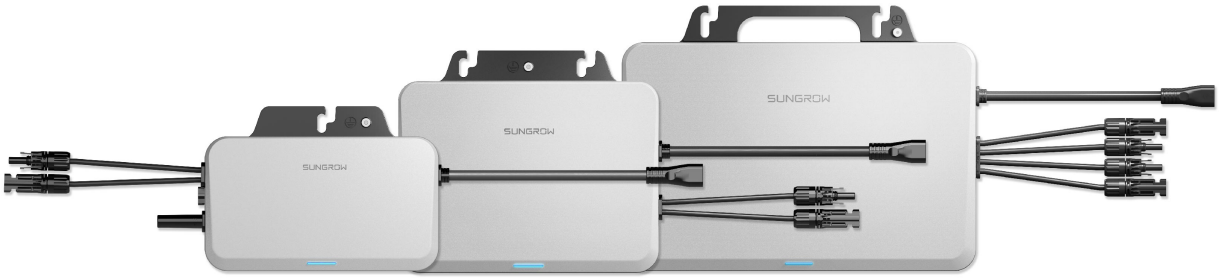
SUNGROW
Clean power for all

User Manual

Single-Phase Microinverter

S450S-L/S1000S-L/S2000S-L



S450_1000_2000S-L-UEN-Ver14-202511

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About This Manual

The manual mainly contains the product information, as well as guidelines for installation, operation, and maintenance. The manual does not include complete information about the photovoltaic (PV) system. Readers can get additional information at **www.sungrowpower.com** or on the webpage of the respective component manufacturer.

Validity

This manual is valid for the following microinverters:

- S450S-L
- S1000S-L
- S2000S-L

It will be referred to as "microinverter" hereinafter unless otherwise specified.

Target Group

This manual is intended for professional technicians who are responsible for installation, operation, and maintenance of microinverters, and users who need to check the parameters of microinverters.

The microinverter must only be installed by professional technicians. The professional technician is required to meet the following requirements:

- Know electronic, electrical wiring and mechanical expertise, and be familiar with electrical and mechanical schematics.
- Have received professional training related to the installation and commissioning of electrical equipment.
- Be able to quickly respond to hazards or emergencies that occur during installation and commissioning.
- Be familiar with local standards and relevant safety regulations of electrical systems.
- Read this manual thoroughly and understand the safety instructions related to operations.

How to Use This Manual

Please read this manual carefully before using the product and keep it properly at a place for easy access.

All contents, pictures, marks, and symbols in this manual are owned by SUNGROW. No part of this document may be reprinted by the non-internal staff of SUNGROW without written authorization.

Contents of this manual may be periodically updated or revised, and the actual product purchased shall prevail. Users can obtain the latest manual from **support.sungrowpower.com** or sales channels.

Security Declaration

For details on the product's network security vulnerability response process and vulnerability disclosure, please visit the following website: https://en.sungrowpower.com/security-vulnerability-management.

For more information on network security, please refer to the user manual of the communication module or the Data Logger that comes with the product.

Symbols

This manual contains important safety instructions, which are highlighted with the following symbols, to ensure personal and property safety during usage, or to help optimize the product performance in an efficient way.

Please carefully understand the meaning of these warning symbols to better use the manual.

⚠ DANGER

Indicates high-risk potential hazards that, if not avoided, may lead to death or serious injury.

⚠ WARNING

Indicates moderate-risk potential hazards that, if not avoided, may lead to death or serious injury.

⚠ CAUTION

Indicates low-risk potential hazards that, if not avoided, may lead to minor or moderate injury.

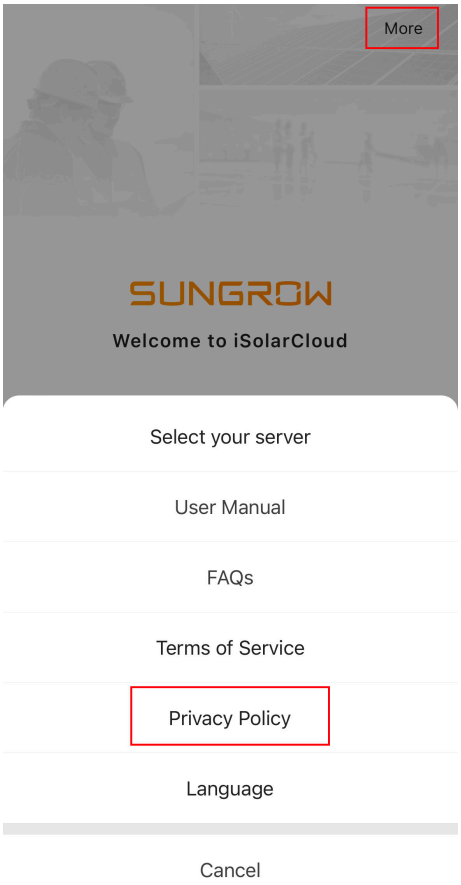
NOTICE

Indicates potential risks that, if not avoided, may lead to device malfunctions or financial losses.

"NOTE" indicates additional information, emphasized contents or tips that may be helpful, e.g., to help you solve problems or save time.

Privacy Policy

The Microinverter device itself does not collect any personal data or telemetry data. It may collect information such as power generation data and product operation data for calculation purposes. You can check and manage such information on the iSolarCloud App. The privacy policy can be found on the login screen of the App.



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1 Safety Instructions

When installing, commissioning, operating, and maintaining the product, strictly observe the labels on the product and the safety requirements in the manual. Incorrect operation or work may cause:

- Injury or death to the operator or a third party.
- Damage to the product and other properties.

⚠ WARNING

- **Do not perform any operation on the product (including but not limited to, handling, installing, powering on, or maintaining the product, performing electrical connection, and working at heights) in harsh weather conditions, such as thunder and lightning, rain, snow, and Level 6 or stronger winds. SUNGROW shall not be held liable for any damage to the device due to force majeure, such as earthquakes, floods, volcanic eruptions, mudslides, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and other extreme weathers.**
- **In case of fire, evacuate from the building or product area and call the fire alarm. Re-entry into the burning area is strictly prohibited under any circumstances.**
- **To protect its internal components, during manufacture, after the product enclosure is closed, sealant will be injected into the product. Do not disassemble the product when using it. Forcible disassembly may damage the product, and the losses caused therefrom will not be covered by warranty.**

NOTICE

- **Tighten the screws with the specified torque using tools when fastening the product and terminals. Otherwise, the product may be damaged. And the damage caused is not covered by the warranty.**
- **Learn how to use tools correctly before using them to avoid hurting people or damaging the device.**
- **Maintain the device with sufficient knowledge of this manual and use proper tools.**

- The safety instructions in this manual are only supplements and cannot cover all the precautions that should be followed. Perform operations considering actual onsite conditions.
- SUNGROW shall not be held liable for any damage caused by violation of general safety operation requirements, general safety standards, or any safety instruction in this manual.
- When installing, operating, and maintaining the product, comply with local laws and regulations. The safety precautions in this manual are only supplements to local laws and regulations.
- During the product transport, installation, wiring, maintenance, etc., the materials and tools prepared by users must meet the requirements of applicable local laws and regulations, safety standards, and other specifications. SUNGROW shall not be held liable for any damage to the product caused by the adoption of materials and tools that fail to meet the above-mentioned requirements.
- Operations on the product, including but not limited to, handling, installing, wiring, powering on, maintenance, and use of the product, must not be performed by unqualified personnel. SUNGROW shall not be held liable for any damage to the product resulting from operations done by unqualified personnel.
- Where the transport of the product is arranged by users, SUNGROW shall not be held liable for any damage to the product that is caused by users themselves or the third-party transport service providers designated by the users.
- SUNGROW shall not be held liable for any damage to the product caused by the negligence, intent, fault, improper operation, and other behaviors of users or third-party organizations.
- SUNGROW shall not be held liable for any damage to the product arising from reasons unrelated to SUNGROW.

2 Product Description

2.1 Microinverter-based Grid-connected PV System

System Introduction

The microinverter-based grid-connected PV system is mainly composed of the PV modules, grid-connected PV microinverter ("microinverter"), communication and data acquisition device (optional), monitoring platform, and power grid. The system structure is shown below. As an integral part of the PV power system, the microinverter converts the DC power generated from the PV modules into the grid-compatible AC power and feeds it to the grid.

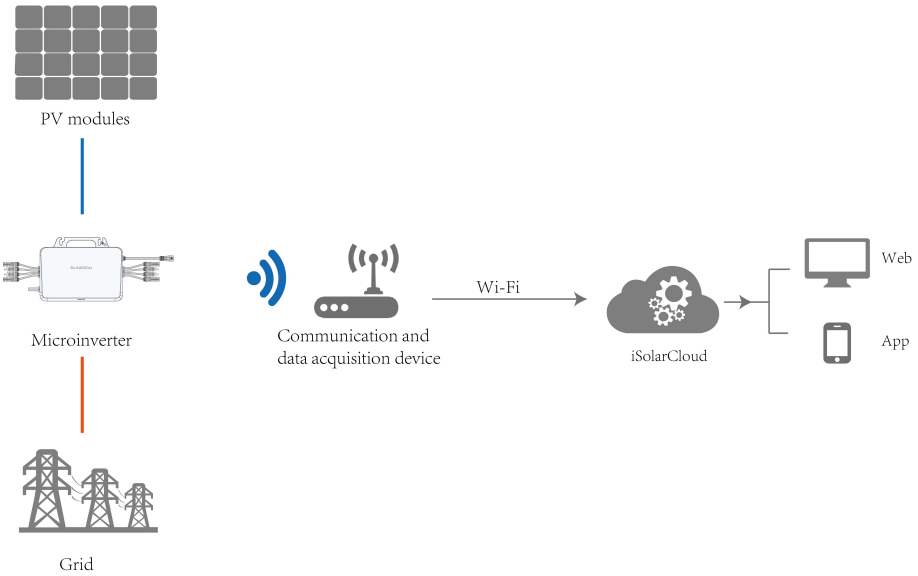


Figure 2-1 Microinverter-based Grid-connected PV System

Microinverter

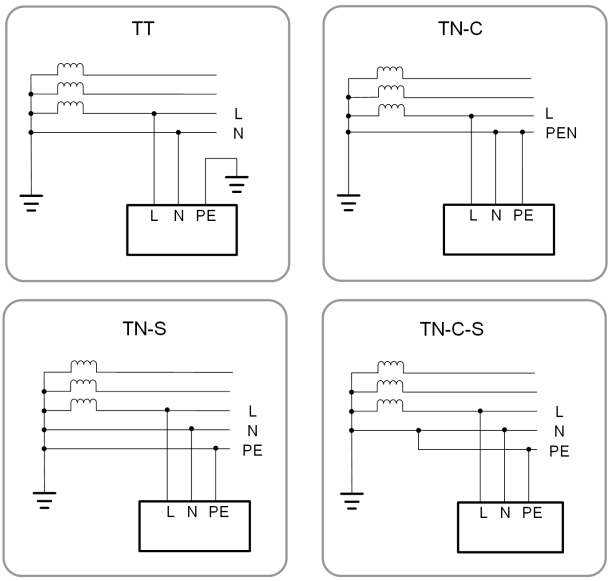
The microinverter is a type of solar inverter that can convert the DC power generated from PV modules into the grid-compatible AC power. Compared with central and string inverters, the microinverter has the advantages of high production and great safety performance and is now widely applied in residential and distributed PV systems.

With its built-in Wi-Fi function, the microinverter can access the Internet through a wireless home router and then upload the data generated during its operation to iSolarCloud. Users can log in to the iSolarCloud monitoring platform or iSolarCloud App to check the cloud data.

This telecommunication equipment conforms to the technical standards or requirements of NBTC.

Grid

The following figure shows the common grid configurations.



iSolarCloud Monitoring Platform

The iSolarCloud monitoring platform is a Web-based monitoring and management software. The platform allows users to view detailed production and performance data of the microinverter. It also enables users to manage and maintain the device remotely and remove some possible faults and alarms in the earliest stage, thus ensuring the device's stable operation. For more information, please refer to the user manual for the iSolarCloud monitoring platform.

iSolarCloud App

The iSolarCloud App is a mobile application designed for new energy power plant management. It can be used on Android and iOS devices. Users can view the plant's running data on the App. It also provides functions such as quick access to the plant, remote parameter setting, quick fault location and notification, and yield and revenue analyzing. The App enables more efficient management since it is not dependent on PC. For more information, please refer to the user manual for the iSolarCloud App.

2.2 Microinverter

Types of Microinverters

Based on the number of PV modules that can be connected, the microinverters are divided into three types: “1-in-1”, “2-in-1”, and “4-in-1”. Only one PV module can be connected

to an "1-in-1" microinverter, while two to a "2-in-1" microinverter and four to a "4-in-1" microinverter.

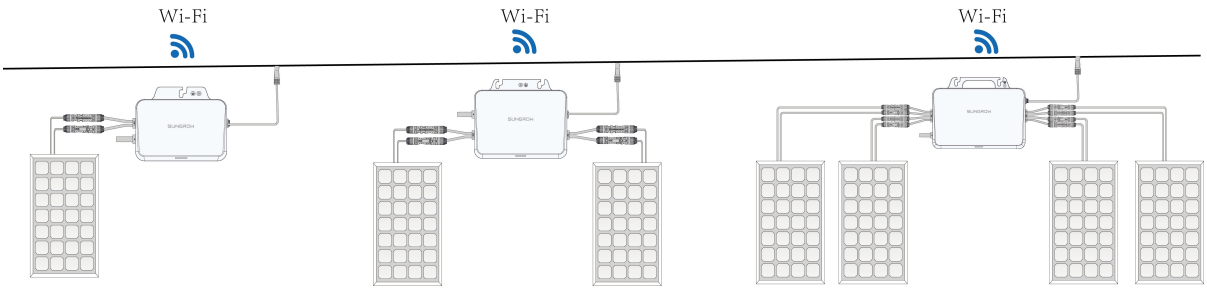


Figure 2-2 Types of Microinverters

Features

- High power generation efficiency: In the microinverter-based grid-connected PV system, the microinverter guarantees that the PV modules all work at their optimal performance, through independent MPPT control for each module. Since the modules each has an independent MPPT, their power generation performance will not be affected by each other. That is, the decrease in the power generation of a single module, due to shading, orientation, or other factors, will not affect the power generation efficiency of other modules in the system.
- Great safety performance: As the microinverter has a relatively low DC voltage rating, only tens of volts, the potential fire risk caused by high-voltage DC arcs is eliminated and the safety is further guaranteed.
- Smarter O&M: The microinverter supports module-level operation and maintenance. Users can locate every one of the PV modules precisely and perform diagnosis of their operating status, which makes O&M easier and smarter.

2.3 Application Scenarios

Given its high power generation efficiency and great safety performance, the microinverter has been widely applied in residential PV systems.

⚠ WARNING

The S450S-L, S1000S-L and S2000S-L are single-phase microinverters.Do not use them in three-phase systems.

2.3.1 Rooftop PV System

In the rooftop PV system, up to 3 microinverters can be connected to one trunk cable.

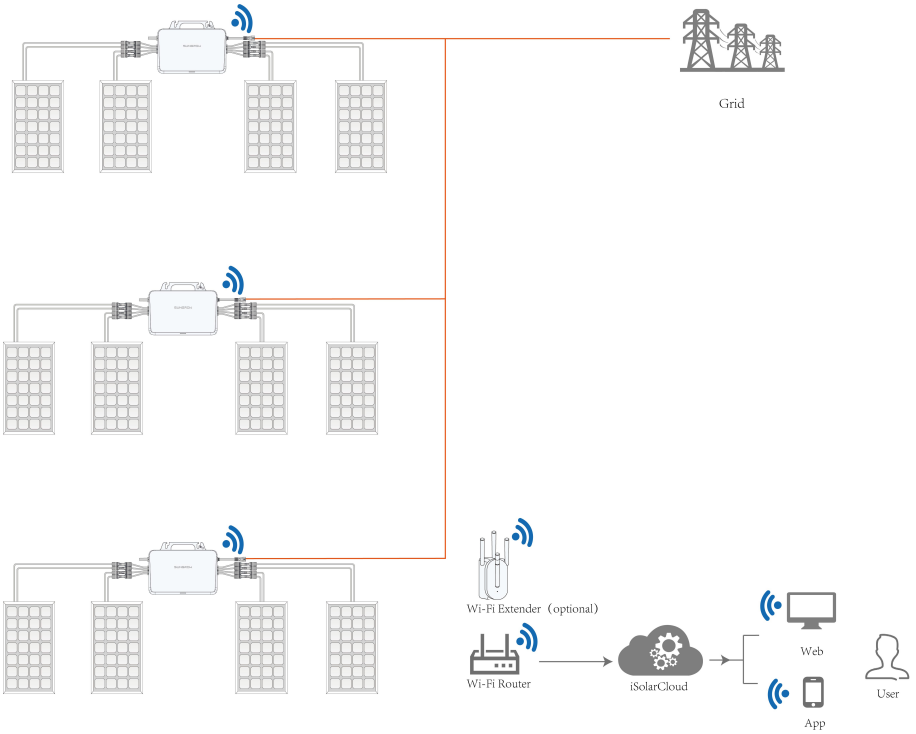
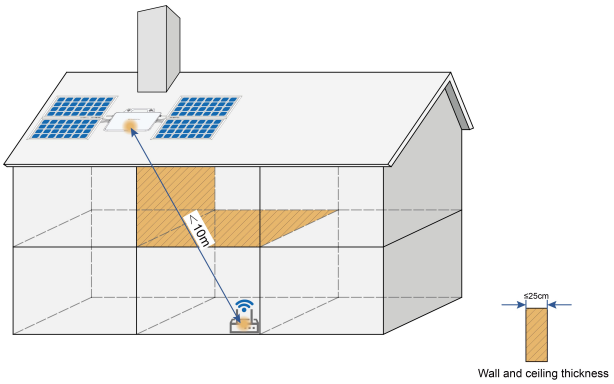


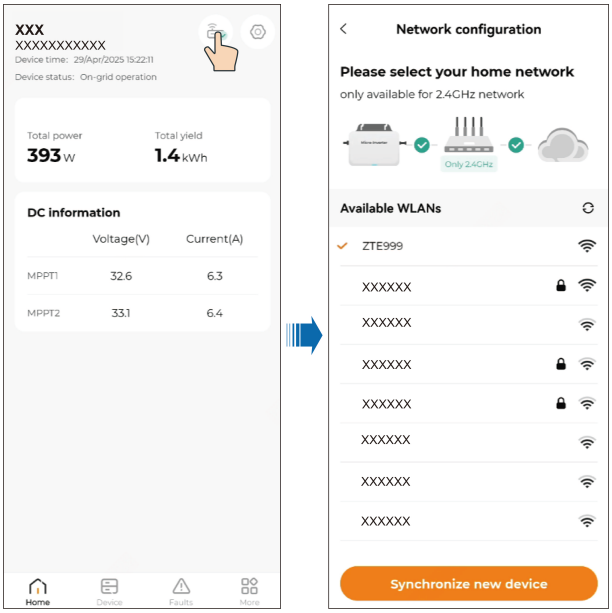
Figure 2-3 Networking Diagram of Rooftop PV System

Wi-Fi Extender (Optional)

For rooftop PV systems requiring higher communication quality, in case the microinverter's Wi-Fi functionality cannot satisfy the requirements for system data communication, a Wi-Fi extender (optional) should be added at a proper position between the microinverter and the router.



The user may stand at the position of the router, log in via local access to the microinverter on the iSolarCloud App, and check the router's Wi-Fi signal strength on the network settings screen. After the Wi-Fi signal has stabilized, see if an extender is needed.



Check the signal strength of the router's Wi-Fi in the network list. If the router's Wi-Fi network cannot be detected or the number of signal bars is ≤2, it is suggested to take the below actions:

1. Move the router to a position closer to the microinverter, until the strength of the router's Wi-Fi reads >2 bars. Then, the microinverter can engage in communication normally.
2. Add an Wi-Fi extender in the middle between the router and the microinverter, and ensure the signal strength at the position of the extender reads >2 bars. Then, the microinverter can engage in communication normally.

- Read the manuals for the router and Wi-Fi extender before use. Ensure the number of devices connected is less than the limit specified by the router or Wi-Fi extender. Otherwise, the device may not be able to access the network.
- The Wi-Fi extender should be prepared by the user separately.

It is recommended to use the microinverter in single-/two-phase grid-connected systems. The compatible grid voltage range is: 154–277 V.

3 Hardware Design

3.1 Product Models

Product Models

- S450S-L, 1-in-1
- S1000S-L, 2-in-1
- S2000S-L, 4-in-1

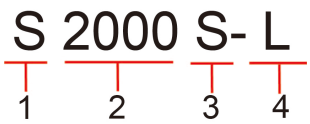


Figure 3-1 Product Model Definition

No.	Definition	Description
1	Brand and model	S: Sungrow
2	Power rating	2000: The product has a rated power of 2000W
3	Single-phase inverter	S: Single phase
4	Introduction to inverter	L: Lite

3.2 S450S-L

External Design

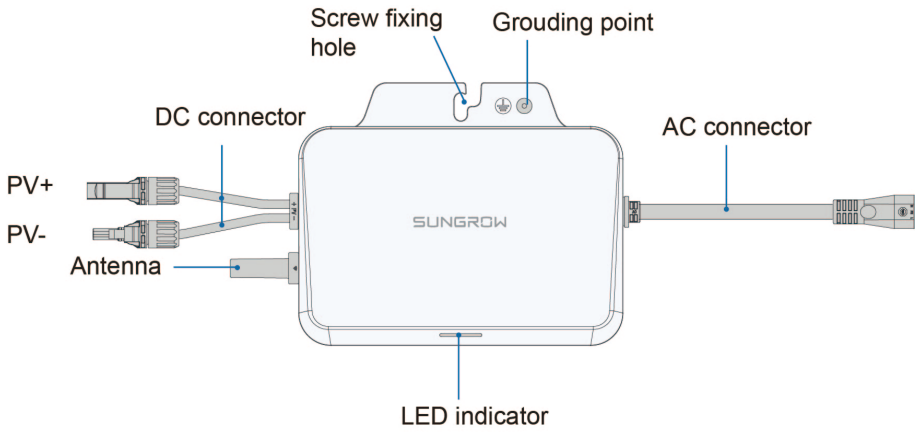


Figure 3-2 External Design

Dimensions

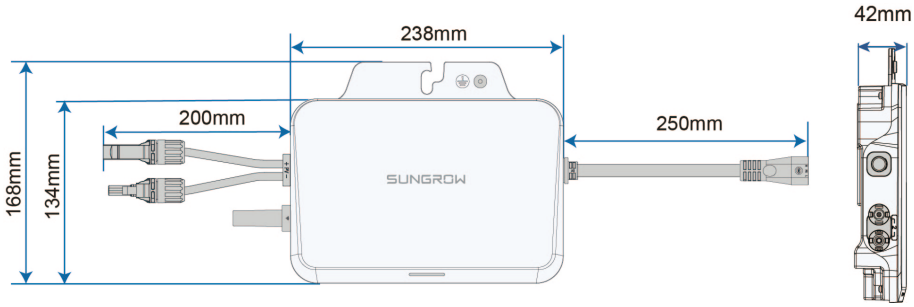


Figure 3-3 Dimensions

3.3 S1000S-L

External Design

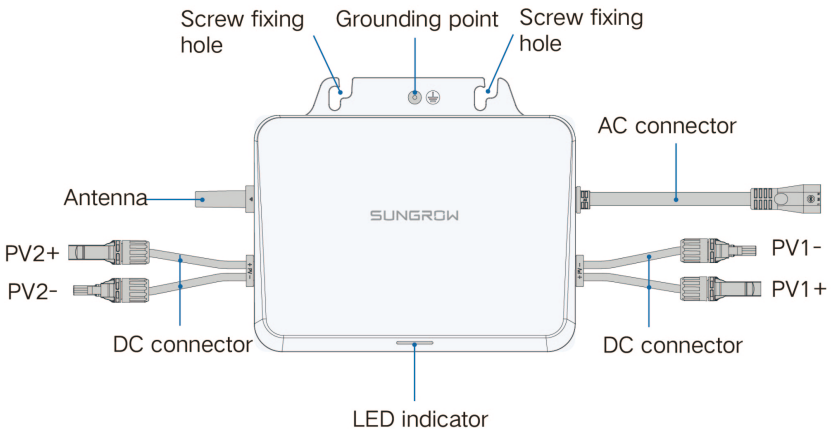


Figure 3-4 External Design

Dimensions

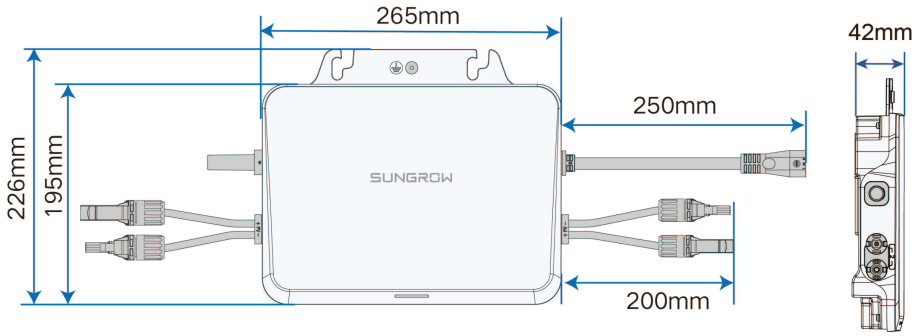


Figure 3-5 Dimensions

3.4 S2000S-L

External Design

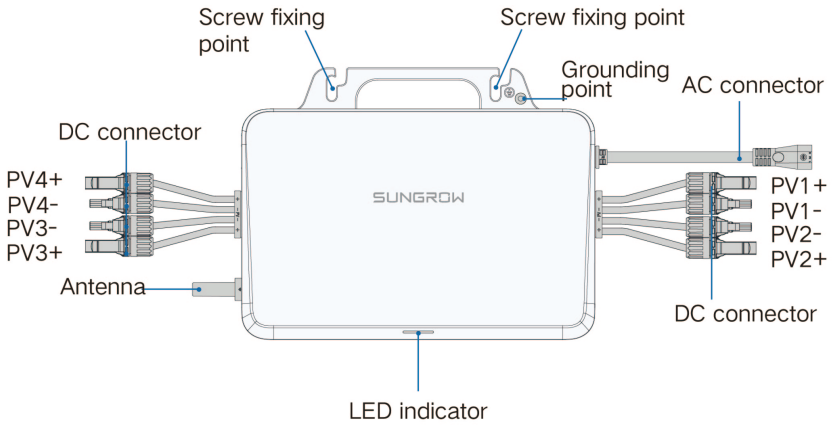


Figure 3-6 External Design

Dimensions

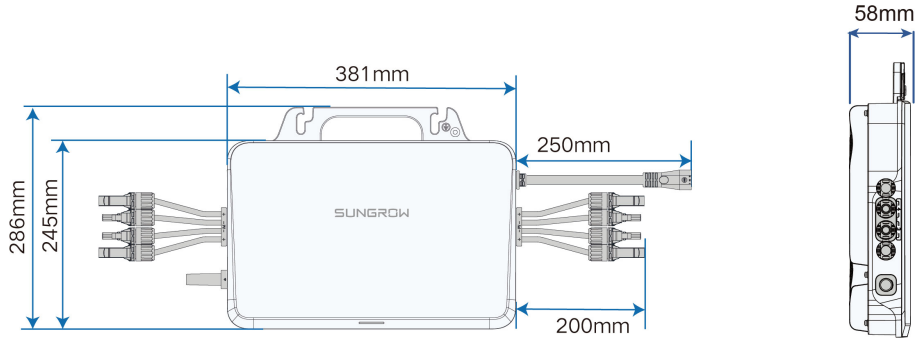


Figure 3-7 Dimensions

3.5 Symbols on Product

Symbol	Explanation
	Do not dispose of the inverter together with household waste.
	Read the user manual before maintenance!

Symbol	Explanation
	CE mark of conformity. EU/EEA Importer.
	Disconnect the inverter from all the external power sources before maintenance!
	TÜV mark of conformity.
	Burn danger due to the hot surface that may exceed 60°C.
	Danger to life due to high voltages! Only qualified personnel can open and service the inverter.
10min	Do not touch live parts for 10 minutes after disconnection from the power sources.
RoHS	RoHS labeling The product complies with the requirements of the applicable EU directives.
	India standard mark for BIS.

* The table shown here is for reference only. The actual product received may differ.

* Users may also attach other warning signs as per the requirements of the local standards or installation specifications.

3.6 Network Port Description

Port No.	Description
502	Used to connect a SUNGROW device or third-party management system to the microinverter via the Modbus TCP protocol. This port is disabled by default.
443	Used for local access via the iSolarCloud App over the HTTPS protocol. Use TLS 1.2 or later.

Port No.	Description
67	Used exclusively for DHCP-related functions. No product information or data transmission is involved.
5353	Used exclusively in device self-networking for device identification purposes. No product data is involved.
6363~6366	Used in mesh networking for the exchange of networking information and the broadcasting of online and offline status between nodes.
10001	Used in mesh networking for device updates, transmitting version and other update-related information.
10000	Used exclusively for data exchange with an associated device.

4 Installation Instructions

4.1 Preparation Before Installation

4.1.1 Safety During Mounting

⚠ DANGER

Make sure there is no electrical connection before installation.
Before drilling, avoid the water and electricity wiring in the wall.

⚠ WARNING

For specific requirements for the installation environment, see 4.1.2 Installation Environment Requirements. In case the environment where the product is installed does not meet the requirements, SUNGROW shall not be held liable for any property damage arising therefrom.

⚠ CAUTION

Improper handling may cause personal injury!

- **When moving the product, be aware of its weight and keep the balance to prevent it from tilting or falling.**
- **Wear proper protective equipment before performing operations on the product.**
- **The bottom terminals and interfaces of the product cannot directly contact the ground or other supports. The product cannot be directly placed on the ground.**

NOTICE

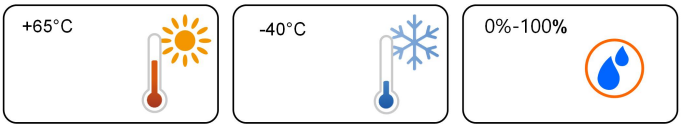
During installation, ensure that no device in the system causes it hard for the AC circuit breaker to act or hinders maintenance personnel from operating.
If drilling is required during installation:

- **Wear goggles and protective gloves when drilling holes.**
- **Make sure to avoid the water and electricity wiring in the wall before drilling.**
- **Protect the product from shavings and dust.**

4.1.2 Installation Environment Requirements

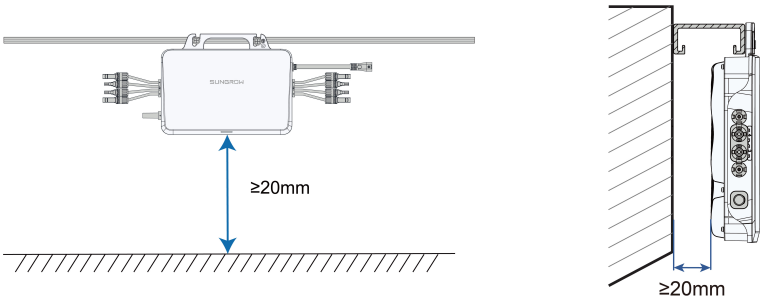
- If the microinverter is installed in a place with lush vegetation, weed on a regular basis. In addition, the ground beneath the microinverter needs to undergo certain treatment, such as laying cement or gravel, etc. (an area of 3m×2.5m is recommended).

- Do not install the microinverter in an environment with flammables, explosives, or smoke.
- Do not install the microinverter in places prone to water leak, e.g., under the air-conditioner vent, the air vent, or the cable outlet window of the machine room, so as to prevent device damage or short circuit caused by intrusion of water.
- Do no install the microinverter in a place with corrosives such as corrosive gas and organic solvent, etc.
- When the microinverter is running, its surface may carry high voltages or get very hot. Do not touch it; otherwise, it may lead to burns or electric shocks.
- Do not install the microinverter in a place that is easy to reach for people.
- Good heat dissipation is very important to the microinverter. Please install the microinverter in a ventilated environment.
- Please consult SUNGROW before installing microinverters outdoors in areas prone to salt damage, which mainly are coastal areas within 500 meters of the coast. The sedimentation amount of salt spray is correlated to the characteristics of the seawater, sea winds, precipitation, air humidity, topography, and forest coverage in the adjacent sea areas, and there are substantial differences between different coastal areas.
- Do not install the microinverter in an environment contaminated with chemicals such as halogen and sulfide.
- Do not install the microinverter in an environment with vibration and strong electromagnetic field. Strong-magnetic-field environments refer to places where magnetic field strength measures over 30 A/m.
- If a microinverter is installed beneath a PV module, placed directly on the ground, or mounted in other small enclosed or semi-enclosed spaces, its operating temperature can become significantly higher than the ambient air temperature due to poor heat dissipation. As the microinverter automatically derates for self-protection at high temperatures, its power output may decrease when the operating temperature rises.
- The average temperature approximately 20 cm around the microinverter should be taken as its operating temperature. The temperature and humidity should meet the requirements below:



4.1.3 Installation Space Requirements

Make sure there is sufficient space at the heat sink of the microinverter for heat dissipation. The space requirements for installing a single microinverter are shown in the figure below.



- To install the microinverter on the rooftop, make sure it is at least 20 mm higher than the rooftop surface.
- To install the microinverter on the wall, make sure it is at least 20 mm away from the wall surface.
- Avoid placing the device in direct sunlight. It is recommended to install it under the PV module.

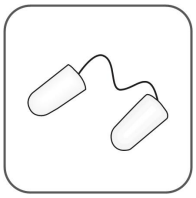
4.1.4 PV Module Requirements

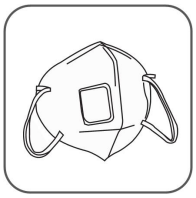
	S450S-L	S1000S-L	S2000S-L
Recommended PV module power range		450 - 650 W	
Max. PV input voltage		60V	
Max. PV input current	16A * 1	16A * 2	16A * 4

4.1.5 Installation Tools

Installation tools to be used include but are not limited to those listed below. If necessary, use other auxiliary tools on site.

Goggles


Earplugs


Dust mask

Safety gloves

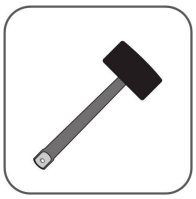
Safety shoes

Utility knife

Marker

Phillips screwdriver

Vacuum cleaner



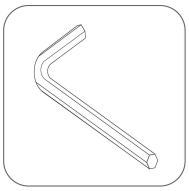
Rubber mallet

Anti-static wrist strap

Wire cutter

Wire stripper

Crimping tool



Allen wrench

4.2 System Wiring Diagram

This section gives an introduction to the wiring diagram of the rooftop PV system and the use of the product accessories, with the S2000S-L microinverter as an example.

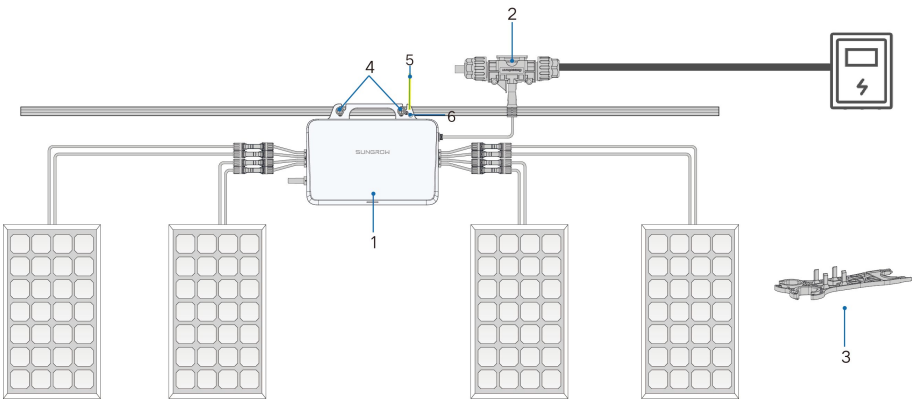


Figure 4-1 Product Accessories for Rooftop PV System

Table 4-1 Product Accessories

No.	Definition	Model	Description
1	Microinverter	S450S-L/S1000S-L/S2000S-L	Included in the scope of delivery as standard equipment.
2	T-type connector	/	Included in the scope of delivery. Used to connect the AC cables of two microinverters.
3	Connector disconnect tool	/	Customers need to place a separate order. Used to disconnect the T-type connector from the microinverter.
4	M8 fixing screw	M8	Prepared by users. Used to fix the microinverter.
5	Grounding cable	Recommended cross-section of the cable: 6 mm^2	Prepared by users. Used for external grounding of the microinverter.
6	Grounding screw	M4	Included in the scope of delivery.Used for external grounding of the microinverter.

4.3 Mounting and Wiring

4.3.1 Mounting the Microinverter

- Do not bump, squeeze, or bend its connectors or Wi-Fi antenna when handling the microinverter. Deformation or damage may impair the device's performance or normal operation.
- Do not lift the cable by hand when handling the device. The S450S-L and S1000S-L microinverters do not have handles. You may move the device by gripping the groove on its back.

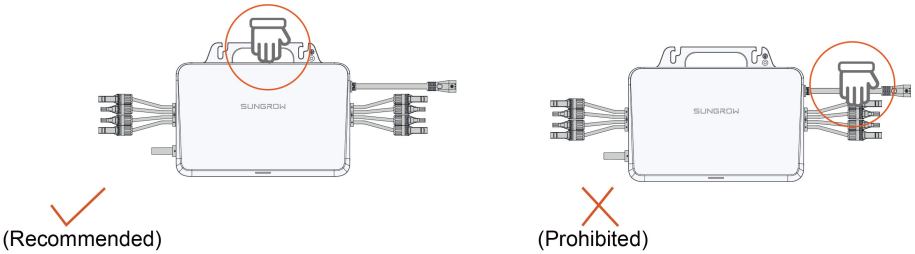
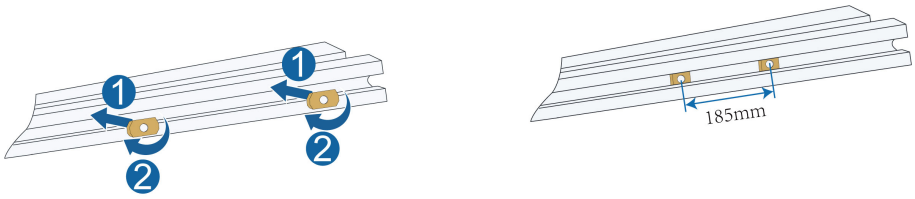


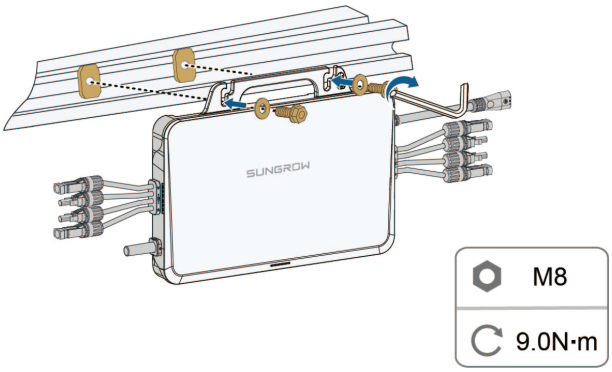
Figure 4-2 Handling Notice

Step 1 Tear off the QR code label on the device enclosure. Two identical QR code labels are provided on the enclosure. Take down one of them and stick it to the appointed location of the Quick Installation Guide. It is used for device operation parameter configuration later.

Step 2 Fit the fixing nuts. Fix the nuts into the bracket, as shown in the figure. The distance between the two nuts should be approximately 185 mm. The nut and the tool used to fix the nut should be prepared by users separately.



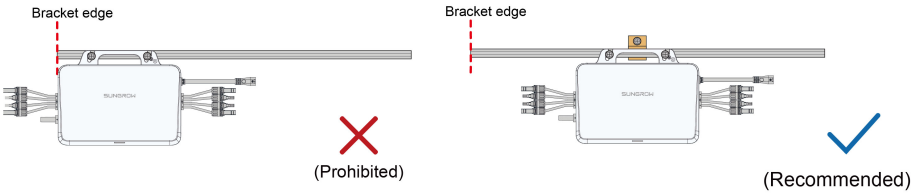
Step 3 Mount the microinverter. Fix the microinverter to the bracket with M8 screws at a torque of 9.0 N.m, as shown in the figure below.



Washers should be added to the M8 screws by the user separately. Washers with an inner diameter of 8.5 mm and a thickness of 2.5 mm are recommended; while the outer diameter of the washer must be greater than 24 mm.

NOTICE

- **Do not mount the microinverter on the edge of the bracket.**
- **It is recommended that the inverter fixing screws be installed around the roof frame fixing hook. This ensures greater support and prevents the fixing profile from bending due to the weight of the microinverter.**



--End

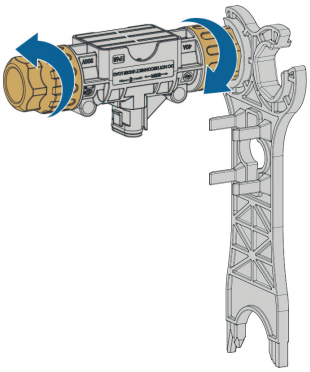
4.3.2 Attaching T-type Connector to AC Cable

As the T-type connector does not come with an AC cable, you need to attach the connector to the AC cable.

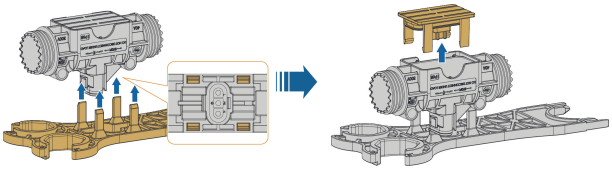
Recommended Cable Specification

Cable	Type	Cable Diameter	Cross-section
AC cable	Outdoor-type 3-core copper-wire cable	13–14.5 mm	3*6 mm^2

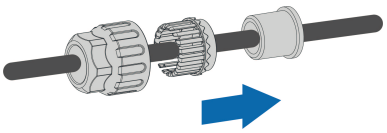
Step 1 Remove the waterproof caps. Unscrew and remove the waterproof caps from the T-type connector, as shown in the figure below.



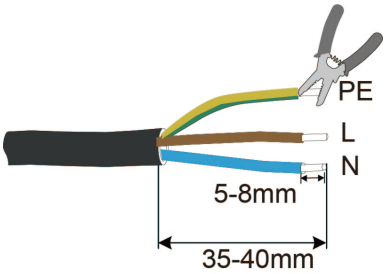
Step 2 Open the T-type connector. Push the disconnect tool into the bottom of the connector, and then pull out the waterproof cover at the top of the connector, as shown in the figure below.



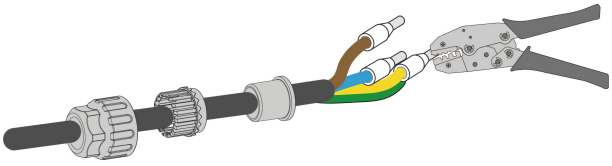
Step 3 Pass the cable. Pass the cable through the waterproof cap and the sealing ring.



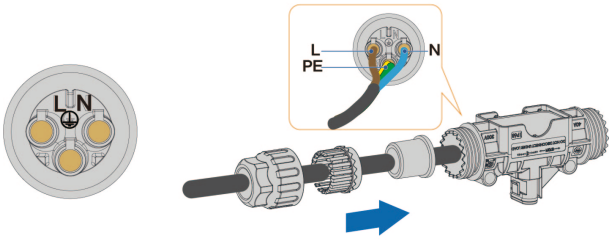
Step 4 Strip the cable. Strip the protection layer and insulation layer by a specific length, as specified in the figure below.



Step 5 Crimp the terminals. Crimp the cold-pressed terminals onto the wires using a crimping tool.



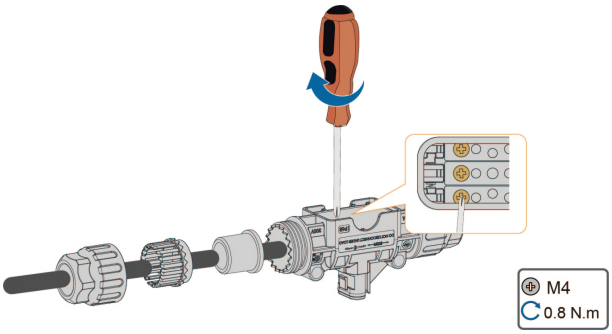
Step 6 Wiring. Insert the L, N, and PE wires into the corresponding holes on the connector, as shown in the figure below.



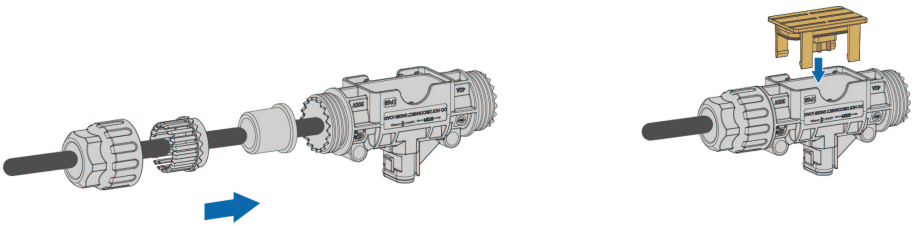
⚠ WARNING

Observe the marks on the terminals when making cables and ensure the polarity is correct. Otherwise, after connecting to the power distribution box, the microinverter may not operate properly, the house's circuit may trip, and it may even result in personal injuries.

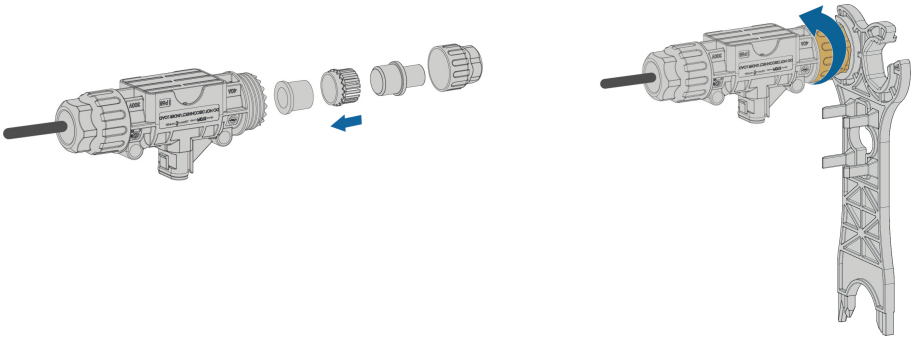
Step 7 Fasten the wires. Tighten the screws for the wiring holes clockwise using a screwdriver, as shown in the figure below.



Step 8 Assemble the connector. Push the sealing ring and waterproof cap into the connector housing, and tighten the waterproof cap. Fit back the waterproof cover.



Step 9 Fit the stopper plug. A stopper plug should be fitted if no cable is connected on the other side of the connector. Put the sealing ring and then the plug into the connector. Then, fit and tighten the waterproof cap onto the connector.



--End

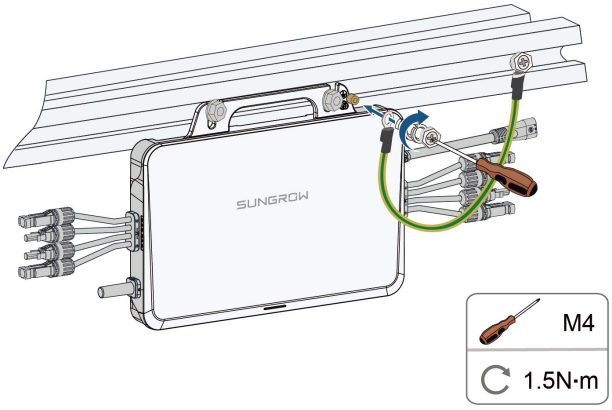
4.3.3 Wiring Steps

Prerequisite

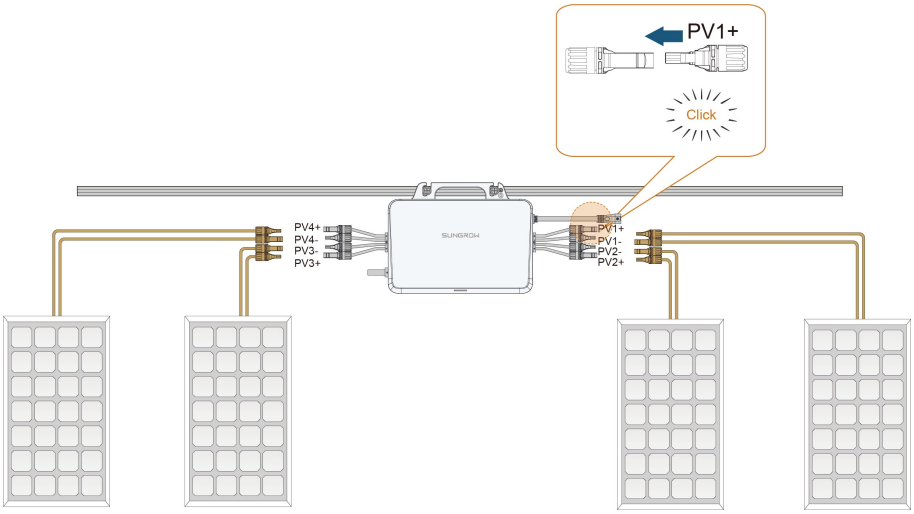
⚠ WARNING

- **It is recommended to make a protective ground connection. Lack of protective grounding or unreliable grounding may lead to personal injuries.**
- **Ensure the PV cables are connected with correct polarity during DC wiring. Otherwise, the microinverter may not operate properly.**
- **The total length of the microinverter PV-side DC cable must be □ 3 m.**
- **When connecting the DC connectors, make sure the order of the connectors corresponds properly to the actual positions of PV modules at the site, to facilitate the later setup of the physical layout of the plant.**
- **If not all of the DC connectors on the microinverter are connected to PV modules, use IP67 waterproof plugs to close off the unused connectors. The waterproof plugs should be prepared by the user.**
- **If the PV module is located too far away from the microinverter, a DC extension cable is needed. The user needs to make the extension cable first.**
- **PV modules cannot be connected in series.**

Step 1 Connect the external grounding cable. Secure the grounding cable with M4 screws at a torque of 1.5 N.m, as shown in the figure below.



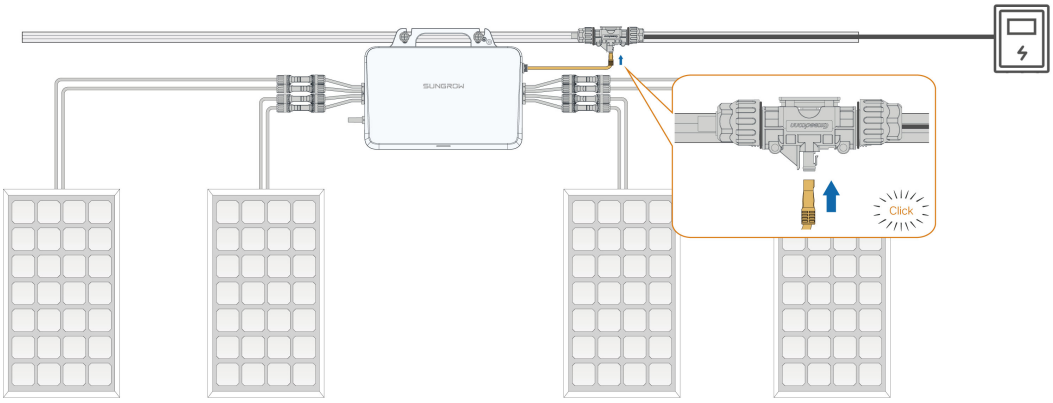
Step 2 Connect the DC connectors. Attach the DC connectors of the microinverter to those of the PV modules, as shown in the figure below. Make sure the polarity is correct.



NOTICE

- **The PV1 channel acts as the host and must be connected with PV module. If it is left unconnected, the system may report a fault and cannot operate properly.**

Step 3 Connect the AC connector. For detailed instructions on AC cable preparation, see 4.3.2 Attaching T-type Connector to AC Cable. Connect the AC connector of the microinverter to the T-type connector, as shown in the figure below. Make sure the connection is secure.



--End

- Store the accessories properly after installation for use in future maintenance.
- After installation, sort and dispose of the packaging materials accordingly.

4.4 iHomeManager Installation and Wiring (Optional)

If the iHomeManager is selected for the system, follow the instructions below to install and wire it.

For detailed information about the iHomeManager, please refer to the user manual. You can access the manual by scanning the QR code below or by visiting https://support.sungrowpower.com.

4.4.1 Installation Methods

The iHomeManager must be installed in a power distribution box that has an SPD inside. It can be mounted on a wall or a guide rail, based on the user's needs.

⚠ CAUTION

Be sure to avoid the water pipes and electricity wires in the wall before drilling.

4.4.1.1 Mounted on a Wall

Prerequisite

The iHomeManager is mounted on a wall using the mounting holes.

> The wall should be flat and solid.
> The operators should wear safety goggles and dust masks, to prevent dust from getting into their eyes or mouths.
> The iHomeManager can be mounted on a concrete or metal wall, based on the actual situation at the site.

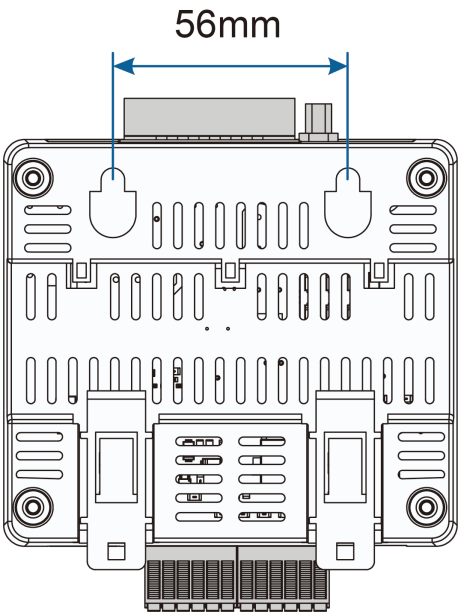
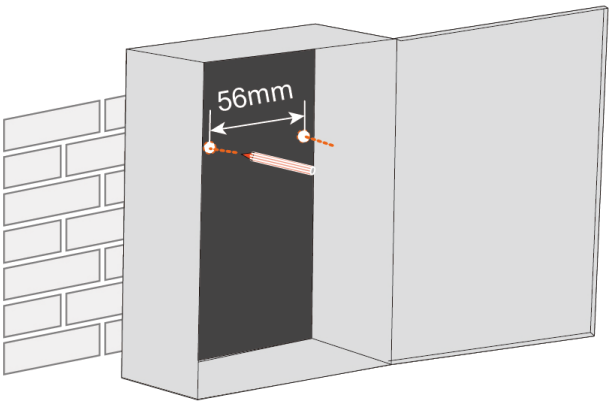


Figure 4-3 Mounting Holes

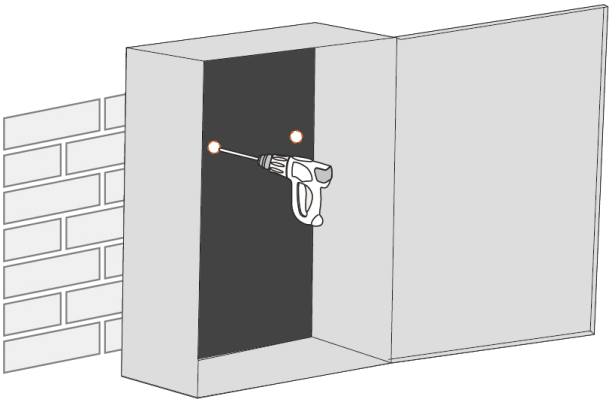
Step 1 Select an appropriate installation position.

Step 2 Measure and determine the positions of the two mounting holes using a tape measure. The distance between them is 56mm. Then, use a marker to mark the hole positions for drilling on the wall.

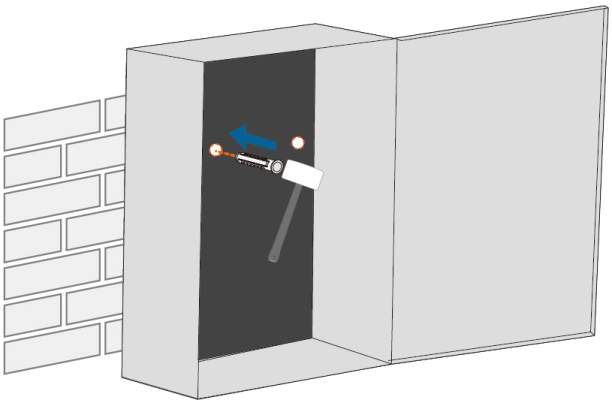


Step 3 Drill holes at the marked positions using a hammer drill.

- Hole diameter on a metal wall: 5mm;
- Hole diameter on a concrete wall: 6mm;

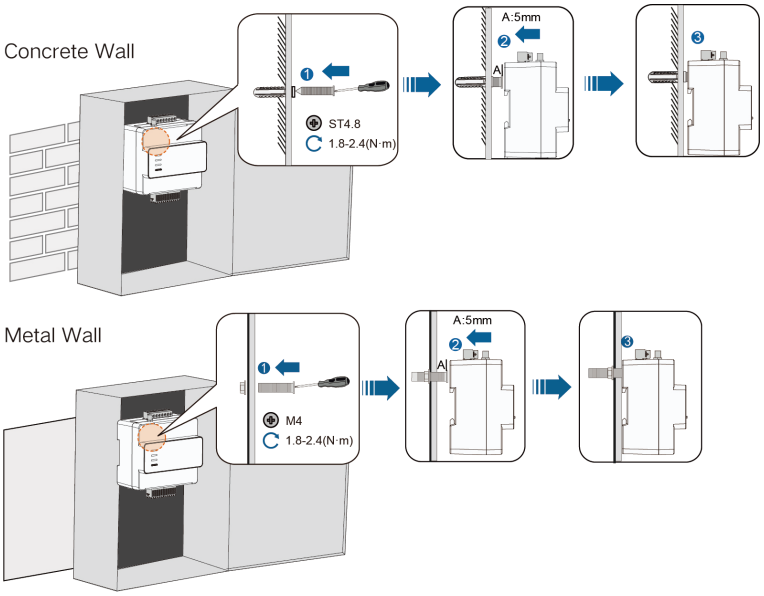


Step 4 Fit all the expansion sleeves into the holes using a rubber mallet.



Skip this step if the device is mounted on a metal wall.

Step 5 Fix the expansion bolts or fasteners into the wall, approximately 5mm higher than the wall surface. Then, hang the iHomeManager to the bolts on the concrete or metal wall by the mounting holes on its back.



Step 6 Gently shake the iHomeManager to make sure the installation is secure.

--End

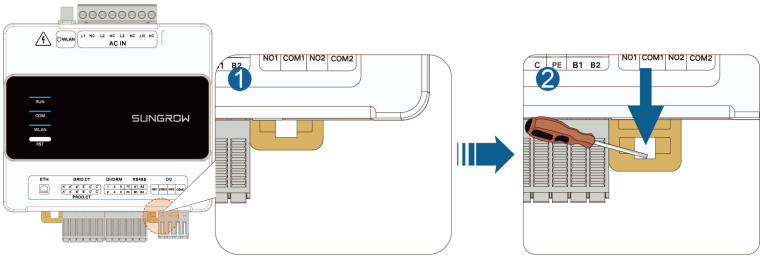
4.4.1.2 Mounted on a Guide Rail

Prerequisite

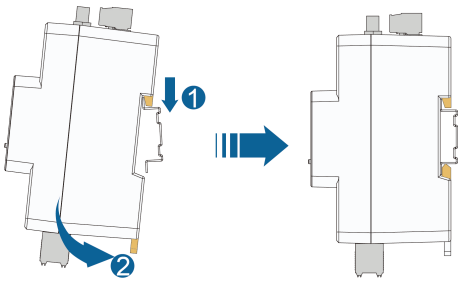
The iHomeManager has clips on the back, which are used to attach it to the guide rail.

Step 1 Mount the guide rail in a proper position and fix it properly.

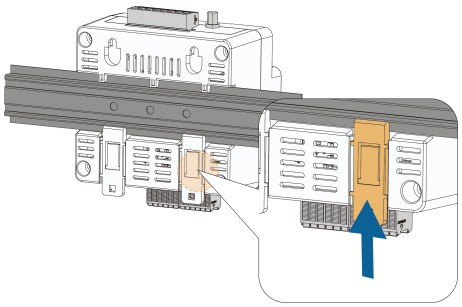
Step 2 Insert the tip of a Phillips screwdriver into the opening on the bottom clips of iHomeManager, then slightly drag downward to pull out the clips.



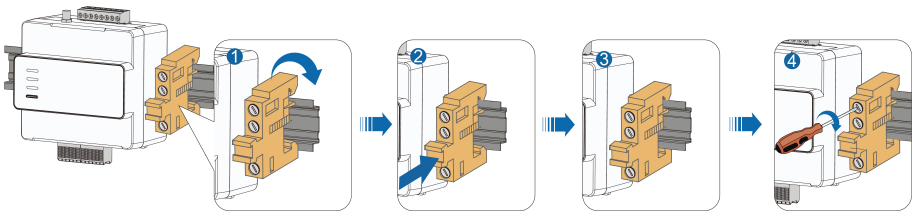
Step 3 Slightly tip the iHomeManager to have its clips latch onto the guide rail.



Step 4 Push the bottom clips upward. Make sure the iHomeManager firmly fits on the guide rail.



Step 5 Install the end brackets on the guide rail at both sides of the iHomeManager to restrict it in a fixed position.



Step 6 Gently shake the iHomeManager to make sure the installation is secure.

--End

4.4.2 Antenna Installation

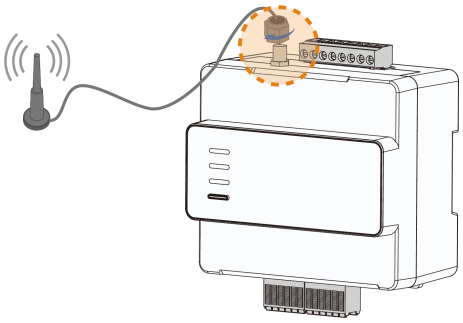
> If the iHomeManager is installed in a metal enclosure or on a metal wall, put the antenna suction base outside of the enclosure or wall, to avoid impacts on signal transmission.
> An external antenna is used by default. If no external antenna is connected, change the antenna settings on the iSolarCloud App.

Requirements

- You have fixed the suction base in a position outside the metal enclosure or the metal wall.
- You have reserved an opening for the antenna (hole diameter: 20mm).

Step 1 Lead the nut end of the antenna cable to the iHomeManager.

Step 2 Rotate the nut clockwise to tighten it onto the WLAN antenna connector on the iHomeManager.



--End

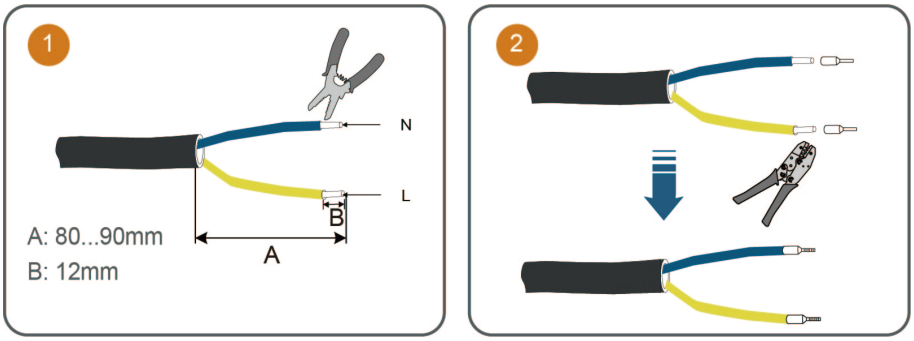
4.4.3 Power Supply and CT Connection

⚠ DANGER

Accidentally touching the live terminals may result in fatal electric shocks.

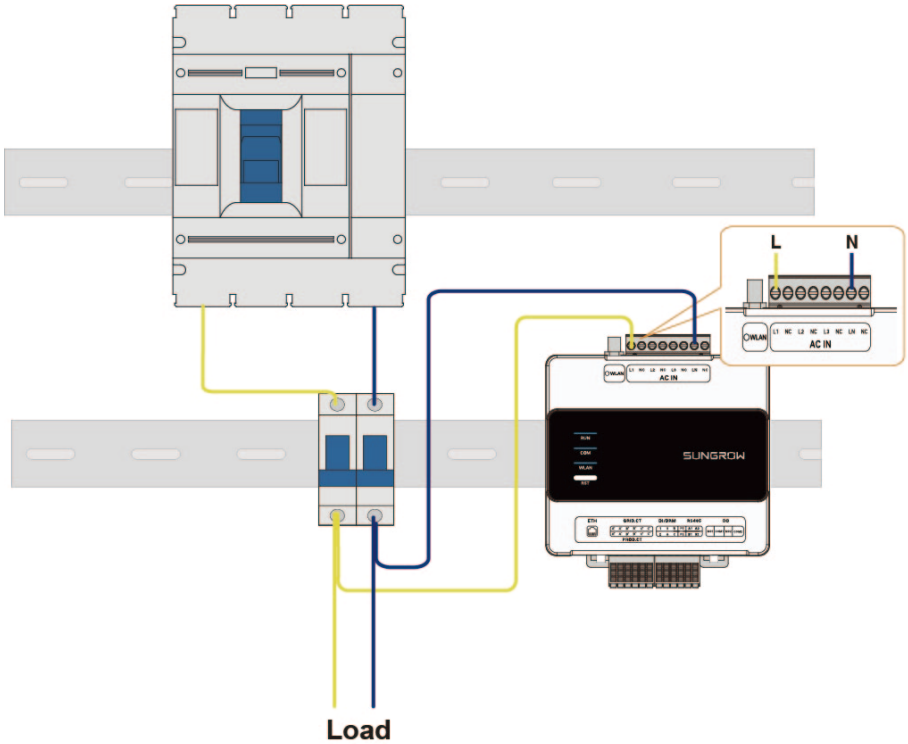
- **Before wiring, make sure the device is completely powered off.**
- **Before wiring, make sure the wiring terminals are voltage-free.**

Step 1 Use wire strippers to strip off the protective layer of the AC cable by approximately 80mm–90mm, and the insulation layer by 12mm. It is suggested to crimp cold-pressed terminals on the cable wires.

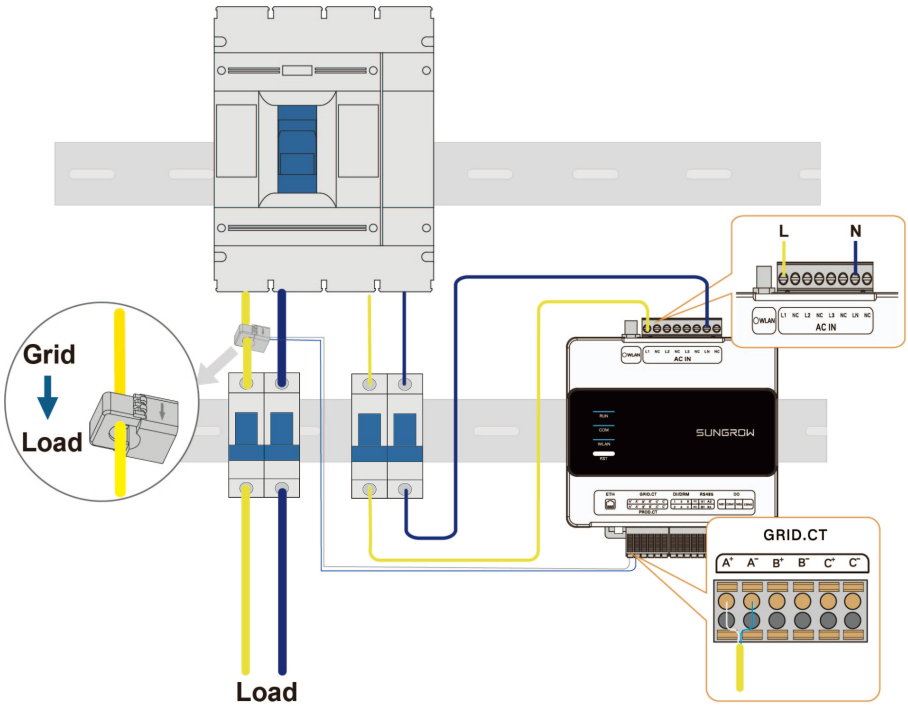


Step 2 Connect one end of the AC cable to the iHomeManager, with its wires connected to L and N respectively.

Step 3 Connect the other end of the AC cable to the corresponding position on the household circuit breaker.



Step 4 Connect the CT wires to the GRID.CT terminal, and clamp the CT to the AC cable with the arrow pointing in the direction of the load.



The iHomeManager comes with three CTs. Connect only one CT to the microinverter.

--End

5 Commissioning

5.1 Commissioning Procedure

Inspection Before Powering on

Perform inspections as follows before turning on the microinverter for the first time, and make sure the requirements below are all met.

- All devices are properly installed.
- The AC circuit breaker is set to “OFF”.
- The grounding cable is properly and reliably connected.
- The AC cable is properly and reliably connected.
- The AC circuit breaker is selected in compliance with the relevant requirements specified in this manual and applicable local standards.
- All safety signs and warning labels are firmly attached, intact and legible.

Commissioning Procedure

1. Turn on the main AC circuit breaker in the house.
2. Download the iSolarCloud App, and complete the grid-connection and network connection parameter settings by referring to Operation Parameter Setting on iSolarCloud.
3. Check the LED indicator. The power generation system will start working if the indicator turns normal.

5.2 Background Information

About the iSolarCloud App

The country/region and grid type set for the microinverter must comply with the local grid-connection standards, so that the energy generated can be fed into the grid. The iSolarCloud App is a software for users to configure the on-grid operation parameters for the microinverter. You may download the App in the following two ways:

- Search for iSolarCloud in App Store, Google Play, or other application stores, and download the App by following the onscreen instructions.
- Scan the QR code below with a phone and download the App.

Figure 5-1 iSolarCloud App

To fully utilize the features of the iSolarCloud App, please grant it access to your camera, location, and network when you first open the App.

The microinverter has its own Wi-Fi function too. Users can complete the network settings for the microinverter to access it to the home wireless network, so that it can upload its production and performance data to iSolarCloud over the Internet. The cloud data can be viewed on the iSolarCloud App or the Web system.

User type	Username	Password	Permissions
General user	user	pw1111	Granted access to monitoring and general settings. For instance,Overview, Device Monitoring, and some of the History Data.
O&M user	admin	pw8888	Operations mentioned in this manual.
Developer Account	develop	Dynamic password	Login with a developer account is allowed only after authorization by an O&M user account.

Operating Frequency and Power of Microinverter Wireless Network

RF operating frequency band

2.4G Wi-Fi: 2412-2472MHz (TX/RX)

Maximum Output Power: 19.93dBm (e.i.r.p.)

Device Check

For ease of operation, the system is able to run a device check automatically to ensure the device can start on-grid operation normally. The check will be performed before the grid-connection on the connection of PV modules, microinverter operating status, country/region setting, etc. After the device check is completed, the microinverter can start up.

Device Synchronization

The system provides a function that allows the users to synchronize network settings across different devices, in case multiple microinverters are used. After completing the network settings for one device, users can synchronize the settings across other devices in one click, thus reducing the time spent in commissioning.

Grid-connection Operation Configuration

To sum up, before the on-grid operation of the microinverter, users need to complete network and grid-connection parameter settings on the iSolarCloud. They can also perform device check and synchronization, etc. The overall work flow is shown below.

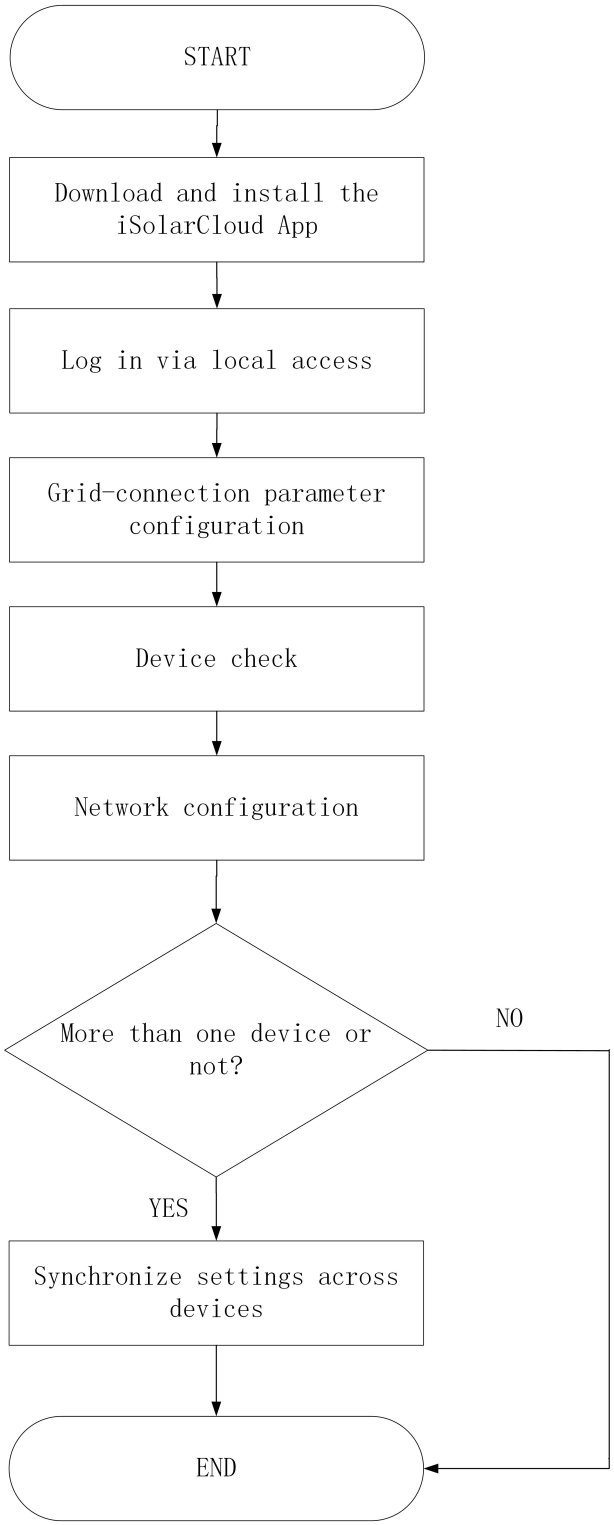


Figure 5-2 Grid-connection Operation Configuration Flow Chart

5.3 Device Configuration (Remote)

After logging in to iSolarCloud, follow the on-screen instructions to create a plant: provide the required plant information, add devices, complete the network configuration and device initialization, and set the tariffs. The plant will then be successfully created.

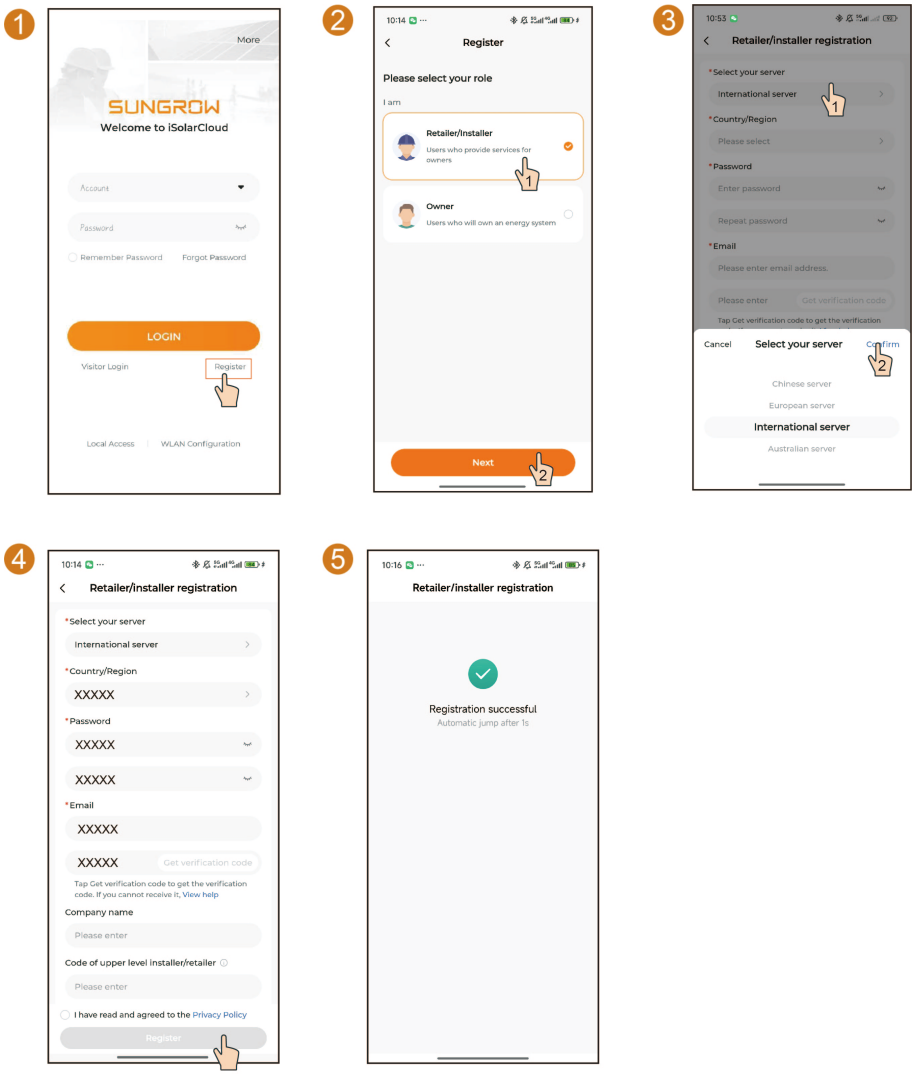
5.3.1 Creating an Account and Completing Plant Information

Set up an iSolarCloud account, then create a plant.

Step 1 Open the iSolarCloud App, and tap **Register** on the login screen.

Step 2 Choose **Retailer/Installer**.

Step 3 Tap **Select your server** and choose **International server**. Then, fill in the required information and tap **Register**.



An account is now created.

Step 4 Log in to your iSolarCloud App account.

Step 5 Following the onscreen instructions, tap **Create Plant**.

Step 6 Fill in the general information about the plant, and then tap **Save and continue**, as shown in the figure below.

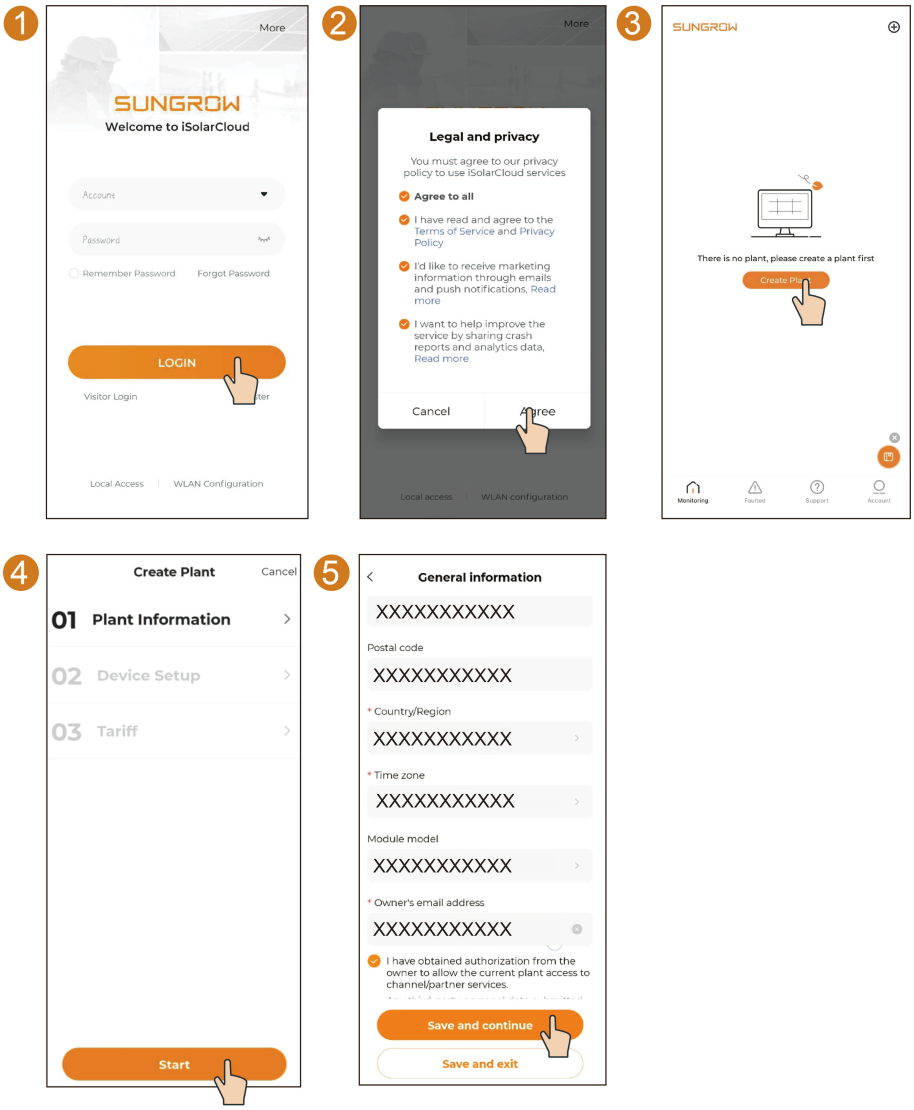


Table 5-1 Parameters Required for Creating a Plant

Parameter	Description
*Plant Name	Enter the plant name.
*Plant Type	Select the plant type.

Parameter	Description
*PV Installation Power (kWp)	Enter the installed power.
*Detailed Address	The location of the plant, which can be set in the following two ways: • Manual setting: Enter the location of the plant in the input box. • Auto acquisition: Tap to get the current location automatically.
*City	The city where the plant is located.
Postal Code	The postal code of the place where the plant is located.
*Country/ Region	The country/region where the plant is located.
*Time Zone	The time zone of the place where the plant is located.
Module Model	The model of the PV module actually used in the plant.
Owner's Email Address*	Enter the owner's email address.
*Grid-connection Type	Set the grid-connection type for the plant.
Grid-connected Date	Shows the current date by default. You may tap to set the grid-connected date.
Plant Image	Upload an image of the plant.
Remark 1	Enter any remarks regarding the plant.

* Indicates that the field is required.

Step 1 of the plant creation process, plant information setup, is now complete.

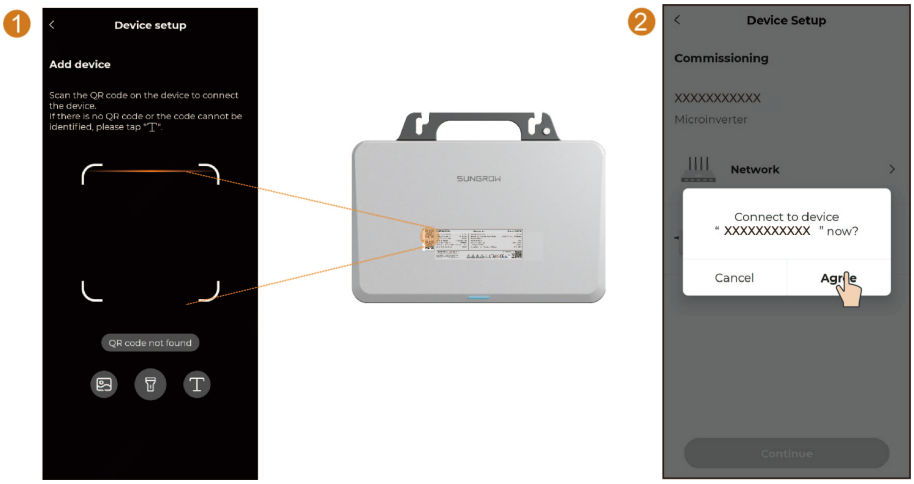
--End

5.3.2 Device Setup

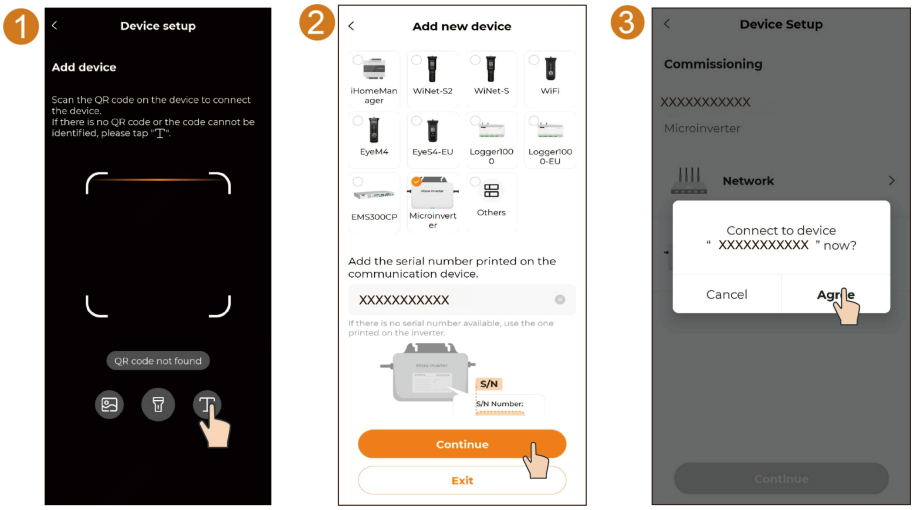
Add the microinverter to the plant, configure the network for the microinverter, and complete the initialization process.

Step 1 After completing the plant information, tap **Save and continue** to open the QR code scanner. You can add the microinverter device to the plant manually, or by scanning its QR code.

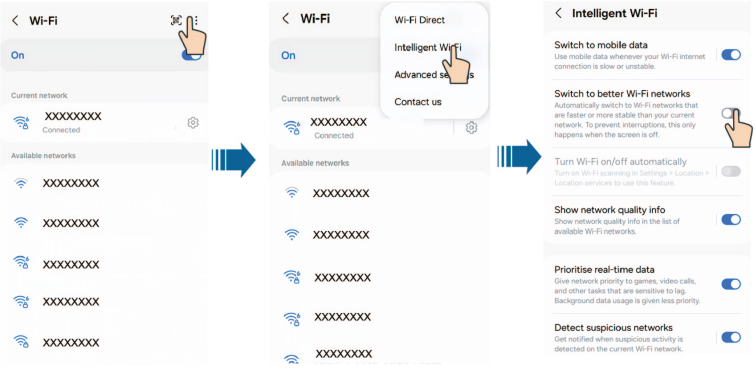
- Scan QR code: Scan the QR code on the device. After the device is recognized, tap **Agree** to connect your phone to the microinverter's hotspot, as shown in the figure below.



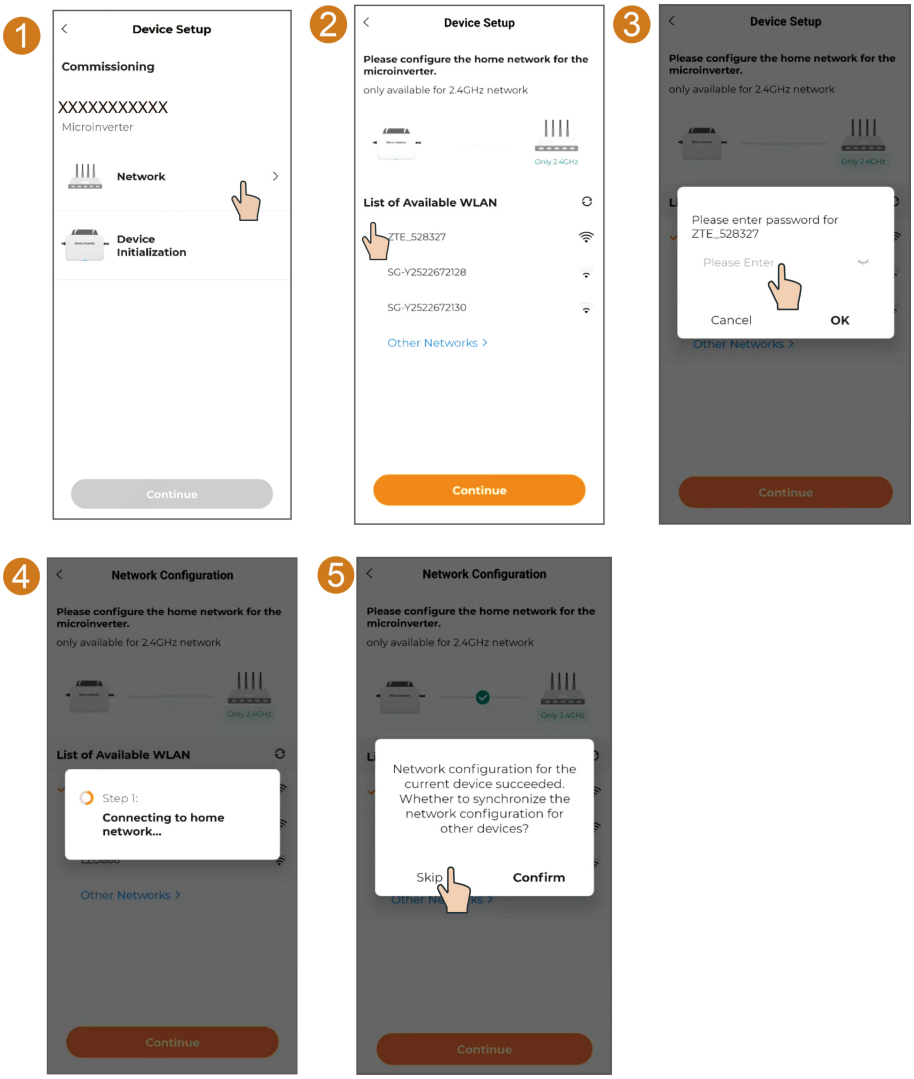
- Add manually: Tap T, select **microinverter**, and enter the device S/N (which can be found on the device nameplate). Then, tap **Continue** to connect your phone to the microinverter's hotspot, as shown in the figure below.



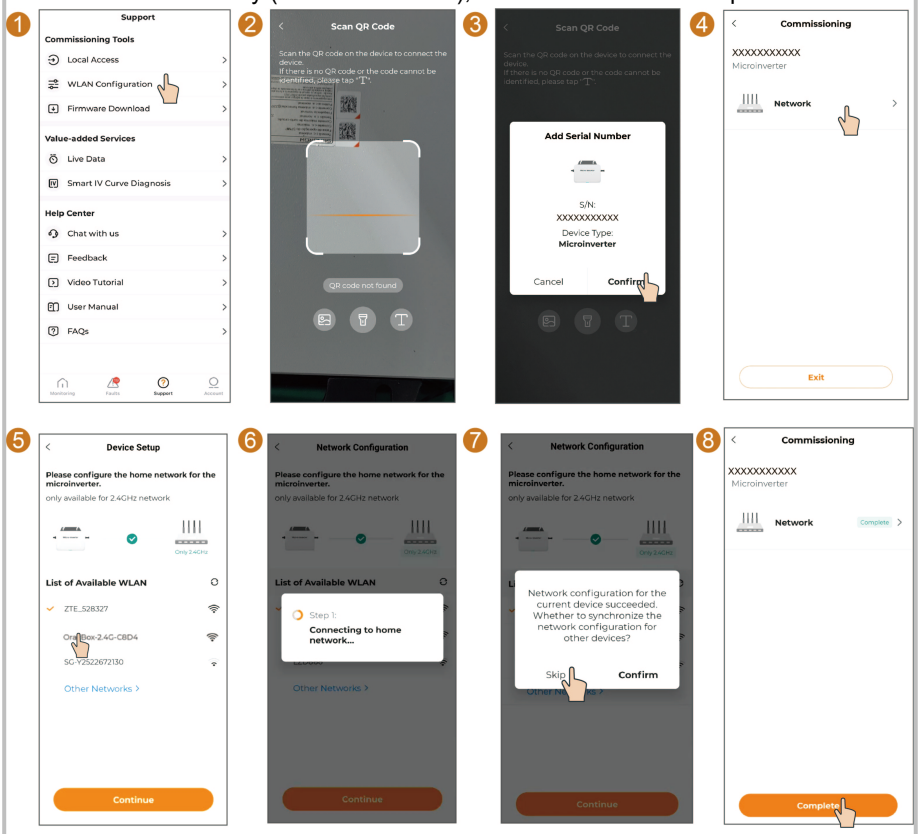
- Connect only one mobile phone to the microinverter's hotspot at a time. Otherwise, it may lead to a conflict issue.
- To keep your account secure, after logging in to the system, change your password immediately and log in again using the new one.
- It is suggested to turn off auto network switching on the mobile phone so that it can stay connected to the microinverter's hotspot. Otherwise, the phone may switch to a stronger Wi-Fi signal automatically and its connection to the microinverter will be interrupted. Instructions are provided as follows, taking a Samsung phone as an example.
  - Open the **Wi-Fi** list on your phone, click ⋮ in the upper right corner, and select **Intelligent Wi-Fi**.
  - Disable **Switch to better Wi-Fi networks** on the **Intelligent Wi-Fi** screen.



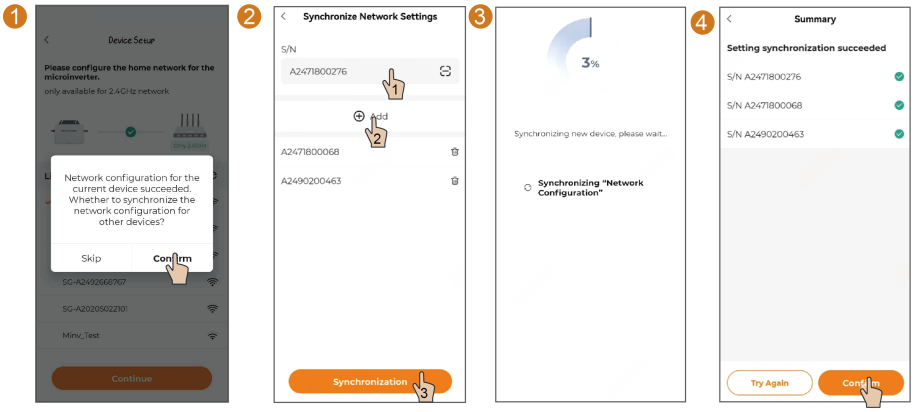
Step 2 Configure the network connection for the microinverter. Once connected to the microinverter's hotspot, the App goes to **Network**. Establish a reliable network connection for the microinverter, by referring to the instructions below.


1
Device Setup
Commissioning
XXXXXXXXXXX
Microinverter
Network
Device Initialization
Continue
2
Device Setup
Please configure the home network for the microinverter.
only available for 2.4GHz network
Only 2.4GHz
List of Available WLAN
ZTE_528327
SG-Y2522672128
SG-Y2522672130
Other Networks
Continue
3
Device Setup
Please configure the home network for the microinverter.
only available for 2.4GHz network
Please enter password for ZTE_528327
Please Enter
Cancel
OK
Other Networks
Continue
4
Network Configuration
Please configure the home network for the microinverter.
only available for 2.4GHz network
List of Available WLAN
Step 1:
Connecting to home network...
Other Networks
Continue
5
Network Configuration
Please configure the home network for the microinverter.
only available for 2.4GHz network
Network configuration for the current device succeeded. Whether to synchronize the network configuration for other devices?
Skip
Confirm
Continue

When you change the router, please set up the network connection again. The steps are: log in to the iSolarCloud App, tap the **WLAN Configuration**, and select the home network to connect to it. When updating network settings for multiple devices simultaneously (as shown in 7), ensure the old router is powered off.



Step 3 To set up network connections for multiple microinverters, tap **Confirm** at the 5 of Step 2 to synchronize the current network settings across different devices. After a successful synchronization, users do not need to spend time in performing network settings for other devices.

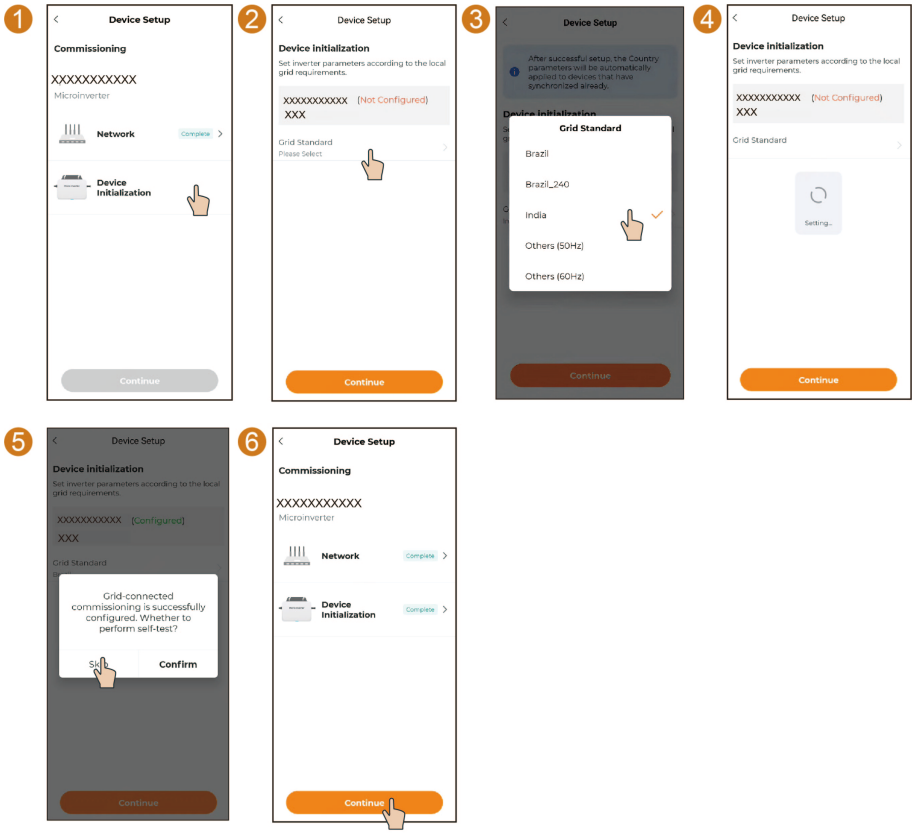


Microinverters for which network settings are synchronized in this step will be added to the plant's device list simultaneously.

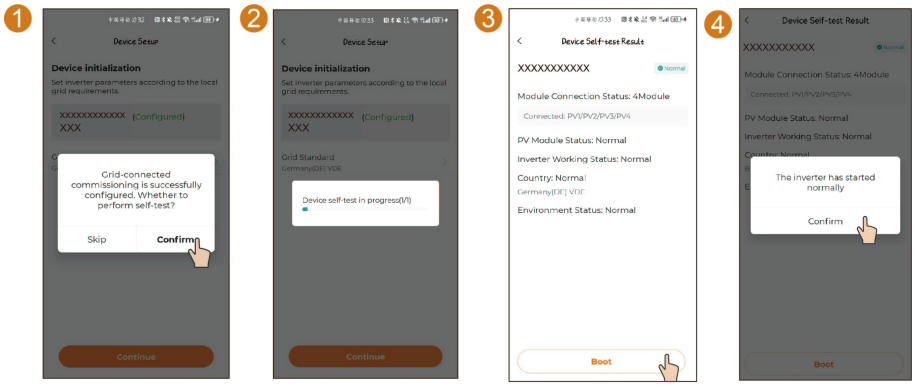
⚠ CAUTION

The S450S-L, S1000S-L, and S2000S-L microinverters support the 2.4GHz band only. If the target network is not shown in the list of available home networks, check whether the 2.4GHz band is enabled for the router. You can go to the router configuration page and enable the 2.4GHz band in wireless settings.

Step 4 Set the country/region . Tap **Device Initialization** to go to **Device Setup**, as shown in the figure below. You can select the **Grid Standard** based on the actual situation.

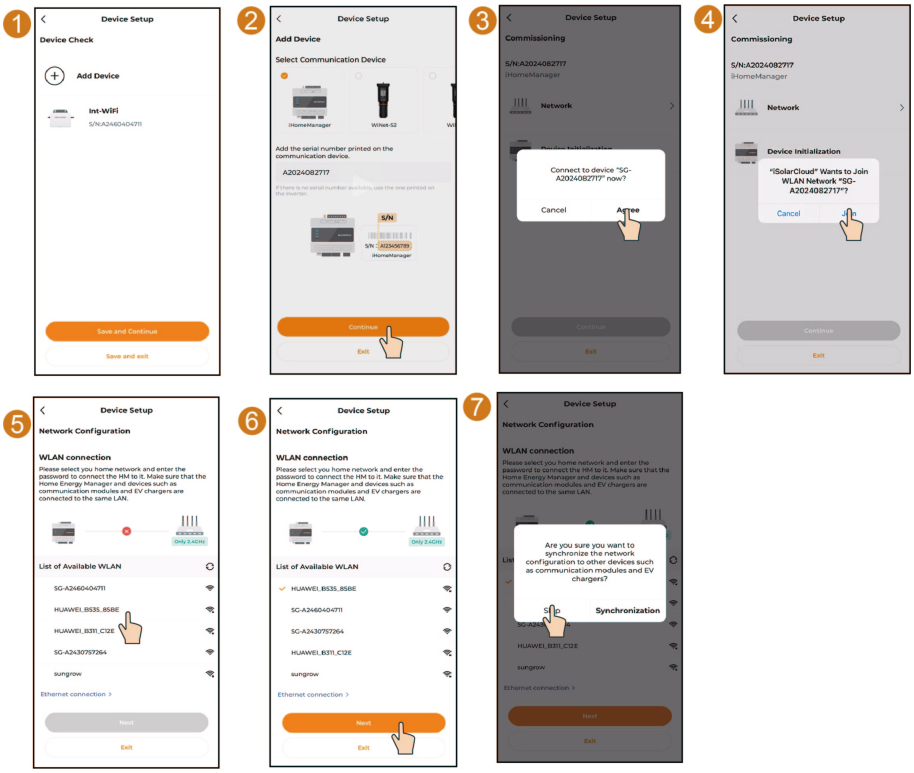


Step 5 (Optional) Device check. To make sure the microinverter can function properly, after the grid-connection parameter settings are completed, it is recommended to tap **Confirm** and run a device check. In case of nothing abnormal, you can start the device up. The microinverter can also start up if you choose to **Skip** the device check.

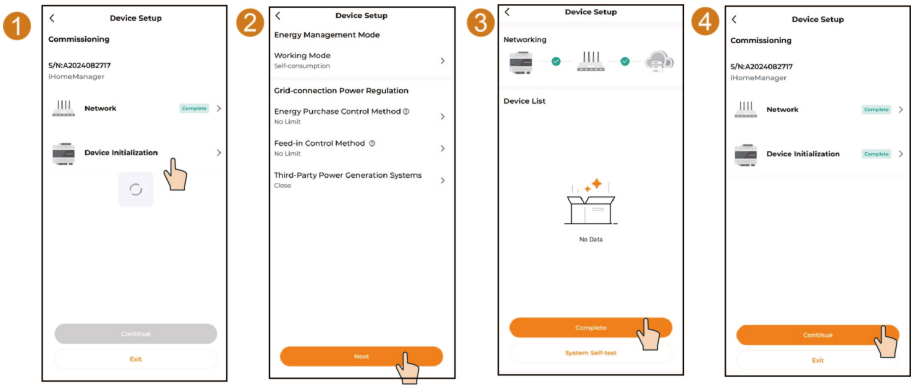


Step 2 of the plant creation process, microinverter device setup, is now complete.

Step 6 (Optional) If the iHomeManager has been installed, add it to the plant and configure it accordingly. First, tap **Add Device**, click “T”, and enter the device S/N. Then, connect to the iHomeManager's hotspot by following the onscreen instructions and configure its network connection, as demonstrated below.



Step 7 (Optional) After completing the network configuration for iHomeManager, click **Device Initialization**. Since iHomeManager is not connected to additional devices (such as charging stations) in this scenario, after entering Device Setup, directly click 'Stop Searching' in the top right corner. Then proceed to Device Initialization to set the initial parameters for iHomeManager (using default values).



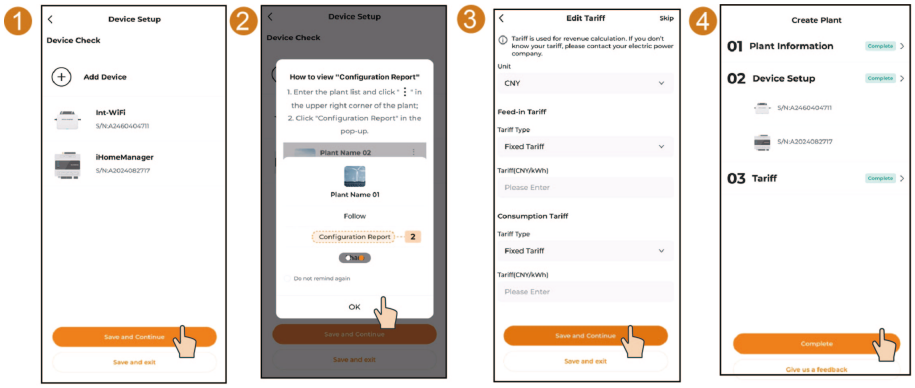
--End

5.3.3 Tariff

Complete the tariff settings and finish the plant creation.

Step 1 After the device has been added, tap **Save and continue**.

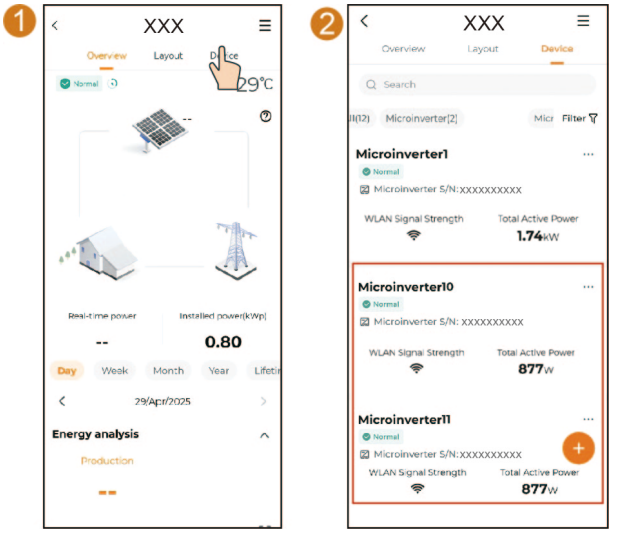
Step 2 You can set **Feed-in Tariff** and **Consumption Tariff** by following the onscreen instructions, and tap **Continue**, as shown in the figure below.



Step 3 of the plant creation process, tariff configuration, is now complete.

Step 3 The plant that has been created will be shown on the "Monitoring" screen. You can tap a plant to check the detailed information about the plant and its devices, as shown in the figure below.

Step 4 Select the **Device** tab to view the devices in the plant. If you have synchronized the network settings for **Microinverter 10** and **Microinverter 11** in step 3 of5.3.2 Device Setup, it will be automatically added to the plant and displayed in the device list.



--End

5.4 Device Configuration (Local)

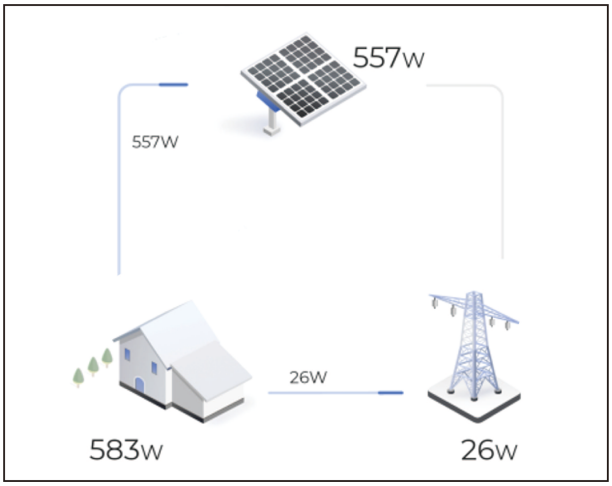
Connect to the microinverter's hotspot and complete device initialization and network configuration for the microinverter via local access. After this, create a plant in iSolarCloud via remote access and add the microinverter to the plant.

Please refer to chapter **Microinverter Commissioning** in the iSolarCloud App User Manual (Overseas) for specific configuration operations.

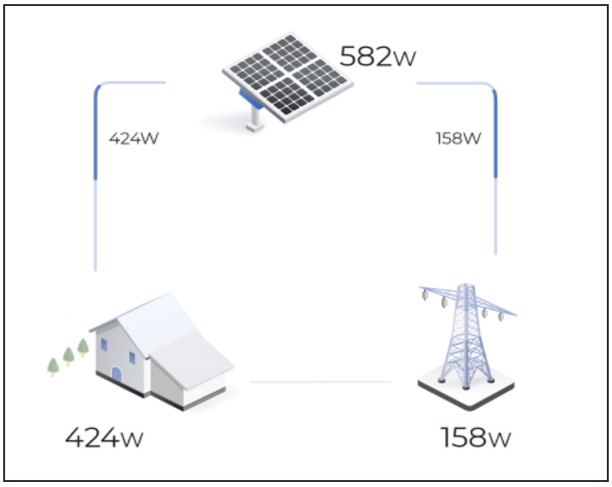
5.5 Power Flow (with iHomeManager)

After connecting the iHomeManager to the system, you can monitor the power at the grid connection point. The power flow diagram allows you to visualize the power flow and monitor data on the grid side.

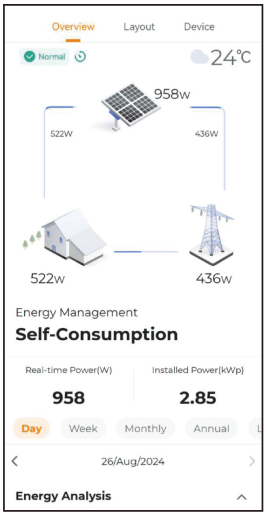
In the self-consumption scenario, when the load power demand exceeds the PV power output, additional power will be imported from the grid to meet the demand. In this case, the power flow diagram will indicate that the grid is supplying power to the load, as illustrated below.

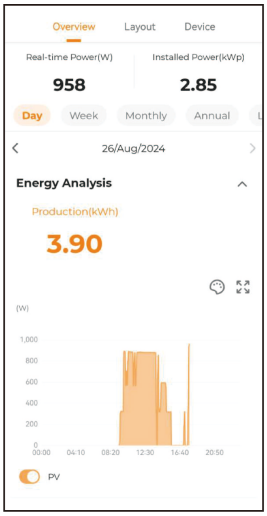


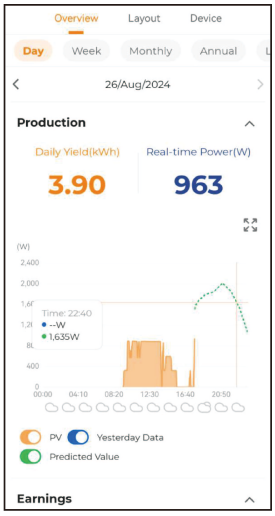
In the self-consumption scenario, if the load power demand is less than the PV power output, the excess output will be fed into the grid. In this case, the power flow diagram will indicate that the PV system is supplying power to the grid, as illustrated below.



Below the power flow diagram, you can view information such as daily yield, real-time power and earnings (revenue).


Overview
Layout
Device
Normal
24℃
958w
522W
436W
522w
436w
Energy Management
Self-Consumption
Real-time Power(W)
Installed Power(kWp)
958
2.85
Day
Week
Monthly
Annual
26/Aug/2024
Energy Analysis


Overview
Layout
Device
Real-time Power(W)
Installed Power(kWp)
958
2.85
Day
Week
Monthly
Annual
26/Aug/2024
Energy Analysis
Production(kWh)
3.90
(W)
1,000
800
600
400
200
0
00:00
04:10
08:20
12:30
16:40
20:50
PV


Overview
Layout
Device
Day
Week
Monthly
Annual
26/Aug/2024
Production
Daily Yield(kWh)
Real-time Power(W)
3.90
963
(W)
2,400
2,000
400
0
Time: 22:40
--W
1,635W
00:00
04:10
08:20
12:30
16:40
20:50
PV
Yesterday Data
Predicted Value
Earnings

6 Remote Monitoring

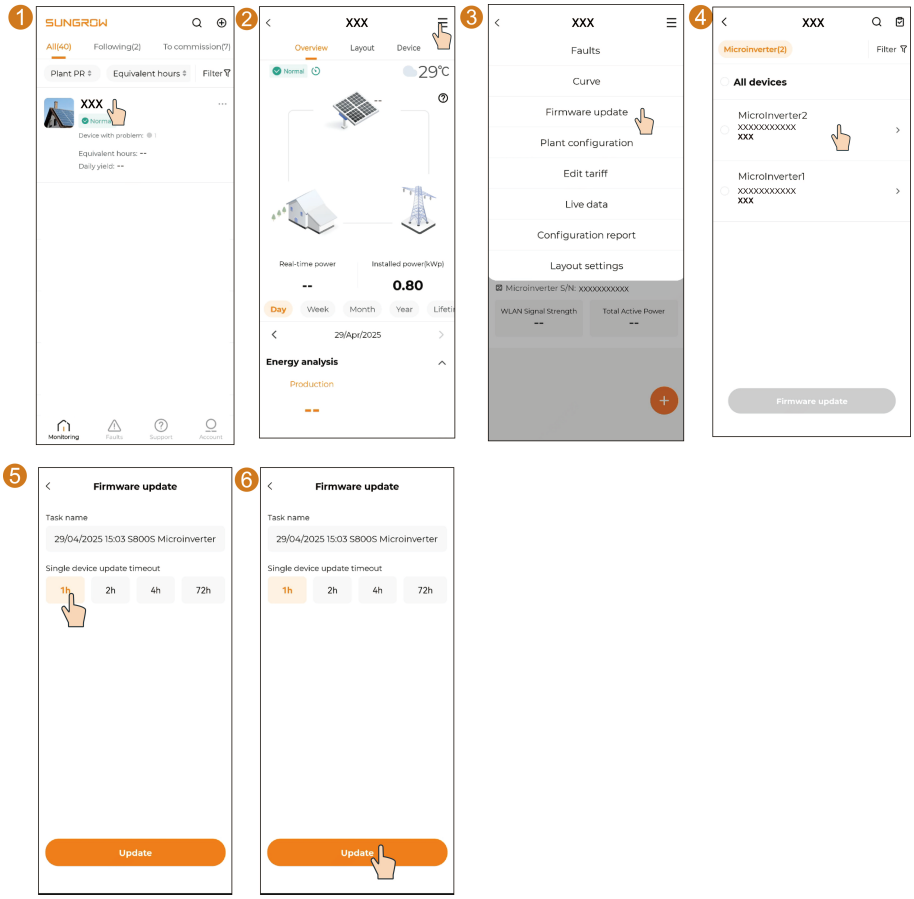
6.1 Firmware Update

Background Information

To further improve the device's performance, stability, and reliability, or to fix the known problems and vulnerabilities, SUNGROW may release new versions of firmware from time to time and notify users accordingly. Please update the firmware regularly to ensure the device's reliable operation.

Step 1 Open the iSolarCloud App, and enter the **Account** and **Password** to log in. Choose **Monitoring** to go to the plant list.

Step 2 Tap the plant name to go to the “Overview” tab. Then, tap the icon in the upper right corner and choose **Firmware update**,Choose the **Microinverter**,Set the **Single Device Update Timeout** to **1h** (user-definable), and tap **Update** to start an update, as shown in the figure below.



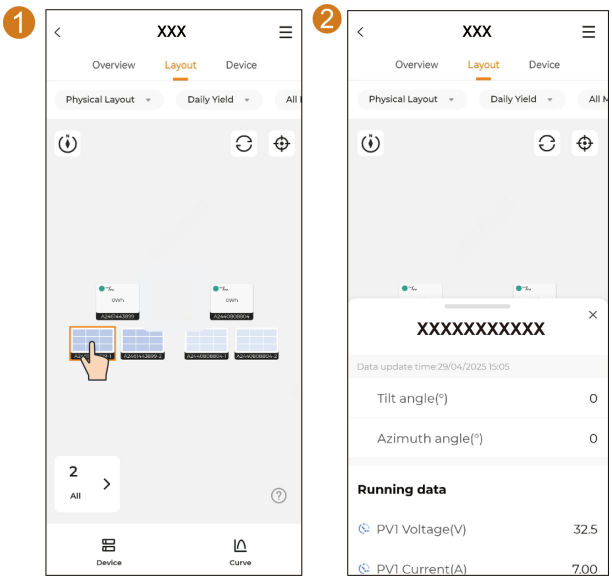
If the firmware update is not completed within the preset time, the system will indicate a firmware update timeout. In this case, start another update.

--End

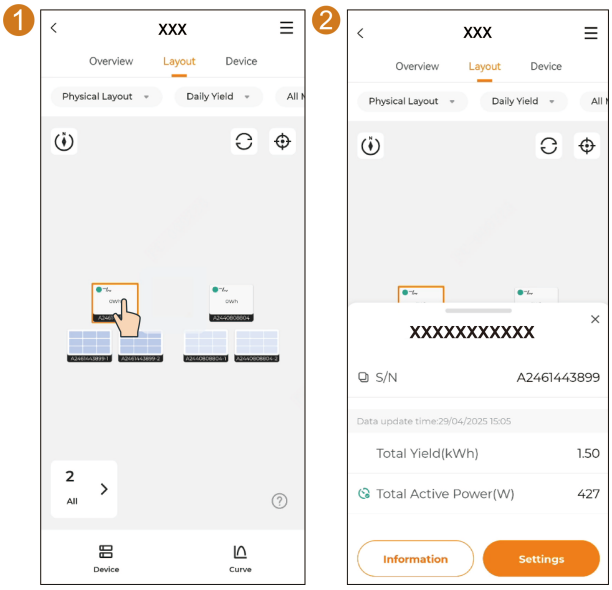
6.2 Viewing Layout

Choose the **Layout** tab at the top of the screen. Here you can check the yield data and arrangement of all PV modules attached to the microinverter.

- View device information
  - View PV module information: Tap a PV module in the layout to check its mounting angle and running data.



- View microinverter information: Tap a microinverter in the layout to check its energy production information.
  - Choose **Information** at the lower left of the screen to view more information about the microinverter, such as **General Information**, **Fault**, **Curve**, **Settings**, and **Communication device parameter setting**.
  - Choose **Settings** at the lower right for device parameter setting.

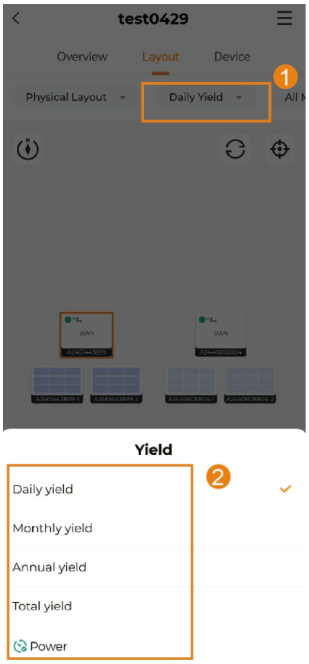


- Switch between layouts: Tap at the upper left of the layout view to switch between **Physical Layout** and **Logical Layout**.

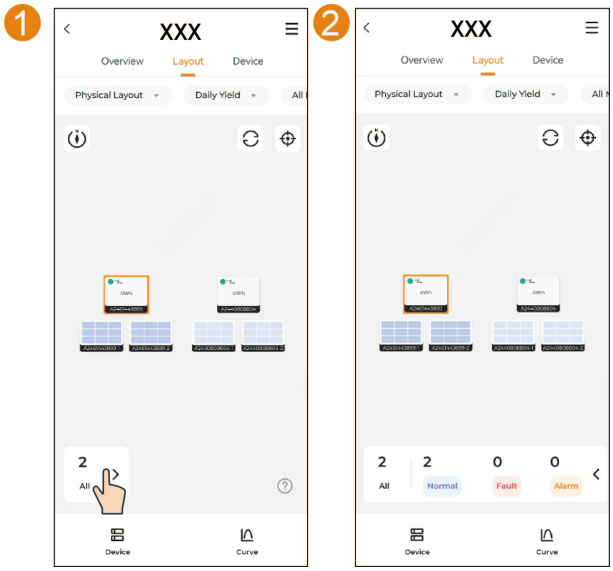
- **Physical Layout**: Shows the installation position and angle of the microinverter and PV modules.
- **Logical Layout**: Shows the connection between the microinverter and PV modules and their assignment status.

• View power yield data:

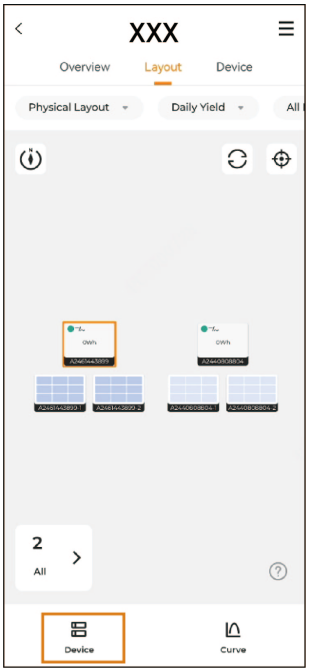
- Tap ▼ at the upper right of the layout view. You can switch between **Daily Yield**, **Monthly Yield**, **Annual Yield**, and **Total Yield** and check the energy production data of PV modules accordingly.
- Tap ▼ at the upper right of the layout view. Choose **Power** and enable the live data function. You can then choose ☰ **> Live Data** to check the live data of this plant.



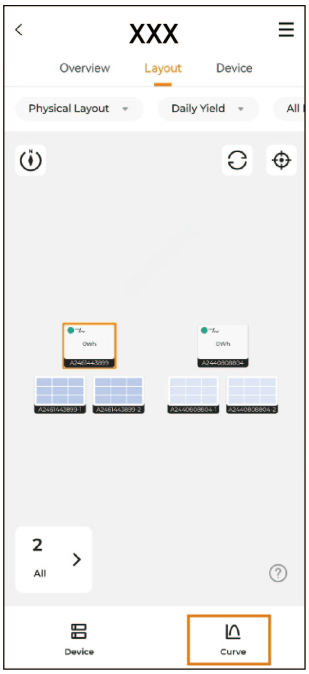
- View device status and quantity: Tap ▼ at the lower left of the layout view to check the status and number of microinverters.



- View device: Tap **Device** at the lower left of the layout view to check the device S/N and assignment status.

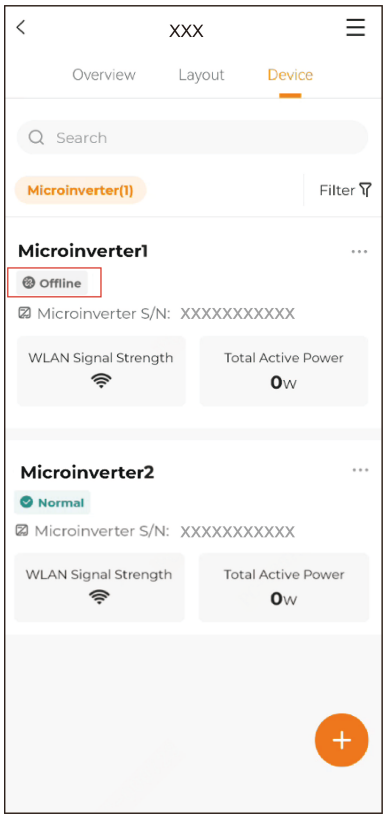


- View curves: Tap **Curve** at the lower right of the layout view. You can choose a module, and tap **Curve** to check its energy production data displayed as a curve.



6.3 Checking Microinverter Status

Choose the **Device** tab on the top of the screen to check the devices in the plant and their status.

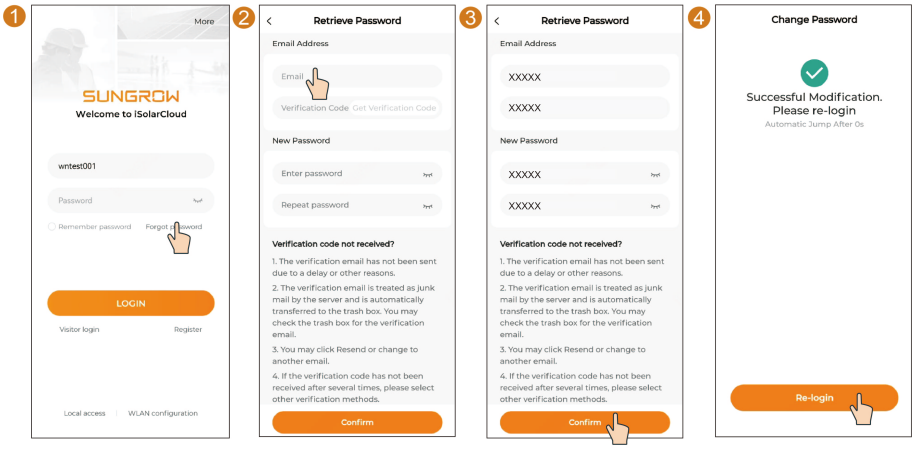


If a microinverter in the list remains offline for an extended period (excluding the situation that the microinverter goes offline at night, which is normal), follow the troubleshooting steps below.

- Check that the home router network is functioning properly.
- Check that the microinverter is using the correct password to connect to the network.
- Determine if the signal is weak because the microinverter is too far from the router. If necessary, add a Wi-Fi extender between the microinverter and the router. See 2.3.1 Rooftop PV System for detailed instructions.

6.4 Resetting iSolarCloud Account Password

Change the password required to log in to the iSolarCloud account.



Step 1 Tap **Forgot Password** on the login screen.

Step 2 Enter the account name, and tap **Get Verification Gode**.

> You may not be able to reset your password if:
> - The account is not associated with an email address.
> - You have deleted your personal information, e.g., your email address.
> - You forgot your account name.
>
> In case of any of the above problems, please contact Customer Service.

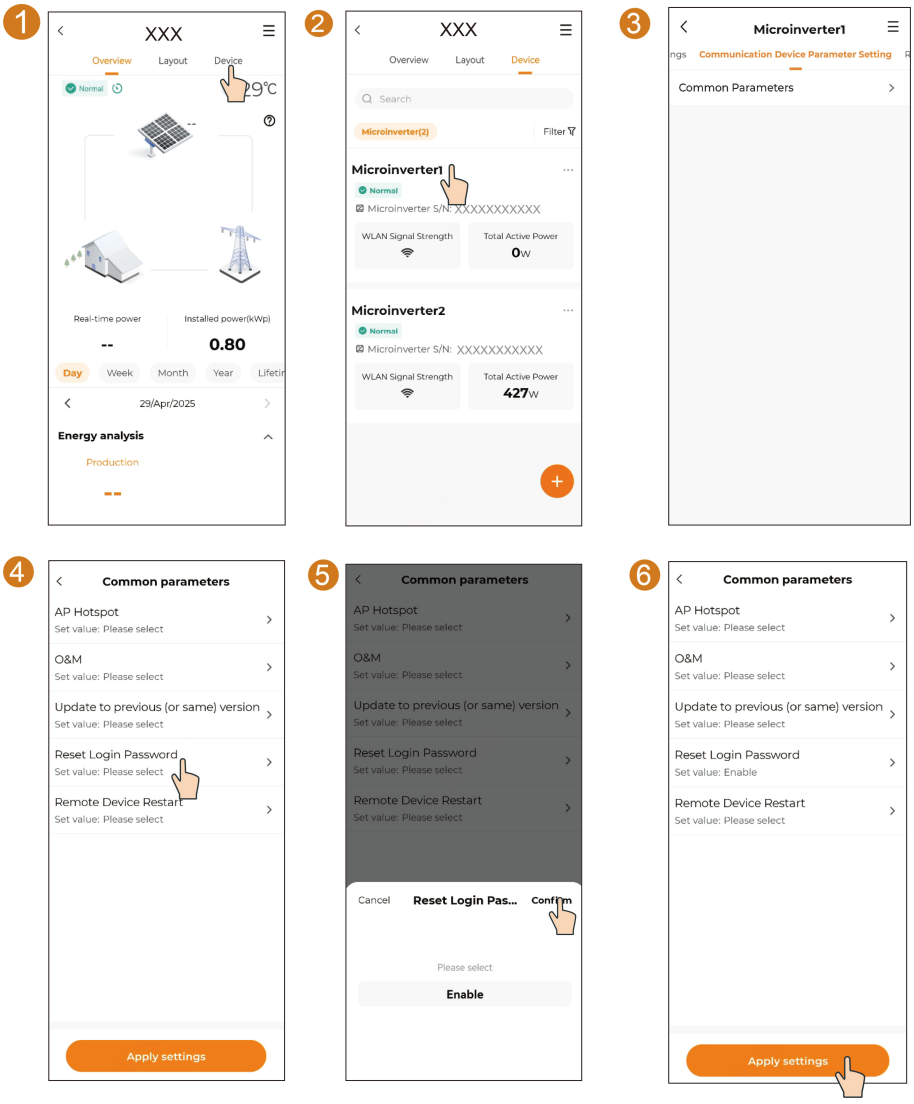
Step 3 Enter a new password. The password should be 8-character long at least and contain at least one letter and one number. Then, tap **Confirm**.

Step 4 After changing the password, tap **Re-login** to go back to the login screen. You can now log in with your new password.

--End

6.5 Resetting Microinverter Password

Change the password required to access the microinverter device.



Step 1 Open the plant that has been created, and tap **Device**.

Step 2 Choose the target microinverter.

Step 3 Tap **Communication Device Parameter Setting** in the scrolling menu bar, and choose **Common Parameters**.

Step 4 Tap **Reset Login Password**.

Step 5 Tap **Enable**.

Step 6 Tap **Apply Settings**.

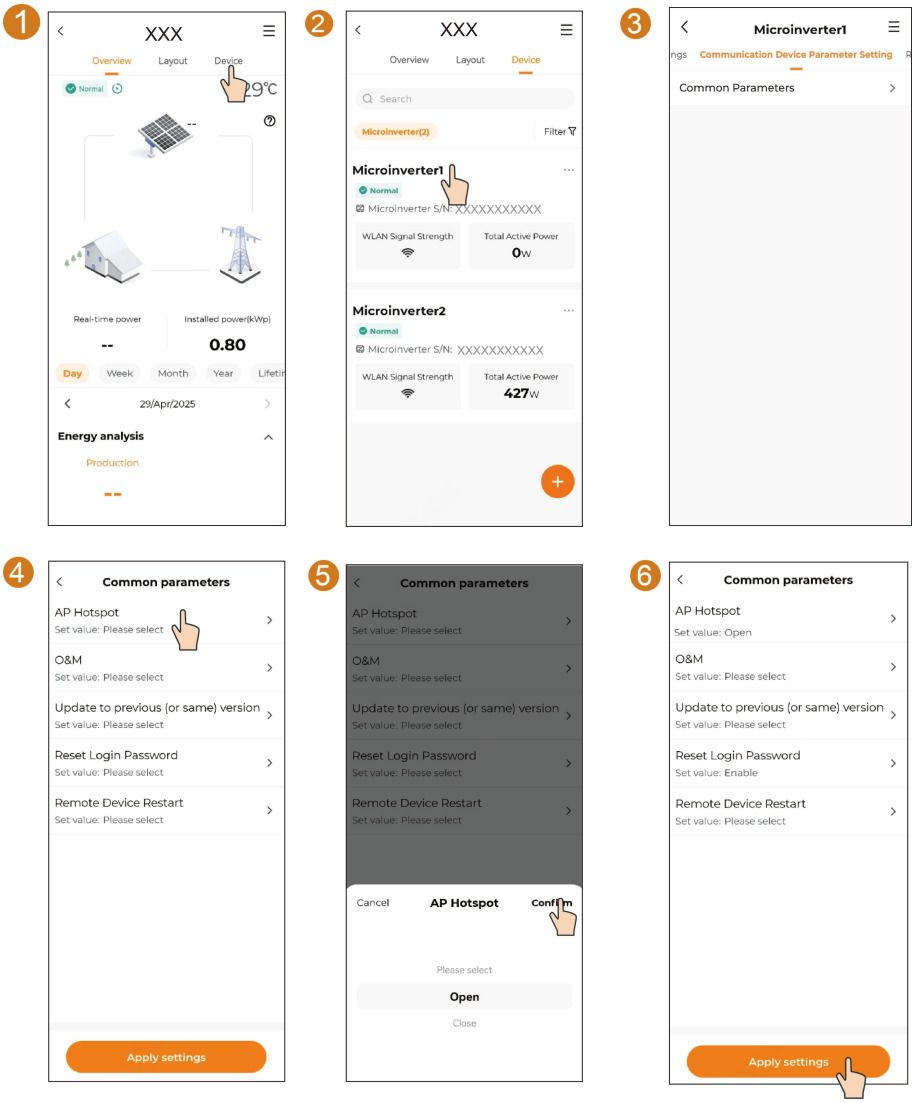
--End

After the setting is completed, the password for this microinverter will be reset to the initial. Then, you can scan the QR code on the device enclosure and change the password again.

6.6 Turning on Microinverter Hotspot

Prerequisite

In case the microinverter's hotspot goes off from timeout, you can turn it on again by following the steps below.



Step 1 Open the plant that has been created, and choose **Device**.

Step 2 Choose the target microinverter.

Step 3 Tap **Communication Device Parameter Setting** in the scrolling menu bar, and choose **Common Parameters**.

Step 4 Tap **AP Hotspot**, and select **Open**.

Step 5 Tap **Apply Settings**.

--End

7 Maintenance

7.1 Maintenance Notices

⚠ DANGER

Risk of microinverter damage or personal injury due to incorrect service!

- **Be sure to use specialized insulated tools when performing high-voltage operations.**
- **Before any service work, first switch off the grid-side AC circuit breaker and check the microinverter status.**
- **After the microinverter is powered off for 10 minutes, measure the voltage and current with professional instrument. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the microinverter.**
- **Even if the microinverter is shut down, it may still be hot and cause burns. Wear protective gloves before operating the microinverter after it cools down.**
- **When maintaining the product, it is strictly prohibited to open the product if there is an odor or smoke or if the product appearance is abnormal. If there is no odor, smoke, or obvious abnormal appearance, repair or restart the microinverter according to the alarm corrective measures. Avoid standing directly in front of the microinverter during maintenance.**

⚠ CAUTION

To prevent misuse or accidents caused by unrelated personnel: Post prominent warning signs or demarcate safety warning areas around the microinverter to prevent accidents caused by misuse.

NOTICE

- **Restart the microinverter only after removing the fault that impairs safety performance.**
- **As the microinverter contains no component parts that can be maintained, never open the enclosure, or replace any internal components.**
- **Store the accessories properly after installation for use in future maintenance.**
- **To avoid the risk of electric shock, do not perform any other maintenance operations beyond those described in this manual. If necessary, contact your distributor first. If the problem persists, contact SUNGROW. Otherwise, the losses caused is not covered by the warranty.**

NOTICE

Touching the PCB or other static sensitive components may cause damage to the device.

- **Do not touch the circuit board unnecessarily.**
- **Observe the regulations to protect against electrostatic and wear an anti-static wrist strap.**

7.2 Routine Maintenance

Read the instructions in 7.1 Maintenance Notices carefully before performing the following operations and proceed with caution.

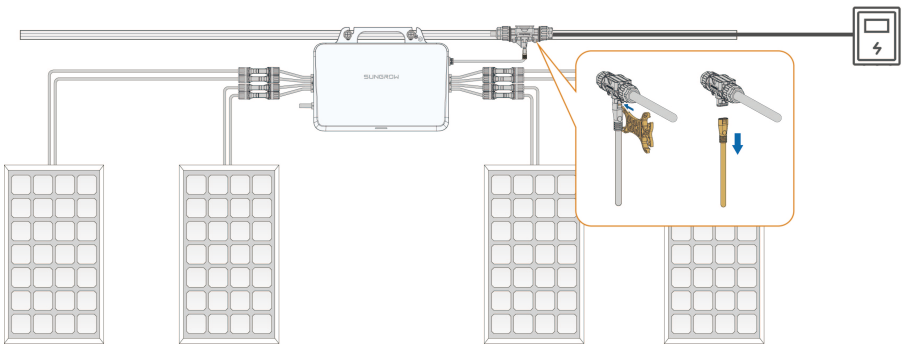
Item	Method	Period
Device clean	Check the temperature and dust of the device. Clean the device enclosure if necessary.	6 months to a year (depending on the dust contents in air)
Electrical connection	• Check whether all cable are firmly connected in place. • Check whether there is damage to the cables, especially the surface in contact with metal.	6 months after commissioning and then once or twice a year
General status of the system	• Visual check for any damage or deformation of the microinverter. • Check any abnormal noise during the operation. • Check each operation parameter. • Be sure that nothing covers the heat sink of the device.	Every 6 months

7.3 Microinverter Removal and Replacement

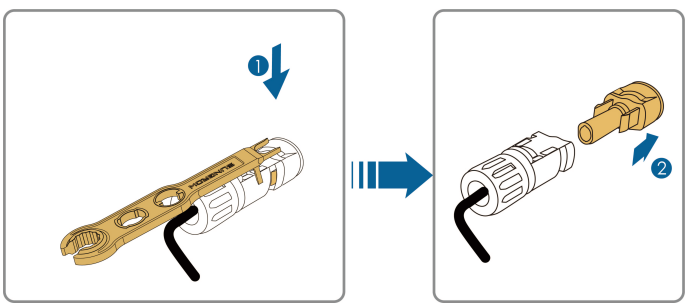
7.3.1 Microinverter Removal and Replacement

Step 1 Turn off the main AC circuit breaker in the house.

Step 2 To remove the AC connector, use a disconnect tool.



Step 3 Remove the DC connector, use a connector wrench to loosen the locking parts.



Connector wrench prepared by users.

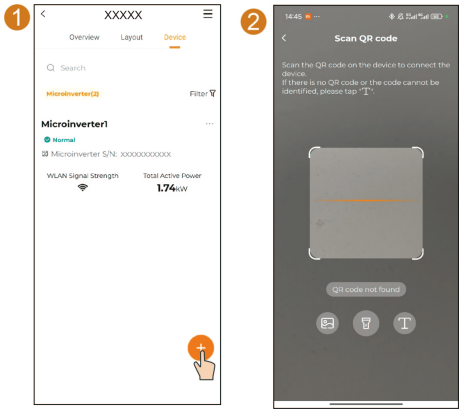
Step 4 Remove the grounding cable.

Step 5 Unscrew the fixing screws using a proper tool.

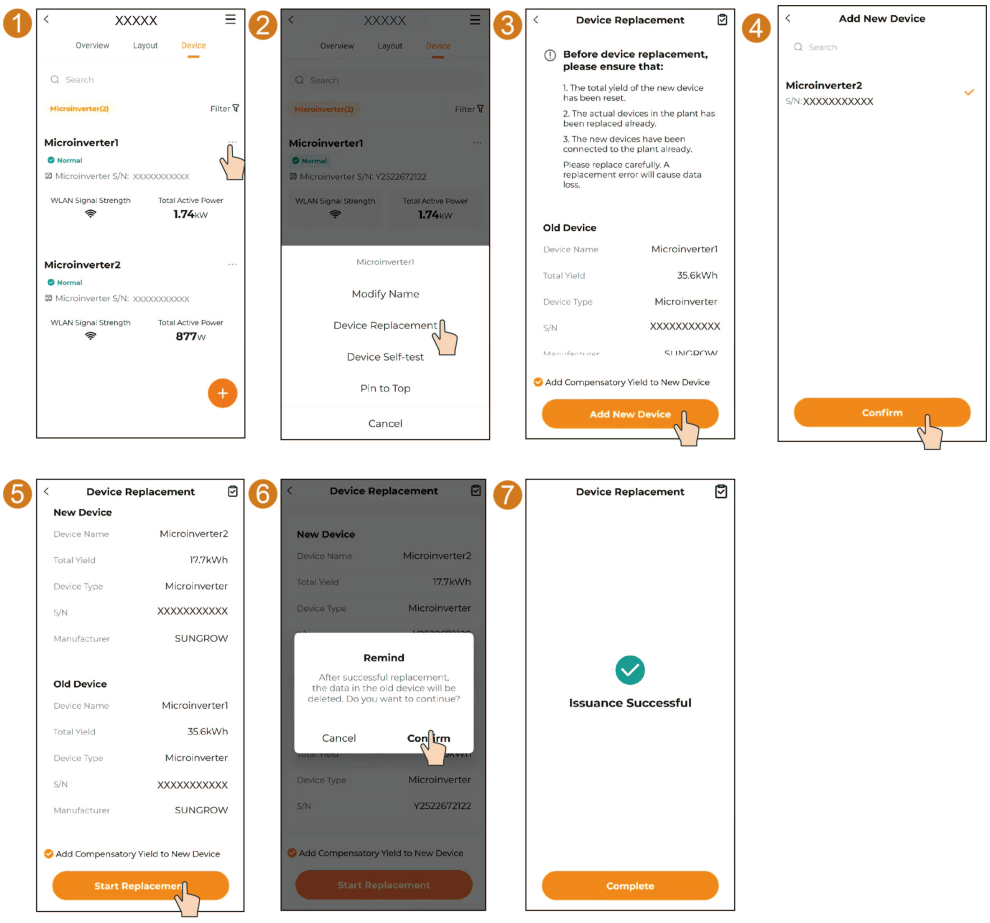
--End

7.3.2 Microinverter Replacement on iSolarCloud App

Step 1 After replacing the device on-site, open the iSolarCloud App and select the plant. Choose **Device** and tap to launch the QR code scanner. Scan the new device's QR code label to add it to the plant, then complete its **Device Initialization** and **Network** settings by referring to 5.3.2 Device Setup.



Step 2 Tap the plant, and choose **Device**. Then, tap ••• and choose **Device Replacement** to add the new microinverter to the plant. The steps are shown below.



--End

7.4 System Decommissioning

7.4.1 Disconnecting the Microinverter

Prerequisite

⚠ CAUTION

Danger of burns!
Even after the microinverter has been stopped, it may still be hot and cause burns. Wait about 30 min for the microinverter to cool down, and then perform operations on it wearing protective gloves.

For maintenance or other service work, the microinverter must be switched off.

Proceed as follows to disconnect the microinverter from the AC power sources. Lethal voltages or damage to the microinverter will follow if otherwise.

Step 1 Switch off the external AC circuit breaker and prevent it from inadvertent switching on.

Step 2 Wait about 10 minutes until the capacitors inside the microinverter completely discharge.

--End

7.4.2 Dismantling the Microinverter

Prerequisite

⚠ CAUTION

Risk of burn injuries and electric shock!
After the microinverter is powered off for 10 minutes, measure the voltage and current using specialized instruments. Operation and maintenance must only be performed by qualified personnel who wear protective equipment after confirming that no voltage or current is present.

- Before dismantling the microinverter, disconnect it from AC power sources.
- Put the microinverter into its original packaging and seal it using adhesive tape. If the original packaging is not available, select an appropriate cardboard box based on the microinverter's weight and size, put the microinverter into the box, and seal it properly.

Step 1 Refer to 4.3 Mounting and Wiring , to dismantle the microinverter in reverse steps.

Step 2 If necessary, remove the wall-mounting bracket from the wall.

Step 3 If the microinverter will be used again in the future, please store it properly.

--End

7.4.3 Disposal of Microinverter

Users take the responsibility for the disposal of the microinverter.

⚠ WARNING

Please dispose of the microinverter in compliance with the applicable local regulations and standards to avoid property damage or casualties.

NOTICE

Some parts or components of the microinverter may contaminate the environment. Therefore, please dispose of the microinverter or its parts or components according to the applicable regulations for electronic waste disposal in the place where the microinverter is located.

8 Troubleshooting and Maintenance

8.1 Indicator Status and Troubleshooting

LED Indicator

LED Indicator	Color	LED Status	Description
	Blue	Steady on	On-grid operation
		Blinking	Standby or starting up
	Red	Steady on	Fault (e.g., microinverter fault, update failed)
		Blinking	Update in progress
	Grey	Off	Power off

If there is a fault in the microinverter, the fault information will be shown on the iSolarCloud App. Fault codes and corresponding troubleshooting methods are all listed in the table below, which are intended for all PV inverter products. Some of these faults may not occur in the product you have purchased. In case of a fault in the inverter, you can check its detailed information by fault code on the iSolarCloud App.

Fault Code	Fault Name	Troubleshooting Methods
2	Grid over-voltage	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage. Contact your local power company for help if the grid voltage is higher than the set value; 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
3	Grid transient overvoltag e	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage. Contact your local power company for help if the grid voltage is higher than the set value;

Fault Code	Fault Name	Troubleshooting Methods
		2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
4	Grid under-voltage	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage. Contact your local power company for help if the grid voltage is lower than the set value; 2. Check whether the AC cable connection is secure; 3. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
5	Grid voltage low	
7,16,38,61, 85,104,105, 107,262,300, 306,307,312, 313,314,315, 316,324,330, 327,1326,1327 1352–1357, 1360–1370, 1372–1378	System fault	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage and frequency. Contact your local power company for help if the grid voltage and frequency fluctuation are out of the operating range required by the device; 2. The grid voltage DC component may be out of the operating range required by the device. In this case, contact your local power company for help; 3. Check the specifications of the PV modules and see if their voltage data exceeds the operating range required by the device; 4. Check if there is any obstruction by foreign objects to the device enclosure. If so, remove them; 5. Turn off the AC switch inside the power distribution box. Then, re-connect the cables of PV modules, restart the device, and wait for it to return to normal; 6. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
8	Grid over-frequency	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage and frequency. Contact your local power company for help if the grid parameter exceeds the set range;

Fault Code	Fault Name	Troubleshooting Methods
		2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
9	Grid under-frequency	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage and frequency. Contact your local power company for help if the grid parameter is below the set range; 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
10	Grid outage	Generally, the inverter will reconnect to the grid automatically once the grid returns to normal. If this fault occurs repeatedly: 1. Check if the grid voltage is lower than the operating range required by the device. If so, contact your local power company for help; 2. Check whether the AC cable connection is secure; 3. Check whether the AC cable is connected in correct polarity; 4. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
13	Grid abnormal	Generally, the inverter will reconnect to the grid once the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid frequency and grid voltage. Contact your local power company for help if the grid parameter exceeds the set range; 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
14	10-minute grid over-voltage	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage. Contact your local power company for help if the grid voltage exceeds the set range;

Fault Code	Fault Name	Troubleshooting Methods
		2. Open the iSolarCloud App and check the setting of the 10-minute over-voltage protection function. With the permission of the local power system operator, you can increase the 10-minute over-voltage protection threshold; 3. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
15	Grid voltage high	Generally, the inverter will reconnect to the grid once the grid returns to normal. If this fault occurs repeatedly: 1. Measure the actual grid voltage. Contact your local power company for help if the grid voltage is higher than the set value. 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
17	Grid voltage unbalance	Generally, the inverter will reconnect to the grid automatically once the grid returns to normal. If this fault occurs repeatedly: 1. If the grid voltage unbalance is out of the operating range required by the inverter, contact your local power company for help; 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
26, 28, 29, 208, 212, 215	PV reserve connection fault	Check the wiring of the positive and negative cables of the PV modules (including extension cables): 1. If the phase sequence is wrong, turn off the AC switch in the power distribution box first. Then, when the light is weak, or after covering the PV module completely with a shelter, reconnect the cables of the PV module (including extension cable); 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
37	Ambient temperatur e too high	Generally, the inverter will reconnect to the grid automatically once the ambient temperature returns to normal. If this fault occurs repeatedly:

Fault Code	Fault Name	Troubleshooting Methods
		1. Check if the ambient temperature exceeds the operating range required by the device; 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
39	Low system insulation resistance	Generally, the device will reconnect to the grid automatically after the fault is removed. If this fault occurs repeatedly: 1. Check whether the preset ISO resistance protection value of the inverter is too high and whether it complies with the local regulations; 2. Check if the resistance of the PV module is too low on rainy or cloudy days, or in the morning or evening. Measure the PV module negative- and positive-to-ground insulation resistance and see if they are too low; 3. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
43	Ambient temperatur e too low	Generally, the inverter will reconnect to the grid automatically once the ambient temperature returns to normal. If this fault occurs repeatedly: 1. Check if the ambient temperature is below the operating range required by the device; 2. If the fault does not arise for the aforementioned reason and still cannot be resolved, please contact SUNGROW Customer Service.
74, 78, 79, 80, 81, 220, 221, 505, 506	System alarm	Generally, the alarm will not affect the device's operation. If this alarm occurs repeatedly: 1. Turn off the AC switch inside the power distribution box, and check if the cables of the PV modules are connected firmly; 2. Check if there are short circuits or open circuits in the cables of PV modules; 3. Re-connect the cables of PV modules, restart the device, and wait for the device to return to normal; 4. If the alarm does not arise for the reasons above, please contact SUNGROW Customer Service.

Fault Code	Fault Name	Troubleshooting Methods
1320, 1321, 1322, 1323, 1324, 1325	PV over-current fault	Generally, the device will reconnect to the grid automatically after the fault is removed. If this fault occurs repeatedly: 1. Check the specifications of the PV modules and see if their current is out of the operating range required by the device; 2. If the fault does not arise for the reasons above, please contact SUNGROW Customer Service.
1500, 1501, 1502, 1503, 1504, 1505	PV over-voltage fault	Generally, the device will reconnect to the grid automatically after the fault is removed. If this fault occurs repeatedly: 1. Check the specifications of the PV module and see if their voltage data is out of the operating range required by the device; 2. If the fault does not arise for the reasons above, please contact SUNGROW Customer Service.

Contact your dealer if you have already tried the “Troubleshooting Methods” listed in the table above but the problem is still not resolved. In case the dealer cannot help you solve the problem, please contact SUNGROW.

9 Appendix

9.1 Technical Data

Type designation	S450S-L	S1000S-L	S2000S-L
Input (DC)			
Recommended PV module power range		450 - 650 W	
Max. PV input voltage		60 V	
Min. PV input voltage / Startup input voltage		16 V / 22 V	
MPPT voltage range		16 V - 60 V	
No. of independent MPP trackers	1	2	4
Max. PV input current	16A * 1	16A * 2	16A * 4
Max. DC short-circuit current	20A * 2	20A * 2	20A * 4
Output (AC)			
Grid Type		Single phase	
Rated AC output power	450 W	1000 W	2000 W
Max. AC output apparent power	450 VA	1000 VA	2000 VA
Max. AC output current	2.1A	4.5 A	9.1 A
Max. AC output current(at 230 V)	2.0 A	4.4 A	8.7A

Type designation	S450S-L	S1000S-L	S2000S-L
Rated AC voltage	220 V / 230 V / 240 V		
AC voltage range*	154 V - 277 V		
Rated grid frequency	50 Hz / 60 Hz		
Grid frequency range	45 Hz - 55 Hz		
	55 Hz - 65 Hz		
Harmonic (THD)	< 5 % (at rated power)		
Power factor at rated power	>0.99		
Maximum units per 10 AWG □6 mm^2□ branch**	14	6	3
Efficiency			
Max. efficiency	96.2 %		
European efficiency	95.4 %		
Protection & function			
Grid monitoring	Yes		
Leakage current protection	Yes		
PV module monitoring	Yes		
Surge Protection	AC type II		
General data			
Dimensions (W * H * D)	238 mm * 168 mm * 42 mm	265 mm * 226 mm * 42 mm	381 mm * 286 mm * 58 mm
Weight	2.5 kg	3.5 kg	8.5 kg
Mounting method	Bracket Mounted		
Isolation design	High Frequency Transformers		

Type designation	S450S-L	S1000S-L	S2000S-L
Degree of protection		IP67	
Night power consumption		< 50 mW	
Operating ambient temperature range		-40 °C - 65 °C	
Allowable relative humidity range(non-condensing)		100 %	
Cooling method		Natural cooling	
Max. operating altitude		2000 m	
Display		LED	
Communication		WLAN	
DC connection type		MC4 compatible	
AC connection type		Plug and play connector	

* Voltage could vary within the supporting range according to the application scenario.

**Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

9.2 Quality Assurance

When product faults occur during the warranty period, SUNGROW will provide free service or replace the product with a new one.

Evidence

During the warranty period, the customer shall provide the product purchase invoice and date. In addition, the trademark on the product shall be undamaged and legible. Otherwise, SUNGROW has the right to refuse to honor the quality guarantee. The warranty period is years and the software service period is years.

Conditions

- After replacement, unqualified products shall be processed by SUNGROW.
- The customer shall give SUNGROW a reasonable period to repair the faulty device.

Exclusion of Liability

In the following circumstances, SUNGROW has the right to refuse to honor the quality guarantee:

- The free warranty period for the whole machine/components has expired.
- The device is damaged during transport.
- The device is incorrectly installed, refitted, or used.
- The device operates in harsh conditions beyond those described in this manual.
- The fault or damage is caused by installation, repairs, modification, or disassembly performed by a service provider or personnel not from SUNGROW.
- The fault or damage is caused by the use of non-standard or non-SUNGROW components or software.
- The installation and use range are beyond stipulations of relevant international standards.
- The damage is caused by unexpected natural factors.

For faulty products in any of above cases, if the customer requests maintenance, paid maintenance service may be provided based on the judgment of SUNGROW.

9.3 Contact Information

In case of questions about this product, please contact us. We need the following information to provide you the best assistance:

- Model of the device
- Serial number of the device
- Fault code/name
- Brief description of the problem

For detailed contact information, please visit: **https://en.SUNGROWpower.com/contactUS**

SUNGROW

Sungrow Power Supply Co., Ltd.

www.sungrowpower.com