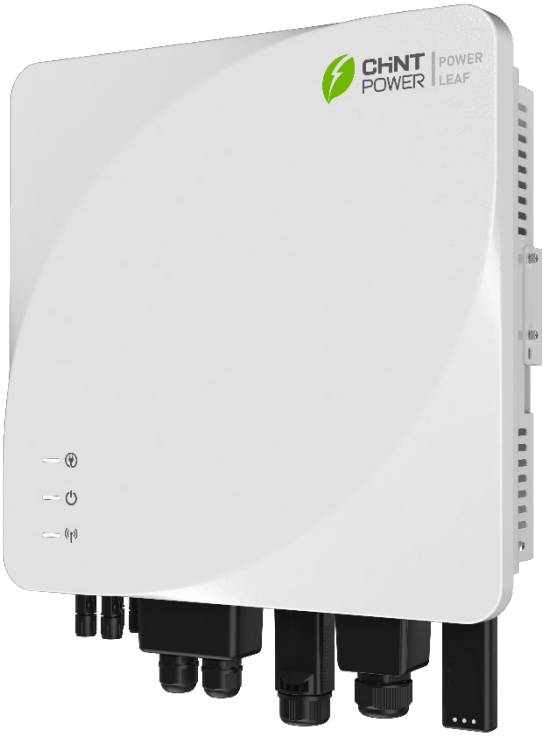
ECH3/3.6/4.6/5/6K-SML-EU Series
Single-phase Energy Storage Inverters
User Manual



Shanghai Chint Power Systems Co., Ltd.

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0. Preface

Thank you for choosing a CHINT energy storage grid-connected inverter (hereinafter referred to as "energy storage inverter" or "inverter" in this manual) developed by Shanghai Chint Power Systems Co., Ltd (hereinafter referred to as "CHINT").

These energy storage inverters feature an innovative design and perfect quality control, ensuring high reliability quality and making them suitable for high-standard grid-connected systems.

IMPORTANT!

Please read this manual carefully and make sure that you have understood all the contents thoroughly before you start any operation.

Main Contents

This Installation and Operation manual contains important information, safety guidelines, detailed planning, and setup information for installation, as well as information about configuration, operation, and troubleshooting. Be sure to read this manual carefully before using.

Target Readers

- Plant owner
- Project Engineer
- Installation engineer
- Maintenance engineer

Installation, commissioning, troubleshooting, and maintenance of the inverter must be done only by qualified personnel. If you encounter any problems during the above-mentioned operation, please check the user manual carefully. You can also contact your local dealer or supplier for help if the problem still exists.

This manual describes important information about product installation and safe operation. Please read it carefully before use.

Manual Management

Please keep this user manual on hand for quick reference.

Copyrights

Version

This manual is subject to change or modification without prior notice. Users can get the latest manual from our sales channel or our official website: www.chintpower.com.

1. Safety Instructions

Please read this manual carefully before installation. If the equipment is damaged as a result of failing to following the instructions in this manual, we reserve the right not to provide quality assurance!

1.1 Definition of Symbols in this Manual

	**DANGER:** There is a high-level potential danger that, if not avoided, may result in death or serious injury to personnel.
	**WARNING:** There is a moderate potential danger that, if not avoided, may result in death or serious injury to personnel.
	**CAUTION:** There is a low-level potential hazard that, if not avoided, may result in moderate or mild injury to personnel.
	**NOTE:** There is a potential risk that, if not avoided, may result in the equipment not functioning properly or causing property damage.
	**IMPORTANT:** Additional information in this manual that highlights and supplements the content and may also provide tips for optimizing product use so it can help solve problems or save you time.

1.2 Interpretation of Product Markings

	**Electric Shock Hazard:** There is a high voltage inside the body. Therefore, follow this manual when operating this product.
	**High Temperature:** This product complies with international safety standards, but it generates heat during operation. Therefore, never touch the cooling

	fin or the metal surface of the inverter during operation.
	**Hazardous Energy:** The electrical energy stored in capacitors may pose a risk of electric shock. Wait for 5 minutes after disconnecting all power supplies before removing the upper cover.
	For more details, see the user manual.
	WARNING! FUSES FOR REPLACEMENT MUST BE OF THE SAME MODEL AND RATING TO MAINTAIN SUSTAINED FIRE RESISTANCE. FOR DETAILS, SEE THE USER MANUAL.
	**Protective Earthing:** This marking is located at the protective earthing (PE) terminal, requiring a solid earthing to ensure the safety of operators.
	**RoHS:** The inverter complies with 2011/65/EU which specifies the restrictions on the use of specific harmful substances in electronic and electrical equipment.
	**CE:** The inverter complies with EU regulations and standards.
	**TUV:** The safety and quality of the inverter have been certified by TÜV Rheinland.
	**Service Life:** The effective service life of the inverter housing is twenty years.

1.3 Precautions for Equipment Safety

DANGER!

Before opening the inverter housing for maintenance, disconnect AC power and DC power, and ensure that the HV energy inside the equipment has been fully released!

Generally, you can maintain and operate the equipment at least 5 minutes after all connections of the inverter are cut off.

WARNING!

All operations and connections shall be completed by professional engineering and technical personnel!

When the PV panel is exposed to sunlight, a DC high voltage will be generated in the PV terminals of the inverter. To prevent the risk of electric shock during equipment maintenance or installation, please ensure that all DC and AC power has been disconnected from the equipment, and ensure that the equipment is reliably earthed.

CAUTION!

Check the wall bracket again before hanging the machine to ensure that it is firmly secured on the support surface.

NOTE:

Do not install the inverter in a place exposed to direct sunlight, to avoid reduction of conversion efficiency caused by high temperature and ensure long-term service life of the inverter.

IMPORTANT:

Before choosing the grid code, contact your local power supply company. If the inverter is set to work under a wrong grid code, the power supply company may cancel the operating license for that equipment.

Ensure that the whole system complies with national standards and applicable safety regulations before operating the inverter.

1.4 Safety Responsibilities

Please read the safety instructions in this chapter carefully before installing and using the energy storage inverter. We will not be liable and provide quality assurance if personal injury or equipment damage is caused as a result of failing to follow the safety instructions in this manual!

1.4.1 Safety Responsibilities of the Owner

When operating and maintaining the energy storage inverters, you need to pay attention to relevant safety precautions. Owner must comply with the following requirements:

1. Operators must be trained and qualified electrical workers. Otherwise, they cannot operate the energy storage inverter. Improper or incorrect operation may cause serious harm to operators;
2. Operators shall be fully familiar with the working principle of energy storage inverters;
3. Operators shall be fully familiar with this manual;
4. Operators shall be fully familiar with the local electrical regulations and standards;
5. Regularly inspect the safety equipment within the system to ensure its reliability;
6. Immediately replace any warning signs damaged or illegible on the equipment;
7. Do not store flammable and explosive articles nearby;
8. The wall surface for storing energy storage inverter products must be firm and reliable;
9. Transportation, installation, and commissioning can only be carried out by professional personnel recognized by the manufacturer;
10. Before operating the energy storage inverter, please evaluate the events that may cause system hazards and troubleshoot them;
11. This manual describes the safety instructions in details. Operators shall read it carefully for full understanding;
12. The software, housing, and internal components of the equipment cannot be

changed without the manufacturer's approval. If these are any unauthorized changes, the quality assurance of the energy storage inverter becomes invalid;

13. The sealing strip on the equipment cannot be damaged. If it is damaged, the quality assurance of this equipment becomes invalid.

1.4.2 Safety Responsibilities of O&M Personnel

Qualified O&M personnel are persons who are trained to have the following necessary electrical knowledge:

1. Understand the installation, use, disassembly, earthing, short circuit, and maintenance of the product;
2. Evaluate the assigned tasks and spot possible hazardous events;
3. Provide immediate rescue for the injured;
4. Understand the relevant maintenance criteria of the product;
5. Observe local regulations and standards.

The O&M personnel must ensure that the following safety requirements are met:

1. Before installation and commissioning, conduct step-by-step inspections according to the safety instructions in this manual;
2. Before running the system, please confirm the system is complete and safe.
3. Before maintenance, use correct testing device to confirm the converter system is completely uncharged.

1.5 Requirements for Safe Operation

1.5.1 Safety Markings

To prevent irrelevant personnel entering the site and performing incorrect operations, inverter maintaining shall comply with the following regulations:

1. The safety warning signs on the energy storage inverter provide important information for safe operation, so they shall not be artificially damaged;
2. The nameplate on the energy storage inverter provides important information of relevant products, so they shall not be artificially damaged;
3. Obvious safety warning tapes are set up near the operation area.

1.5.2 Safe Operation

Observe following rules in order to use the energy storage system in a safe way:

1. Only authorized staff can operate the energy storage inverter;
2. Check the energy storage inverter on before powering it on, to ensure that the system is ready and safe. If there is a possibility of danger, please do not power on the inverter;
3. Abide by regulations described in the manual during the inverter operation;
4. Do not disassemble any component when the system is running;
5. Start maintenance work at least 5 min after the energy storage inverter is powered off;
6. Disconnect all power supply and provided signs to prevent accidental closing before maintenance;
7. Check the components before maintenance to ensure that they are completely de-energized;
8. Assign at least two persons onsite during maintenance, one for operation and the other for ensuring safety;
9. Take insulation measures, such as wearing insulating gloves if the maintenance components will always be live;
10. During maintenance, ensure that the AC and DC switches are disconnected and the power grid is disconnected;
11. Never touch the battery electrode as short-circuit current of the battery module is very high. Otherwise, serious injury may be caused;
12. Do not perform maintenance in rainy days, to avoid accidental water falling into the machine.

2. Overview

2.1 Function Features

The ECH3/3.6/4.6/5/6K-SML-EU energy storage inverter is a single-phase device that integrates a PV grid-connected inverter with a battery energy storage inverter. It features multiple operating modes to meet various user needs and includes an energy management system for optimizing energy flow. The energy management system can distribute power generated in the PV system to loads, store it in batteries, and export excess power to the grid.

Energy storage inverters provide comprehensive solutions in various challenging conditions, such as the continuous rise in energy costs (e.g., petroleum and coal), decreasing subsidies for PV grid-connected systems, off-grid areas like mountainous regions or base stations, and situations requiring UPS (Uninterruptible Power Supply) or emergency power.

The ECH3/3.6/4.6/5/6K-SML-EU energy storage inverter supports overloads of up to 150%, maximizing support for high-power loads. Its UPS mode accommodates both capacitive and inductive loads, such as motors, refrigerators, and air conditioners. The key functional features of this series of energy storage inverters are as follows:

- 2-channel independent MPPT inputs
- Wide series voltage range of PV panels (80-550V)
- Automatic switching between flexible on-grid and off-grid modes
- 120A continuous high-current charging/discharging current
- Parallel connection of multiple inverters, making system solutions more flexible
- APP intelligent monitoring: RS485/WIFI/4G/Bluetooth
- Automatic derating operation in external high temperature and harsh environment
- Integrated AFCI function
- Output short circuit protection

- Input earth insulation impedance monitoring
- Output voltage and frequency monitoring
- Earth leakage current monitoring
- Output current DC component monitoring
- Anti-islanding protection
- Input and output overvoltage protection
- Input overcurrent protection
- Module temperature monitoring
- Support external quick shutdown device
- Support external smart load control

2.2 Model Meaning

This document takes ECH3K-SML-EU as an example to illustrate the meaning of each letter combination in a product model, as described in the following table.

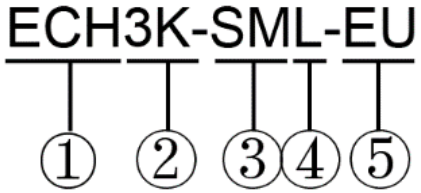


Figure 2-1 Meaning of Product Model

S/N	Letter Combination	Meaning
1	ECH	Energy storage inverter
2	3K	Rated power 3 kW
3	SM	Single-phase multichannel with MPPT
4	L	LV battery 48V
5	EU	European market

Table 2-1 Meanings of Letter Combination

2.3 Product Appearance Components and Dimensions

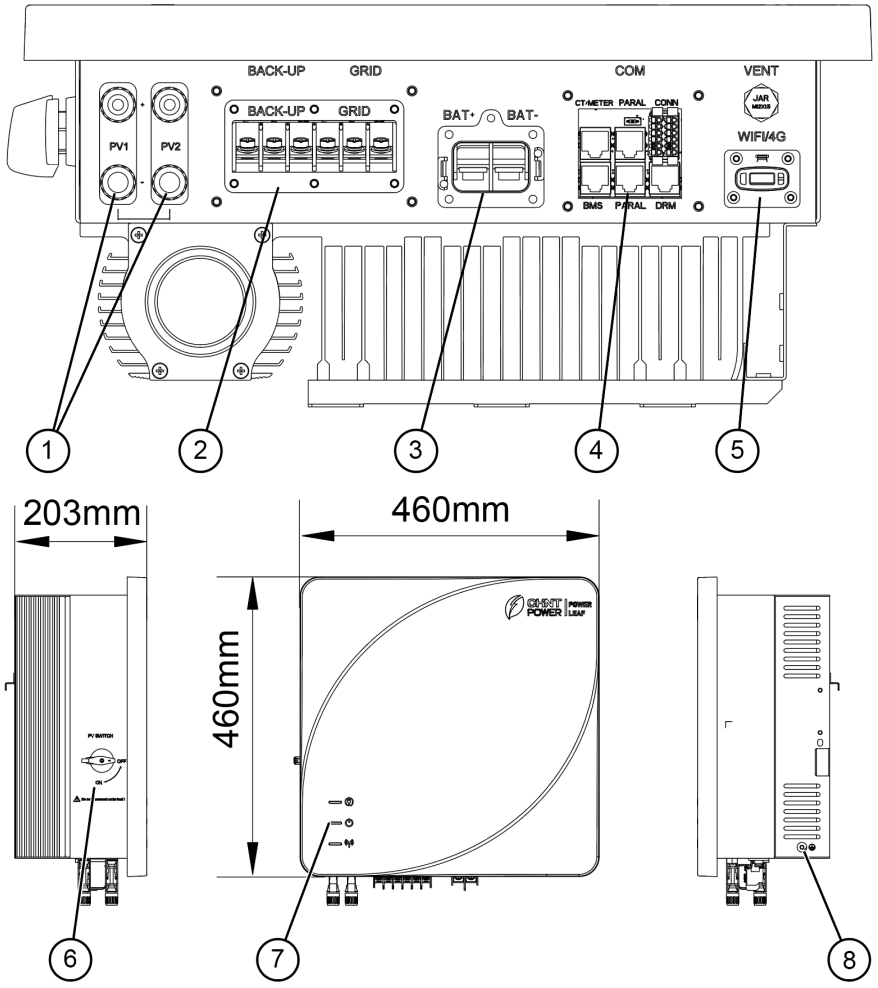


Figure 2-2 Product Appearance Components and Dimensions

No.	Name	Function
1	PV DC Input Terminal	Connect to DC cable
2	AC Output terminals (BACK-UP and GRID)	Connect to the load cable and grid cable
3	BAT Terminal	Connect to the battery cable

4	COM port	For external communication
5	WIFI/4G Port	Connect Communication rod
6	PV Switch	Power ON and Power off PV power supply
7	LED Indicator	Indicate the product operation state
8	Protection Earthing Hole	For protective earthing

Table 2-2 Product Appearance Components

2.4 LED Indicator

The indicator in the lower left corner will light up. To help users to understand the working status and fault information of the inverter, the following table explains the operation state for each indicator light state. If an abnormal operation occurs, detailed fault information can be found in Table 6-1: Energy Storage Inverter Fault Information.

Indicator	Description	Status	Description
	AC output light (Back-up/Grid)	On (Green)	On-grid operation
		Flash (Green)	Off grid operation
		On (Yellow)	Bypass operation
		On (Red)	No AC output
		Off	Internal communication fault
	System light	On (Green)	In running
		Flash (Green)	Self-inspection
		Flash (Yellow)	Module fault
		On (Yellow)	Standby
		On (Red)	Failure occurred
		Off	Internal communication fault
	Communication light	On (Green)	Communication is normal
		On (Yellow)	Abnormal meter communication
		Flash (Red)	Abnormal BMS communication
		On (Red)	Internal communication fault
		Off	No communication

Table 2-3 LED Indicator Description

2.5 System Scheme Diagram

The following is the system scheme diagram, which illustrates the overall configuration and connections of the system components.

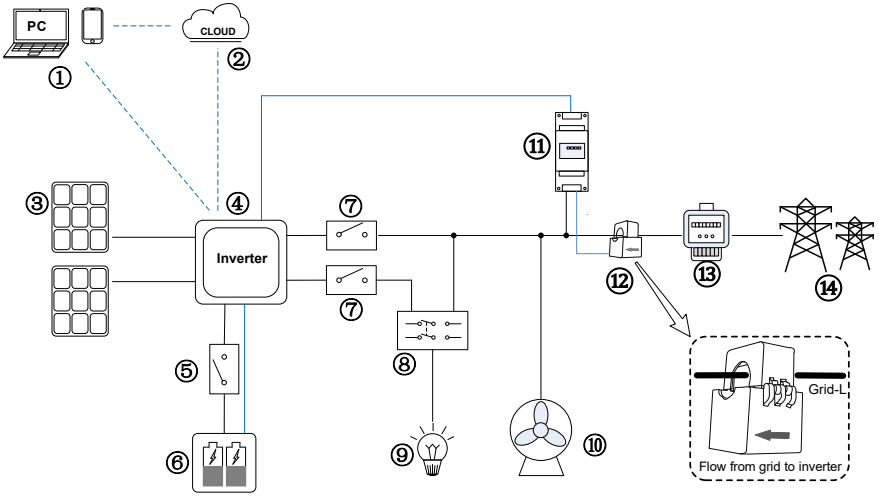


Figure 2-3 Structure of ECH Energy Storage Inverter

No.	Name	No.	Name
1	Web & APP	8	Double Pole Double Throw (DPDT) switch
2	Cloud	9	Back-up load
3	PV module	10	On-Grid load
4	Energy storage inverter	11	Smart meter
5	DC circuit breaker (Omit if it is equipped in battery end)	12	CT
6	Battery pack	13	Household electric meter
7	AC circuit breaker	14	Power grid

Table 2-3 Structure Diagram of ECH Energy Storage Inverter

3. Product Installation

3.1 Product Installation Process

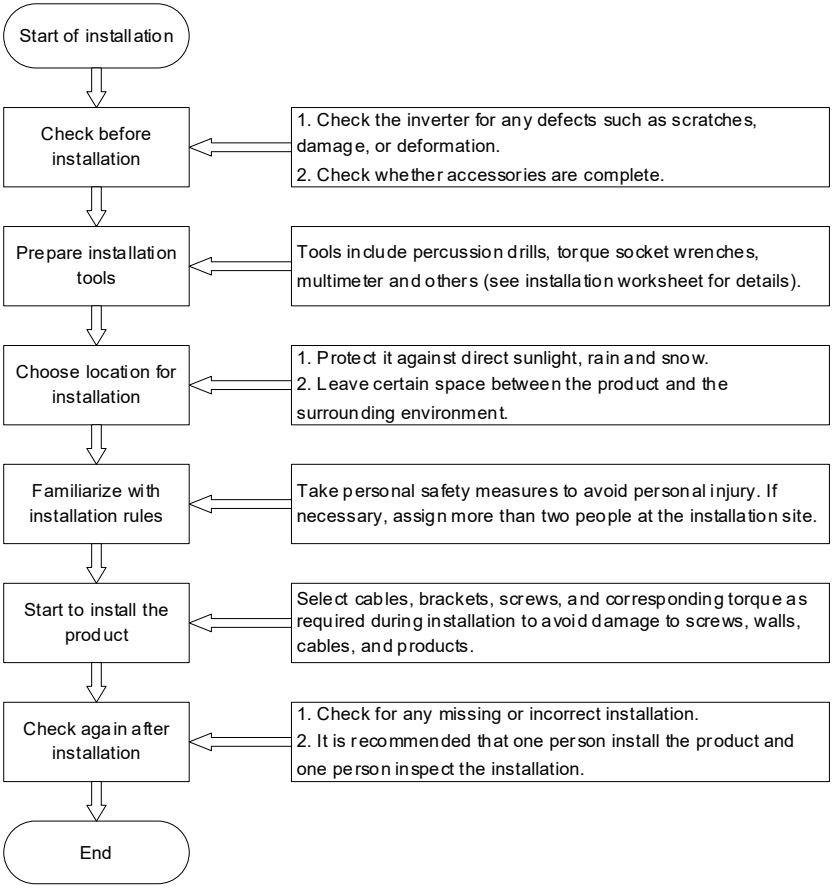


Figure 3-1 Schematic Diagram of Installation Process

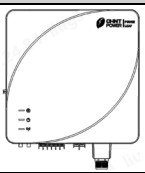
3.2 Device Check

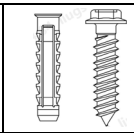
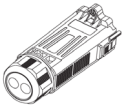
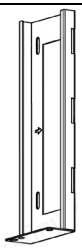
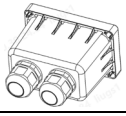
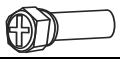
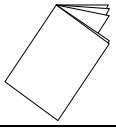
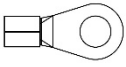
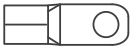
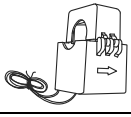
3.2.1 Arrival Check

The energy storage inverter has undergone detailed factory test and careful check before delivery. However, there is still a possibility of equipment collision or even damage during transportation. So, check the integrity of the energy storage inverter at first after receiving it. The checklist mainly includes the following items:

1. Check the outer packaging for any damage, such as deformation, holes, cracks, or other signs that may cause damage to the device inside. If there is any damage, do not unpack it and contact your dealer immediately.
2. Check whether the inverter model is correct. If there is any discrepancy, do not unpack and contact your dealer immediately.
3. Check whether the type and quantity of deliverables are correct, and whether the appearance is damaged. If there is any damage, please contact your dealer immediately.

3.2.2 Delivery List Check

No.	Figure	Description	QTY	Purpose
1		Inverter	1	/
2		PV+ Connector	2	PV cable quick-plug connector: 2 for positive and 2 for negative
3		PV- Connector	2	
4		Communication Rod	1	Monitoring

5		Expansion Screw	4	Lock wall bracket to the wall
6		Battery Protective Cover	1	Prevent from touching battery terminal
7		Inverter Back Bracket	1	For mounting the inverter
8		AC protective cover		Prevent from touching AC terminal
9		Smart meter	1	For monitoring energy output
10		M5×12 Screw	3	1 for earthing end; 2 for fixing wall bracket and right baffle
11		Quick Guide	1	For installation instructions
12		Warranty card	1	Provide warranty terms
13		OT terminal	7	1 for earth cable; 6 for AC cable
14		Battery Cable Connection Terminal	2	Crimp the battery cable
16		CT(Current Transformer)	1	Detect the grid current

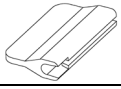
17		Meter cable(10m)	1	Connect to Meter
18		MC4 tool	1	Unlock the PV connector
19		AC terminal spacer	5	Add the AC insulation distance

Table 3-1 Components and Mechanical Parts to be Delivered

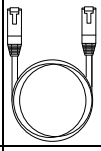
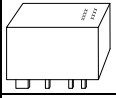
No.	Figure	Description	QTY	Usage
1		Net cable	1	Used for parallel connection
2		electromagnetic relay	1	Conversion relay for smart load wiring
3		Base of relay	1	Conversion relay for smart load wiring

Table 3-2 Optional Accessories

Important!

If parallel operation or smart load control is required, additional materials in table 3-2 need to be purchased.

3.3 Environment Selection

3.3.1 Installation Environment

It is recommended to install the inverter under a roof or CHINT sunshade, avoiding direct sunlight, rain, and snow accumulation, and desert environments. which can reduce power derating and extend service life.

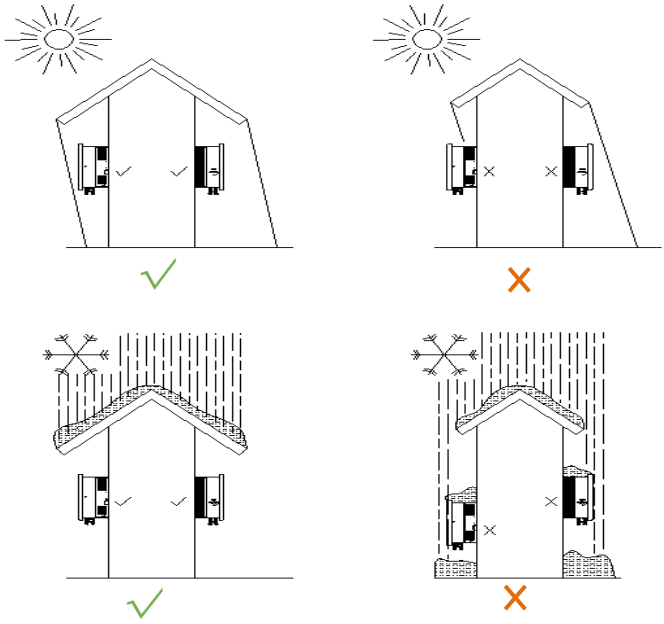


Figure 3-2 Installation Environment

3.3.2 Installation Mode Requirements

Before installing the inverter, confirm whether support structure can bear the weight of the inverter, and install the inverter as per the following recommended methods:

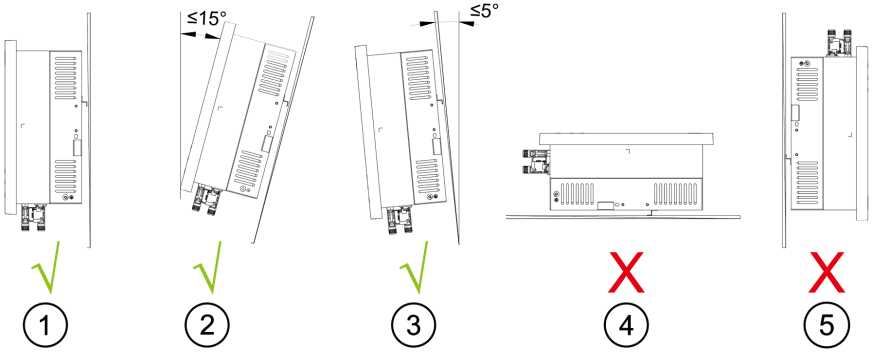


Figure 3-3 Installation Modes Requirement

No.	Method	Description
1	Upright	If the installation position allows, install the inverter vertically.
2	Lean Back	If vertical installation cannot be guaranteed, inverter can tilt backward from gravity direction an angle of ⩽ 15°.
3	Tilt forward	If vertical installation cannot be guaranteed, inverter can tilt forward from gravity direction an angle of ⩽ 5°.
4	No Horizontal	Inverters are not allowed to be installed horizontally.
5	No Upside down	Inverters are not allowed to be installed upside down.

Table 3-3 Description of Installation Method

3.3.3 Installation Space Requirement

To maintain good heat dissipation conditions for the inverter, the distance between the inverter and surrounding objects during installation and planning shall meet the following conditions:

NOTE:

In case an enclosed surrounding area, increase this distance appropriately.

If multiple inverters are used, between them, there shall be no objects that affect the heat dissipation of the inverter.

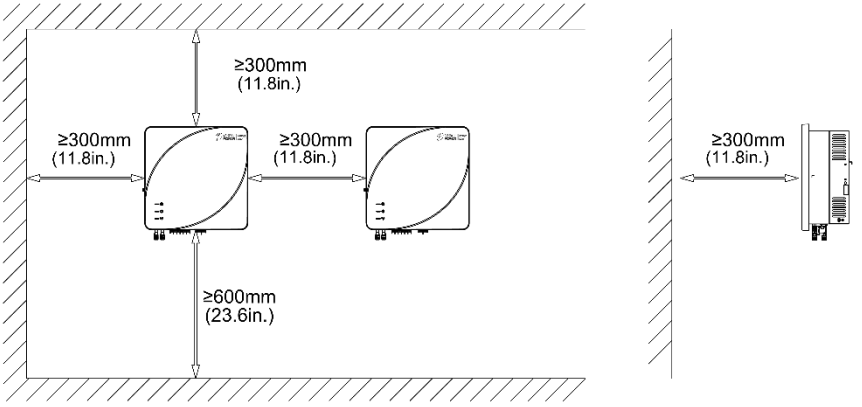


Figure 3-4 Installation Space Requirement

3.4 Installation Tools

The recommended tools for installation are listed below. If needed, other helpful tools can be used on-site.

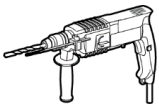
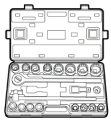
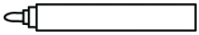
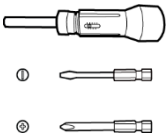
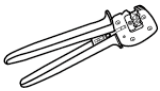
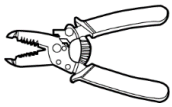
Type	Tools and Instruments		
Installation Tool	 Percussion drill (bit Φ10 mm)	 Torque socket wrench	 Multimeter
	 Marker pen	 Steel clicke	 Level gauge
	 Torque screwdriver	 Rubber hammer	 Diagonal pliers
	 Crimping pliers (model: PV- CZM-22100/19100)	 Wire stripper	 Hot air gun
	 Heat-shrinkable sleeve		
Personal Protective Equipment	 Safety gloves	 Protective glasses	 Safety shoes

Table 3-4 Installation tool and PPE

3.5 Inverter Installation

NOTICE:

Ensure that PV switch remains in the “OFF” position during installation.

1. Place the mounting bracket horizontally on the wall and mark the drilling hole positions with a marker, following the dimension limits. (Note: The arrow must face upward).

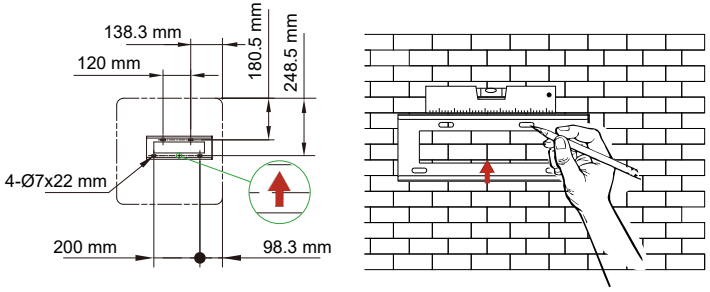


Figure 3-5 Marking of Drilling Position

2. Use a percussion drill with a 10 mm (0.39 in) diameter bit to drill holes to a depth of approximately 70 mm (2.75 in). Use rubber hammer to knock in the four expansion tubes.

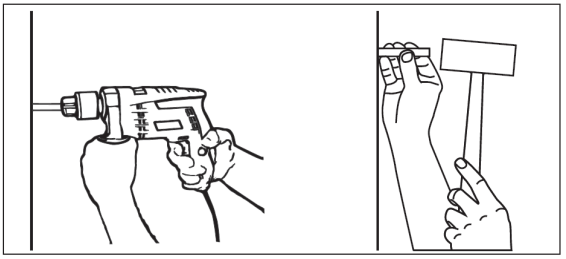


Figure 3-6 Drilling with Percussion Drill

3. Tighten expansion screws into the expansion tubes to secure the inverter back panel to the wall. Tool: PH2 screwdriver. Torque: 12.5 N.m.

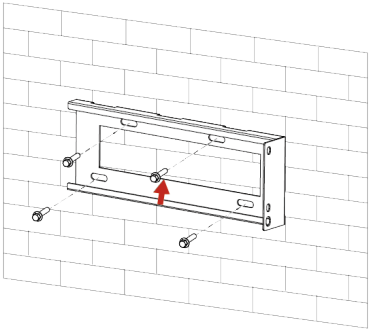


Figure 3-7 Fixing Back Panel on Wall

4. Mount the inverter onto the back panel.

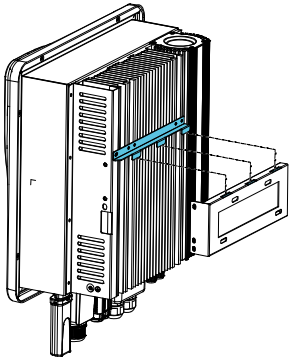


Figure 3-8 Mounting onto Back Panel

NOTICE:
Before installing the inverter, ensure that supporting structure can support its weight of 26 kg.

5. Tighten the two M5x12 screws to secure the mounting bracket and inverter. It is recommended to install an inverter anti-theft lock. Tool: PH2 screwdriver. Torque: 1.5-2.0 N.m.

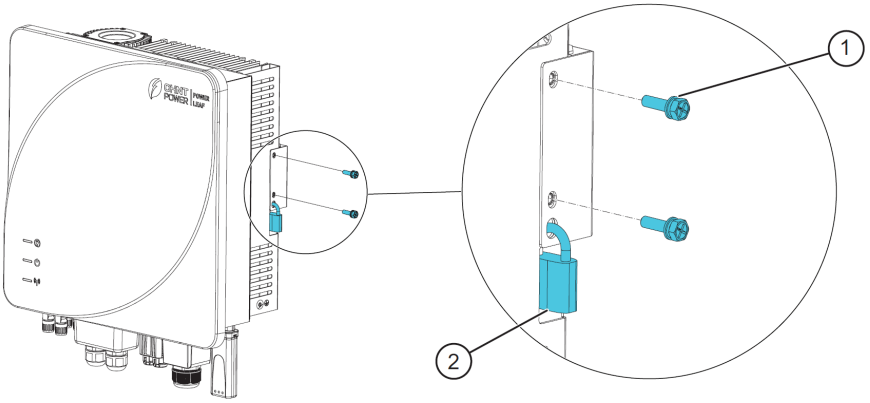


Figure 3-9 Fixing Back Panel and Invert

4. Electrical Connection

4.1 Safety Instructions

Danger:
Before electrical connection, ensure that the AC terminal, DC terminal and battery terminal of the inverter are de-energized. Otherwise, there is a risk of HV electric shock.

Warning:

- The technical parameters such as power grid level and frequency must meet the technical parameter requirements of the energy storage inverter.
- The energy storage inverter can be connected to the power grid only after being approved by the local power supply company and installed by professional technicians.
- All electrical connections must comply with local electrical installation standards.

Note:

- The installation design of energy storage inverters must comply with the relevant standards or specifications of the country/region where the project is located.
- Any energy storage inverter or system fault, resulting from failure to install it in accordance with the installation design requirements given in this manual, will not be covered by the warranty.

Throughout the entire process of electrical connection and all other operations carried out on energy storage inverters and other equipment, the following safety rules must be followed:

- Disconnect all external connections of the energy storage inverter and its internal power supply.
- Ensure that all disconnection points are not accidentally re-energized.
- Use a multimeter to ensure that the inverter port is completely de-energized.
- Implement necessary earthing connections.
- Cover parts that may be live near the operable part with fabric of insulating material.

4.2 Port and Cable Specifications

The following figure shows the inverter ports:

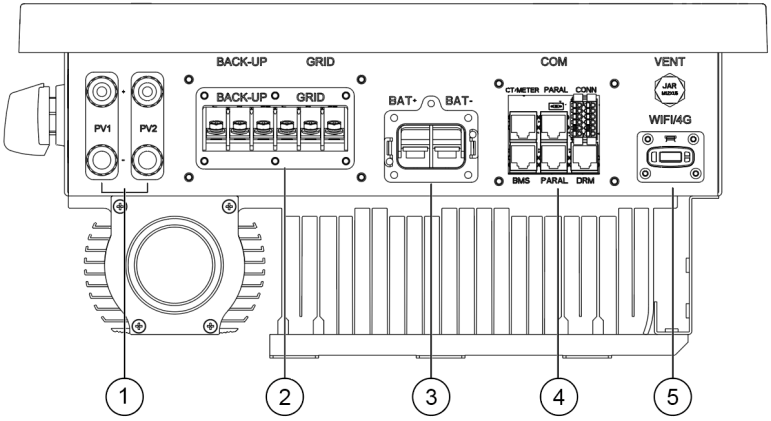


Figure 4-1 Inverter Ports

No.	Description
1	PV DC input ports PV1/PV2
2	AC port
3	Battery port
4	COM port
5	WIFI/4G Port

Table 4-1 Mapping Between S/N and Port Name

4.3 Inverter Cable Specifications

Name	Cable Type	(Material of wire: copper) Sectional Area of Conductor:	
		Range	Recommended Value
AC-end GRID and BACK-UP	Multi-core outdoor special cable	8.37-13.3 mm^2 8-6 AWG	13.3 mm^2 6 AWG
PV DC end	General PV cable in the industry (model PV1-F)	3.31-5.26 mm^2 12-10 AWG	3.31 mm^2 12 AWG
Secondary protective earthing	Outdoor special cable (Color requirements: yellow-green)	8.37-13.3 mm^2 8-6 AWG	13.3 mm^2 6 AWG
Battery DC end	Outdoor special cable	21.2-33.6 mm^2 4-2 AWG	21.2 mm^2 4 AWG

Table 4-2 Cable Specifications

4.4 Tools and Torques

S/N	Tools	Purpose	Torque Range
1	Phillips screwdriver	AC wiring terminal	1.5-2 N.m
		AC port protective cover	1.2-1.5 N.m
		Earthing terminal	1.5-2 N.m
		Communication port waterproof cover	1.2-1.5 N.m
		Battery terminal	5-6 N.m
		Battery protective cover	0.3-0.5 N.m
2	Diagonal pliers	Cut cables	-
3	Wire stripper	Strip cables	-
4	Crimping pliers	Crimp cables	-
5	Hot air gun	Seal heat shrink tube	

Table 4-3 Tools and Torques

4.5 Electrical Cable Connection

NOTE:

- According to the regulatory requirements in different regions, the wiring methods of N line and PE line at ON-GRID and BACK-UP ports of inverters are different. The specific requirements of local laws and regulations shall prevail.
- Circuit breakers shall be connected on the AC side and battery side (If the battery itself has a circuit breaker, there is no need for an external circuit breaker):
- Circuit breaker at battery side: rated current ≥ 150A, rated voltage ≥ 60V.
- Circuit breaker at AC side: rated current ≥63A, rated voltage ≥230V.
- Choose whether to install an RCD device according to local regulations. Specifications for reference:
  - RCD (On-Grid): 300 mA
  - RCD (Back-up):30 mA

4.5.1 System Wiring Diagram

The figure below shows the connection of BMS, CT, and meter cable.

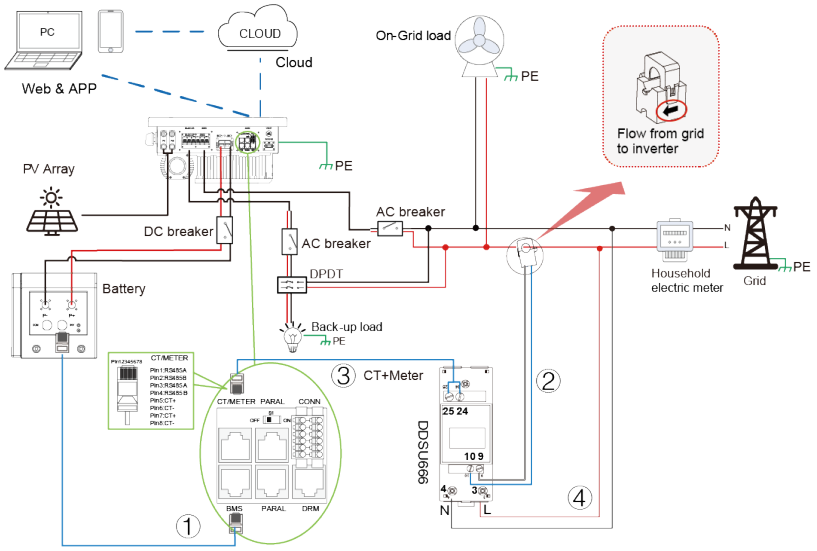


Figure 4-2 System Wiring Diagram

No.	Description
1	BMS cable: Connect RJ45 cable to inverter BMS interface and battery BMS communication interface.
2	CT cable: Connect white wire end to "I*" terminal and blue wire end to "I" terminal.
3	Meter cable: Connect RJ45 cable to inverter "CT/METER" interface and meter A & B terminals. (If the Meter RS485 cable needs to be extended, use PIN1 and PIN2)
4	Connect L and N interface of meter to grid.

Table 4-4 System Wiring Diagram Description

N line and PE line are connected together in the distribution box:

The wiring method for Australia, New Zealand, South Africa, and similar regions is shown in the following figure (If N and PE are not short circuited, the voltage between N and PE is required to be less than 10V).

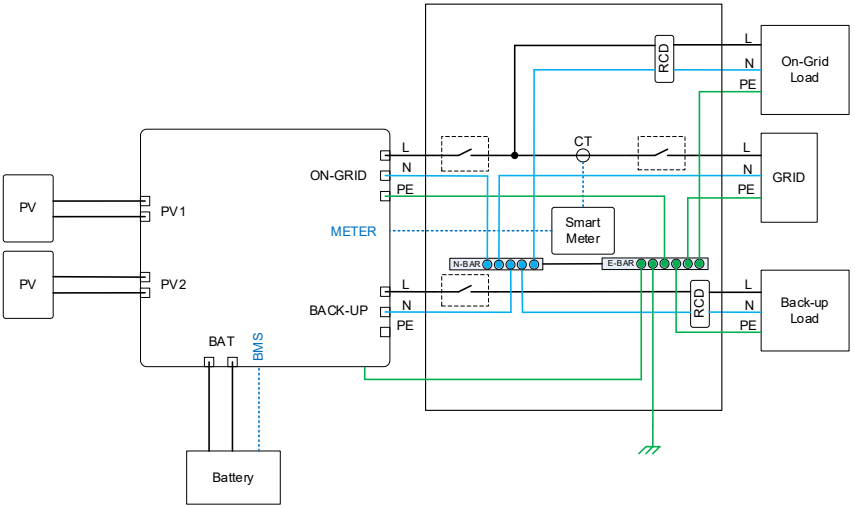


Figure 4-3 Wiring Method for Australia, New Zealand, and South Africa, etc.

N line and PE line need to be connected separately in the distributin box：

For regions outside of Australia, New Zealand, and South Africa, the wiring method is shown in the following figure:

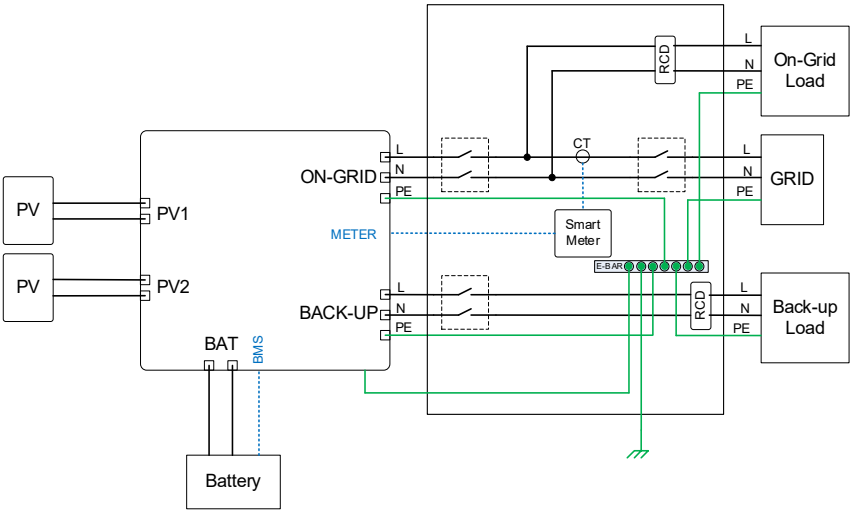


Figure 4-4 Wiring Method for Other Regions

4.5.2 Secondary Protective Grounding Cable Connection

WARNING:

- The protective earthing of the housing cannot replace the protective earth cable of the AC output port. When wiring, ensure that both protective earth cables can be reliably connected.
- When there are multiple inverters, ensure the protective earthing equipotential connection of all inverter housings.
- To improve the corrosion resistance of terminals, it is recommended to apply silicone or paint on the outside of the earthing terminal for protection after the installation of the protective earth wire connection.

Please follow the steps below for wiring:

1. Remove an appropriate length of insulation layer from the grounding cable

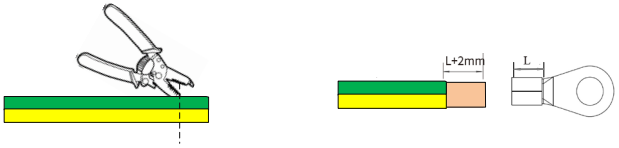


Figure 4-5 Stripping

2. Insert the exposed wire core into the crimp area of the OT terminal, use crimping pliers to crimp the OT terminal. After crimping, wrap the wire crimping area with heat shrink tube and use hot air gun to seal tubes.

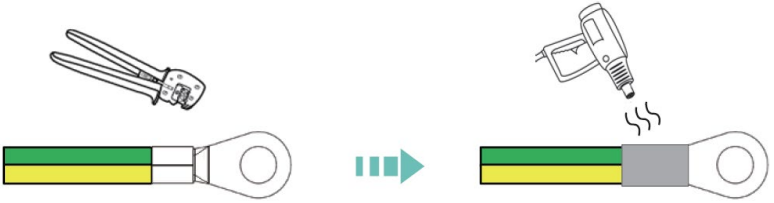


Figure 4-6 Crimp and Seal Grounding Cable

3. Tighten the M5x12 screw to fix the OT terminal of grounding cable. Torque: 1.5-2.0 N.m.

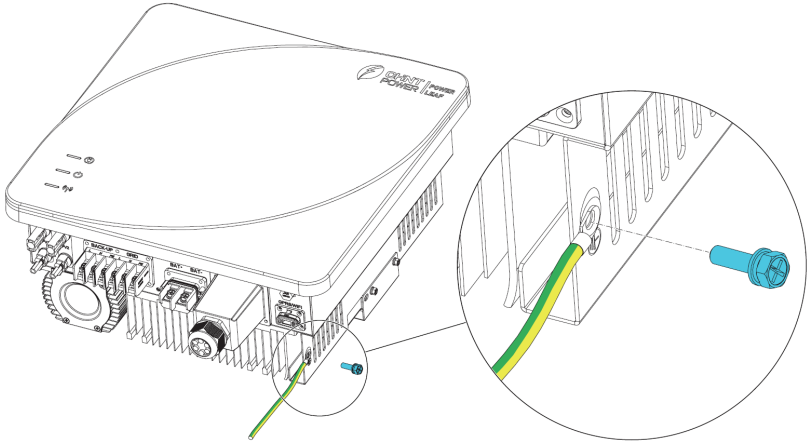


Figure 4-7 Tighten the Grounding Cable

4.5.3 GRID and BACK-UP (Load) Cable Connection

WARNING:

- After the inverter is powered on, the BACK-UP AC port is energized. If maintenance is required on the BACK-UP load,

power off the inverter. Otherwise, it may cause electric shock.

- Disconnect the switch on the grid side at first, and then carry out wiring after the inverter is powered off.
- Pay attention to distinguishing between load wiring ports and power grid wiring ports.

Please follow the steps below for GRID and BACK-UP(Load) cable wiring:

1. Screw off the nut (2) of the protective cover (1), put the GRID cable (3) through the nut.

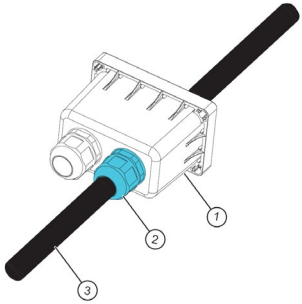


Figure 4-8 Screw off the nut of protective cover

2. Make the insulation layer of load and grid cables as follows.

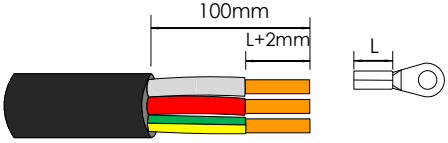
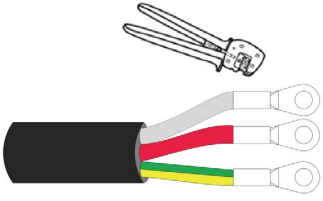


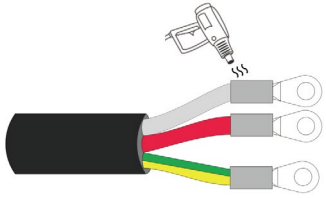
Figure 4-9 Treatment of Insulation Layer

3. Insert the exposed wire core into the crimp area of the OT terminal, use crimping pliers to crimp the OT terminal. After crimping, wrap the wire crimp area with heat shrink tube and use hot air gun to seal the tubes.



a

Figure 4-10 (a)Crimping



b

Figure 4-10(b) Sealing

4. Loosen the screws from the GRID AC port. Connect the GRID cables to the L, N, and PE studs, then re-tighten the screws securely.

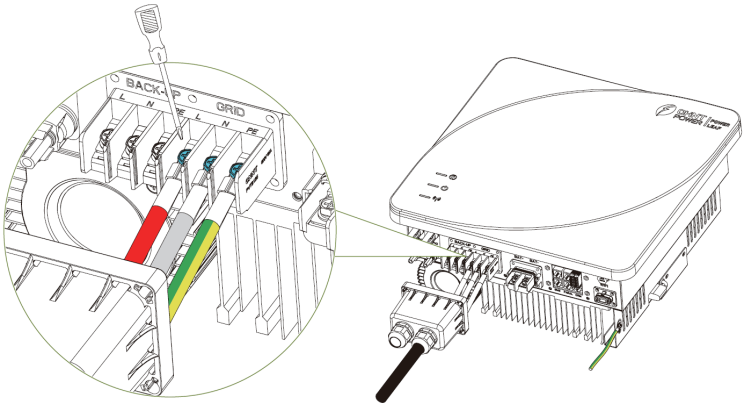


Figure 4-11 Connect GRID Cables

5. Connect the BACK-UP(Load) cable and insert the AC terminal spacers.

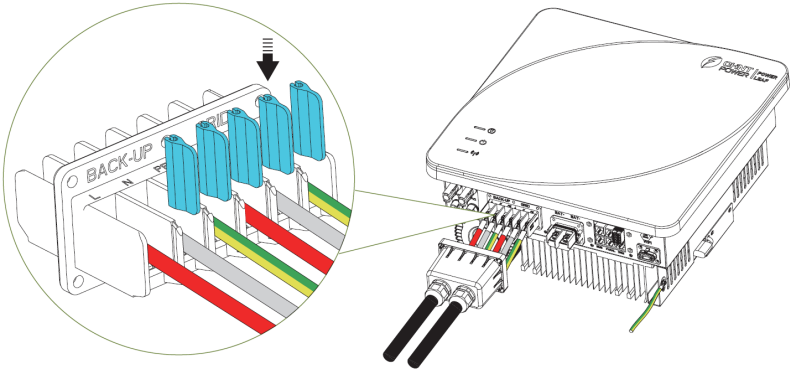


Figure 4-12 Connect BACK-UP(Load) Cable

6. After finishing connecting the GRID cables (1) and BACK-UP cables (2), tighten the screws (5) to install the protective cover and tighten the two nuts (4) on the protective cover (3).

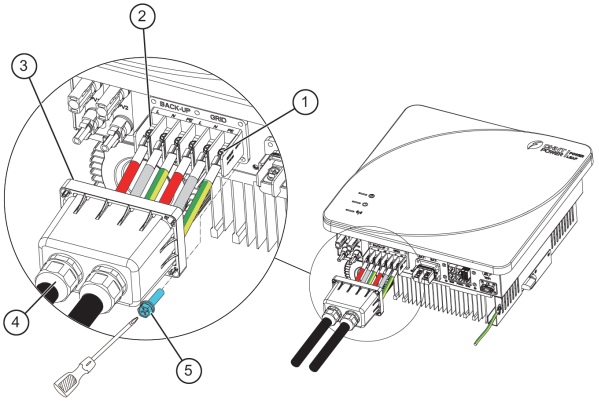


Figure 4-13 Tighten Protective Cover

4.5.4 Battery Cable Connection

DANGER:

- Batteries used together with the inverter shall be approved by the inverter manufacturer, and the approved battery list can be obtained from the official website.
- Do not connect the same battery pack to multiple inverters, as this may cause damage to the inverters.
- A DC switch is required between the inverter and the battery.

NOTICE:

- It is recommended that the battery cable length be shorter than 3 m.

Please follow the steps below for battery cable wiring:

1. Disassemble the battery protective cover into these parts: the nut (1), sleeve (2), clamping ring (3) and cover (4).

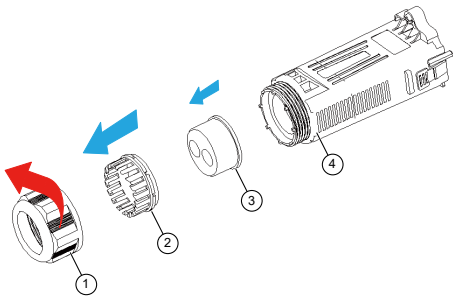


Figure 4-14 Disassemble the Battery Protective Cover

2. Thread the battery cables through the nut, threaded sleeve, clamping ring and protective cover body, then assemble the protective cover again.

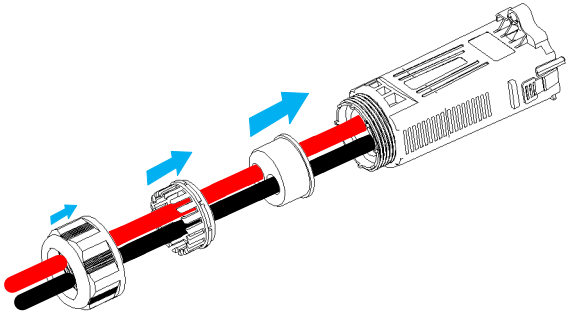


Figure 4-15 Thread Battery Cable and Assemble Protective Cover

3. Crimp the battery cable and battery terminal by referring to section 4.5.2 Secondary Protective Grounding Cable Connection.
4. Screw off the two screws (1) on the battery terminal (BAT+ and BAT-). Position the BAT OT terminals onto wiring holes and re-tighten the screws (1) with Phillips screwdriver.

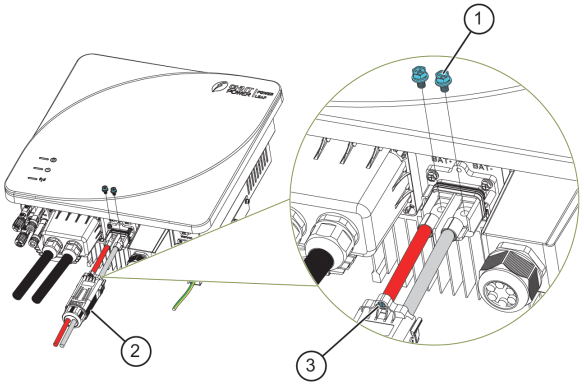


Figure 4-16 Tighten Battery Cables and Protective Cover

4.5.5 PV Cable Connection

DANGER!

- Do not connect the same PV string to multiple inverters, as this may cause damage to the inverters.
- Ensure that the positive pole of PV string is connected to PV+ and the negative pole to PV- of inverter.

Check the polarity before terminating the DC cables of PV strings according to the following steps, as shown in Figure 4-16:

i. Use a multi-meter to measure the PV strings' cable ends and check the polarity.

ii. The positive (+) terminal of cable should match the positive (+) terminal of inverter's DC input.

iii. The negative (-) terminal of cable should match the negative (-) terminal of inverter's DC input.

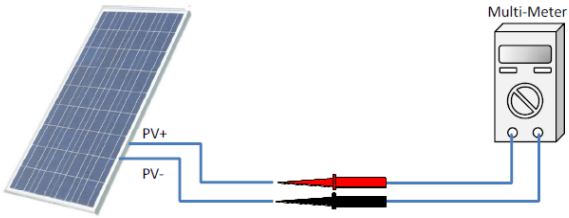


Figure 4-17 Checking the Polarity of PV Panel Cable

NOTICE!

It is important to use a multi-meter to check the polarity of the DC input cables to avoid any risk of reverse polarity.

Please follow the steps below for PV cable connection:

1. Use wire stripper to remove an appropriate length of insulation layer from the DC cables.

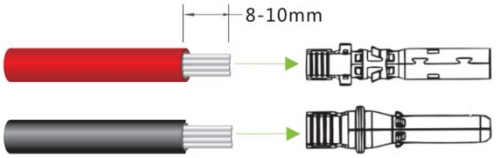


Figure 4-18 Strip Insulation Layer of DC cable

2. Insert the exposed areas of the positive and negative power cables into the metal terminals of the positive and negative connectors respectively and crimp them by crimping pliers.

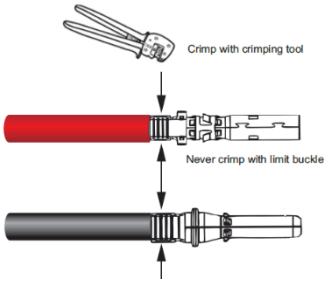


Figure 4-19 Terminal Crimping

3. Insert the crimped positive and negative power cables into the corresponding positive and negative connectors until a "click" sound is heard. Tighten the locking nuts of the positive and negative connectors.

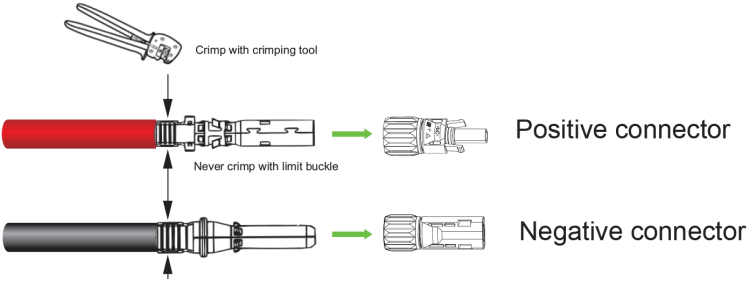


Figure 4-20 Inserting Cable Terminal into Connector

NOTICE！

The DC input connectors must be those delivered with the device or have the same model from the same manufacturer. Otherwise, poor contact may occur and affect normal use.

4. Measure the voltage of every route string using a multimeter. Ensure that the polarities of the DC input power cables are correct.

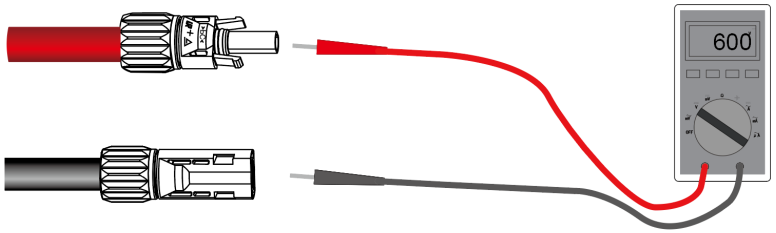


Figure 4-21 Measure the Voltage of String

5. Insert the positive and negative connectors into their corresponding terminals of the inverter until a "click" sound is heard. Note: Use MC4 tool to remove connectors if necessary.

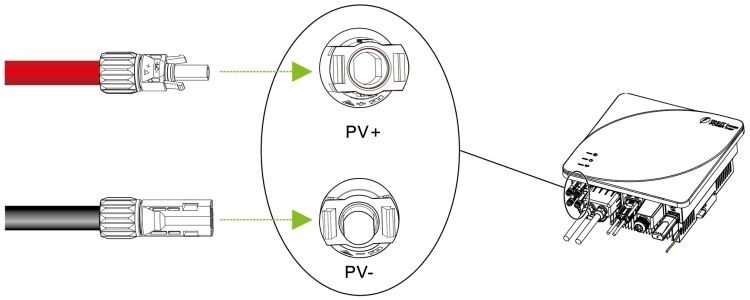


Figure 4-22 Inserting PV Cable into Inverter Port

NOTICE!

Before connecting to the device, it must be confirmed that:

1. The earth cable shall be connected properly.
2. The DC switch shall be in OFF state.

4.6 Communication Cable Connection

4.6.1 Introduction of Signal Pin

The figure below is the diagram of product external communication port:

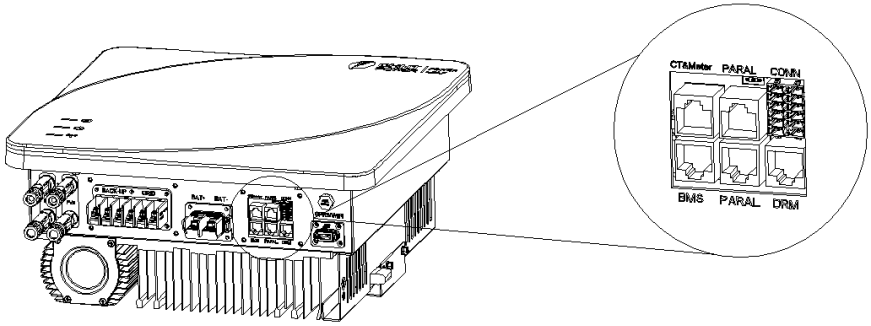
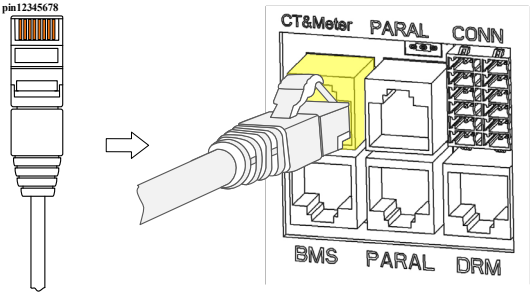


Figure 4-23 External Communication Port

The table below is the signal pin description of external communication port:

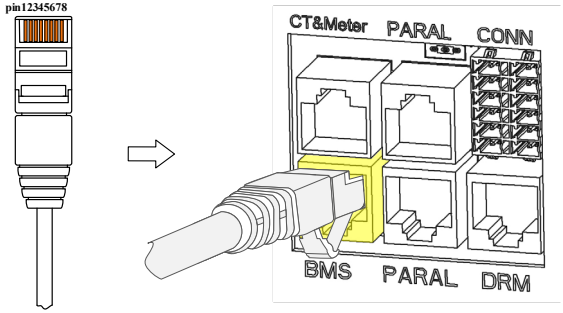
External CT and Smart Meter Communication Port (CT&METER)



RJ45 connector supporting connection standard

Pin	Signal	Description
1	RS485A	485A communication of smart meter
2	RS485B	485B communication of smart meter
3	RS485A	485A communication of smart meter
4	RS485B	485B communication of smart meter
5	CT+	Positive terminal of external CT
6	CT-	Negative terminal of external CT
7	CT+	Positive terminal of external CT
8	CT-	Negative terminal of external CT

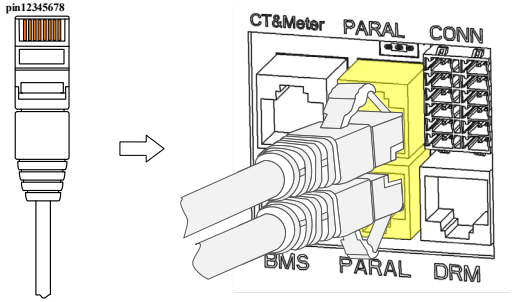
Battery Communication Port (BMS)



RJ45 connector supporting connection standard

Pin	Signal	Description
1	RS485B	BMS 485B communication
2	RS485A	BMS 485A communication
3	\	\
4	CAN_H	BMS CAN communication
5	CAN_L	BMS CAN communication
6	GND	GND
7	RS485A	BMS 485 communication
8	RS485B	BMS 485 communication

Parallel Function Port (PARAL)

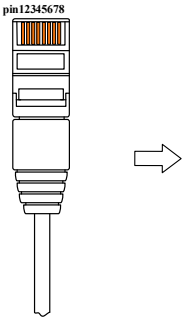


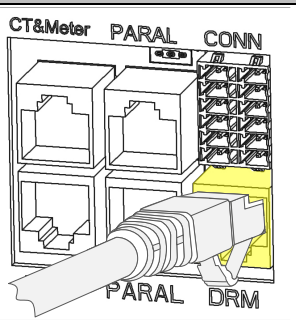
RJ45 connector supporting connection standard

Pin	Signal	Description
1	PARALLEL_CANH	Parallel communication
2	PARALLEL_CANL	Parallel communication
3	\	\
4	PARALLEL_CANH	Parallel communication

5	PARALLEL_CANL	Parallel communication
6	\	\
7	\	\
8	\	\

Australian Grid Dispatching Port (DRM)

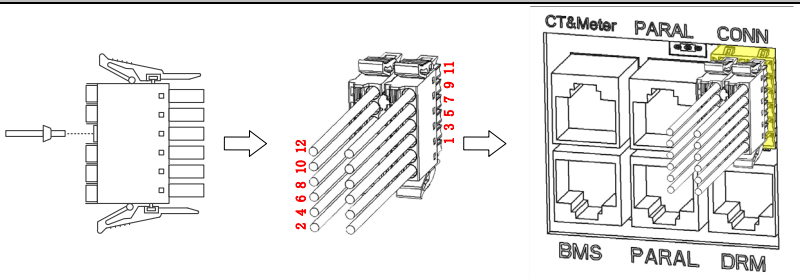




RJ45 connector supporting connection standard

Pin	Signal	Description
1	DRM1/5	DREM dispatching signal
2	DRM2/6	DREM dispatching signal
3	DRM3/7	DREM dispatching signal
4	DRM4/8	DREM dispatching signal
5	REF/GEN	DREM dispatching signal
6	COM/DRM0	DRM dispatching signal
7	GND	Reference ground
8	GND	Reference ground

Other Ports (CONN)



Pin	Signal	Description
1	BAT_Temp+	Lead-acid battery temperature signal

2	BAT_Temp-	Lead-acid battery temperature signal
3	12V	12V Power
4	GND	12V Power grounding
5	NO	Normally open point of dry node
6	COMM	Common point of dry node
7	NC	Normally closed point of dry node
8	DI+	External signal input
9	DI-	External signal input
10	RSD_POWER	Quick power-off terminal
11	RSD+	Quick power-off positive terminal
12	RSD-	Quick power-off negative terminal

Table 4-4 External Communication Port

4.6.2 External Communication Port Wiring

Please follow the steps below for wiring:

1. Unscrew the screws of the protective cover, and remove the waterproof cover.

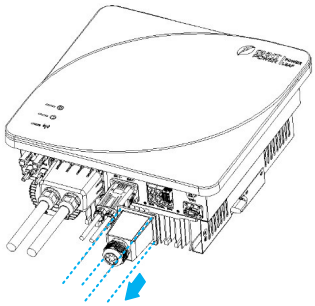


Figure 4-24 Remove the protective cover

2. Disassemble the protective cover: nut (1), clamping ring (2) and waterproof cover (3). And remove the stopper rod from clamping ring.

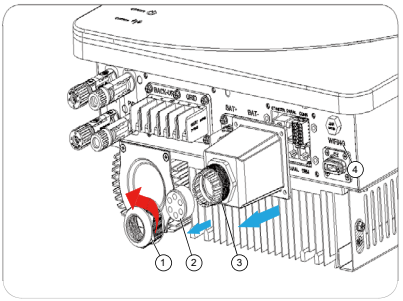


Fig 4-25 Disassemble the protective cover

3. Thread the communication cables through the nut, clamping ring (press the communications cables in the seal via the side incisions) and cover body, then assemble the clamping ring into the waterproof cover.

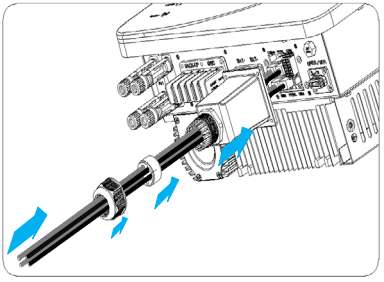


Figure 4-26 Diagram of communication cable connection

4. Tighten the screws and fix the protective cover, then tighten the nut.

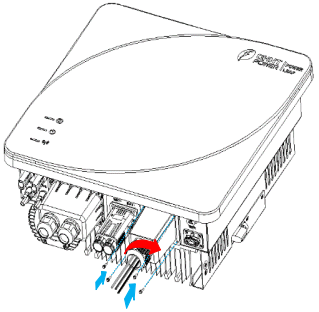


Figure 4-27 Install the protective cover

4.7 Communication Module Installation

Insert the communication module in the accessories into the WIFI/4G port of the

inverter until you hear a "click" sound.
Note: The indicators of COM rod shall face outward.

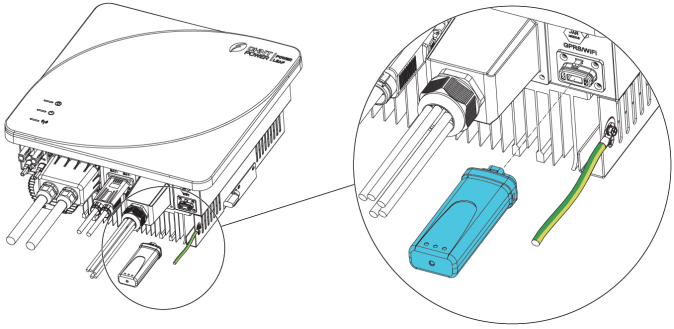


Figure 4-28 Communication Rod installation

4.8 Parallel Connection Function

AC output sides can be connected in parallel to extend power, meeting users' on-grid and off-grid switching requirement.

DANGER!

All inverters in parallel PCS system must be considered as a unified system. This means that the parameters for each inverter must be set identically. The inverter can only be powered on when the parallel enable function is activated. Failure to do so may result in damage to the inverter.

NOTICE!

- Each inverter must be configured with a single battery system, sharing batteries will cause system working abnormally.
- Support up to 5 inverters in parallel and AC cable length of each inverter shall be the same.
- Before powering on, please read section 5 and section 6 carefully.
- Any single inverter in parallel system detects abnormal grid status, all inverters will report grid faults. i.e.: grid faults will be synchronized; other faulty inverters will issue warning or trigger protection individually.
- If assistance is needed, please contact the after-sales service personnel.

Set the parallel function by following the steps below:

1. Follow the diagram provided for parallel connection. Before wiring, ensure that all the devices and ports are electrically neutral.

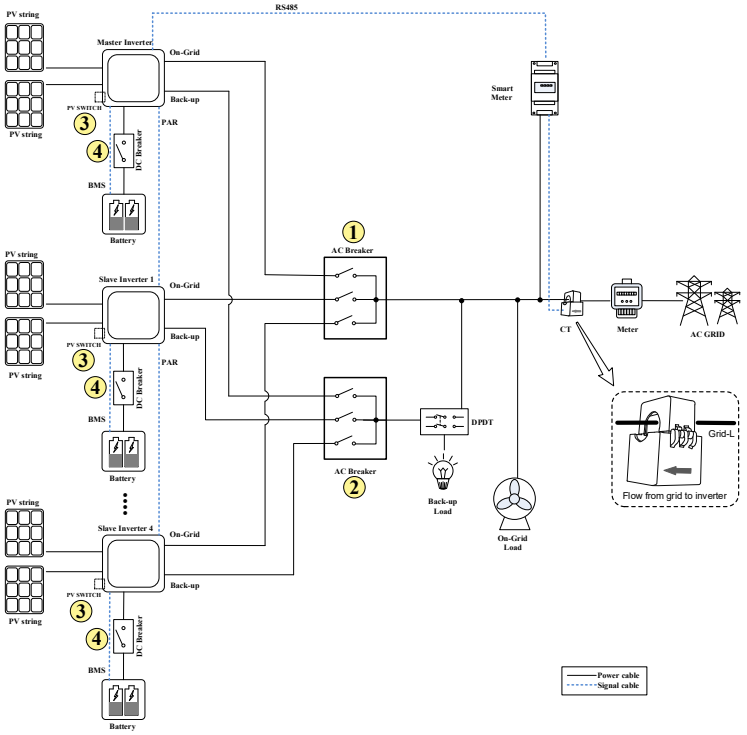


Figure 4-29 Parallel connection

2. Parallel communication: Use standard RJ45 net cable to connect the PARAL port of every inverter, turn the DIP switch (S1) of the first and the last inverter to “ON” position, and turn DIP switch of other inverters to “OFF” position as below.

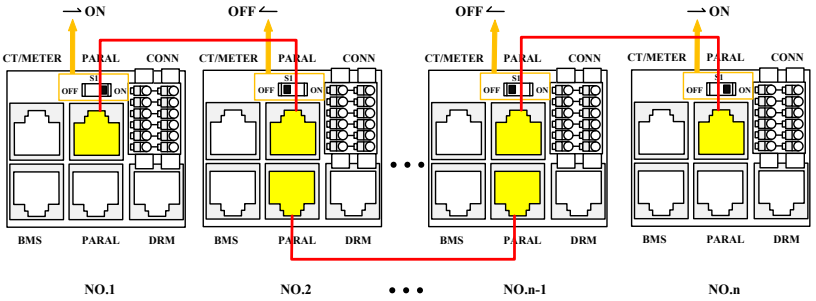


Figure 4-30 Parallel Net Cable Connection

3. Power on the parallel system as the following steps in Figure 4-28.
   ① Close grid side AC circuit breaker of each inverter.
   ② Close load side AC circuit breaker of each inverter.
   ③ Close PV side PV switch of each inverter.
   ④ Close energy storage side DC breaker of each inverter.
4. Ensure that the regulatory settings of each inverter are consistent. Configure the regulatory settings through MatriCloud App, please refer to 6.4.19 System Configuration Parameters for guidance:
   - MatriCloud App: Settings ->System configuration Para -> Selection of regulationsd, select the corresponding regulation according to local electrical standards.
5. Parallel ID setting: When working in parallel, set a unique ID for each inverter. It is important to designate only one "master" within the entire parallel system, while all others should be configured as "slaves". Furthermore, each "slave" inverter must have a distinct ID; duplicate IDs among the "slave" inverters are not permissible. Please refer to 6.4.15 Other Parameters for guidance.
   - MatriCloud App: Settings -> Others Para -> Parallel ID -> set the inverter to be “master” or “slave”
6. Enable the parallel function. By default, the parallel function is disabled. To enable parallel operation, ensure that each inverter's parallel function is activated. Please refer to 6.4.15 Other Parameters for guidance.
   - MatriCloud App: Settings -> Others Para > Parallel Setting->enabled

7. Please check the system wiring and software settings again.
8. Power on. After finishing all the settings, you only need to power on one inverter and the other inverters can power on automatically.

   (Note: Powering off is the same as powering on, you only need to power off one of the inverters, and the other inverters will execute synchronously.)

   - MatriCloud: Settings -> Ctrl Commands -> Power-on/off command -> power on.（You can also click the on/off button in the top right corner of the home page to power on and power off the device.）

4.9 Smart Load

User can choose whether to enable the smart load control function and then perform correct wiring operations according to the schematic diagram.

NOTICE:

- NO dry contact current is not more than 3A.
- AC contactor drive current is not more than 5A.
- An intermediate relay needs to be installed between the inverter and household equipment, and it is prohibited to directly connect the load to the NO port.
- It's recommended to select intermediate relays RS-NXI-2Z/C1, NXJ/2Z(D).
- It is recommended to install intermediate relays and AC contactors in the corresponding rails of the distribution cabinet.
- Before powering on, please carefully read the relevant content in section 5 and section 6.

Please refer to the following steps to set up the smart load function:

1. The intermediate relay and AC contactor can be regarded as a switch: the inverter controls the opening or closing of the intermediate relay, thereby controlling the openingor closing of the AC contactor, and then controlling the connection or disconnection of the load.

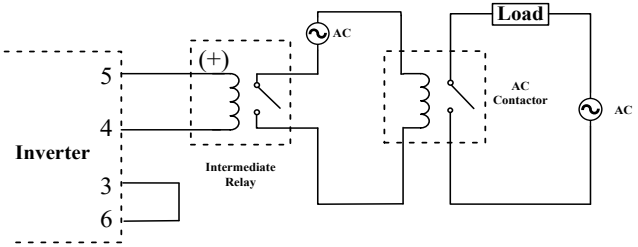


Figure 4-31 Schematic diagram of smart load

2. When wiring, please ensure that all devices and ports are not live.

3. (a) Short circuit PIN 3 and PIN 6 of CONN terminal, then connect its PIN 5 to positive terminal of intermediate relay power input, and connect its PIN 4 to negative terminal of the intermediate relay power input at last.
   (b) Connect the normal open output end of the intermediate relay to live wire of power grid, and the other end to the input end of the AC contactor; connect neutral line of the power grid to another input terminal of the AC contactor.
   (c) Connect the normal open output end of the AC contactor to the live wire of the power grid, and the other end to the L terminal of the load; connect the neutral line of the power grid to the N terminal of the load.

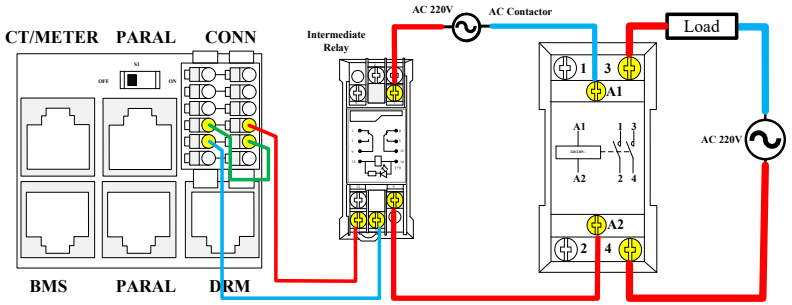


Figure 4-32 Schematic diagram of smart load wiring

4. The smart load function is disabled by default. After powering on the inverter, enable it through the settings interface of MatriCloud App.
   - Smart load control mode select: Settings -> LoadCtrlPara -> LoadCtrlSel -> Select control mode according to actual application requirements and set corresponding parameters according to the selected control mode.

4.10 DRM Connection

The COM port of inverter provides an 8-pin RJ45 interface to meet power grid dispatching demands. DRM and Ripple Control can only meet one kind of dispatching requirement simultaneously.

4.10.1 DRM

IMPORTANT:

According to Australian AS4777.2-2015 standard requirements, this series of inverters supports Demand Response Modes (DRM).

The DRM interface inside COM port responds to the corresponding demand mode by detecting short-circuited switch. The wiring diagram between the DRM interface and DRED is shown in the following figure:

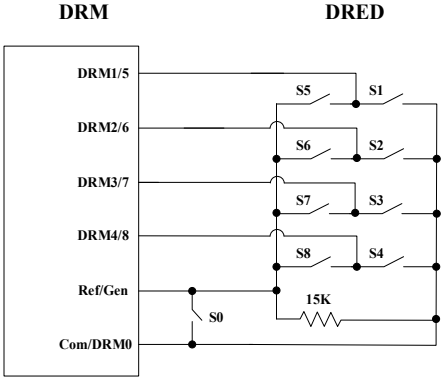


Figure 4-33 DRED Wiring

DRM mode is as the following table.

Mode	Asserted by Shorting Terminals on Inverter	Switch Operation on External DRED
DRM 0	Ref/Gen & Com/DRM0	Close S0
DRM 1	DRM1/5 & Com/DRM0	Close S1
DRM 2	DRM2/6 & Com/DRM0	Close S2
DRM 3	DRM3/7 & Com/DRM0	Close S3
DRM 4	DRM4/8 & Com/DRM0	Close S4
DRM 5	DRM1/5 & Ref/Gen	Close S5
DRM 6	DRM2/6 & Ref/Gen	Close S6
DRM 7	DRM3/7 & Ref/Gen	Close S7
DRM 8	DRM4/8 & Ref/Gen	Close S8

Table 4-5 Method of asserting DRMs

4.10.2 Ripple Control

IMPORTANT!
According to VDE-AR-N4105:2018-11 code, management equipment of European grids, represented by Germany, uses Radio Ripple Control Receiver (RRCR) to convert power grid dispatching signals and send them as dry contact signals.

The wiring diagram of the inverter DRM signal and RRCR signal is shown in the following figure:

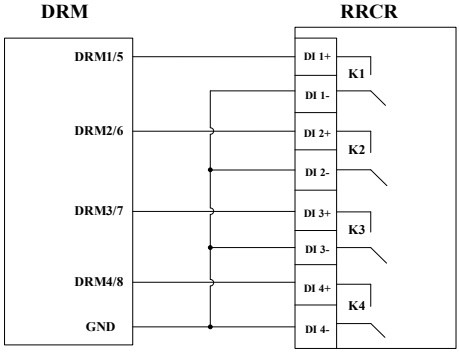


Figure 4-34 DRM signal and RRCR signal wiring

The following table shows the allocation of inverter power levels:

Asserted by Shorting Terminals on Inverter	Switch Operation on RRCR	Active power Cos(φ)	Cos(φ)
DRM1/5 & GND	Close K1	0%	1
DRM2/6 & GND	Close K2	30%	1
DRM3/7 & GND	Close K3	60%	1
DRM4/8 & GND	Close K4	100%	1

Table 4-6 RRCR power distribution

4.11 External Rapid Shutdown Device (RSD)

NOTICE!

- Connect external switch between RSD POWER and RSD+, which shall be normally closed when inverter works normally.
- Connect RSD box between RSD+ and RSD-.
- Before powering on, please read section 5 and section 6 carefully.

The inverter supports external RSD. Please refer to the following steps to enable RSD function:

1. When wiring, please ensure that all devices and ports are not live.
2. Connect PIN 10 and PIN 11 of CONN terminal to both ends of the external switch, connect PIN 12 to GND terminal of the RSD box power input. Connect one end (connected to PIN 11) of the external switch to +12V terminal of the RSD box power input.

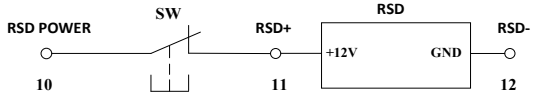


Figure 4-35 RSD schematic diagram

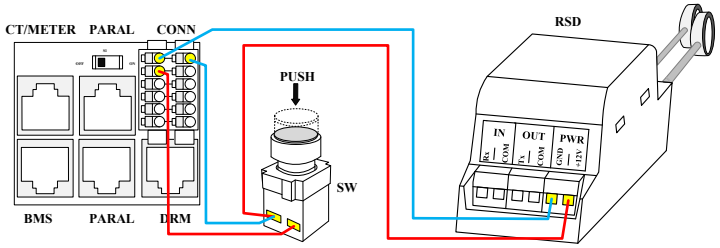


Figure 4-36 RSD wiring schematic diagram

3. The external quick shutdown function is disabled by default. After powering on the inverter, enable it through the settings interface of MatriCloud.
   - RSD enable: Settings -> Safety Protection Parameters -> RSD function setting -> RSDEnable.

4.12 AFCI Protection Function

The AFCI (Arc-Fault Circuit-Interrupter) protection function meets the IEC 63027 standard. The type of ARC protect device is F-I-AFPE-1-1-2. The explanation of the device type is as the following table.

Letter	Meaning
F	Full coverage
I	Integrated
AFPE	Provide the function of detecting and interrupting
1	One string input port connect to one PV string
1	Each detection channel has one string input port
2	2 detection channels

Table 4-7 Meanings of F-I-AFPE-1-1-2

ARC detection:

This function is used to manually detect if there is fault in the ARC board.

Before inverter runs normally, it will begin to detect faults if ARC detection function is enabled.

- If there is any fault, ARC detection will show “failure”, and record “AFCI Self-test Fault” in “Fault history”.
- If there is no fault, the ARC detection will display “success”.

Note: The inverter will automatically run ARC detection before normal running every day. Generally, it is unnecessary to use ARC detection when the inverter is running normally.

ARC elimination:

This function is applied to manually eliminate the “AFCI Fault” fault.

When the fault occurs, there are two methods to reconnect the inverter: Automatic re-connection and manual re-connection.

- Inverter has the function of 4 times automatic re-connection in 24 hours: when the ARC fault occurs, inverter record “AFCI Fault” in “Fault history”, and the inverter will reconnect after 5 minutes;
- When the fault occurs the fourth time, it is necessary to manually eliminate the ARC fault. After the fault elimination, the inverter continues to maintain the default 4 times automatic re-connection function in 24 hours.

5. Inverter Commissioning

5.1 Pre-commissioning Checks and Preparation

5.1.1 Inverter Installation Checks

The inverter shall be firmly installed in a position convenient for operation and maintenance, with the installation space convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.

5.1.2 Cable Connection Checks

- Confirm that the protective earth cable, DC cable, AC cable and communication cable are connected correctly and firmly.
- Confirm that the cable binding meets the wiring requirements, is reasonably distributed and free of damage.
- Ensure that unused through holes are provided with waterproof covers.
- Ensure that the used through hole is sealed.

5.1.3 Electrical Connection Check

- Confirm that the voltage and frequency of the inverter on-grid connection point meet the grid connection requirements.
- Confirm whether the battery pack is connected normally.
- Test whether the voltage on AC side is normal.
- Test whether the open-circuit voltage at PV side is $\leqslant$ 550V.

5.2 Closing of the Electrical Circuit Breaker of Each Module

1. Close the inverter ON-GRID AC circuit breaker.
2. Close inverter BACK-UP AC circuit breaker.
3. Close the inverter PV switch.
4. Close the energy storage circuit breaker between inverter and battery.

5.3 Operating Mode

Inverters can automatically switch between various modes—such as Self-Consumption, Full Feed-In, Emergency Charging, Forced Off-Grid, PV Mode, and TOU Mode—based on the time period and system requirements. These configurations are configured through the MatriCloud App and Matric Cloud Web,

allowing for optimized operation tailored to specific needs and conditions.

5.3.1 Self-Consumption Mode

Self-consumption mode is applicable to areas with high electricity tariffs and little or no subsidies for solar power on-grid tariffs. PV supplies loads first, surplus charges battery, then feeds grid. When PV is insufficient, batteries is preferred to provide power, if battery capacity runs low, grid backs up. No battery discharge to the grid.

Day time	• When the electricity generated in the PV system is sufficient, the electricity generated in the PV system prioritizes to supply power to the household load, the excess electricity is used for charging batteries, and the remaining electricity is sold to the power grid. • When the electricity generated in the PV system is insufficient, battery power is prioritized for the load use. If the battery power is insufficient, the power grid will provide power to the load.
Night time	• If the battery is fully charged, it supplies power to the load. • If the battery is not fully charged, the power grid and battery will jointly supply power to the load. • If the battery power is unavailable, the grid will supply power to the load.

Note:

- Lithium battery: If the SOC capacity is lower than backup SOC setting value, it will switch to the grid charging. Once the SOC power reaches the set value, it will stop charging SOC from the grid.
- Lead acid battery: If battery voltage is low or battery has under-voltage alarm, and the battery voltage is lower than the backup voltage, it will switch to charging from grid until the battery voltage recovers and the charging stops.

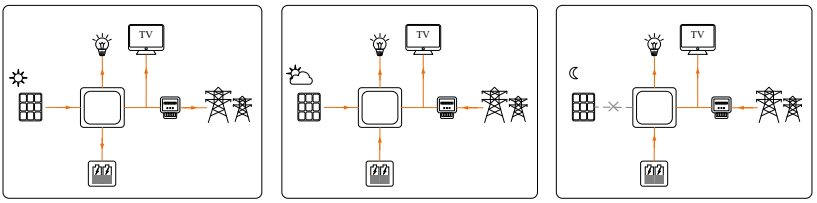


Figure 5-1 Schematic Diagram of Self-Consumption

5.3.2 Full Feed-In Mode

It is recommended to use the full feed-in mode in scenarios where there is a significant difference between peak and off-peak electricity tariffs. This mode is particularly suitable when the electricity tariff is high during the daytime.

The power supply scenario in the full feed-in mode is as follows:

- When the tariff is at its peak and the PV system generates sufficient electricity, the PV system supplies power to household loads first. Any Excess power is sold to the grid, while the remaining power charges the battery.
- When the PV system generates insufficient electricity, the PV system and battery jointly supply power to the load, any excess energy can still be sold to the grid.

The following is the charging behaviors of different type of batteries in the full feed-in mode:

- Lithium battery: If the SOC capacity is lower than backup SOC setting value, it will switch to the grid charging. Once the SOC power reaches the set value, it will stop charging SOC from the grid.
- Lead acid battery: If battery voltage is low or battery has under-voltage alarm, and the battery voltage is lower than the backup voltage, it will switch to charging from grid until the battery voltage recovers and the charging stops.

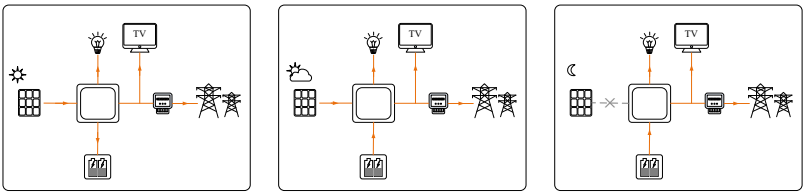


Figure 5-2 Schematic Diagram of Full feed-in

5.3.3 Emergency Charging Mode

This mode is for emergency charging in bad weather. Charge battery fully as quickly as possible and then left to stand (Keep from discharging) until it enters off-grid operation, or switches to another mode

The power supply scenario in the emergency charging mode is as follows:

- When the PV system generates sufficient electricity, the electricity generated will first charge the battery, any excess electricity is used to supply loads, the remaining electricity is sold to the power grid.
- When the PV system generates insufficient electricity, the PV system and the grid jointly charge the battery.
- When no electricity is generated by the PV system:
  - If the power grid is operating normally, it can supply power to the loads.
  - If the power grid is abnormal, the inverter will enter off-grid mode, and the battery will supply power to the loads.

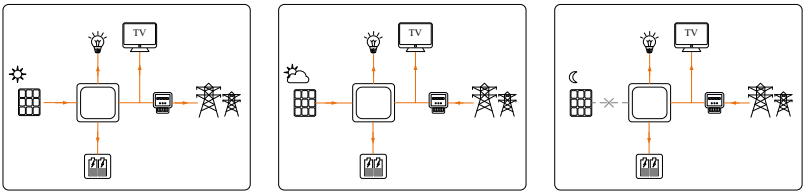


Figure 5-3 Schematic Diagram of Emergency charging

5.3.4 Forced Off-Grid Mode

The forced off-grid mode is mainly applicable to scenarios where the power grid is unstable, grid disconnection is frequent, there are important loads, and no interruption is allowed.

This mode cannot be affected by grid stability and can make load run stably.

The conditions for switching from on-grid operation to forced off-grid mode are as follows:

- For lithium batteries: State of Charge (SOC) greater than 40%.
- For lead acid batteries: Battery voltage higher than the recovery voltage of the battery under-voltage alarm.

The conditions for switching from forced off-grid mode to on-grid operation are as follows:

- For lithium batteries: SOC less than 20%.
- For lead acid batteries: Battery voltage is low or battery under-voltage alarm

triggered, and battery voltage is lower than the backup voltage.

When the battery voltage is low or battery is under-voltage, it is permitted to start the inverter to charge from grid. When the PV power is enough, the battery under-voltage alarm will disappear and when SOC>40%, inverter will be in forced off-grid mode again.

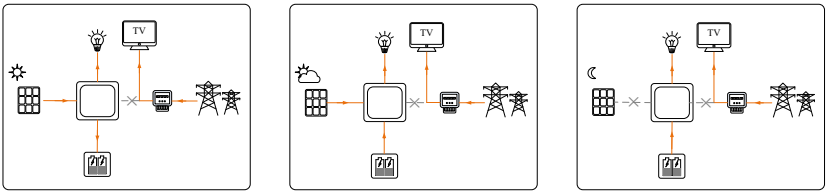


Figure 5-4 Schematic Diagram of Forced Off-Grid

5.3.5 PV Mode

The PV site will be directly connected to the grid in full amount, energy storage cannot be used under only PV operation mode.

When the PV generates sufficient electricity, it will supply power to grid and load at the same time. When the PV does not generate electricity, the grid will supply power to load. When the battery is in low electric level, the inverter will charge the battery.

For lithium batteries: If the SOC electric level is lower than the predefined SOC backup electric, it will switch to charging from grid. The grid will charge the battery until the SOC reaches a shutdown level and the battery stops charging.

For lead-acid batteries: If battery voltage is low or battery has under-voltage alarm, and the battery voltage is lower than the backup voltage, it will switch to charging from grid until the battery voltage recovers and the charging stops.

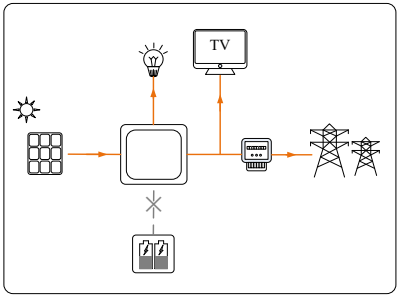


Figure 5-5 Schematic Diagram of PV Mode

5.3.6 TOU Mode

In TOU (Time of Use) mode, users can create typical daily scenarios and assign specific base modes—such as self-consumption mode, full feed-in mode, emergency charging mode, and PV mode—to different time slots. These scenarios can be categorized by week and adjusted according to seasonal operation rules. Additionally, unique strategies can be set for holidays throughout the year.

6. App Local Control

IMPORTANT:
Complete the test and inspection before operation to confirm that there is no error.
When updating inverter through the app, the inverter will stop generating power for 3-5 minutes.

6.1 App Download

The application “MatriCloud” enabling users to control the device conveniently. User can download the " MatriCloud " app from the app store (available in the Apple Store for iOS devices or the Google Store for Android devices) or directly download it by scanning the provided QR code. The App is compatible with Android 4.4 and iOS 11.0 or higher.

6.2 App Connection and Configuration

Users can perform the following procedures to set the APP easily. First, open the Bluetooth function on your phone.

1. Open the MatriCloud App. Click setting icon in the top right corner. Select right server and language.

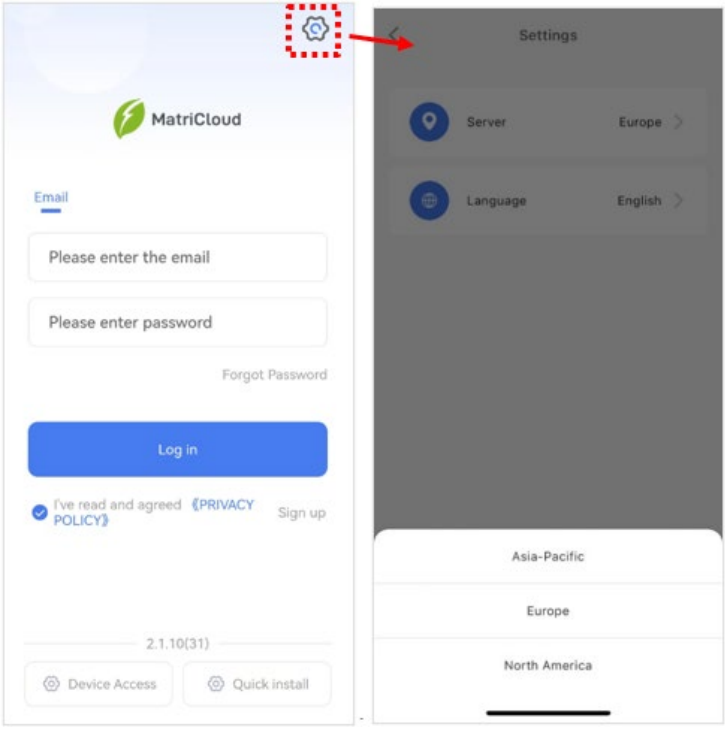


Figure 6-1 Configure the server and language

2. After setting, click the “Quick installation wizard”. Click the "Bluetooth Connect" to open the device name list. The device name "**XXXXXXXX**" is the last 8 digits of SN on the WIFI module label.

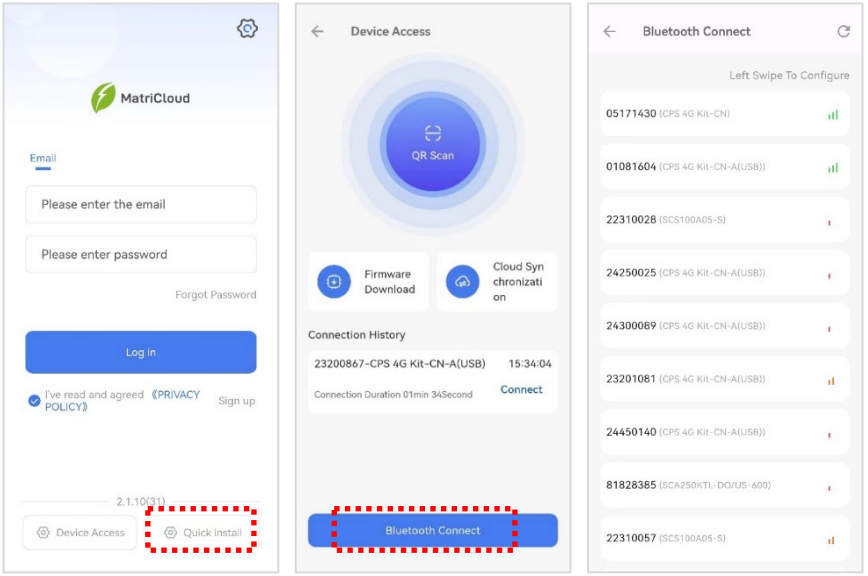


Figure 6-2 Connect to inverter

3. When APP is successfully connected to inverter, the following guide page will be showed in APP. Check if the cables are connected correctly and click “Next Step”.

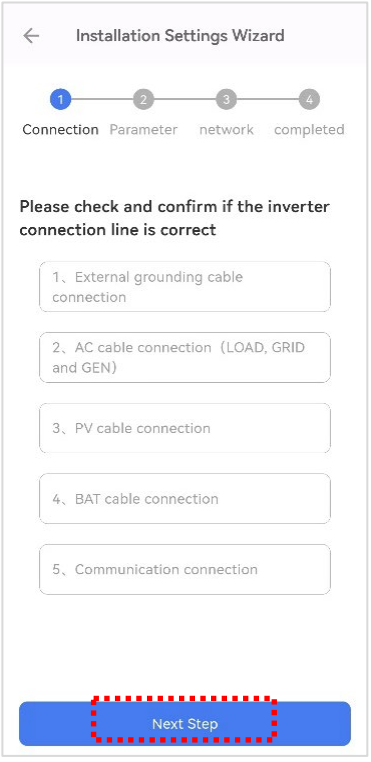


Figure 6-3 Connection Check

4. Parameter configuration page: in this page, you need to set grid information configuration, parallel connection mode, equipment access and operation mode configuration.

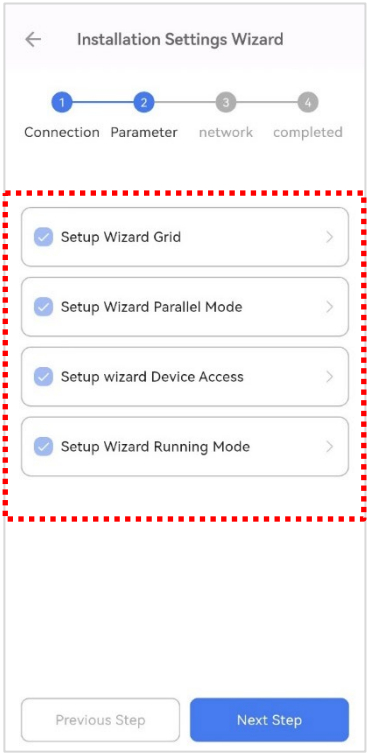


Figure 6-4 Parameter Configuration

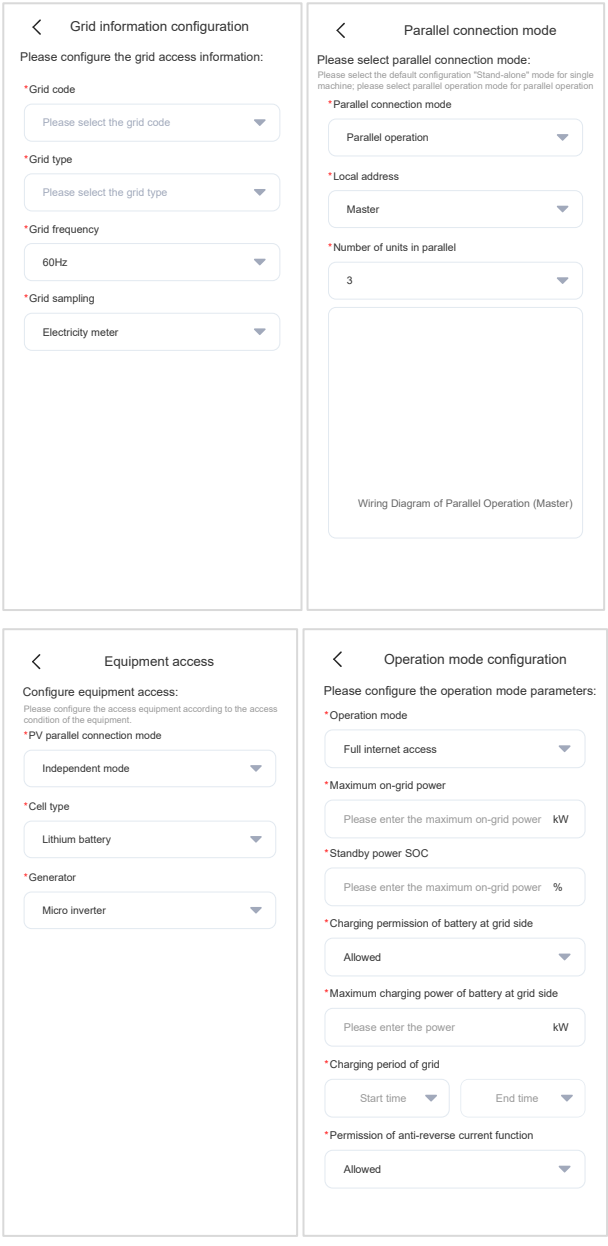
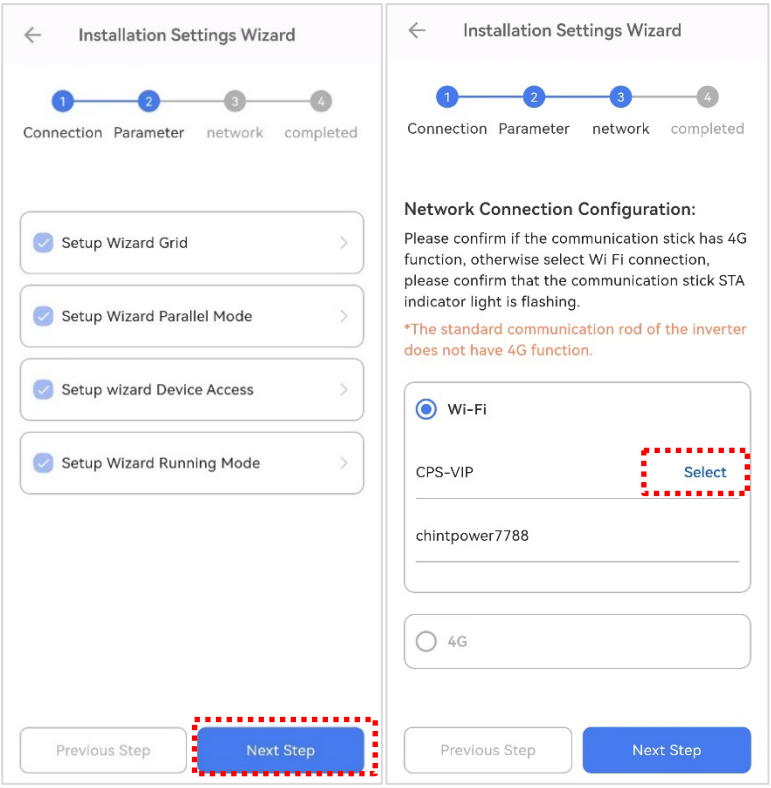


Figure 6-5 Detail parameter configuration

5. After finishing parameter configuration, click “Next Step” to enter network configuration interface.



6. Click “Select” to select the target Wi-Fi and enter the password. Click “Confirm” to finish network configuration.

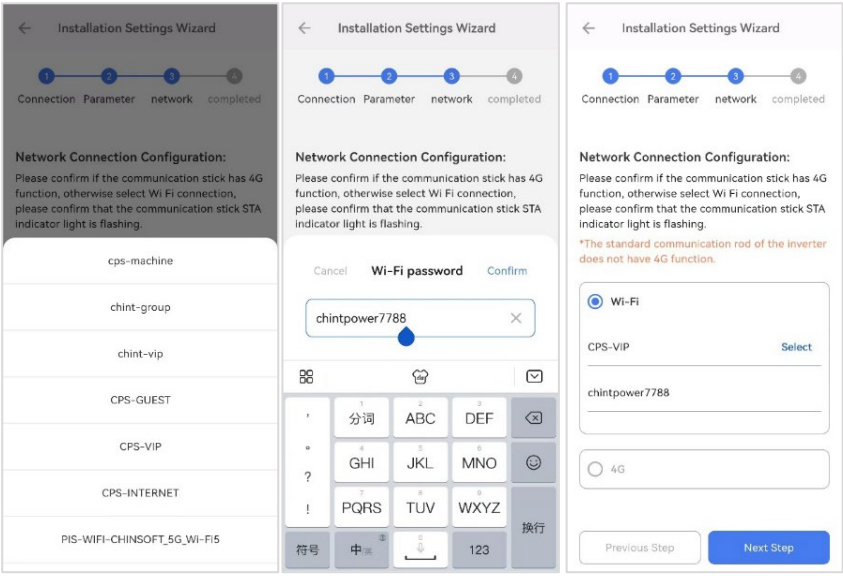


Figure 6-7 Connect Wi-Fi

- If you see “**Initialization setting completed**”, click “**Finish and power on**”. The configuration is completed and the inverter will restart automatically.
- If there is equipment failure, it will be displayed as figure below. Troubleshooting until the failures are disappeared (Click icon ↻ to check if there is any equipment failure). When you see “**Initialization setting completed**”, click “**Not processing yet**”.

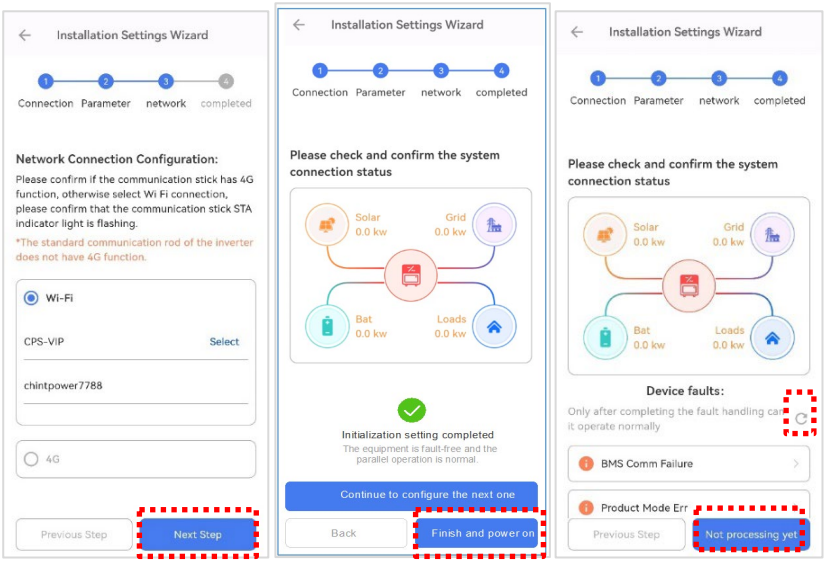


Figure 6-8 Complete Configuration

8. Repeat step 1 and step 2 to connect to inverter again and enter APP the main interface.**Main Interface**

After successful connection, the main interface will be displayed as below:

1. **Terminal Parameter Setting:** Click the icon on the upper-right corner to access the terminal parameter setting interface.
   Within this interface, users can set the communication mode (4G or WIFI).
   If WiFi is selected, the user needs to set or modify the **"wifi ssid"** and **"wifi pwd"** to establish an internet connection for the inverter.

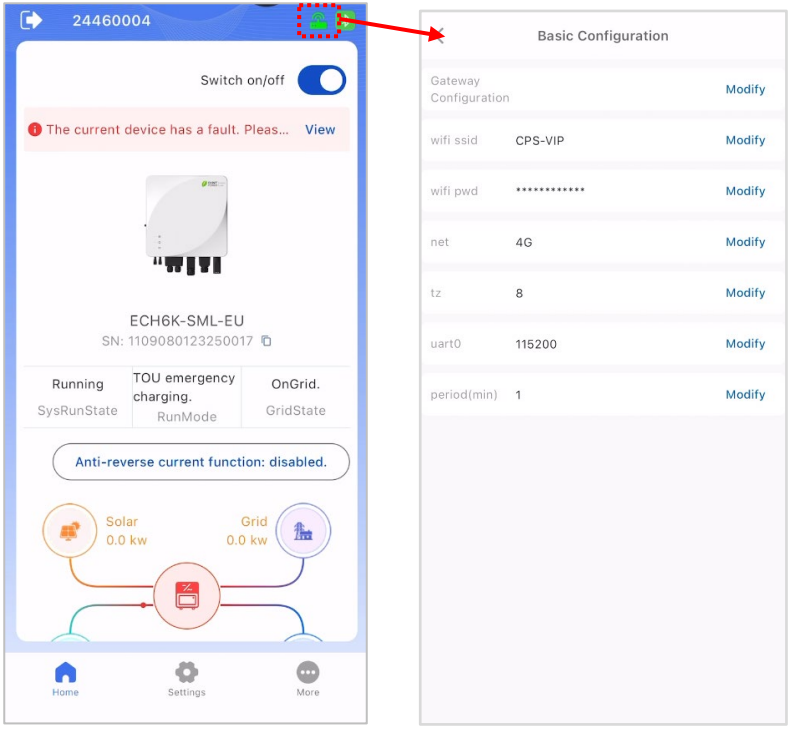


Figure 6-9 Terminal Parameter Setting

2. The “Switch on/off” button controls the inverter to power on or power off. The green indicate that the inverter is on.

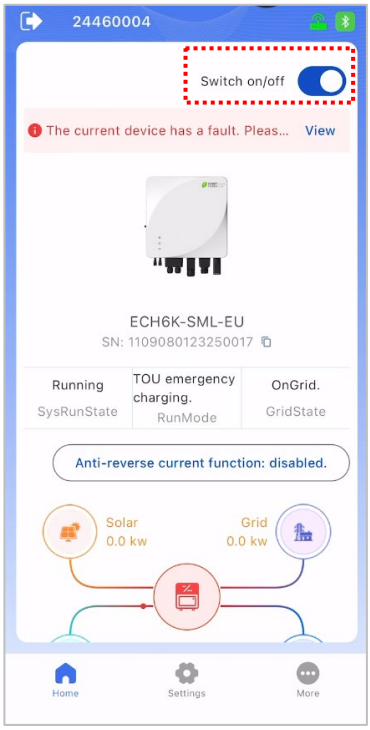


Figure 6-10 Inverter Main Interface

3. If the inverter is in Failure mode, click “View”, the fault records will be displayed.

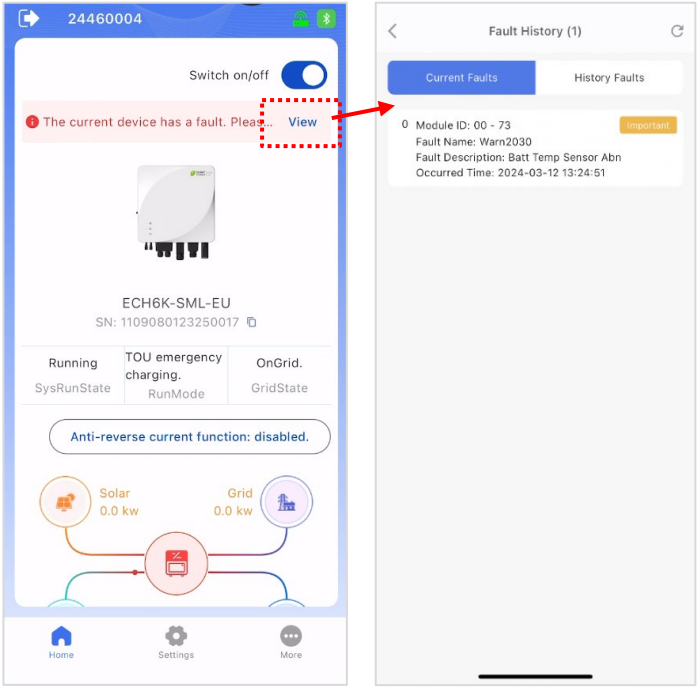


Figure 6-11 View Fault Record

4. The “system status” shows the four running statuses of the inverter:
   - Standby：Previous state of running mode, the machine will perform a series of self-checks. Once the running conditions are met, it will enter running mode from standby mode.
   - SysRunning: The machine is working normally, converting the direct current composed of photovoltaics into alternating current.
   - Fault: The machine stops working and fault codes will be displayed on the app.
   - SysChecking: Before power on, the inverter will perform a series of self-check programs. If it is finished, it will switch to running mode. If there is any failure, it will switch to Failure mode and provide a fault code.

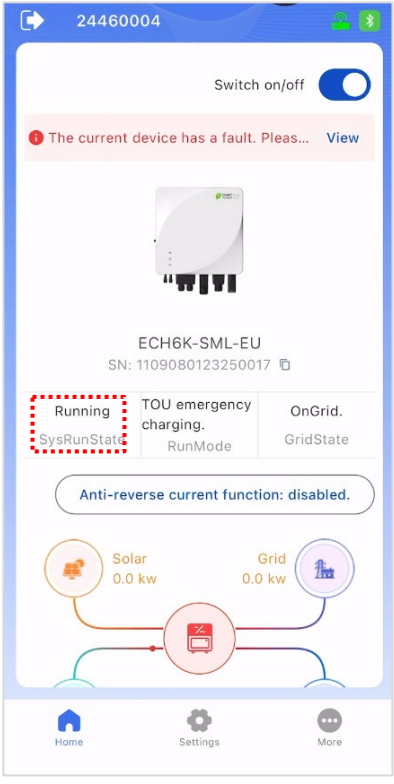


Figure 6-12 System Status

5. In the main interface of MatriCloud, the figure below display the Generation capacity along with eight subcategories: Detail, Power Grid, PV, Inversion, Battery information, Temperature, Rated parameter, and Version, Other.
   - **Detail:** Display the information of “Energy Storage charge” and “Energy Storage discharge”.
   - **Power grid:** Display the two-phase voltage, current, and power of the power grid.
   - **PV:** Display the voltage, current, and power of three MPPT channels;
   - **Inversion:** Display a total of 17 parameters, including current and voltage frequency, active power, reactive power, total power, power factor, and apparent power, for the A and B phases of the inverter.
   - **Battery information:** Display 13 parameters of the battery, including voltage, current, temperature, SOC, SOH, etc**.**
   - **Temperature:** Display the temperatures of the five main modules of the inverter.
   - **Rated parameter:** Display the three main rated parameters of the inverter.
   - **Version:** Display the software version numbers of the current 6 modules for customers to check if the software used is the latest version.
   - **Other:** Only display the status of generator.

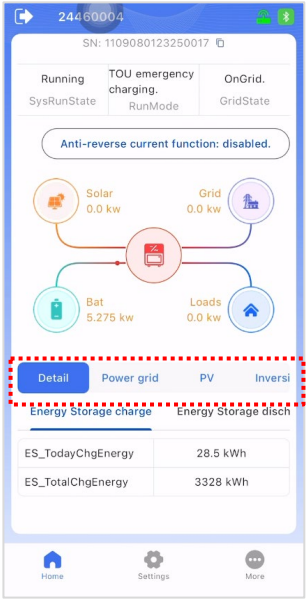


Figure 6-13 Inverter Generation Data

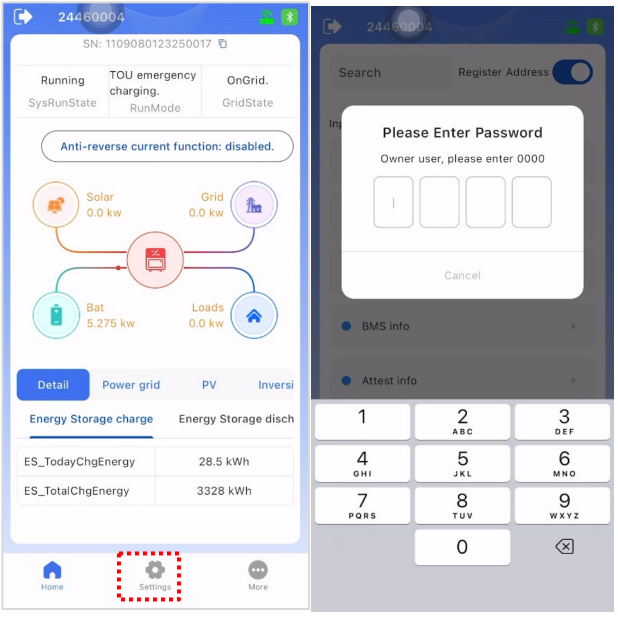
6.4 Setting Interface

Click the **Setting** icon, enter the password “1111”, you will be directed to the setting interface.

Then it’s possible to access the following sub-menus on the setting interface.

Passwords are categorized into three levels:

- Level 1 password (any 4-digit number) - Customer
- Level 2 password (1111) - Installation personnel
- Level 3 Password (not provided in this manual)- Engineer



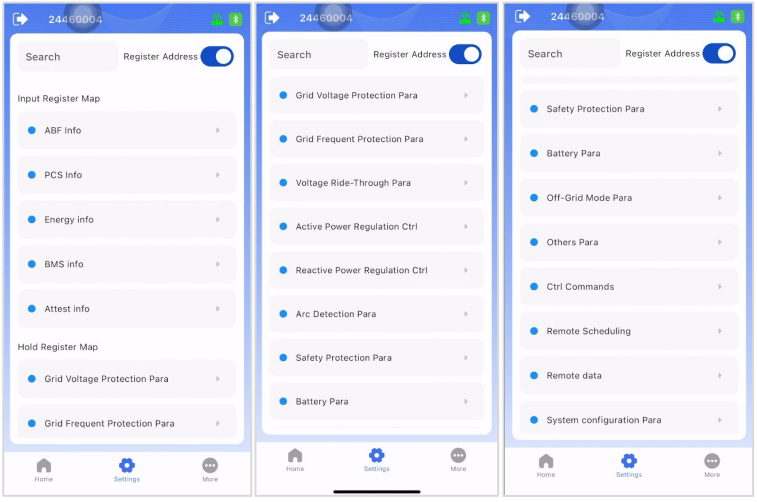
Within the “Settings” interface, there are parts - “Input Register Map” and “Hold Register Map”.

Input Register Map (only “READ”)

- ABF Info
- PCS Info
- Energy Info
- BMS Info
- Attest Info

Input Register Map

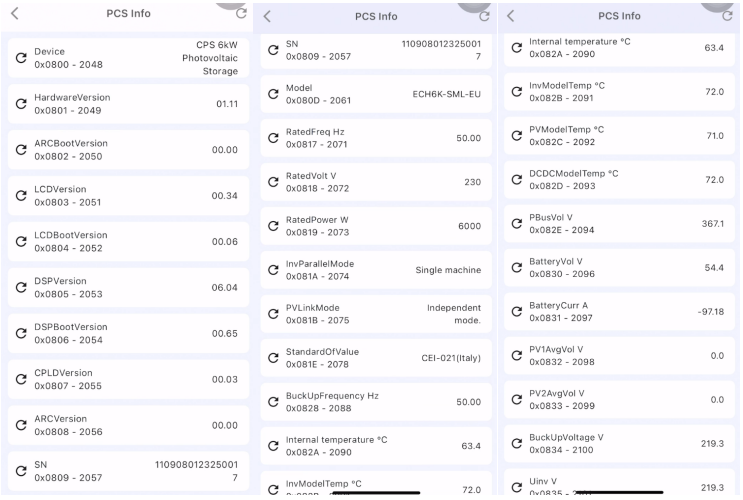
- Grid Voltage Protection Parameters
- Grid Frequency Protection Parameters
- Voltage Ride-Through Parameters
- Active Power Regulation Control
- Reactive Power Regulation Control
- ARC Detection Parameters
- Safety Protection Parameters
- Battery Parameters
- Off-Grid Mode Parameters
- Other Parameters
- Control Commands
- Remote Scheduling (No authorization)
- Remote Data
- System Configuration Parameters

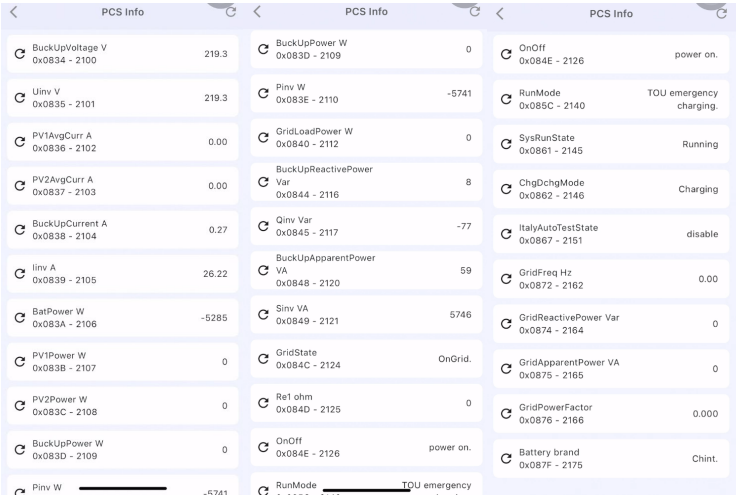


6.4.1 ABF Info

6.4.2 PCS Info

Within PCS Info interface, you can see more detailed PCS information.





6.4.3 Energy Info

Within Energy Info interface, you can see more detailed Energy information.

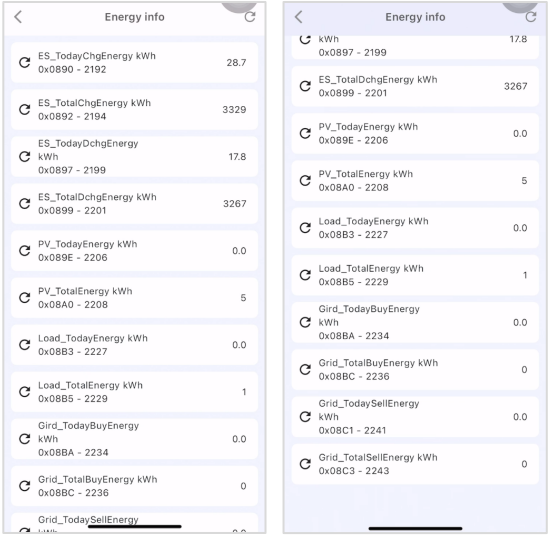


Figure 6-18 Energy Info

6.4.4 BMS Info

Within BMS Info interface, you can see more detailed BMS information.

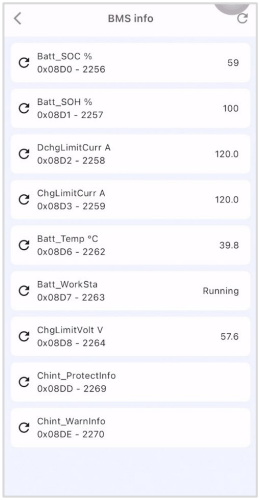


Figure 6-19 BMS Info

6.4.5 Attest Info

In Level 2 password, registers are hidden due to conditions or no permissions.

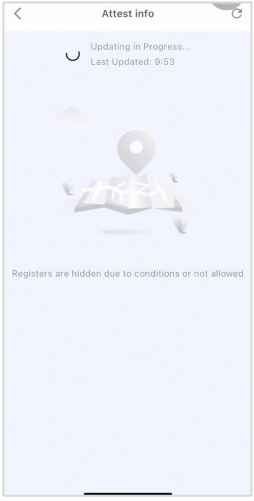


Figure 6-20 Attest Info

6.4.6 Grid Voltage Protection Parameters

You can perform self-test steps through the Grid Voltage Protection Parameters

interface.

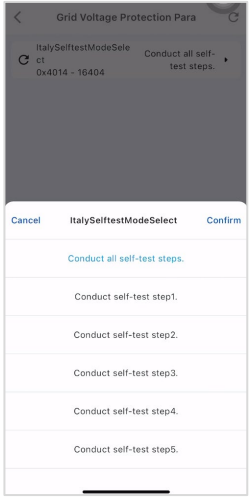


Figure 6-21 Grid Voltage Protection Parameters

6.4.7 Grid Frequent Protection Parameters

In Level 2 password, registers are hidden due to conditions or no permissions.

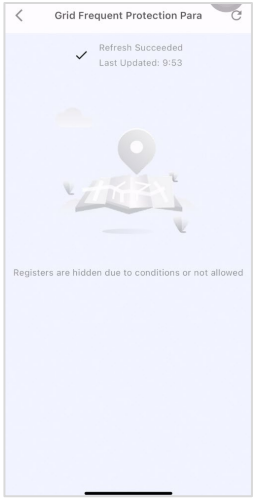


Figure 6-22 Grid Frequent Protection Parameters

6.4.8 Voltage Ride-Through Parameters

In Level 2 password, voltage ride-through parameters are hidden due to conditions or no permissions.

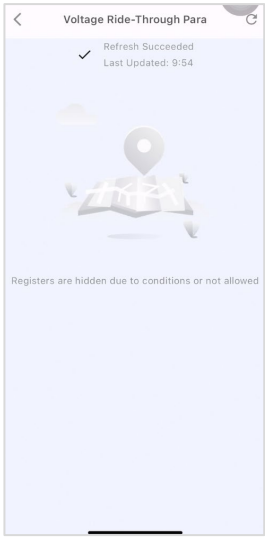


Figure 6-23 Voltage Ride-Through Parameters

6.4.9 Active Power Regulation Control

In Level 2 password, active power regulation control function is hidden due to conditions or no permissions.

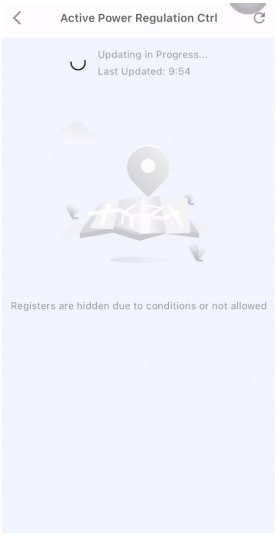


Figure 6-24 Active Power Regulation Control

6.4.10 Reactive Power Regulation Control

In Level 2 password, reactive power regulation control function is hidden due to conditions or no permissions.

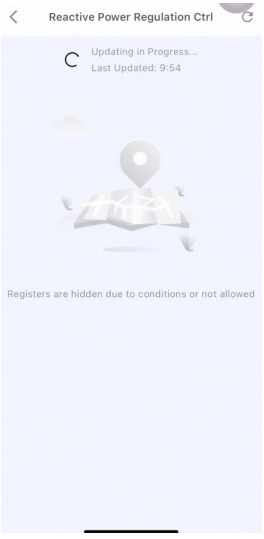


Figure 6-25 Reactive Power Regulation Control

6.4.11 Arc Detection Parameter

Enable or disable arc detection function.

Figure 6-26 Arc Detection Parameter

6.4.12 Safety Protection Parameters

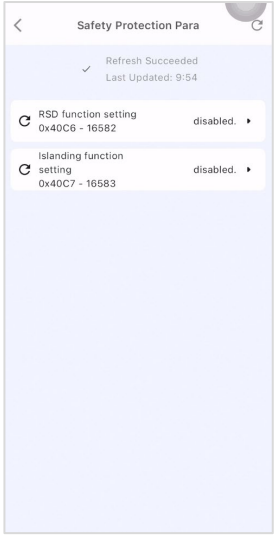


Figure 6-27 Safety Protection Parameters

6.4.13 Battery Parameters

Within the Battery Parameters interface, you can change the battery type, battery brand, battery discharging current, and battery active enable parameters.

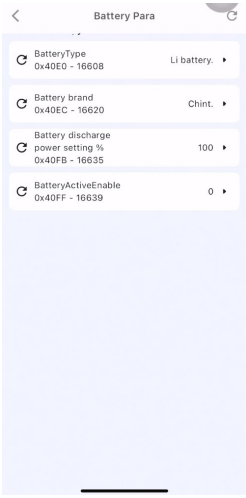


Figure 6-28 Battery Parameters

6.4.14 Off-Grid Mode Parameters

In Level 2 password, off-grid mode parameters are hidden due to conditions or no permissions.

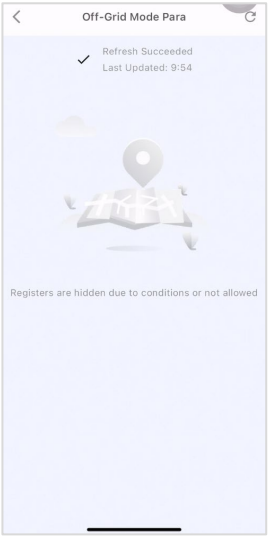


Figure 6-29 Off-Grid Mode Parameters

6.4.15 Other Parameters

Within **Other Parameters** interface, you can enable or disable Independent PV, parallel setting, and parallel ID.

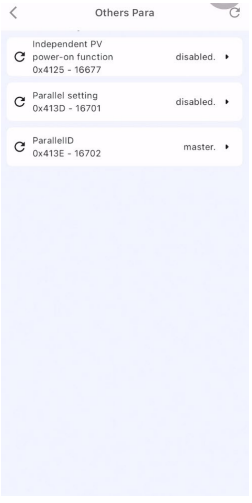


Figure 6-30 Other Parameters

6.4.16 Control Command

Within Control Command interface, you can forced restart, reset the inverter to its original factory settings, call default value, exit the parallel, and auto test the voltage, current and other related information.

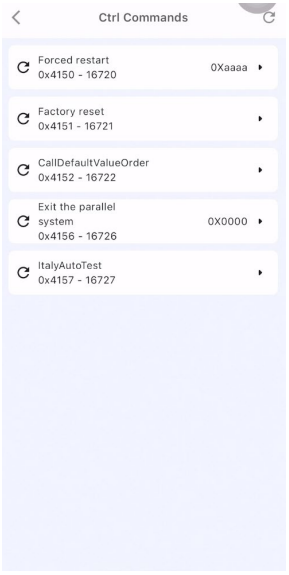


Figure 6-31 Control Commands

6.4.17 Remote Scheduling

In Level 2 password, remote scheduling is hidden due to conditions or no permissions.

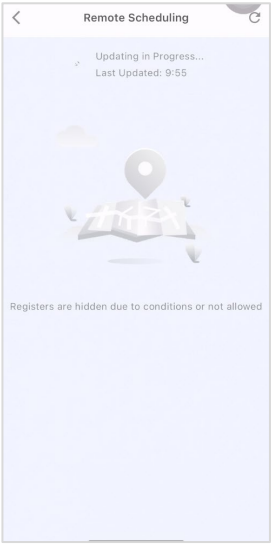


Figure 6-32 Remote Scheduling

6.4.18 Remote Data

In Level 2 password, remote data hidden due to conditions or no permissions.

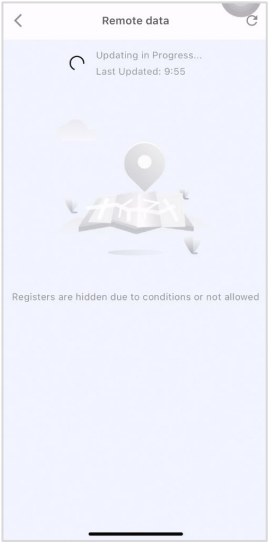


Figure 6-33 Remote Data

6.4.19 System Configuration Parameters

Configure PV parallel connection mode, standard value, meter type, meter 485 address, baud rate, BMS 485 address, BMS baud rate, and system time. Additionally, you can configure PV parallel connection mode and standard value by accessing the “More” -> “Basic Settings” interface.

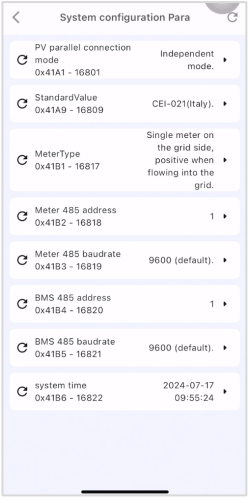


Figure 6-34 System Configuration Parameters

- PV parallel connection: configure the PV link mode.

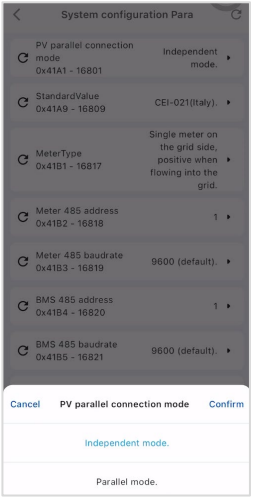


Figure 6-35 PV Parallel Connection

- Standard Value: configure the regulations based on the location or region.

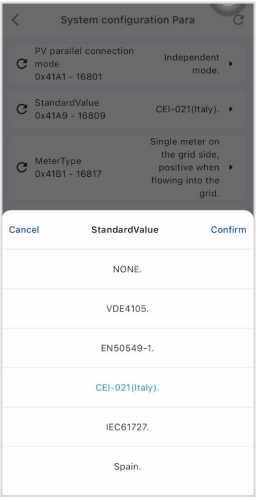


Figure 6-36 Standard Value

- Meter type: There are four types of meter are available four selection, as shown in the figure below.

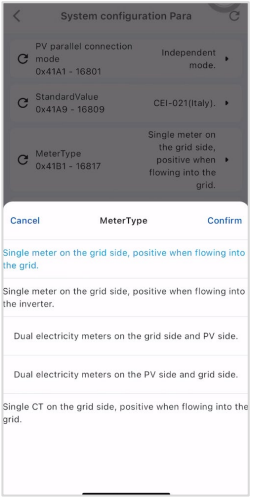


Figure 6-37 Meter Type

- Meter 485 address and baud rate

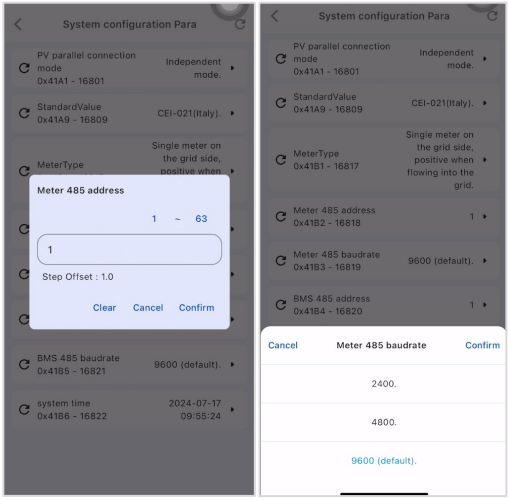


Figure 6-38 Meter 485 address and baud rate

- BMS 485 address and baud rate

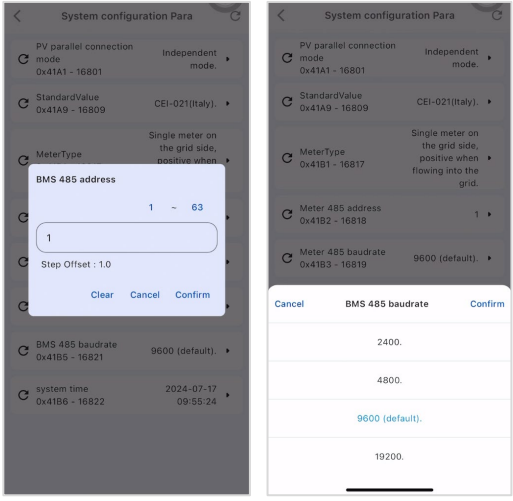


Figure 6-39 BMS 485 address and baud rate

- Configure system time

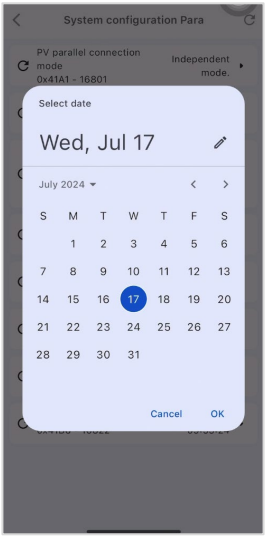


Figure 6-40 Configure system time

6.4.20 EMS Parameters

There are six system running modes for selection: PV mode, self-consumption, full feed-in, emergency charging, forced off-grid, TOU mode.

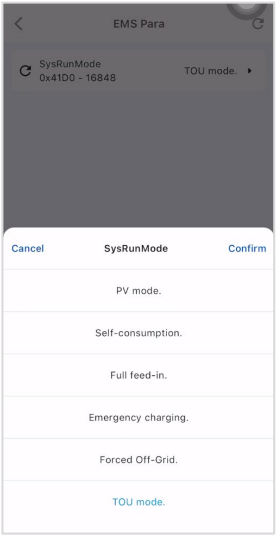


Figure 6-41 Configure System Running Mode

6.4.21 Load Control Parameters

There are two configuration options: Load control selection and manual control of intelligent load.

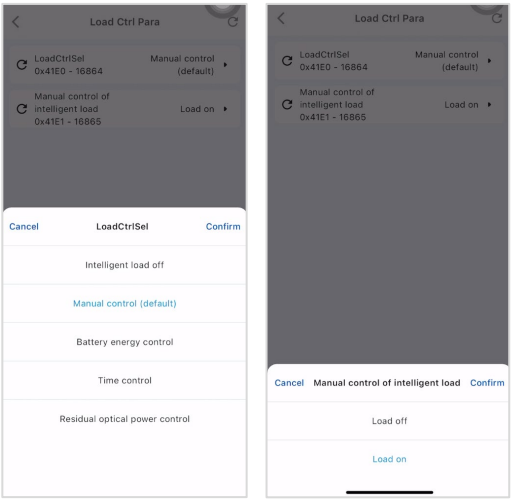


Figure 6-42 Load Control Parameters

6.5 More Interface

Click “**More”** icon and you can see the following parameters:

- Basic Settings
- Fault History
- Operate History
- Running log
- Upgrade
- Yield Statistics
- Auto test
- Restore Factory Settings

6.5.1 Basic Settings

In "Basic Settings" interface, user can set "PVLinkMode" and "StandardValue". PV Link Mode and Standard Value can be also configured within the “Settings ->

System Configuration Parameters" interface.

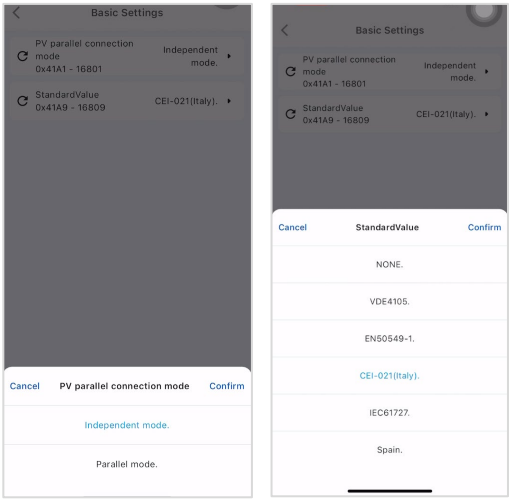
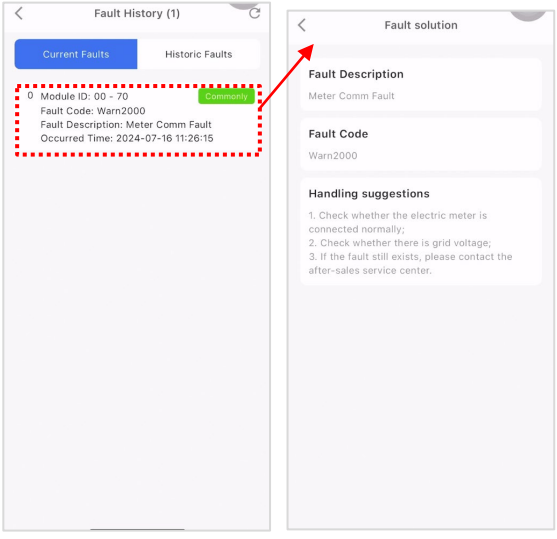


Figure 6-43 System Configuration Parameters

6.5.2 Fault History

Fault History records both currents faults and historical faults. To view the solution for a specific fault, simply click on the corresponding current fault.



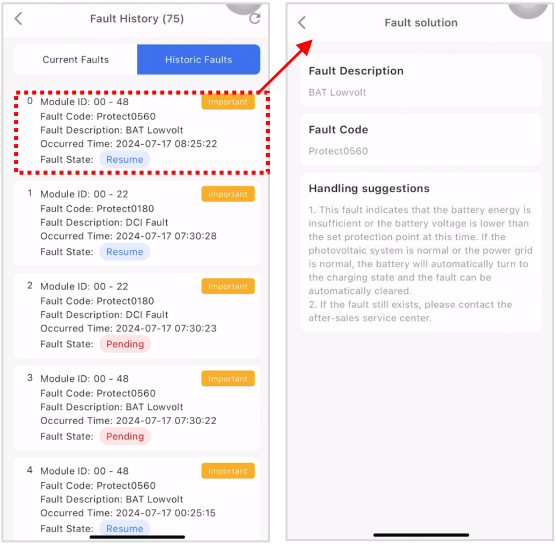


Figure 6-44 Fault History

6.5.3 Operation History

The operation history provides a detailed log of the actions taken, including the operational port, the type of register, the register address, and the data written to the register.

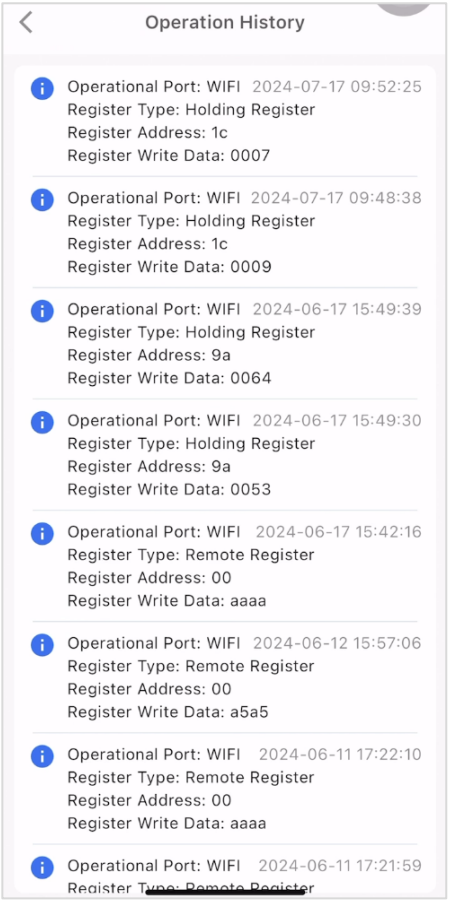


Figure 6-45 Operation History

6.5.4 Running Log

The Running Log is a chronological record that tracks the running status of the inverter.

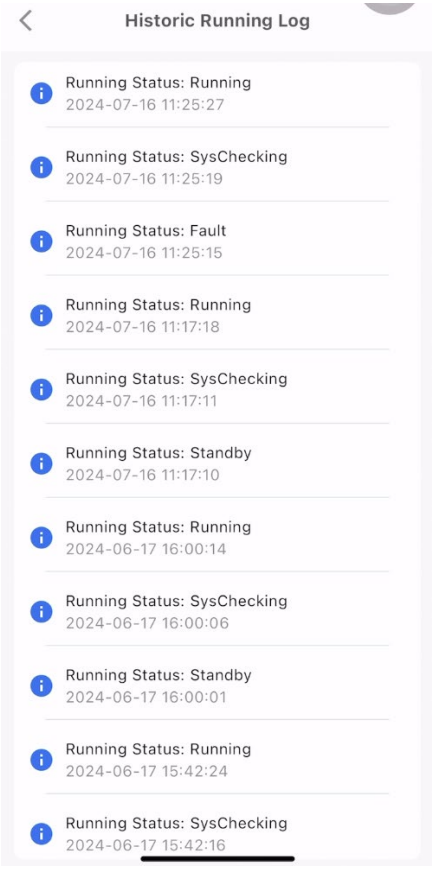


Figure 6-46 Running Log

6.5.5 Upgrade

Administrative privileges are required to access this interface. Contact after-sales for support.

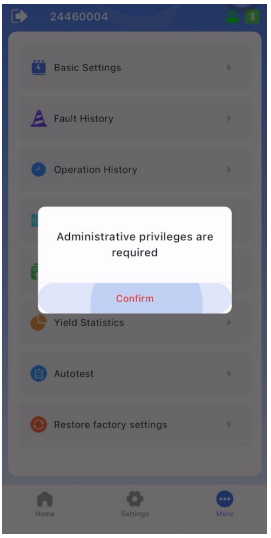


Figure 6-47 Upgrade

6.5.6 Yield Statistics

Yield Statistics refers to the recorded data that related to energy yield or production for different time periods, including daily, monthly, and yearly intervals.

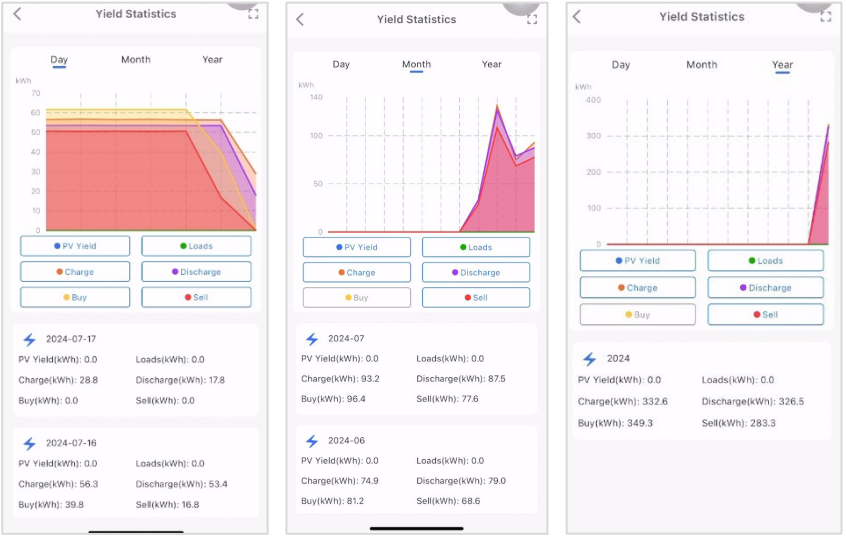


Figure 6-48 Yield Statistics

6.5.7 Auto test and Restore Factory Settings

Before performing an automated test or restoring factory settings, it is necessary to first turn off the machine.

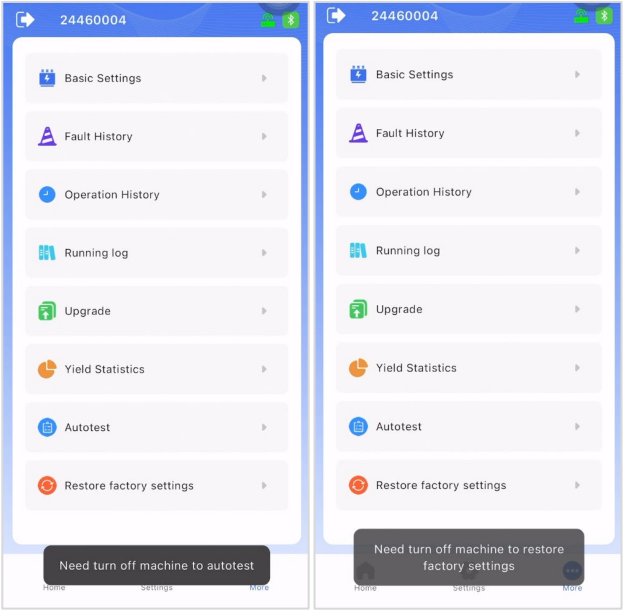


Figure 6-49 Auto test and Restore Factory Settings

7. App Remote Control

Please refer to section *6.1 App Download* to download MatriCloud App first.

7.1 Login Interface

Open the App and access the following login interface.

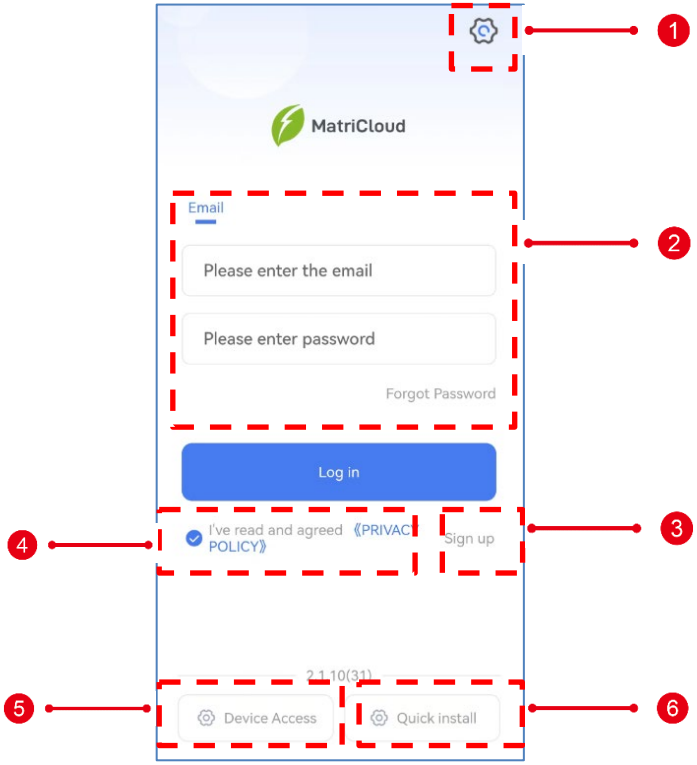


Figure 7-1 Login Interface

No.	Name	Description
1	Setting	Select the Server: Europe. Multi-language setting: switch the system language
2	Email input box	Login: Enter the platform account and password, and click Login to access the cloud platform App. Forgot password: Click "Forgot Password" to change the

		account password. Remember Password: Check "Remember password" without entering the password at the next login.
3	Registration	Register an account: See Section "7.3 Account Registration" for specific steps.
4	Privacy policy	Privacy policy: Check the privacy policy and log in after agreeing. Please refer to the description of "Privacy Policy" for details.
5	Device Access	This is for local control, please refer to Chapter 6 App Local Control for more information.
6	Quick install	Click to open quick installation wizard.

Table 7-1 Login Interface Introduction

7.2 Server Area and Language Configuration

Click the setting icon in the top right corner, select Europe server and language.

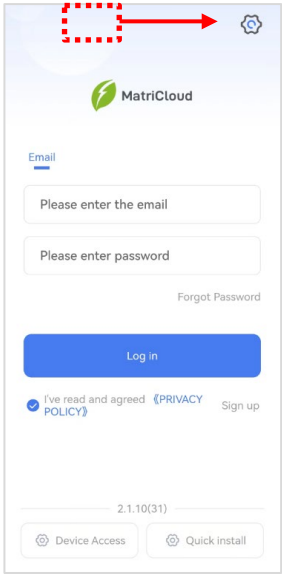


Figure 7-2 Server Area and Language Configuration

7.3 Account Registration and Login

The account types include distributor and installer. Both account types can assist the owner user in creating sites, managing installed and operated sites, and maintained sites, maintenance, and managing users and organizations.

The steps to register an account are as follows:

1. Click "Sign up" to access the account registration interface.
2. Choose your account role as either a distributor or an installer.
3. Fill in the registration information, including your company name, email address, country/region, verification code, password, and distributor number (obtained by contacting your superior distributor/installer). Then, click "Submit" to complete the account registration.

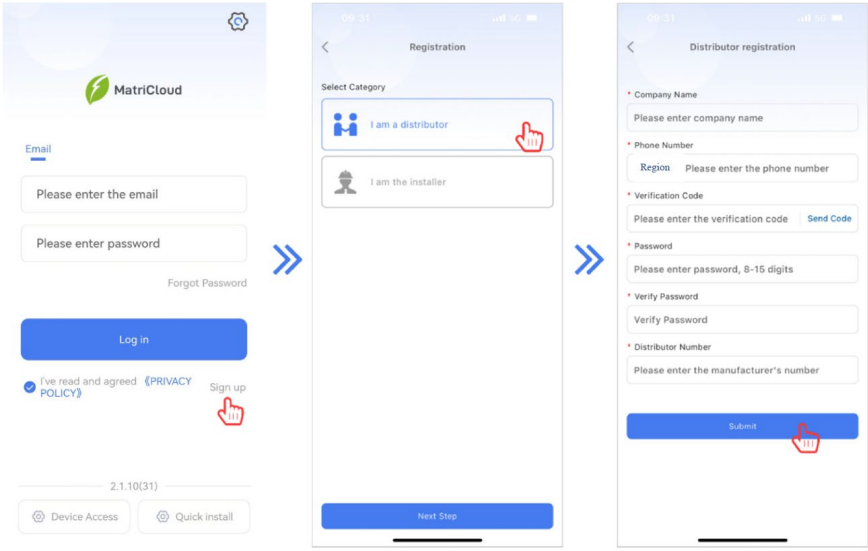


Figure 7-3 Sign Up

4. Login in MatriCloud using the account registered. You will be directed to the Home Page Interface.

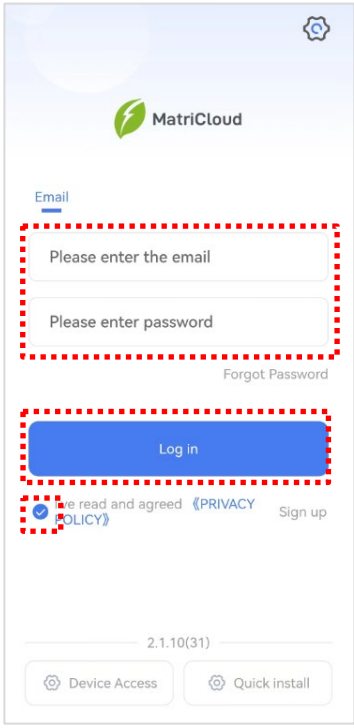


Figure 7-4 Login

7.4 MatriCloud Interface Overview

The MatriCloud App interface for remote control consists of includes four navigation bars: homepage, site, application, and account. These navigation bars provide different functionalities and options for users to navigate and manage their remote-control experience.

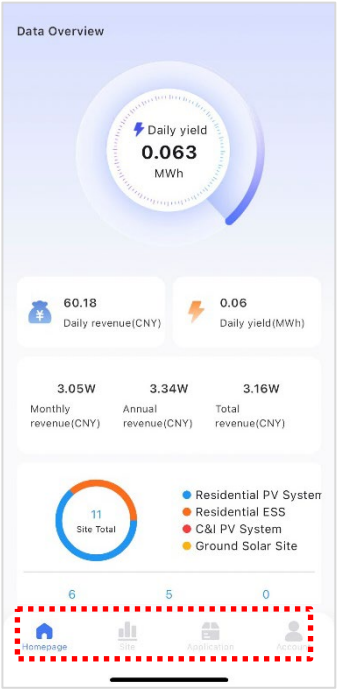


Figure 7-5 Navigation Bar

Here's a brief description of each interface:

Navigation Bar	Description
HomePage	View the electricity generation data and energy conservation and emission reduction indexes of all sites under the account. See "HomePage" for details.
Site	View all sites under the account. Create a site, view site information, and set up the site. See "Site" for details.

Application	Alarm, firmware upgrade, device center, logger center, maintenance service and other applications. See "Application" for details.
Account	View and set the account information. See "Account" for details.

Table 7-2 Navigation Bar Description

7.5 Home Page

The Home Page interface provides a comprehensive overview of the power yield, electricity generation data, and energy conservation and emission reduction indexes of all sites associated with the account

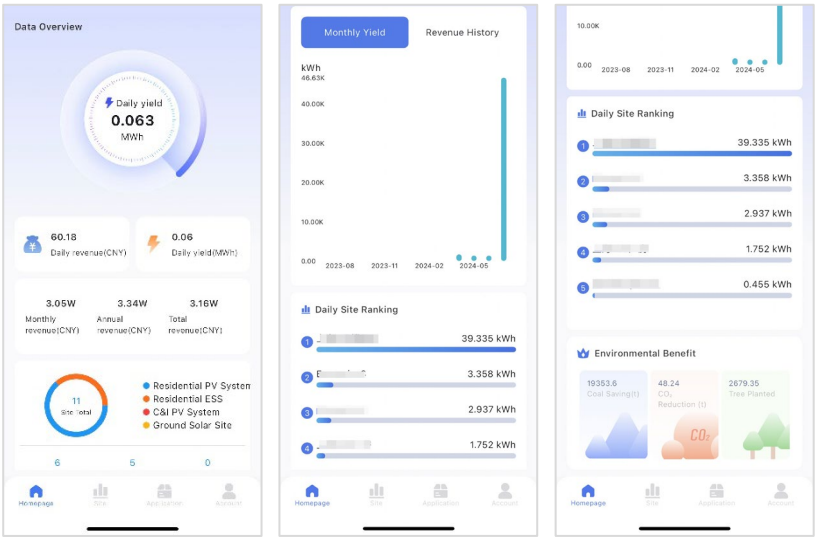


Figure 7-6 Home Page Interface

7.6 Site

Site interface provides the site information, users can create a new site within this interface.

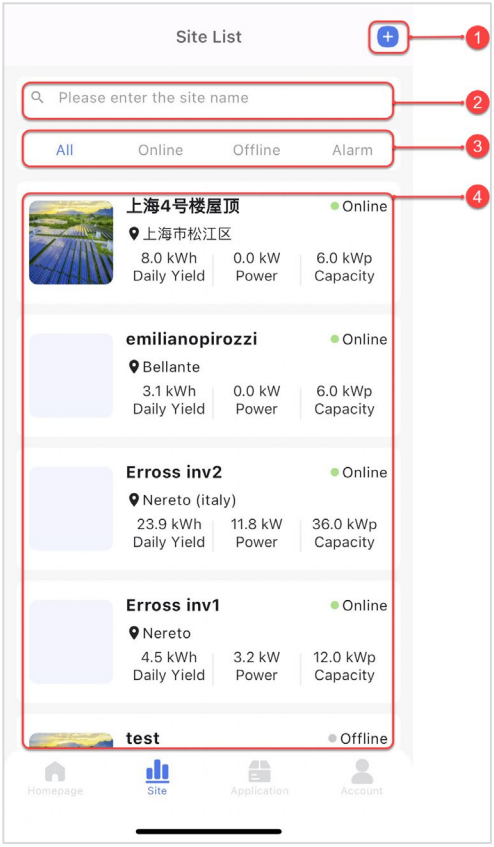


Figure 7-7 Site Interface Overview

No.	Function	Description
1	New site	Click to enter the page of creating a site. See **Section 7.6.1 Create Site** for more information.
2	Search box	Search for the site by its name and device S/N.
3	Status bar	Switch according to the site status to view relevant site information.
4	Site Card	Click the site to view detailed information. See section 7.6.2 Site Details for more information.

Table 7-4 Description of Site Interface Overview

7.6.1 Create Site

The steps to create a site are as follows:

1. Click “+” button to create a new site.

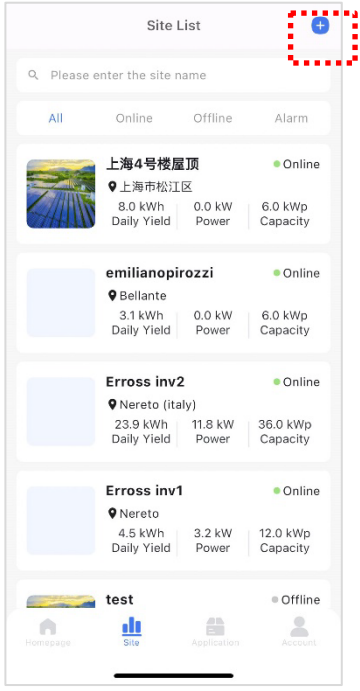


Figure 7-8 Create Site

2. Click the "Scan to add device" button to scan the barcode on the stick, then click "Confirm".
   Note: If the barcode cannot be scanned, you can also enter the stick SN number manually.

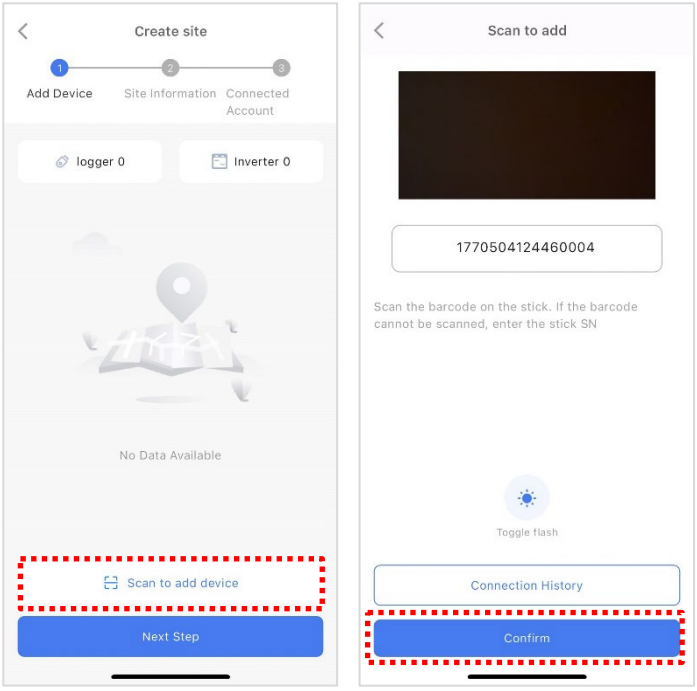


Figure 7-9 Scan to add device

3. Fill in all the necessary site information, then click "Next Step".

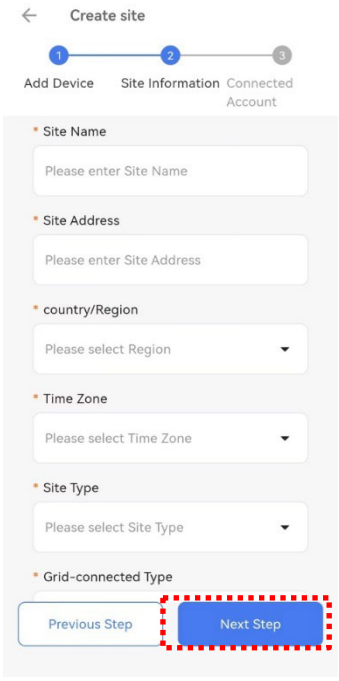


Figure 7-10 Fill In Site Information

4. Click “Select Connected Account” to choose an existing account, then click “Create” to create site. Or you can create a new count by entering all the necessary information step by step and then click “Create” to create a site.

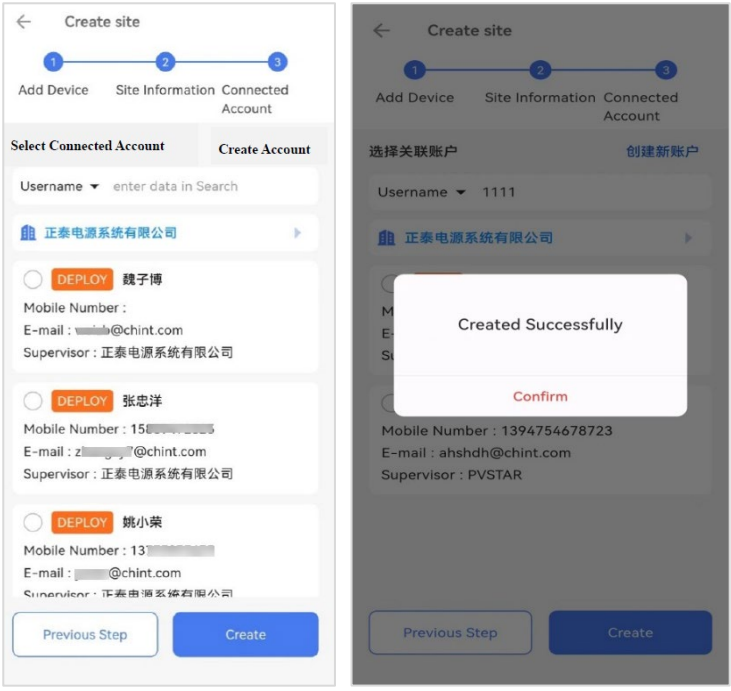


Figure 7-11 Select Linked Account

7.6.2 Site Detail

Site details includes site dashboard, device, alarm, and other related information.

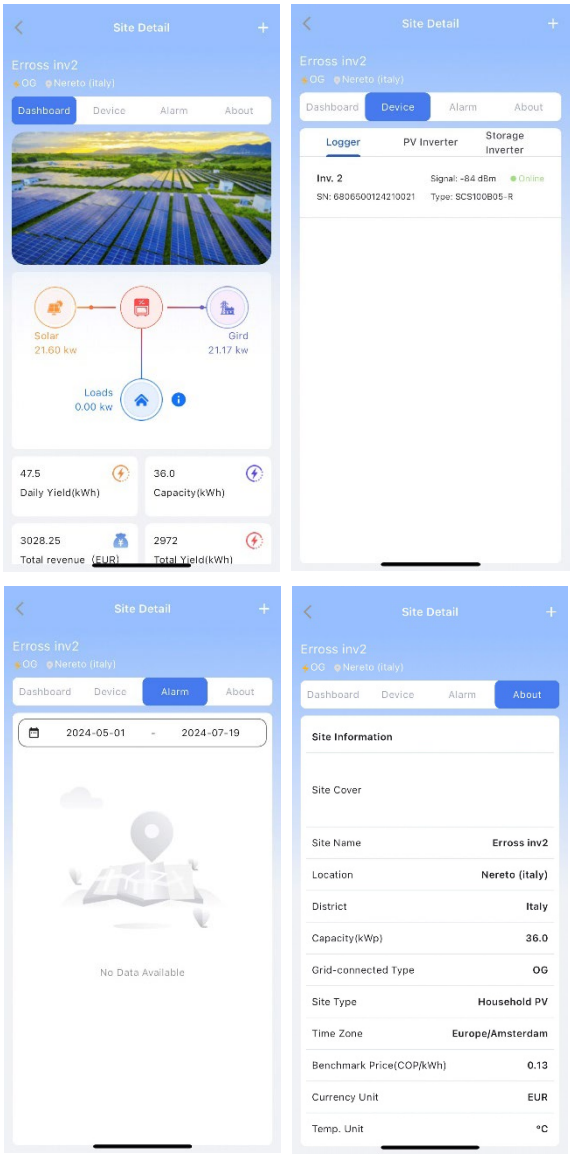


Figure 7-12 Site Detail

7.7 Application

Application interface provides operations such as device maintenance, asset management and maintenance services.

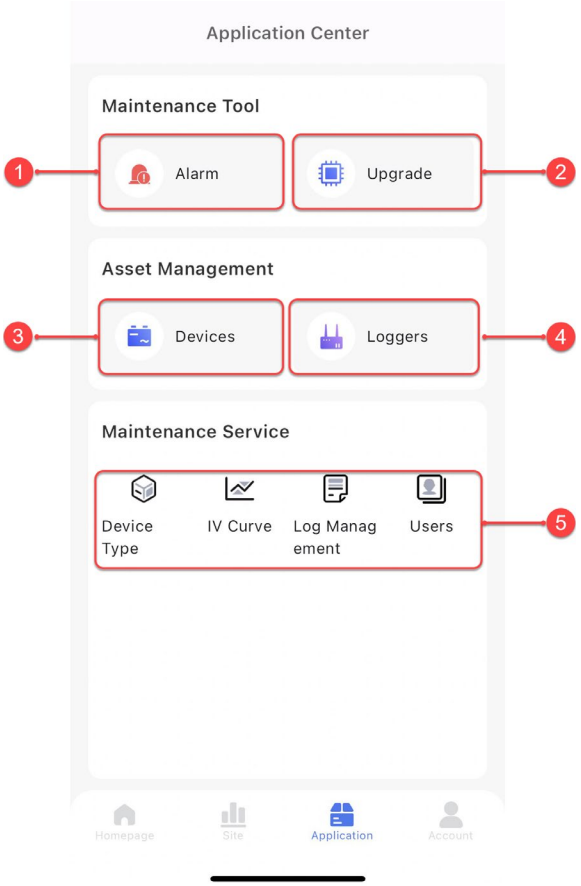


Figure 7-13 Application Interface

No.	Function	Description
1	Alarm	Click to enter the alarm information page to view all alarm information under the account.
2	Upgrade	The device can be upgraded with firmware remotely in the cloud.
3	Devices	All devices under the current account can be

		viewed, including inverter and energy storage devices.
4	Loggers	All logger devices under the current account can be viewed.
5	Maintenance Service	Equipment Type: Equipment types can be added or deleted. IV Curve: the service of IV curve scanning. Log Management: system log management. Users: management of users under the current account. System Settings: currency unit, time zone, DTC and other settings in the system.

Table 7-x

7.7.1 Alarm

The alarm information list can be used to screen sites by selecting the time range, entering the keywords for search, and selecting the alarm type.

The priority levels for alarms are categorized into four types: important, common, prompt, and urgent.

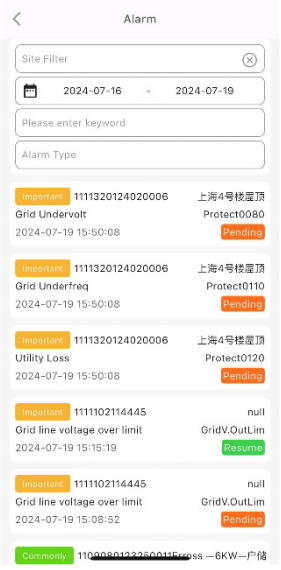


Figure 7-14 Alarm

7.7.2 Upgrade (Remote)

This section describes how to upgrade the firmware of inverter remotely.

7.7.2.1 Create an Upgrade Task

The steps to create an upgrade task are as follows:

Step 1: On the firmware "Upgrade" page, click the **+Add New Task** in the upper right corner.

Step 2: Select the model and firmware to be upgraded, and whether to make an appointment for upgrade

Step 3: Select the device to be upgraded (multiple choices), and click "Confirm Submission" to create an upgrade task.

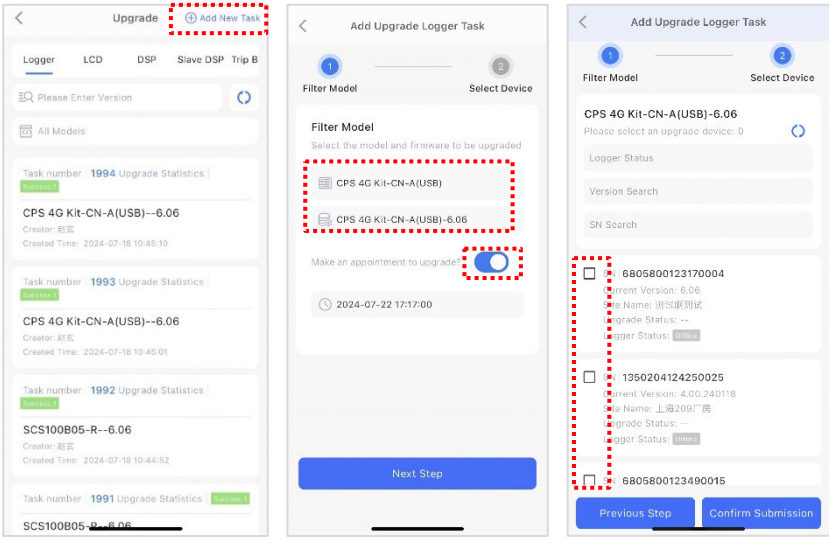


Figure 7-15 Create an Upgrade Task

7.7.2.2 Check Upgrade Task

The steps to view an upgrade task are as follows:

Step 1: On the firmware upgrade page, select an update task and click it to enter "Upgrade Details".

Step 2: View the upgrade status on the page of upgrade details. Click "Upgrade Progress" to view the detailed upgrade progress.

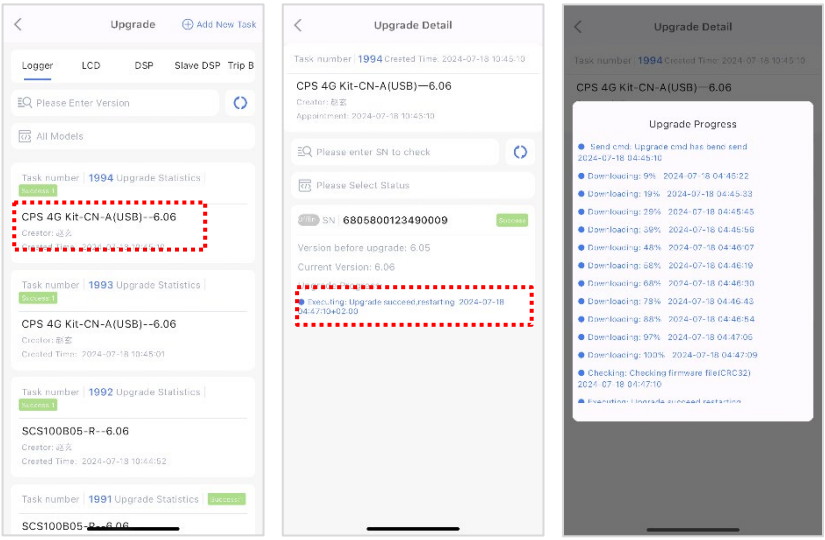


Figure 7-16 Check Upgrade Task

7.7.3 Device

The device interface is a device list that records detailed information and the status of each device managed under the current login account.

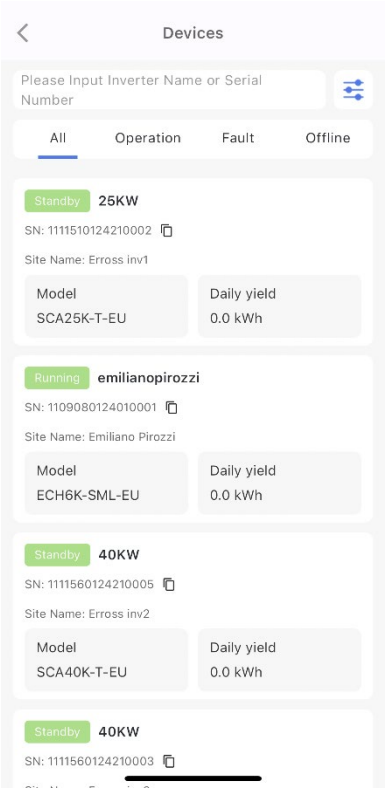


Figure 7-17 Devices

- **Details:** Under the overview tab, the serial number, operation status, overview information, DC information, AC information and device information of the device can be viewed. The information displayed varies by equipment type. Please refer to the actual page.
- **Chart:** Select Day, 3-Day or 7-Day and click, or set the display time range of the curve. Switch tabs to view the power, DC and AC curves of the inverter device.
- **Alarms:** You can find alarm history here.
- **More:** The "More" tab includes the functions of [Device Remote Setting], [Yield], [Data] and [Upgrade History]. This tab is opened to the user depending the user type, so the parameters displayed on the interface vary. Please refer

to the actual interface.

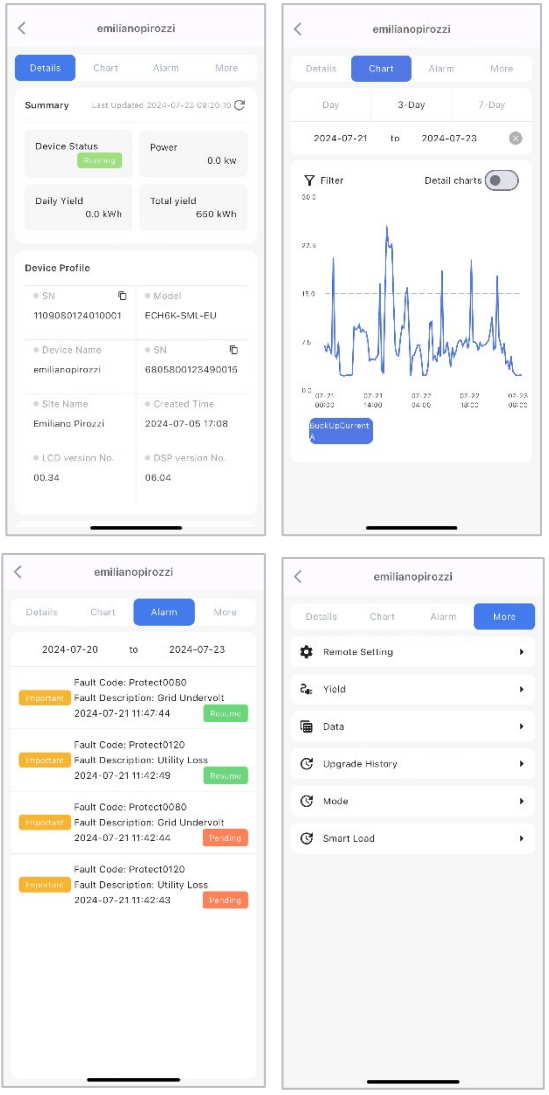


Figure 7-18 Device Interface

7.7.4 Loggers

The loggers interface is a communication module list that records detailed

information and the status of each logger (communication module) managed under the current login account.

The equipment list shows all the equipment of the current site, including loggers, PV and energy storage inverters, and weather stations (click for details).

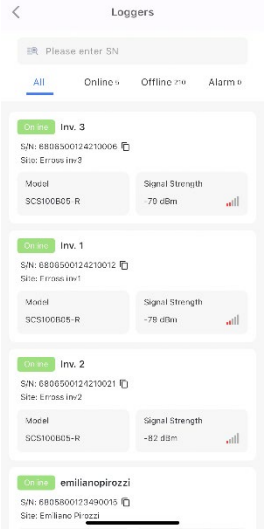


Figure 7-19 Loggers

- **Details:** Display the overview and detailed information of logger devices.
- **Devices:** Display the affiliated devices under this logger.
- **Upgrade History:** View the upgrade history of the logger.
- **More:** Set logger parameters, including upload interval, baud rate, protocol configuration, remote setting, and device restart.

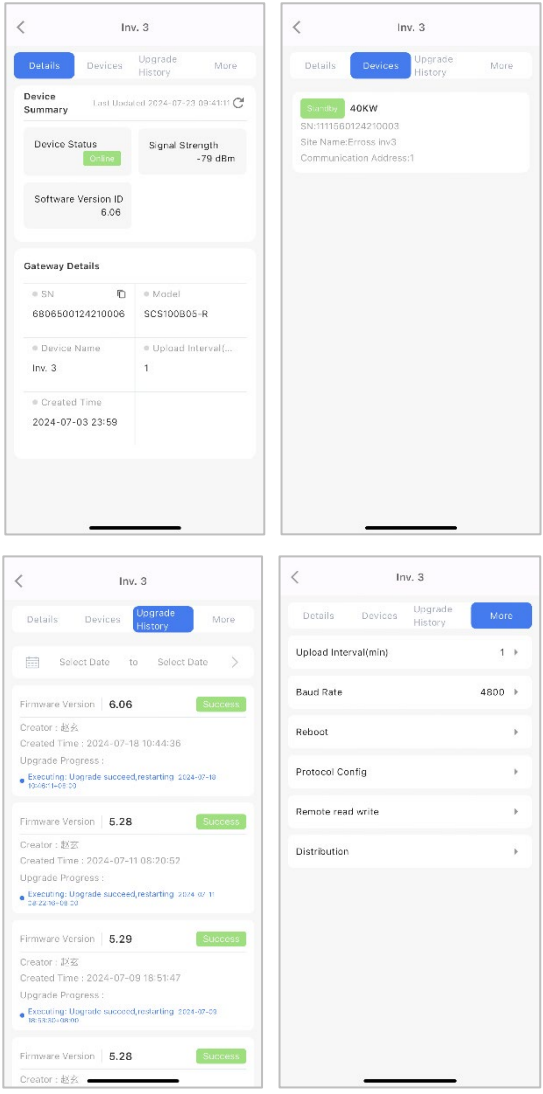


Figure 7-20 Logger Detail

7.7.4.1 Logger Setting

Configure the protocol, remote reading and writing.

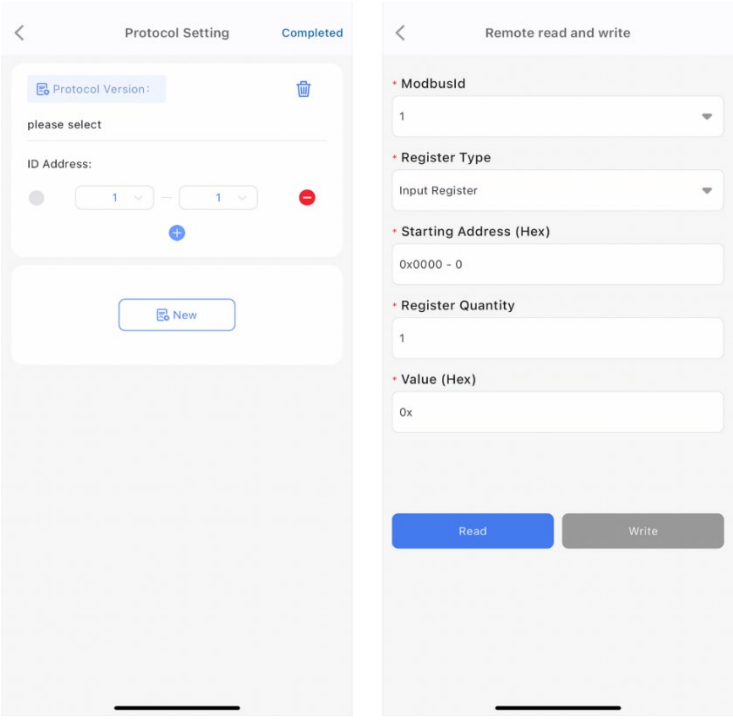
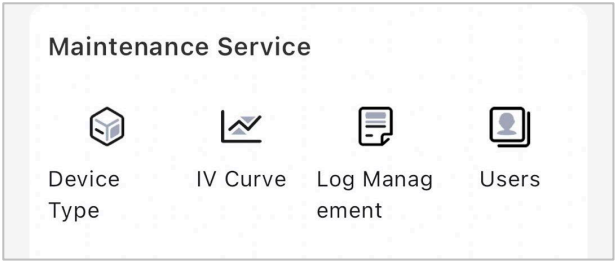


Figure 7-21 Logger Setting

The parameters displayed on the interface will be different for different models of loggers. Please refer to the actual interface.

7.7.5 Maintenance Services

Maintenance services include Equipment Type, IV Curve, Log Management and Users



S/N	Name	Description
1	Equipment Type	System equipment types can be imported or deleted
2	IV Curve	IV curve function
3	Log Management	Viewing and management of system log
4	Users	Management of users under the current account

7.8 Account

In the Account interface, you can modify account information, adjust security settings, log out, access general settings, and view software information.

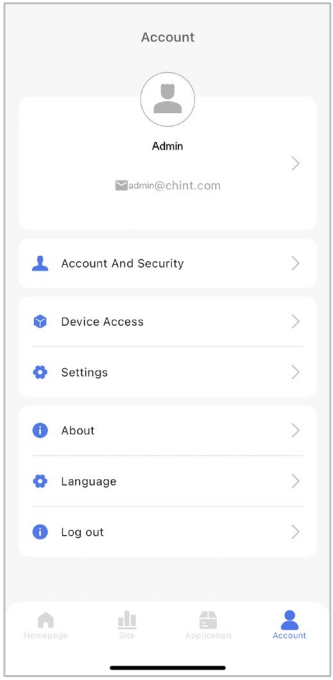


Figure 7-22 Account

S/N	Name	Description
1	Account and Security	Change the phone number, email address and password.
2	Device Access	Near-end debugging and local debugging and testing functions
3	About	Display app software version and download QR code
4	Language	Switch the system language
5	Setting	Switch between multiple languages and log out of the account
6	Log out	Log out of the system

7.8.1 Account and Security

The steps to modify phone number, email, and password are as follows:

1. Click "Account and Security", and you can bind or modify the mobile phone number and email address, and set account password.

2. Click the mobile phone number or email address, enter the mobile phone number or email address to be bound, click "Send Code", enter the received verification code, and then click "Confirm" to complete binding and modification.

3. Reset the password, click "Modify Password", enter the original mobile phone number, enter the verification code, and enter and confirm the new password to complete the modification.

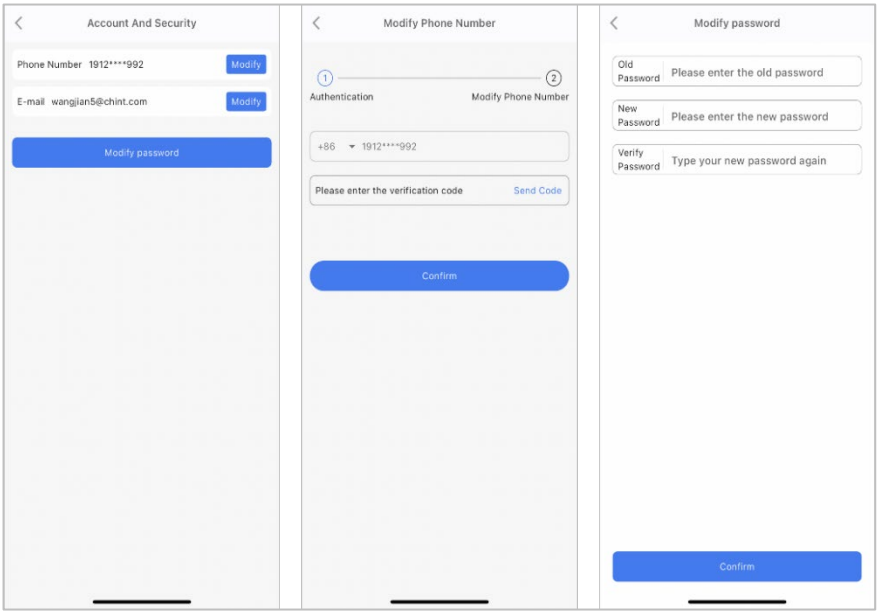


Figure 7-23 Update Phone Number, Email, and Password

Note:

- The bound mobile phone number cannot be repeated and shall be unique
- Email/mobile phone number can be used as a login account, but the mobile phone number needs to be verified for binding.

7.8.2 Device Access

"Device Access" is for reading and setting parameters for local inverter device through Bluetooth connection. This function is provided based on special scenarios to meet the needs of customers or O&M personnel. It is used to realize local debugging and testing, near-end O&M, firmware upgrade, parameter setting, fault reading and other functions of the device.

7.8.3 Account Cancellation

In the **Settings -> Cancel Account** interface, you can delete or destroy the account.

Step 1: Agree to cancel the agreement, and click.

Step 2: Click "Apply for Cancellation".

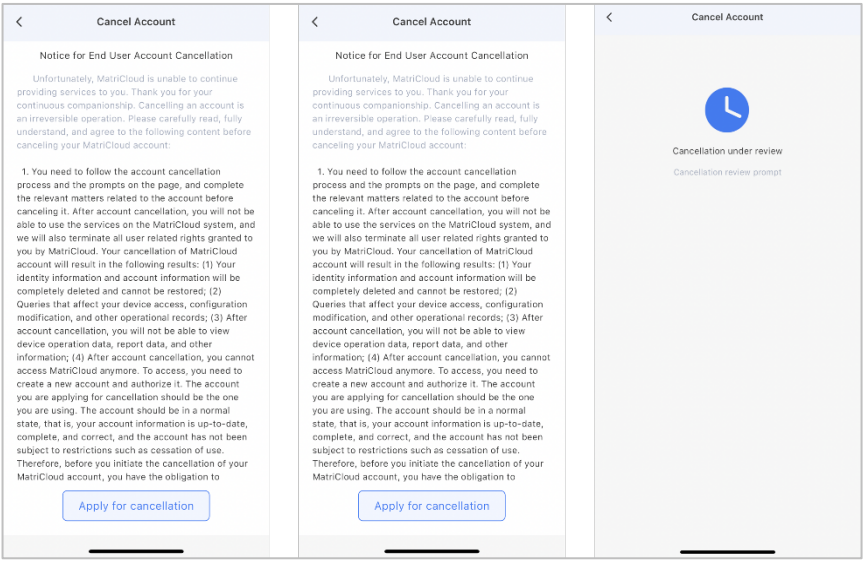
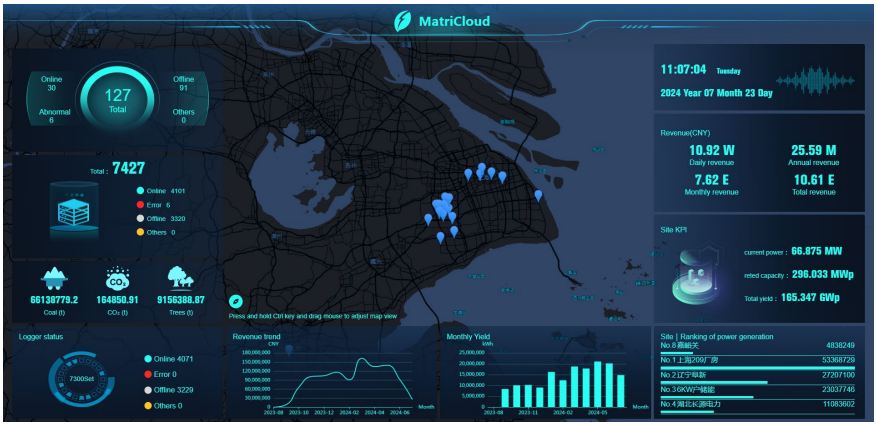


Figure 7-24 Account Cancellation

8. Cloud Platform Introduction



8.1 System Login

8.1.1 Registration and Login

Introductions to the process of signing up a MatriCloud account for distributor/installer.

Suitable crowd: users who provide the owner with services such as site construction, operation, and maintenance.

Methods for signing up: 1) contact the superior company for registration assistance; 2) self-registration.

Self-registration process are as follows:

1. To access the login page, please navigate to the provided website: https://chintpower.online.
2. Click “Sign Up Now” to access the registration page.

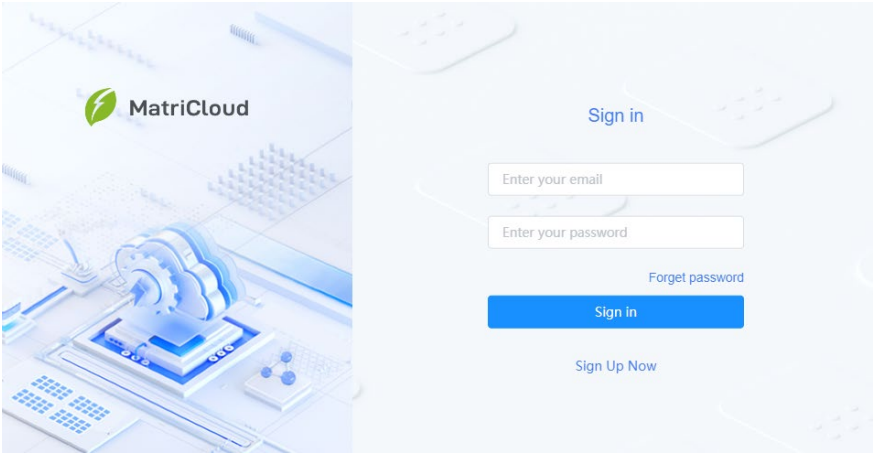


Figure 8-1 Sign in Page

3. Select your account type (Distributor or Installer Account), click “Next” to fill in your registration information.

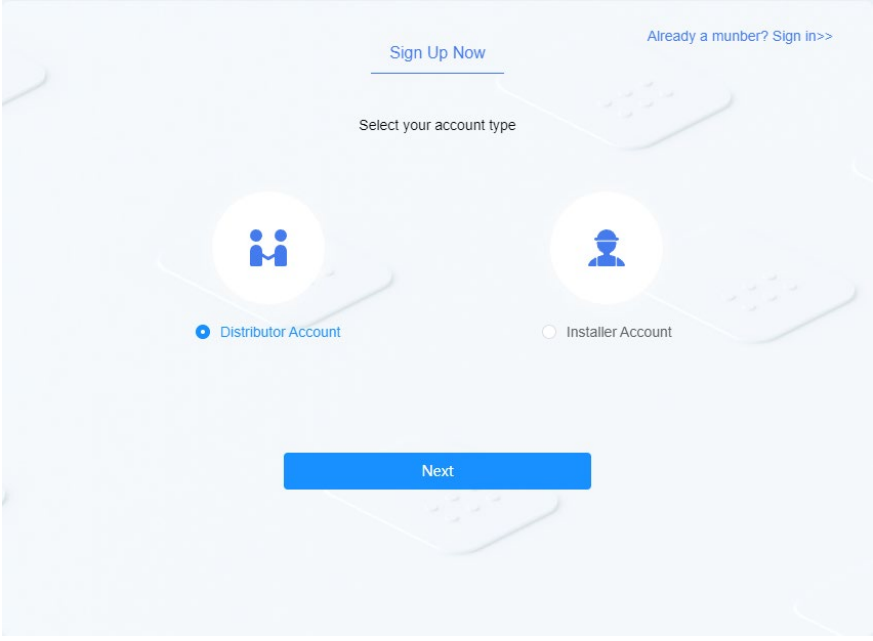


Figure 8-2 Sign Up

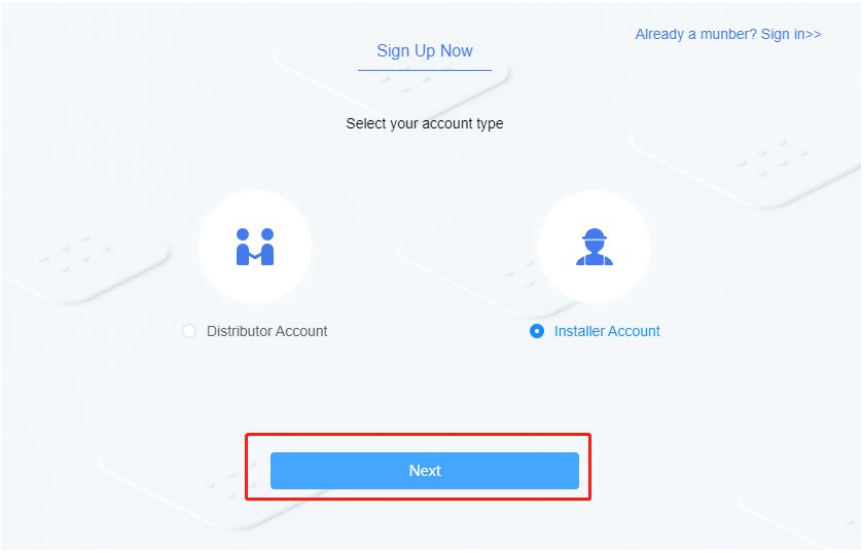


Figure 8-2 Select account type

4. Fill in the registration information. Agree to the Privacy Policy, and click “submit” to complete the registration.

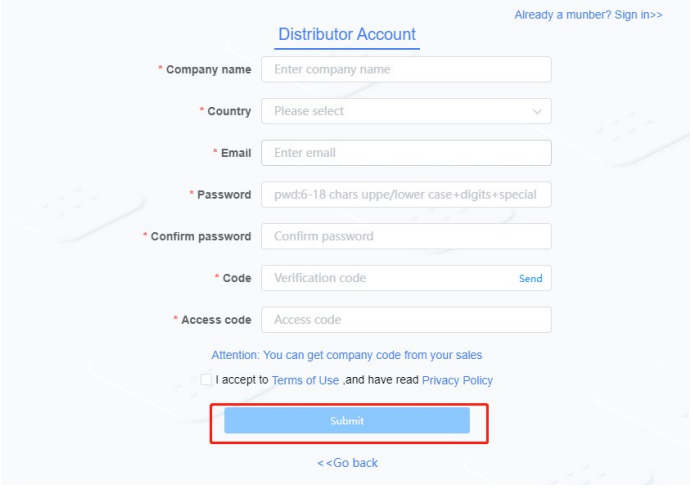


Figure 8-3a Distributor account information

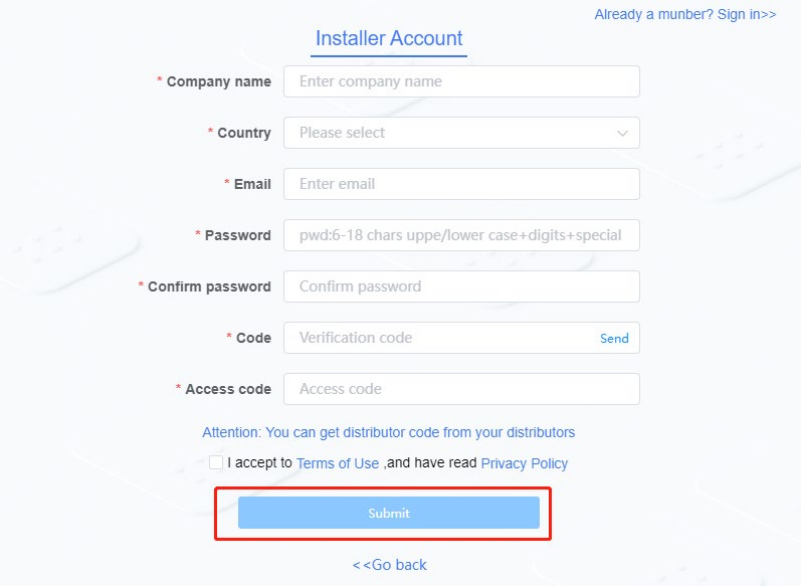


Figure 8-3b Installer Account Information

Item	Description
Company name	Enter correct Company name
Country	Choose the country
Email	Enter your email account
Password	The password is a combination of 8-30 digits, letters, or symbols.
Confirm password	Keep it consistent with the password entered
Code	After entering the email, click **Send** and enter the verification code received.
Access Code	Organization code of superior service provider. It can be obtained by contacting your superior service provider. After filling in, your superior service provider can browse and manage the site you manage

Table 8-1 Account Parameters Description

5. Go back to sign in page. Fill in account and password. Click “Sign in” to enter the management page.

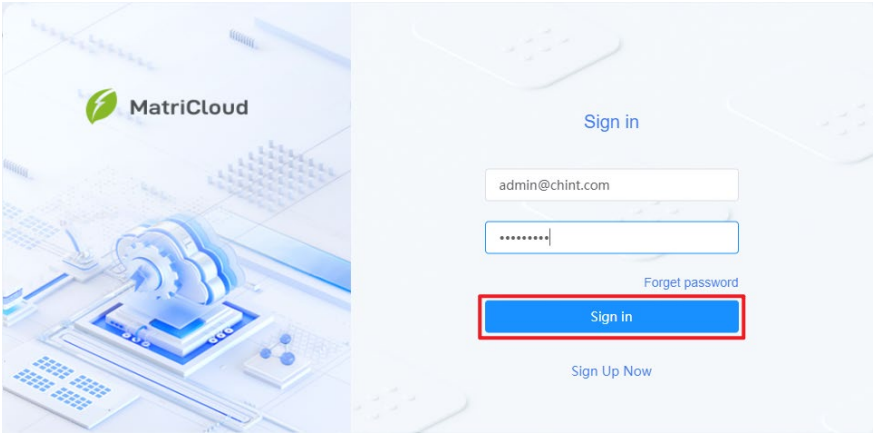


Figure 8-4 Access the management page

8.1.2 Reset Password

This section describes two methods to retrieve your password:

- Contact the service provider to reset the password. After resetting, the new password will be sent to the reserved mobile phone number/e-mail.
- Self-reset: Alternatively, you can reset your password on your own by following the steps outlined below:

1. Navigate to https://chingpower.online.
2. Click “Forget password” to enter the password retrieval page

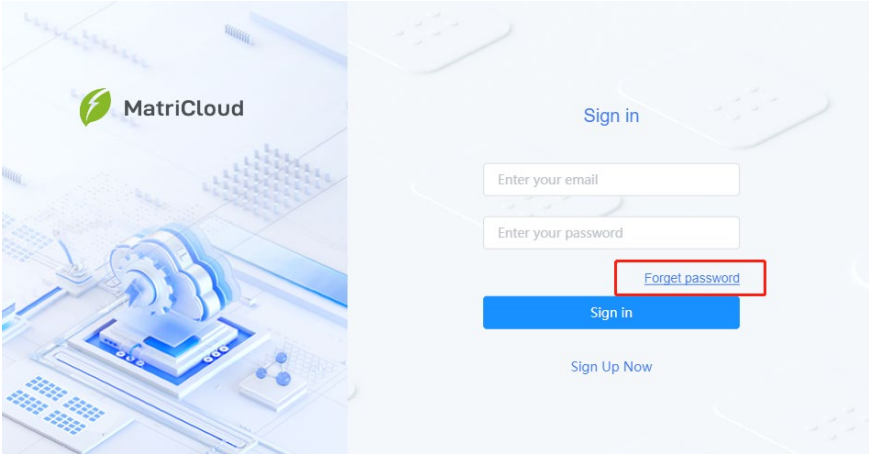


Figure 8-5 Forgot password

3. Fill in registration information and click “Determine” button to retrieve password.

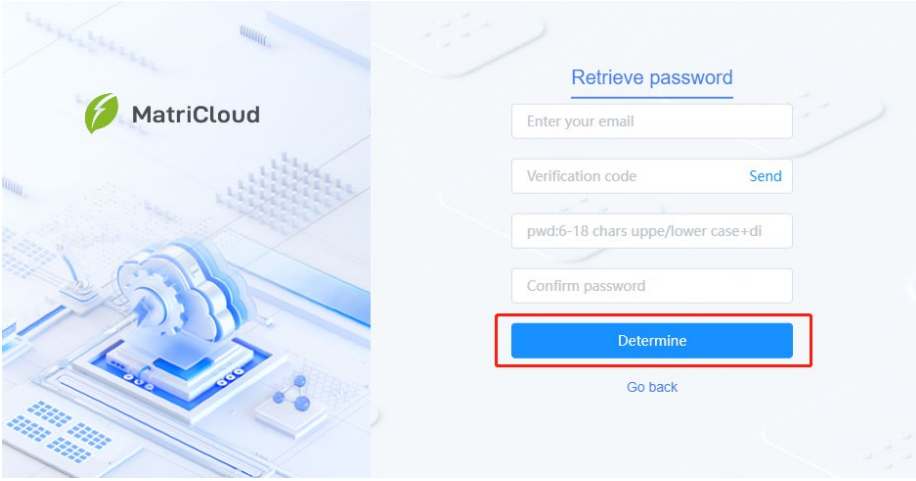


Figure 8-6 Reset password

8.2 Home

After logging in to the MatriCloud web, you will be directed to the Home page, as shown in the figure. The status, generated power, yield, and revenue of all sites under this account can be viewed. Information such as active alarms, yield trend in various dimensions, yield ranking, and CERs can also be checked.

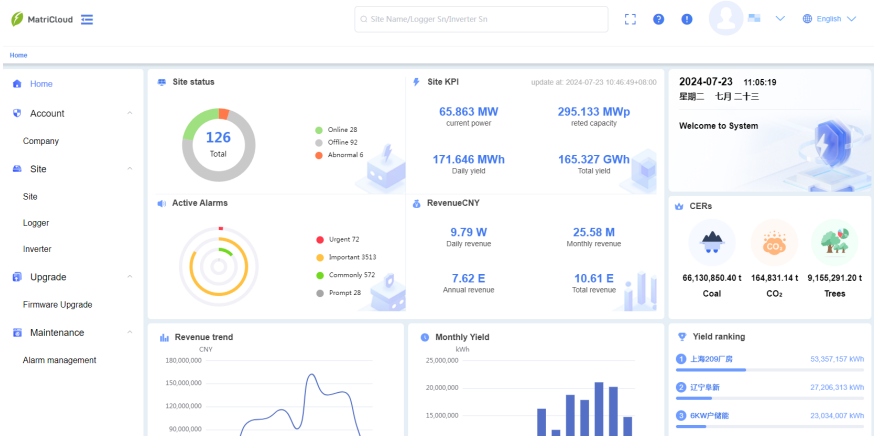


Figure 8-7 Home Page of Web

8.3 Account Management

In the Account Interface, you can manage companies and users.

8.3.1 Add Company

Click the "Add company " button to access the “Add company” interface, select the company type, superior, company name, country and add the company description and other information, and then click the "OK" button below to successfully add a company.

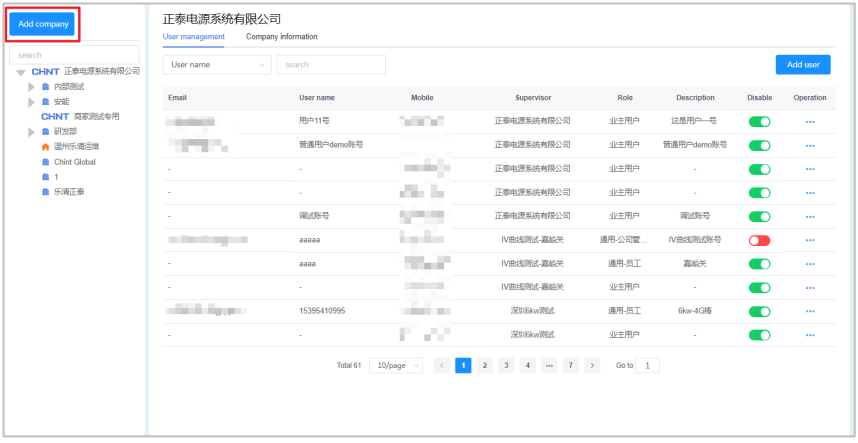


Figure 8-8a Add Company

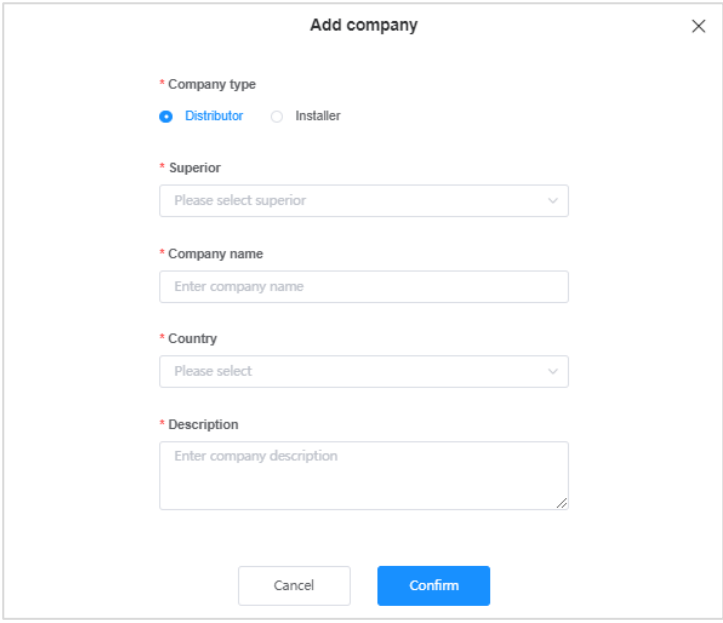


Figure 8-8b Add Company

8.3.2 Add User

click the "Add User" button to enter the new user interface, select the country, business, user description and other information, and then click the "Next" button below. Select a role on the following interface, click the "OK" button below, you can successfully add a user.

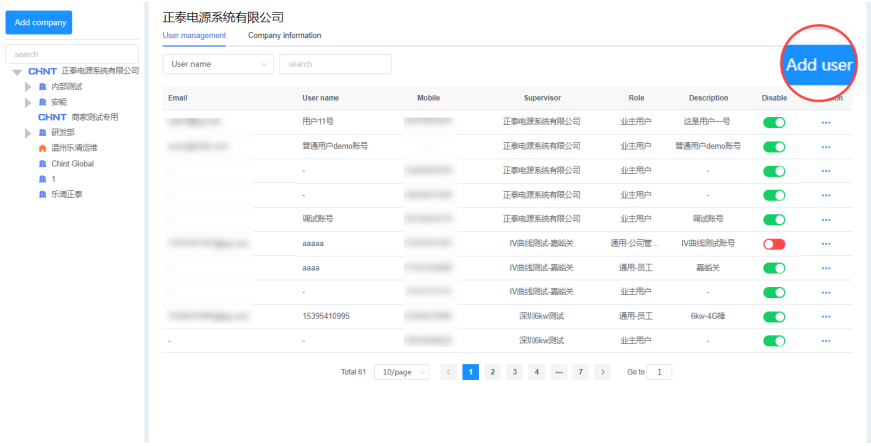


Figure 8-9a Add User

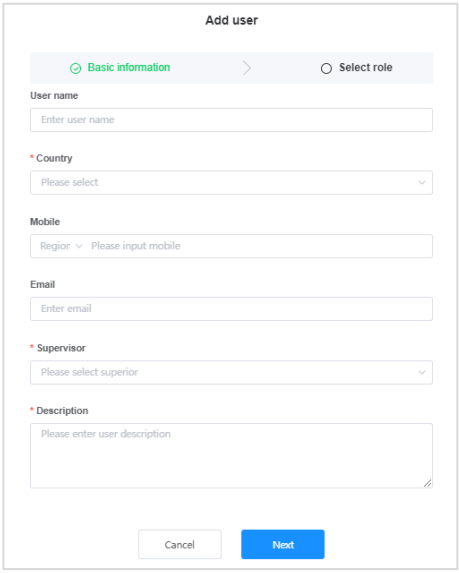


Figure 8-9b Add User

8.3.3 Update Company Information

Click the "Company information" menu to view or update the detailed company information.

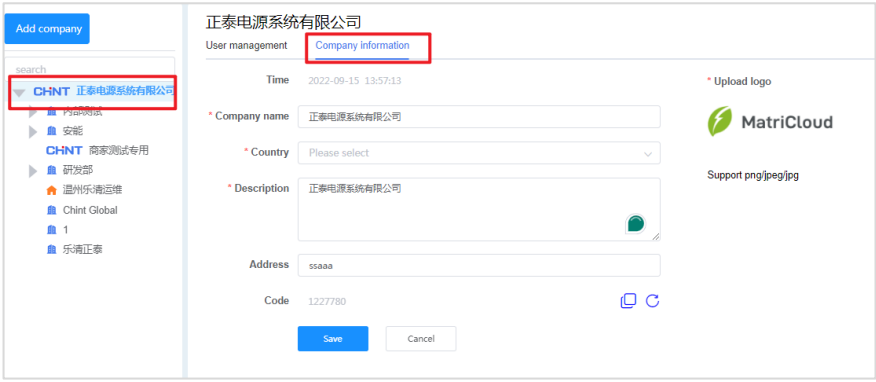


Figure 8-10 Update Company Information

8.3.4 Manage User

If you want to change the user information of a company, click the "..." on the right side of the user. Operation button, select "Edit" to edit or modify user information or select role, click "Save" to make changes. In addition, you can also select the "Reset Password" button to reset your password.

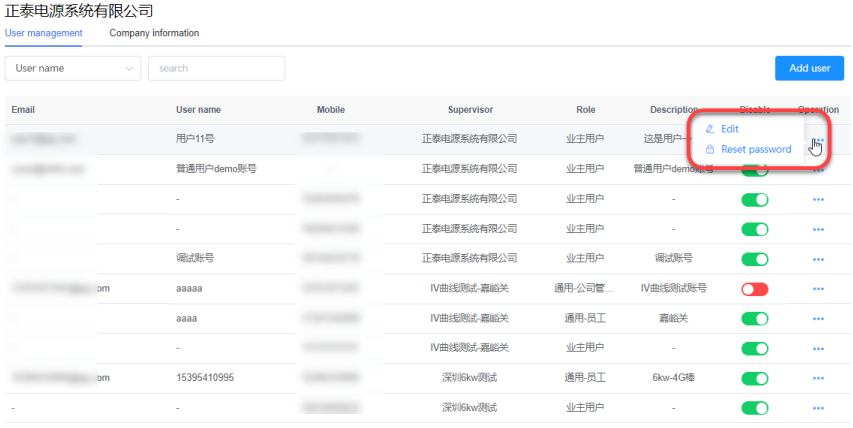


Figure 8-11 Manage User

8.4 Site Management

In the Site page, click any site name to view site information, device information, fault information and operate site devices.

8.4.1 Site

On the “Site” page, you can view the information about the site details, the number of devices, the energy yield, and revenue.

In addition, you can also set the parameters of the site through the relevant function buttons in the "Site List" area.

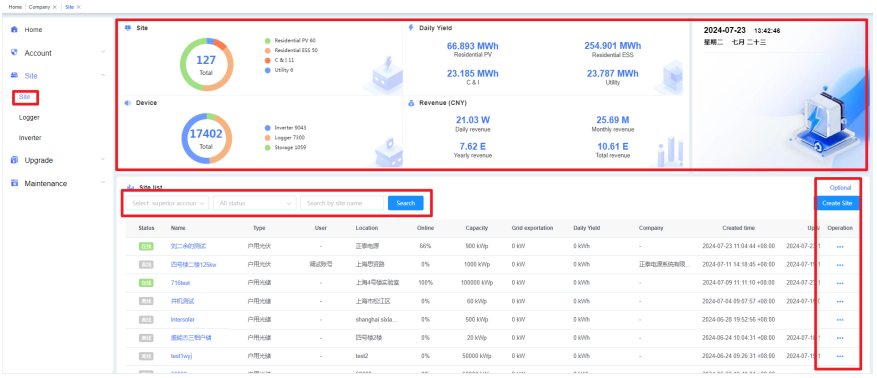


Figure 8-12 Site Overview

8.4.1.1 Create Site

Click the " Create Site" button to pop up a dialog box, which is used to create a new site.

Figure 8-13a Create Site

Step 1: Add logger information (skip this step)

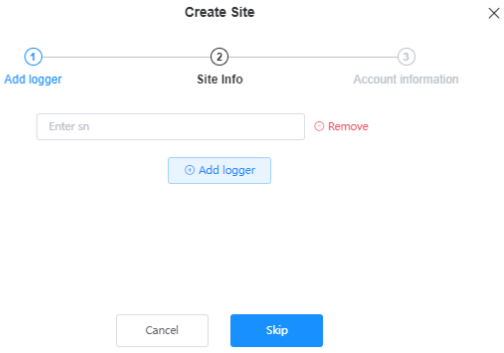


Figure 8-13b Create Site

Step 2: Fill in the basic information of the site.

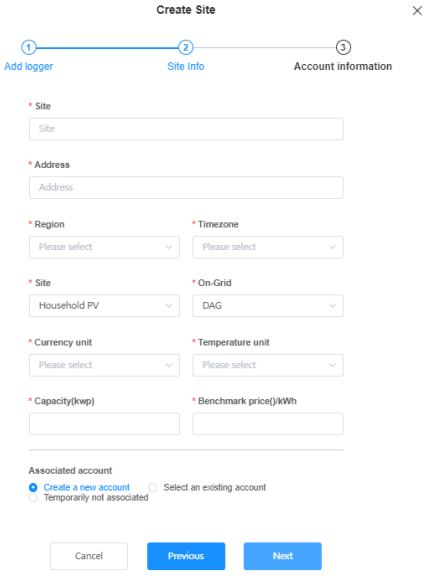


Figure 8-13c Create Site

Item	Description
Site name	Enter the name of the site. If you need to modify it after completing the construction, please go to the site Details

	page
Address	Set according to the actual situation of the site
Region	The region where the site is located
Time zone	Automatically filled in according to the region
Site type	Set according to the actual situation of the site
On-Grid	Set according to the actual situation of the site
Currency unit	Automatically filled in according to the region
Temperature unit	Automatically filled in according to the region
Capacity	Set according to the actual situation of the site
Benchmark price	Automatically filled in according to the region
Associated account	Create a new account or bind an existing one as required

Table 8-2 Site Parameter Descriptions

Step 3: Select the merchant, language and enter the mobile phone number, click "OK" button to confirm the account information.

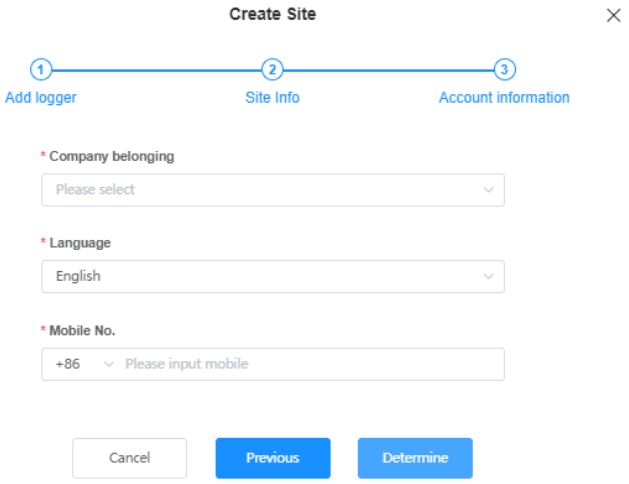


Figure 8-13d Create Site

8.4.1.2 Distribute Site

Distribute site to users. On the "site" interface, select the operation bar of any site and click to “Distribute”, “rename”, or “delete” a site.

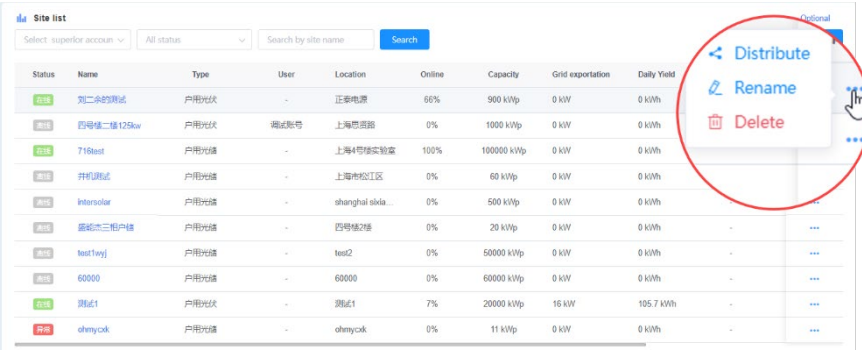


Figure 8-14a Distribute Site

Click on "Distribute ", select or search for users that need to be assigned, and then click "Determine" to complete the assignment.

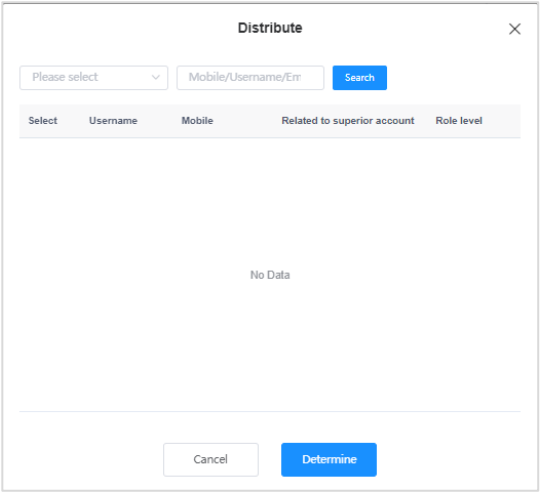


Figure 8-14b Distribute Site

8.4.1.3 Search Sites

Enter the search information in the “Please Select a power Plant”, “All Status”,

and “Please Enter the Power Plant” text boxes in the left of the search button. You can find an existing power plant that meets the search criteria.

You can also filter the list items you want to display by clicking "Optional" in the top right corner. For example, if you do not want to pay attention to the site type, you can deselect the site type, and the site information displayed will no longer show this column.

Click the site name link to see the details.

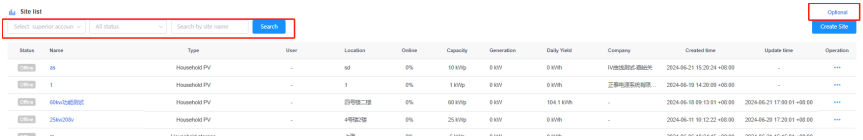


Figure 8-15 Search Sites

8.4.1.4 Site Overview

Click site name to access the site overview page, you can edit and modify the site information and location.

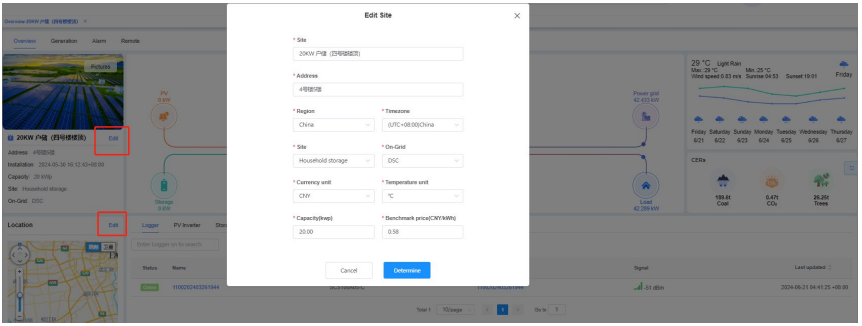


Figure 8-16 Site Page

After the specific address of the site is entered, the geographical location (site coordinates) of the site can be located through the map/satellite, and the meteorological data of the last 7 days can be displayed according to the pre-set site coordinates.

The flow diagram shows the current power supply equipment, Site, feed volume, load consumption, purchased power and power supply direction. With these data values, the contribution area on the right can show the energy saving and

emission reduction effect of the current site.

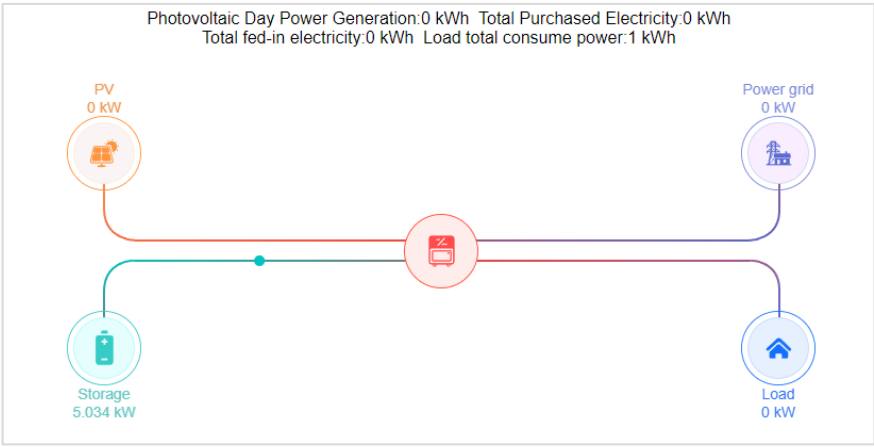


Figure 8-17 Current Power Supply Flow

The equipment list shows all the equipment of the current site, including loggers, PV and energy storage inverters, and weather stations (click for details).

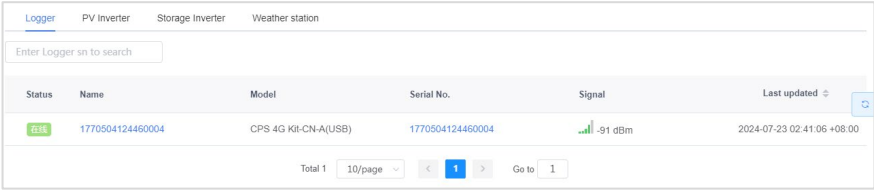


Figure 8-18 Site Equipment List

8.4.1.5 **Generation**

Click the "Select Device" button under the "Site" menu and select a single device to view the Site of the device.

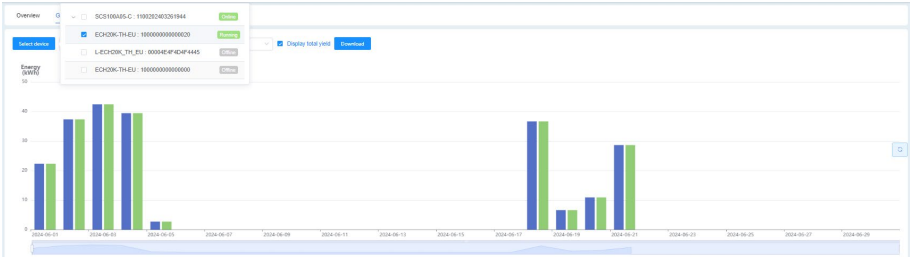


Figure 8-19a Site Power Generation Data

Select the time range, and then you can display the energy generation bar graph in a variety of time dimensions (year, month, and day). If you want to display the total Site of the entire site: select Show total Site. You can also click the "Download" button to download the searched Site information for a certain device in certain time ranges to your computer.

Figure 8-19b Site Power Generation Data

8.4.1.6 Alarm

In case of device abnormality/fault, key information such as occurrence time and content can be recorded in real time and displayed in the alarm list.

Click the "Alarm" menu, then click "Select Device" to select the desired device, click "Alarm Type" to select the alarm level, and then select a time zone and time range to search, view the alarm information. The information includes the alarm level, time, device name, fault code, alarm content, and status.

In addition, you can click “download” button to save the selected fault records to your computer.

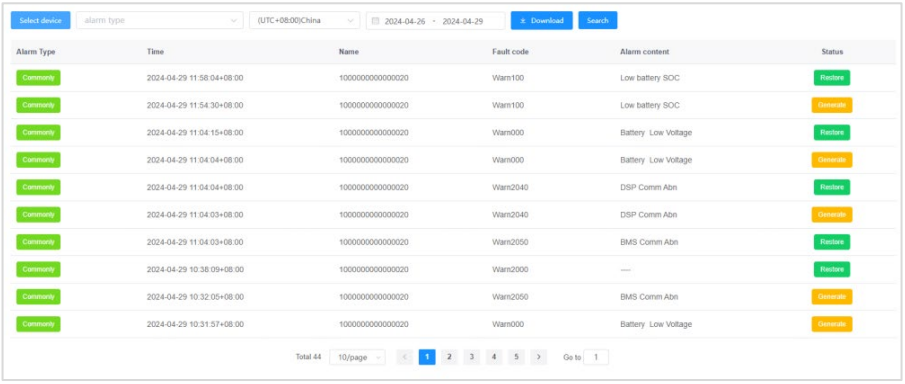


Figure 8-20 Alarm List

Alarm Type	Description
Urgent	The device stops running, and immediate intervention is required
Important	The efficiency of device operation is affected, and intervention is required
Commonly	No impact on device operation, intervention is optional
Prompt	Messages are prompted

Table 8-3 Alarm Type Description

8.4.1.7 Remote

Remotely control/read the operating parameters and status of the inverter, and support remote parameter control of devices (open only to O&M roles).

In the selection text box, select "Fuzzy Match Data" or "Exact Match Data", then select the group of registers in the "Register Group" drop-down menu (you can search by name), then enter the register name to search, and click the "Refresh" button to refresh the search results.

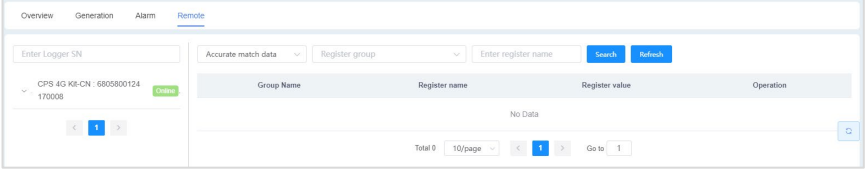


Figure 8-20 Search Remote

By clicking the “Read” option in operation column, you can read the current value

of the register.

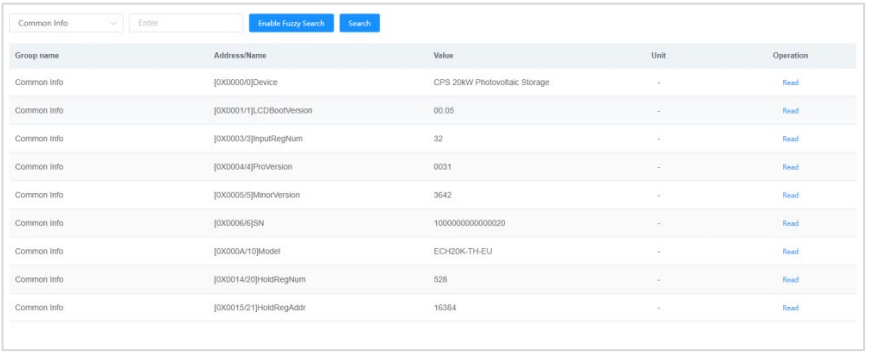


Figure 8-21 Read Current Value of the Register

By clicking the “Write” option in operation column, it pops up a modification window, and you can modify or keep the value of the register. The modified value shall be within the specified range.

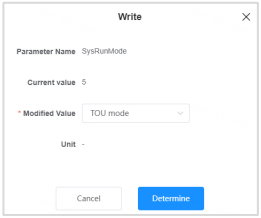


Figure 8-22 Modify Current Value of the Register

8.4.2 Logger

Click "Logger” menu to enter the logger interface.

In the Details section, you can view the logger status, logger type, and firmware version information.

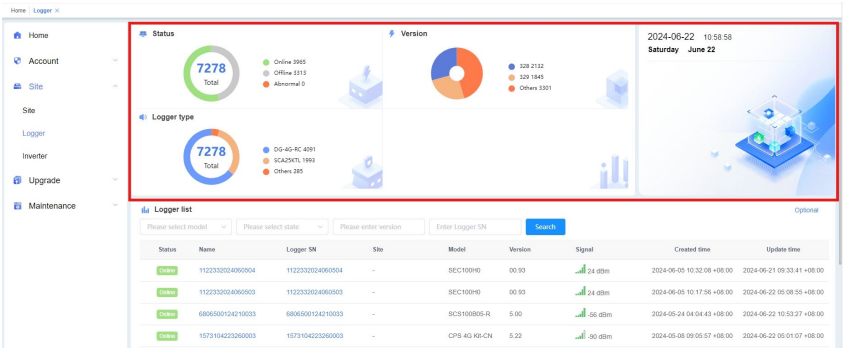


Figure 8-23 Logger Page

8.4.2.1 Search Loggers

On the Logger > Logger List page, select the logger type (4G/WIFI/ETH) in the "Please select model" text box, select the status (online, offline, faulty) in the "Please select status" text box, enter the version in the "Please enter version" text box, and enter the serial number in the "Please enter logger SN" text box to search and view the relevant logger information, device information, and configure the logger.

Click "Optional" in the top right corner to filter the content categories you want to display.

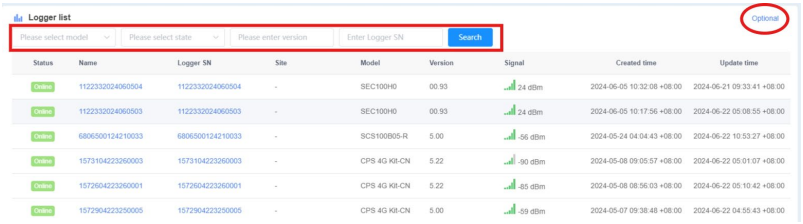


Figure 8-24 Search Loggers

8.4.2.2 Logger Overview

Click the logger name to view the details of a logger.

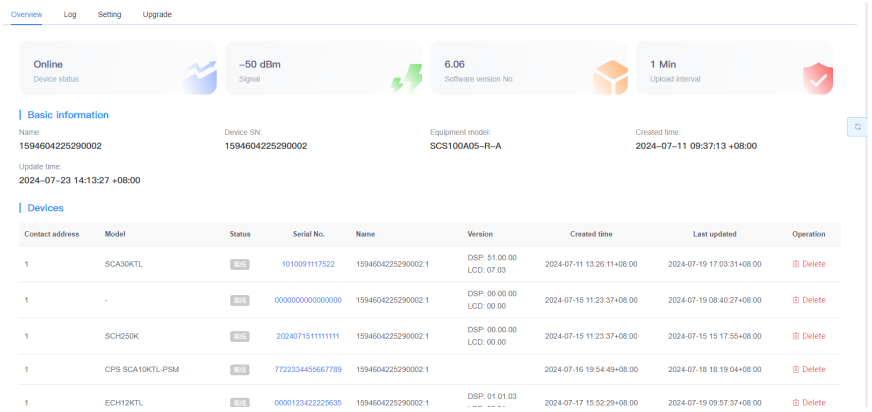


Figure 8-25 Logger Detail

8.4.2.3 Log

Click “Log” and select time range and select log level in the text box to view logger records.

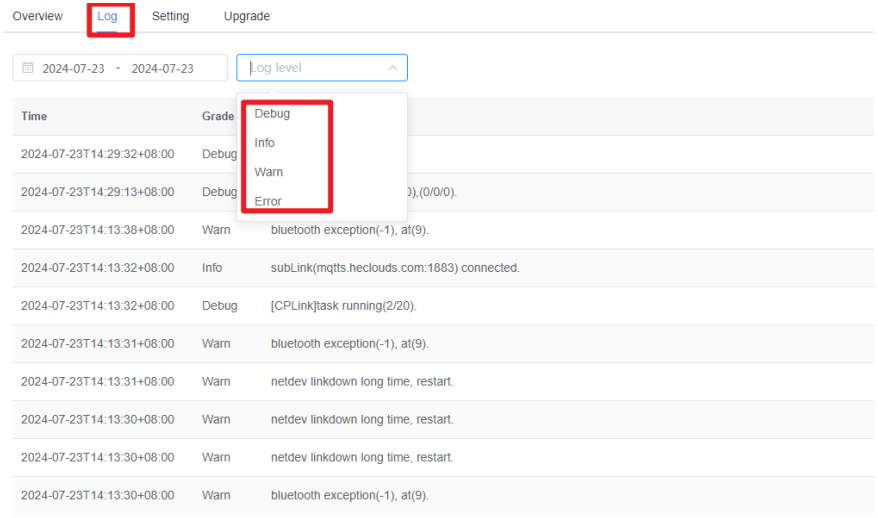


Figure 8-26 Log List

Log Level	Description
Debug	Prompt for device operation

Info	Prompt for communication information of external device
Warning	Prompt for abnormal external communication
Error	Prompt for system operation risk

Table 8-4 Log Level Description

8.4.2.4 Setting

Network card parameter setting, user can match model protocol, upload interval, device address, etc.

Protocol: Configure device data parsing rules.

Click the "Add Protocol" button to add a set of protocol address and protocol selections; Click "Submit Settings" button to submit the NIC settings and restart it (10s-20s); Click "Intelligence" button to automatically identify the device protocol.

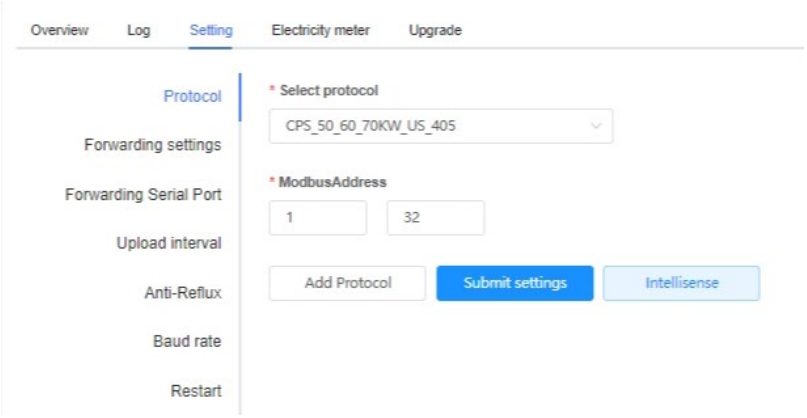


Figure 8-27a Logger Setting

Parameter name	Description
Select protocol	Select the parsing protocol used by the device under the network card and the data uploaded by the user parsing device
Modbus Address	Set the parsing address of the protocol application parsing

Table 8-5 Logger Setting Parameters Description

Forwarding settings: select forwarding settings in the text box.

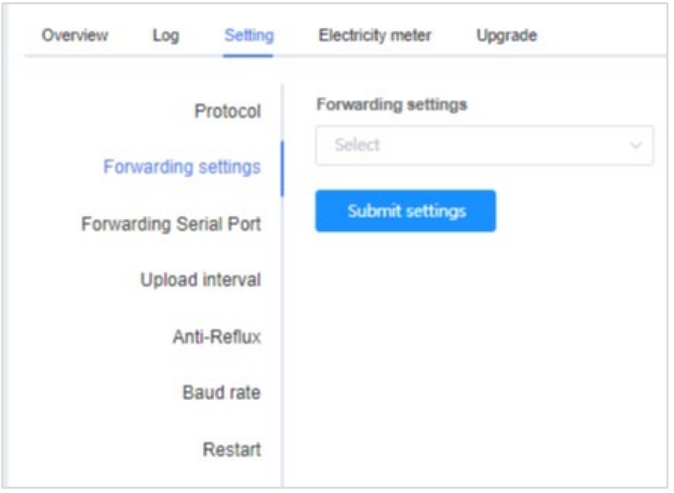


Figure 8-27b Logger Setting

Forwarding Series Port: Enter the communication port, select the baud rate, check digit, protocol type and other information as needed and click the "Submit" button to submit.

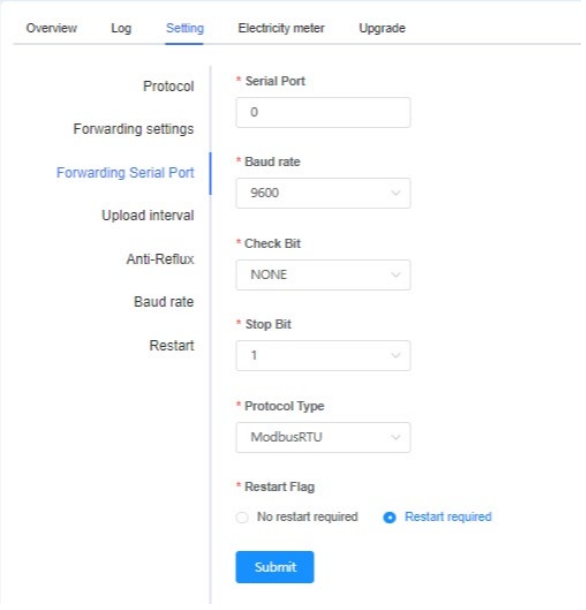


Figure 8-27c Logger Setting

Upload Interval: Configure the upload time of device data, select whether to restart safely (10s-20s), and click the "Submit Settings" button to submit the settings.

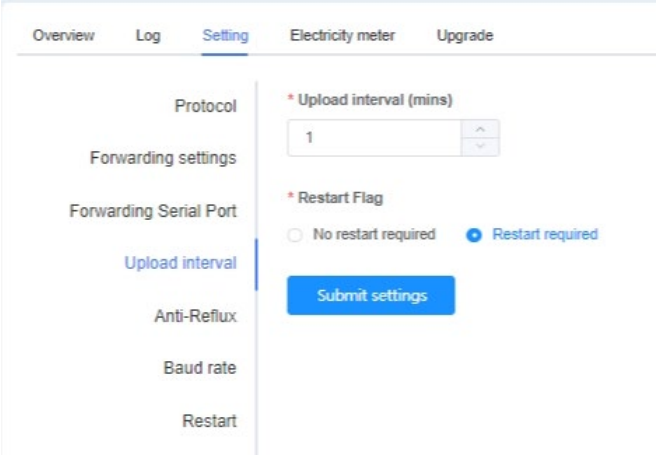


Figure 8-27d Logger Setting

Parameter name	Description
Upload interval	Set the upload interval of device data

Table 8-6 Logger Setting Parameters Description

Baud Rate: Upload speed of communication data. It needs to be consistent with the baud rate of the device. Select or enter the corresponding values or options in each text box, and click "Submit" to confirm the selection and complete the Baud Rate settings.

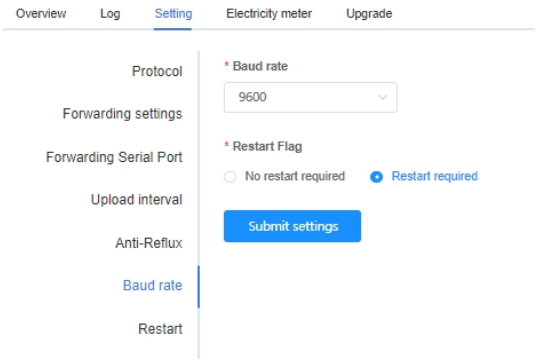


Figure 8-27e Logger Setting

Parameter name	Description
Baud rate	The transmission speed of electronic communication data and baud rate of each model are different. The network card shall be adjusted as required to be consistent.

Table 8-7 Baud Rate Setting Description

Restart: Click to restart Logger.

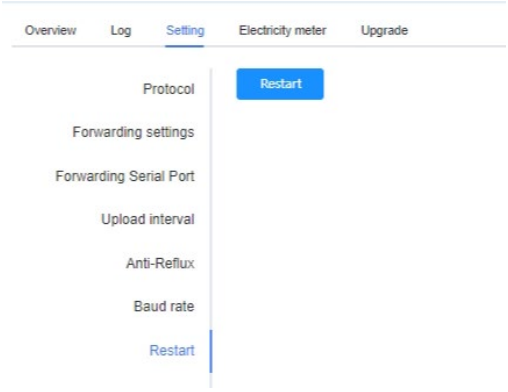


Figure 8-27f Logger Setting

Electricity meter: Select a time range and click the "Search" button to search the corresponding meter list. Click “chart” to show its grid power, consumer,

feedback, and load power in chart.

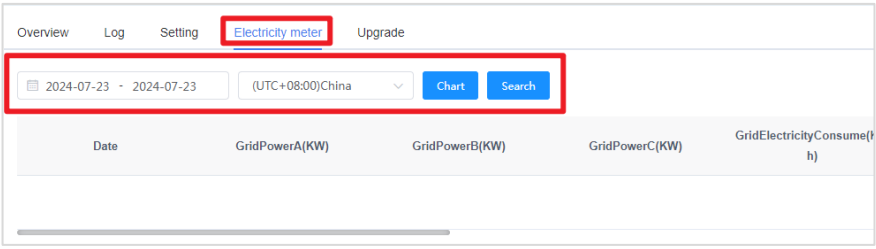


Figure 8-28 Electricity Meter

Upgrade: select time range and search the logger to be upgraded. Click the "…" under the operation column to delete the item.

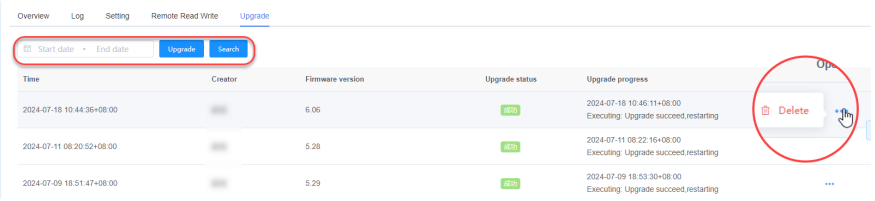


Figure 8-28 Upgrade Tasks

Click "Upgrade" to pop-up an upgrade window. Select firmware in textbox and select reservation options, and click "Confirm" to upgrade.

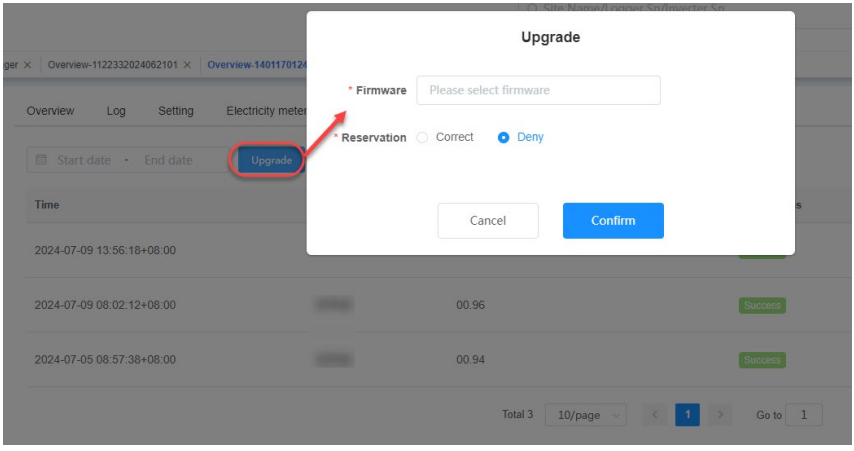


Figure 8-29 Create Upgrade Task

Parameter	Description

Firmware	Firmware version of network card
Reservation	Correct: upgrade according to the reservation time; Deny: upgrade immediately
Reservation time	When the Reservation option is Correct, the time can be selected

Table 8-8 Firmware Upgrade Task Description

8.4.3 Inverter

On the Inverter page, you can select the status of the device in the "All Status" text box, search for the model of the device in the "All Models" text box, enter a keyword in the "Please enter search" text box, and click the "Search" button to search for eligible devices.

For specific device item, you can click the "…" under the operation column to delete or rename it.

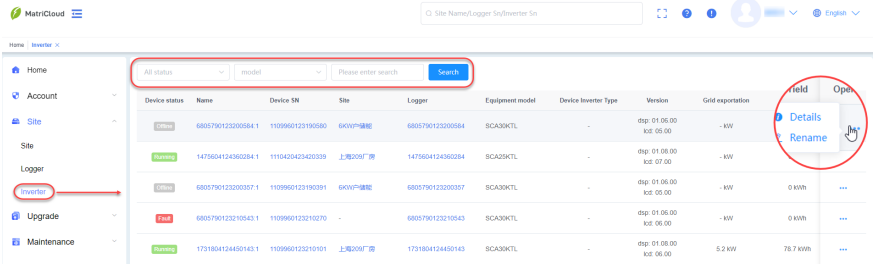


Figure 8-30 Inverter Page

8.4.3.1 Inverter Details

In the device list page, click any device name/SN number to enter the Details page by default and view the details of the device.

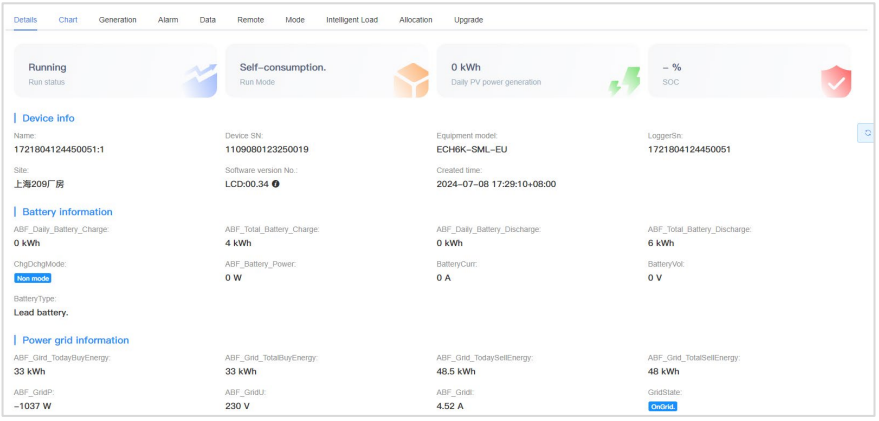


Figure 8-31 Inverter Details

8.4.3.2 Chart

Chart data is displayed by selecting the chart style (simplified or detailed), time interval, time dimension, time range, refresh interval, and filtering curve parameters (generation information, temperature, power, AC, DC).

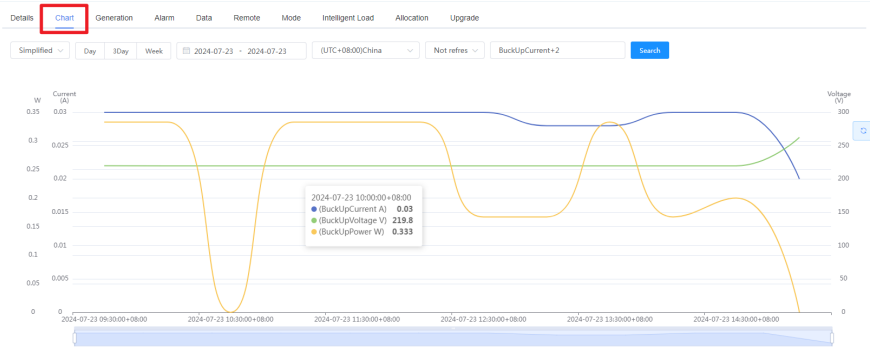


Figure 8-31 Inverter Chart

8.4.3.3 Generation

First, select the time dimension, then click the calendar to select the time or time range, and then click the "Search" button to display the power generation histogram in a variety of time dimensions. You can also click the "Download" button to download the energy yield information of a searched device for a certain time range to your computer.

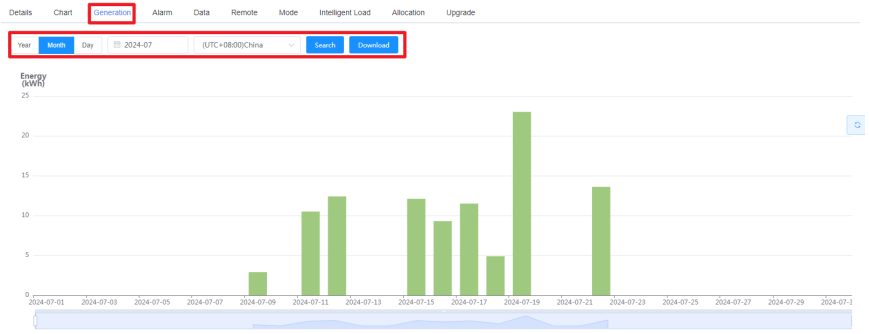


Figure 8-32 Inverter Generation

8.4.3.4 Alarm

You can search for alarm events that occurred within a specified period by selecting the alarm severity and the time range within which the alarm occurred. Click the "Download" button to download the searched alarm information to your computer.

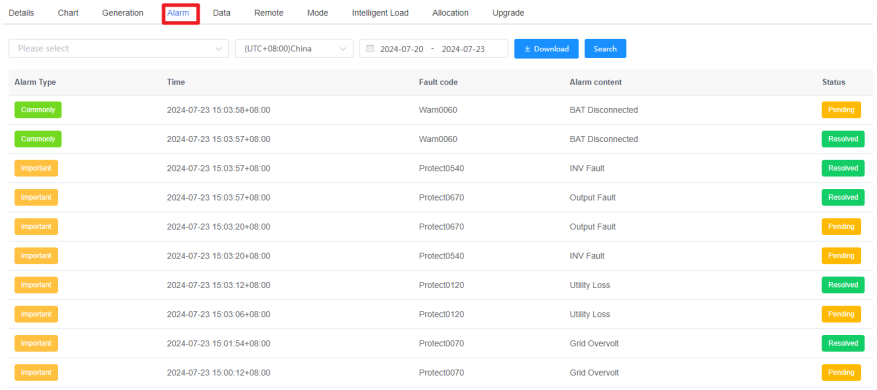


Figure 8-33 Inverter Alarm

8.4.3.5 Data

Select a time range, click "Search" to search for data within that period, and click "Download" to download the data to your computer.

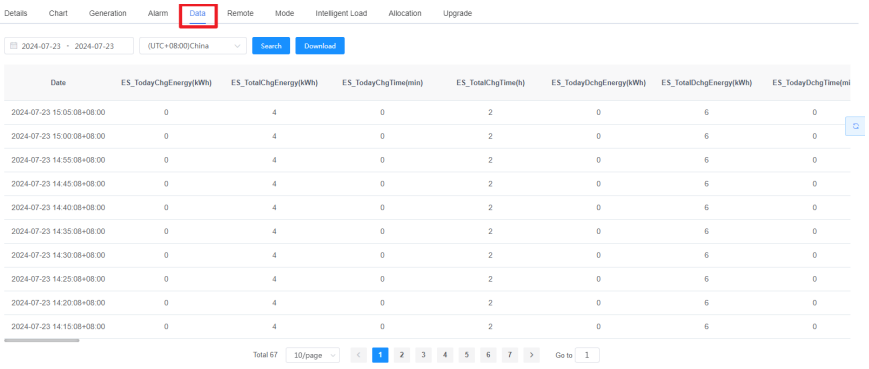


Figure 8-33 Inverter Data

8.4.3.6 Remote

In the Devices interface, click any device name to enter the **Details page** by default. Click **Remote** in the function bar to enter the page to view/edit register parameters.

Select the register group in the “Enter Register Group” text box, enter the register name or keyword in the “Please Enter” text box, then select “Enable Fuzzy Search”, and click the “Search” button to search for register parameters that meet the requirements.

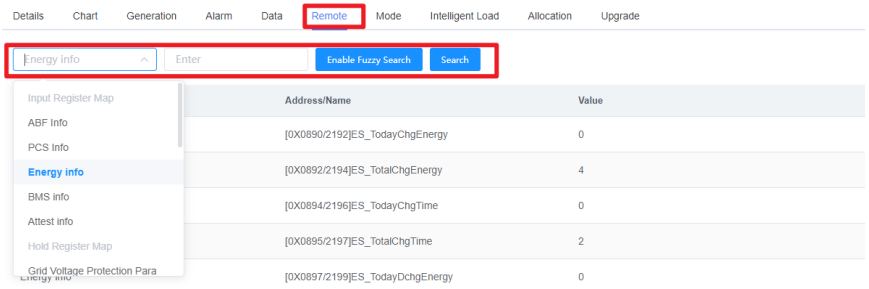


Figure 8-33 Inverter Remote Control

Click the "Read" button in the operation column to read the current register information, and click the "Write" button to write the register information.

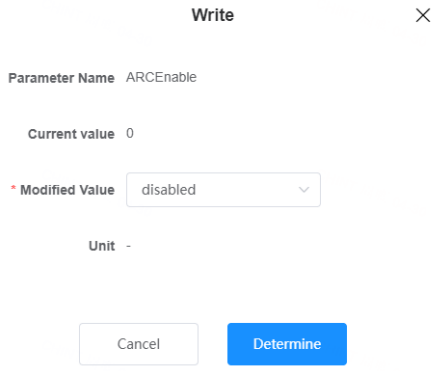


Figure 8-34 Write Register of Inverter

Parameter	Description
Parameter name	Register name
Current value	Current value of the register
Modified value	Value to be modified to; It shall be within the value range.
Unit	Unit

Table 8-9 Register Parameters of Inverter Description

8.4.3.7 Mode

In the Inverter interface, click any device name to enter the Details page by default. Click Mode in the function bar to enter the page to control the machine operation mode (energy storage device only).

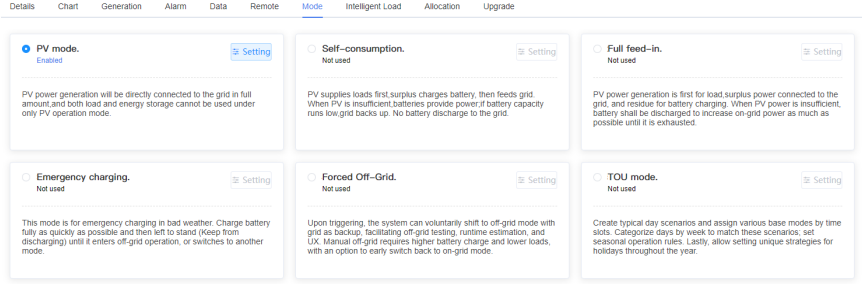


Figure 8-35 Operating Mode

Mode	Description
PV mode	PV power generation will be directly connected to the grid in full amount, and both load and energy storage cannot be used under only PV operation mode.
Self-consumption	PV supplies loads first, surplus charges battery, then feeds grid. When PV is insufficient, batteries is preferred to provide power, if battery capacity runs low, grid backs up. No battery discharge to the grid.
Full feed-in	PV Site is first for load, surplus power connected to the grid, and residue for battery charging, when PV power is insufficient, battery shall be discharged to increase on-grid power as much as possible until it is exhausted.
Emergency charging	This mode is for emergency charging in bad weather. Charge battery fully as quickly as possible and then left to stand (Keep from discharging) until it enters off-grid operation, or switches to another mode
TOU mode	Create typical day scenarios and assign various base modes by time slots. Categorize days by week to match these scenarios; set seasonal operation rules. Lastly, allow setting unique strategies for holidays throughout the year.
Forced off-grid	Upon triggering, the system can voluntarily shift to off-grid mode with grid as backup, facilitating off-grid testing, runtime estimation, and UX. Manual off-grid requires higher battery charge and lower loads, with an option lo early switch back to on-grid mode.

Table 8-10 Operating Mode Description

Click Setting button to set parameters in the corresponding mode. Users can control the operation mode of the device to achieve expected benefits

For example, Click Setting button in TOU mode, you can set up the following parameters.

Figure 8-36 Example of Configuring Operating Mode

8.4.3.8 Intelligent Load

In the Devices page, click any device name to enter the Details page by default, and click Intelligent Load in the function bar to enter the page.

Click Setting button to set parameters in the corresponding mode. Users can control the operation mode of the device to achieve expected control effects.

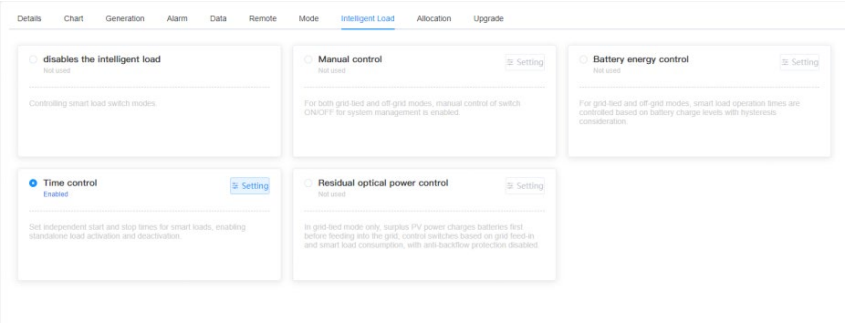


Figure 8-37 Intelligent Load

Mode	Description
Manual control	For both grid-tied and off-grid modes, manual control of switch ON/OFF for system management is enabled.

Battery energy control	For grid-tied and off-grid modes, intelligent load operation times are controlled based on battery charge levels with hysteresis consideration.
Time control	Set independent start and stop times for smart loads, enabling standalone load activation and deactivation.
Residual optical power control	In grid-tied mode only, surplus PV power charges batteries first before feeding into the grid, control switches based on grid feed-in and smart load consumption, with anti-backflow protection disabled.

Table 8-11 Intelligent Load Description

8.4.3.9 Allocation

Select power on or power off function in the ComdOnOff textbox.

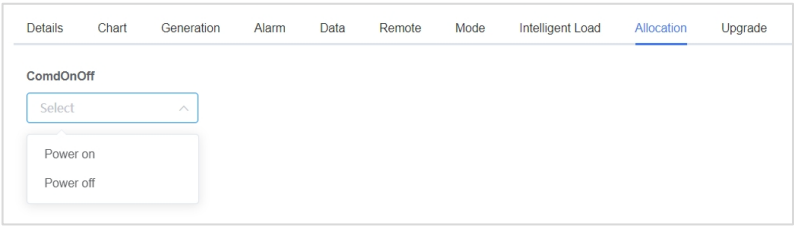


Figure 8-38 Allocation

8.4.3.10 Upgrade

It is mainly used for version upgrade of devices. In the Devices page, click any device name or serial number to enter the **Details** page by default. Click "Upgrade" in the navigation menu to enter the page.

Display device version upgrade history & upgrade log

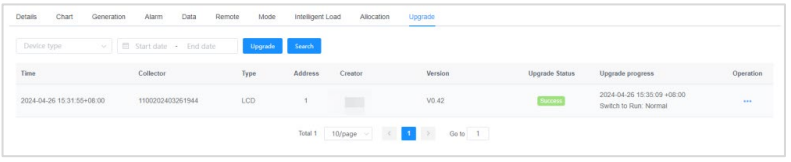


Figure 8-39 Upgrade Page

Click “Upgrade” to upgrade the firmware corresponding to the device

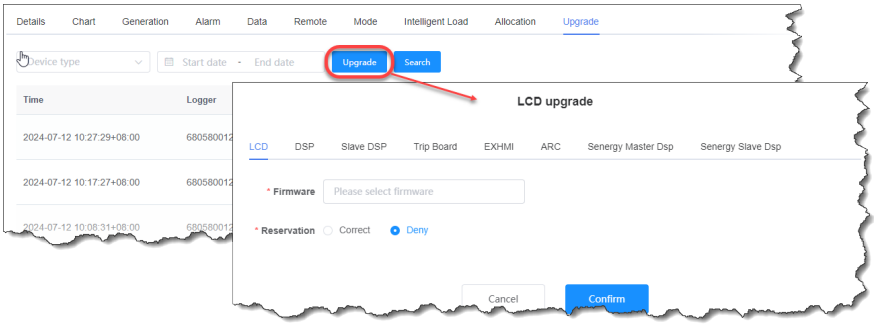


Figure 8-40 Create Upgrade Task

Parameter Description

Parameter	Description
Firmware type	LCD/DSP/Slave DSP/Trip Board/EXHMI/ARC
Firmware	Select the corresponding firmware version
Reservation	Correct: upgrade according to the reservation time; Deny: upgrade immediately
Reservation time	When the Reservation option is Correct, the time can be selected

Table 8-12 Inverter Upgrade Task Description

8.4.4 Upgrade

8.4.4.1 Firmware Upgrade

After logging in to the MatriCloud page, click “Firmware Upgrade” on the left function bar to enter the Firmware List page by default. You can click any menu to select the upgrade items, such as LCD, DSP or ARC, etc.

Select the model or input version in the "model" and "version" text box to search for a list of eligible firmware; or you can delete certain searched items by clicking the Delete icon under the operation column.

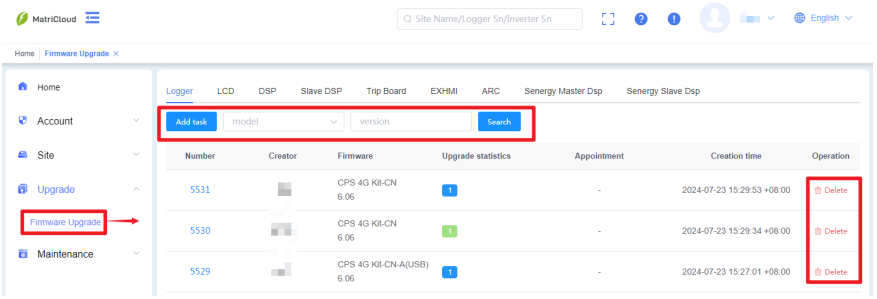


Figure 8-41 Firmware Upgrade Page

Click the "Add Task" button on the far left to add a single/multiple devices for upgrade, as shown in the figure below, enter the firmware, select whether to make an appointment, then select a single/multiple devices, and click the "OK" button to complete the task of adding a gateway upgrade.

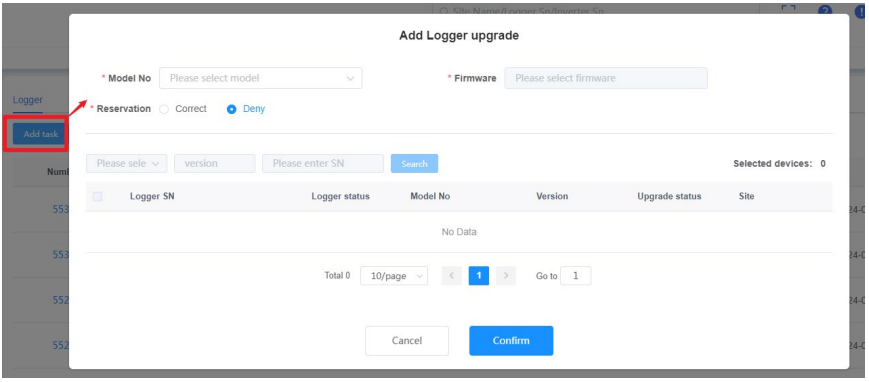


Figure 8-42 Create Firmware Upgrade Task

8.5 Maintenance

8.5.1 Alarm management

Select a site in the Site Screening text box, enter a serial number in the Search SN text box, select an alarm level in the Please Select text box, and select a time in the Time Zone and Time Range text boxes to view the alarm information that meets the requirements.

You can also click the "Download" button to download the energy yield information of a searched device for a certain time range to your computer.

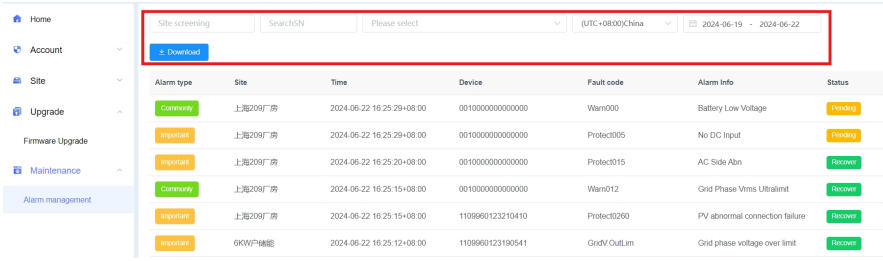


Figure 8-43 Alarm Management

Alarm Type	Description
Urgent	The device stops running, and immediate intervention is required
Important	The efficiency of device operation is affected, and intervention is required
Commonly	No impact on device operation, intervention is optional
Prompt	Messages are prompted

Table 8-13 Alarm Type Description

9. Fault and Maintenance

9.1 Fault Analysis and Troubleshooting

Before contacting after-sales service, you can check the working environment of the inverter based on the following points, quickly locate the cause of the fault, and follow the recommended troubleshooting methods.

1. Internal information of the inverter: You can view the occurrence time and frequency of the fault through the APP or webpage, and handle it according to the corresponding "Solution" based on the “Fault Description ", as shown in the table below.
2. Device installation environment: Check weather conditions and whether components are obstructed, etc. It is recommended to provide photos, videos, and other files to assist in analyzing the installation environment.
3. Power grid: Check whether there is a power failure on the power grid, resulting in an abnormal alarm on the power grid side.
4. PV panel: Check whether the PV panel is damaged and whether the installation joints are aged or loose.
5. Battery: Check whether the battery switch is closed and whether the battery power runs out.
6. Electrical cable: Check whether the cables at the joints of each node are aged or damaged.

Table 6-1 Energy Storage Inverter Fault Information

Fault description	Alarm code	Solutions
Fan Fault	Warn0020	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Over Temp Protection	Protect0140	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Low Temp Warn	Warn0010	1. Confirm whether the ambient temperature is within the working range; 2. Observe whether it is automatically cleared within 5 min; 3. Turn off the machine if it is not cleared, and restart it after 5 min; 4. If the fault still exists, please contact the after-sales service center.
Grid Relay Fault	Protect0130	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Utility Loss	Protect0120	1. Check whether the AC circuit breaker is closed. 2. Check whether the cable connection on the power grid side is correct. 3. Check whether the power grid quality is reliable. 4. If the fault still exists, please contact the after-sales service center.
Grid Underfreq	Protect0110	1. Observe whether it is automatically cleared within 10 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Grid Overfreq	Protect0100	1. Observe whether it is automatically cleared within 10 min;

		2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Grid Undervolt	Protect0080	1. Observe whether it is automatically cleared within 10 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Grid Overvolt	Protect0070	1. Observe whether it is automatically cleared within 10 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
	Protect0210	
Bus Overvolt	Protect0050	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
BUS Fault	Protect0450	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
BUS Lowvolt	Protect0640	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Bus HW Overvolt	Protect0300	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Para ID Setting Error	Protect0290	Please contact the after-sales service center.
Para Setting Error	Protect0280	1、Check whether anti-reverse current enabled of each machine are consistent; 2、If the fault still exists, please contact the after-sales service center.
	Warn0000	

INV Relay Fault	Protect0260	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
INV Overcurr	Protect0090	1. Observe whether it is automatically cleared within 5 min; 2. Reduce the load of Back up and observe whether the fault is cleared; 3. Turn off the machine if it is not cleared, and restart it after 5 min; 4. If the fault still exists, please contact the after-sales service center.
INV HW Overcurr	Protect0240	1. Observe whether it is automatically cleared within 5 min; 2. Reduce the load of Back up and observe whether the fault is cleared; 3. Turn off the machine if it is not cleared, and restart it after 5 min; 4. If the fault still exists, please contact the after-sales service center.
INV Fault	Protect0540 Protect0530 Protect0520 Protect0500 Protect0760	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Leakage Curr Fault	Protect0650	1. Observe whether it is automatically cleared within 5 min; 2. If the environment is normal, please check whether the insulation impedance of PV string to ground is too low and whether the AC cable insulation is good; 3. Turn off the machine if it is not cleared, and restart it after 5 min; 4. If the fault still exists, please contact the after-sales service center.
Leakage Curr Rapid Fault	Protect0200	1. Observe whether it is automatically cleared within 5 min; 2. If the environment is normal, please check whether the insulation impedance of PV string to ground is too low and whether the AC cable insulation is good; 3. Turn off the machine if it is not cleared, and restart it after 5 min; 4. If the fault still exists, please contact the after-sales service center.

ISO Fault	Protect0190	1. Observe whether it is automatically cleared within 5 min; 2. If the environment is normal, please check whether the wiring of PV modules is in good condition; 3. Turn off the machine if it is not cleared, and restart it after 5 min; 4. If the fault still exists, please contact the after-sales service center.
DCI Fault	Protect0180	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV1 Overcurr	Protect0060	1. Check whether the configuration of PV panels is within the specified range; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV2 Overcurr	Protect0040	1. Check whether the configuration of PV panels is within the specified range; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV1 Overvolt	Protect0410	1. Check whether the configuration of PV panels is within the specified range; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV2 Overvolt	Protect0430	1. Check whether the configuration of PV panels is within the specified range; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV1 Reverse Connect	Protect0400	1. Check whether the polarity of PV string is correct; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV2 Reverse Connect	Protect0420	1. Check whether the polarity of PV string is correct; 2. Turn off the machine if it is not cleared, and restart it after 5 min;

		3. If the fault still exists, please contact the after-sales service center.
PV1 HW Overcurr	Protect0370	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV2 HW Overcurr	Protect0360	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
PV Fault	Protect0490	Please contact the after-sales service center.
Output Fault	Protect0350 Protect0330 Protect0670	1. Observe whether it is automatically cleared within 5 min; 2. Check whether the wiring of Back up port is short-circuited. 3. If the fault still exists, please contact the after-sales service center.
AFCI Fault	Protect0630	1. Check whether the PV wiring and PV module wiring are loose and in good contact, and observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
AFCI Self-test Fault	Protect0620	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
GFCI Self-test Fail	Protect0310	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
System Fault	 Protect0610	1. Check whether the AC cable is damaged, and whether the terminal is loose or in poor contact; 2. Observe whether it is automatically cleared within 5 min; 3. Turn off the machine if it is not cleared, and restart it after 5 min;

		4. If the fault still exists, please contact the after-sales service center.
BAT Undervolt	Protect0570	1. This fault indicates that the battery energy is insufficient or the battery voltage is lower than the set protection point at this time. If the photovoltaic system is normal or the power grid is normal, the battery will automatically turn to the charging state and the fault can be automatically cleared. 2. If the fault still exists, please contact the after-sales service center.
BAT Lowvolt	Protect0560	1. This fault indicates that the battery energy is insufficient or the battery voltage is lower than the set protection point at this time. If the photovoltaic system is normal or the power grid is normal, the battery will automatically turn to the charging state and the fault can be automatically cleared. 2. If the fault still exists, please contact the after-sales service center.
BAT Overvolt	Protect0550	1. Check whether the battery voltage exceeds the specification; 2. Observe whether it is automatically cleared within 5 min; 3. Turn off the machine if it is not cleared, and restart it after 5 min; 4. If the fault still exists, please contact the after-sales service center.
BAT Activation Failed	Protect0700	1. Check whether the battery is connected normally; 2. Check whether the activation voltage of inverter is abnormal; 3. If the fault still exists, please contact the after-sales service center.
BAT Disconnected	Warn0060	1. Check whether the battery is connected normally; 2. Check whether the battery is turned on normally.
BAT Fault	Protect0680	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
	Protect0270	
BAT Overcurr	Protect0250	1. Observe whether it is automatically cleared within 5 min; 2. Check whether the power of Back up is too large; 3. If the fault still exists, please contact the after-sales service center.

BAT Temp Fault	Protect0230	1. Observe whether it is automatically cleared within 5 min; 2. Check whether the ambient temperature meets battery specifications; 3. Check whether the NTC thermistor is connected correctly; 4. Check whether the NTC thermistor is damaged; 5. If the fault still exists, please contact the after-sales service center.
DCDC Fault	Protect0480 Protect0770	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
MidBus Fault	Protect0750 Protect0660	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Overload	Protect0740 Protect0730 Protect0720 Protect0690	1. Observe whether it is automatically cleared within 5 min; 2. Check whether the power of Back up is too large; 3. If the fault still exists, please contact the after-sales service center.
Buck-Boost Overcurr	Protect0160	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Buck-Boost HW Overcurr	Protect0710	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
LLC HW Overcurr	Protect0460	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min;

		3. If the fault still exists, please contact the after-sales service center.
Meter Comm Fault	Warn2000	1. Check whether the electric meter is connected normally; 2. Check whether there is grid voltage; 3. If the fault still exists, please contact the after-sales service center.
BMS Comm Fault	Fault0201	1. Check whether the network cable of BMS communication is connected normally; 2. Check whether the battery is turned on; 3. If the fault still exists, please contact the after-sales service center.
DSP Comm Fault	Fault0200 Protect0020	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
MCU Comm Fault	Protect0150	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Eeprom Fault	Protect0030	1. Observe whether it is automatically cleared within 5 min; 2. Turn off the machine if it is not cleared, and restart it after 5 min; 3. If the fault still exists, please contact the after-sales service center.
Para CAN Comm Fault	Protect0010	1. Check whether the network cable of parallel communication is connected normally; 2. Check whether the parallel dial switch is set to the correct position; 3. If the fault still exists, please contact the after-sales service center.

9.2 Fault Maintenance

9.2.1 Inverter Power-off

WARNING:

Before maintenance, you need to shut down the inverter first and then power off the inverter. Wait for 5 minutes after powering off, then you can begin maintenance.

- **Step 1:** Shut down the inverter.
- **Step 2:** Disconnect the inverter ON-GRID AC circuit breaker.
- **Step 3:** Disconnect the inverter BACK-UP AC circuit breaker.
- **Step 4:** Disconnect the inverter PV Switch.
- **Step 5:** Disconnect the energy storage circuit breaker between inverter and battery.

9.2.2 Inverter Removal

DANGER:

- Ensure that the inverter is de-energized.
- Wear personal protective equipment when operating the inverter.

- **Step 1:** Disconnect all electrical connections of the inverter, including DC cable, AC cable, communication cable, communication module, and protective earth cable.
- **Step 2:** Remove the inverter from the back bracket.
- **Step 3:** Remove the back bracket.
- **Step 4:** Properly store the inverter. If the inverter needs to be put into use in the future, ensure that the storage conditions meet the requirements.

9.3 Routine Maintenance

WARNING:

Before maintenance, you need to shut down the inverter first and then power off the inverter. Wait for 5 minutes after powering off, then you can begin maintenance.

Inverters usually do not require maintenance, but in order to ensure the long-term

good operation of the inverter, it is recommended to perform routine maintenance according to this chapter.

- **Inverter cleaning:**
  1. Clean the inverter with an electric compressed air blower, a dry soft cloth or a soft brush.
  2. Do not use water, corrosive chemicals, cleaning agents or strong detergents to clean the inverter.
- **Cooling fin cleaning:**
  1. Ensure that there is enough airflow space around the radiator at the rear of the inverter and there shall be no substances that hinder airflow around the cooling fin, such as dust or snow which must be removed, to ensure the normal function and long-term service life of the inverter.
  2. Clean the cooling fins with compressed air, soft cloth or soft brush.
  3. Do not use water, corrosive chemicals, cleaning agents or strong detergents to clean the cooling fin.
- **System cleaning:**
  1. Regularly check whether the inverter is blocked or stained.
  2. Do it every six months to one year.
- System operation state indicator:
  1. Observe whether the appearance of the inverter is damaged or deformed. Listen if there is any abnormal sound when the inverter is running. When running, check if the parameters of inverter are right.
  2. Do it every six months.
- **Electrical connection:**
  1. Check whether the cable connection is disengaged or loose, whether the cable is damaged, and especially whether there are any cut marks on the surface of the cable in contact with the metal surface. Check if the terminals are locked.
  2. Do it every six months to one year.
- **Earthing reliability:**
  1. Check whether the earth cable is reliably earthed.
  2. Do it every six months to one year.

10. Technical Data

Model (ECHxxK-SML-EU)	3K	3.6K	4.6K	5K	6K
Efficiency					
Max. Efficiency	97.50%	97.5%	97.5%	97.5%	97.5%
Eur. Efficiency	96.50%	96.50%	96.80%	96.80%	96.70%
Input (PV)					
Max. Input Voltage (V)	600				
Max. Input Power (W)	9000	9680	10600	10800	10800
Rated Input Voltage (V)	360				
Max. Input Current (A)	2*16				
Max. Short Circuit Current (A)	2*20				
Start Input Voltage (V)	100				
MPPT voltage range of Full load (V)	150-500		200-500		
MPPT Operating Voltage Range (V)	80-550				
No. of Strings per MPPT	1				
No. of MPPTs	2				
Input (Battery)					
Battery Type	Lithium-ion/Lead-Acid				
Nominal Battery Voltage (V)	48				
Battery Voltage Range (V)	40-60				
Cut Off Voltage (V)	40				
Max. Protective Voltage (V)	61				
Max. Charge/Discharge Current (A)	120 / 60	120 / 75	120 / 95	120 / 120	120 / 120
Max. Charge/Discharge Power (W)	6000 / 3000	6000 /3680	6000 / 4600	6000 / 5000	6000 / 6000
Lithium-ion Battery Charge Curve	Self-adaption to BMS				
Lead-Acid Battery Charge Curve	3 stages				
Input (From Grid)					
Max. Apparent Power from Utility Grid (VA)	12000	12000	12000	12000	12000
Max. AC Current Input from Utility Grid (A)	54.6	54.6	54.6	54.6	54.6
Rated AC Input Voltage	L/N/PE~220/230V				
AC Voltage Range	176V-276V(Adjustable)				
Rated Grid Frequency	50Hz/60Hz				
Grid Frequency Range	45Hz~55Hz / 55Hz~65Hz (Adjustable)				

Power Factor	> 0.99 Rated power (Adjustable 0.8 Leading - 0.8 Lagging)				
Output (To Grid)					
Rated AC Apparent Power (VA)	3000	3680	4600	5000	6000
Max. AC Apparent power(VA)	3300	4048	4600	5500	6000
Rated AC Voltage (V)	220/230				
Rated AC Output Current(A)	13.7/ 13.1	16.8/ 16.0	21.0/ 20.0	22.8/ 21.8	27.3/ 26.1
Max. AC Current Output to Utility Grid (A)	15.0	18.4	21.0	25.0	27.3
AC Voltage Range ①	176V-276V(Adjustable)				
Rated Grid Frequency (Hz)	50/60				
Grid Frequency Range ②	45Hz~55Hz / 55Hz~65Hz (Adjustable)				
THDI	<2% （Rated Power）				
Power Factor	> 0.99 Rated power (Adjustable 0.8 Leading - 0.8 Lagging)				
Output (BACK-UP)					
Max. Output Apparent Power (VA)**On Grid**	12000	12000	12000	12000	12000
Max. Output Current(A) **On Grid**	54.6	54.6	54.6	54.6	54.6
Max. Output Apparent Power (VA)**Off Grid**	3300	4000	5060@ 30min	5500	6600@ 30min
Nominal Output Apparent Power (VA) **Off Grid**	3000	3680	4600	5000	6000
Max. Output Current (A)**Off Grid**	15.0	18.4	21.0	25.0	27.3
Peak Output Apparent power (VA) **Off Grid**	4500@ 60S	5500@ 60S	6900@ 60S	7500@ 60S	9000@ 60S
Nominal Output Voltage (V)	220/230				
Nominal Output Current(A)	13.7/ 13.1	16.8/ 16.0	21.0/ 20.0	22.8/ 21.8	27.3/ 26.1
Nominal Output Frequency (Hz)	50/60				
THDV	<2% @100% R Load				
Switching Time (Typical)	<10ms				
Protection					
DC switch	Support				
Anti-islanding protection	Support				
Zero export to the grid	Meter+CT				
AC overcurrent protection	Support				
AC Overvoltage Protection	Support				
AC short circuit protection	Support				

PV String reverse connection	Support
Overvoltage Category	III(Mains)，II(PV, Battery)
Surge Arrester	AC Type II，DC Type II
Insulation detection	Support
Leakage current protection	Support
AFCI	Support
RSD Function	Support
Arc Fault Protection Equipment Classification	F-I-AFPE-1-1-2
General	
Protective Class	I
Pollution Degree	III
Topology	Non-Isolation(PV), High Frequency Isolation (Battery)
IP Rating	IP66
Self-consumption at Night (W)	<15
Cooling	Natural cooling
Operating Temperature Range	-25℃-60℃
Relative Humidity Range	0-100%
Max. Operating Altitude	4000m[Derating began at 3000m （-30%Pn/Km）]
Noise (Typical)	<35dB
Dimensions (W*H*D)	460*460*203mm
Weight	26Kg
Mounting Method	Wall Mounting
Max. Parallel Number of inverters	5
Environmental Category	4K4H
HMI & COM	
Display	LED&APP
Communication	RS485, CAN, WIFI/4G(optional)
Certification	
Safety	IEC/EN62109-1&2 IEC/EN62477-1 IEC/EN61727 / 62116 IEC/EN61000-6-1/2/3
Grid Code	German VDE 4105 Italy CEI 0-21 Holland EN 50549-1 Poland PTPiREE+NCRfG Spain NTS 2.1，217001，217002

Warranty	5 Years/10 Years (Optional)
Remarks:	
* The maximum output power in Germany market is 4600 VA;	
* The maximum output power in the Italian market is considered for 10% overload, except for 6 KW;	
*AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback;	
* DRM is considered for Australian market. * RRCR	

11. Quality Assurance

11.1 Liability exemption

1. Exceed the quality assurance period of the product.
2. Cannot provide product serial number or the SN is not clear/complete.
3. Damage during transportation/storage/handling.
4. Misuse, abuse, intentional damage, negligence, or accidental damage.
5. Improper commissioning, testing, operation, maintenance, or installation performed by customer, including but not limited to:
   - Failure to meet safe operating environment or system requirements of external electrical parameters provided in written document;
   - Failure to operate the covered product in accordance with the product's operating manual or user guide;
   - Relocate and reinstall systems not in accordance with the requirements of Chint power;
   - Unsafe electrical or chemical environment or other similar kind of conditions;
   - Direct failure caused by wrong voltage or faulty power system;
   - Unauthorized disassembly of the products, or unauthorized modification of the product or provided software;
6. Entrust installation, maintenance personnel not designated by the CHINT to install, repair, and disassemble the products;
7. Damages caused by ignoring the safety warnings in the manual or break the rules in relevant statutory safety regulations;
8. Damages caused by operating environment beyond the requirements of the product user manual or failure to commissioning, install, use and maintain the equipment according to the requirements of the product user manual.
9. Equipment malfunctions or software damages caused by using non-standard components/accessories specified by CHINT, connecting incompatible configurations (such as batteries) or unauthorized products or accessories from other brands, or caused by improper configuration selection/storage/use.
10. Unforeseen disasters or irresistible accidents (including but not limited to acts of public enemies, acts of government agencies or domestic or foreign institutions, vandalism, riots, fires, floods, typhoons, explosions or other disasters, epidemic or quarantine restrictions, labor disturbances or labor shortages, accidents, cargo embargoes or any other events beyond the control of CHINT).
11. Other circumstances that are not covered by the company's after-sales warranty agreement.

11.2 Quality Clause (warranty clause)

1. For products that fail during the warranty period, our company will repair or replace new products free of charge; Customer shall present the invoice of the product and date of purchase. At the same time, the trademark on the product should be clearly visible, otherwise we have rights to refuse quality assurance.
2. The unqualified product under replacement should be returned to our company;
3. It is necessary to provide a reasonable time for the company to overhaul the equipment.
4. For more warranty terms, refer to the applicable standard warranty policy in place at time of purchase

If you have any questions, please contact us, we will be very happy to help you.

12. Recycling and Scrapping

The dealer or installer shall remove the inverter from the PV module and contact the inverter manufacturer to handle it as instructed.

The inverter cannot be scrapped as household garbage.

When the inverter service life expires, please dispose of it in accordance with the applicable electrical waste disposal laws in the place where it is installed. You can contact the inverter manufacturer or dealer for handling.

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