this mode, the load supply priority is PV> Grid mains > Battery. 1. When PV power is available, PV power will provide power to the load first. If it's sufficient, PV power will charge the battery, if it's more sufficient, PV power will feed-in to the grid. 2. When PV power is not available or not sufficient, the grid mains will provide power to the load. 3. When PV power and the grid mains is not available, the battery will provide power to the load.	
NOTE In this mode, only the PV power can charge the battery, and the battery can only provide power to the load and can't provide power to feed-in the grid.	

Off-grid mode	
	In this mode, the load supply priority is PV > Battery. In this mode, the inverter will provide 230V pure sine waveform to ensure the load can use pure electricity. 1. When PV power is available, provide 230V pure sine waveform to ensure the load. 2. When PV power is not available or not sufficient, the battery will provide power to the load.
	NOTE In this mode, only the PV power can charge the battery. to ensure the load can use pure electricity, the grid mains is not available.

Economical mode	
	In this mode, you can set a set of battery charging and discharging time.
	(1) During the battery charging period: 1. When PV power is available, PV power will provide power to the load first. If it's sufficient, PV power will charge the battery, if it's more sufficient, PV power will feed-in to the grid. 2. When PV power is not available or not sufficient, the grid mains will provide power to the load and charge the battery at the meanwhile. NOTE: In this mode, the grid mains can charge the battery. So we suggest that the charging period is setting in the electricity valley time.
(2) During the battery discharging period: 1. When PV power is available, PV power will provide power to the load first. If it's sufficient, PV power will feed-in to the grid directly. 2. When PV power is not available or not sufficient, the battery will provide power to the load. 3. When the battery voltage is under the cut-off voltage, the grid mains will provide power to the load.	

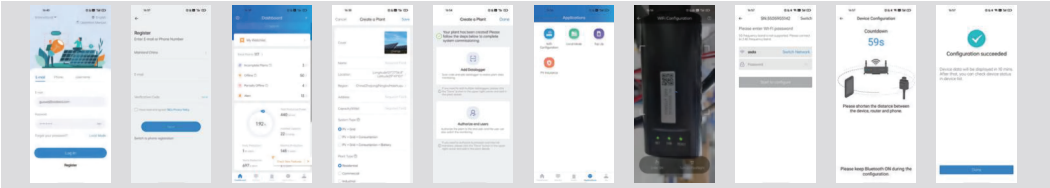
3.4 Daily Operation and Maintenance



IPhone:
Search "SOLARMAN Business" in Apple Store

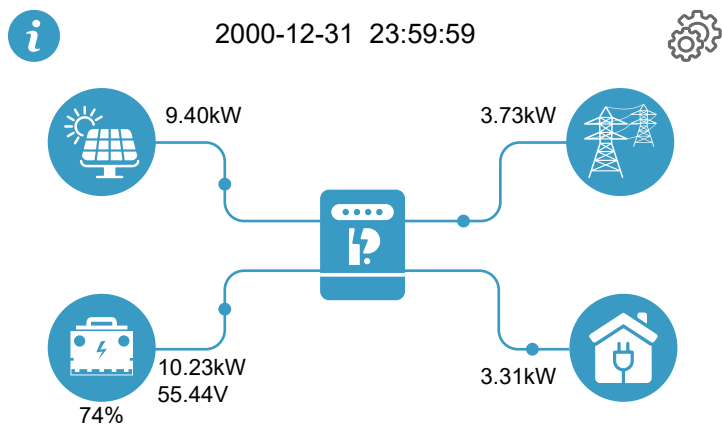


Android:
Search "SOLARMAN Business" in Google Play



4.1 Main Page

The LCD is a touchscreen, please touch the screen to operate.



This is the main page. Power on the LcD to show the flow chart on the main page.When powering on, data refreshing exists a dittle delay, so please wait for a few secondsbefore operation until the real time appears directly above on the screen.The main page displays PV, grid, battery, load power, battery voltage and SOc. At thesame time, the color of the inverter icon indicates the real time operation status. Based onthe real-time power changes, the battery icon changes, and through the signal dots flowdirection to show the dynamic flow of power relationship.

• Description of Touch Functions

Lcons	Functions
	Click to enter the PV page, and view real-time data for the PV section.
	Click to enter the Grid page, and view real-time data for the Grid section.
	Click to enter the GEN page, and view real-time data for the GEN section.
	Click to enter the Battery page, and view real-time data for the Battery section.
	Click to enter the Load page, and view real-time data for the Load section.
	Click to enter the Run page, and overview the basic information of each section. If the icon is orange, it indicates current normal operation.

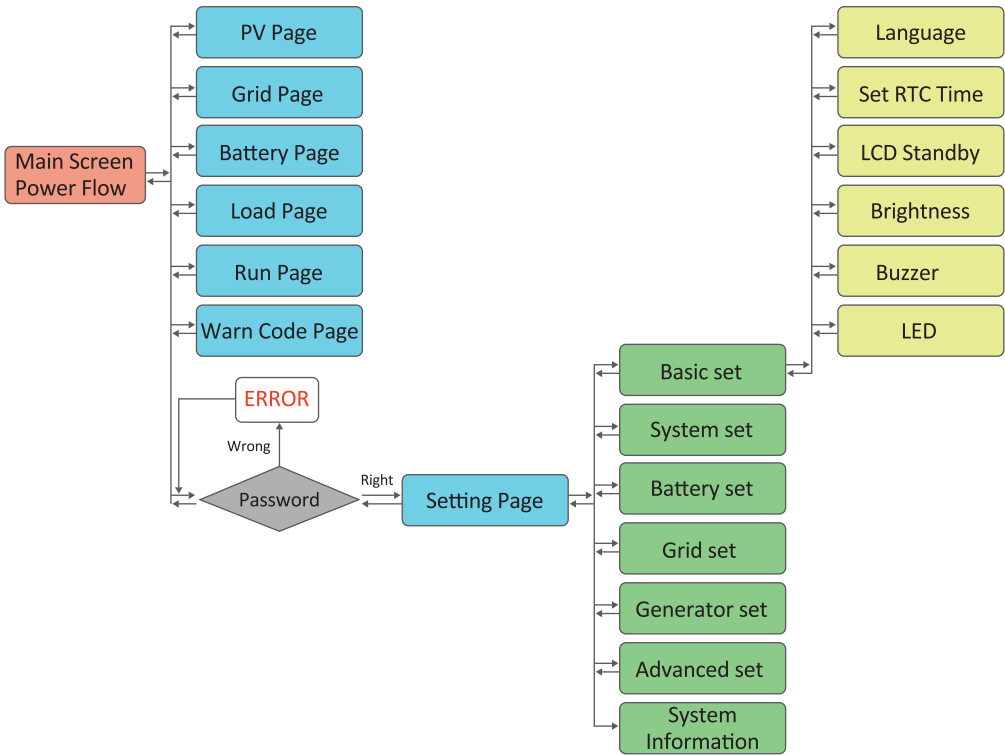
	If the icon is red, it means current alarm faults.
	Click to enter the Error Code page, and view the latest alarm records (up to 99). The content includes the number of messages, alarm time, and error code.
	Click to enter the Setting page, but you need to enter the password correctly at first.
	Home-return button.
	Back button.
 	Page-up button. When the button turns transparent, it means untouchable.
 	Page-down button. When the button turns transparent, it means untouchable.
 	Save button. When the button turns transparent, it means untouchable.
 	It indicates that the password is correct, click to enter the Setting page. It indicates the password is wrong and you need to re-enter, or it shows ERROR.
 	It means unselected. It means selected.
 	It means off. It means on.

Click on the icons of each section to view real-time data, as shown in the table above.

Click on the gear icon in the upper right corner of the Main screen to enter the Setting interface. In order to protect the information security and prevent misuse, each time you enter the Setting interface, you need to enter the password once. The default password is 1234. There is a delay of a few seconds in the judgment of the password, please be patient and wait for the entry icon to turn on and change to green, click and enter Setting menu interface, select the system set, battery set, grid set, generator set, basic set, advanced set and others. Enter the sub-setting interface for parameter modification (If the password is wrong, the entry icon closes and turns red, you need to re-enter the correct password. If you click on the icon at this time, it will display "Error", you can only click on the home return button or back button to re-enter the password interface and enter the correct password).

In each sub-setting interface, the selection way is to click on the hollow circle to make it become a solid circle or click on the box to make the check mark appear, and the input way is to click on the rectangular input box to use the keyboard to input the numbers (there is no need to input the unit), and then click on save button to take effect. After successful setting, it will return back to the previous interface automatically. Any parameter modification needs to click save to take effect, otherwise the modification will not work. LCD brightness and standby time are adjusted by clicking the plus/minus icon or dragging the slider, and system time is adjusted by clicking the plus/minus icon. Similarly, you need to save after modification. The parameter settings have limited the range of input values to protect against accidental touch, so you can operate with peace of mind.

• Operation Flow Chart



4.2 REAL-TIME INFORMATION PAGE

• PV PAGE

PV Info		
DC Voltage 1	0.0V	
DC Current 1	0.00A	
DC Voltage 2	0.0V	
DC Current 2	0.00A	
DC Power 1	0W	
DC Power 2	0W	
E-PV-Day	0.0kWh	
E-PV-Day	0.0kWh	
E-PV-Day	0.0kWh	
E-PV-Day	0.0kWh	

This is PV Page, one page in total.

① Real-time data: It can display the two-channel DC voltage, current, and power in real time, and simultaneously display the current day, current month, current year, and cumulative power generation.

② Button: The right area of the screen is the button area, the top one to return to the home page, next to return to the previous page button, page-up button, page-down button, save button. When the button turns transparent, it means untouchable.

• GRID PAGE

Grid Info		
Grid Voltage	0.0V	
Grid Current	0.00A	
Grid Frequency	0.00Hz	
Output Power	0W	
Reactive Power	0W	
Power Factor	0.000	
Grid Power Status	Sell	
Meter Power	0W	
Meter COM Status	Failure	

This is Grid Page, six pages in total. The number of pages is displayed in the lower left corner.

② Real-time data: Real-time display of grid voltage, current, AC output power and reactive power, power factor, meter power, display of grid frequency, status and meter COM status, statistics of the day, month, year, and the cumulative amount of bought/sold energy.

② Grid Power Status: Balance, Sell, Buy.

③ Meter COM Status: Failure, Ok.

Grid Info		
E-Buy-Day	0.0kWh	
E-Buy-Month	0.0kWh	
E-Buy-Year	0.0kWh	
E-Buy-All	0.0kWh	
E-Sell-Day	0.0kWh	
E-Sell-Month	0.0kWh	
E-Sell-Year	0.0kWh	
E-Sell-All	0.0kWh	

2/2

• BATTERY PAGE

Battery Info		
Battery Voltage	0.00V	
Battery Current	0.00A	
Battery Power	0W	
Battery Capacity	0.0%	
Battery working Status	Discharge	
Battery Test Status	Both allowed	
BMS COM Status	OK	
BMS Temperature	0.0 °C	
BMS Max Charge Current	0.00A	
BMS Max Discharge Current	0.00A	

1/2

Battery Info		
LLC Voltage	0.0V	
LLC Current	0.00A	
E- Charging-Day	0.0kWh	
E- Charging-Month	0.0kWh	
E- Charging-Year	0.0kWh	
E- Charging-All	0.0kWh	
E- Discharging - Day	0.0kWh	
E- Discharging - Month	0.0kWh	
E- Discharging - Year	0.0kWh	
E- Discharging - All	0.0kWh	

2/2

- ① Real-time data: Real-time display of battery voltage, current, power, working status, detection status, BMS COM status, temperature, maximum charging and discharging current, LLC voltage and current, and statistics of the day, month, year, and the cumulative amount of charged/discharged energy.
- ② Battery Working Status: Standby, Charge, Discharge.
- ③ Battery Test Status: Disconnect, Charging allowed, Both allowed, Discharging allowed.
- ④ BMS COM Status: Failure, OK.

• LOAD PAGE

Load Info		
Backup Voltage	0.0V	
Backup Current	0.00A	
P Load	0W	
E Load Day	0.0kWh	
E Load Month	0.0kWh	
E Load Year	0.0kWh	
E Load All	0.0kWh	

This is the Load Page, with two pages in total. The number of pages is displayed in the lower left corner.

- ① Real-time data: Real-time display of three-phase load voltage, current, AC output power, statistics of total power consumption, and the day, month, year, and the cumulative amount of consumed energy.

• GEN PAGE

Gen Info		
Gen Voltage	0.0V	
Gen Current	0.00A	
Gen Power	0W	
Gen Frequency	0.00Hz	

This is Gen Page, one pages in total.

- ① Real-time data: Real-time display of the voltage, current, power frequency of the Gen.

• RUN PAGE

Load		Grid	Inverter	
0W		0W	0W	
0.0V	0W	0.0V	0W	
Battery		PV 1	PV 2	
0W		0W	0W	
0.00V	0.0V	0.0V	0.0V	
0.00A	0.00A	0.00A	0.00A	

This is Run Page, one pages in total.

- ① Real-time data: Real-time display of the voltage, power and total power of the load, the grid, the inverter output, the battery, and the two PVs.

• ERROR CODE PAGE

Error Code			
No	Time	Error Code	
01	20-00-00 00:00:00	W_1:1:Under Ugrid	
02	20-00-00 00:00:00	W_1:3:Under Fr	
03	20-00-00 00:00:00	F_1_15:Remote shutdown	
04	20-00-00 00:00:00	W_1:5:Under Upv	
05	20-00-00 00:00:00	W_1:1:Under Ugrid	
05	20-00-00 00:00:00	W_1:3:Under Fr	
07	20-00-00 00:00:00	W_1:5:Under Upv	
08	20-00-00 00:00:00	F_1_15:Remote shutdown	
09	20-00-00 00:00:00	W_1:1:Under Ugrid	
10	20-00-00 00:00:00	W_1:3:Under Fr	
11	20-00-00 00:00:00	W_1:5:Under Upv	

1/9

This is Error Code Page, nine pages in total. The number of pages is displayed in the lower left corner.

① Real-time data: Real-time display of latest alarms (up to 99, 1 page stores 11), the latest is displayed at the top, and it doesn't show if there is none. Specific contents include serial number, alarm time, and corresponding fault codes.

4.3 PASSWORD ENTER PAGE

Settings Security

Enter the 4 Digit password

0

0

0

0



Settings Security

Enter the 4 Digit password

1

2

3

4



This is Password Enter Page, you need to enter the password correctly before entering the Setting Page.

① The default password is 1234.

② If the password is wrong, the entry icon in the lower right corner turns red, the door closes, and an "X" appears; if the password is correct, the entry icon in the lower right corner turns green and the door opens.

③ If the password is correct, you can enter the setting page by clicking on the "door icon". If you click on the wrong password, "ERROR" will pop up, and you can only go back to the home page or the previous page by clicking on the button, and then go back to the password page to re-enter.

④ When the settings are changed and you back out to the main page, the password will be cleared automatically.

7

8

9



4

5

6

Esc

1

2

3

OK

0

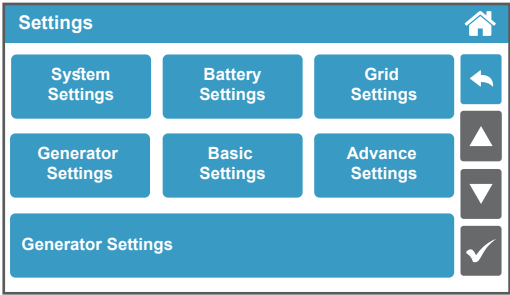
.

+/-

This is Keyboard Input Page.

① "0-9" is used to input numbers, "." is used to input decimal, "+/-" is used to switch between positive and negative values, "<" is used to delete, "Esc" is used to quit or cancel input, "OK" is used to confirm.

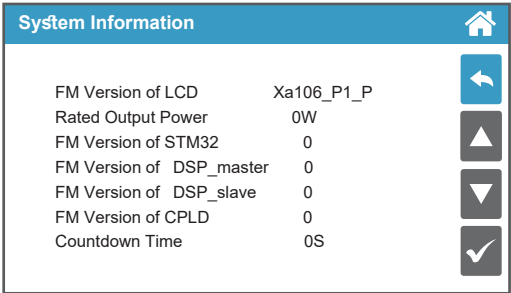
4.4 SETTING PAGE



This is Setting Page, seven buttons in total.

- ① System set: switch on/off; anti-reflux source, max. power selling; PV energy mode, charging and discharging periods, power battery SOC, voltage settings.
- ② Battery set: protocol selection; discharge protection; BAT activation mode; equal charge configuration; float charge configuration.
- ③ Grid set: frequency selection; upper and lower limits of grid voltage; reconnection time.
- ④ Basic set: language; time; standby; brightness; buzzer; LED.
- ⑤ Advanced set: battery paralleling; forced off-grid mode; PCS paralleling address; PCS paralleling quantity; active/reactive power adjustment; power factor adjustment; PV shadow scanning; islanding protection; low voltage ride-through; clearing overload faults.
- ⑥ System information: rated output power; FM version of LCD; program version of STM32, DSP slave/master, CPLD, startup countdown time.

4.5 SYSTEM INFORMATION PAGE



This is System Information Page, one page in total.

- ① Real-time data: Real-time display of rated output power; machine serial number, program version of STM32, DSP slave/master, CPLD; startup countdown time.

4.6 SYSTEM SET PAGE

System Settings

Switch ☐ OFF ☐ ON

☐ Selling First

☐ Anti-Reflex to Grid ☐ Solar Sell

☐ Anti-Reflex to CT ☐ Solar Sell

Max Sell Power 0W

Zero-export Power 0W

Energy Mode ☐ Batt First ☐ Load First

1/2

System Settings

CHG	EDC	Time	Power	Battery
☐	☐	0 : 0	0 : 0 0W	0.0% 0.0V
☐	☐	0 : 0	0 : 0 0W	0.0% 0.0V
☐	☐	0 : 0	0 : 0 0W	0.0% 0.0V
☐	☐	0 : 0	0 : 0 0W	0.0% 0.0V
☐	☐	0 : 0	0 : 0 0W	0.0% 0.0V
☐	☐	0 : 0	0 : 0 0W	0.0% 0.0V

2/2

This is System Set Page, two pages in total. The number of pages is displayed in the lower left corner.

- ① Switch: controls the power on and off of the inverter. ☐ means unselected, ☒ means selected.
- ② Work Mode:

i) Seling First: PV is used to power loads and battery, allowing the inverter to sell excess energy enerated by the solar panels back to the grid. If it is during a discharging period, energy of battery can also be sold back to the grid. Prioritization of power supply sources for loads: PV>Grid>Battery.

ii) Anti-reflux to grid: The inverter only supplies power to the connected backup load. it neither supplies power to household loads nor sells power to the grid. The built-in CT will detect the power flowing back to the grid and will reduce the power of the inverter, only to supply local loads and charge for battery.

iii) Anti-reflux to CT: The inverter supplies power to connected backup loads and household loads. If PV power and battery power are insufficient, they will be supplied with grid power. The inverter won't sell power to the grid. in this mode, a CT is required and an external CT will detect the power flowing back to the grid and wil reduce the power of the inverter, only to supply local and household loads, charge for battery.
- ③ Solar Sell: it is a special pattern in the Anti-reflux to grid or Anti-reflux to CT mode. If this paterin is on, excess energycan can be sold back to the grid. At this time PV is prioritized for use as follows: loads, charging batiery, grid. ☐ means off, ☒ means on.
- ④ Max Sell Power: The maximum output power allowed to flow into the grid.
- ⑤ Zero-export Power: The maximum amount of power flowing into the grid with the "Solar Sell" off.
- ⑥ Energy Mode: Priorizaon of PV energy supply.

i) Batt First: PV energy supply is first used to charge the battery and then used to power the load. If the PV energy is insufficient, the grid will supply both the battery and the load.

ii) Load First: PV energy supply is first used to power the load and then used to charge the battery. If the PV energy is insufficient, the grid will supply both the battery and the load.
- Note: If operating on off-grid status, the PV energy mode is always load first.
- ⑦ Charging and Discharging Periods: Up to six charging and discharging time periods can be set, click the circle to select charging (CHG) and discharging (EDC) mode, solid circle means selected. For convenience, hours and minutes are set separately, click on the input box and enter with the keyboard, set the start time first and then set the end time. Moreover, charge and discharge power can be set, as well as battery cut-off SOC and voltage. In order to avoid generating program conflicts, the two time periods front and rear are configured with a continuous relationship, where the end time of the previous period is the start time of the subsequent period. In addition, if the battery protocol is a Pb Acid, the battery cut-off SOC item can only be set to 0% or 100% when setting the period parameter. Charging needs to be set to 100% and discharging needs to be set to 0%.
- ⑧ GEN Charge: utilize diesel generator to charge the battery in a time period.

4.7 BATTERY SET PAGE

Battery Settings

Protocol Setting - - Pb Acid

Discharging Protection

On-grid SOC

Off-grid SOC

Voltage

Cut-off

0%

0%

0.00V

Restored

0%

0%

0.00V

Discharge Max. Current

0.00A

1/2

☐ Active BAT Mode enable

Battery Settings

☐ Pb Acid ☐ CAN Bus Proto-PYLON-v1.3

Battery Settings

U-Equal Charge 0.00V

I - Equal Charge 0.00A

U-Float Charge 0.00V

I - Float Charge 0.00A

T-Float Charge 0min

2/2

☐ Grid Charge Reserve SOC 0%

This is battery set page, two pages in total. The number of pages is displayed in the lower left corner.

① Protocol Setting: Select battery BMS protocol, currently supports Pb Acid and CAN-Bus-proto-PYLON-v1.3. Click to sub-page to select, and click save, back to Battery set page.

② Discharging Protection: i) Cut-off: Set the battery discharge to stop only when it reaches the given conditions (battery SOC and voltage in on-grid/off-grid state). ii) Restored: Set the power supply to load to restore only when it reaches the given conditions (battery SOC and voltage in on-grid/off-grid state). iii) Discharge Max.Current: The maximum value of current allowed to be reached in the discharging state of the battery.

③ Active BAT Mode Enable: Restore the battery from is over-discharged state by slowly charging it from the PV array or the grid. This feature needs to be set up when the inverter is down.

④ Equal Charge: Battery equal charge voltage and current can be set.

⑤ Float Charge: Battery float charge voltage, current and time (in minutes) can be set.

⑥ Grid Charge : The inverter draws energy from the grid to charge the battery, allowing the battery's capacity to reach Reserver SOC.

4.8 GRID SET PAGE

Grid Settings

Grid Frequency ☐ 50Hz ☐ 60Hz

Grid Voltage Upper limit 0.0V

Grid Voltage Lower limit 0.0V

Grid Frequency Up limit 0.00Hz

Grid Frequency Low limit 0.00Hz

Grid Reconnect delay 0

This is Grid Set Page, one page in total.

① Frequency select: please select your local grid frequency, you can choose 50Hz, 60Hz.

② Grid Voltage: Upper and lower grid voltage limits can be set.

③ Grid Frequency: Upper and lower grid frequency limits can be set.

④ Grid Reconnect delay: The reconnection time can be set in the on-grid state. The grid frequency needs to be selected when the inverter is down, and the inverter needs to be powered back on after the selection is completed.

⑤ Grid Level: There're several voltage levels for the inverter output voltage.

LN:230VAC LL:400VAC
LN:133VAC LL:230VAC

Note: The grid frequency and grid level need to be selected when the inverter is down, and the inverter needs to be powered back on after the selection is completed.

4.9 ADVANCE SET PAGE

Advance Settings

☐ Force Off -grid Mode

☐ Only PV Off -grid enable

☐ Gen Signal

PCS Parallel address

0

PCS Parallel quantity

0

CT Ratio

0

1/3

Advance Settings

☐ Factory Reset

☐ Default Reset

3/3

Advance Settings

☐ Overload Reset

☐ Smart Load Output

SOC

Voltage

Protection

0%

Restored

0%

Active Power

0.0

☐ Reactive Power

0.0

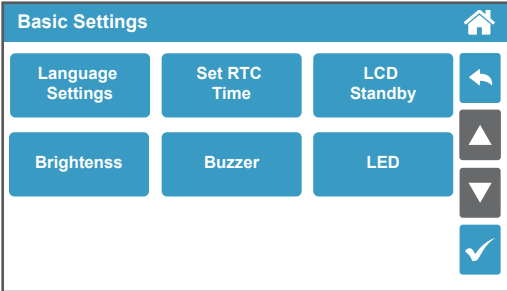
☐ Power Factor

0.0

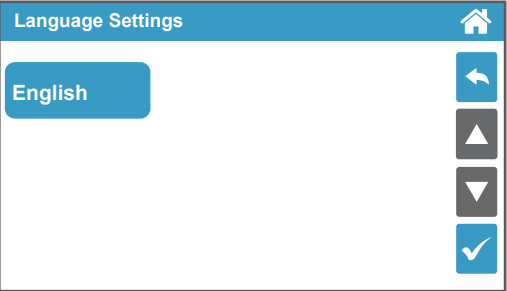
2/3

- This is Advance Set Page, two pages in total. The number of pages is displayed in the lower left corner.
- ① Force Off-grid Mode: Use this function to force a switch to the off-grid state, which prioritizes power to the load in this mode.
 - ② Only PV Of-Grid Enable: Inverter in the off-grid state with only PV input, if this function is enabled, the machine can start to supply power to the load. This feature needs to be set up when the inverter is down. Note: If operating on off-grid status, the PV energy mode is always load first.
 - ③ GEN Signal: If this function is turned on, then when the power grid suddenly disappears, the inverter will send a dry contact signal to control the generator to start running, When the power grid returned to normal, the dry contact signal was disconnected and the generator stopped working.
 - ④ PCS Parallel: Support PCS parallel function, you can set the address and quantity of parallel machine. (Multiple machines in parallel: the address of each machine must start from 1, consecutive and less than or equal to parallel quantity). This function needs to be set when the inverter is down, and the inverter needs to be powered back on after the setup is completed.
 - ⑤ Overload Reset: After an alarm occurs, while other kinds of fault can be cleared automatically, only overload faults need to be cleared manually with this function, The operation way is to click on the hollow circle to change it to a solid circle, click on the Save button, and return to the Setting page automatically, then the overload fault is cleared successfully once. The next time you need to clear it, just repeat the operation above.
 - ⑥ Smart Load Output: This mode utilizes the Gen input connection as an output which only receives power when the battery SOC and voltage is above a user programmable threshold. This feature needs to be set up when the inverter is down.
 - ⑦ CT Ratio: Set CT Ratio.
 - ⑧ Factory Reset: Reset all parameters of the inverter and reset the power generation data to zero.
 - ⑨ Default Reset: Reset all parameters of the inverter without clearing the power generation data.
 - ⑩ Active power: Active power which is used to adjust inverter Active power.
 - ⑪ Power Factor: Power factor which is used to adjust inverter reactive power.
 - ⑫ Reactive Power: Reactive power which is used to adjust inverter reactive power.

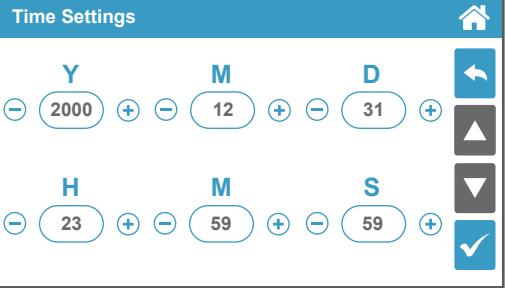
4.10 BASIC SET PAGE



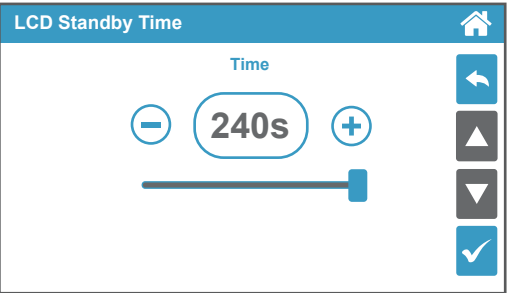
- This is Basic Set Page, six buttons in total.
- ① Language: LCD language can be set, switching between 中文 and English.
 - ② Set RTC Time: The RTC time can be changed.
 - ③ LCD Standby: Screen standby time can be set, that is to say, how long there is no touch to apply to the screen, it's brightness is automatically reduced to lowest. The settable range is 1~240s.
 - ④ Brightness: The current brightness of the screen can be set. The settable range is 1~100%. powered back on after the selection is completed.
 - ⑤ Buzzer: Buzzer can be set to sound or not when touching.
 - ⑥ LED: Support LED night mode function, you can set whether to enable or not and the period



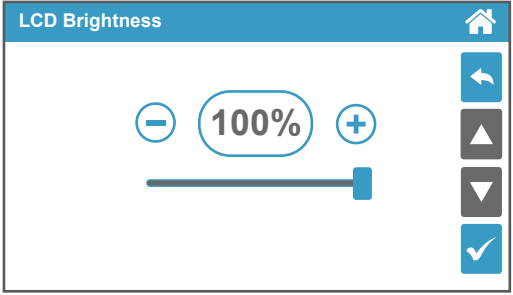
- This is Language Page.
- ① The current language is displayed in real time by the color of the option block, blue is selected, white is not.
 - ② When you change the language, you can judge whether the click is effective or not by whether the color of the option block changes to blue, and then click save.
 - ③ After changing the language, it will take a few seconds for all the text to be changed to the new language, so please don't click it too often.



- This is Set Time Page.
- ① Time can be set to meet the needs of different areas of use.
 - ② For ease of operation, the year, month, day, hour, minute, and second are added and subtracted respectively Y-MM-D H:M:S means Year-Month-Day Hour: Minute: Second.
 - ③ After changing the time, you can return to the main page to see that the system time has been changed to the newly set time.

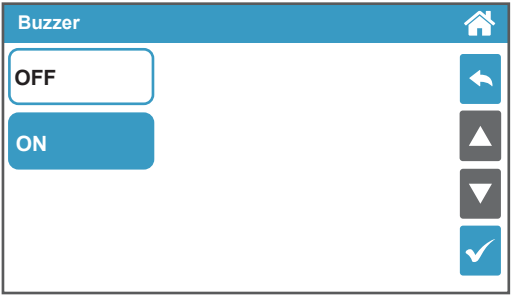


- This is LCD Standby page.
- ① Screen standby time can be set, that is to say, how long there is no touch to apply to the screen, it's brightness is automatically reduced to lowest.
 - ② There are two ways to adjust, clicking on the plus or minus icon or dragging the slider to adjust.
 - ③ The settable range is 1~240s. The default value is 240s.



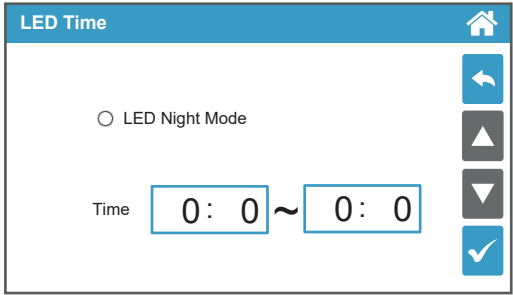
This is Brightness page.

- ① The current brightness of the screen can be set to be displayed as a percentage of the maximum brightness.
- ② There are two ways to adjust, clicking on the plus or minus icon or dragging the slider to adjust.
- ③ The settable range is 1~100%. To protect the screen, upper and lower limits are set for the actual display brightness. The default value is 64%.



This is Buzzer page.

- ① Buzzer can be set to sound or not when touching.
- ② The current buzzer setting is displayed in real time by the option block color, blue is the current buzzer selected state.
- ③ When changing the buzzer switch, you can judge whether the click is valid by whether the option box color changes to blue, and then click save setting.



This is LED Time page.

- ① For settings related to controlling the LED light off at night.
- ② You can set whether to enable the LED night mode or not.
- ③ You can set the time period to use the night mode and enable the control function, to realize automatic control of LED light off.

5.1 Warning List

System Warning Code 1	Warning Event	Description	Solutions
0	Over Ugrid	The Grid Voltage is Higer than the setting value when the inverter is running	1. Check the AC voltage is in the range of standard voltage inspecification; 2. Check whether grid AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
1	Under Ugrid	The Grid Voltage is Lower than the setting value when the inverter is running	1. Check the AC voltage is in the range of standard voltage inspecification; 2. Check whether grid AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer
2	Over Fr	The Grid Frequency is Higer than the setting value when the inverter is running	1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
3	Under Fr	The Grid frequency is Lower than the setting value when the inverter is running	1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
4	Line Check	The Grid is Loss when the inverter is running	1. Check whether grid AC cables are firmly and correctly connected; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
5	Under Upv	The PV voltage is lower than 120V when turn on the PV switch	1. Check the PV is in the range of specification or not; 2. Check whether PV cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
6	Reserved		
7	Reserved		
8	Reserved		
9	Reserved		
10	Reserved		
11	Reserved		
12	Reserved		
13	Reserved		
14	Reserved		
15	Reserved		

System Warning Code 2	Warning Event	Description	Solutions
0	UBATTERY_LOW	The battery voltageis lower than 44V orlower than the SOCthat you setting	1. Check the battery voltage; 2. Check whether Battery cables are firmly and correctly connected; 3. Restart the inverter 2-3 times; 4. if the fault still existing, Please contact your installer.
1	UBATTERY_LOSS	The battery is lower than 25V	1. Check the battery voltage; 2. Check whether Battery cables are firmly and correctly connected; 3. Restart the inverter 2-3 times; 4. if the fault still existing, Please contact your installer.

2	Reserved		
3	Reserved		
4	Fault FAN	The FAN isn't working	1. Restart the inverter 2-3 times; 2. if the fault still existing, Please contact your installer.
5	Reserved		
6	Battery Transient under voltage	The battery voltage is lower than 40V at one moment	1. Check the battery voltage; 2. Check whether Battery cables are firmly and correctly connected; 3. Restart the inverter 2-3 times; if the fault still existing, Please contact your installer.
7	Reserved		
8	Reserved		
9	DC Stop	The DC side isn't working	1. The BUS voltage can't be built from PV or battery. 2. Check whether Battery cables are firmly and correctly connected; 3. Restart the inverter 2-3 times; 4. if the fault still existing, Please contact your installer.
10	Reserved		
11	Reserved		
12	Reserved		
13	Reserved		
14	Reserved		
15	Reserved		

5.2 Fault Reference Codes

System Fault Code 1	Fault Event	Description	Solutions
0	Under Upv1	The PV voltage is lower than 20V ,and the current is higher than 2A	1. Check the PV is in the range of specification or not; 2. Check whether PV cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
1	Over Ipv1	The PV current is higher than 30A	DC side over current fault 1. Check PV module connect and battery connect; 2. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 3. If the error message still remains, please contact your installer.
2	Over Upv1	The PV voltage is higher than 500V	1. Check the PV is in the range of specification or not; 2. Check whether PV cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
3	Over Ipv2	The PV current is higher than 30A	DC side over current fault 1. Check PV module connect and battery connect; 2. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 3. If the error message still remains, please contact your installer.
4	Over temp	The temperature is higher than 100℃	1. Check whether the work environment temperature is too high; 2. Turn off the inverter for 10mins and restart; 3. if the fault still existing, please contact us for help.
5	Over Iac	AC over current fault	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is in normal;

			3. Check the backup load connected, make sure it is in allowed power range. 4. If the fault still exists, please contact us for help. 5. If the error message still remains, please contact your installer.
6	Over Ugrid	The Grid Voltage is Higer than the setting value when the inverter isn't running	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage inspecification; 2. Check whether grid AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
7	Over Fr	The Grid Frequency is Higer than the setting value when the inverter isn't running	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer
8	Under Backup	The backup is connected with the Grid	1. Check the backup terminal; 2. Detect the backup voltage with the multimeter; 3. Restart the inverter 2-3 times; 4. if the fault still existing, please contact us for help.
9	Over Ubus	The BUS Voltage is Higer than 560V	1. check the total power of the inverter; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
10	Over lIeak	AC leakage current fault	Leakage current fault 1. Check the PV side cable ground connection; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
11	Fault Relay	The Relay isn't working	1. Restart the inverter 2-3 times; 2. if the fault still existing, please contact us for help.
12	Fault GFD	DC insulation failure	PV isolation resistance is too low 1. Check the connection of PV panels and inverter is firmly and correctly; 2. Check whether the PE cable of inverter is connected to ground; 3. If the error message still remains, please contact your installer.
13	Over Backup Voltage	The Backup Voltage is high	1. Check the backup terminal; Detect the backup voltage with the multimeter; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
14	XINT Iac	The inverter current is high and touch the protection.	1. check the power of the backup load; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
15	Remote Shutdown	Turn off the inverter	1. Check the other fault code of the inverter and according to the solution to solve the problem. 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.

System Fault Code 2	Fault Event	Description	Solutions
0	Fault SPI	The upper computer communicates with the lower computer fault	1. Restart the inverter 2-3 times; 2. if the fault still existing, please contact us for help.
1	Under Ugrid	The Grid Voltage is Lower than the setting value when the inverter isn't running	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage inspecification; 2. Check whether grid AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.

2	Under Fr	The Grid Frequency is Lower than the setting value when the inverter isn't running	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
3	Under Upv2	The PV voltage is lower than 20V ,and the current is higher than 2A	1. Check the PV is in the range of specification or not; 2. Check whether PV cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
4	Over Upv2	The PV voltage is higher than 500V	1. Check the PV is in the range of specification or not; 2. Check whether PV cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.
5	Reserved		
6	Under Ubus	The BUS Voltage is Lower than 300V	1. check the total power of the inverter; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
7	Reserved		
8	Fault Temper	The Temper is fault	1. Check whether the work environment temperature is too high or too low; 2. Turn off the inverter for 10mins and restart; 3. if the fault still existing, please contact us for help.
9	Over Load	The Relay isn't working	1. check the total power of the inverter; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
10	Reserved		
11	Parallel Data Loss	Parallel Data Loss	1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; 2. Restart the inverter 2-3 times; 3. If the fault still exists, please contact us for help.
12	Parallel Phase Loss	Parallel Phase Loss	1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; 2. Restart the inverter 2-3 times; 3. If the fault still exists, please contact us for help.
13	Parallel Stop	Parallel system stop	1. Check the hybrid inverter work status. According to the fault code to solve the problem. 2. if the fault still existing, please contact us for help.
14	XINT lpv	The PV boost current is high and touch the protection.	1. check the PV voltage and the power of the backup load; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
15	Reserved		

System Fault Code 3	Fault Event	Description	Solutions
0	UBUS_OVER	The BUS Voltage is Higer than 560V	1. check the total power of the inverter; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
1	UBUS_LOW	The BUS Voltage is Lower than 300V	1. check the total power of the inverter; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.

2	UBATTERY_OVER	The Battery Voltage is Higher than 60V	1. Check the battery voltage; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
3	Reserved		
4	ILLC_OVER	The LLC current is high	1. check the total power of the inverter include the charging and the discharging current; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
5	IBuckBoost_OVER	The Buck-boost voltage is high and touch the protection	1. check the total power of the inverter include the charging and the discharging current; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
6	ULLC_OVER	The LLC voltage is high and touch the protection	1. check the total power of the inverter include the charging and the discharging current; 2. Check the battery voltage; 3. Restart the inverter 2-3 times; 4. if the fault still existing, please contact us for help.
7	Fault data SPI	The upper computer communicates with the lower computer fault	1. Restart the inverter 2-3 times; 2. if the fault still existing, please contact us for help.
8	Over time SPI	The upper computer communicates with the lower computer fault	1. Restart the inverter 2-3 times; 2. if the fault still existing, please contact us for help.
9	Over Ibat	The battery current is higher than 1.5 multiples of the setting value	1. check the discharging current that you setting; 2. check the total power of the inverter; 3. if the fault still existing, please contact us for help.
10	Reserved		
11	Reserved		
12	Reserved		
13	Reserved		
14	ILLC_XINT	The LLC current is high and touch the protection	1. check the total power of the inverter include the charging and the discharging current; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.
15	IBuckBoost_XINT	The Buck-boost current is high and touch the protection	1. check the total power of the inverter include the charging and the discharging current; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.

5.3 Troubleshootings

• Troubleshootings

Checking before starting up

- PV Input Connection: Confirm the connection between inverter and PV panels : polarity (+/ -) not reversed.
- Battery Connection: Confirm the connection between inverter and battery : polarities (+/ -) not reversed.
- On-Grid & Back-Up Connection: Confirm On-Grid connected to public grid and Back-Up to loads : polarity (L/N) not reversed.

Problems During Operation

Hybrid inverter not start up with only battery

Solution:

1. Make sure the voltage of battery is higher than 48V, otherwise battery cannot start Hybrid inverter up.

Hybrid inverter not start up with only PV

Solution:

1. Make sure the voltage of PV is higher than 150V.
2. Make sure that connection between Hybrid inverter and PV panels : polarities (+/-) not reversed.

No discharge or output from hybrid inverter at night without PV or PV power lower than load power:

Solution:

1. Communication between Hybrid inverter and Meter is OK or not.
2. Make sure load power is higher than 150W.
 - a. battery will not discharge continuously unless load power is higher than 150W.
 - b. If battery still not discharge when Meter power is higher than 150W, then please check Meter connection and direction.

Battery not charge when pv power higher than load power:

Solution:

1. Check if charge voltage on App (Set→Basic Setting) is properly set (for lead-acid battery) as battery cannot charge if battery voltage reaches charge voltage.
2. Check if it is during discharge time set on App.
3. Check if battery is fully charged or not, or battery voltage reach "charge voltage" or not.

High power fluctuation battery charge or discharge:

Solution:

1. Check if there is a fluctuation on load power.
2. Check if there is a fluctuation on PV power.

Battery does not charge:

Solution:

1. Make sure BMS communication is OK on App.
2. Check if the total load power is much higher than PV power.

Questions & Answers (Q & A)

About Wi-Fi configuration

Q: Why cannot see Solar-WiFi signal on mobile devices?

A: Normally Solar-WiFi signal could be searched right after inverter powered up. But Solar-WiFi signal will disappear when Hybrid inverter connected to internet, If need change settings, can connect to the router to change. If cannot see WiFi signal even not connect to router, then please try to reload WiFi.

About battery operation

Q: Why battery does not discharge when grid is not available, while it discharge normally when grid is available?

A: On APP Off-Grid Output and backup function should be turned on to make battery discharge under off-grid mode.

Q: Why there is output on Back-Up side?

A: For Back-Up supply, the "Back-Up Function" on App must be turned on. Under off-grid mode or grid power is disconnected, "Off-Grid Out" function must be turned on as well.

NOTE: As turn "Off-Grid Output" on, don't restart inverter or battery, otherwise the function will switch off automatically.

Q: Why battery switch always trip when starts it up (Lithium battery)?

A: For lithium battery like BYD, normally the switch trips for following reason:

1. BMS communication fails, or battery SOC is so low to protect itself.
2. Battery SOC is too low, battery trips to protect itself.
3. An electrical short-cut happened on battery connection side.

Q: Which battery should I use for Hybrid inverter?

A: For Hybrid inverter, it could connect lithium or lead-acid batteries, with nominal voltage 48V, max charge voltage 60V. Compatible lithium batteries for now: BYD B-Box 2.5/5.0/7.5/10 For lead-acid batteries: please contact us to confirm if it is suitable to use.

Q: How to set the battery charging and discharging current?

A: Inverter factory default battery charging current 10A and discharging current 20A. You can adjust it according to the specifications of the battery used.

About SOLARMAN Business App operation and monitoring

Q: Why Cannot save settings on APP?

A: This could be caused by losing connection to WiFi.

1. Make sure you connected WiFi (make sure no other devices connected) or router (if connected WiFi to router) and on APP home page shows connection well.

2. Make sure Hybrid inverter under waiting mode (on APP) before you change any settings on SOLARMAN Business disconnect grid/load/battery only leave PV connected and then restart till see work mode as "wait" on APP.

Q: On App, some columns show NA, like battery SOH, etc. why is that?

A: NA means App does not receive data from inverter or server, normally it is because communication problem, such as battery communication, and communication between inverter and the APP.

About meter and power limit function

Q: How to Act Output Power Limit function?

A: For Hybrid Inverter system, the function could be realized by:

1. Make sure Meter connection and communication well;
2. Turn on Export Power Limit function and Set the max output power to grid on APP.

NOTE: If Out-put Power Limit set as 0W, then there might still have deviation max 100W . exporting to grid.

Q: Why there is still power exporting to grid after I set power limit as 0W?

A: Export limit could theoretically to minimum 0W, but there will have a deviation of around 50-100W for Hybrid Inverter system.

Q: Can I use other brand Meter to take over Meter in Hybrid inverter system or change some settings on Meter?

A: Cannot, because there the communication protocol is inset between inverter and Meter, other brand Meter cannot communicate. Also any manual setting change could cause Meter communication failure.

6.1 Disclaimer

The hybrid inverters are transported, used and operated under environmental and electrical conditions. We have the right not providing after-sales services or assistance under following conditions:

- Inverter is damaged during transferring.
- Inverter is out of warranty year and extended warranty is not bought.
- Inverter is installed, refitted or operated in improper ways without authority from us.
- Inverter is installed or used under improper environment or technical condition mentioned in this user manual, **without authority from us.**
- Installation or configuration of the inverter does not follow requirements mentioned in this user manual.
- The inverter is installed or operated against the requirements or warnings that are mentioned in this user manual.
- Inverter is broken or damaged by any force majeure like lightening, earthquake, fire hazard, storm and volcanic eruption etc.
- Inverter is disassembled, changed or updated on software or hardware without authority from us.
- Inverter is installed, used or operated against any related items in international or local policies or regulations.
- Any non-compatible batteries, solar panels, loads or other devices connected to Hybrid inverter system.



We will keep right to explain all the contents in this user manual.

• Maintenance

The inverter requires periodically maintenance, details as below:

Heat sink: please use clean towel to clean up heat sink once a year.

Torque: please use torque wrench to tighten AC and battery wiring connection once a year.

DC switch: check DC switch regularly, active the DC switch 10 times in a row once a year. Operating DC switch will clean contacts and extend lifespan of DC switch.



Make sure inverter is totally isolated from all DC and AC power for at least 5 mins before maintenance.

Appendix: Protection category definition

Overvoltage Category Definition

Category I	Applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level.
Category II	Applies to equipment not permanently connected to the installation. Examples are appliances, portables tools and other plug-connected equipment.
Category III	Applies to a fixed equipment downstream of and including the main distribution board. Examples are switchgear and other equipment in an industrial installation.
Category VI	Applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board), Example are electricity meters, primary over-current protection equipment and other equipment connected directly to outdoor open lines.

Moisture Location Category Definition

Moisture Parameters	Level		
	3K3	4K2	4K4H
Temperature Range	0~+40 ℃	-33~+40 ℃	-20~+55 ℃
Humidity Range	5%~85%	15%~100%	4%~100%

Environment Category Definition

Environment Condition	Ambient Temperature	Relative Humidity	Applied to
Outdoor	-20~+50 C	4%~100%	PD3
Indoor Unconditioned	-20~+50 C	5%~95%	PD3
Indoor Conditioned	0~+40 C	5%~85%	PD2

Pollution Degree Definition

Pollution Degree I	No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.
Pollution Degree II	Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.
IPollution Degree III	Conductive pollution occurs, or dry, non-conductive pollution occurs, which becomes conductive due to condensation which is expected.
Pollution Degree IV	Persistent conductive pollution occurs, for example, the pollution caused by conductive dust, rain and snow.

6.2 Technical Parameters

Model	PSE-DUAL-4KW
PV Input	
Max. DC input power(W)	6000
Max. DC input voltage(V)	500
MPPT voltage range(V)	150-450
Starting voltage(V)	125
Max. input current(A)	18/18
Max. short circuit current (A)	22.5/22.5
Number of MPP trackers	2
Strings per MPP tracker	1
AC Output (Grid)	
Rated output power (W)	4000
Max. output apparent power(VA)	4400
Rated output voltage(V)	220/230/240
Rated output frequency(Hz)	50/60
Max. output current(A)	20
THDi	< 3%
Output power factor	~1 (-0.8 leading~+0.8 lagging)
AC Output (Two Backup)	
Full Max. output power(W)	4000
Max. output apparent power(VA,sec)	8000,15
Rated output voltage(V)	220/230
Rated output frequency(Hz)	50/60(±0.2%)
Back up1 Max. output power(W)	4000
Back up2 Max. output power(W)	4000
Output Power Factor(off grid)	1~(0.8 leading to 0.8 lagging)
Output Current Harmonic Distortion	THD<3%(Nonlinear load); THD<1.5%(Linear load)
Max. output current(A)	18

Battery Parameters	
Battery Type	Lithium or lead acid battery
Rated battery voltage(V)	48
Voltage range(V)	44-57
Max. charge/discharge current(A)	100
BMS communication	CAN/RS485
Efficiency	
Max. efficiency(PV)	97.6%
Max. efficiency(cell)	94.5%
European efficiency	97%
Protection	
PV input reverse polarity protection	Yes
PV insulation resistance detection	Yes
Residual current detection	Yes
Output over current protection	Yes
Output short circuit protection	Yes
Output over voltage protection	Yes
Others	
Operating temperature range(°C)	-25~60
Storage temperature range(°C)	-30~65
Humidity range	0~95%
Operating altitude (m)	≤4000
Communication	RS485/CAN/WiFi/Ethernet/4G
Noise (db)	<25
Size (W×H×D mm)	424*555*197
Weight (kg)	19
Standard	
EN 62109-1/2,IEC 62109-1/2,EMC 61000,EN50549,VDE 4105/0124,NRS 097-2-1,IEC61727/62116/61683	

