

FusionSolar App and SUN2000 App

User Manual

Issue 03
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About This Document

Purpose






This document describes common operations of FusionSolar, frequently asked questions (FAQs), and troubleshooting methods.

Intended Audience

This document is intended for PV plant installers and owners.

Symbol Conventions

The symbols that may be found in this guide are defined as follows.

| Symbol | Description |
|--|---|
|  DANGER | Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury. |
|  WARNING | Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury. |
|  CAUTION | Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury. |
|  NOTICE | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury. |
|  NOTE | Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration. |

Change History

| Issue | Date | Description |
|-------|------------|---|
| 03 | 2022-08-23 | Deleted the local maintenance script . |
| 02 | 2022-06-02 | Update the domain name list of management systems |
| 01 | 2022-05-07 | The issue is the first official release. |

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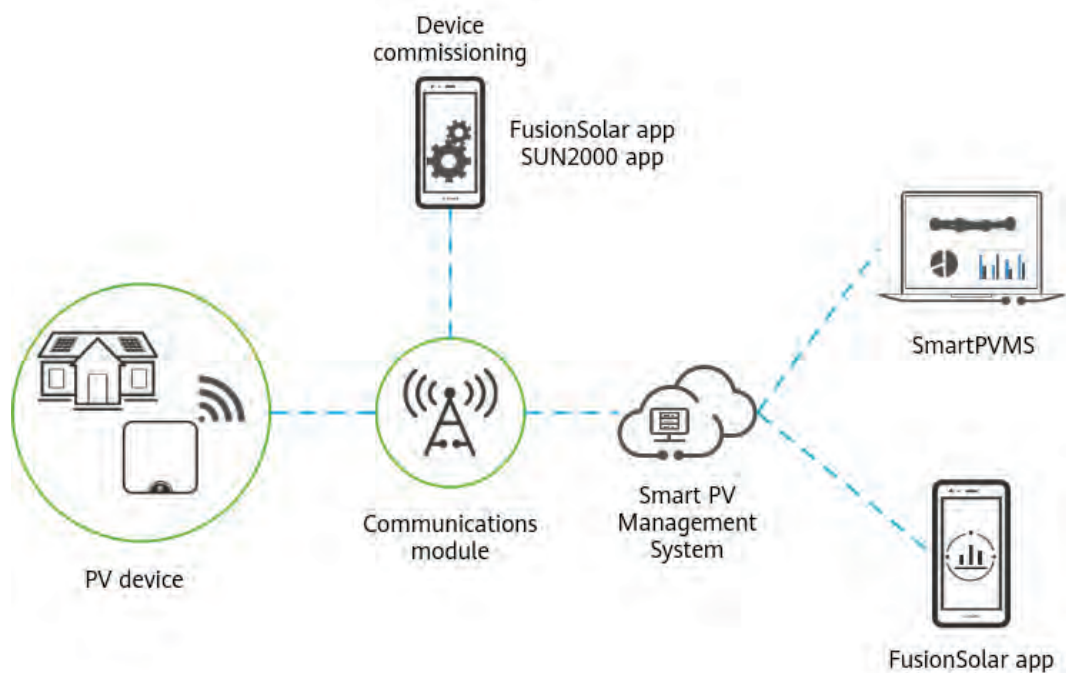
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1 SmartPVMS Overview

Smart PV Management System (SmartPVMS) is a software system used for monitoring and performing operation and maintenance (O&M) on PV energy generation systems. Users can manage PV plants on the app (FusionSolar) and WebUI.

Networking Mode



Access Mode

The SmartPVMS connects to the public network on a PC and can be accessed at <https://intl.fusionsolar.huawei.com> on a browser.

The FusionSolar can be accessed at <https://intl.fusionsolar.huawei.com> using mobile networks or WLAN.

The SUN2000 directly connects to PV devices using the built-in or connected communications modules (such as the Dongle, SmartLogger, or Bluetooth module).

SmartPVMS

The system monitors the running status of PV devices in real time and provides visualized energy flow diagrams and energy management, helping users easily learn about energy generation, storage, and consumption. The system also provides other functions, such as intelligent alarm reporting, analysis, diagnosis, and O&M to improve energy yield efficiency, reduce O&M costs, and ensure continuous and stable operation of PV plants throughout its life cycle.

FusionSolar

The system provides energy yield monitoring and mobile O&M services. Specifically, the system provides functions such as device commissioning, quick site deployment, visualized energy management, real-time alarm locating and troubleshooting, and work order handling. These functions lower O&M costs and improve energy yield efficiency.

SUN2000

PV devices connect to the SUN2000 at the near end using their built-in or external communication modules. This enables quick commissioning before site deployment. In addition, users can configure parameters and perform routine maintenance for the PV devices on the SUN2000. This makes it a convenient maintenance platform.

The FusionSolar is integrated with the SUN2000 functions. You can use the device commissioning function of the FusionSolar to connect to devices at the near end without downloading the SUN2000.

Account Management

The FusionSolar and SmartPVMS share the same accounts. Users can use the registered account and password to access the FusionSolar or SmartPVMS.

SUN2000 provides built-in accounts of the devices. Different devices have different login accounts. You can obtain the accounts and passwords from the *SUN2000 User Manual*.

2 Downloading and Installing the App

NOTE

- Supported mobile phone operating system: Android 5.0, iOS 11.0, or later versions
- To ensure the stability of each function, you are advised to use mobile phones running Android 8.0, iOS 13.0, or later versions. (For the mobile phones running iOS, iPhone 6 and later versions are supported, but iPhone SE is not supported.)
- The mobile phone supports the access to the Internet over a web browser.

Procedure

Method 1: Download and install the app from the app store.

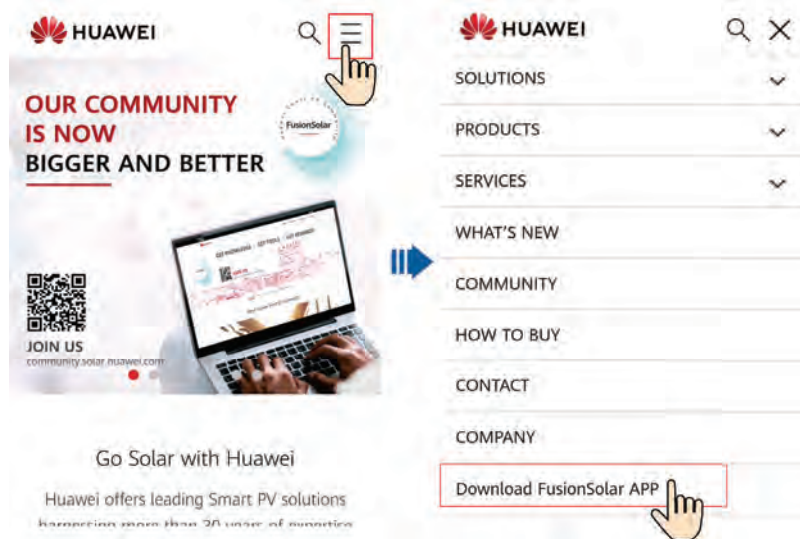
- Huawei mobile phone users: Search for **FusionSolar** in Huawei AppGallery.
- iPhone users: Search for **FusionSolar** in App Store.
- Other mobile phone users: Select method 2 or 3.



Method 2: Scan the QR code to download and install the app.



Method 3: Visit <https://solar.huawei.com> using a browser on your mobile phone to download and install the app.



NOTE

Users who select method 2 or 3 can select the download method based on the mobile phone type.

- Huawei mobile phone users: Download from Huawei AppGallery.
- Non-Huawei phone users: Download on a browser.
- iPhone users: Download from the App Store.

When you select **Download via the Browser**, if a security warning message is displayed indicating that the app is from an external source, tap **ALLOW**.

3 Obtaining the Account and Password

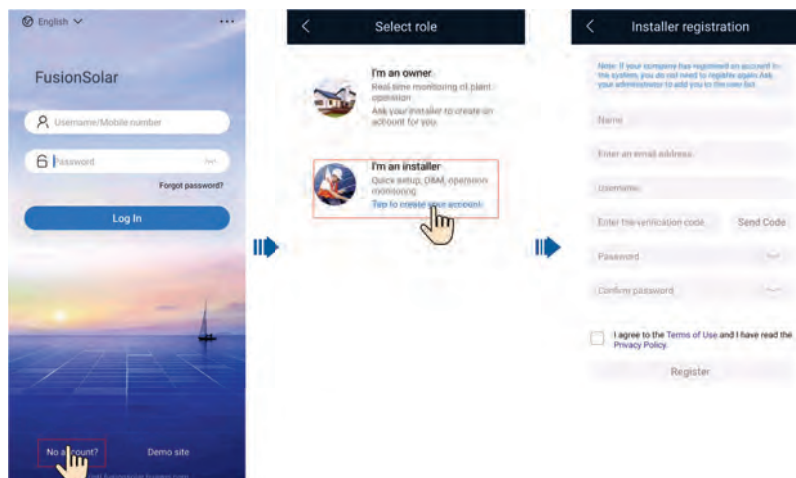
Owner

An owner account is created by an installer. The user needs to provide personal information required for creating the account, such as the name and email address. After the installer creates an account, the system sends the account and initial password to the owner by email.

Installer

- If your company has not registered an account in the management system, tap **No account?** in the lower part of the app login screen to register an account. Registering the first installer user will register a company at the same time.
 - a. Tap **No account?** in the lower part of the FusionSolar login screen.
 - b. On the **Select role** screen, tap **I'm an installer** and register an account as prompted.

After the account is registered, the user can log in to the FusionSolar or SmartPVMS with the registered username and password.



- If your company has registered an account, contact the administrator to add you to the user list. For details, see [6.2 Creating a User](#).

4 Logging In to or Logging Out of FusionSolar

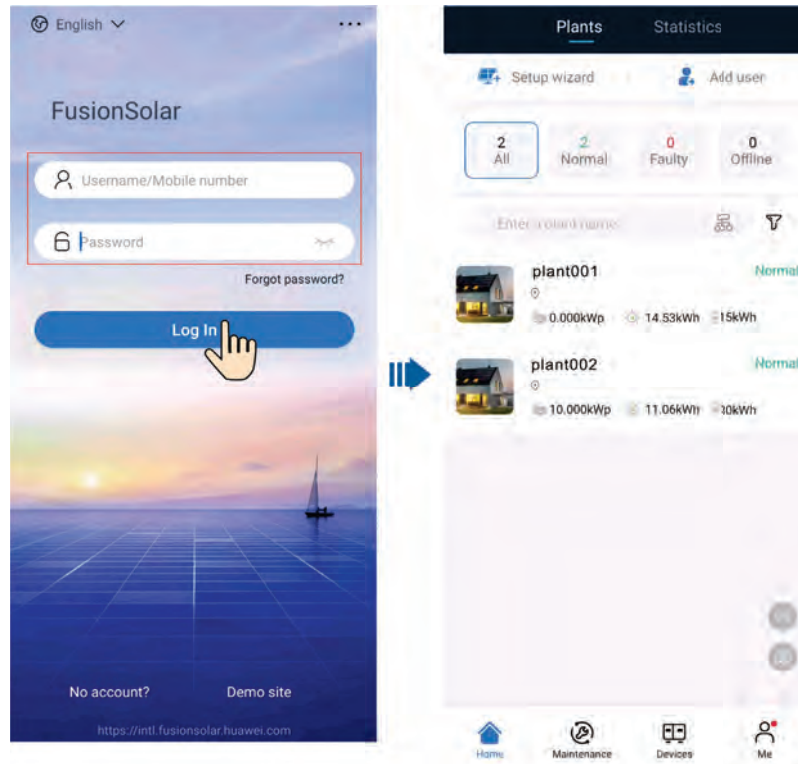
After the app is correctly installed on a mobile phone, you can access the management system through the app.

Prerequisites

- Your mobile phone is connected to WLAN or mobile network.
- The FusionSolar app has been installed. For details, see [2 Downloading and Installing the App](#).
- You have obtained the user name and password for logging in to FusionSolar. For details, see [3 Obtaining the Account and Password](#).

Logging In to the App

1. On the mobile device, tap the app icon to access the login screen.
2. On the app login screen, enter the account and password and tap **Log In**.



NOTE

- If a new user logs in to the app for the first time or a user logs in to the app for the first time after the password is reset, change the login password as prompted.
- If a user enters incorrect passwords for five consecutive times within 5 minutes, the account will be locked for 30 minutes. The user can log in again after the lockout period expires or contact the installer or administrator to unlock the account.

Logging Out of the App

1. On the home screen, tap **Me**.
2. On the **Me** screen, tap **Settings** > **Log out**.

5 I am an Owner

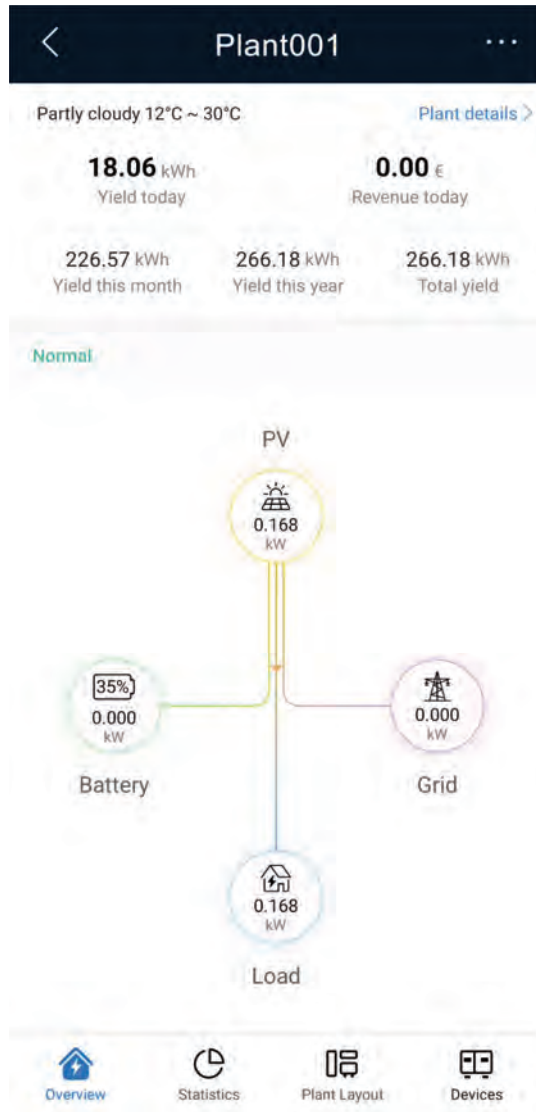
An owner user can monitor the running status, energy yield, and revenue of a plant on the FusionSolar.

5.1 Viewing PV Plant Status

The FusionSolar provides an overview of plants. You can view the plant running status, energy output and consumption, revenue, and energy flow diagram in real time.

Viewing Plant Overview

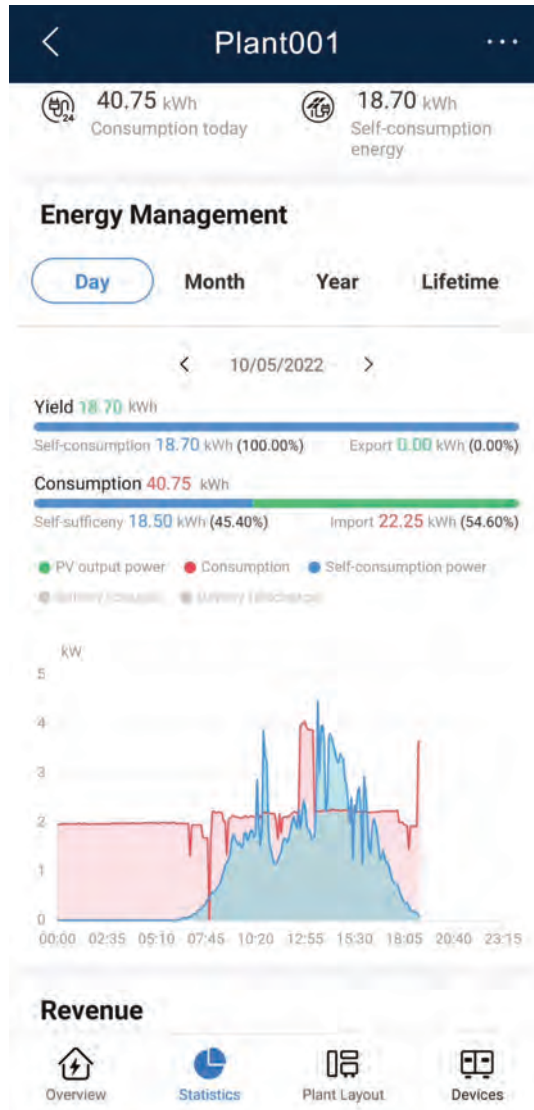
Log in to the app, tap **Home** and tap **Plants**. Tap a desired plant to check its overview. The plant overview includes the basic plant information, energy yield and revenue statistics, real-time running status, and energy flow diagram.



- Basic plant information: Displays the weather information of the place where the plant is located on the current day. Tap **Plant details** to view the detailed plant information.
- Energy yield and revenue statistics: Displays the energy yield and revenue of the plant.
- Real-time running status: Allows you to check whether the current running status of the plant is normal.
- Energy flow diagram: Displays the current power supply direction of the plant.

Viewing Plant Statistics

Tap the **Statistics** tab to view the energy yield, energy consumption, revenue, and social contributions of a plant.




- Energy management: Displays the energy yield, energy consumption, and self-consumption of a plant in different time dimensions, helping you analyze the energy consumption trend and optimize electricity consumption. In the energy storage scenarios, energy is stored and discharged, improving the self-consumption rate.
- Revenue statistics: Calculate the sum of feed-in revenue of a PV plant (feed-in electricity x feed-in tariff) and savings in electricity bills (self-consumed electricity x purchase price) to display the benefits brought by the PV plant.

NOTE

- An electricity price must be configured for revenue statistics. Otherwise, the system cannot calculate revenue data. For details, see [Modifying the Electricity Price](#).
- If the electricity price unit is inconsistent with the local currency, contact the installer to change the currency.
- Environmental benefits:
Unlike thermal power plants, PV power plants generate electricity without CO2 emissions, which is equivalent to planting trees. For details, see [10.1 PV generation and carbon emissions](#).

Viewing the Plant Layout (with Optimizers)

Tap **Plant Layout**. The logical view and physical view are displayed. You can view the physical location and status of an optimizer.


- Tap a PV module to view the SN and running information.
- Tap  to display the logical connections between inverters and PV modules in different colors. PV modules connected to the same inverter are in the same color.

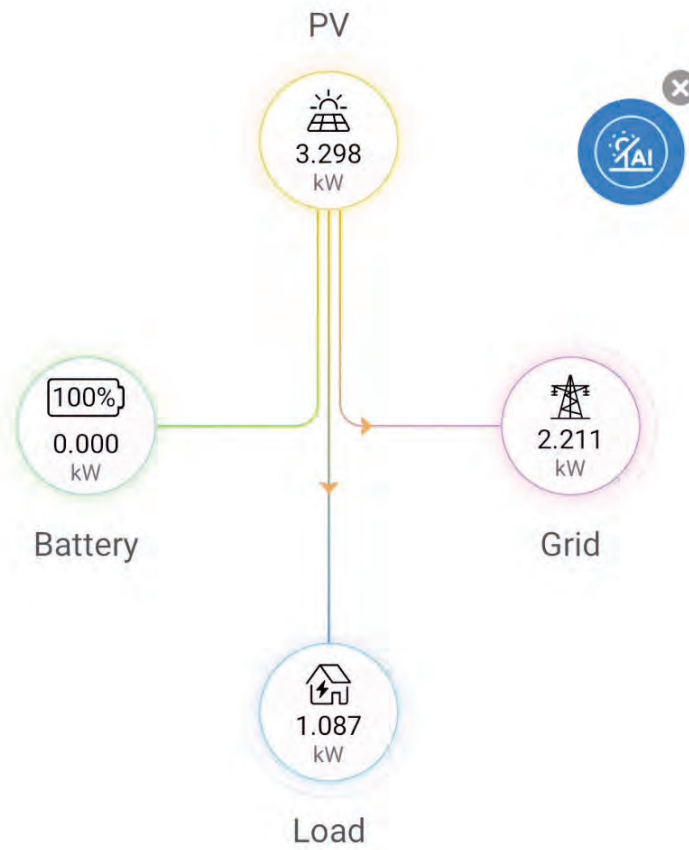
5.2 Enabling EMMA

The AI Energy Management Assistant (EMMA) provides intelligent energy scheduling and management functions. Based on big data analysis, it accurately predicts the power generation and consumption curves of households, and intelligently stores, purchases, and sells electricity to achieve optimal system performance, improve the utilization rate of green power, and maximize financial benefits.

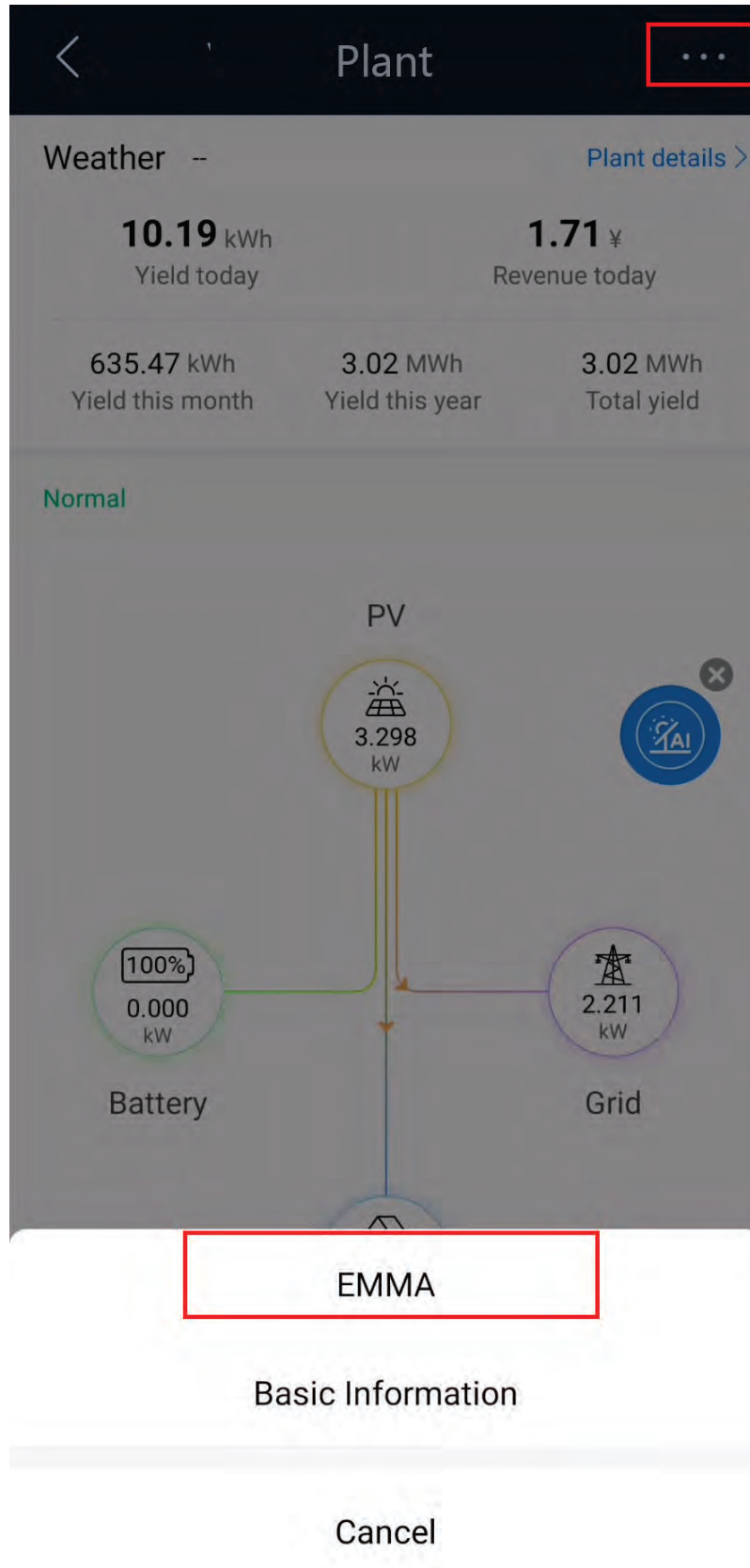
Procedure

1. On the **Overview** screen, if the system determines that the plant meets the

conditions for enabling the EMMA function,  is displayed in the energy flow diagram. You can tap this icon to enable the EMMA function.



Alternatively, tap ... in the upper right corner and then tap **EMMA**.



NOTE

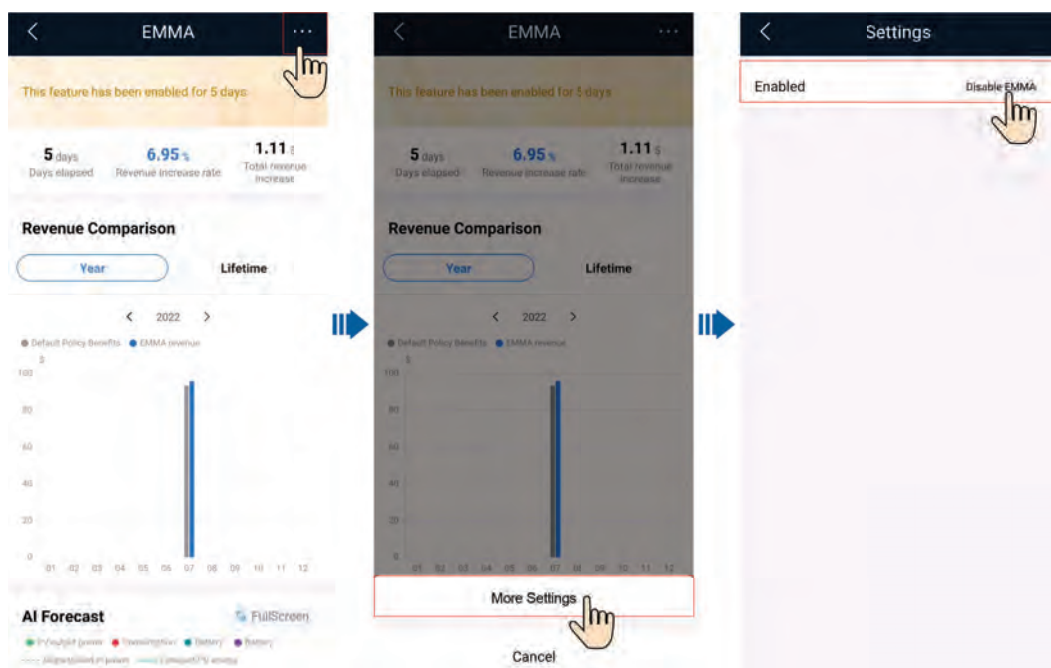
Only owners have the permission to enable the EMMA function. After the EMMA function is enabled, owners and installers can view the EMMA revenue and energy forecast and analysis.

Viewing the Revenue after EMMA Was Enabled and Energy Forecast and Analysis

- On the **Overview** screen, tap ... in the upper right corner and then tap **EMMA** to view the revenue information, revenue comparison, and energy forecast analysis.
 - Viewing the revenue comparison: In the Revenue Comparison area, you can view the comparison between the revenues when EMMA is enabled and disabled.
 - Viewing energy analysis: In the Energy Analysis area, you can view details about the energy yield, power consumption, and battery charge and discharge in the past 24 hours, and energy forecast in the next 24 hours.

Disabling EMMA

- On the top of the **EMMA** screen, tap ... > **More Settings** to disable the EMMA function as prompted.



NOTE


After the EMMA function is disabled, you can still view historical revenue information and revenue comparison.

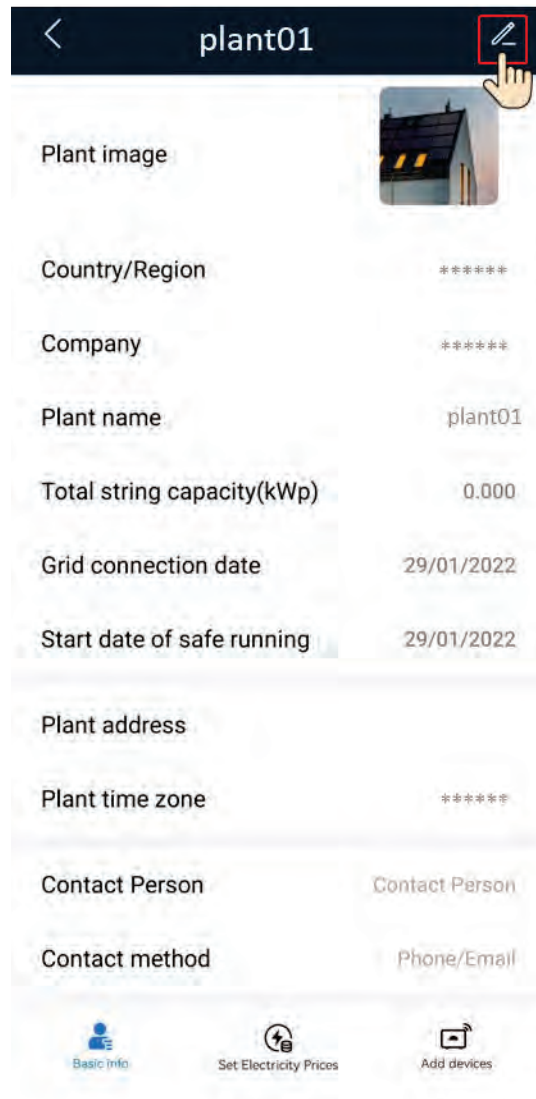
5.3 Managing PV Plants

On the app, you can modify the basic plant information and electricity price information, and unbind or delete devices.

Modifying Basic Plant Information


You can change the plant address, time zone, and other information.

1. On the **Overview** screen, tap **Plant details**.
2. On the **Basic info** screen, tap  in the upper right corner.
3. Modify related information as required and tap **Save**.



Modifying the Electricity Price

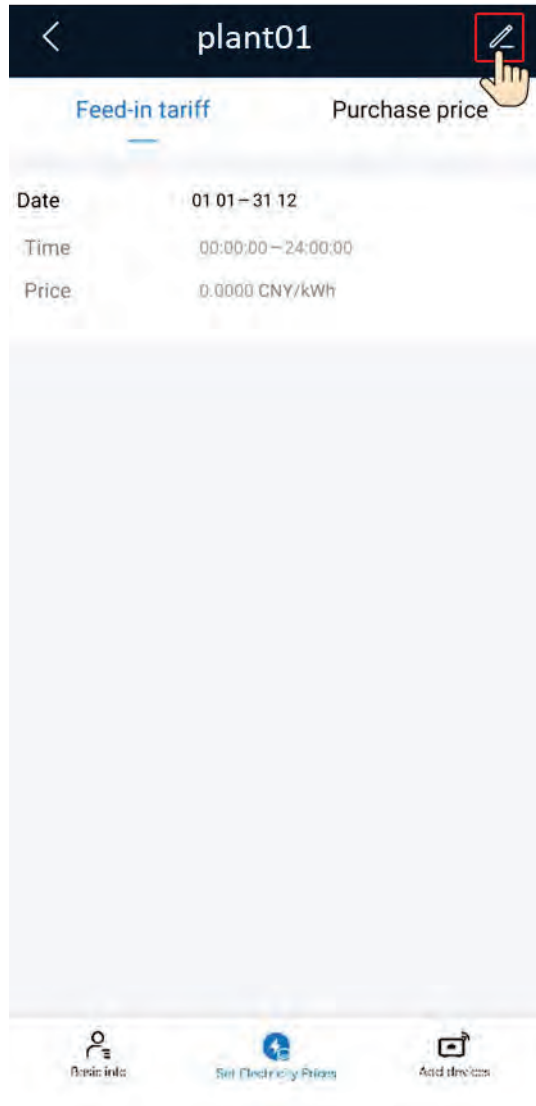
If the electricity price varies or changes in different time periods, you need to modify the electricity price to ensure that the plant benefit calculation is more accurate.

1. On the **Overview** screen, tap **Plant details**.
2. Tap **Set Electricity Prices**.
3. Tap  in the upper right corner and set **Feed-in tariff** and **Purchase price** as prompted.


4. Tap **Save**.

 **NOTE**

If the electricity price unit is inconsistent with the local currency, contact the installer to change the currency.

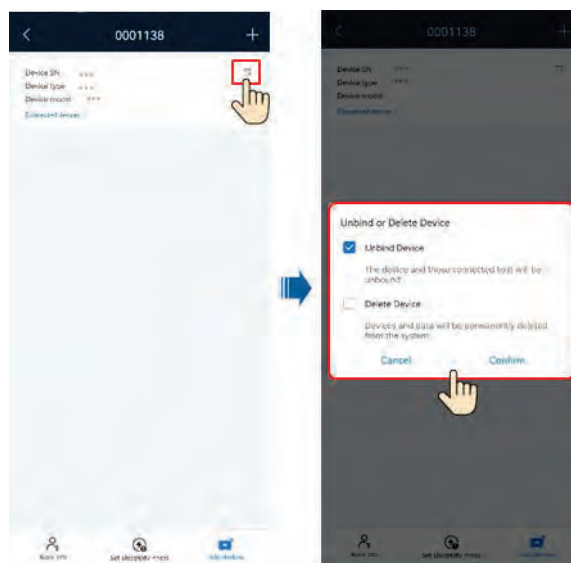


Unbinding or Deleting Devices

1. On the **Overview** screen, tap **Plant details**.
2. Tap **Add devices**.
3. Tap  and tap **Unbind Device** or **Delete Device** as prompted.

 NOTE

- After a device is unbound, the running data of the device and its subdevices is stored in the database. The default data retention period is six months. To change the retention period, contact the system administrator.
 - If a device is rebound to a plant within the data retention period, the device inherits the retained data.
 - If a device is not bound to a plant within the data retention period, the data will be automatically deleted.
- After a device is permanently deleted, the running data of the device and its subdevices is deleted immediately. When the device is bound to the plant again, the running data of the device is not restored.



5.4 Viewing Device Information

You can view the real-time, historical, and basic information about a device.

Viewing Real-Time Information

On the **Real-time info** screen, you can view key running parameters such as the device running status and energy yield.



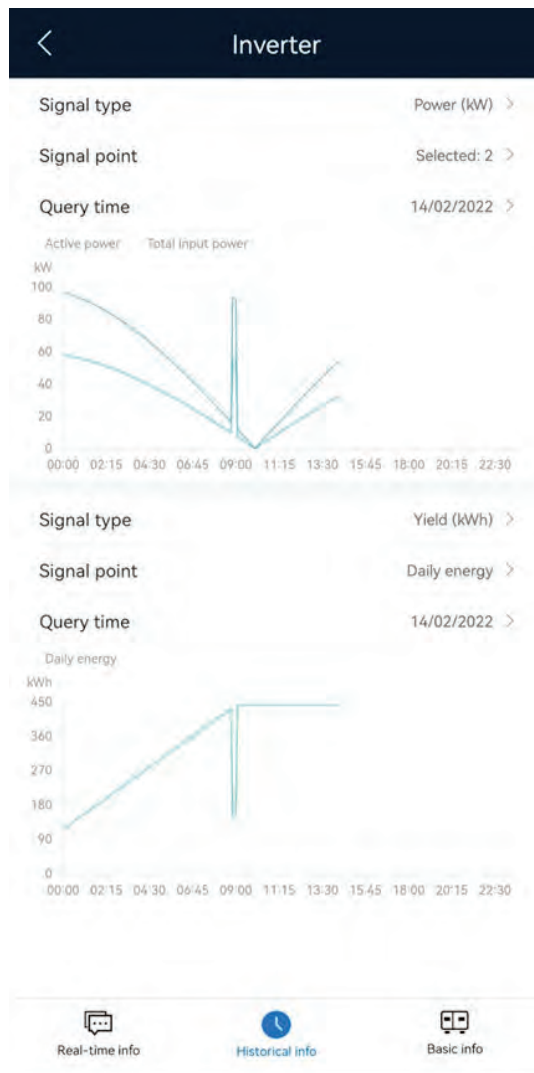
Viewing Historical Information

On the **Historical info** screen, you can query the running status of devices in a specified period.

Set **Signal type**, **Signal point** and **Query time**, and view the query results of historical information.

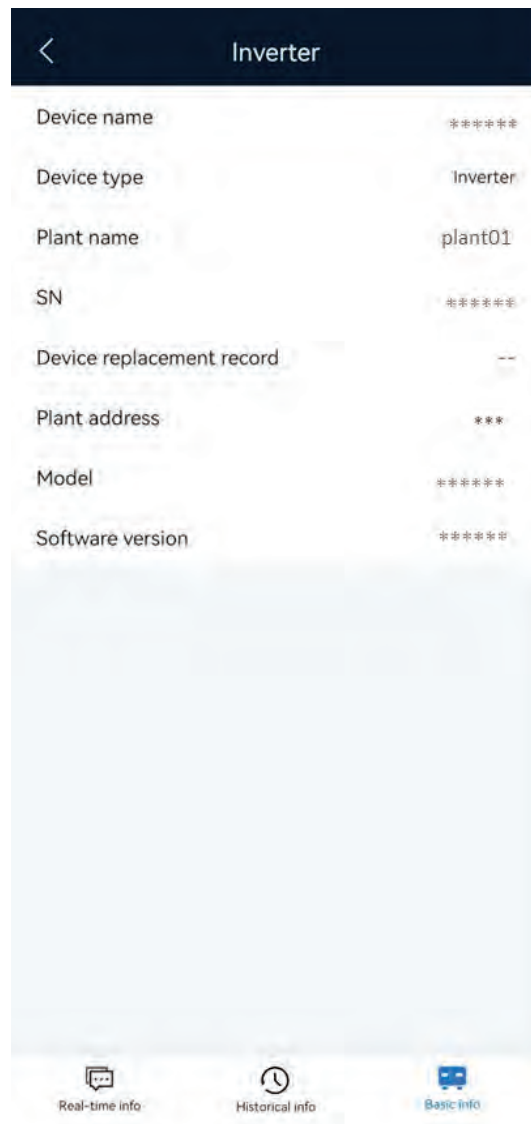
NOTE

If the data in a certain period is incomplete or missing, contact the installer to collect the missing data.



Querying Basic Information

On the **Basic info** screen, you can view basic information such as the device type and SN.



Setting Device Parameters

1. Log in to the app on the home screen and tap **Devices**.
2. On the **Device management** screen, tap a device name.
3. Tap ... in the upper right corner and tap **Parameter settings**.
4. On the **Parameter settings** screen, set parameters as required.
5. Tap **Confirm**.

NOTE

- The parameters that can be set vary according to the device model. For details about how to set the parameters, see the user manual of the device.
How to obtain: Visit <https://support.huawei.com/enterprise/en/category/fusion-solar-pid-1600073963553?submodel=doc> and enter your device model to search for the corresponding user manual.
- For details about how to set energy storage parameters, see [10.2 Battery Control Parameters](#).

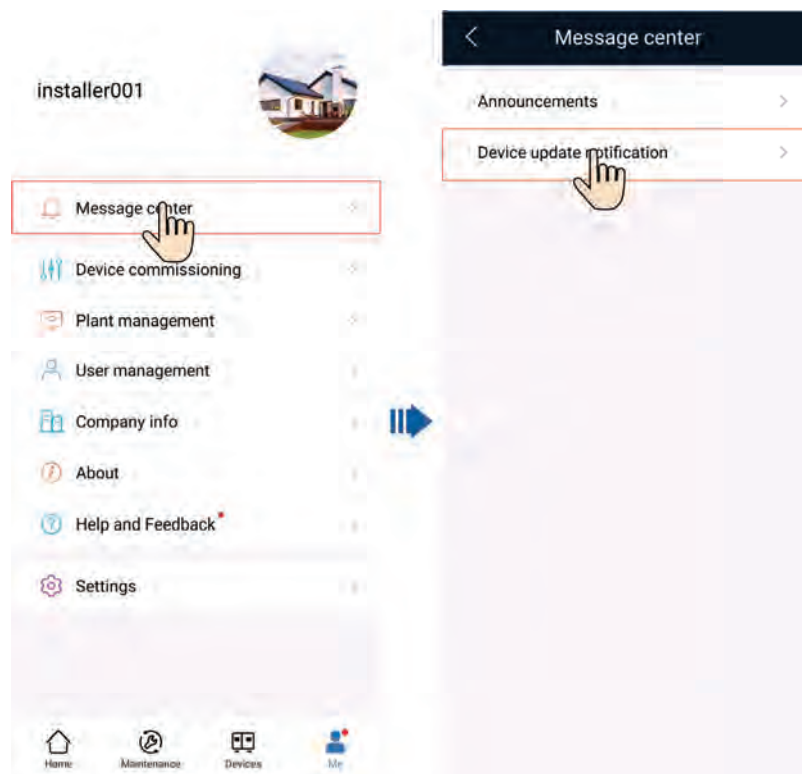
5.5 Processing an Upgrade Task

After the management system pushes a device version upgrade message to an owner user, the owner user can process the upgrade task on the app.

1. On the home screen, tap **Me** > **Message center** > **Device update notification**.
2. Tap the upgrade task to be processed to view the upgrade details.
 - If you agree to upgrade the device, tap **OK** to start the upgrade.
 - If you do not agree to upgrade the device, tap **Cancel** to cancel the upgrade task.

NOTE

A discarded task cannot be restarted. If the device still needs to be upgraded, contact the installer to create an upgrade task again.



5.6 Processing Plant Migration Task

After the administrator creates a plant migration task, the owner user needs to approve the task in the app to complete the plant migration.

1. On the home screen, tap **Me** > **Message center** > **To-do tasks**.
2. In the task list to be approved, tap the plant migration task to be processed, then tap **Process Request**.
 - If you agree to migrate the plant, tap **Approve** to start the migration.

- If you do not agree to migrate the plant, tap **Reject** to cancel the migration task.

 **NOTE**


A discarded task cannot be restarted. If the device still needs to be upgraded, contact the installer to create an upgrade task again.




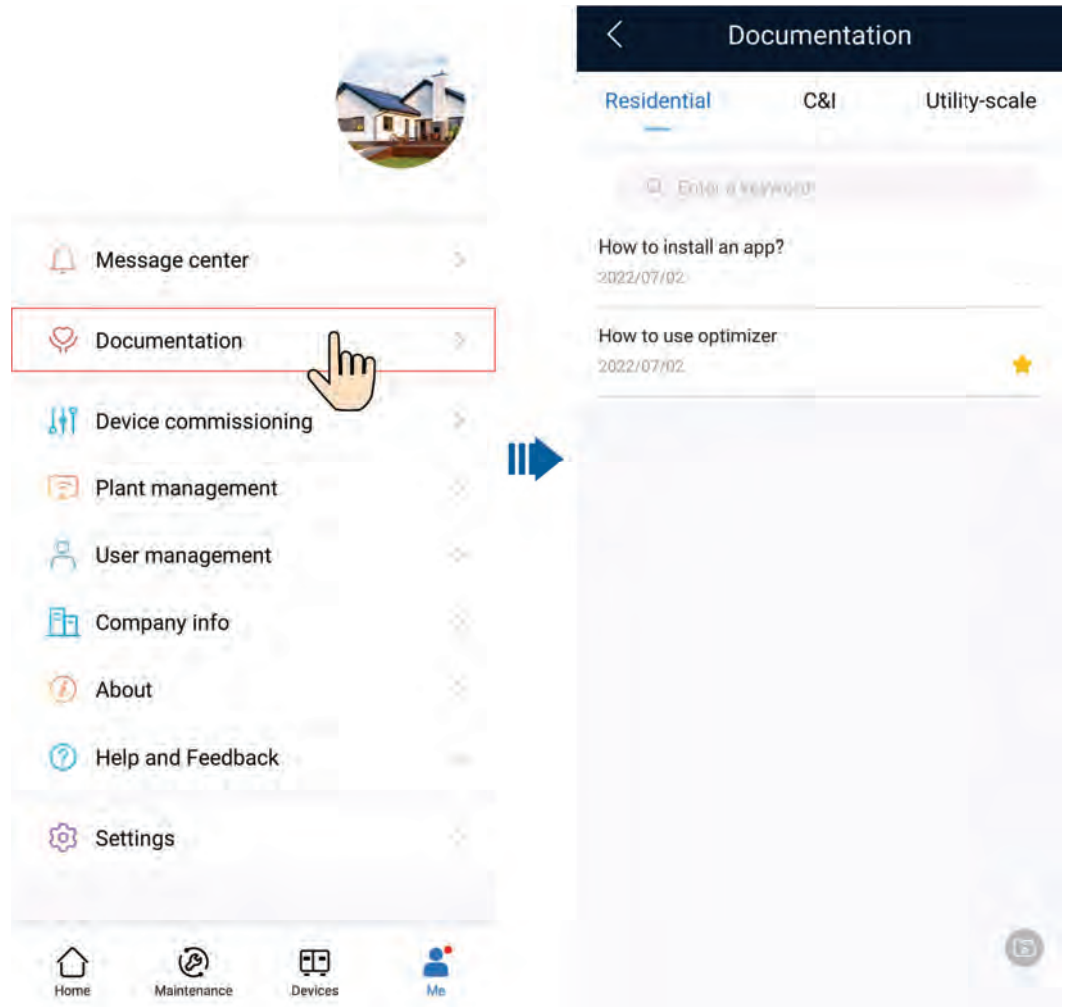
5.7 Documentation

1. On the home screen, choose **Me > Documentation**.

- Tap the target document to read it.

- Tap  next to a document title to add the document to your favorites.

- Tap  to view your favorite documents. On this screen, you can pin a document to the top or remove it from your favorites.



6 I am an Installer

An installer can perform wizard-based site deployment commissioning on the FusionSolar to monitor the overall running status of the plant. If a device is faulty, the installer can perform O&M on the app.

6.1 Setup Wizard

After PV devices are installed and commissioned, you can create a PV plant and configure basic information on the FusionSolar to implement unified device monitoring and O&M.

6.1.1 Creating a PV Plant

For details about how to create a PV plant, see the app commissioning video or *FusionSolar App Quick Guide*.

Obtaining the Commissioning Video

Method 1: Visit the following website to obtain the commissioning video:

<https://support.huawei.com/enterprise/en/doc/EDOC1100165056>

Method 2: Scan the QR code below to obtain the commissioning video.



Obtaining the Quick Guide

Method 1: Visit the following website to obtain the quick guide:

<https://support.huawei.com/enterprise/en/doc/EDOC1100165052>

Method 2: Scan the QR code below to obtain the quick guide.





6.1.2 Adding a Device

After a PV plant is created, you can bind a new device to the plant.

Prerequisites

You have commissioned devices and set management system parameters using the local commissioning tool. For details, see *FusionSolar App Quick Guide*.

Procedure


- Method 1: Add devices on the **Setup wizard** screen. (This method is recommended if only one device or a group of cascaded devices are connected at a time.)
 - a. Tap **Home > Plants**, and tap **Setup wizard**.
 - b. Scan the QR code on the inverter or SmartLogger to be connected.
 - c. On the **Create Site** screen, tap **Connect to existing plant**.
 - d. On the **Add device** screen, tap a desired plant and enter the string capacity.
 - e. Tap **OK**.
- Method 2: Add devices on the **Add device** screen. (This method is recommended if multiple devices or multiple groups of cascaded devices need to be connected.)
 - a. On the home screen of the app, **Me > Plant management**. In the plant list, tap the target plant.
 - b. Tap **Add device** and tap  in the upper right corner.
 - c. Tap  on the right of **Device SN** and scan the QR code on the device to connect the device.
 - d. Tap **Save**.

----End

6.1.3 Setting the String Capacity

Configure the string capacity of a PV array to calculate the device operating efficiency.

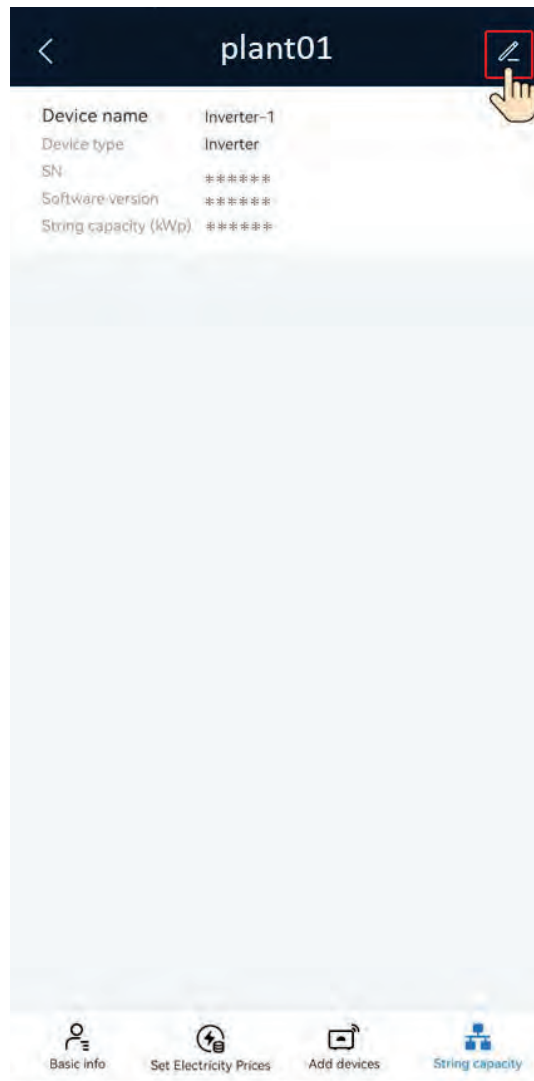
1. On the home screen of the app, **Me > Plant management**. In the plant list, tap the target plant.
2. Tap **String capacity**.

3. Tap  in the upper right corner, select the device whose capacity needs to be set, and tap **Set string capacity**.

 **NOTE**


You can select inverters of the same model or string capacity and set the string capacity.

4. Enter the PV capacity and tap **Confirm**.

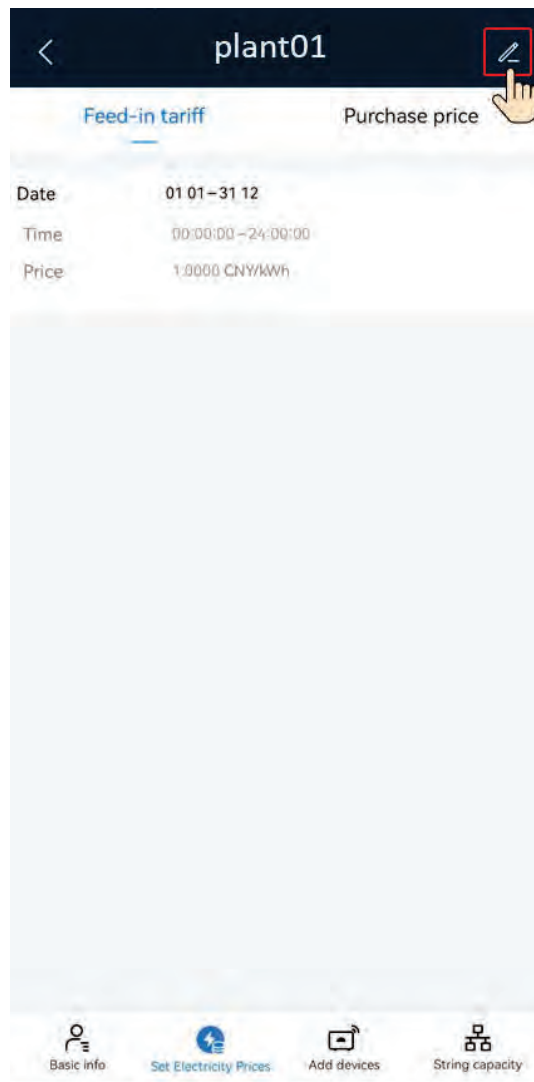


6.1.4 Setting Electricity Prices

Configure the time-of-use electricity prices to calculate the revenue based on different electricity prices in different time segments so that the calculation is more accurate.

1. On the home screen of the app, **Me > Plant management**. In the plant list, tap the target plant.
2. Tap **Set Electricity Prices**.
3. Tap  in the upper right corner and set **Feed-in tariff** and **Purchase price** as prompted.

4. Tap **Save**.



6.1.5 Creating a Physical Location Layout (with Optimizers)

Create a physical location layout diagram. If an optimizer is faulty, you can locate the faulty optimizer based on the physical location layout diagram. This facilitates optimizer replacement. For details, see the *FusionSolar Quick Guide*.

Obtaining the Quick Guide

Method 1: Visit the following website to obtain the quick guide:

<https://support.huawei.com/enterprise/en/doc/EDOC1100165052>

Method 2: Scan the QR code below to obtain the quick guide.



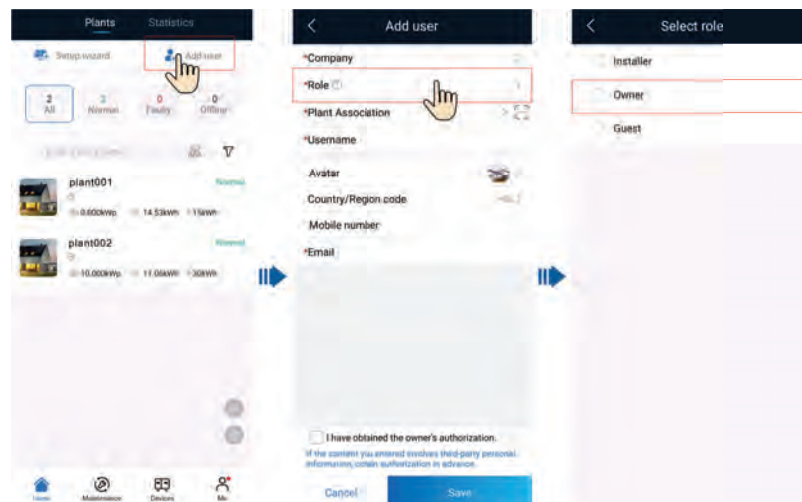
6.2 Creating a User

An installer can create owner user accounts and installer user accounts on the FusionSolar. Owner users can monitor the running status, energy yield, and revenue of plants. Installer users can perform wizard-based site deployment and commissioning, monitor the running status of the plants, manage devices, query alarms, and perform mobile O&M.

When creating a user, ensure that the PV plant to be associated is available. If your company has created a plant, you can directly create a user and associate the user to the plant. If your company has not created a plant, create a plant and then add a user. For details, see [6.1.1 Creating a PV Plant](#).

Creating an Owner User

On the **Home** screen, tap **Plants**. Tap **Add user** and create an account as prompted.

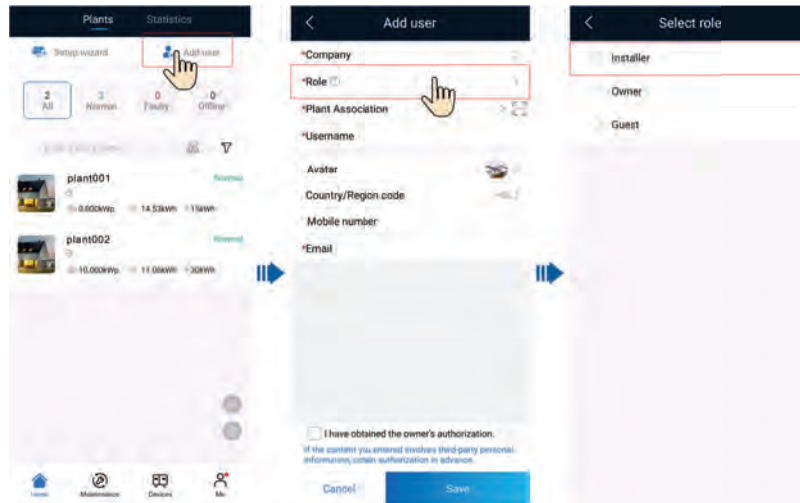


NOTE

After an account is created, the system sends a notification to the entered email address. Then the user can use the received username and password to log in to the FusionSolar or SmartPVMS WebUI.

Creating an Installer User

On the **Home** screen, tap **Plants**. Tap **Add user** and create an account as prompted.



NOTE

- For a new user who is assigned the **Installer** role, if the user is associated with only PV plants, the installer can manage the associated PV plants within the permission of the role but cannot create a PV plant. If the installer is associated with a company, the installer can manage all PV plants of the associated company and has the permission to create PV plants.
- After an account is created, the system sends a notification to the entered email address. Then the user can use the received username and password to log in to the FusionSolar or SmartPVMS WebUI.



6.3 Viewing PV Plant Status

The FusionSolar provides an overview of plants. You can view the plant running status, energy output and consumption, revenue, and energy flow diagram in real time.

Viewing Plant Summary Information

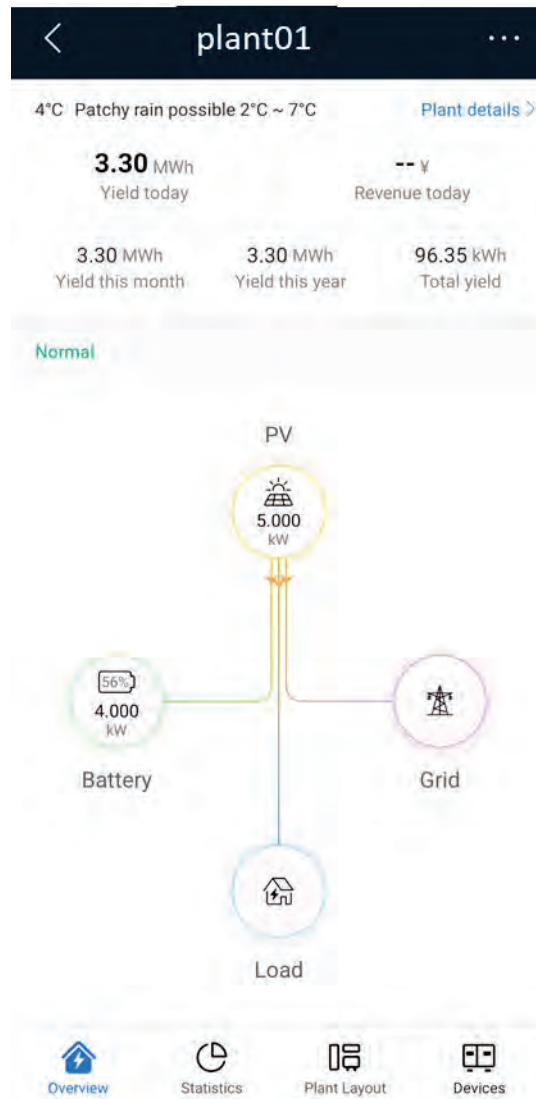
Log in to the app, tap **Home**, and tap **Plants**. This screen displays the real-time running status and basic information of all plants managed by the user by default.



- Tap  to compare plants in the same environment to evaluate their energy yield efficiency.
- Tap  to switch to the map view and display the geographical distribution and alarm statistics of the plant.

Viewing Plant Overview

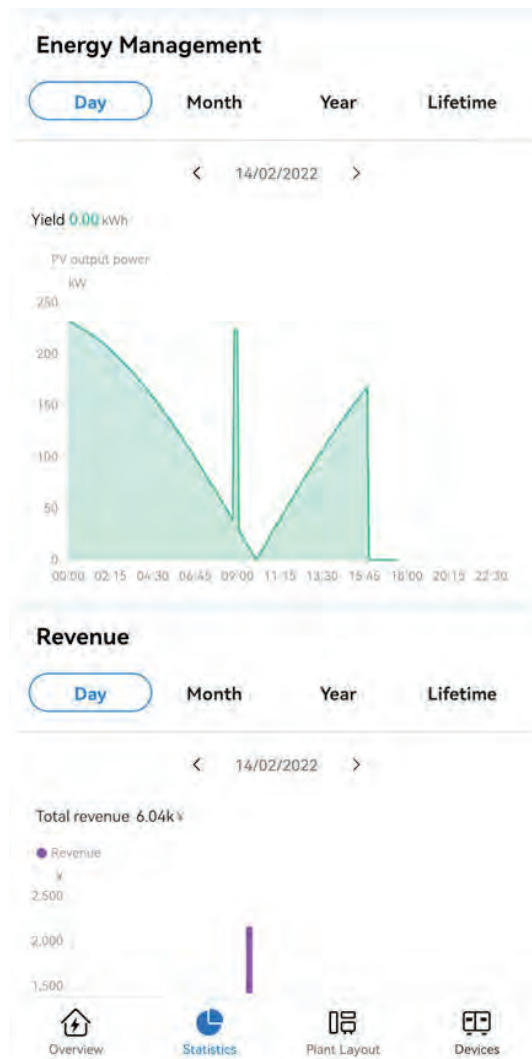
Log in to the app, tap **Home** and tap **Plants**. Tap a desired plant to check its overview. The plant overview includes the basic plant information, energy yield and revenue statistics, real-time running status, and energy flow diagram.



- Basic plant information: Displays the weather information of the place where the plant is located on the current day. Tap **Plant details** to view the detailed plant information.
- Energy yield and revenue statistics: Displays the energy yield and revenue of the plant.
- Real-time running status: Allows you to check whether the current running status of the plant is normal.
- Energy flow diagram: Displays the current power supply direction of the plant. If a plant has current alarms, the latest alarm information is displayed in the upper part of the energy flow diagram. You can tap **>** on the right of the alarm information to view and handle all current alarms of the plant.

Viewing Plant Statistics

Tap the **Statistics** tab to view the energy yield, energy consumption, revenue, and social contribution of a plant.



- Energy management: Displays the energy yield, energy consumption, and self-consumption of a plant in different time dimensions, helping you analyze the energy consumption trend and optimize electricity consumption. In the energy storage scenarios, energy is stored and discharged, improving the self-consumption rate.
- Revenue statistics: Calculate the sum of feed-in revenue of a PV plant (feed-in electricity x feed-in tariff) and savings in electricity bills (self-consumed electricity x purchase price) to display the benefits brought by the PV plant.
- Environmental benefits:
Unlike thermal power plants, PV power plants generate electricity without CO₂ emissions, which is equivalent to planting trees. For details, see [10.1 PV generation and carbon emissions](#).

6.4 EMMA

The AI Energy Management Assistant (EMMA) provides intelligent energy scheduling and management functions. Based on big data analysis, it accurately predicts the power generation and consumption curves of households, and intelligently stores, purchases, and sells electricity to achieve optimal system

performance, improve the utilization rate of green power, and maximize financial benefits.

Prerequisites

The owner has enabled the EMMA function for the plant.

Viewing the Revenue after EMMA Was Enabled and Energy Forecast and Analysis

1. On the **Overview** screen, tap ... in the upper right corner and then tap **EMMA** to view the revenue information, revenue comparison, and energy forecast analysis.
 - Viewing the revenue comparison: In the Revenue Comparison area, you can view the comparison between the revenues when EMMA is enabled and disabled.
 - Viewing energy analysis: In the Energy Analysis area, you can view details about the energy yield, power consumption, and battery charge and discharge in the past 24 hours, and energy forecast in the next 24 hours.

6.5 Optimizer Disconnection Detection

Perform disconnection detection on optimizers and locate the disconnected optimizers.

Procedure

Step 1 On the **Home** screen, tap **Plants** and tap the desired plant.

Step 2 Tap **Plant Layout**. If no physical layout diagram is created for the plant, the logical layout screen is displayed.

Step 3 On the logical layout screen, tap **Disconnection detection**.

- If multiple inverters are installed in the plant and all of them are equipped with optimizers, select the inverter to be detected in the displayed dialog box and tap **OK**.
- If only one inverter in the plant is equipped with an optimizer, the detection task is directly executed after you tap **Disconnection detection**.

Step 4 If a disconnected optimizer is detected, you can quickly locate the optimizer based on the physical layout diagram and rectify the fault based on the repair suggestions.

----End

Follow-up Procedure

After the disconnection fault is rectified, perform the disconnection detection again to ensure that the fault is rectified.

6.6 O&M Management

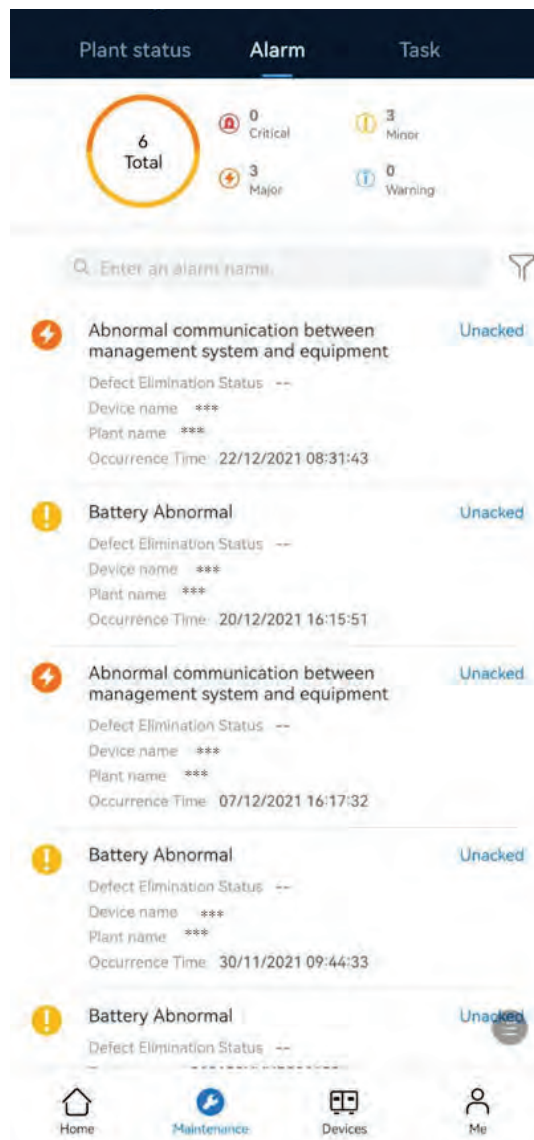
You can learn about the running status, location distribution, and alarm information of plants, and quickly track and handle plant faults.

6.6.1 Monitoring Alarm Information

You can monitor current alarms that are updated in real time to learn about the latest alarm status and handle alarms.

Viewing Alarm Information

1. Tap **Maintenance** on the home screen. The **Plant status** screen is displayed by default.
2. Tap the **Alarm** screen to view the current alarms of all PV plants that you have permission to manage.



Handling Alarms

On the **Alarm** screen, tap an alarm to view its details.

You can create a ticket for, acknowledge, or clear an alarm based on the alarm cause and handling suggestions in the alarm details.

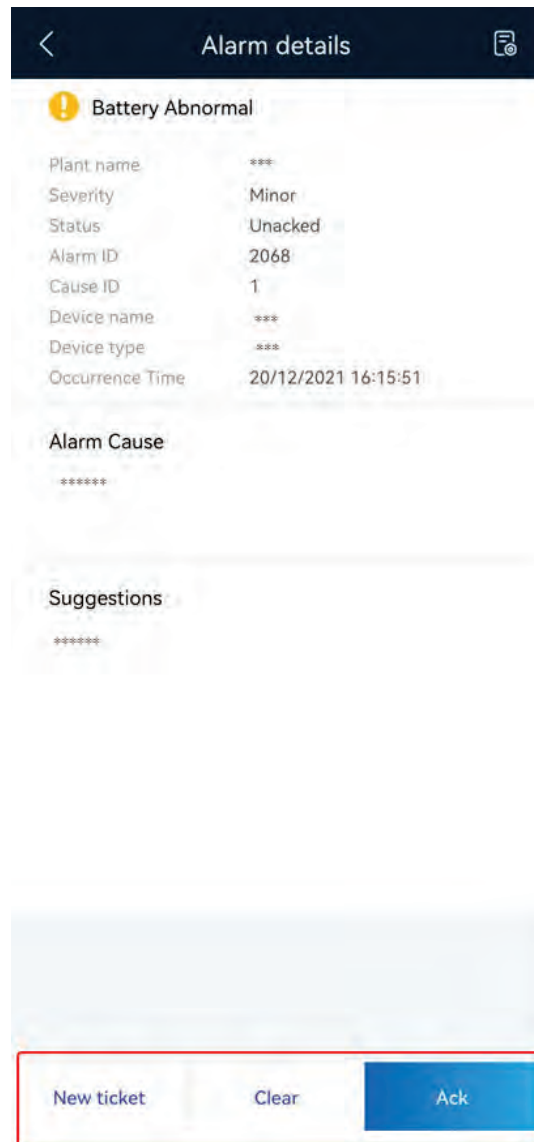


Table 6-1 Alarm handling

| Operation | Description |
|------------|---|
| New ticket | Record, track, and monitor the faults or defects that have occurred, and manage them using defect elimination tickets. If a defect elimination ticket has been created for the alarm, this button is not displayed. |
| Ack | Acknowledging an alarm indicates that an alarm is to be or has been handled. After an alarm is acknowledged, the alarm status is converted from Unacked to Acked . |

| Operation | Description |
|-----------|---|
| Clear | If a fault is rectified but the alarm is not automatically cleared, tap Clear to manually clear the alarm. |

 **NOTE**

If a defect elimination ticket has been created for an alarm, you can trace and process the defect elimination task on the **Task > Elimination task** screen. For details, see [6.6.2.1 Defect Elimination](#).


6.6.2 Mobile O&M

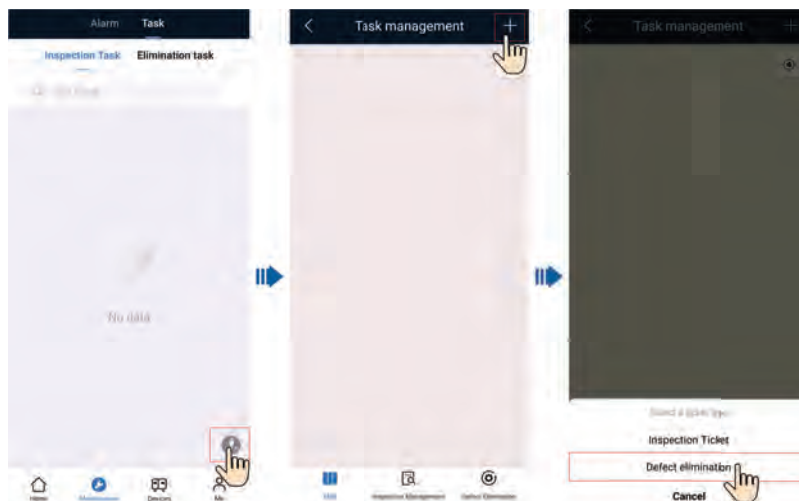
Create tasks to perform routine inspection on plant equipment, identify risks, and track and monitor faults or defects that have occurred.

6.6.2.1 Defect Elimination

You can record, track, and monitor the faults or defects that have occurred to eliminate them in a timely manner.

Creating an Elimination Task

1. Tap **Maintenance** on the home screen. The **Plant status** screen is displayed by default.
2. On the **Plant status** screen, tap **Task**.
3. On the **Task** screen, tap . The **Task management** screen is displayed.
4. Tap + in the upper right corner and tap **Defect elimination**.
5. Fill in the ticket information as prompted and submit it.



Processing a Defect Elimination Task

1. Tap **Maintenance** on the home screen. The **Plant status** screen is displayed by default.

2. On the **Plant status** screen, tap **Task > Elimination task**.
3. On the **Elimination task** screen, view and process defect elimination tasks.

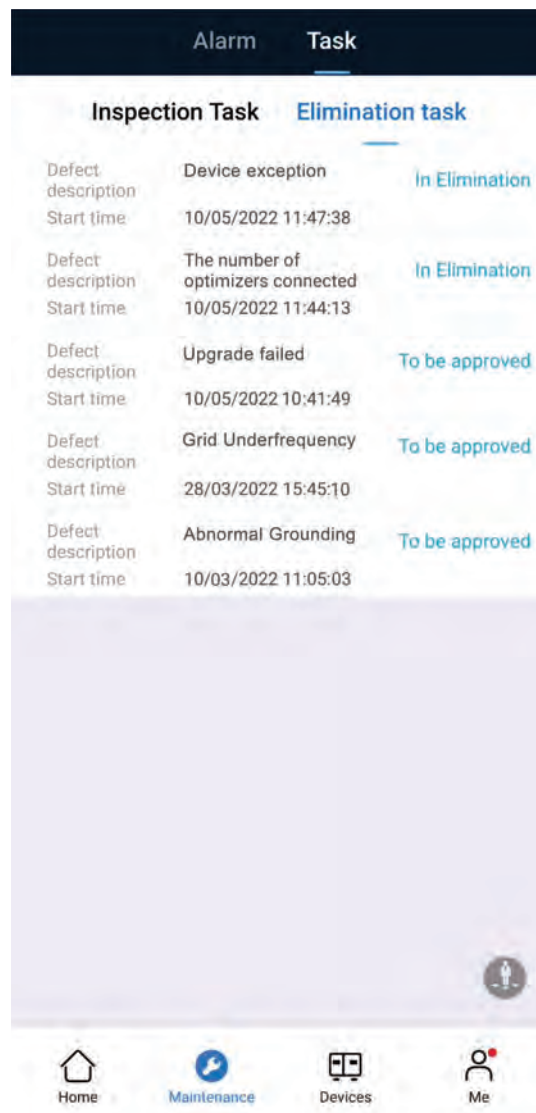

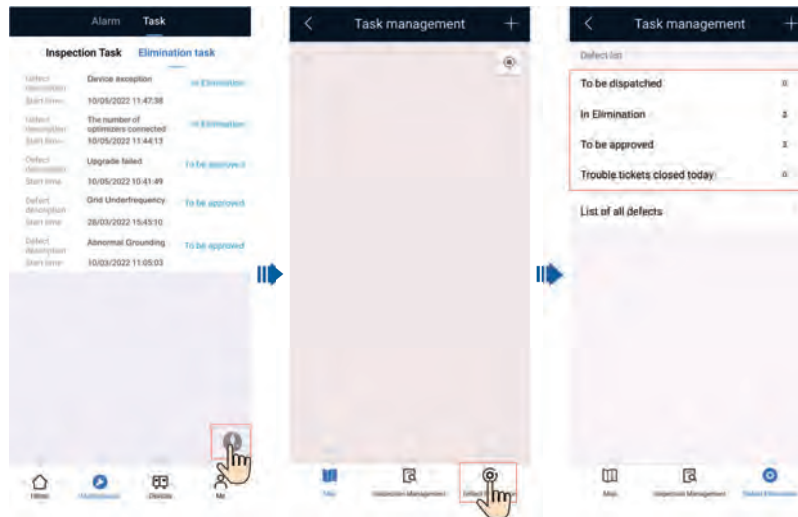


Table 6-2 Defect elimination task status description

| Task Status | Description |
|------------------|--|
| To be dispatched | After the current handler returns a task in the In Elimination state to the creator, the task enters the To Be Dispatched state. The creator can re-assign or cancel the task. |
| In Elimination | You can submit the defect handling description and handling result. Alternatively, you can return the task to the upper-level handler for re-assigning the task. |
| To be approved | Accept the completed defect elimination task to ensure that the defects are completely eliminated. |

Managing Defect Elimination Tasks

1. On the **Elimination task** screen, tap . The **Task management** screen is displayed.
2. Tap **Defect Elimination**, tap and view all defect elimination tasks as required.




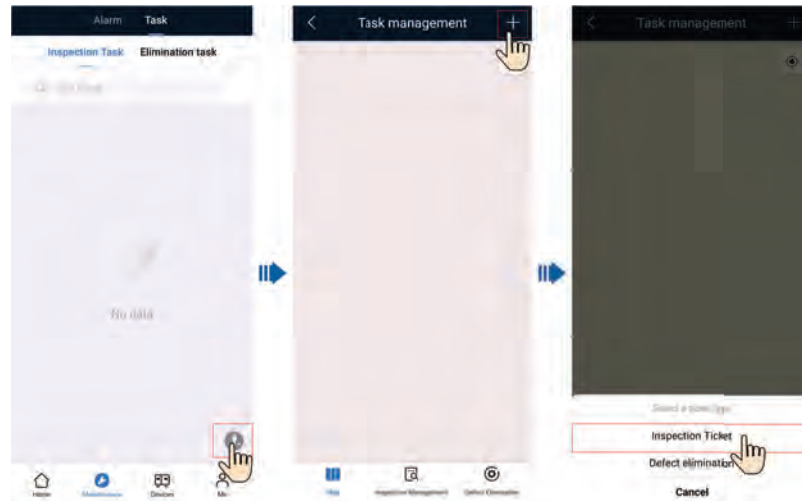
6.6.2.2 Inspection Management

Perform routine inspection on plant equipment to detect and report exceptions in a timely manner.

You can use the common inspection items preset by the management system for routine O&M of PV plants.

Creating an Inspection Task

1. Tap **Maintenance** on the home screen. The **Plant status** screen is displayed by default.
2. On the **Plant status** screen, tap **Task**.
3. On the **Task** screen, tap . The **Task management** screen is displayed.
4. Tap + in the upper right corner and tap **Inspection Ticket**.
5. Fill in the ticket information as prompted and submit it.



Processing an Inspection Task

1. Tap **Maintenance** on the home screen. The **Plant status** screen is displayed by default.
2. On the **Plant status** screen, tap **Task > Inspection Task**.
3. On the **Inspection Task** screen, view and process inspection tasks.

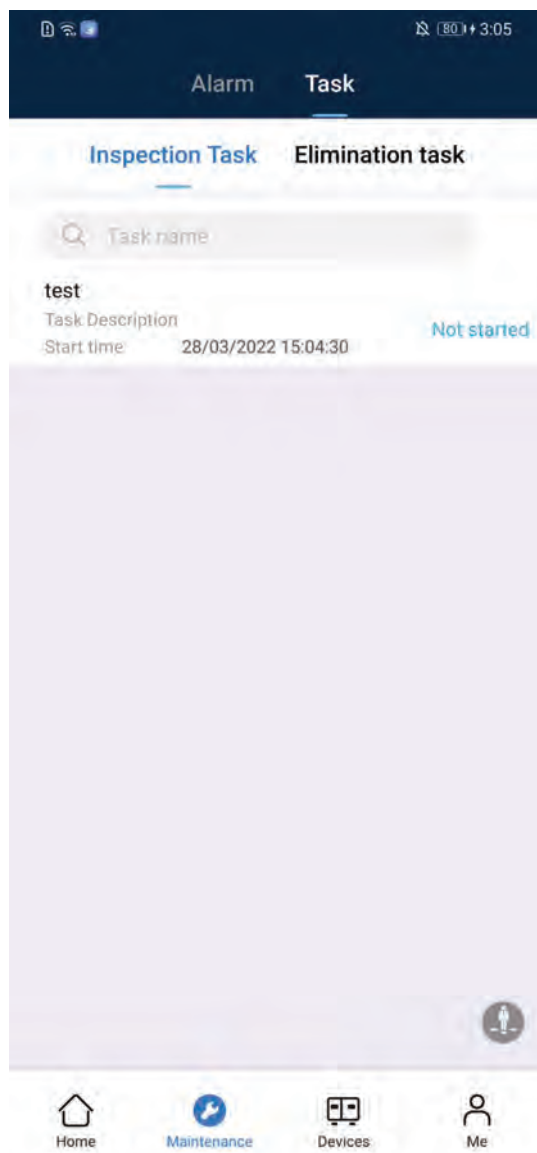


Table 6-3 Inspection task status description


| Task Status | Description |
|------------------------|---|
| Not started | After receiving a task, the inspection personnel can tap the task to be inspected to start it. 1. Tap a task in the Not started state. The Task details screen is displayed. 2. Tap Start Inspection to start the inspection task. |
| Inspection in progress | The inspection personnel can tap an inspection task to complete the inspection, fill in the inspection report as prompted, and save the report. |
| To be approved | You can accept the inspection tasks that have been completed. |

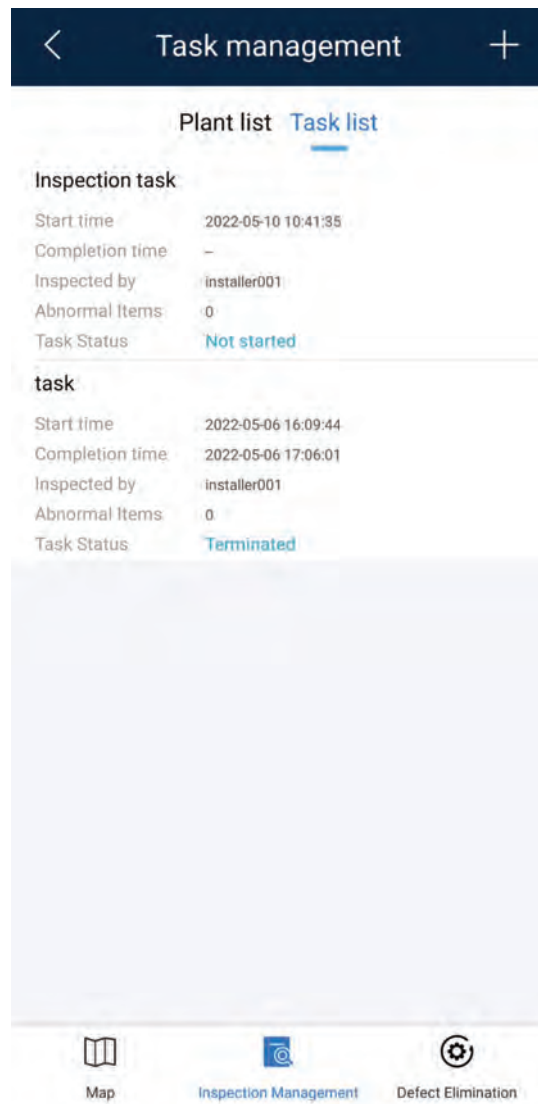
| Task Status | Description |
|-------------|--|
| Finished | The current inspection task is complete. |

Managing Inspection Tasks

Inspection tasks can be viewed and managed by plant and task.

- By plant: View the historical inspection results and inspection details of a plant.
- By task: View the execution information about inspection tasks and process the tasks.

1. On the **Inspection Task** screen, tap . The **Task management** screen is displayed.
2. Tap **Inspection Management**. Tap **Plant list** or **Task list** as required to view all inspection tasks.
3. View and manage inspection tasks as prompted.



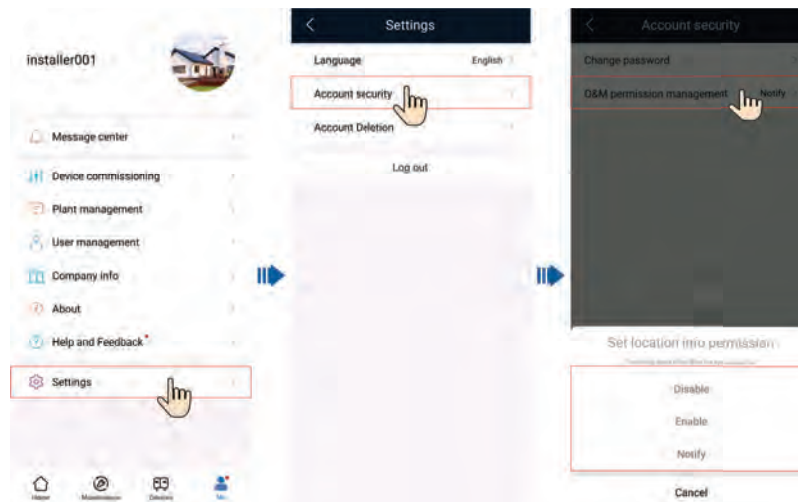
6.6.2.3 Setting the Physical Location Permission

Tap **Settings > Account security > O&M permission management** to authorize the app to obtain the locations of mobile O&M personnel.

NOTE

- After the app is authorized to obtain the location information, the locations of the O&M personnel are displayed on the map on the **Maintenance > Task > Task management** screen.
- When a user creates a PV plant or modifies the PV plant location information, the system reads the current location of the user by default.
- By default, the O&M permission is in **Notify** state. Each time a user logs in to the system, a dialog box is displayed, asking the user whether to authorize the app to obtain the user's current location information. The user can perform authorization based on the site requirements.
- If **Disable** is selected, the app does not obtain the user's location information each time the user logs in, and no dialog box is displayed.

- If **Enable** is selected, the app obtains the user's location information each time the user logs in, and no dialog box is displayed.



6.7 Device Management

You can monitor the device running status in real time, set parameters, change device names, and replace devices.

Setting Device Parameters

1. Log in to the app on the home screen and tap **Devices**.
2. On the **Device management** screen, tap a device name.
3. Tap ... in the upper right corner and tap **Parameter settings**.
4. On the **Parameter settings** screen, set parameters as required.
5. Tap **Confirm**.

NOTE

- The parameters that can be set vary according to the device model. For details about how to set the parameters, see the user manual of the device.

How to obtain: Visit <https://support.huawei.com/enterprise/en/category/fusion-solar-pid-1600073963553?submodel=doc> and enter your device model to search for the corresponding user manual.

- For details about how to set energy storage parameters, see **10.2 Battery Control Parameters**.

Changing a Device Name


1. Log in to the app on the home screen and tap **Devices**.
2. On the **Device management** screen, tap a device name.
3. Tap ... in the upper right corner and tap **Modify device name**.
4. Enter a new device name and tap **Confirm**.

Replacing a Device



NOTICE

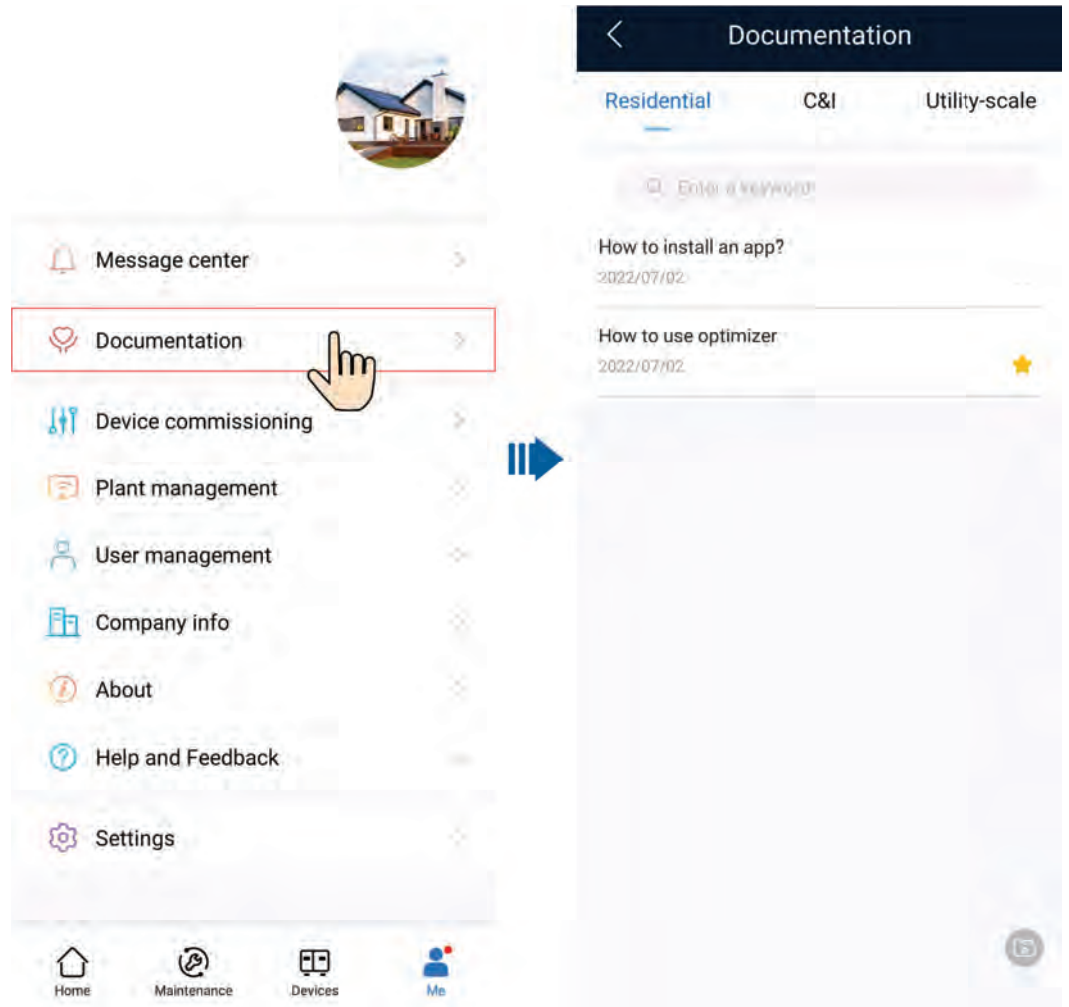
The following conditions must be met for device replacement:

- The current device is disconnected from the management system.
- The target device has been replaced and commissioned. For details, see *FusionSolar Smart PV Solution-Device Replacement Commissioning Guide* at <https://support.huawei.com/enterprise/en/doc/EDOC1100197498>.

1. Tap **Devices** on the home screen.
2. On the **Device management** screen, tap a device name.
3. Tap ... in the upper right corner and tap **Device Replacement**.
4. On the **Device management** screen, tap  to scan the QR code of the target device or enter its SN.
5. Tap **Replace**.

6.8 Documentation

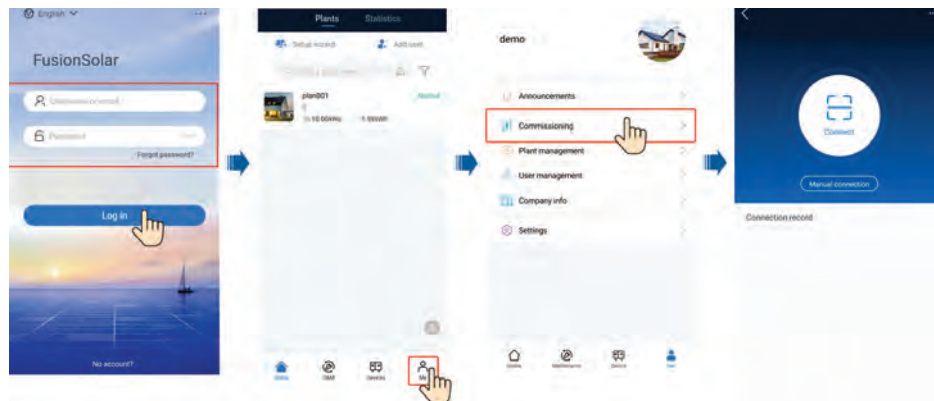
1. On the home screen, choose **Me > Documentation**.
 - Tap the target document to read it.
 - Tap  next to a document title to add the document to your favorites.
 - Tap  to view your favorite documents. On this screen, you can pin a document to the top or remove it from your favorites.



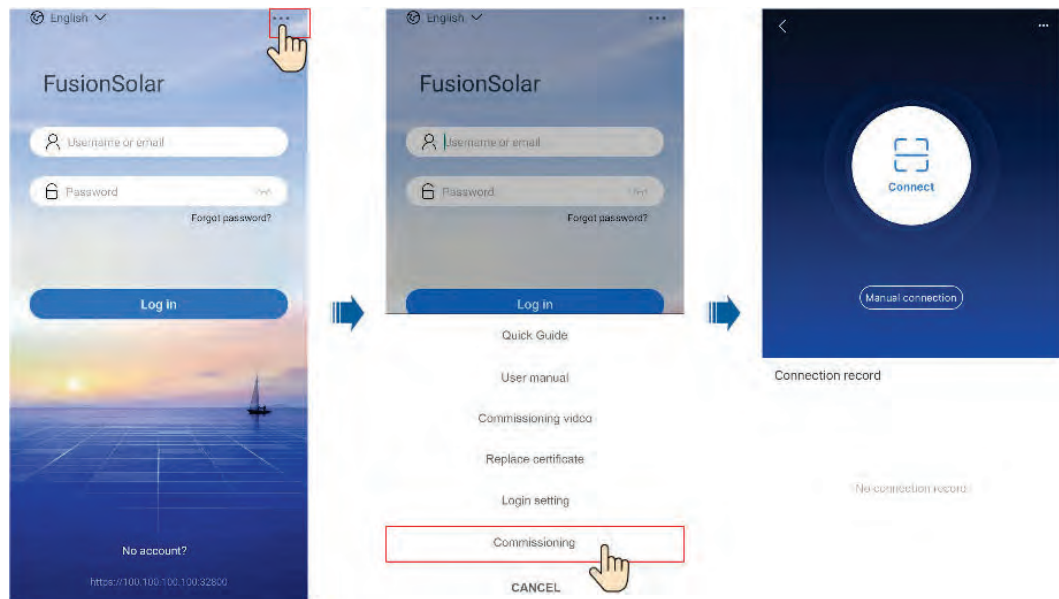
7 Device Commissioning

Access device commissioning:

Method 1: (FusionSolar App) mobile phone connected to the Internet



Method 2: (FusionSolar App) mobile phone not connected to the Internet



Method 3: (SUN2000 App) open SUN2000 App

 NOTE

Method 2 is available only when no network is available. You are advised to use method 1 to log in to the FusionSolar app to commission devices.

7.1 Operations on the Screen for Connecting to the Distributed Solar Inverter

NOTICE

- The figures and data displayed in this chapter are for reference only.
- The parameters displayed on the screen vary according to the solar inverter model connected to the app.
- Delivering a reset, factory reset, shutdown, or upgrade command to the solar inverters may cause power grid connection failure, which affects the energy yield.
- Only professionals are allowed to set the grid parameters, protection parameters, feature parameters, power adjustment parameters, and grid-tied point control parameters of the solar inverters. If the grid parameters, protection parameters, and feature parameters are incorrectly set, the solar inverters may not connect to the power grid. If the power adjustment parameters and grid-tied point control parameters are incorrectly set, the solar inverters may not connect to the power grid as required. In these cases, the energy yield will be affected.

7.1.1 Distributed Solar Inverter

Connection Modes

After the DC or AC side of the solar inverter is powered on, the app can connect to the solar inverter through the built-in WLAN of the solar inverter.

 NOTE

If the **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Table 7-1 Product mapping

| Product | Solar Inverter Model |
|----------|--|
| SUN2000L | SUN2000L-5KTL, SUN2000L-4.6KTL, SUN2000L-4KTL, SUN2000L-3.68KTL, SUN2000L-3KTL, SUN2000L-2KTL, SUN2000L-5KTL-CN, SUN2000L-5KTL-CN-4G, SUN2000L-4KTL-CN, SUN2000L-4KTL-CN-4G, SUN2000L-3KTL-CN, SUN2000L-3KTL-CN-4G |

| Product | Solar Inverter Model |
|-----------|--|
| | SUN2000-7.6KTL-USL0, SUN2000-5KTL-USL0, SUN2000-3.8KTL-USL0, SUN2000-11.4KTL-USL0, SUN2000-9KTL-USL0, SUN2000L-4.95KTL-JP, SUN2000L-4.125KTL-JP, SUN2000-10KTL-USL0, SUN2000-3KTL-CNLO, SUN2000-4KTL-CNLO, SUN2000-5KTL-CNLO, SUN2000-6KTL-CNLO, SUN2000-2KTL-L0, SUN2000-3KTL-L0, SUN2000-4KTL-L0, SUN2000-5KTL-L0, SUN2000-4.95KTL-JPL0, |
| | SUN2000-6KTL-L1, SUN2000-5KTL-L1, SUN2000-4.6KTL-L1, SUN2000-4KTL-L1, SUN2000-3.68KTL-L1, SUN2000-3KTL-L1, SUN2000-2KTL-L1, SUN2000-4.95KTL-L1 |
| SUN2000MA | SUN2000-5KTL-M0, SUN2000-6KTL-M0, SUN2000-8KTL-M0, SUN2000-10KTL-M0, SUN2000-12KTL-M0, SUN2000-3KTL-M0, SUN2000-4KTL-M0, SUN2000-15KTL-M0, SUN2000-17KTL-M0, SUN2000-20KTL-M0, SUN2000-8KTL-M0, SUN2000-10KTL-M0, SUN2000-12KTL-M0, SUN2000-15KTL-M0, SUN2000-17KTL-M0, SUN2000-20KTL-M0 |
| | SUN2000-3KTL-M1, SUN2000-4KTL-M1, SUN2000-5KTL-M1, SUN2000-6KTL-M1, SUN2000-8KTL-M1, SUN2000-10KTL-M1 |
| | SUN2000-8KTL-M2, SUN2000-10KTL-M2, SUN2000-12KTL-M2, SUN2000-15KTL-M2, SUN2000-17KTL-M2, SUN2000-20KTL-M2 |

 **NOTE**

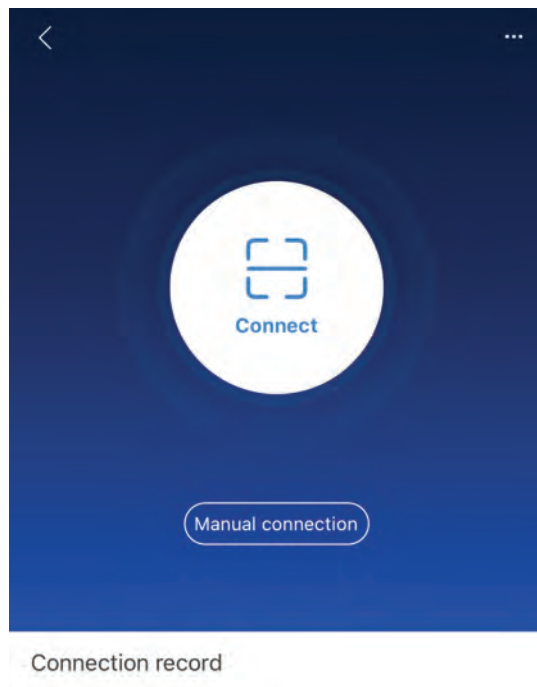
The version mapping in the preceding table is subject to change and is for reference only.

7.1.2 Login the SUN2000 APP

Procedure

Step 1 Connect the solar inverter.

Figure 7-1 Connect



- Code scanning: Tap **Connect** to access the scanning screen, place the QR code or bar code of the solar inverter in the scan frame. The device will be automatically connected after the code is identified.
- Manual connection: Tap **Manual Connection** and select a connection mode.

Figure 7-2 Manual connection



- Select **WLAN** and connect to the corresponding WLAN in the WLAN connection list of the APP. The initial name of the WLAN hotspot is **solar inverter SN**, and the initial password is **Changeme**.

NOTICE

- Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
- If the **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 2 Select a login user and enter the password.

Figure 7-3 Login



NOTICE

- For the initial power-on, set the password as prompted and then log in to the system. If not prompted, log in with the initial password **00000a**.
 - To ensure account security, change the password periodically and keep the new password in mind. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
 - During the login, if five consecutive invalid password entries are made (the interval between two consecutive entries is less than 2 minutes), the account will be locked for 10 minutes. The password should consist of six characters.
-

Step 3 After successful login, the **Quick Settings** or **Function Menu** screen is displayed.

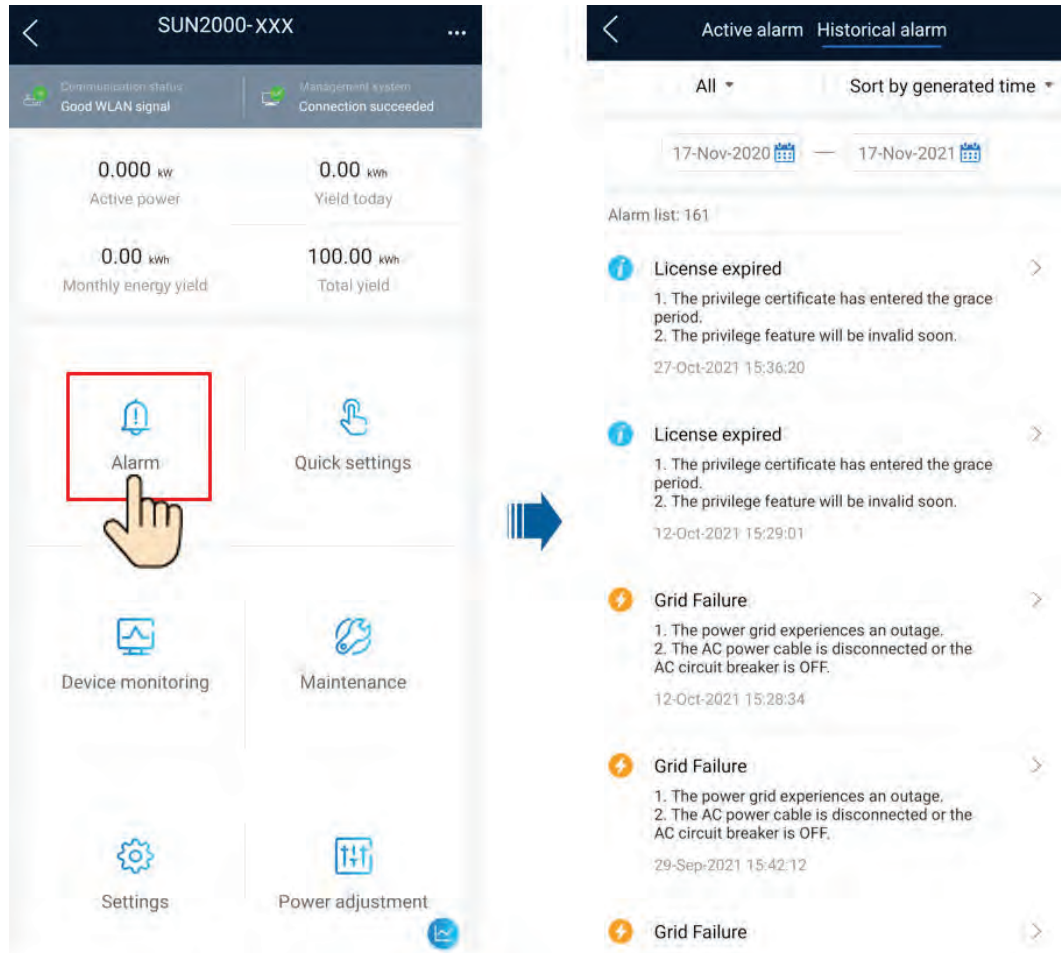
NOTICE

If you log in to the SUN2000 app after the device powers on for the first time or factory defaults are restored, the **Quick Settings** screen will be displayed. If you do not set the basic parameters for the solar inverter on the **Quick Settings** screen, the screen is still displayed when you log in next time.

----End

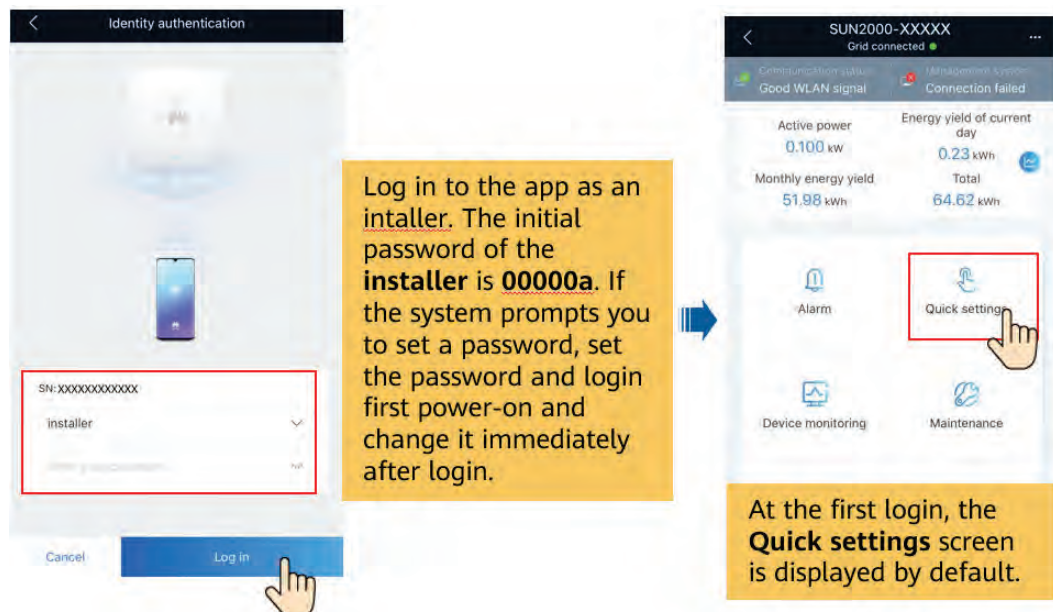
7.1.3 Alarm Management

On the home screen, tap **Alarm management**. You can query active and historical alarms.



7.1.4 Quick Settings

On the home screen, tap **Quick Settings**. Set parameters as prompted.



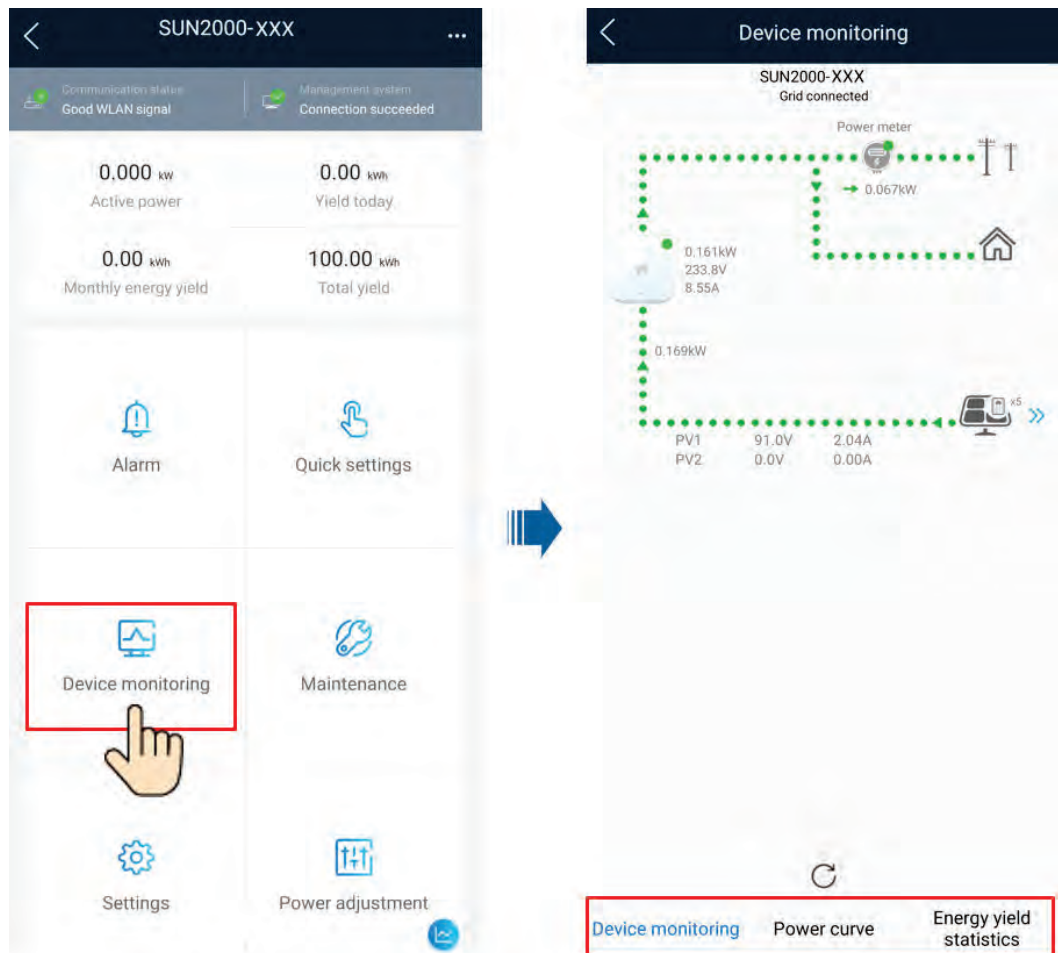
 **NOTE**

The UI is for reference only. The UI varies with associated devices. The actual UI prevails.

7.1.5 Device Monitoring

On the home screen, tap **Device Monitoring**. Then tap a tab in the lower part of the screen as required to view related information.

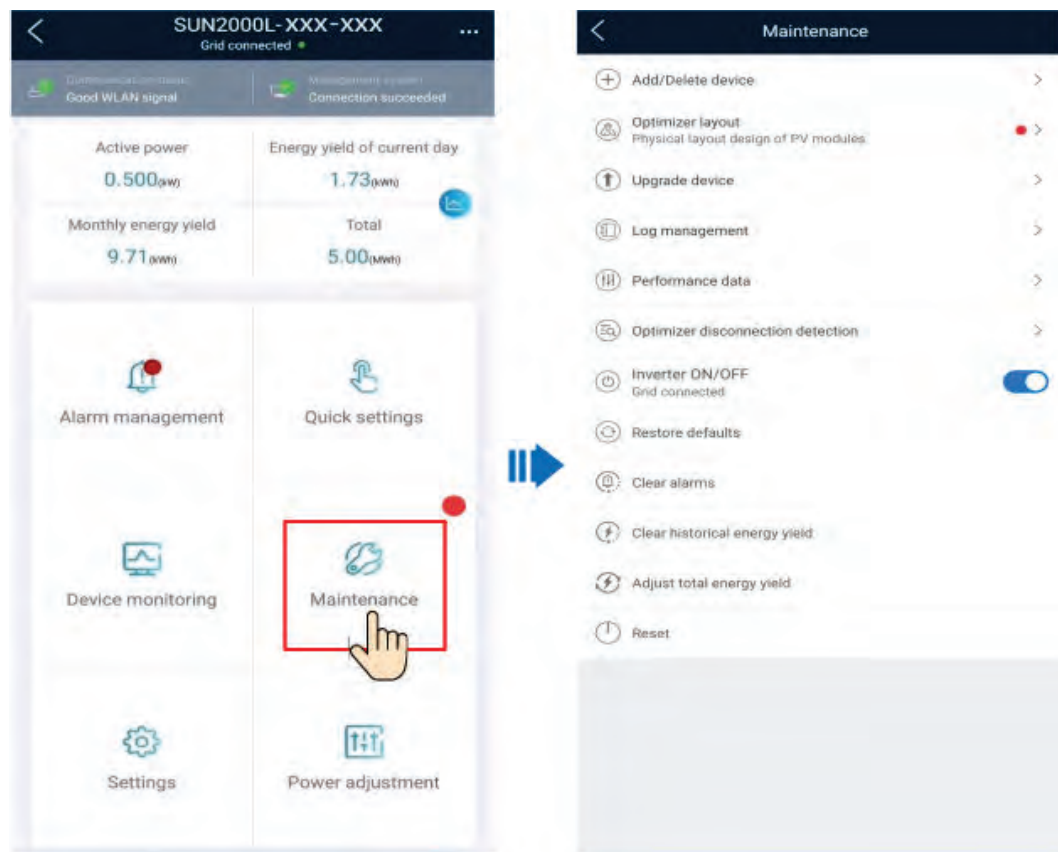
Figure 7-4 Device information



7.1.6 Maintenance

On the home screen, tap **Maintenance** to set device parameters.

Figure 7-5 Maintaining devices



NOTE

The parameter list provided in this document includes all configurable parameters that vary with the device model and grid code. The actual screen prevails.

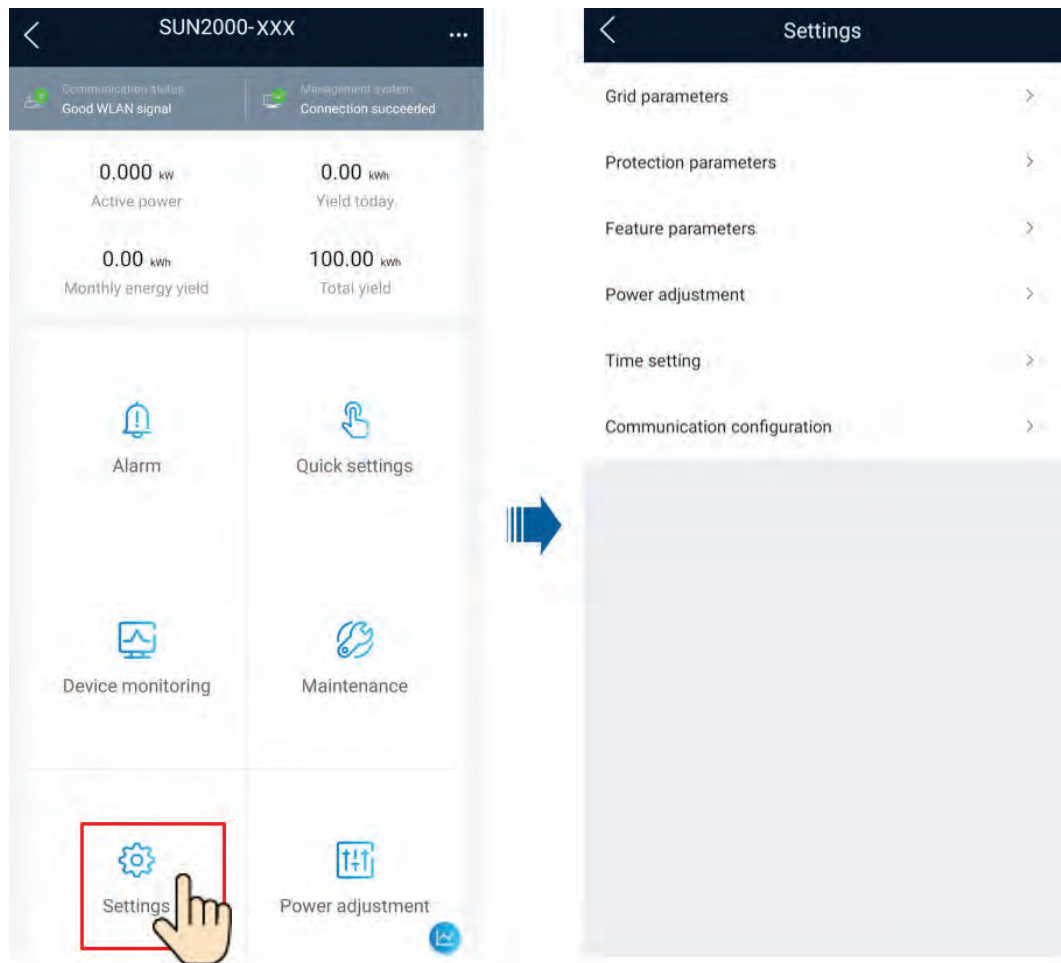
| Parameter | Description | Parameter | Description |
|-------------------------------|--|---------------------------|---|
| Add/Delete device | Adds power meters, batteries, optimizers, or safety shutdown boxes as required. | IPS test | Performs IPS self-check and generates a self-check report. |
| Physical Layout of PV Modules | Specifies the physical location of the optimizer. | Inverter ON/OFF Detection | Sends a command to start or shut down the solar inverter based on its current startup or shutdown status. |
| Upgrade device | Upgrades the software version of devices such as the solar inverter as required. | Restore defaults | Restores the solar inverter parameters to factory settings. |
| Log Management | Downloads the logs of the solar inverters, batteries, optimizers, or the app. | Clear alarms | Clears historical alarms of the solar inverter. |

| Parameter | Description | Parameter | Description |
|--|--|-------------------------------|--|
| Performance data | Views the performance data of devices such as power meters. | Clear historical energy yield | Clears historical energy yields of the solar inverter. |
| Alarm beacon | If this parameter is enabled, the alarm beacon produces audible and visual signals when the solar inverter generates an alarm. | Adjust total energy yield | Specifies the initial energy yield of the solar inverter. This parameter is used in solar inverter replacement scenarios. Set the initial energy yield of the new solar inverter to the total energy yield of the old solar inverter to ensure continuous statistics of cumulative energy yield. |
| AFCI (Arc-Fault Circuit-Interrupter) self-test | Performs the AFCI self-test. | Restart | Restarts the solar inverter. |
| Optimizer Disconnection Detection | Detect the disconnection point of the optimizer and determine the physical location of the fault point. | -- | -- |

7.1.7 Settings

On the home screen, tap **Settings** to set solar inverter parameters.

Figure 7-6 Settings



NOTE

- The parameter list provided in this document includes all configurable parameters that vary with the device model and grid code. The actual screen prevails.
- The parameters are for reference only. The configurable parameters vary with the device model and grid code. The actual configurable parameters prevail.
- The parameter names, value ranges, and default values are subject to change.

Grid Parameters

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) |
|-----------|--|--|
| Grid Code | Set this parameter based on the grid code of the country or region where the inverter is used and the inverter application scenario. | N/A |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) |
|---|--|--|
| Isolation settings | Set the working mode of the inverter based on the grounding status at DC side and the connection to the power grid. | <ul style="list-style-type: none"> Input ungrounded, without TF Input ungrounded, with TF |
| Output mode | Specifies whether the inverter output has a neutral wire based on the application scenario. | <ul style="list-style-type: none"> Three-phase three-wire Three-phase four-wire L/N L1/L2/N L1/L2 |
| Automatically start upon grid recovery | Specifies whether to allow the inverter to automatically start after the power grid recovers. | <ul style="list-style-type: none"> Disable Enable |
| Grid connected recovery time from grid faults (s) | Specifies the time after which the inverter begins connecting after the power grid recovers. | [0, 7200] |
| Grid reconnection voltage upper limit (V) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid voltage is higher than Grid reconnection voltage upper limit , the inverter is not allowed to reconnect to the grid. | [100% Vn, 136% Vn] |
| Grid reconnection voltage lower limit (V) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid voltage is lower than Grid reconnection voltage lower limit , the inverter is not allowed to reconnect to the grid. | [45% Vn, 100% Vn] |
| Grid reconnection frequency upper limit (Hz) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid frequency is higher than Grid reconnection frequency upper limit , the inverter is not allowed to reconnect to the grid. | [100% Fn, 120% Fn] |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) |
|--|---|--|
| Grid reconnection frequency lower limit (Hz) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid frequency is lower than Grid reconnection frequency lower limit , the inverter is not allowed to reconnect to the grid. | [80% Fn, 100% Fn] |
| Reactive power compensation (cosφ-P) trigger voltage (%) | Specifies the voltage threshold for triggering reactive power compensation based on the cosφ-P curve. | [100, 136] |
| Reactive power compensation (cosφ-P) exit voltage (%) | Specifies the voltage threshold for exiting reactive power compensation based on the cosφ-P curve. | [70, 100] |

Protection Parameters

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) |
|---|---|---|
| Insulation resistance protection threshold (MΩ) | To ensure device safety, the inverter detects the insulation resistance of the input side with respect to ground when it starts a self-check. If the detected value is less than the preset value, the inverter does not connect to the grid. | [0.02, 1.5] |
| Voltage unbalance protection threshold (%) | Specifies the inverter protection threshold when the power grid voltage is unbalanced. | [0, 50] |
| Phase protection point (°) | The Japanese standard requires that during passive islanding detection, protection should be triggered if an abrupt voltage phase change is detected. | [0.5, 15] |
| Phase angle offset protection | The standards of certain countries and regions require that the inverter needs to be protected when the phase angle offset of the power grid three phases exceeds a certain value. | <ul style="list-style-type: none"> • Disable • Enable |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) |
|---|---|--|
| 10-min overvoltage protection threshold (V) | Specifies the 10-minute overvoltage protection threshold. | [1 * Vn, 1.5 * Vn] |
| 10-min overvoltage protection duration (ms) | Specifies the 10-minute overvoltage protection duration. | [50, 7200000] |
| Level-1 overvoltage protection threshold (V) | Specifies the level-1 overvoltage protection threshold. | [1 * Vn, 1.5 * Vn] |
| Level-1 overvoltage protection duration (ms) | Specifies the level-1 overvoltage protection duration. | [50, 7200000] |
| Level-2 overvoltage protection threshold (V) | Specifies the level-2 overvoltage protection threshold. | [1 * Vn, 1.5 * Vn] |
| Level-2 overvoltage protection duration (ms) | Specifies the level-2 overvoltage protection duration. | [50, 7200000] |
| Level-3 overvoltage protection threshold (V) | Specifies the level-3 overvoltage protection threshold. | [1 * Vn, 1.5 * Vn] |
| Level-3 overvoltage protection duration (ms) | Specifies the level-3 overvoltage protection duration. | [50, 7200000] |
| Level-4 overvoltage protection threshold (V) | Specifies the level-4 overvoltage protection threshold. | [1 * Vn, 1.5 * Vn] |
| Level-4 overvoltage protection duration (ms) | Specifies the level-4 overvoltage protection duration. | [50, 7200000] |
| Level-5 overvoltage protection threshold (V) | Specifies the level-5 overvoltage protection threshold. | [1 * Vn, 1.5 * Vn] |
| Level-5 overvoltage protection duration (ms) | Specifies the level-5 overvoltage protection duration. | [50, 7200000] |
| Level-6 overvoltage protection threshold (V) | Specifies the level-6 overvoltage protection threshold. | [1 * Vn, 1.5 * Vn] |
| Level-6 overvoltage protection duration (ms) | Specifies the level-6 overvoltage protection duration. | [50, 7200000] |
| Level-1 undervoltage protection threshold (V) | Specifies the level-1 undervoltage protection threshold. | [0.15 * Vn, 1 * Vn] |
| Level-1 undervoltage protection duration (ms) | Specifies the level-1 undervoltage protection duration. | [50, 7200000] |
| Level-2 undervoltage protection threshold (V) | Specifies the level-2 undervoltage protection threshold. | [0.15 * Vn, 1 * Vn] |
| Level-2 undervoltage protection duration (ms) | Specifies the level-2 undervoltage protection duration. | [50, 7200000] |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) |
|---|---|--|
| Level-3 undervoltage protection threshold (V) | Specifies the level-3 undervoltage protection threshold. | [0.15 * Vn, 1 * Vn] |
| Level-3 undervoltage protection duration (ms) | Specifies the level-3 undervoltage protection duration. | [50, 7200000] |
| Level-4 undervoltage protection threshold (V) | Specifies the level-4 undervoltage protection threshold. | [0.15 * Vn, 1 * Vn] |
| Level-4 undervoltage protection duration (ms) | Specifies the level-4 undervoltage protection duration. | [50, 7200000] |
| Level-5 undervoltage protection threshold (V) | Specifies the level-5 undervoltage protection threshold. | [0.15 * Vn, 1 * Vn] |
| Level-5 undervoltage protection duration (ms) | Specifies the level-5 undervoltage protection duration. | [50, 7200000] |
| Level-6 undervoltage protection threshold (V) | Specifies the level-6 undervoltage protection threshold. | [0.15 * Vn, 1 * Vn] |
| Level-6 undervoltage protection duration (ms) | Specifies the level-6 undervoltage protection duration. | [50, 7200000] |
| Level-1 overfrequency protection threshold (Hz) | Specifies the level-1 overfrequency protection threshold. | [1 * Fn, 1.2 * Fn] |
| Level-1 overfrequency protection duration (ms) | Specifies the level-1 overfrequency protection duration. | [50, 7200000] |
| Level-2 overfrequency protection threshold (Hz) | Specifies the level-2 overfrequency protection threshold. | [1 * Fn, 1.2 * Fn] |
| Level-2 overfrequency protection duration (ms) | Specifies the level-2 overfrequency protection duration. | [50, 7200000] |
| Level-3 overfrequency protection threshold (Hz) | Specifies the level-3 overfrequency protection threshold. | [1 * Fn, 1.2 * Fn] |
| Level-3 overfrequency protection duration (ms) | Specifies the level-3 overfrequency protection duration. | [50, 7200000] |
| Level-4 overfrequency protection threshold (Hz) | Specifies the level-4 overfrequency protection threshold. | [1 * Fn, 1.2 * Fn] |
| Level-4 overfrequency protection duration (ms) | Specifies the level-4 overfrequency protection duration. | [50, 7200000] |
| Level-5 overfrequency protection threshold (Hz) | Specifies the level-5 overfrequency protection threshold. | [1 * Fn, 1.2 * Fn] |
| Level-5 overfrequency protection duration (ms) | Specifies the level-5 overfrequency protection duration. | [50, 7200000] |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) |
|--|--|--|
| Level-6 overfrequency protection threshold (Hz) | Specifies the level-6 overfrequency protection threshold. | [1 * Fn, 1.2 * Fn] |
| Level-6 overfrequency protection duration (ms) | Specifies the level-6 overfrequency protection duration. | [50, 7200000] |
| Level-1 underfrequency protection threshold (Hz) | Specifies the level-1 underfrequency protection threshold. | [0.8 * Fn, 1 * Fn] |
| Level-1 underfrequency protection duration (ms) | Specifies the level-1 underfrequency protection duration. | [50, 7200000] |
| Level-2 underfrequency protection threshold (Hz) | Specifies the level-2 underfrequency protection threshold. | [0.8 * Fn, 1 * Fn] |
| Level-2 underfrequency protection duration (ms) | Specifies the level-2 underfrequency protection duration. | [50, 7200000] |
| Level-3 underfrequency protection threshold (Hz) | Specifies the level-3 underfrequency protection threshold. | [0.8 * Fn, 1 * Fn] |
| Level-3 underfrequency protection duration (ms) | Specifies the level-3 underfrequency protection duration. | [50, 7200000] |
| Level-4 underfrequency protection threshold (Hz) | Specifies the level-4 underfrequency protection threshold. | [0.8 * Fn, 1 * Fn] |
| Level-4 underfrequency protection duration (ms) | Specifies the level-4 underfrequency protection duration. | [50, 7200000] |
| Level-5 underfrequency protection threshold (Hz) | Specifies the level-5 underfrequency protection threshold. | [0.8 * Fn, 1 * Fn] |
| Level-5 underfrequency protection duration (ms) | Specifies the level-5 underfrequency protection duration. | [50, 7200000] |
| Level-6 underfrequency protection threshold (Hz) | Specifies the level-6 underfrequency protection threshold. | [0.8 * Fn, 1 * Fn] |
| Level-6 underfrequency protection duration (ms) | Specifies the level-6 underfrequency protection duration. | [50, 7200000] |

Feature Parameters

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|--|--|---|--|
| MPPT multi-peak scanning | When the inverter is used in scenarios where PV strings are greatly shaded, set this parameter to Enable , and then the inverter will perform MPPT scanning at regular intervals to locate the maximum power. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| MPPT multi-peak scan interval (min) | Specifies the MPPT scanning interval. | [5, 30] | This parameter is displayed when MPPT multi-peak scan interval is set to Enable . |
| Automatic OFF due to communication interrupted | The standards of certain countries and regions require that the inverter must shut down after the communication is interrupted for a certain time. | <ul style="list-style-type: none"> • Disable • Enable | If Automatic OFF due to communication interrupted is set to Enable and the inverter communication is interrupted for a specified time (set by Communication interruption duration), the inverter will automatically shut down. |
| Communication interruption duration (min) | Specifies the duration for determining communication interruption. Used for automatic shutdown for protection in case of communication interruption. | [1, 120] | N/A |
| Automatic ON due to communication resume | If this parameter is set to Enable , the inverter automatically starts after communication recovers. If this parameter is set to Disable , the inverter needs to be started manually after communication recovers. | <ul style="list-style-type: none"> • Disable • Enable | This parameter is displayed when Automatic OFF due to communication interrupted is set to Enable . |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|--------------------------------|--|---|---|
| Soft start/boot time (s) | Specifies the duration for the power to gradually increase when the inverter starts. | [1, 1800] | N/A |
| AFCI | The North American standard requires that the inverter should have DC arc detection function. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| AFCI detection adaptation mode | This function is used to adjust the sensitivity of arc detection. | <ul style="list-style-type: none"> • High • Moderate • Low | This parameter is displayed when AFCI is set to Enable. |
| OFF due to abnormal ground | This function is used to check whether the solar inverter is properly grounded before the solar inverter starts, or check whether the solar inverter ground cable is disconnected when the solar inverter is running. By default, this parameter is set to Enable . If the solar inverter cannot be grounded properly, it shuts down. | <ul style="list-style-type: none"> • Disable • Enable | For certain power grid types, if the output side of the solar inverter is connected to an isolation transformer, grounding detection is not required. Ensure that the solar inverter is properly grounded and set the parameter to Disable to enable the solar inverter to run properly. If you are not sure whether the solar inverter is connected to such a type of power grid, contact your dealer or Huawei technical support for confirmation. |
| Delay upgrade | This parameter is mainly used in the upgrade scenarios where the PV power supply is disconnected at night due to no sunlight or unstable at dawn or dusk due to poor sunlight. | <ul style="list-style-type: none"> • Disable • Enable | After the inverter starts to upgrade, if Delay upgrade is set to Enable , the upgrade package is loaded first. After the PV power supply recovers and the activation conditions are met, the inverter automatically activates the upgrade. |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|---|--|---|--|
| Unlock optimizer | When replacing the optimizer, you need to disable the binding relationship between the optimizer and the MBUS master solar inverter. Set this parameter to Enable , and then unlock optimizer . | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Heartbeat period at application layer (min) | Specifies the timeout period for the solar inverter to connect to the management system. | [1, 65535] | N/A |
| TCP frame length | Specifies the maximum length of the TCP frame sent by the northbound device to the solar inverter. | [320, 1500] | N/A |
| TCP heartbeat interval (s) | Specifies the TCP link timeout period for the solar inverter to connect to the management system. | [0, 65535] | N/A |
| LVRT | LVRT is short for low voltage ride-through. When the grid voltage is abnormally low for a short time, the inverter cannot disconnect from the power grid immediately and has to work for some time. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Threshold for triggering LVRT (V) | Specifies the threshold for triggering LVRT. The threshold settings should meet the local grid standard. | [50% Vn, 100% Vn] | This parameter is displayed when LVRT is set to Enable . |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|---|---|---|--|
| LVRT reactive power compensation factor | During LVRT, the inverter needs to generate reactive power to support the power grid. This parameter is used to set the reactive power generated by the inverter. | [0, 10] | <ul style="list-style-type: none"> This parameter is displayed when LVRT is set to Enable. For example, if this parameter is set to 2, the reactive power generated by the inverter is 20% of the rated power when the AC voltage drops by 10% during LVRT. |
| LVRT characteristic curve | Specifies the low voltage ride through curve. | N/A | This parameter is displayed when LVRT is set to Enable . |
| HVRT | HVRT is short for high voltage ride-through. When the grid voltage is abnormally high for a short time, the inverter cannot disconnect from the power grid immediately and has to work for some time. | <ul style="list-style-type: none"> Disable Enable | N/A |
| Threshold for triggering HVRT (V) | Specifies the threshold for triggering HVRT. The threshold settings should meet the local grid standard. | [100% Vn, 136% Vn] | This parameter is displayed when HVRT is set to Enable . |
| Grid voltage protection shield during VRT | Specifies whether to apply voltage protective shielding to the power grid when HVRT or LVRT is enabled. | <ul style="list-style-type: none"> Disable Enable | This parameter is displayed when LVRT is set to Enable or HVRT is set to Enable . |
| Active islanding protection | Specifies whether to enable the active islanding protection function. | <ul style="list-style-type: none"> Disable Enable | N/A |
| Passive islanding protection | Specifies whether to enable the passive islanding protection function. | <ul style="list-style-type: none"> Disable Enable | This parameter is displayed if the Japanese grid code is selected. |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|--|--|---|---|
| Voltage rise suppression | The standards of certain countries and regions require that when the output voltage exceeds a certain value, the inverter must suppress voltage rise by outputting reactive power and reducing active power. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Voltage rise suppressing reactive power adjustment point (%) | The standards of certain countries and regions require that the inverter generate a certain amount of reactive power when the output voltage exceeds a certain value. | [100, 115) | <ul style="list-style-type: none"> • This parameter is displayed when Voltage rise suppression is set to Enable. • The value of Voltage rise suppressing active power derating point must be greater than that of Voltage rise suppressing reactive power adjustment point. |
| Voltage rise suppressing active power derating point (%) | The standards of certain countries and regions require that the active power of the inverter be derated according to a certain slope when the output voltage exceeds a certain value. | (100, 115] | |
| Voltage rise suppression P-U curve | The standards of certain countries and regions require that the P-U curve be set. | <ul style="list-style-type: none"> • U (V): [176, 1500] • U device verification (V) : [0.8 Un, 1.36 Un] • P/Pn (%): [0, 100] | This parameter is displayed when Voltage rise suppression is set to Enable . |
| Voltage rise suppression Q-U curve | The standards of certain countries and regions require that the Q-U curve be set. | <ul style="list-style-type: none"> • U (V): [176, 1500] • U device verification (V) : [0.8 Un, 1.36 Un] • Q/S: [-0.6, 0.6] | |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|---|--|--|--|
| Soft start time after grid failure (s) | Specifies the time for the power to gradually increase when the inverter restarts after the power grid recovers. | [1, 1800] | N/A |
| PID running mode | Specifies the operation mode of the inverter built-in PID. | <ul style="list-style-type: none"> • Disable • Suppress • Repair • Suppress + Repair | N/A |
| PID nighttime off-grid repair | Specifies whether to enable the PID nighttime off-grid repair. | <ul style="list-style-type: none"> • Disable • Enable | This parameter is displayed when PID running mode is set to Repair . |
| Closed-loop controller | <ul style="list-style-type: none"> • Set this parameter to SDongle/SmartLogger when the SmartLogger1000A is connected. • If multiple inverters are cascaded, set this parameter to SDongle/SmartLogger. • If there is only one inverter, set this parameter to Inverter. | <ul style="list-style-type: none"> • SDongle/SmartLogger • Solar inverter | N/A |
| Active power output limit for fail-safe (%) | When the communication between the SDongle/SmartLogger, power meter, and solar inverter is interrupted, the solar inverter output is limited. | [0, 100] | N/A |

Power Adjustment

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|---|--|---|---|
| Remote power schedule | If this parameter is set to Enable , the inverter responds to the scheduling instruction from the remote port. If this parameter is set to Disable , the inverter does not respond to the scheduling instruction from the remote port. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Schedule instruction valid duration (s) | Specifies the time for maintaining the scheduling instruction. | [0, 86400] | When this parameter is set to 0, the scheduling instruction takes effect permanently. |
| Apparent power baseline (kVA) | Adjust the apparent output baseline of the inverter. | $[P_{max}, S_{max_real}]$ | N/A |
| Active power baseline (kW) | Adjusts the active output baseline of the inverter. | $[0.1, \text{Min}(P_{max_real}, S_{max})]$ | N/A |
| Maximum apparent power (kVA) | Specifies the output upper threshold for the maximum apparent power to adapt to the capacity requirements of standard and customized inverters. | $[P_{max}, S_{max}]$ | N/A |
| Maximum active power (kW) | Specifies the output upper threshold for the maximum active power to adapt to different market requirements. | $[0.1, P_{max}]$ | N/A |
| OFF at %0 power limit | If this parameter is set to Enable , the inverter shuts down after receiving the 0% power limit command. If this parameter is set to Disable , the inverter does not shut down after receiving the 0% power limit command. | <ul style="list-style-type: none"> • Disable • Enable | N/A |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|--|---|--|--|
| Active power change gradient (%/s) | Specifies the change speed of the inverter active power. | [0.1, 1000] | N/A |
| Derated by fixed active power (kW) | Adjusts the active power output of the inverter by fixed value. | [0, P _{max}] | N/A |
| Active power percentage derating (%) | Adjusts the active power output of the inverter by percentage. | [0, 100] | If this parameter is set to 100 , the solar inverter generates power based on the maximum output power. |
| Reactive power change gradient (%/s) | Specifies the change speed of the inverter reactive power. | [0.1, 1000] | N/A |
| Reactive power compensation (Q/S) | Specifies the reactive power output by the inverter. | [-1, 1] | N/A |
| Power factor | Specifies the power factor of the inverter. | [-1.000, -0.800] U [0.800, 1.000] | N/A |
| Overfrequency derating | If this parameter is set to Enable , the active power of the inverter will be derated according to a certain slope when the grid frequency exceeds the frequency that triggers overfrequency derating. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Frequency for triggering overfrequency derating (Hz) | The standards of certain countries and regions require that the output active power of inverters be derated when the power grid frequency exceeds a certain value. | <ul style="list-style-type: none"> • 50Hz: [40, 60] • 60Hz: [48, 72] | <ul style="list-style-type: none"> • This parameter is displayed when Overfrequency derating is set to Enable. • When setting this parameter, ensure that the following condition is met: Frequency for exiting overfrequency derating ≤ Trigger frequency of overfrequency derating < Cutoff frequency of |
| Frequency for exiting overfrequency derating (Hz) | Specifies the frequency threshold for exiting overfrequency derating. | <ul style="list-style-type: none"> • 50Hz: [40, 60] • 60Hz: [48, 72] | |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|---|---|---|--|
| Cutoff frequency of overfrequency derating (Hz) | Specifies the frequency threshold for cutting off overfrequency derating. | <ul style="list-style-type: none"> • 50Hz: [40, 60] • 60Hz: [48, 72] | overfrequency derating. |
| Cutoff power of overfrequency derating (%) | Specifies the power threshold for cutting off overfrequency derating. | [0, 100] | |
| Power recovery gradient of overfrequency derating (%/min) | Specifies the recovery rate of the overfrequency derating power. | [1, 6000] | |
| Dry contact scheduling | The standards of some countries and regions require that this parameter be set to Enable when power scheduling through dry contacts is required. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Dry contact scheduling settings | Specifies the dry contact power scheduling parameters. | N/A | This parameter is displayed when Dry contact scheduling is set to Enable . |
| cos ϕ -P/Pn characteristic curve | After this parameter is set, the solar inverter can adjust the power factor cos ϕ in real time based on the P/Pn. | <ul style="list-style-type: none"> • P/Pn (%): [0, 100] • cosϕ: (-1, -0.8]U[0.8, 1] | N/A |
| Q-U characteristic curve | Specifies the voltage reactive power scheduling curve. | <ul style="list-style-type: none"> • U/Un (%): [80, 136] • Q/S: [-0.6, 0.6] | N/A |
| Q-U hysteresis curve | Specifies the voltage reactive power scheduling hysteresis curve. | <ul style="list-style-type: none"> • U/Un (%): [80, 136] • Q/S: [-0.6, 0.6] | Associated with the Italian standard code. |

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|--|--|--|---|
| Underfrequency rise power | The standards of certain countries and regions require that if the power grid frequency is lower than Frequency for triggering of underfrequency rise power , the inverter needs to increase the active power output to help increase the power grid frequency. In this case, set this parameter to Enable . | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Frequency for triggering of underfrequency rise power (Hz) | Specifies the frequency threshold of Underfrequency rise power . | <ul style="list-style-type: none"> • 50Hz: [40, 60] • 60Hz: [48, 72] | <ul style="list-style-type: none"> • This parameter is displayed when Underfrequency rise power is set to Enable. • When setting this parameter, ensure that the following condition is met: Cutoff frequency of underfrequency rise power < Frequency for triggering of underfrequency rise power < Frequency for exiting of underfrequency rise power. |
| Power recovery gradient of underfrequency rise (%/min) | Specifies the recovery rate of Underfrequency rise power . | [1, 6000] | |
| Cutoff frequency of underfrequency rise power (Hz) | Specifies the cutoff frequency of Underfrequency rise power . | <ul style="list-style-type: none"> • 50Hz: [40, 60] • 60Hz: [48, 72] | |
| Cutoff power of underfrequency rise power (%) | Specifies the cutoff power of Underfrequency rise power . | [0, 100] | |
| Frequency for exiting of underfrequency rise power (Hz) | Specifies the exit frequency of Underfrequency rise power . | <ul style="list-style-type: none"> • 50Hz: [40, 60] • 60Hz: [48, 72] | |
| | | | |

Time Setting

| Parameter | Description | Value Range (Vn: Rated Voltage; Fn: Rated Frequency) | Remarks |
|-----------------------------------|---|---|--|
| Time zone | Specifies the time zone. | N/A | N/A |
| Time setting | Specifies the time. | N/A | N/A |
| Daylight saving time | Specifies whether to enable daylight saving time (DST). | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| Offset time | Specifies the DST offset. | [-240, 240] | This parameter is displayed when Daylight saving time is set to Enable . |
| Start date | Specifies the DST offset start date. | [01-01, 12-31] | |
| Start time | Specifies the DST offset start time. | [00:00:00, 23:59:59] | |
| End date | Specifies the DST offset end date. | [01-02, 12-30] | |
| End date | Specifies the DST offset end time. | [00:00:00, 23:59:59] | |
| NTP time synchronization | Specifies whether to enable NTP time synchronization. | <ul style="list-style-type: none"> • Disable • Enable | N/A |
| NTP server address | Specifies the NTP server IP address or domain name. | N/A | This parameter is displayed when NTP time synchronization is set to Enable . |
| NTP server port | Specifies the server port. | [0, 65535] | |
| NTP time synchronization interval | Specifies the NTP time synchronization interval. | [1, 1440] | |

Communication Configuration

| Parameter | Description | Parameter | Description |
|------------------------|---|-----------------------------------|--|
| Inverter WLAN settings | Changes the WLAN password for the solar inverter. | Inverter's connection to a router | When using WLAN for communication, enter the information about the connected router. |

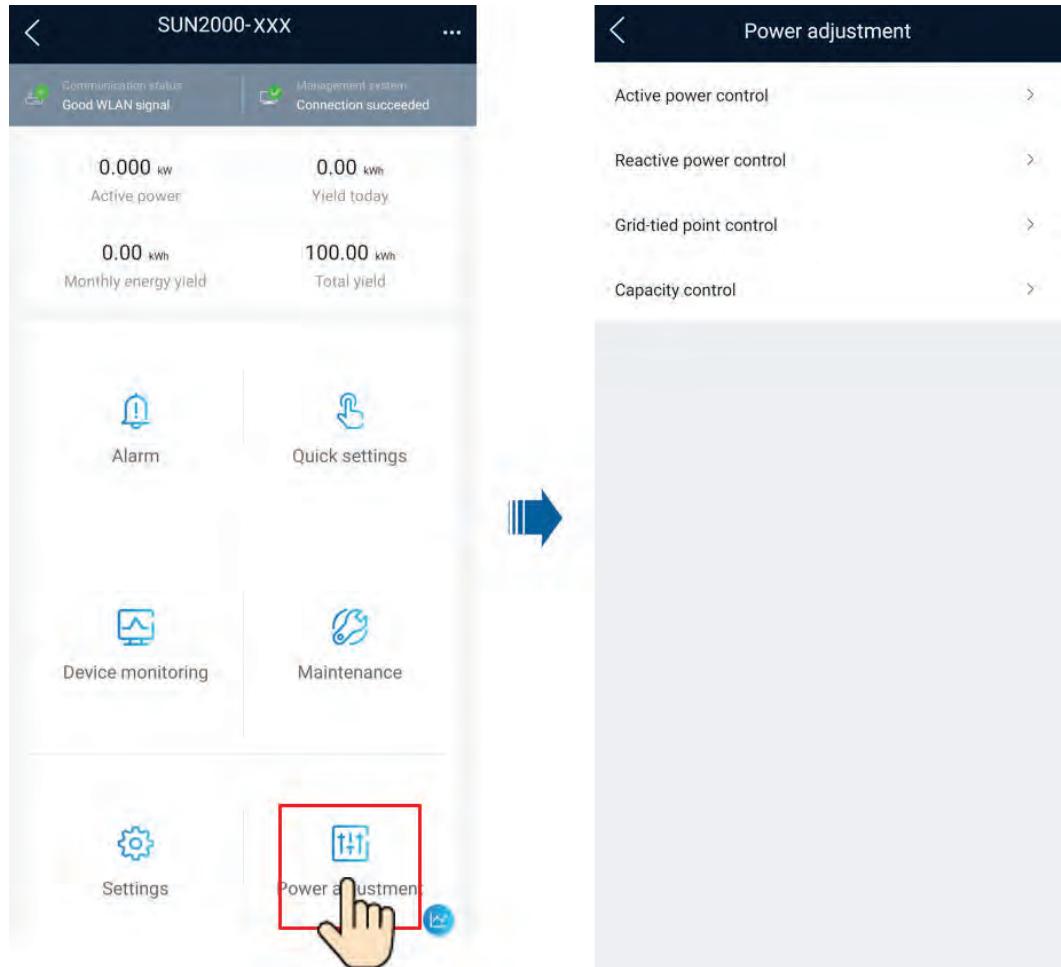
| Parameter | Description | Parameter | Description |
|---------------------------|--|---------------------------------|---|
| Dongle parameter settings | If the solar inverter is configured with a Dongle, view and set communication addresses to the solar inverter. | 4G | When using a 4G Dongle, enter the SIM card information. |
| RS485 settings | Specifies the RS485 communications parameters of the solar inverter. | Management System Configuration | Enter information about the management system to which the solar inverter connects. |

Table 7-2 RS485 settings

| Parameter | Description | Value Range |
|-------------|---|--|
| Protocol | Set the RS485 baud rate to be consistent with the baud rate of the devices on the same bus. | <ul style="list-style-type: none"> • 4800 • 9600 • 19200 |
| Baud rate | The solar inverter can connect to the upper-layer management unit over the Modbus RTU, SunSpec, or AVM protocol. | <ul style="list-style-type: none"> • MODBUS RTU • Sunspec • AVM |
| Com address | Set the communications address of the SUN2000 when it connects to the upper-level management unit, which should not conflict with the addresses of other devices on the same bus. | [1, 247] |

7.1.8 Power Adjustment

On the home screen, tap **Power Adjustment** and set power parameters as required.



NOTE

- The UI is for reference only. The UI varies with associated devices. The actual UI prevails.
- The parameter list provided in this document includes all configurable parameters that vary with the device model and grid code. The actual screen prevails.
- For details about how to set active and reactive power control parameters, see [Power Adjustment](#).
- For details about how to set the grid-tied point control parameters, see [Table 7-3](#).

Table 7-3 Grid-tied Point Control Parameters

| Parameter | | | Description |
|--------------|-----------|-----|---|
| Active power | Unlimited | N/A | If this parameter is set to Unlimited , the output power of the solar inverter is not limited and the solar inverter can connect to the power grid at the rated power. |

| Parameter | | Description |
|-----------|---------------------------------|---|
| | Grid connection with zero power | Closed-loop controller <ul style="list-style-type: none"> When the SmartLogger1000A is connected, set this parameter to SDongle/SmartLogger. When multiple solar inverters are cascaded, set this parameter to SDongle/SmartLogger. When there is only one solar inverter, set this parameter to Inverter. |
| | | Limitation mode <ul style="list-style-type: none"> Total power indicates export limitation of the total power at the grid-tied point. Single-phase power indicates export limitation of the power in each phase at the grid-tied point. (Note: COUNTIS E43 does not apply to this scenario.) |
| | | Power adjustment period <p>Specifies the shortest interval for a single export limitation adjustment.</p> |
| | | Maximum protection time <p>Specifies the time for detecting power meter data. If the Dongle does not detect any power meter data within the preset time, the Dongle delivers the preset value of the Fail-safe power threshold to the solar inverter for protection.</p> |
| | | Power control hysteresis <p>Specifies the dead zone for adjusting the inverter output power. If the power fluctuation is within the power control hysteresis, the power is not adjusted.</p> |
| | | Communication disconnection fail-safe <p>In the solar inverter export limitation scenario, if this parameter is set to Enable, the solar inverter will derate according to the active power derating percentage when the communication between the solar inverter and the Dongle is disconnected for a period longer than Communication disconnection detection time.</p> |
| | | Communication disconnection detection time <p>Specifies the time for determining the communication disconnection between the solar inverter and the Dongle. This parameter is displayed only when Communication disconnection fail-safe is set to Enable.</p> |
| | | Active power output limit for fail-safe <p>Specifies the derating value of the solar inverter active power by percentage. If the Dongle does not detect any power meter data or the communication between the Dongle and the solar inverter is disconnected, the Dongle delivers the derating value of the solar inverter active power by percentage.</p> |

| Parameter | | Description |
|---|--|--|
| Grid connection with limited power (kW) | Closed-loop controller | <ul style="list-style-type: none"> For a single inverter, set Closed-loop controller to Inverter or SDongle/SmartLogger. <ul style="list-style-type: none"> When Closed-loop controller is set to Inverter, the duration of export limitation control is less than 2s. When Closed-loop controller is set to SDongle/SmartLogger, the duration of export limitation is less than 5s. For multiple inverters, Closed-loop controller can only be set to SDongle/SmartLogger. The duration of export limitation control is less than 5s. |
| | Limitation mode | <ul style="list-style-type: none"> Total power indicates export limitation of the total power at the grid-tied point. Single-phase power indicates export limitation of the power in each phase at the grid-tied point. (Note: COUNTIS E43 does not apply to this scenario.) |
| | PV plant capacity | Specifies the total maximum active power in the solar inverter cascading scenario. |
| | Maximum grid feed-in power (kW) | Specifies the maximum active power transmitted from the grid-tied point to the power grid. |
| | Power adjustment period | Specifies the shortest interval for a single export limitation adjustment. |
| | Maximum protection time | Specifies the time for detecting power meter data. If the Smart Dongle does not detect any power meter data within the preset time, the Smart Dongle delivers the preset value of the Fail-safe power threshold to the inverter for protection. |
| | Power control hysteresis | Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. |
| | Communication disconnection fail-safe | In the inverter export limitation scenario, if this parameter is set to Enable , the inverter will derate according to the active power derating percentage when the communication between the inverter and the Smart Dongle is disconnected for a period longer than Communication disconnection detection time . |
| | Communication disconnection detection time | Specifies the time for determining the communication disconnection between the inverter and the Smart Dongle. This parameter is displayed when Communication disconnection fail-safe is set to Enable . |

| Parameter | | Description |
|--|---|--|
| | Active power output limit for fail-safe | Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage. |
| Grid connection with limited power (%) | Closed-loop controller | <ul style="list-style-type: none"> For a single inverter, set Closed-loop controller to Inverter or SDongle/SmartLogger. <ul style="list-style-type: none"> When Closed-loop controller is set to Inverter, the duration of export limitation control is less than 2s. When Closed-loop controller is set to SDongle/SmartLogger, the duration of export limitation is less than 5s. For multiple inverters, Closed-loop controller can only be set to SDongle/SmartLogger. The duration of export limitation control is less than 5s. |
| | Limitation mode | <ul style="list-style-type: none"> Total power indicates export limitation of the total power at the grid-tied point. Single-phase power indicates export limitation of the power in each phase at the grid-tied point. (Note: COUNTIS E43 does not apply to this scenario.) |
| | PV plant capacity | Specifies the total maximum active power in the inverter cascading scenario. |
| | Maximum grid feed-in power (%) | Specifies the percentage of the maximum active power of the grid-tied point to the PV plant capacity. |
| | Power adjustment period | Specifies the shortest interval for a single export limitation adjustment. |
| | Maximum protection time | Specifies the time for detecting power meter data. If the Smart Dongle does not detect any power meter data within the preset time, the Smart Dongle delivers the preset value of the Fail-safe power threshold to the inverter for protection. |
| | Power control hysteresis | Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. |
| | Communication disconnection fail-safe | In the inverter export limitation scenario, if this parameter is set to Enable , the inverter will derate according to the active power derating percentage when the communication between the inverter and the Smart Dongle is disconnected for a period longer than Communication disconnection detection time . |

| Parameter | | Description | |
|----------------|----------------------------------|--|--|
| | | Communication disconnection detection time | Specifies the time for determining the communication disconnection between the inverter and the Smart Dongle. This parameter is displayed when Communication disconnection fail-safe is set to Enable . |
| | | Active power output limit for fail-safe | Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage. |
| Reactive power | Power factor closed-loop control | Target power factor | Specifies the target power factor of the power meter. |
| | | Reactive power adjustment period | Specifies the interval for sending adjustment commands. |
| | | Reactive power adjustment deadband | Specifies the adjustment power factor precision. |
| | | Fail-safe power factor | When the communication between the SDongle/ SmartLogger, power meter, and solar inverter is interrupted, the solar inverter outputs power based on this threshold. |
| | | Communication disconnection fail-safe | When this parameter is set to Enable , and the communication between the solar inverter and the SDongle/SmartLogger is interrupted for a certain period (set by Communication disconnection detection time), the solar inverter outputs power based on Fail-safe power . |
| | | Communication disconnection detection time | Specifies the protection duration to determine whether the communication between the SDongle/SmartLogger and the solar inverter is interrupted. This parameter is displayed only when Communication disconnection fail-safe is set to Enable . |
| | No Output | N/A | If this parameter is set to No Output , no parameter is available. |

 **NOTE**

The duration for export limitation control is as follows:

- For a single solar inverter, set **Closed-loop controller** to **Inverter** or **SDongle/SmartLogger**.
 - When **Closed-loop controller** is set to **Inverter**, the duration of export limitation control is less than 2s.
 - When **Closed-loop controller** is set to **SDongle/SmartLogger**, the duration is less than 5s if the controller is the SDongle. The duration is less than 2s if the controller is the SmartLogger.
- For multiple solar inverters, **Closed-loop controller** can only be set to **SDongle/SmartLogger**.
 - The duration is less than 5s if the controller is the SDongle.
 - The duration is less than 2s if the controller is the SmartLogger.
- Battery Control Parameters

| Parameter | Description | Value Range |
|------------------------------|--|--|
| Working mode | For details, see the description on the App screen. | <ul style="list-style-type: none"> • Maximum self-consumption • Time-of-use • Fully fed to grid |
| Maximum charge power (kW) | Retain this parameter to the maximum charge power. Additional configuration is not required. | • Charge: [0, Maximum charge power] |
| Maximum discharge power (kW) | Retain this parameter to the maximum discharge power. Additional configuration is not required. | • Discharge: [0, Maximum discharge power] |
| End-of-charge SOC (%) | Set the charge cutoff capacity. | 90%–100% |
| End-of-discharge SOC (%) | Set the discharge cutoff capacity. | 0%–20% (When no PV module is configured or the PV modules have no voltage for 24 hours, the minimum value is 15%.) |
| Charge from grid | If Charge from grid function is disabled by default, comply with the grid charge requirements stipulated in local laws and regulations when this function is enabled. | <ul style="list-style-type: none"> • Disable • Enable |
| Grid charge cutoff SOC | Set the grid charge cutoff SOC. | [20%, 100%] |

- Capacity Control Parameters

| Parameter | Description | Range |
|---------------------------------------|--|--|
| Capacity control | <ol style="list-style-type: none"> 1. Before enabling Capacity control, set Charge from grid to Enable. 2. Before disabling Charge from grid, set Capacity control to Disable. | <ul style="list-style-type: none"> • Disable • Active capacity limit |
| Backup power SOC for peak shaving (%) | The value of this parameter affects the peak shaving capability. A larger value indicates stronger peak shaving capability. | [0.0, 100.0] Backup power SOC for peak shaving > Backup power SOC (when BackUp is enabled) > End-of-discharge SOC |
| Start date | <ul style="list-style-type: none"> • Set the peak power range based on the start time and end time. The peak power is configured based on electricity prices in different time segments. You are advised to set the peak power to a low value when the electricity price is high. • A maximum of 14 time segments are allowed. | - |
| End date | | |
| Peak power (kW) | | [0.000, 1000.000] |

 **NOTE**

- The capacity control function is unavailable when the energy storage working mode is set to **Fully fed to grid**.
- When capacity control has been enabled, you must first disable capacity control and then set the energy storage working mode to **Fully fed to grid**.

7.2 Operations on the Screen for Connecting to the Commercial Solar Inverter

NOTICE

- The figures and data displayed in this chapter are for reference only.
- The parameters displayed on the screen vary according to the solar inverter model connected to the app.
- The 1000 V and 1500 V solar inverters have the maximum input voltages of 1000 V and 1500 V respectively. The 1100 V solar inverter refers to the one with the maximum input voltage of 1100 V or SUN2000-33KTL-US/36KTL-US/40KTL-US. The maximum input voltage can be queried from the product nameplate or the user manual.
- Delivering a reset, factory reset, shutdown, or upgrade command to the solar inverters may cause power grid connection failure, which affects the energy yield.
- Only professionals are allowed to set the grid parameters, protection parameters, feature parameters, power adjustment parameters, and grid-tied point control parameters of the solar inverters. If the grid parameters, protection parameters, and feature parameters are incorrectly set, the solar inverters may not connect to the power grid. If the power adjustment parameters and grid-tied point control parameters are incorrectly set, the solar inverters may not connect to the power grid as required. In these cases, the energy yield will be affected.

7.2.1 Commercial Solar Inverter

Table 7-4 Product mapping

| Product | Solar Inverter Model |
|---------|--|
| SUN2000 | SUN2000-20KTL, SUN2000-17KTL, SUN2000-15KTL, SUN2000-12KTL, SUN2000-10KTL, SUN2000-8KTL, SUN2000-24.5KTL, SUN2000-23KTL, SUN2000-28KTL, SUN2000-33KTL, SUN2000-40KTL, SUN2000-25KTL-US, SUN2000-30KTL-US, SUN2000-30KTL-A, SUN2000-22KTL-US, SUN2000-42KTL, SUN2000-36KTL, SUN2000-33KTL-JP, SUN2000-40KTL-JP, SUN2000-50KTL, SUN2000-24.7KTL-JP, SUN2000-40KTL-US, SUN2000-33KTL-US, SUN2000-36KTL-US, SUN2000-33KTL-A, SUN2000-33KTL-E001, SUN2000-29.9KTL |
| | SUN2000-70KTL-C1, SUN2000-75KTL-C1, SUN2000-50KTL-C1, SUN2000-43KTL-IN-C1 |
| | SUN2000-65KTL-M0, SUN2000-70KTL-INM0, SUN2000-63KTL-JPM0, SUN2000-50KTL-JPM0, SUN2000-60KTL-M0, SUN2000-50KTL-M0, SUN2000-100KTL-M0, SUN2000-100KTL-INM0, SUN2000-110KTL-M0, SUN2000-125KTL-M0 |

| Product | Solar Inverter Model |
|-----------|--|
| | SUN2000-100KTL-M1, SUN2000-50KTL-JPM1 |
| SUN2000HA | SUN2000-60KTL-HV-D1, SUN2000-45KTL-US-HV-D0, SUN2000-55KTL-HV-D1, SUN2000-55KTL-IN-HV-D1, SUN2000-55KTL-HV-D1-001, SUN2000-60KTL-HV-D1-001 |
| | SUN2000-100KTL-USH0, SUN2000-100KTL-H0, SUN2000-95KTL-INH0, SUN2000-90KTL-H0, SUN2000-63KTL-JPH0, SUN2000-175KTL-H0, SUN2000-185KTL-INH0, SUN2000-193KTL-H0, SUN2000-196KTL-H0, SUN2000-215KTL-H0, SUN2000-125KTL-JPH0 |
| | SUN2000-100KTL-H1, SUN2000-90KTL-H1, SUN2000-105KTL-H1, SUN2000-95KTL-INH1, SUN2000-168KTL-H1, SUN2000-185KTL-H1, SUN2000-196KTL-H1 |
| | SUN2000-100KTL-H2, SUN2000-90KTL-H2, SUN2000-200KTL-H2 |

NOTE

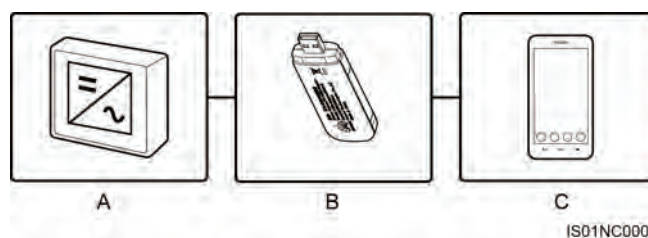
- The version mapping in the preceding table is subject to change and is for reference only.
- You can view the solar inverter version on the app, LCD, SmartLogger, and the management system.

7.2.2 Connection Modes

After the DC or AC side of a solar inverter is energized, the app can connect to the solar inverter in two methods:

1. Connect over a WLAN/Bluetooth module.

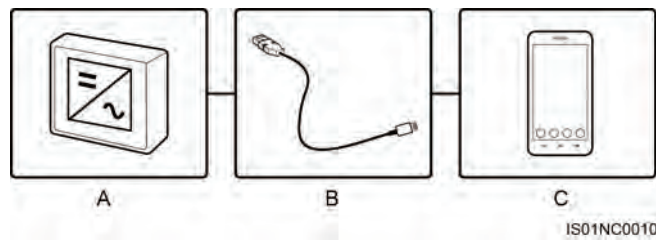
Figure 7-7 WLAN/Bluetooth connection



(A) Solar inverter (B) WLAN/Bluetooth module (C) Mobile phone

2. Connect over a USB data cable.

Figure 7-8 USB data cable connection



(A) Solar inverter (B) USB data cable (C) Mobile phone

7.2.3 Required Accessories

Mobile Phone

- Mobile phone operating system: Android 4.4 or later
- Recommended phone brands: Huawei and Samsung
- The mobile phone supports the access to the Internet over a web browser.
- WLAN/Bluetooth supported

WLAN/Bluetooth Module

Purchase a Bluetooth module or WLAN module that matches the solar inverter. A Bluetooth module or a WLAN module purchased from any other source may not support communication between the app and the solar inverter.

Table 7-5 WLAN/Bluetooth module model

| Model | Module | Item Code | Purchased From |
|-------------------|------------------|-----------|------------------------------|
| USB-Adapter2000-C | WLAN module | 02312MCK | Can be purchased from Huawei |
| USB-Adapter2000-B | Bluetooth module | 02311NEA | |
| BF4030 | Bluetooth module | 06080358 | |

USB Data Cable

The USB data cable is delivered with the phone.

NOTE

The port type of the USB data cable connected to the solar inverter is USB 2.0.

7.2.4 User Operation Permissions

The user accounts that can log in to the app are classified into common users, special users, and advanced users. You can set different user permissions based on the responsibilities of PV plant operation personnel.

- Common user: Has the permission of viewing data and setting user parameters.
- Advanced user: Has the permission of viewing data, setting functional parameters, and maintaining devices.
- Special user: Has the permissions of viewing solar inverter data, setting grid related parameters, and maintaining devices (including starting and shutting down the solar inverter, restoring factory defaults, and upgrading devices).

Figure 7-9 Operation permissions of common users

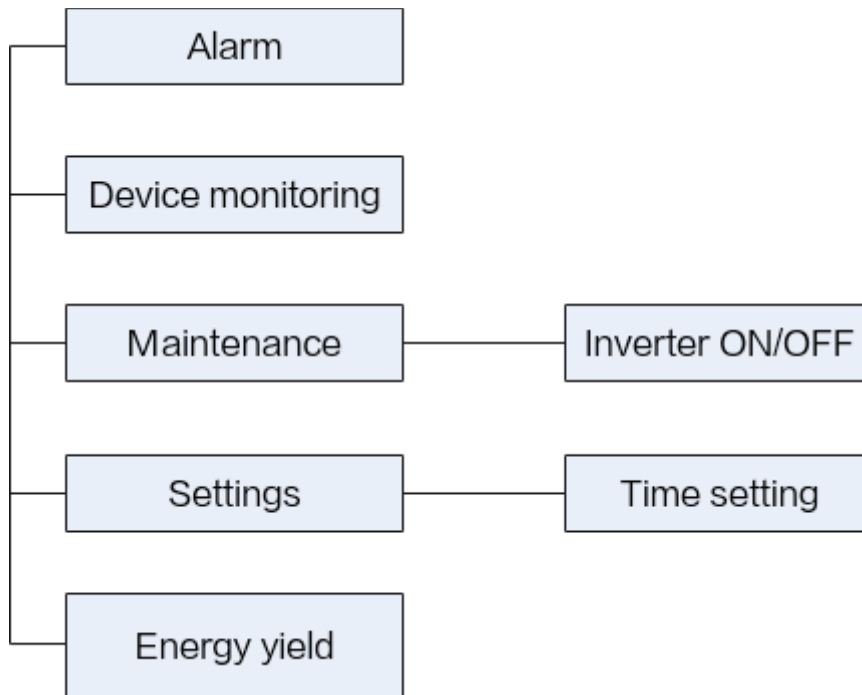
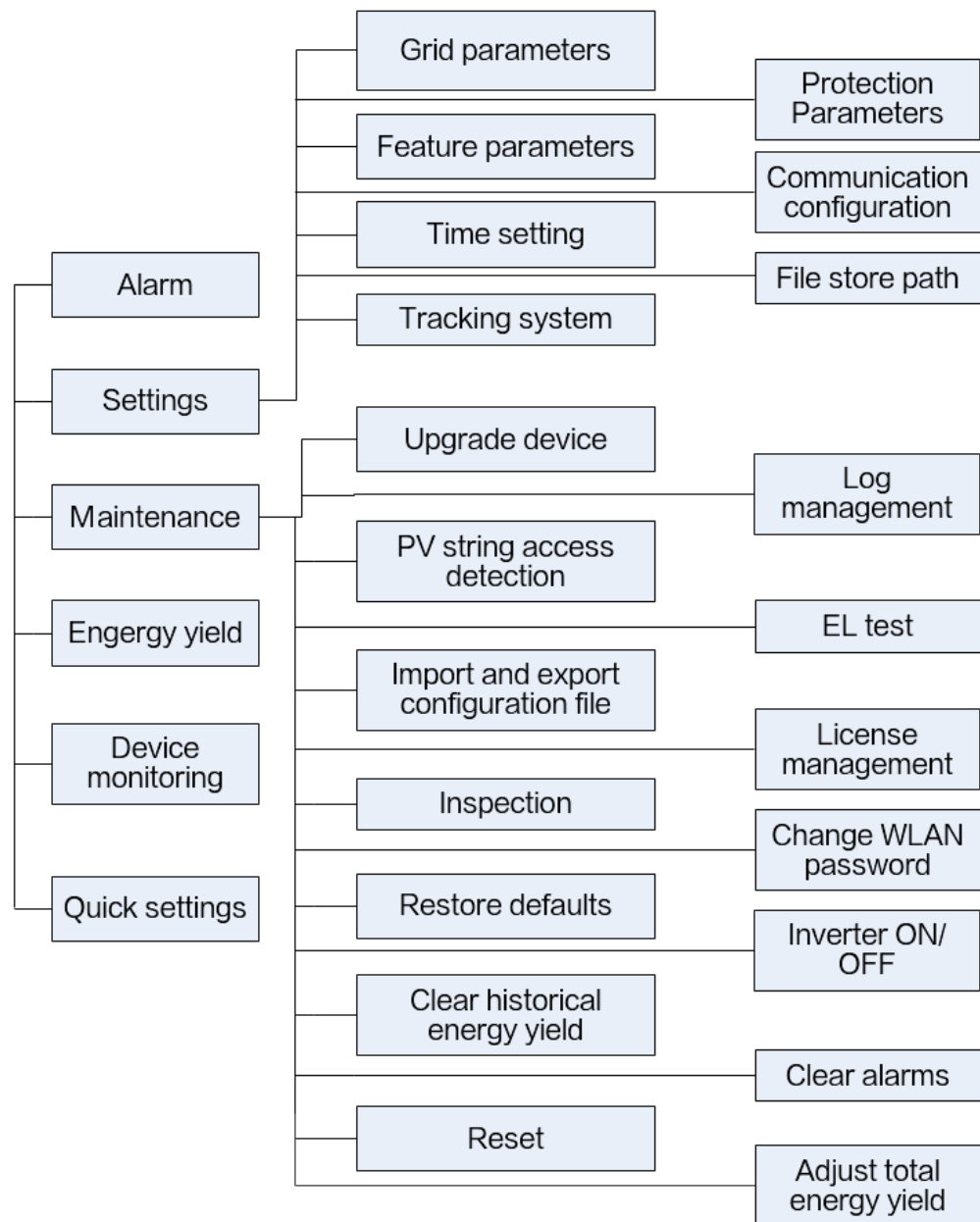


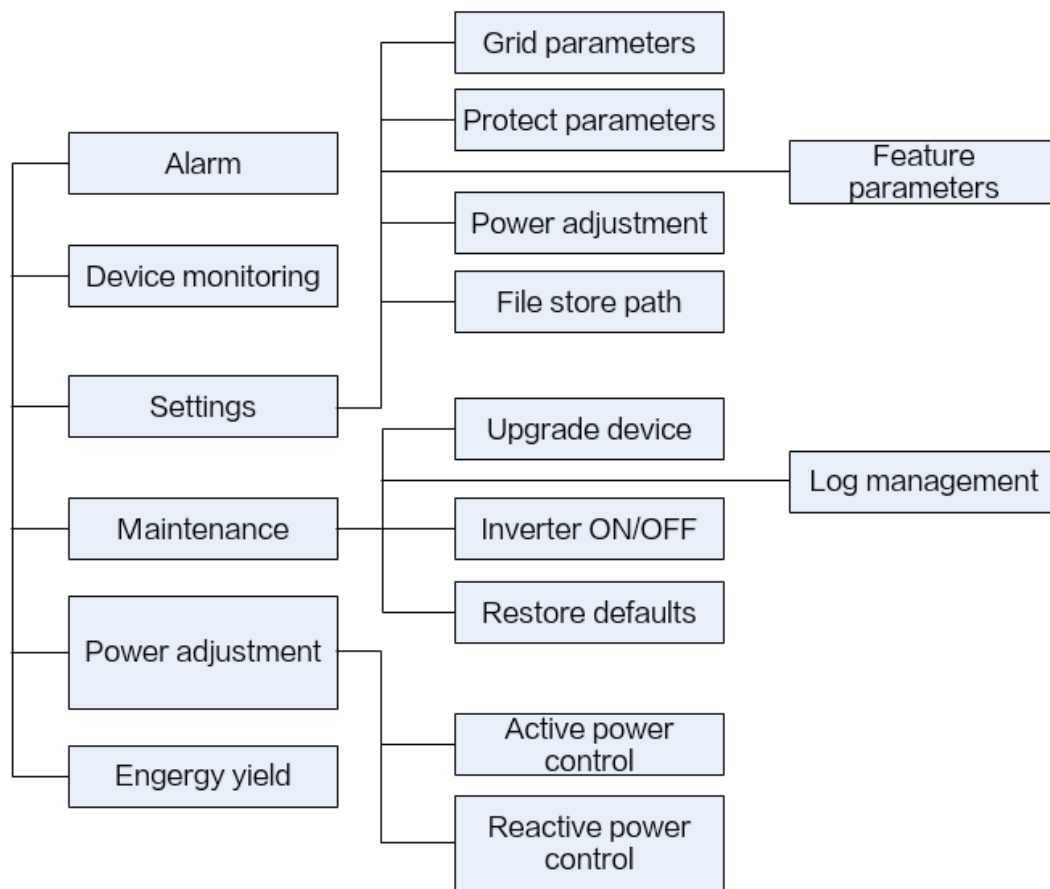
Figure 7-10 Operation permissions of advanced users



NOTE

- **Track system** is available for SUN2000 V200R001C91 and SUN2000 V200R001C93 of 1000 V solar inverters, all 1100 V solar inverters, and all 1500 V solar inverters.
- **File store path** is displayed only for the Android system.

Figure 7-11 Operation permissions of special users



7.2.5 Login the SUN2000 APP

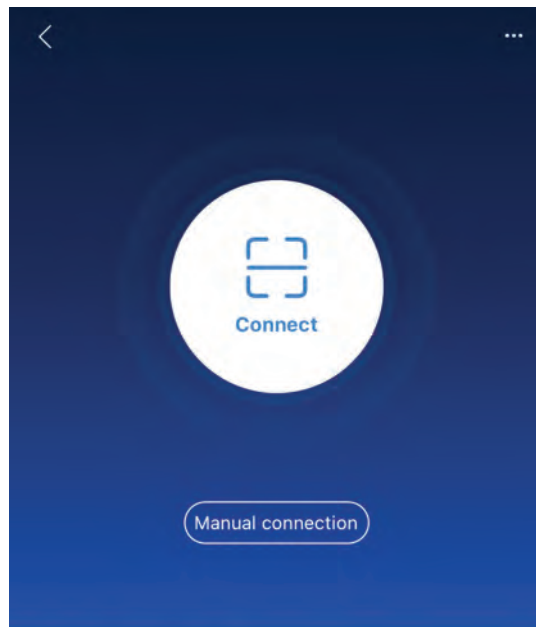
Prerequisites

- The DC or AC side of the solar inverter has been energized.
- Connect over a WLAN/Bluetooth module:
 - a. The WLAN/Bluetooth module is connected to the **USB** port at the bottom of the solar inverter.
 - b. The WLAN/Bluetooth function is enabled on the mobile phone.
 - c. Keep the mobile phone within 5 m from the solar inverter. Otherwise, communication between them would be affected.
- Connect over a USB data cable:
 - a. The USB data cable is connected from the USB port at the bottom of the solar inverter to the USB port on the mobile phone.
 - b. The USB data cable has been successfully connected and **Connected to USB Accessory** is displayed on the screen. Otherwise, the connection is invalid.

Procedure

Step 1 Connect the solar inverter.

Figure 7-12 Connect



- Connection record

- Code scanning: Tap **Connect** to access the scanning screen, place the QR code or bar code of the WLAN/Bluetooth module in the scan frame. The device will be automatically connected after the code is identified.
- Manual connection: Tap **Manual Connection** and select a connection mode.

Figure 7-13 Manual connection



- Select **WLAN** and connect to the corresponding WLAN in the WLAN connection list of the APP. The initial name of the WLAN hotspot is **Adapter-WLAN module SN**, and the initial password is **Changeme**.

NOTICE

- Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
 - If the **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.
-
- Select **Bluetooth**, and tap **Search for device**. After a Bluetooth device is found, select the target Bluetooth device, and set up a connection. If the Bluetooth module is USB-Adapter2000-B, the connected Bluetooth device is named after **last 8 digits of the SN barcode + HWAPP**.
 - Select **USB**, and tap **OK** to allow the app to access the USB accessory. After you select **Use by default for this USB accessory**, the message will not appear if you log in to the app again without removing the USB data cable.

Step 2 Select a login user and enter the password.

Figure 7-14 Login



NOTICE

- For the initial power-on, set the password as prompted and then log in to the system. If not prompted, log in with the initial password **00000a**.
- To ensure account security, change the password periodically and keep the new password in mind. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
- During the login, if five consecutive invalid password entries are made (the interval between two consecutive entries is less than 2 minutes), the account will be locked for 10 minutes. The password should consist of six characters.

Step 3 After successful login, the **Quick Settings** or **Function Menu** screen is displayed.

NOTICE

- If you log in to the SUN2000 app after the device powers on for the first time or factory defaults are restored, the **Quick Settings** screen will be displayed. If you do not set the basic parameters for the solar inverter on the **Quick Settings** screen, the screen is still displayed when you log in next time.
- To set the basic parameters on the **Quick Settings** screen, switch to **Advanced User**. When you log in as **Common User** or **Special User**, enter the password of **Advanced User** in the dialog box that is displayed. After you confirm the password, go to the **Quick Settings** screen.

Table 7-6 Quick settings

| Parameter | Description |
|-----------------|---|
| Grid code | Set this parameter based on the grid code of the country or region where the SUN2000 is used and the SUN2000 application scenario. |
| Date | Specifies the system date. |
| Time | Specifies the system time. |
| Baud rate (bps) | Set the RS485 baud rate to be consistent with the baud rate of the devices on the same bus. |
| RS485 protocol | <ul style="list-style-type: none"> • The solar inverter can connect to the upper-layer management unit over the Modbus RTU, SunSpec, or AVM protocol. • When the solar inverter connects to the support tracking system, only the Modbus RTU protocol is supported. |
| Com address | Set the communications address of the SUN2000 when it connects to the upper-level management unit, which should not conflict with the addresses of other devices on the same bus. |

----End

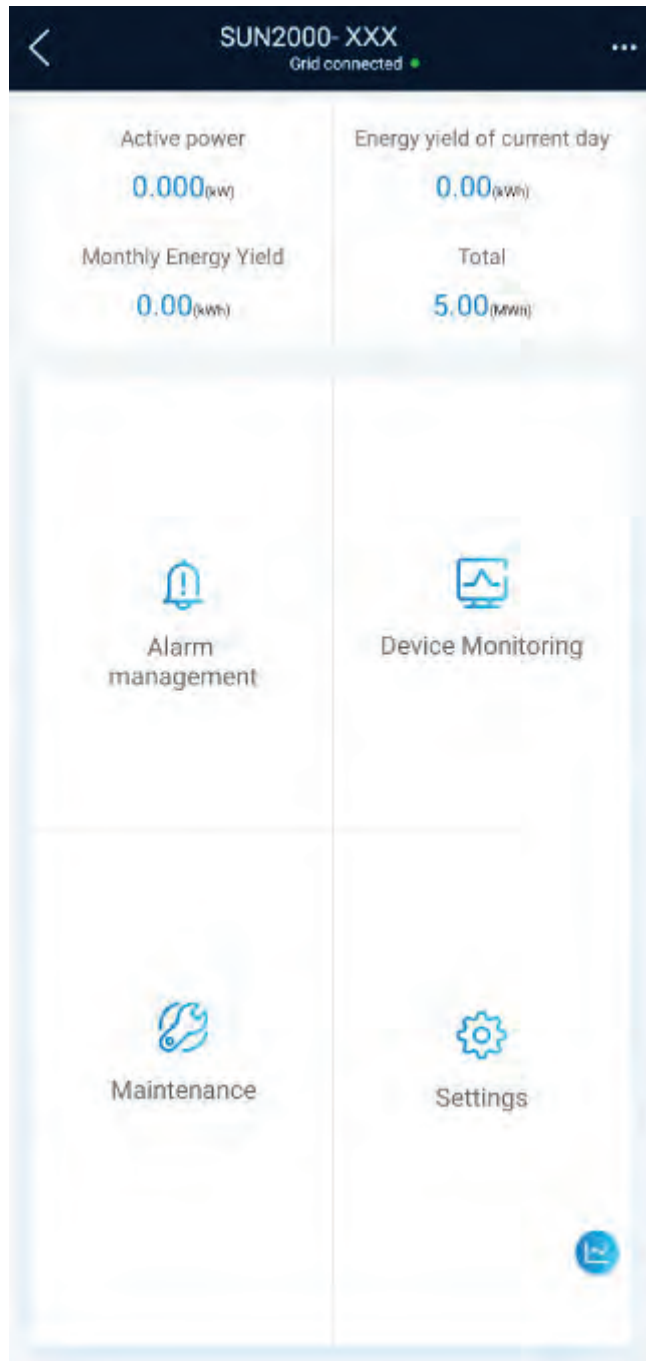
7.2.6 Screen Operations (Common User)

7.2.6.1 Query

Procedure

- Step 1** After logging in to the app, you can view the active power and energy yield of solar inverters on the home screen.

Figure 7-15 Home screen




Step 2 Tap **Alarm** or **Device Monitoring** to view active alarms, historical alarms, and running information of the solar inverters.

You can view the following information on the **alarm** screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.

 **NOTE**

- Tap **Sort by generated time** to set the alarm sorting mode for active alarms or historical alarms.
- Tap  to set a time criterion. The historical alarms generated within the time segment are displayed.
- Select the alarms that can be manually cleared, and tap **Delete** on the right of the alarm to manually clear the alarms.

 **NOTE**

- Alarms that have been manually cleared can be viewed on the **Historical Alarm** screen.
- Only the **AFCI Self-Check Failure** and **DC Arc Fault** alarms can be manually cleared. Only the products whose technical specifications contain AFCI supports manual alarm clearance.

----End

7.2.6.2 Settings

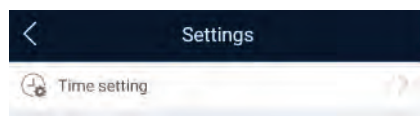
Context

Due to permission restrictions, common users can set time parameters only for the solar inverters.

Procedure

- Step 1** On the home screen, choose **Settings > Time setting** and set the system time.

Figure 7-16 Time settings (common user)



 **NOTE**

- For a solar inverter that supports DST, if an advanced user enables DST, a common user can view DST data.
- When an advanced user enables NTP time synchronization, common users can view the related data.

----End

7.2.6.3 Maintenance

7.2.6.3.1 System Maintenance

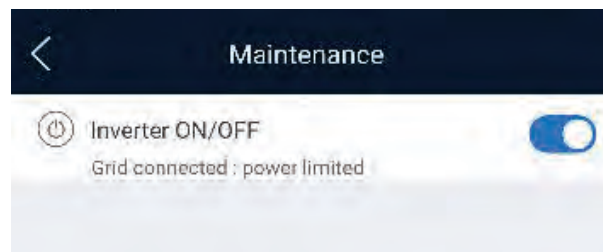
Context

Because of permission restriction, common users can only turn on or off solar inverters.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Figure 7-17 Maintenance



Step 2 Tap  next to **Inverter ON/OFF** to perform the operation.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.6.3.2 Feedback

Context

Users can provide feedback in text, pictures, and files.

NOTE

Do not add private data.

Procedure


Step 1 Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-18 Feedback



Step 2 Tap **Specify the type** and select **Feedback** or **Suggestion**.

Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.2.6.3.3 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-19 Help



Step 2 Specify your question. A solution will be displayed.

----End

7.2.6.3.4 About

Context

You can query the app version, connected product model, SN, part number, firmware version, software version, technical support website, privacy policy (displayed only on the SUN2000 app), customer service contact information, and open source software policy.

 **NOTE**

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


- Step 1** In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, part number, firmware version, software version, and technical support website.

Figure 7-20 About



- Step 2** Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

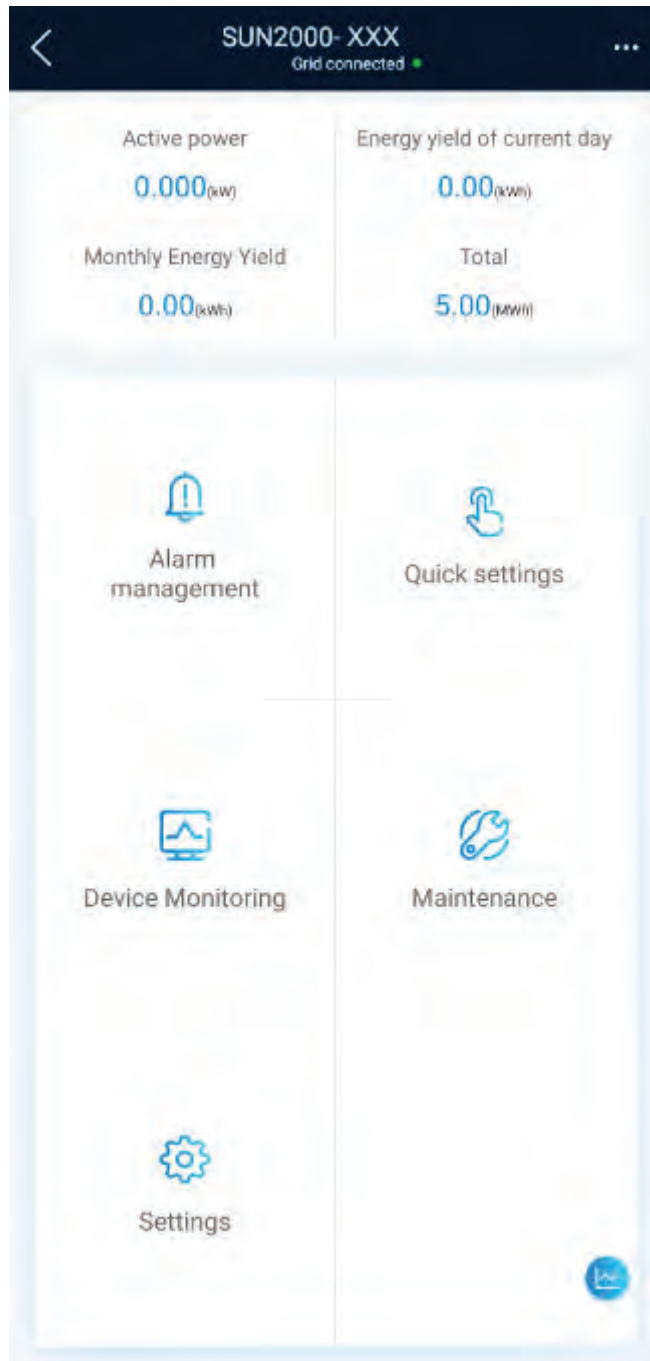
7.2.7 Screen Operations (Advanced User)

7.2.7.1 Query

Procedure

- Step 1** After logging in to the app, you can view the active power and energy yield of solar inverters on the home screen.

Figure 7-21 Home screen




Step 2 Tap **Alarm** or **Device Monitoring** to view active alarms, historical alarms, and running information of the solar inverters.

You can view the following information on the **Alarm** screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.

 **NOTE**

- Tap **Sort by generated time** to set the alarm sorting mode for active alarms or historical alarms.
- Tap  to set a time criterion. The historical alarms generated within the time segment are displayed.
- Select the alarms that can be manually cleared, and tap **Delete** on the right of the alarm to manually clear the alarms.

 **NOTE**

- Alarms that have been manually cleared can be viewed on the **Historical Alarm** screen.
- Only the **AFCI Self-Check Failure** and **DC Arc Fault** alarms can be manually cleared. Only the products whose technical specifications contain AFCI supports manual alarm clearance.

----End

7.2.7.2 Quick Settings

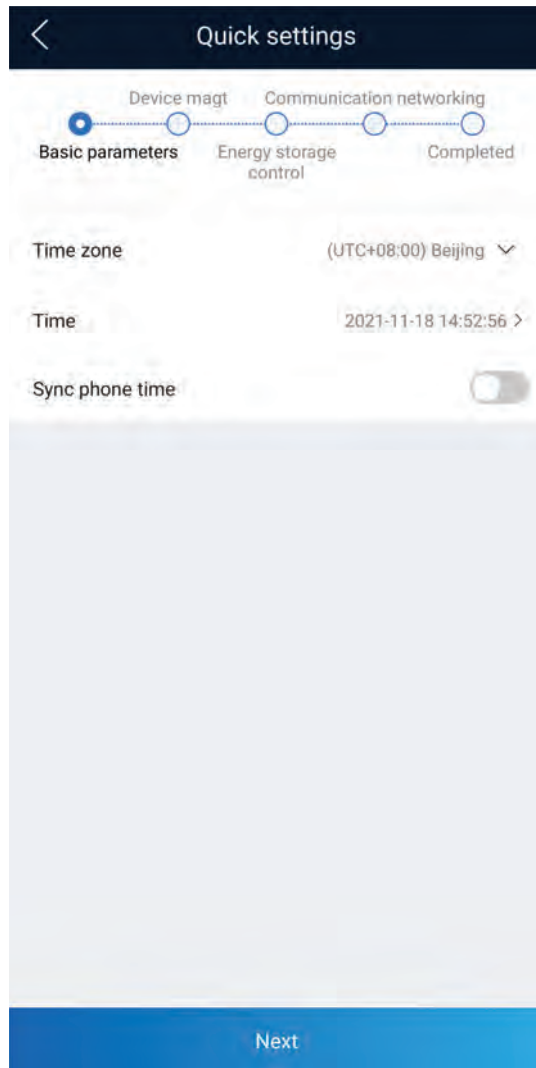
Context

Due to permission restrictions, only advanced users can quickly set up the solar inverter.

Procedure

- Step 1** On the home screen, tap **Quick Settings**.

Figure 7-22 Quick settings



NOTE

The screenshot of **Quick settings** provided in this document is for reference only. The actual screens prevail.

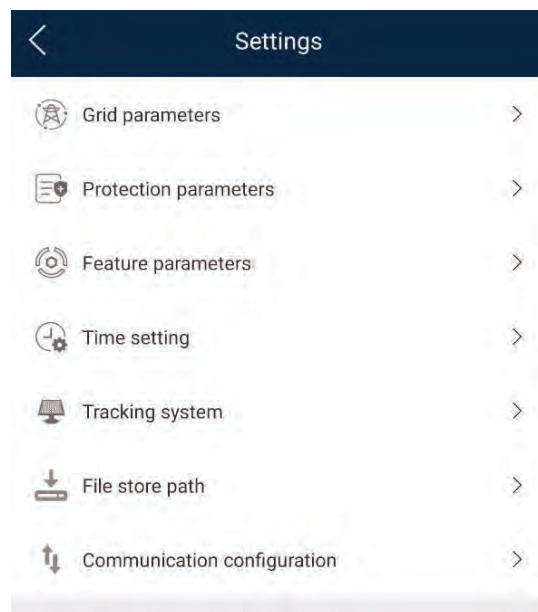
Step 2 Set parameters as prompted.

----End

7.2.7.3 Settings

On the home screen, an advanced user can tap **Settings** to set power grid, protection, and feature parameters for the solar inverter.

Figure 7-23 Settings (advanced user)



NOTICE

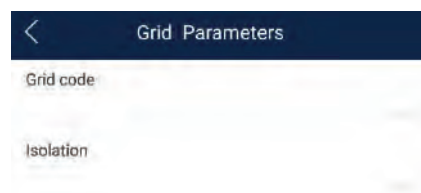
- The configurable solar inverter parameters vary with the solar inverter model and grid code. The displayed parameters prevail. The parameter list provided in this section includes all configurable parameters.
- The parameter ranges vary with the device model. The listed ranges are for reference only.
- The parameter names, value ranges, and default values are subject to change. The actual display prevails.

7.2.7.3.1 Setting Grid Parameters

Procedure

- Step 1** On the home screen, choose **Settings** > **Grid Parameters** to access the parameter setting screen.

Figure 7-24 Grid Parameters (advanced user)



For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

----End

7.2.7.3.2 Setting Protection Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Protection Parameters** to access the parameter setting screen.

Figure 7-25 Protection parameters (advanced user)



For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

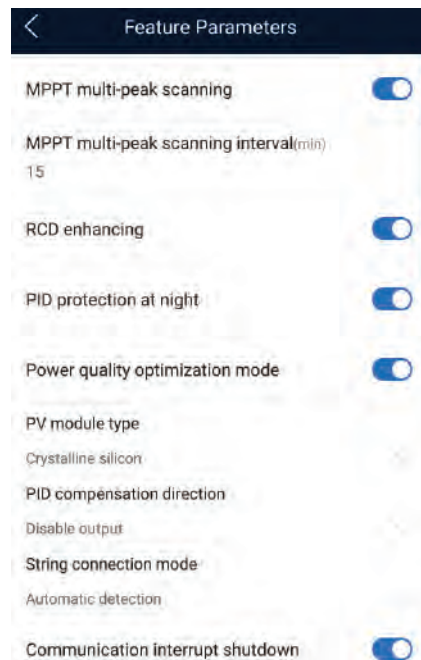
----End

7.2.7.3.3 Setting Feature Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Feature Parameters** to access the parameter setting screen.

Figure 7-26 Feature parameters (advanced user)



For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

----End

7.2.7.3.4 Time setting

Procedure

Step 1 On the home screen, choose **Settings > Time setting** and set time parameters.

Figure 7-27 Time setting (advanced user)

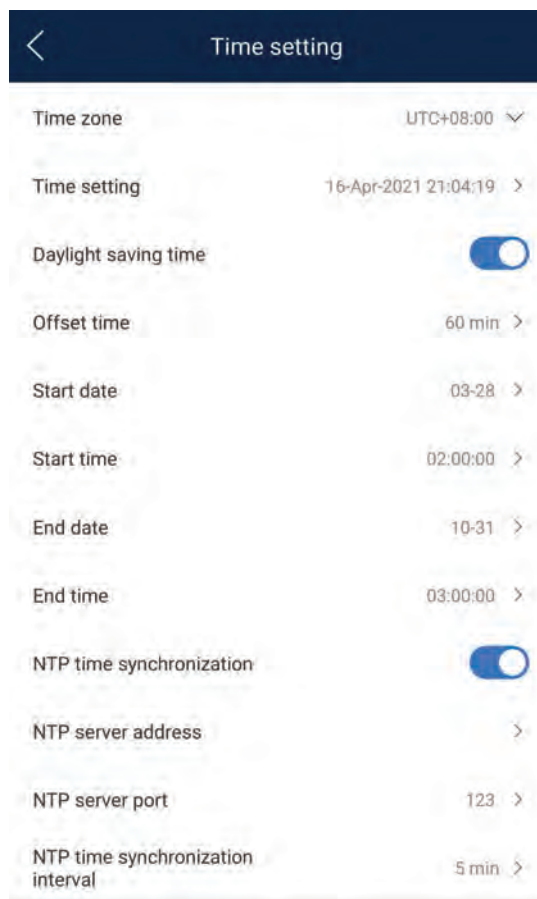


Table 7-7 Time settings

| Parameter | Description |
|-----------------------------------|---|
| Time zone | Specifies the time zone. |
| Time setting | Specifies the system date and time. |
| Daylight saving time | Specifies whether to enable daylight saving time (DST). |
| Offset time | Specifies the DST offset. |
| Start date | Specifies the DST offset start date. |
| Start time | Specifies the DST offset start time. |
| End date | Specifies the DST offset end date. |
| End time | Specifies the DST offset end time. |
| NTP time synchronization | Specifies whether to enable NTP time synchronization. |
| NTP server address | Specifies the NTP server IP address or domain name. |
| NTP server port | Specifies the server port. |
| NTP time synchronization interval | Specifies the NTP time synchronization interval. |

 NOTE

You can set DST parameters and NTP parameters.

----End

7.2.7.3.5 Setting Communications Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Communication configuration** to access the parameter setting screen.

Figure 7-28 Communications parameters

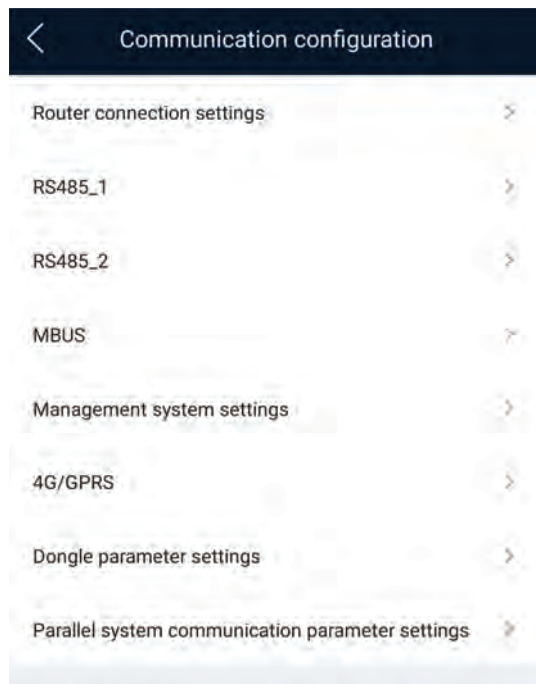


Table 7-8 Setting communications parameters

| Parameter | Description |
|-------------------|--|
| RS485_1 | Set RS485 communications parameters. RS485 CAN Resistor is available only to the 1000 V solar inverters. This parameter is set to <input type="checkbox"/> by default. If signals are distorted or the communication is of poor quality because of an overlong communications cable, set the parameter to <input checked="" type="checkbox"/> for the last solar inverter in the daisy chain. |
| RS485_2 | Set RS485 communications parameters. This parameter is displayed only for the solar inverters that can connect to the RS485 slave device. |
| MBUS | Set MBUS communications parameters. This parameter is displayed only for the solar inverters that support the MBUS function. |
| Ethernet | Set Ethernet parameters. NOTE <ul style="list-style-type: none"> When DHCP is set to <input checked="" type="checkbox"/>, the IP address, Subnet mask, and Gateway of the solar inverter are automatically allocated. When DHCP is set to <input type="checkbox"/>, you can manually set the IP address, Subnet mask, and Gateway. |
| Management system | Set management system parameters. This parameter is displayed only for the solar inverters that can connect to the SDongle. NOTE If TLS encryption is set to <input type="checkbox"/> , data will be transmitted without being encrypted, which may pose security risks. Therefore, exercise caution when setting this parameter. |
| 4G/GPRS | Set 4G/GPRS communications parameters. This parameter is displayed only for the solar inverters that can connect to the SDongle. |
| WLAN | Setting WLAN communications parameters This parameter is displayed only for the solar inverters that can connect to the SDongle. |
| Dongle | Set Dongle communications parameters. This parameter is displayed only for the solar inverters that can connect to the SDongle. |

NOTE

You can check whether the solar inverter supports the MBUS or SDongle function by viewing the product nameplate on it.

----End

7.2.7.3.6 Setting a Tracking System

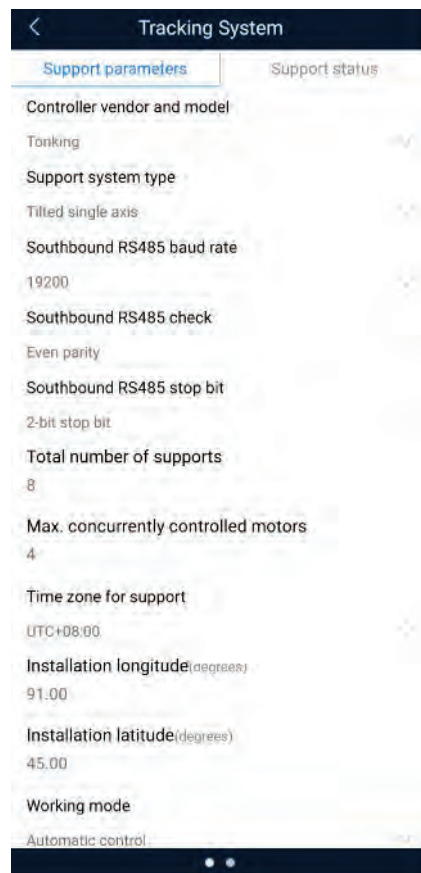
Context

This function is available to the 1000 V (SUN2000 V200R001C91 and SUN2000 V200R001C93 only), 1100 V, and 1500 V solar inverters. The support parameters vary depending on the controller manufacturer. Set parameters based on site requirements. The following screenshots are based on the same scenario.

Procedure

- Step 1** On the home screen, choose **Settings > Tracking System** to access the support parameter setting screen.

Figure 7-29 Tracking system



- Step 2** Swipe left on the screen to access the support status screen, tap a support, and set parameters for the support.

Figure 7-30 Support



----End

7.2.7.3.7 Setting a File Save Path

Prerequisite

This function is available only on the Android system.

Context

You can modify the save path for operation logs and solar inverter logs and export logs from the path.

Procedure

- Step 1** On the home screen, choose **Settings > File Save Path** to access the path setting screen.
- Step 2** Tap **File save path** to set a file save path.

----End

7.2.7.4 Power Adjustment

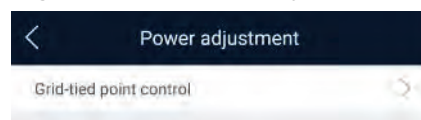
Context

Due to permission restrictions, advanced users support the setting of power adjustment, which can set the grid-connected control parameters of the solar inverter.

Procedure

- Step 1** On the home screen, tap **Power Adjustment**.

Figure 7-31 Power adjustment



Step 2 Set power parameters as required.

For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

 **NOTE**

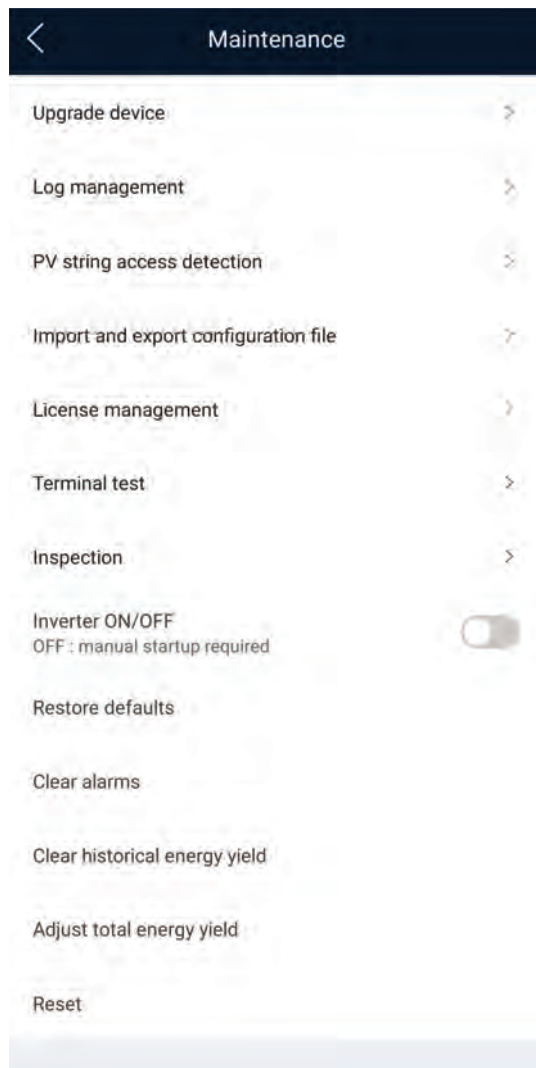
When setting the Grid-tied point control parameters, you need to enter the APP login password.

----End

7.2.7.5 Maintenance

An advanced user can tap **Maintenance** on the home screen to inspect, turn on, or turn off the solar inverters and detect the DC input.

Figure 7-32 Maintenance screen (advanced user)



7.2.7.5.1 Device Inspection

Context

After a solar inverter is put into use, it should be inspected periodically to detect any potential risks and problems.

Procedure

- Step 1** On the home screen, choose **Maintenance > Inspection** to access the inspection screen.

Figure 7-33 Device inspection




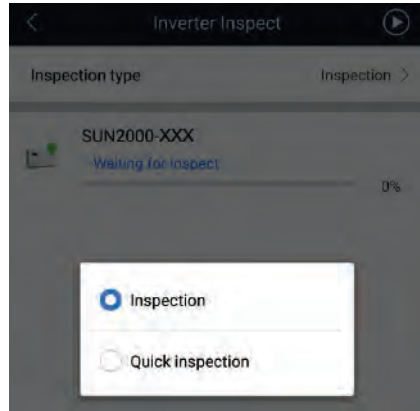
- Step 2** Choose **Inspection type**, tap  in the upper-right corner of the screen to start solar inverter inspection.

Figure 7-34 Inverter Inspect



----End

7.2.7.5.2 License Management

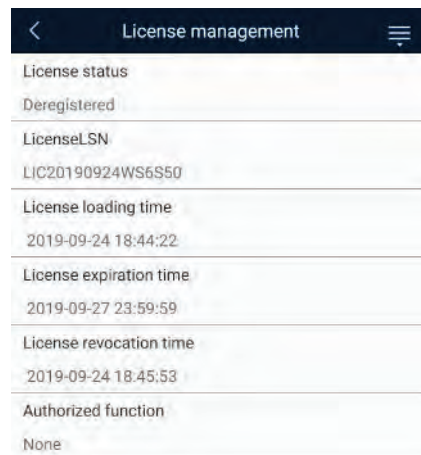
Context

The **License management** screen allows an advanced user to view the solar inverter certificate and obtain the status of the certificate.

Procedure

- Step 1** On the home screen, choose **Maintenance > License management** to access the license management screen.

Figure 7-35 License management



| |
|-------------------------|
| License status |
| Deregistered |
| LicenseLSN |
| LIC20190924WS6S50 |
| License loading time |
| 2019-09-24 18:44:22 |
| License expiration time |
| 2019-09-27 23:59:59 |
| License revocation time |
| 2019-09-24 18:45:53 |
| Authorized function |
| None |

NOTE

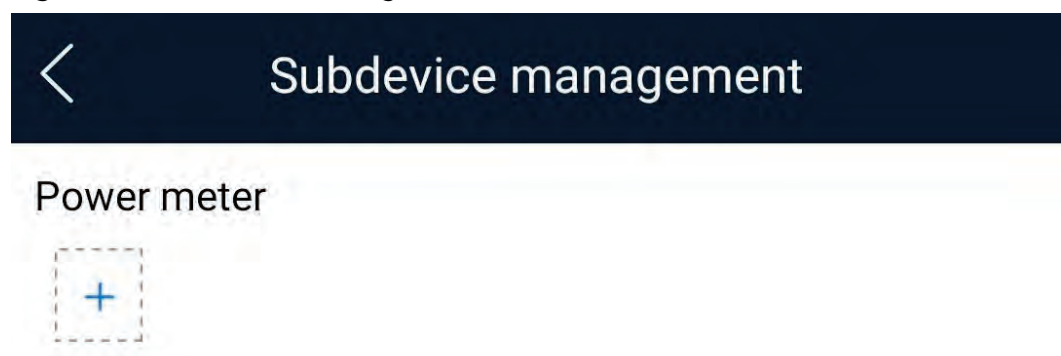
- When **License status** is **Normal**, you can revoke the license through the drop-down list box in the upper-right corner.
- When **License status** is **Deregistered**, you can export and view the license revocation code.
- When **License status** is **No license**, you can load the license through the drop-down list box in the upper-right corner.

----End

7.2.7.5.3 Subdevice management

- Step 1** On the home screen, choose **Subdevice management** to access the **Subdevice management** screen.

Figure 7-36 Subdevice management



- Tap + to add a power meter.

| Parameter | Description |
|----------------------|---|
| Model | <p>Set this parameter to the corresponding meter model.</p> <p>NOTE</p> <ul style="list-style-type: none"> - Select an appropriate power meter based on the application scenario. The device model is subject to change. The actual product prevails. - Set the power meter model correctly. Otherwise, the power meter function may be unavailable. |
| Device address | <p>Set this parameter to the communication address of the power meter.</p> |
| Current change ratio | <ul style="list-style-type: none"> - Set this parameter to 1 if the power meter uploads the primary value. - Set this parameter based on the actual transformer ratio if the power meter uploads the secondary value. |

- After a power meter is added, tap it to view and modify the power meter parameters. To delete the power meter, touch and hold it.

----End

7.2.7.5.4 PV String Access Detection

Context

- PV string access detection applies to large-scale commercial ground PV plants with PV strings facing the same direction.
- In AC or DC power limiting scenarios:
 - If the PV string access type has not been identified, **String Access Detection** will be displayed as **Not connected**. The PV string access type can be identified only when the solar inverters restore to the non-power limiting state and the current of all connected PV strings reaches the startup current.
 - If the PV string access type has been identified, when a certain PV string connected to the 2-in-1 terminals is lost, no alarm will be generated. If a certain PV string connected to the 2-in-1 terminals is restored, the access type cannot be identified. You can determine whether both 2-in-1 PV strings are restored only when the PV string current reaches **Startup current for 2-in-1 detection**.
- After setting the parameters, on the home screen, choose **Running Info.** > **Details** to check whether the PV string access status is normal.

Procedure

- Step 1** On the home screen, choose **Maintenance > String Access Detection** and set PV string access detection parameters.

Figure 7-37 String access detection



Table 7-9 PV string access detection

| Parameter | Description |
|--|---|
| String Access Detection | String Access Detection is set to Disable by default. After solar inverters are connected to the power grid, set String Access Detection to Enable . |
| Startup current (A) | When the current of all connected PV strings reaches the preset value, the PV string access detection function is enabled. NOTE Startup current setting rules: <ul style="list-style-type: none"> • Startup current = $I_{sc} (S_{tc}) \times 0.6$ (rounded up). For details about $I_{sc} (S_{tc})$, see the PV module nameplate. • Default startup current (5 A): applicable to the scenarios where the short-circuit current $I_{sc} (S_{tc})$ is greater than 8 A for the monocrystalline and polycrystalline PV modules. |
| Startup current for 2-in-1 detection (A) | When the current of a PV string reaches Startup current for 2-in-1 detection , the PV string is automatically identified as 2-in-1 string. You are advised to retain the default settings. |
| PV string <i>N</i> access type NOTE <i>N</i> is the DC input terminal number of the solar inverter. | Set this parameter based on the type of the PV string connected to DC input terminal <i>N</i> of the solar inverter. You are advised to retain the default value. If the value is incorrectly set, the PV string access type may be incorrectly identified and alarms may be generated by mistake for the PV string access status. |

----End

7.2.7.5.5 Startup and Shutdown

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.



Step 2 Tap  next to **Inverter ON/OFF** to perform the operation.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.7.5.6 Restoring Factory Settings

Context

NOTICE

Perform this operation with caution because all configured parameters except the current date, time, baud rate, and address will be restored to their factory default values. This operation will not affect operating information, alarm records, or system logs.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **Restore defaults** to perform the operation.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.7.5.7 Performing an AFCI Self-Check

Context

The AFCI self-check function is available only to the solar inverter model marked with **-US**.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **AFCI Self-Check** to perform the operation.

Step 3 Tap **OK**.

----End

7.2.7.5.8 Resetting a Solar Inverter

Context

The solar inverter automatically shuts down and restarts after reset.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **Reset** to perform the operation.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.7.5.9 Clearing Alarms

Context

After alarms are reset, all active alarms and historical alarms of the solar inverter connected to the app will be cleared.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **Clear alarms** to perform the operation.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.7.5.10 Clearing Historical Energy Yield Data

Context

If you clear historical energy yield data, all the historical energy yield data of the solar inverters connecting to the app will be cleared.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **Clear historical energy yield** .

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.7.5.11 Importing and Exporting Configuration Files

Procedure

1. On the home screen, choose **Maintenance > Import and export configuration file** to access the screen for configuration file import and export.
 - Tap **Export Configuration File** to export the configuration files of the solar inverter to the phone.
 - Tap **Import Configuration File** to import the configuration files from the phone to the solar inverter.

7.2.7.5.12 Spot-Check

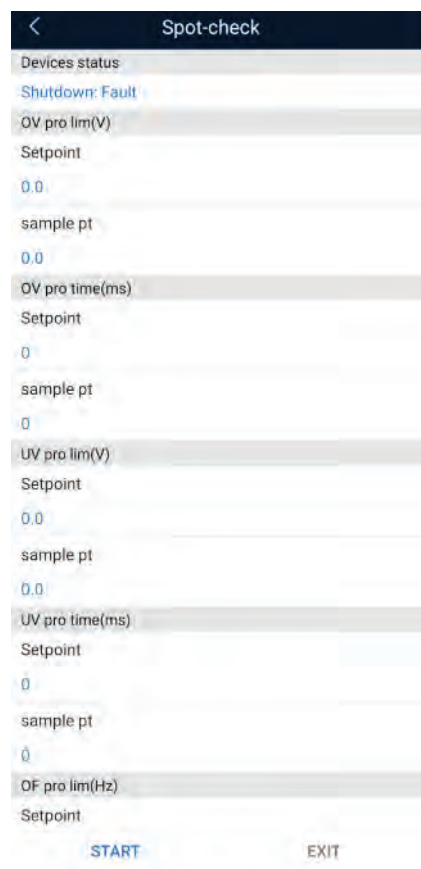
Context

You can perform spot-check for the solar inverter whose **Grid Code** is **Japan standard**.

Procedure

Step 1 On the home screen, tap **Spot-check** to access the spot-check screen.

Figure 7-38 Spot-Check



Step 2 Tap **START**.

----End

7.2.7.5.13 DC Input Detection

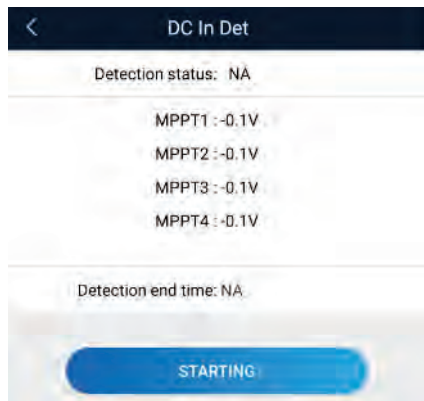
Context

The DC input detection function is only applicable to the 1500 V solar inverter system.

Procedure

- Step 1** On the home screen, choose **Maintenance > Start DC Input Detection** to access the DC input detection screen.

Figure 7-39 Starting DC input detection



- Step 2** Tap **Start**.

----End

7.2.7.5.14 Device Upgrade

Prerequisites

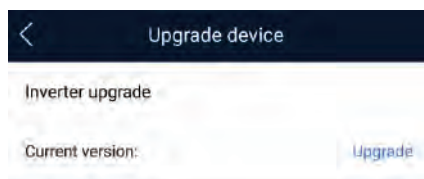
- You have obtained the upgrade package with the help of the supplier or Huawei engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.
 - a. Log in to Huawei enterprise technical support website <http://support.huawei.com/enterprise>.
 - b. Browse or search for **PGP Verify**.
- In the Android system, you have copied the upgrade package has been copied to the Android/data/com.huawei.inverterapp/files/ directory on the mobile phone. The upgrade package is a .zip file.
- Certain solar inverters (only SUN2000 V500R001C00) support MBUS upgrade. The actual UI prevails.

Procedure

- Step 1** On the home screen, choose **Maintenance > Upgrade device** .

- Step 2** Access the device upgrade screen and tap **Upgrade**.

Figure 7-40 Device upgrade



Step 3 Perform operations as prompted.

----End

7.2.7.5.15 Log management

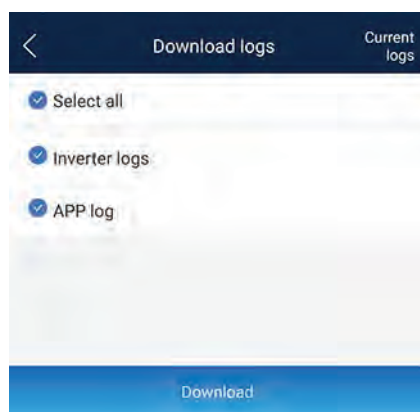
Context

You can tap **Log management** to export operation logs, as well as alarm records and energy yield information of the solar inverter from the mobile phone.

Procedure

Step 1 On the home screen, choose **Maintenance > Log management** to access the log download screen.

Figure 7-41 Downloading logs



Step 2 You can download **Inverter logs** and **APP log**.

NOTE

- By default, Android system logs are saved in the **Android/data/com.huanwei.smartpvms/files/inverterapp** folder in the phone memory. You can change the save path by referring to "Setting a File Save Path".
- The downloaded solar inverter logs are saved at the **Device Log** directory in **File Management** in your mobile phone. You can also send the logs to your mailbox for checking.

----End

7.2.7.5.16 Changing the WLAN Password

Context

You can tap **Maintenance** on the home screen to change the WLAN password to ensure account security.

NOTE

If the communication between the app and the solar inverter has not been established over WLAN, **Change WLAN Password** is not displayed on the screen.

Procedure

Step 1 On the **Maintenance** screen, tap **Change WLAN Password** on the app connection screen to access the password change screen.

Step 2 Specify **Old password**, **New password**, and **Confirm password**, and then tap **OK**.

NOTE

The password must meet the following requirements:

- Contains 8–30 characters.
- Contains at least two of the three types: lowercase letters, uppercase letters, and digits.

----End

7.2.7.5.17 Feedback

Context

Users can provide feedback in text, pictures, and files.

NOTE

Do not add private data.

Procedure


Step 1 Choose  > **Feedback** in the upper-right corner of the home screen.


Figure 7-42 Feedback



Step 2 Tap **Specify the type** and select **Feedback** or **Suggestion**.

Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.2.7.5.18 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-43 Help



Step 2 Specify your question. A solution will be displayed.

----End

7.2.7.5.19 About

Context

You can query the app version, connected product model, SN, part number, firmware version, software version, technical support website, privacy policy (displayed only on the SUN2000 app), customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


Step 1 In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, part number, firmware version, software version, and technical support website.

Figure 7-44 About



Step 2 Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

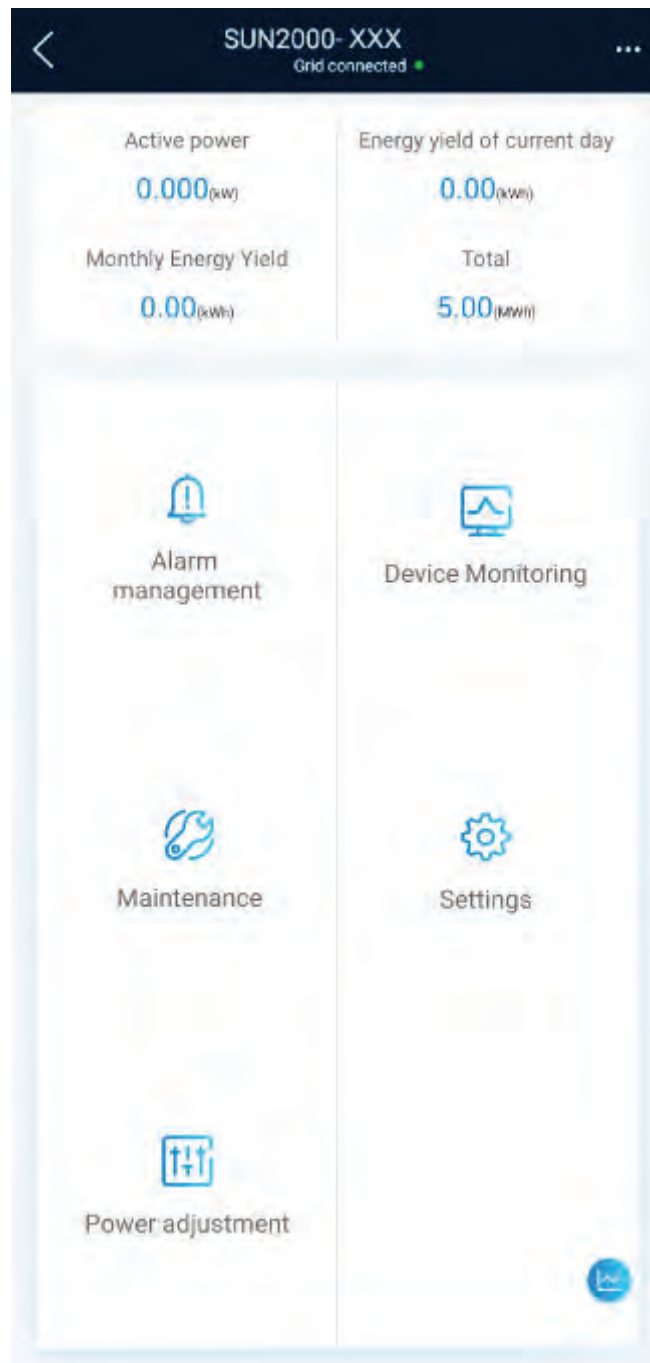
7.2.8 Screen Operations (Special User)

7.2.8.1 Query

Procedure

Step 1 After logging in to the app, you can view the active power and energy yield of solar inverters on the home screen.

Figure 7-45 Home screen




Step 2 Tap **Alarm management** or **Device Monitoring** to view active alarms, historical alarms, and running information of the solar inverters.

You can view the following information on the alarm management screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.

 **NOTE**

- Tap **Sort by generated time** to set the alarm sorting mode for active alarms or historical alarms.
- Tap  to set a time criterion. The historical alarms generated within the time segment are displayed.
- Select the alarms that can be manually cleared, and tap **Delete** on the right of the alarm to manually clear the alarms.

 **NOTE**

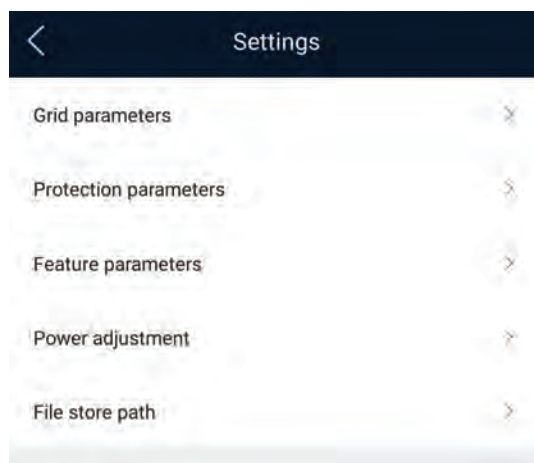
- Alarms that have been manually cleared can be viewed on the **Historical Alarm** screen.
- Only the **AFCI Self-Check Failure** and **DC Arc Fault** alarms can be manually cleared. Only the products whose technical specifications contain AFCI supports manual alarm clearance.

----End

7.2.8.2 Settings

On the home screen, a special user can tap **Settings** to set power grid, protection, and feature parameters for the solar inverter.

Figure 7-46 Settings



NOTICE

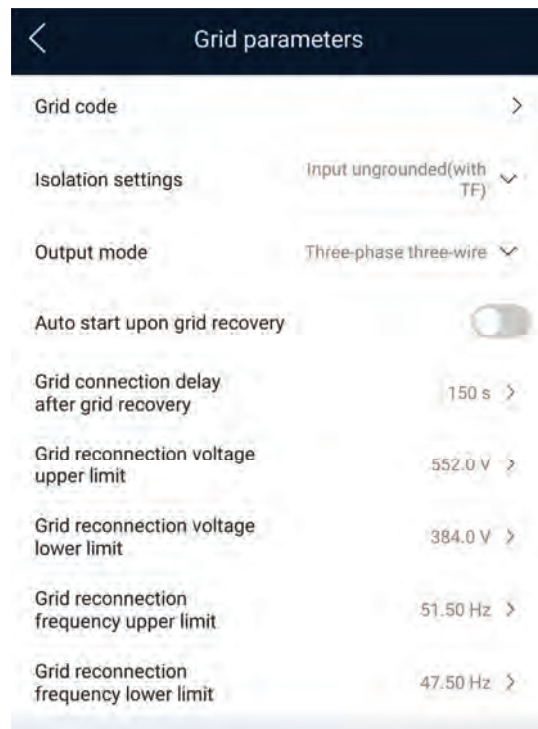
- The configurable solar inverter parameters vary with the solar inverter model and grid code. The displayed parameters prevail. The parameter list provided in this section includes all configurable parameters.
- The parameter ranges vary with the device model. The listed ranges are for reference only.
- The parameter names, value ranges, and default values are subject to change. The actual display prevails.

7.2.8.2.1 Setting Grid Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Grid Parameters** to access the parameter setting screen.

Figure 7-47 Grid parameters (special user)



For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

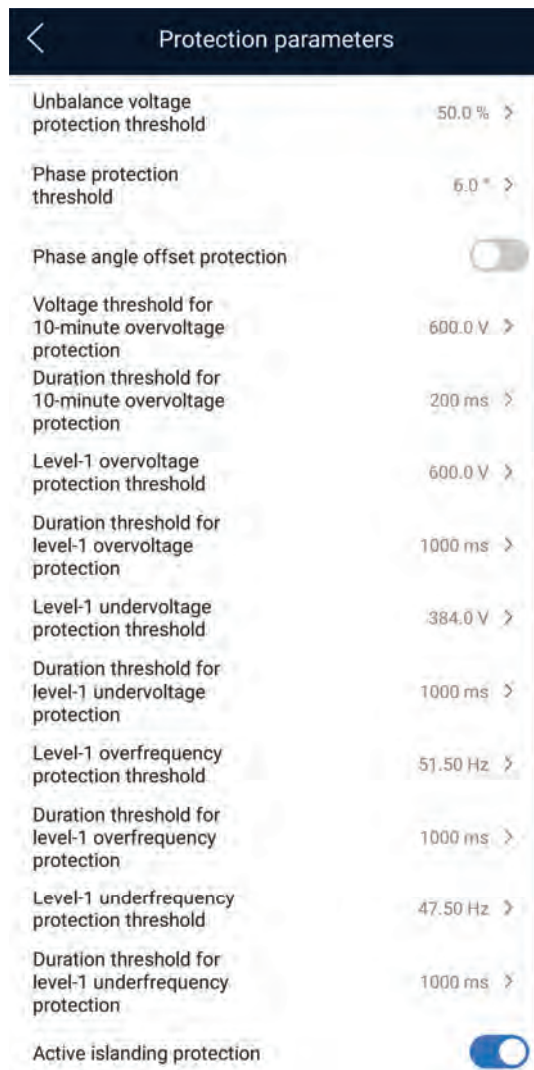
----End

7.2.8.2.2 Setting Protection Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Protection Parameters** to access the parameter setting screen.

Figure 7-48 Protection parameters



For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

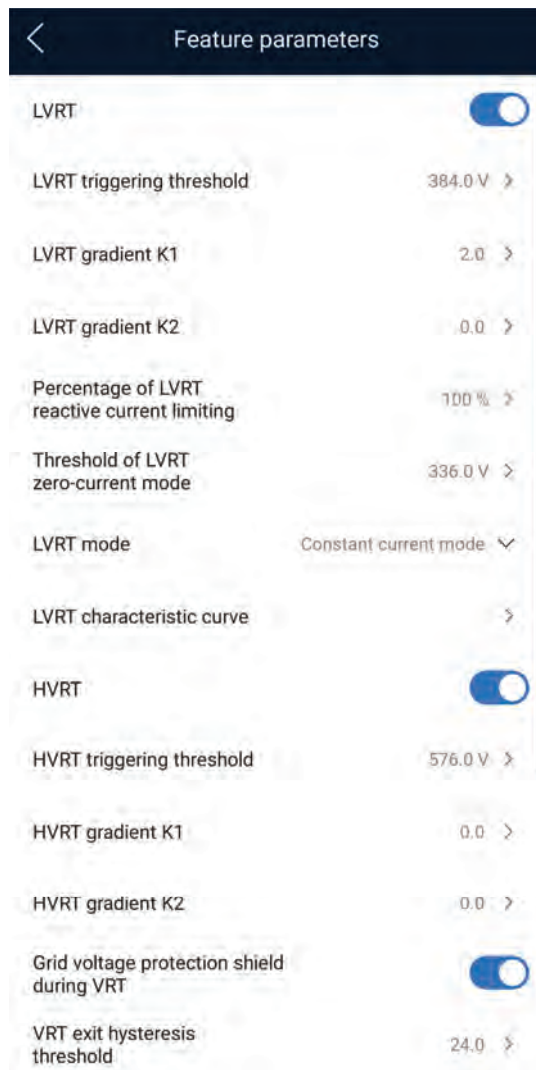
----End

7.2.8.2.3 Setting Feature Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Feature Parameters** to access the parameter setting screen.

Figure 7-49 Feature parameters



For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

----End

7.2.8.2.4 Setting Power Adjustment Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Power Adjustment** to access the parameter setting screen.

Figure 7-50 Power adjustment parameters



For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

----End

7.2.8.2.5 Setting a File Save Path

Prerequisite

This function is available only on the Android system.

Context

You can modify the save path for operation logs and solar inverter logs and export logs from the path.

Procedure

Step 1 On the home screen, choose **Settings** > **File Save Path** to access the path setting screen.

Step 2 Tap **File save path** to set a file save path.

----End

7.2.8.3 Power Adjustment

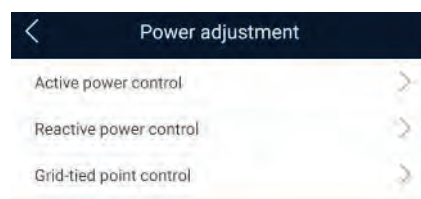
Context

Due to permission restrictions, special users support the setting of power adjustment, which can set the active power, reactive power, and grid connection point control parameters of the solar inverter.

Procedure

Step 1 On the home screen, tap **Power Adjustment**.

Figure 7-51 Power adjustment



Step 2 Set power parameters as required.

For details about how to set the parameters, see [A Commercial Smart Inverters Parameters](#).

NOTE

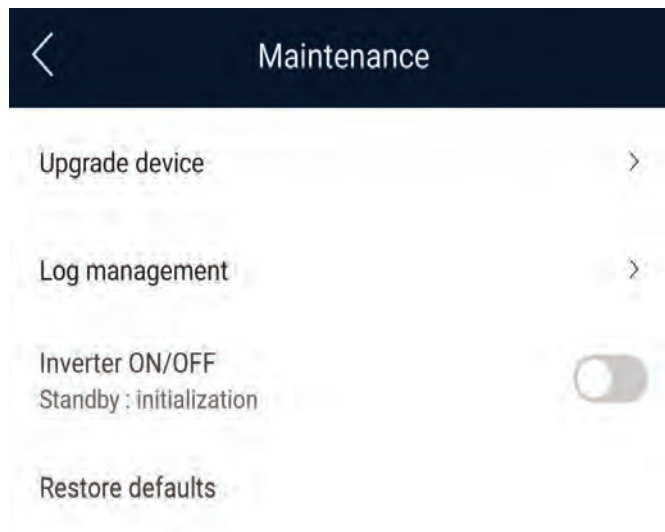
When setting the Grid-tied point control parameters, you need to enter the APP login password.

----End

7.2.8.4 Maintenance

On the home screen, a special user can tap **Maintenance** to start or shut down the solar inverter and restore factory settings.

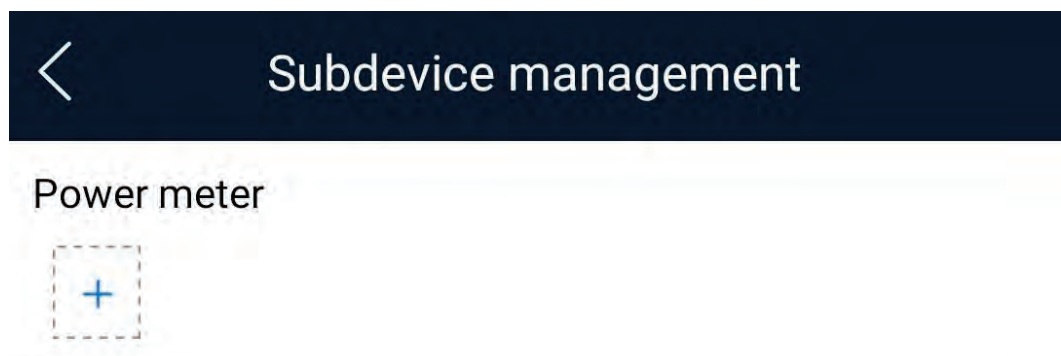
Figure 7-52 Maintenance (special user)



7.2.8.4.1 Subdevice management

- Step 1** On the home screen, choose **Subdevice management** to access the **Subdevice management** screen.

Figure 7-53 Subdevice management



- Tap + to add a power meter.

| Parameter | Description |
|----------------|--|
| Model | Set this parameter to the corresponding meter model. NOTE <ul style="list-style-type: none"> - Select an appropriate power meter based on the application scenario. The device model is subject to change. The actual product prevails. - Set the power meter model correctly. Otherwise, the power meter function may be unavailable. |
| Device address | Set this parameter to the communication address of the power meter. |

| Parameter | Description |
|----------------------|--|
| Current change ratio | <ul style="list-style-type: none"> - Set this parameter to 1 if the power meter uploads the primary value. - Set this parameter based on the actual transformer ratio if the power meter uploads the secondary value. |

- After a power meter is added, tap it to view and modify the power meter parameters. To delete the power meter, touch and hold it.

----End

7.2.8.4.2 Startup and Shutdown

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.



Step 2 Tap  next to **Inverter ON/OFF** to perform the operation.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.8.4.3 Restoring Factory Settings

Context

NOTICE

Perform this operation with caution because all configured parameters except the current date, time, baud rate, and address will be restored to their factory default values. This operation will not affect operating information, alarm records, or system logs.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **Restore defaults** to perform the operation.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.2.8.4.4 Device Upgrade

Prerequisites

- You have obtained the upgrade package with the help of the supplier or Huawei engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.
 - a. Log in to Huawei enterprise technical support website <http://support.huawei.com/enterprise>.
 - b. Browse or search for **PGP Verify**.
- In the Android system, you have copied the upgrade package to the `Android/data/com.huawei.inverterapp/files/` directory on the mobile phone. The upgrade package is a .zip file.
- Certain solar inverters (only SUN2000 V500R001C00) support MBUS upgrade. The actual UI prevails.

Procedure

Step 1 On the home screen, choose **Maintenance > Device upgrade**.

Step 2 Access the device upgrade screen and tap **Upgrade**.

Figure 7-54 Device upgrade



Step 3 Perform operations as prompted.

----End

7.2.8.4.5 Log management

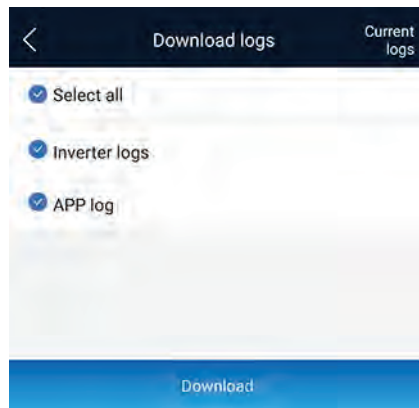
Context

You can tap **Log management** to export operation logs, as well as alarm records and energy yield information of the solar inverter from the mobile phone.

Procedure

Step 1 On the home screen, choose **Maintenance > Log management** to access the log download screen.

Figure 7-55 Downloading logs



Step 2 You can download **Inverter logs** and **APP log**.

NOTE

- By default, Android system logs are saved in the **Android/data/com.huanwei.smartpvms/files/inverterapp** folder in the phone memory. You can change the save path by referring to "Setting a File Save Path".
- The downloaded solar inverter logs are saved at the **Device Log** directory in **File Management** in your mobile phone. You can also send the logs to your mailbox for checking.

----End

7.2.8.4.6 Feedback

Context

Users can provide feedback in text, pictures, and files.

NOTE

Do not add private data.

Procedure


Step 1 Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-56 Feedback



Step 2 Tap **Specify the type** and select **Feedback** or **Suggestion**.

Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.2.8.4.7 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-57 Help



Step 2 Specify your question. A solution will be displayed.

----End

7.2.8.4.8 About

Context

You can query the app version, connected product model, SN, part number, firmware version, software version, technical support website, privacy policy (displayed only on the SUN2000 app), customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


- Step 1** In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, part number, firmware version, software version, and technical support website.

Figure 7-58 About



- Step 2** Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

7.3 Operations on the Screen for Connecting to the SmartLogger

NOTICE

- The figures and data displayed in this chapter are for reference only.
- Delivering a reset, factory reset, shutdown, or upgrade command to the solar inverters may cause power grid connection failure, which affects the energy yield.
- Only professionals are allowed to set the grid parameters, protection parameters, feature parameters, power adjustment parameters, and grid-tied point control parameters of the solar inverters. If the grid parameters, protection parameters, and feature parameters are incorrectly set, the solar inverters may not connect to the power grid. If the power adjustment parameters and grid-tied point control parameters are incorrectly set, the solar inverters may not connect to the power grid as required. In these cases, the energy yield will be affected.
- Only professionals are allowed to set the power grid scheduling parameters of the SmartLogger. Incorrect settings may cause the PV plant to fail to connect to the power grid as required, which affects the energy yield.

7.3.1 SmartLogger

Connection Modes

- The SmartLogger2000 has a built-in Bluetooth module. The app can be connected to the SmartLogger2000 over Bluetooth after the SmartLogger2000 is powered on.
- The SmartLogger1000A/SmartLogger3000 has a built-in WLAN module. The app can be connected to the SmartLogger1000A/SmartLogger3000 over WLAN after the SmartLogger1000A/SmartLogger3000 is powered on.

Table 7-10 Product mapping

| SmartLogger | SmartLogger Version | App Version | Bluetooth Connection | WLAN Connection |
|------------------|---|-------------|----------------------|-----------------|
| SmartLogger3000 | SmartLogger V300R001C00 and later versions | 3.2.00.005 | - | Supported |
| SmartLogger2000 | SmartLogger V200R001C00S PC103 and later versions | | Supported | - |
| | SmartLogger V200R001C10S PC010 and later versions | | | |
| | SmartLogger V200R001C30 and later versions | | | |
| | SmartLogger V200R002C10 and later versions | | | |
| | SmartLogger V200R002C20 and later versions | | | |
| SmartLogger1000A | SmartLogger V100R002C00 and later versions | - | Supported | |

7.3.2 User Operation Permissions

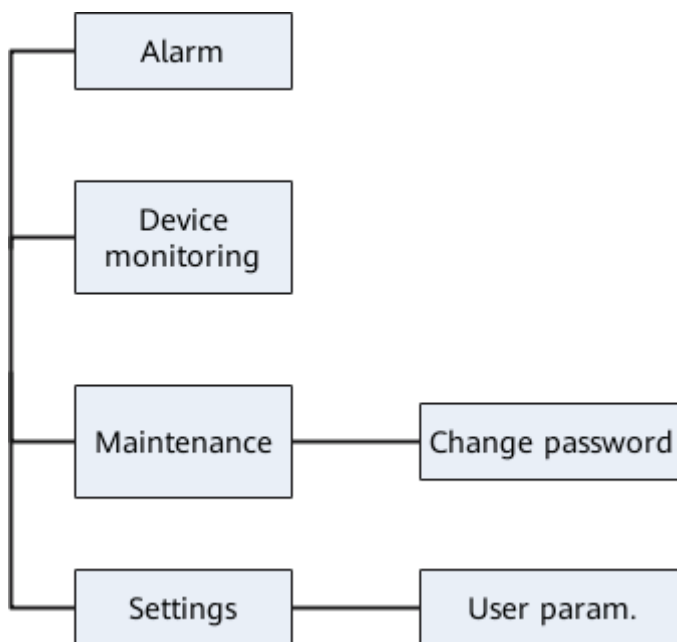
For SmartLogger2000 and SmartLogger1000A, the user accounts that can log in to the app are classified into common users, special users, and advanced users. You can set different user permissions based on the responsibilities of PV plant operation personnel.

- Common users: Has the permissions of viewing data about the SmartLogger and the devices connected to it, setting SmartLogger user parameters, and changing the system password.
- Advanced users: Has the permissions of viewing data about the SmartLogger and the devices connected to it, setting functional parameters, managing devices, and maintaining the system.
- Special users: Has the permissions of viewing data about the SmartLogger and the devices connected to it, managing devices, and maintaining the system.

For SmartLogger3000, the user accounts that can log in to the app are classified into installer and user, user permissions can refer to common users permissions, and installer permissions can refer to advanced users permissions and special users permissions.

Figure 7-59, Figure 7-60, and Figure 7-61 show the menu operation permissions of common users, special users, and advanced users respectively.

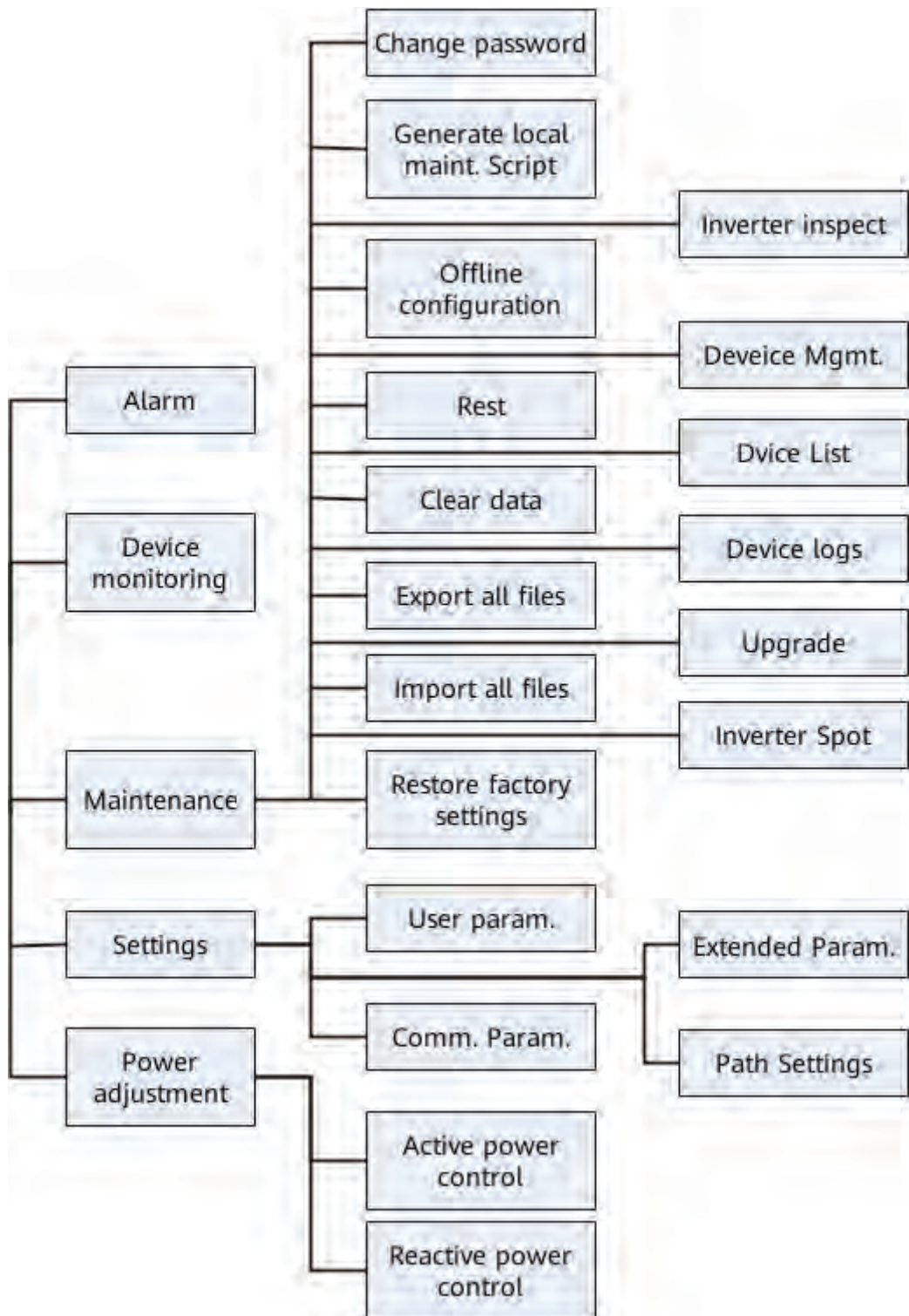
Figure 7-59 Operation permissions of common users



NOTE

Common users can view data and start or shut down the devices under **Monitoring**.

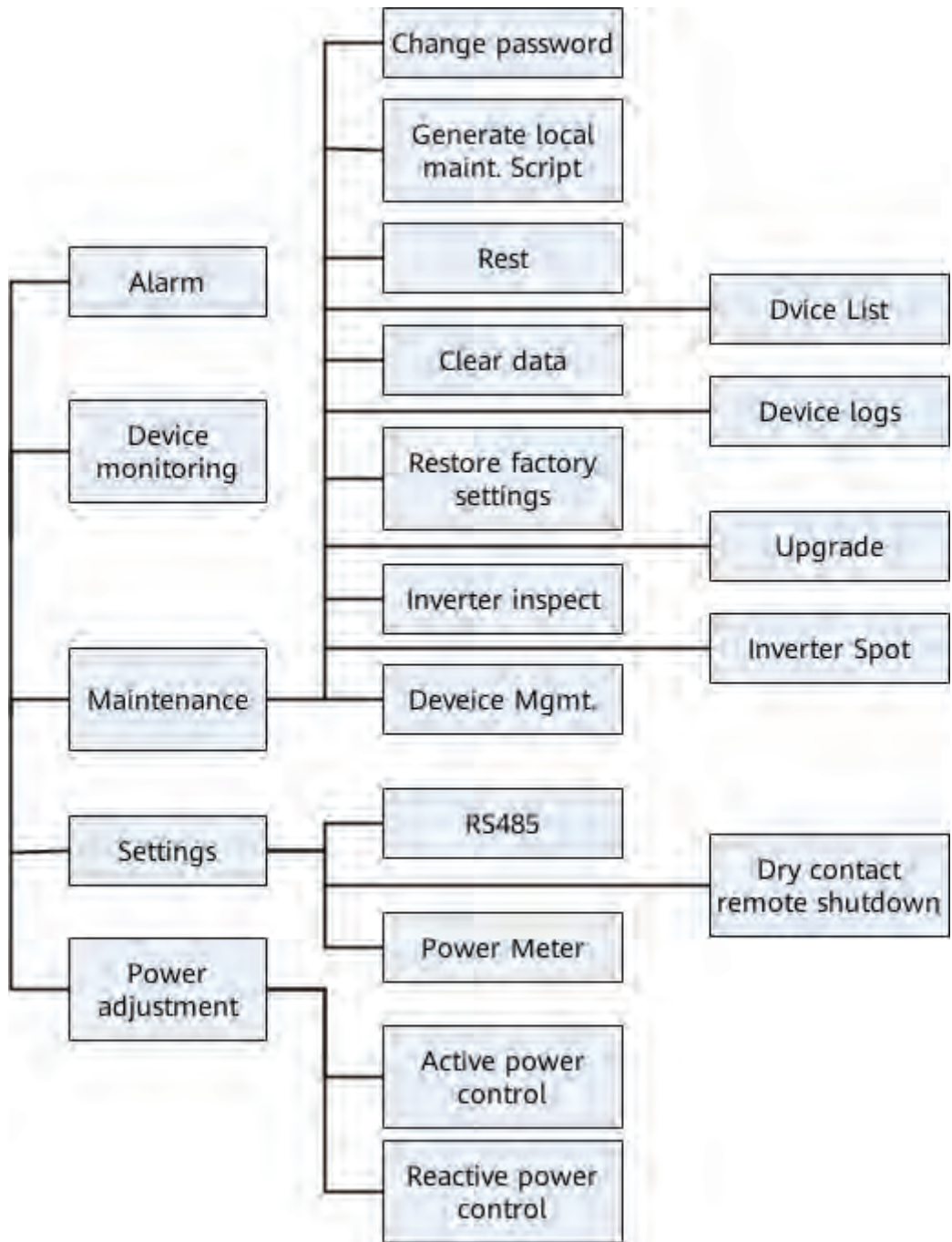
Figure 7-60 Operation permissions of advanced users



NOTE

- Advanced users can view data, set parameters, download logs, and start or shut down the devices under **Monitoring**.
- **Path Settings** is available only to the Android system.

Figure 7-61 Operation permissions of special users



NOTE

Special users can view data, download logs, and start or shut down the devices under **Monitoring**.

7.3.3 Login the SUN2000 APP

Prerequisites

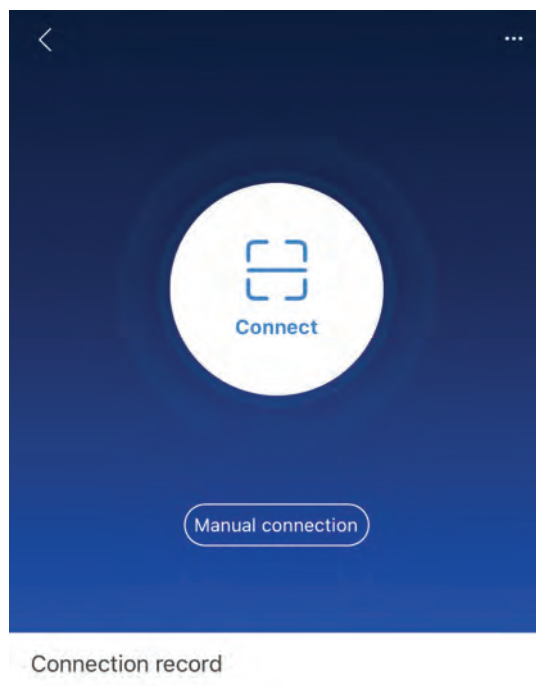
- The SmartLogger has been powered on.

- The Bluetooth function of the SmartLogger is enabled by default.
- The WLAN function of the SmartLogger is disabled by default. Ensure that the WLAN function is enabled before connecting to the SmartLogger.
- Connect over a WLAN/Bluetooth:
 - a. The WLAN/Bluetooth function is enabled on the mobile phone.
 - b. Keep the mobile phone within 5 m from the SmartLogger. Otherwise, the communication between them would be affected.

Procedure

Step 1 Connect to the SmartLogger.

Figure 7-62 Connect



- Code scanning: Tap **Connect**, on the scanning screen, place the QR code of the Device in the scan frame. The device will be automatically connected after the code is identified.
- Manual connection: Tap **Manual Connection** and select a connection mode.

Figure 7-63 Manual connection



- Select **WLAN** and connect the SmartLogger1000A or SmartLogger3000 to the corresponding WLAN in the WLAN connection list of the APP. The initial name of the WLAN is **Logger_SN bar code**, and the initial password is **Changeme**.

NOTICE

- Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, the device needs to be restored to its factory settings. In these cases, the user is liable for any loss caused to the PV plant.
 - If the **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.
- Select **Bluetooth**, and tap **Search for Device**. After a Bluetooth device is found, select the target Bluetooth device, and set up a connection. When the Bluetooth connection is used for the SmartLogger2000, the name of the connected Bluetooth device is **LOG+last eight digits of the SN bar code**.

Step 2 Select a login user and enter the password, tap **Log In**.

Figure 7-64 Login



NOTICE

- The login password is the same as that for the SmartLogger connected to the app and is used only when the SmartLogger connects to the app.
- For SmartLogger1000A and SmartLogger2000, the initial passwords for **Common User**, **Advanced User**, and **Special User** are all **00000a**.
- For SmartLogger3000, the initial passwords for **installer** and **user** are all **00000a**.
- Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
- During the login, if five consecutive invalid password entries are made (the interval between two consecutive entries is less than 2 minutes), the account will be locked for 10 minutes. The password should consist of six characters.

Step 3 After successful login, the quick settings screen or home screen is displayed.

NOTE

- If you log in to the app after the SmartLogger powers on for the first time or the SmartLogger factory defaults are restored, the quick settings screen will be displayed. You can set basic parameters for the SmartLogger on the **Quick Settings** screen. After the setting, you can modify the parameters after choosing **MoreSettings**.
- If you do not set basic parameters for the SmartLogger on the **Quick Settings** screen, the screen is still displayed when you log in to the app next time.

----End

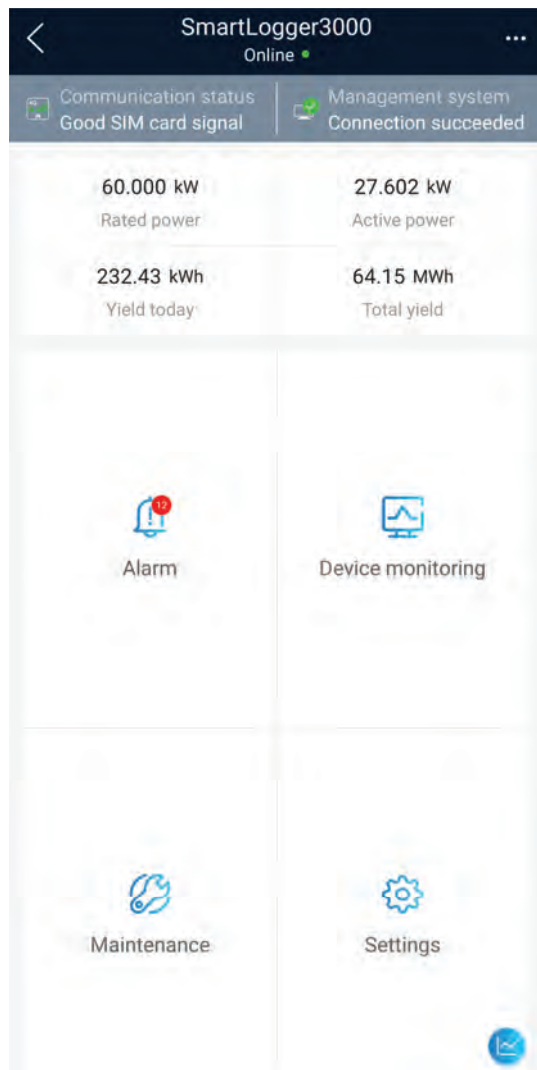
7.3.4 Screen Operations (Common User)

7.3.4.1 Query

Procedure

Step 1 After logging in to the app, you can view the active power and energy yield of the connected solar inverters on the home screen.

Figure 7-65 Home



Step 2 Tap **Alarm management** or **Device Monitoring** to view active alarms, historical alarms, and running information.

You can view the following information on the alarm management screen:

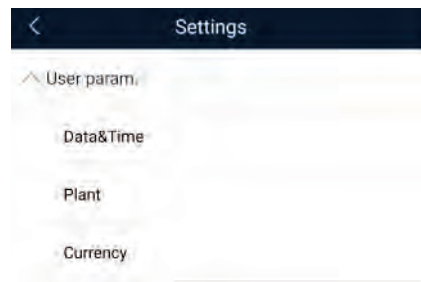
- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.
- Select the alarms that can be manually cleared, and tap **Delete** on the right of the alarm to manually clear the alarms.

----End

7.3.4.2 Settings

A common user can choose **Settings** to set user parameters for the SmartLogger.

Figure 7-66 Settings (Common User)



7.3.4.2.1 Setting the System Date and Time

Procedure

Step 1 Choose **Settings > User param. > Date&Time** to set the date and time.

Figure 7-67 Date&Time screen



Step 2 Set the date and time based on the region where the SmartLogger is located.

NOTE

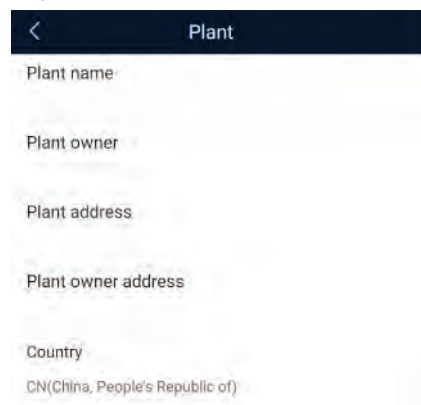
For a solar inverter that supports DST, if an advanced user enables DST, a common user can view DST data. The displayed parameters are for reference only.

----End

7.3.4.2.2 Setting Plant Information

Step 1 Choose **Settings > User param. > Plant** to access the parameter setting screen.

Figure 7-68 Plant



Step 2 Tap target parameters. On the displayed screen, enter or select relevant information.

 **NOTE**

The plant parameters that are manually entered must not contain any special character, such as "<>,'?()#&|\\$|%+;~^" in the English half-width status.

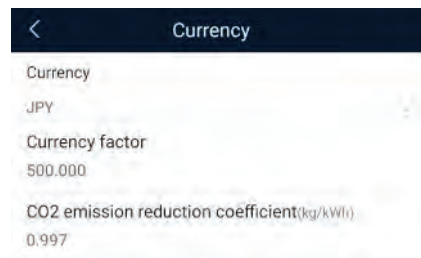
----End

7.3.4.2.3 Setting Revenue Parameters

Procedure

Step 1 Choose **Settings > User param. > Currency** to access the parameter setting screen.

Figure 7-69 Gain



----End

7.3.4.3 Maintenance

7.3.4.3.1 System Maintenance

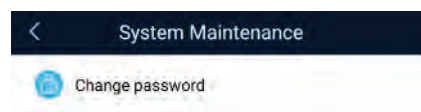
Context

A common user can choose **Maintenance** to change only the SmartLogger password.

Procedure

Step 1 Choose **Maintenance > Change Password** to access the password change screen.

Figure 7-70 Changing a password



Step 2 Type the old password, new password, and confirmation password. Tap **OK**.

 **NOTE**

The password must meet the following requirements:

- Contains 6–20 characters.
- Contains at least two of the three types: lowercase letters, uppercase letters, and digits.

----End

7.3.4.3.2 Feedback

Context

Users can provide feedback in text, pictures, and files.

 **NOTE**

Do not add private data.

Procedure


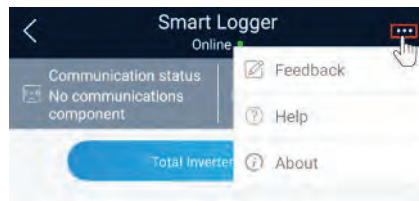
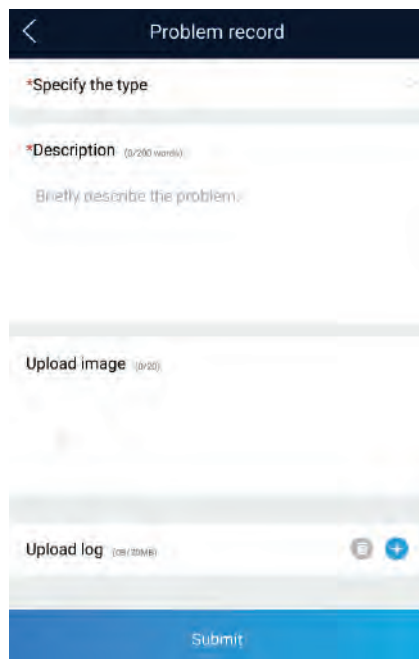
- Step 1** Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-71 Feedback



- Step 2** Tap **Specify the type** and select **Feedback** or **Suggestion**.

Figure 7-72 Problem record



Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.3.4.3.3 Help

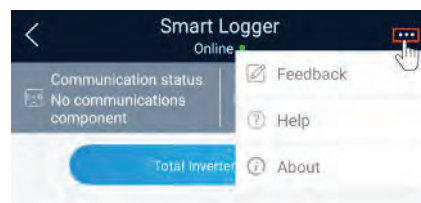
Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure

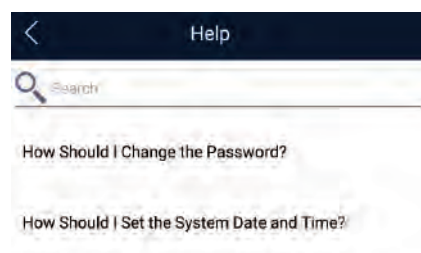
Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-73 Help 1



Step 2 Specify your question. A solution will be displayed.

Figure 7-74 Help 2



----End

7.3.4.3.4 About

Context

You can query the app version, connected product model, SN, firmware version, software version, technical support website, privacy policy (displayed only on the SUN2000 app), customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


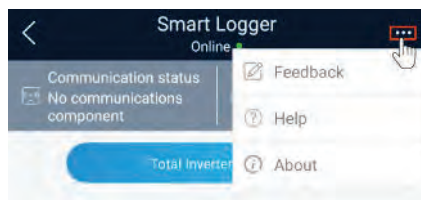
Step 1 In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, firmware version, software version, and technical support website.

Figure 7-75 About



Step 2 Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

7.3.4.4 Device Monitoring

7.3.4.4.1 Query

Step 1 On the home screen, tap **Monitor** to access the device monitoring screen.

Figure 7-76 Device monitoring



Step 2 Select a target device to access the function menu screen of the device.

Step 3 Tap **Alarm**, **Running Info.**, **Energy Yield**, or **About** to view the alarms, running information, energy yield, and version information about the device.

NOTE

- The displayed information varies according to the device type.
- The SmartLogger can connect to third-party devices that support the Modbus-RTU protocol, such as the box-type transformer and EMI. The SmartLogger cannot automatically search user-defined devices. You need to manually add them.
- The SmartLogger can connect to a maximum of five types of user-defined devices and can connect to multiple devices of the same type.
- The SmartLogger can connect to a third-party device that supports IEC103, such as a relay protection or monitoring device like a box-type transformer. The SmartLogger cannot automatically search IEC103 devices. You need to manually add them.
- The SmartLogger can connect to a maximum of five types of IEC103 devices and can connect to multiple devices of the same type.

----End

7.3.4.4.2 Maintenance

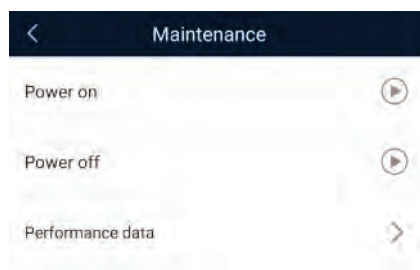
Context

Common users can maintain only a solar inverter. They manually send commands to start or shut down the solar inverter.


Procedure

- Step 1** Tap **SUN2000** on the **Monitor** screen and select the target device to access the function menu screen of the solar inverter.

Figure 7-77 Maintenance



- Step 2** Tap **Maintenance**.

- Step 3** Tap  next to **Power on** or **Power off** to perform the operation.

NOTE

Tap **Performance Data** to view the performance data curve of the solar inverter.

- Step 4** Enter the password for logging in to the app, and tap **OK**.

----End

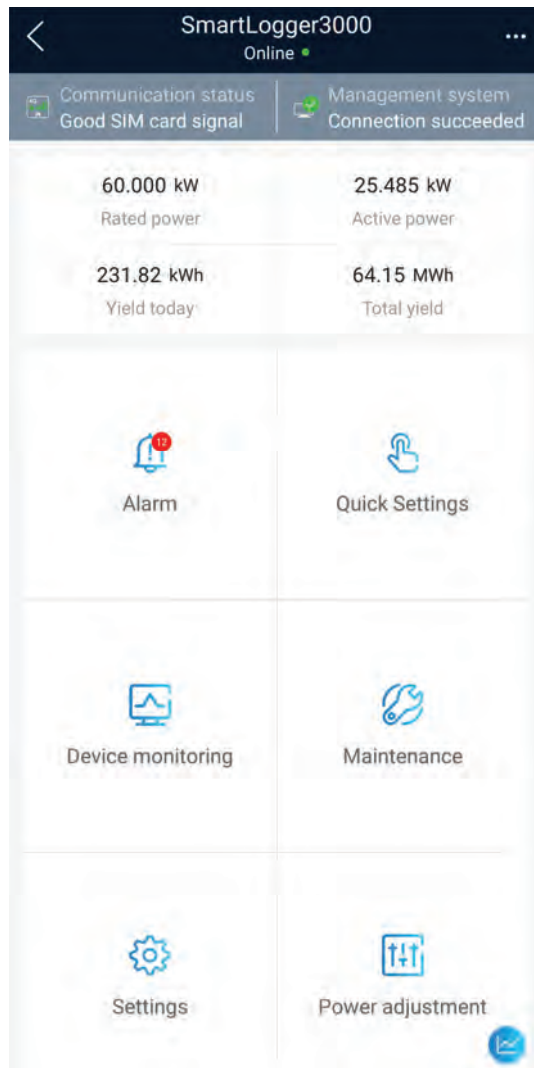
7.3.5 Screen Operations (Advanced User)

7.3.5.1 Query

Procedure

- Step 1** After logging in to the app, you can view the active power and energy yield of the connected solar inverters on the home screen.

Figure 7-78 Home



- Step 2** Tap **Alarm management** or **Device Monitoring** to view active alarms, historical alarms, and running information.

You can view the following information on the alarm management screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.
- Select the alarms that can be manually cleared, and tap **Delete** on the right of the alarm to manually clear the alarms.

----End

7.3.5.2 Device Monitoring

An advanced user can tap **Device Monitor** to query the running information and alarms about the SmartLogger and the devices connected to it, set parameters, and send commands.

7.3.5.2.1 Query

Step 1 On the home screen, tap **Device Monitor** to access the device monitoring screen.

Figure 7-79 Device monitoring



Step 2 Select a target device to access the function menu screen of the device.

Step 3 Tap **Alarm**, **Running Info.**, **Energy Yield**, or **About** to view the alarms, running information, energy yield, and version information about the device.

NOTE

- The displayed information varies according to the device type.
- The SmartLogger can connect to third-party devices that support the Modbus-RTU protocol, such as the box-type transformer and EMI. The SmartLogger cannot automatically search user-defined devices. You need to manually add them.
- The SmartLogger can connect to a maximum of five types of user-defined devices and can connect to multiple devices of the same type.
- The SmartLogger can connect to a third-party device that supports IEC103, such as a relay protection or monitoring device like a box-type transformer. The SmartLogger cannot automatically search IEC103 devices. You need to manually add them.
- The SmartLogger can connect to a maximum of five types of IEC103 devices and can connect to multiple devices of the same type.

----End

7.3.5.2.2 Settings

Context

An advanced user can set solar inverter parameters, MBUS parameters, PID Module parameters and DL/T645 parameters.

Procedure

Step 1 On the **Device Monitor** screen, select the target device to access the function menu screen of the solar inverter.

Step 2 Tap **Settings** to access the settings screen.

Step 3 Set parameters as required.

 **NOTE**

For Setting MBUS Parameters, set **Anti-crosstalk** to **Enable** to make devices in the anti-crosstalk list take effect.

----End

7.3.5.2.3 Maintenance

?1. Log Download

Context

An advanced user can download only the logs of the SmartLogger, solar inverter, MBUS, and PID module.

Procedure

Step 1 Select a device on the **Device Monitor** screen to access the function menu screen of the device.

Step 2 Tap **Device Logs** to access the log download screen.

Step 3 Download log files as required.

 **NOTE**

- By default, Android system logs are saved in the **Android/data/com.huawei.smartpvms/files/inverterapp** folder in the phone memory. You can change the save path by referring to "Setting a File Save Path".
- The downloaded solar inverter logs are saved at the **Device Log** directory in **File Manager** in your mobile phone. You can also send the logs to your mailbox for checking.

----End

?2. Solar Inverter Maintenance

Procedure

Step 1 Tap **SUN2000** on the **Device Monitor** screen and select the target device to access the function menu screen of the solar inverter.

Step 2 Tap **Maintenance** to access the maintenance screen.

Step 3 Tap  next to **Power on**, **Power off**, **AFCI self-check**, or **Reset**.

 **NOTE**

- AFCI self-check is available only for the solar inverter model marked with **-US**.
- Tap **License Management** or **Performance Data** to view the certificate information and performance data curve of the solar inverter.

Step 4 Enter the password for logging in to the app, and tap **OK**.


----End

7.3. MBUS Maintenance

Procedure

Step 1 Tap **MBUS** on the **Device Monitor** screen and select the target device to access the function menu screen of the MBUS.

Step 2 Tap **Maintenance** to access the maintenance screen.

Step 3 Tap  next to **Search STA Again** and search for the STA list again as prompted.

Step 4 Tap  next to **MBUS reset** and reset the MBUS as prompted.

Step 5 Tap **Anti-crosstalk list** to synchronize, import, or export the list.

----End

7.4. PID Module Maintenance

Procedure

Step 1 Tap **PID** on the **Device Monitor** screen and select the target device to access the function menu screen of the PID module.

Step 2 Tap **Maintenance** to access the maintenance screen.

Step 3 Tap  next to **Power on**, **Power off**, or **Data clear** as required.

NOTE

- If you clear data, active and historical alarms stored on the PID module will all be cleared.
- Tap **Performance Data** to view the performance data curve of the PID module.

Step 4 Enter the password for logging in to the app, and tap **OK**.

----End

7.3.5.3 Maintenance

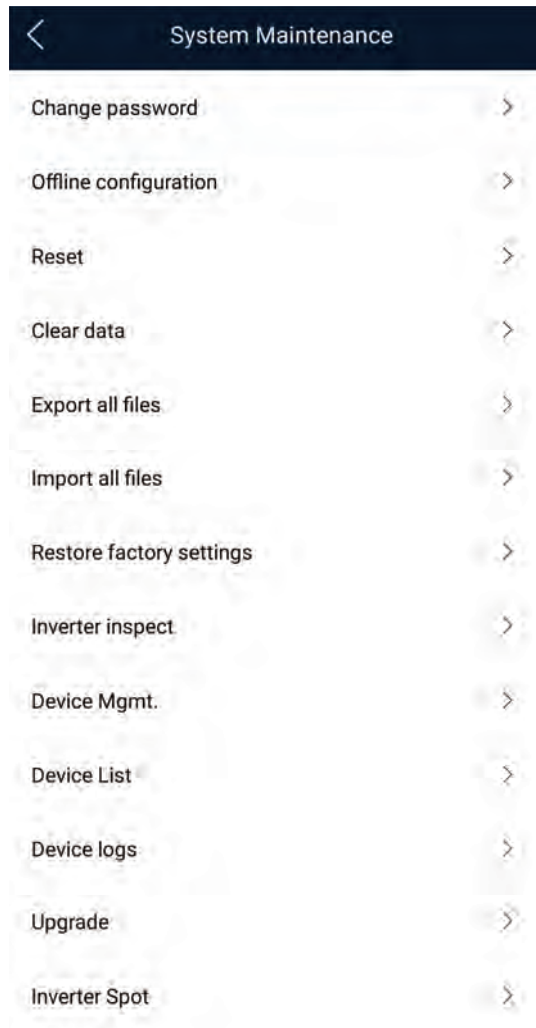
7.3.5.3.1 System Maintenance

7.1. Changing a User Password

Procedure

Step 1 Choose **Maintenance** > **Change Password** to access the password change screen.

Figure 7-80 System Maintenance



NOTE

The password must meet the following requirements:

- Contains 6–20 characters.
- Contains at least two of the following types: lowercase letters, uppercase letters, and digits.

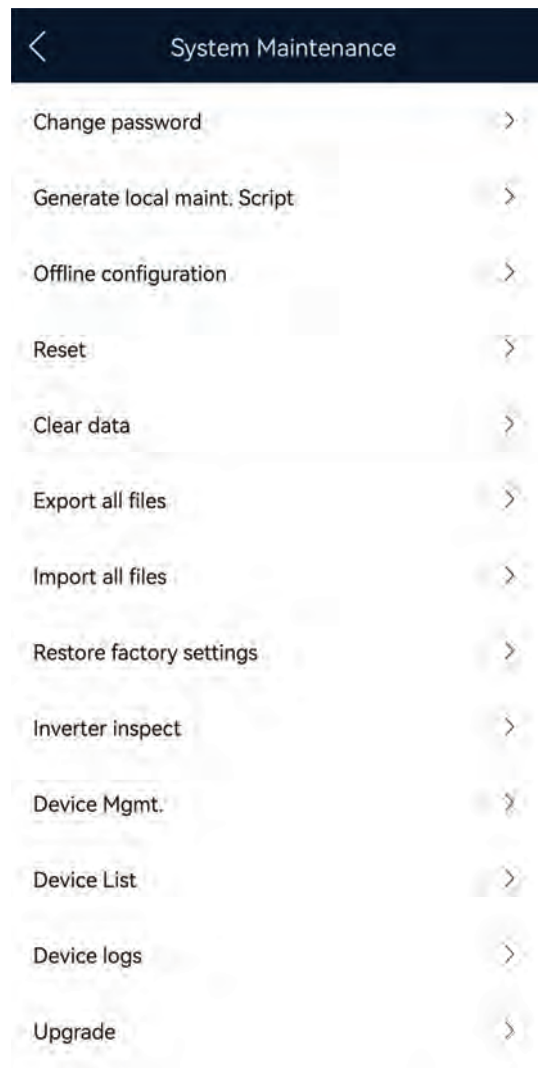
----End

?.2. Offline Configuration

You can import the offline configuration files to the SmartLogger over the app.

Step 1 Choose **Maintenance > Offline configuration** to perform offline configuration.

Figure 7-81 System Maintenance



----End

 **NOTE**

After the configuration file is imported, choose **Latest Status** to view the import status of the last offline configuration file and choose **Enable offline config** to import other offline configuration files.

7.3. Resetting the System

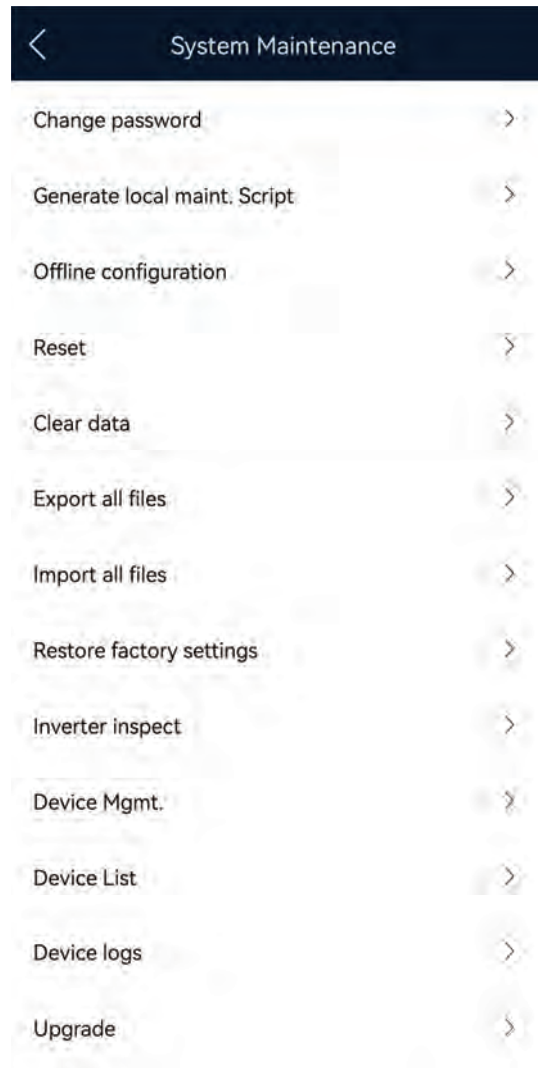
Context

After the system resets, the SmartLogger restarts.

Procedure

Step 1 Choose **Maintenance > Reset**. A dialog box for resetting the system is displayed.

Figure 7-82 System Maintenance



Step 2 Enter the password for logging in to the app, and tap **OK**.

----End

7.4. Clearing Data

Context

Clear data if the SmartLogger is relocated and its historical data needs to be deleted.

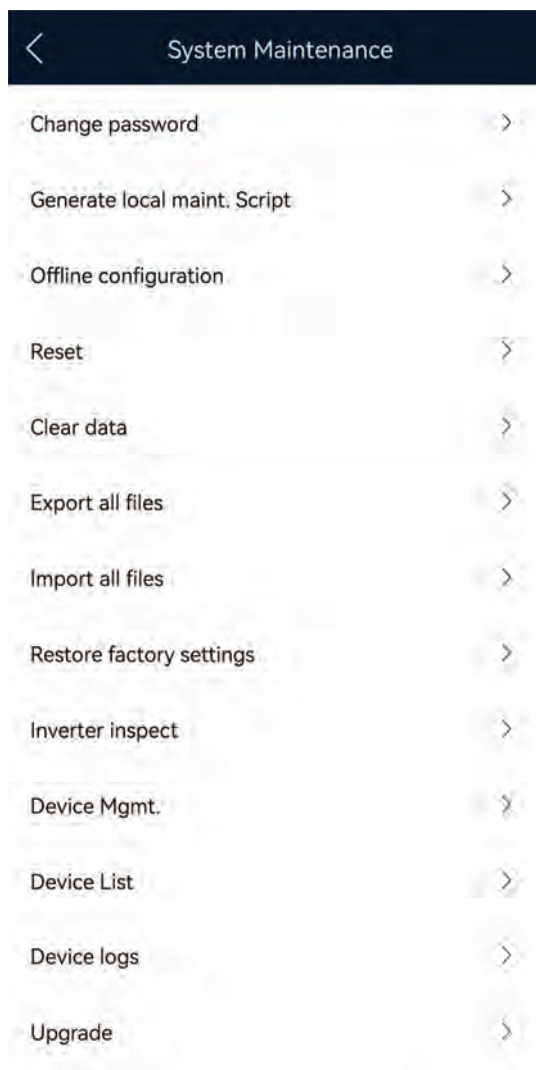
NOTICE

- After you perform **Clear Data**, electric energy yield data, performance data, and alarms are cleared from the SmartLogger.
- After you perform **Clear Data**, the devices connected to the SmartLogger are not removed. If the original device will no longer connect to the SmartLogger, remove the device.
- If you perform **Clear Data** on the SmartLogger, you also have to perform **Reset Alarms** on the NMS. Otherwise, the alarm information collected by the NMS and SmartLogger will be different.

Procedure

Step 1 Choose **Maintenance > Clear Data**. A dialog box for clearing data is displayed.

Figure 7-83 System Maintenance



Step 2 Enter the password for logging in to the app, and tap **OK**.

----End

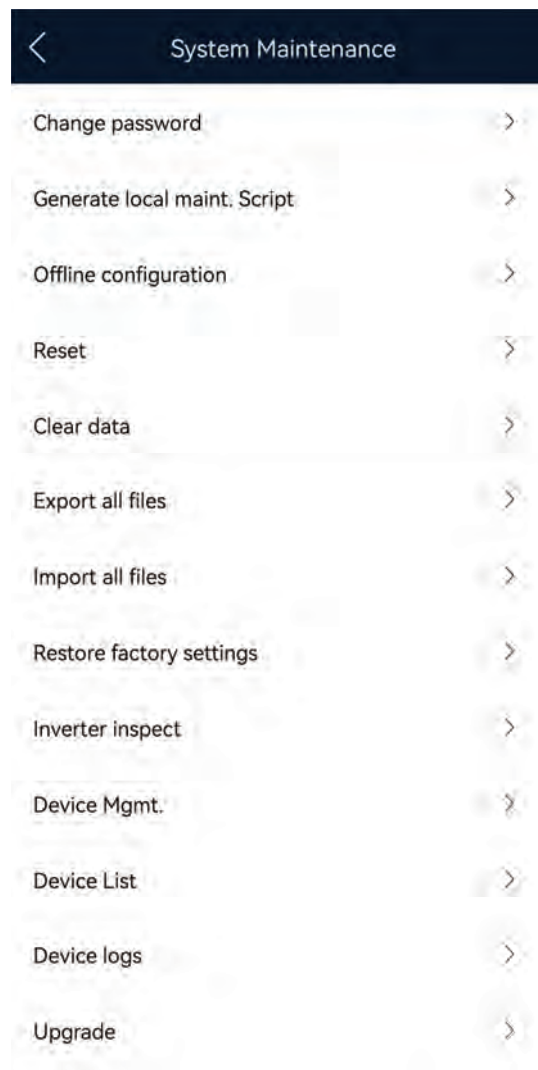
7.5. Importing and Exporting All Files

If the SmartLogger needs to be replaced, you can export the files before the replacement and then import the files of the new SmartLogger to ensure data integrity.

Procedure

- Step 1** Choose **Maintenance > Import all files (or Export all files)** to import or export all files.

Figure 7-84 System Maintenance



----End

7.6. Restoring Factory Settings

Context

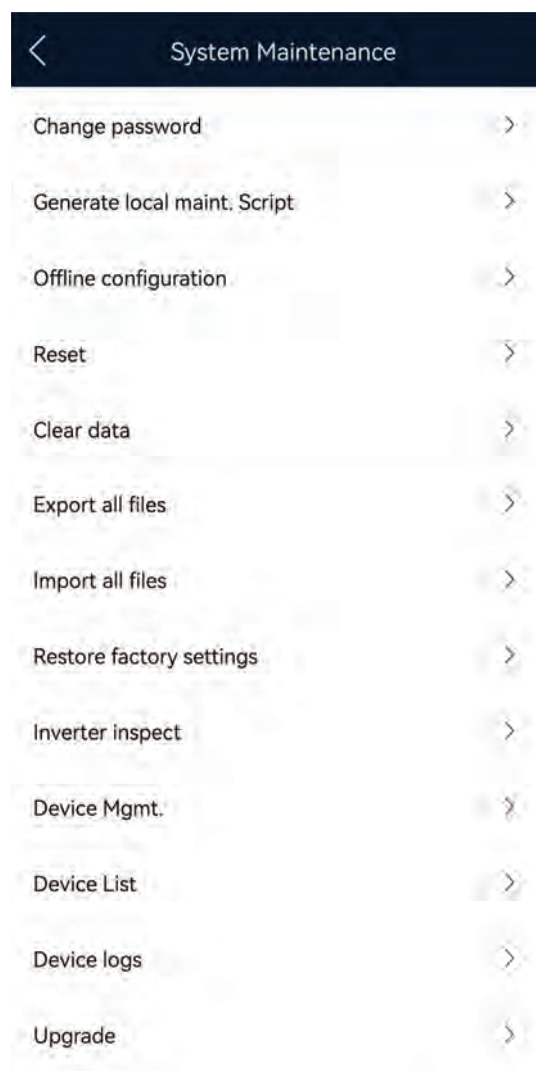
NOTICE

Perform this operation with caution because all configured parameters except the current date, time, baud rate, and address will be restored to their factory default values. This operation will not affect operating information, alarm records, or system logs.

Procedure

- Step 1** Choose **Maintenance > Restore factory settings**. The **Restore factory** dialog box is displayed.

Figure 7-85 System Maintenance



- Step 2** Enter the password for logging in to the app, and tap **OK**.
----End

7.3.5.3.2 Solar Inverter Inspection

Context

After a solar inverter is put into use, it should be inspected periodically to detect any potential risks and problems.

Procedure

- Step 1** Tap **Maintenance > Inverter Inspect** to access the inspection screen.



- Step 2** Select **Inspection method** and **Inspection type**, tap **Next**.

Figure 7-86 Inspection method

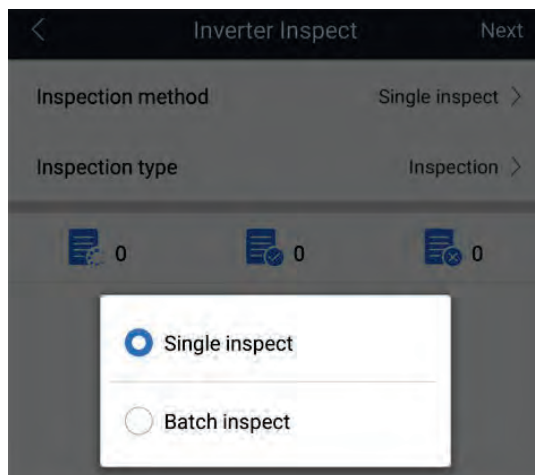
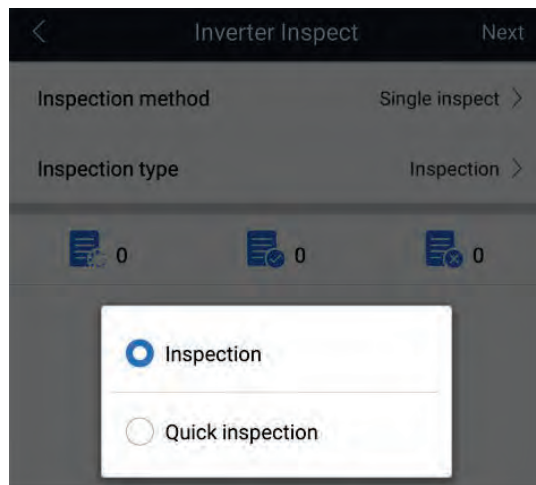


Figure 7-87 Inspection type



Step 3 Select **Inspection type** and tap **Next** in the upper-right corner of the screen to start inspection.

Figure 7-88 Select device



Step 4 An inspection file is generated after the inspection is complete.

NOTE

By default, the inspection file is saved in **Android/data/com.huawei.smartpvms/files/inverterapp** in the phone memory. You can change the log save path by referring to *Setting a File Save Path*.

----End

7.3.5.3.3 Device Management

?1. Changing a Device Name

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Step 2 Tap a device name to change it.

Figure 7-89 Changing a device name



NOTE

The name of the SmartLogger cannot be changed.

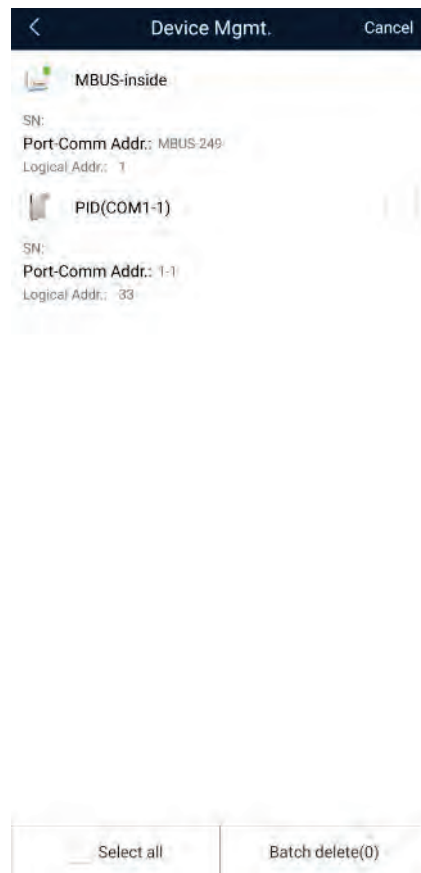
----End

?2. Deleting Devices

Procedure

- Step 1** Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.
- Step 2** Hold down a device name, select the devices to be deleted, and tap **Batch delete** to delete them.

Figure 7-90 Deleting devices



NOTE

Deleted devices are not displayed on the **Monitor** screen.

----End

7.3. Automatically Searching for Devices

Context

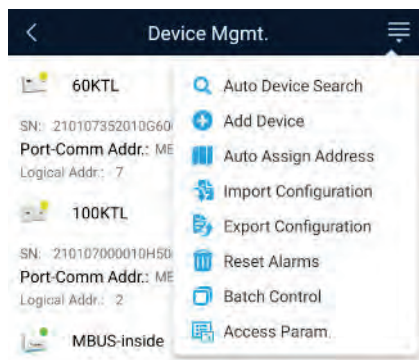
The SmartLogger can automatically detect and connect to devices.

The EMI, power meter, slave SmartLogger, and third-party devices cannot be automatically detected. You need to add them manually. For details, see [Manually Adding a Device](#).

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-91 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Automatically searching for devices

----End

7.4. Manually Adding a Device

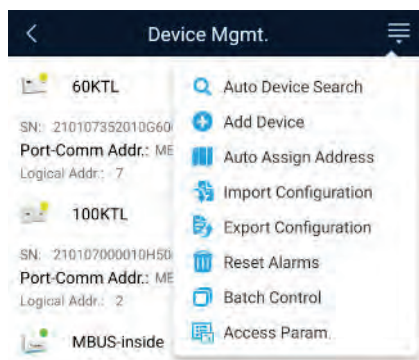
Context

The EMI, power meter, slave SmartLogger, and third-party devices cannot be automatically detected. You need to add them manually.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-92 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Add Device** and set device parameters.

NOTE

- **Comm. Protocol** is set to **Modbus RTU** by default. If you need to modify it, refer to [7.3.5.4.5 Setting RS485 Parameters](#).
- Before adding the EMI or power meter manually, set the EMI or power meter parameters. For details, see *SmartLogger3000 User Manual*, *SmartLogger2000 User Manual* or *SmartLogger1000A User Manual*.

----End

7.5. Automatically Allocating Addresses

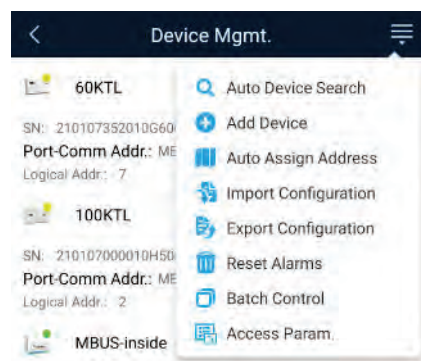
Context

The SmartLogger can automatically allocate addresses to the connected devices and adjust the addresses based on device sequence numbers.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-93 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Auto Assign Address**.

----End

7.6. Importing Configuration

Prerequisites

The name extension of the file to be imported must be **.cfg**. Otherwise, the file will be unavailable.

- The file to be imported is stored in the memory or SD card of the mobile phone.

Context

When connecting to a user-defined device or the IEC103 device, import a configuration file and add a device manually. Then, the device can be queried on the **Monitor** screen.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-94 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Import Config** to import the **.cfg** file.

----End

?7. Exporting Configuration

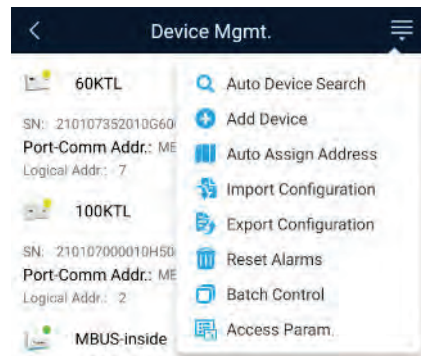
Context

After connecting to a third-party device, you can choose **Export Config** to view its configuration file.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-95 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Export Config**.

----End

?8. Resetting Alarms

Context

- If you reset alarms, all the active and historical alarms of the selected device are deleted and the SmartLogger starts to collect new alarm data.

- If data is deleted for a solar inverter, you must reset alarms on the SmartLogger and the NMS; otherwise, the SmartLogger cannot collect new alarm data from the solar inverter.
- If alarms are reset on the SmartLogger, you must reset alarms on the NMS; otherwise, the NMS cannot obtain the new alarm data collected by the SmartLogger from the solar inverter.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-96 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Reset Alarms** and select a device on the **Reset Alarms** screen.

Step 4 Tap **OK**.

----End

?9. Starting, Shutting down, and Resetting Solar Inverters in Batches

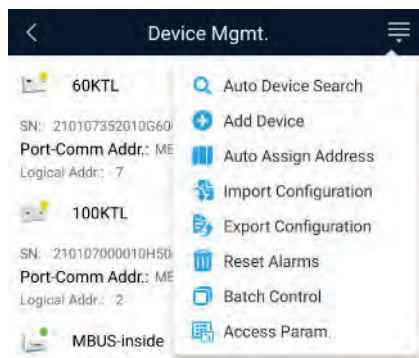
Context

Batch control operations allow the SmartLogger to start, shut down, and reset the connected solar inverters in batches. The solar inverters automatically restart after reset.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-97 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Batch Control**.

Step 4 Tap **Batch startup**, **Batch shutdown**, or **Batch reset**, enter the app login password, and tap **OK**.

----End

7.10. Setting Access Parameter

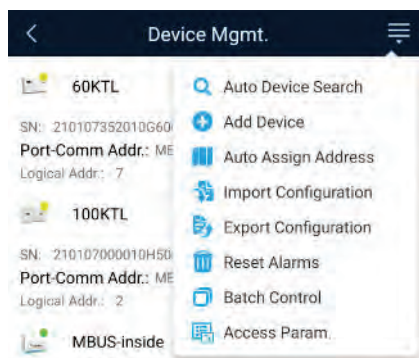
Context

Before connecting a device to the SmartLogger, configure access parameters correctly.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-98 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Access Param.** to access the settings screen.

NOTE

If the SmartLogger communicates with the solar inverter over the MBUS, set **Embedded MBUS enable** to **Enable**.

----End

7.3.5.3.4 Managing the Device List

Context

On the device list screen, you can choose **Export Device Info > Edit Device Info File > Import Device Info** to modify device information in the information file.

Procedure

Step 1 Choose **Maintenance > Device List** to access the device list screen.

Figure 7-99 Device List



Step 2 Tap **Export Device Info** to export the device information file.

NOTE

The exported device information file is in .csv format.

Step 3 Tap **Edit Device Info File** to modify the device information file.

1. In the path where the device information file is exported, tap the exported .csv file to access the screen for modifying the file.
2. Tap a parameter to be modified and enter or select target information.
3. After all modifications, tap **Save** in the upper-right corner of the screen.

Step 4 Tap **Import Device Info** to import the modified device information file to the SmartLogger.

----End

7.3.5.3.5 Exporting Device Logs

Prerequisites

A USB flash drive has been inserted into the USB port on the SmartLogger.

Procedure

Step 1 Choose **Maintenance > Device logs** to access the device log screen.


Step 2 Tap  in the upper-right corner of the screen, select a device whose logs are to be exported, and tap **Next**.

Figure 7-100 Exporting device logs



Step 3 Select the types of logs to be exported and tap **OK** to start exporting device logs.

NOTE

The downloaded device logs are saved at the storage path of the USB flash drive.

----End

7.3.5.3.6 Device Upgrade

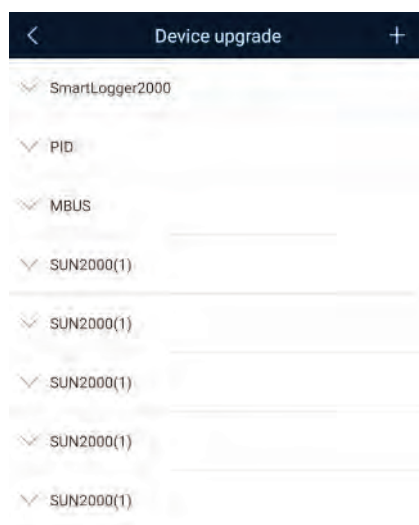
Prerequisites


- You have obtained the upgrade package with the help of the supplier or Huawei engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.
 - a. Log in to Huawei enterprise technical support website <http://support.huawei.com/enterprise>.
 - b. Browse or search for **PGP Verify**.
- Insert the USB flash drive where the upgrade package is saved into the USB port on the SmartLogger.

Procedure

Step 1 Choose **Maintenance > Upgrade** to access the device upgrade screen.

Figure 7-101 Device upgrade



- Step 2** Tap  in the upper-right corner, select a single device or devices of the same type, and tap **Next**.
- Step 3** Select the upgrade package and tap **Next**.
- Step 4** Confirm the upgrade package and the device to be upgraded, and tap **Finish** to start upgrading the device.

----End

7.3.5.3.7 Spot-Checking Solar Inverters

Context


You can perform spot-check for the solar inverter whose **Grid Code** is **Japan standard**.

Procedure

- Step 1** Choose **Maintenance > Inverter Spot** to access the solar inverter spot-check screen.


Figure 7-102 Inverter spot



- Step 2** (Optional) Tap  in the upper-right corner of the **Inverter Spot** screen, select **Sel Ana Para**, and tap **Finish** to set analog parameters.

NOTE

After the parameters on the **Sel Analog Para** screen are set, the analog parameters and their values are displayed on the solar inverter spot-check screen. You can also tap **Sel Device** to set parameters when the solar inverters are being spot-checked.

- Step 3** Tap  in the upper-right corner of the **Inverter Spot** screen and select **Sel Device** to access the **Sel Device** screen.
- Step 4** Select one or more devices to be spot-checked, and then tap **Finish** to start spot-check.

----End

7.3.5.3.8 Feedback

Context

Users can provide feedback in text, pictures, and files.

 **NOTE**

Do not add private data.

Procedure


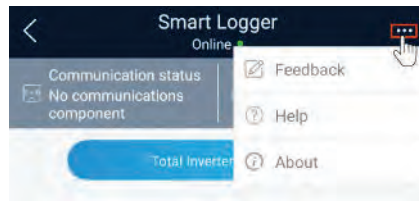
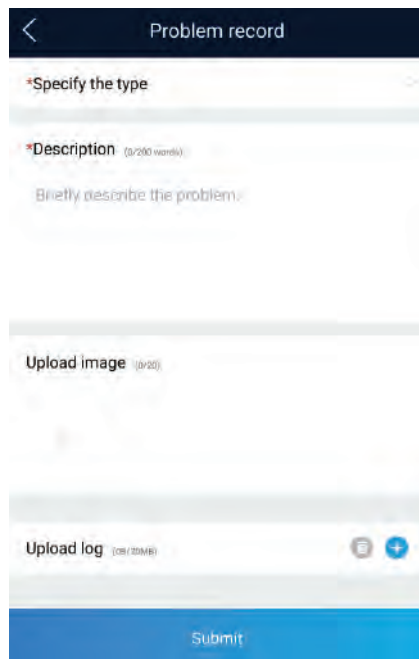
Step 1 Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-103 Feedback



Step 2 Tap **Specify the type** and select **Feedback** or **Suggestion**.

Figure 7-104 Problem record



Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.3.5.3.9 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


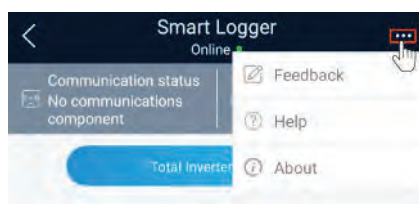
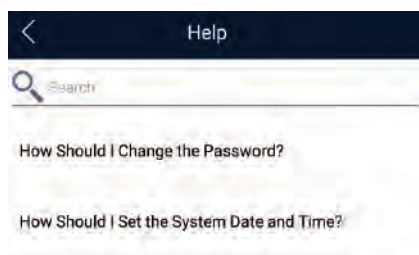
Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-105 Help 1



Step 2 Specify your question. A solution will be displayed.

Figure 7-106 Help 2



----End

7.3.5.3.10 About

Context

You can query the app version, connected product model, SN, firmware version, software version, technical support website, privacy policy (displayed only on the SUN2000 app), customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


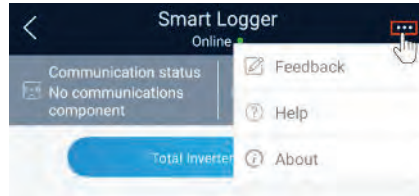
- Step 1** In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, firmware version, software version, and technical support website.

Figure 7-107 About



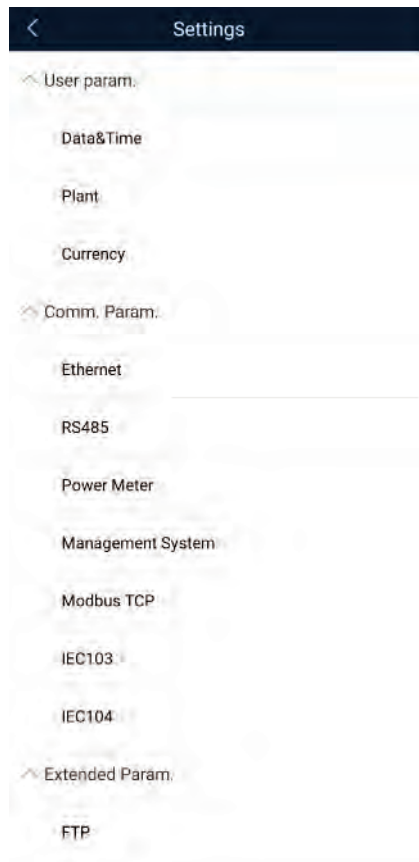
- Step 2** Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

7.3.5.4 Settings

An advanced user can choose **Settings** to access the settings screen and set the user parameters, communications parameters, extended parameters, and file save path for the SmartLogger.

Figure 7-108 Settings (advanced user)



NOTE

Only the SmartLogger1000A/SmartLogge3000 supports **Mobile Data (4G/3G/2G)** and **WLAN** settings.

7.3.5.4.1 Setting the System Date and Time

Procedure

Step 1 Choose **Settings > User param. > Date&Time** to set the date and time.

Figure 7-109 Date&Time screen



Step 2 Set the date and time based on the region where the SmartLogger is located.

 **NOTE**

For a solar inverter that supports DST, if an advanced user enables DST, a common user can view DST data. The displayed parameters are for reference only.

----End

7.3.5.4.2 Setting Plant Information

Step 1 Choose **Settings > User param. > Plant** to access the parameter setting screen.

Figure 7-110 Plant



Step 2 Tap target parameters. On the displayed screen, enter or select relevant information.

 **NOTE**

The plant parameters that are manually entered must not contain any special character, such as <>:,`?()#&\\$|%+;~^" in the English half-width status.

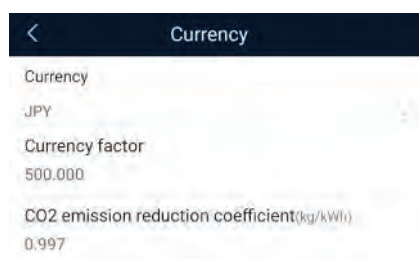
----End

7.3.5.4.3 Setting Revenue Parameters

Procedure

Step 1 Choose **Settings > User param. > Revenue** to access the parameter setting screen.

Figure 7-111 Gain



----End

7.3.5.4.4 Setting Ethernet Parameters

Context

Set Ethernet parameters to ensure proper operation of Ethernet ports and functions of logging in to the embedded WebUI of the SmartLogger, connecting to the NMS, and sending emails.

Procedure

- Step 1** Choose **Settings > Comm. Param. > Ethernet** to access the Ethernet parameter setting screen.
- Step 2** Tap target parameters. On the displayed screen, enter relevant information.

NOTICE

If the SmartLogger connects to the Internet through a router, note the following when setting Ethernet parameters:

- Set the NMS address to the IP address of the router.
- Ensure that the IP address of the SmartLogger is in the same network segment as the NMS address.
- Set the domain name server (DNS) address to the IP address of the router or obtain the DNS address from the network provider.
- After the IP address is changed, you need to use the new IP address to log in to the system.
- When DHCP is enabled, the IP address cannot be set.

----End

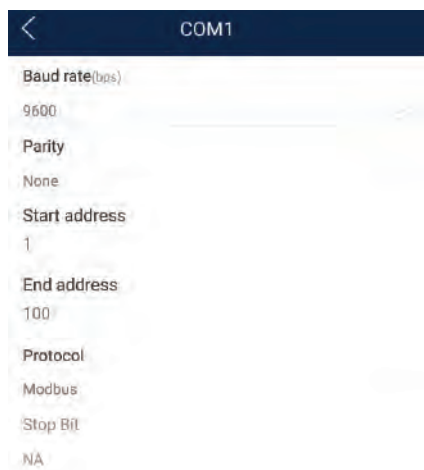
7.3.5.4.5 Setting RS485 Parameters

Context

Set RS485 parameters to ensure normal communication between the SmartLogger and devices such as the SUN2000, EMI, and power meter.

Procedure

- Step 1** Choose **Settings > Comm. Param. > RS485** to access the parameter setting screen.
- Step 2** Select a port from **COM1** to **COM6**.
Use the settings of **COM1** as an example.

Figure 7-112 COM1**NOTE**

- **COM1** to **COM6** correspond to communications ports **COM1–COM3** (SmartLogger1000A and SmartLogger3000) or **COM1–COM6** (SmartLogger2000). The default baud rate is **9600 bit/s**.
- The SmartLogger3000 expansion module corresponds to communication ports **M1.COM1~M1.COM3**.
- Set the protocol supported by the RS485 port based on either the protocol supported by the connected device or the status of the device in the network. When the SmartLogger serves as a slave node to interconnect with a third-party device over Modbus-RTU, set **Protocol** to **Modbus-Slave**. When the connected solar inverter performs rapid power grid scheduling using both MBUS and RS485, set **Protocol** to **Modbus-Control**.
- **Parity**, **Protocol**, and **Stop bit** must be set to the same values for all devices connected to the same RS485 port.
- The baud rate for the RS485 ports of the SmartLogger must be the same as the baud rate for the device that communicates with the SmartLogger.
- $1 \leq \text{Start address} \leq \text{End address} \leq 247$. The address range of the ports can overlap. Set the address range as required. A larger address range requires a longer searching time. The start and end addresses have no impact on the devices that have been connected.

Step 3 On the **RS485** screen, tap **Night Communication Settings** to set the parameters for communication at night.

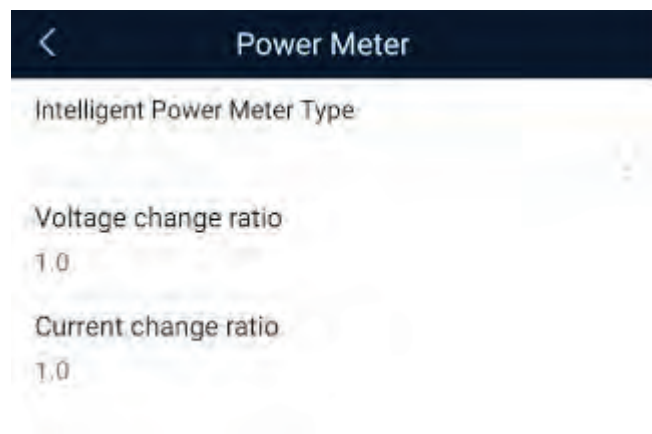
----End

7.3.5.4.6 Setting Modbus-RTU Power Meter Parameters

Procedure

Step 1 Choose **Settings > Comm. Param. > Power Meter** to access the parameter setting screen.

Figure 7-113 Power Meter



Step 2 Tap target parameters. On the displayed screen, enter relevant information.

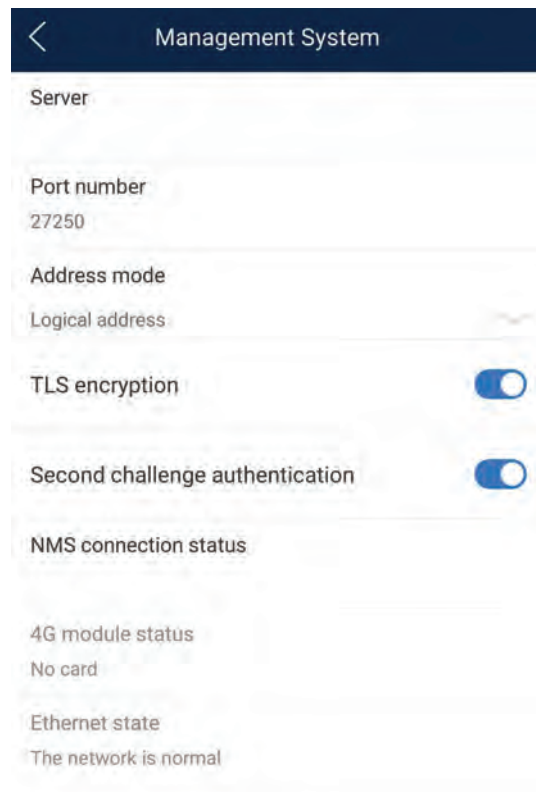
----End

7.3.5.4.7 Setting Management System Parameters

Procedure

Step 1 Choose **Settings > Comm. Param. > Management System** to access the parameter setting screen.

Figure 7-114 Management system



NOTE

- Set **Server** to the IP address or domain name of the NMS server.
- When the SmartLogger connects to the Huawei NMS, retain the default value **27250** for **Port number**. When the SmartLogger connects to a third-party NMS, set **Port number** according to the server port enabled in the third-party NMS.
- In most cases, set **Address mode** to **Physical address**. In this mode, addresses of devices connected to each RS485 port cannot be duplicate. If the devices connected to the six RS485 ports of the SmartLogger have duplicate addresses, set **Address mode** to **Logical address**.
- If **TLS encryption** is set to , data will be transmitted without being encrypted, which may pose security risks. Therefore, exercise caution when setting this parameter.
- If **Secondary challenge authentication** is set to , the result of the second challenge authentication is not checked, which may pose security risks. Therefore, exercise caution when setting this parameter.

----End

7.3.5.4.8 Setting Modbus TCP Parameters

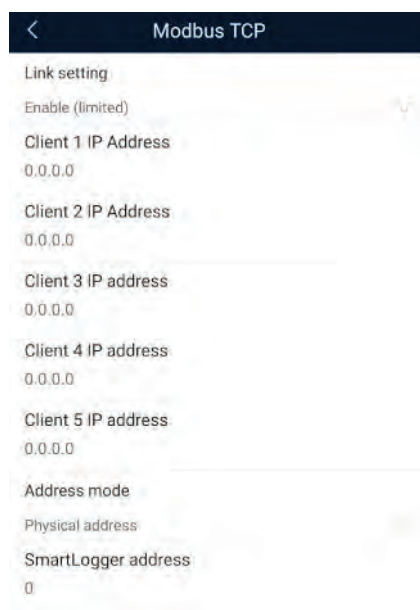
Context

Set Modbus-TCP parameters correctly to ensure normal communication between the SmartLogger and a third-party NMS.

Procedure

- Step 1** Choose **Settings > Comm. Param. > Modbus TCP** to access the parameter setting screen.

Figure 7-115 Modbus TCP



NOTE

- Modbus TCP is a universal standard protocol used to connect to a third-party management system. Because there is no security authentication mechanism, data transmitted by Modbus TCP is not encrypted. To reduce network security risks, the function of connecting to a third-party management system using Modbus TCP is disabled by default. This protocol can transmit the running data and control commands of PV plants, which may cause user data breach and control permission theft. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the use of this protocol to connect to a third-party management system (non-secure protocol). Users are advised to take measures at the PV plant level to reduce security risks, or use Huawei management system to mitigate the risks.
- If the devices connected to the six RS485 ports of the SmartLogger have duplicate addresses, set **Address mode** to **Logical address**.

----End

7.3.5.4.9 Setting IEC103 Device Parameters

Procedure

Step 1 Choose **Settings > Comm. Param. > IEC103** to access the parameter setting screen.

Figure 7-116 IEC103



Step 2 Tap target parameters. On the displayed screen, enter relevant information.

----End

7.3.5.4.10 Setting IEC104 Device Parameters

Procedure

Step 1 Choose **Settings > Comm. Param. > IEC104** to access the parameter setting screen.

Figure 7-117 IEC104



Step 2 Tap target parameters. On the displayed screen, enter relevant information.

NOTE

- IEC104 is a universal standard protocol used to connect to a third-party management system. Because there is no security authentication mechanism, data transmitted by IEC104 is not encrypted. To reduce network security risks, the function of connecting to a third-party management system using IEC104 is disabled by default. This protocol can transmit the running data and control commands of PV plants, which may cause user data breach and control permission theft. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the use of this protocol to connect to a third-party management system (non-secure protocol). Users are advised to take measures at the PV plant level to reduce security risks, or use Huawei management system to mitigate the risks.
- You can set the IP whitelist after **Linking setting** on the **Basic parameters** screen is enabled.
- On the **Transfer table config** screen, you can set teleindication and telemetry signals for devices.

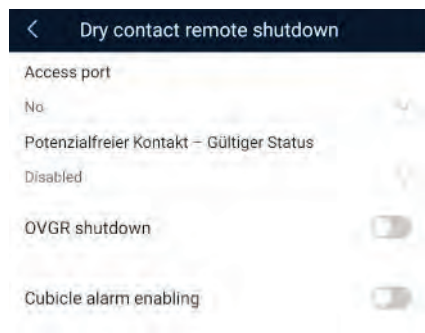
----End

7.3.5.4.11 Remotely Shutting Down Solar Inverters in Dry Contact Mode

Procedure

- Step 1** Choose **Settings > Extended Param. > Dry contact remote shutdown**. On the displayed screen, set parameters to remotely shut down solar inverters in dry contact mode.

Figure 7-118 Remotely shutting down solar inverters in dry contact mode



----End

7.3.5.4.12 Setting FTP Parameters

Context

The FTP function is used to access a third-party NMS. The SmartLogger can report the configuration information and running data of the managed plant system through FTP. The third-party NMS can access Huawei devices with proper configurations.

NOTE

FTP is a universal standard protocol without any security authentication mechanism. Data transmitted by FTP is not encrypted. To reduce network security risks, the IP address of the connected third-party FTP server is left blank by default. This protocol can transmit the running data of PV plants, which may cause user data breach. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the enabling of the FTP protocol (non-secure protocol). Users are advised to take measures at the PV plant level to reduce security risks, or use Huawei management system to mitigate the risks

Procedure

- Step 1** Choose **Settings > Extended Param. > FTP** to access the parameter setting screen.

Figure 7-119 FTP**NOTE**

- Perform **Test transmission** to check whether the SmartLogger can report data to the FTP server.
- Set **FTP server** to the domain name or IP address of the FTP server. If **FTP server** is set to the domain name of the FTP server, ensure that the address of the DNS server is set correctly.
- Set **User name** and **Password** for logging in to the FTP server.
- Set **Remote directory** to create a subdirectory of the same name under the default path for uploading data.
- If **Data export** is enabled, you can set the SmartLogger to report data regularly or at a specified time. Data reported at a specified time is all data, whose file name remains the same for a whole day. You can choose all data or incremental data to be reported regularly.

----End

7.3.5.4.13 Setting Email Parameters

Context

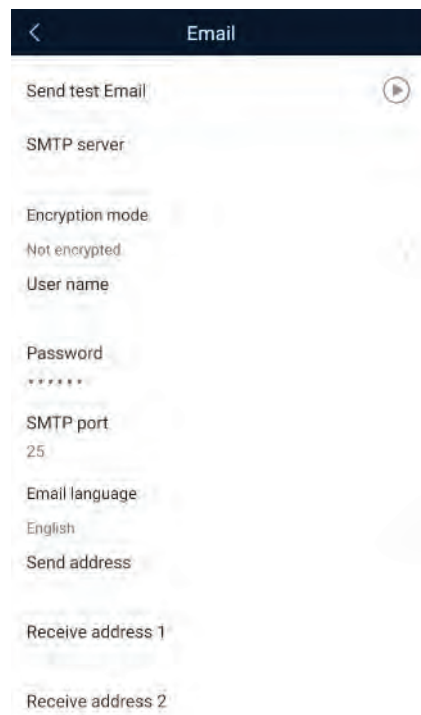
The SmartLogger can send emails to inform users of the current energy yield information, alarm information, and device status of the power plant system, helping users know the running status of the power plant system in time.

When using this function, ensure that the SmartLogger can connect to the configured email server and the Ethernet parameters and email parameters are correctly set for the SmartLogger.

Procedure

- Step 1** Choose **Settings > Extended Param. > Email** to access the parameter setting screen.

Figure 7-120 Email



NOTE

- You can tap **Send test email** to check whether the SmartLogger can successfully send emails to users.
- You can set **SMTP server** to the domain name or IP address of the SMTP server. If it is set to the domain name of the SMTP server, ensure that the address of the DNS server is set correctly.
- Set **User name** and **Password** for logging in to the SMTP server.
- **Send address** indicates the sender's email address. Ensure that the sender's email server is the same as the server specified by **SMTP server**.

----End

7.3.5.4.14 Setting a File Save Path

Prerequisites

This function is available only on the Android system.

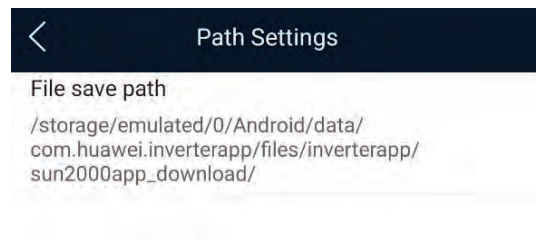
Context

You can modify the save path for logs of devices connected to the SmartLogger and export logs from the path.

Procedure

- Step 1** Choose **Settings > Path Settings > File save path** to access the screen for setting a file save path.

Figure 7-121 Setting a file save path



Step 2 Tap **File save path** to set a file save path.

----End

7.3.5.5 Power adjustment

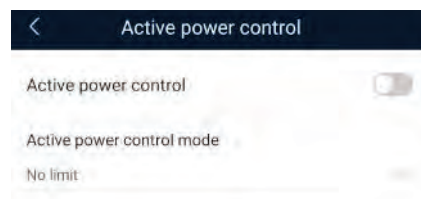
7.3.5.5.1 Active Power Control

Procedure

Step 1 Choose **Power adjustment** > **Active Power Control** to access the **Active Power Control** screen.

Step 2 Tap **Active power control mode** to set the active power control mode.

Figure 7-122 Active power control



----End

7.3.5.5.2 Setting Reactive Power Control

Procedure

Step 1 On the home screen, tap **Power adjustment** > **Reactive Power control** to access the parameter setting screen.

Step 2 Tap **Reactive power control mode** to set the active power control mode.

----End

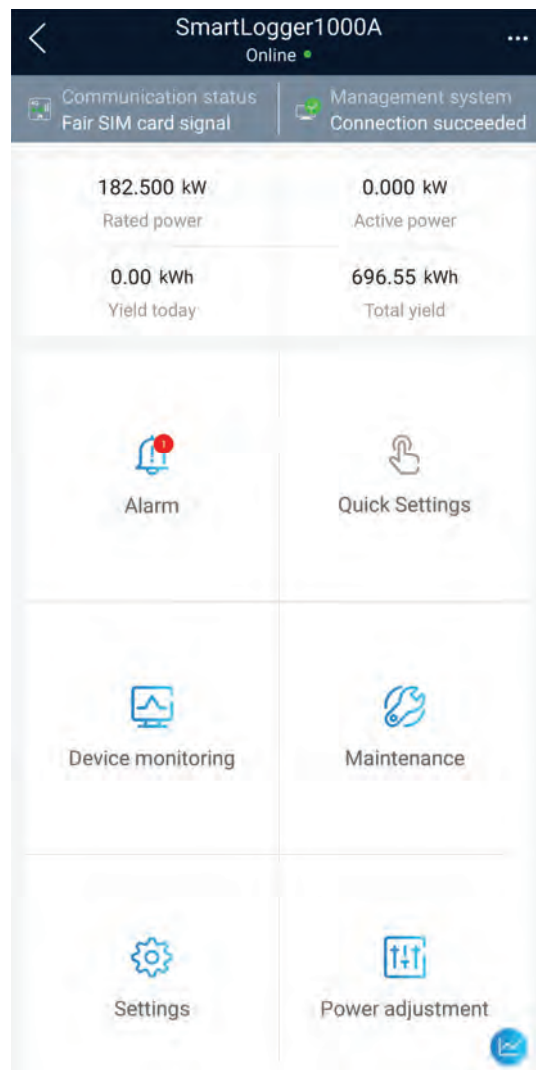
7.3.6 Screen Operations (Special User)

7.3.6.1 Query

Procedure

- Step 1** After logging in to the app, you can view the active power and energy yield of the connected solar inverters on the home screen.

Figure 7-123 Home



- Step 2** Tap **Alarm management** or **Device Monitoring** to view active alarms, historical alarms, and running information.

You can view the following information on the alarm management screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.
- Select the alarms that can be manually cleared, and tap **Delete** on the right of the alarm to manually clear the alarms.

----End

7.3.6.2 Settings

7.3.6.2.1 Setting RS485 Parameters

Context

Set RS485 parameters to ensure normal communication between the SmartLogger and devices such as the SUN2000, EMI, and power meter.

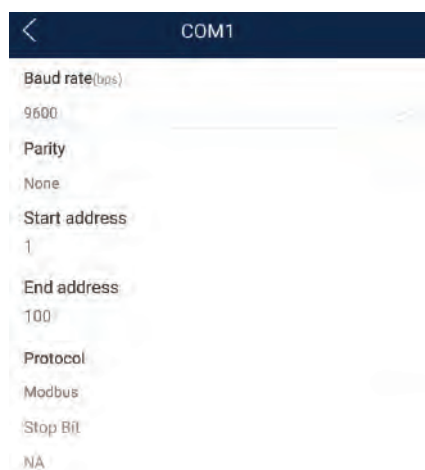
Procedure

Step 1 Choose **Settings** > **RS485** to access the parameter setting screen.

Step 2 Select a port from **COM1** to **COM6**.

Use the settings of **COM1** as an example.

Figure 7-124 COM1



NOTE

- **COM1** to **COM6** correspond to communications ports **COM1–COM3** (SmartLogger1000A and SmartLogger3000) or **COM1–COM6** (SmartLogger2000). The default baud rate is 9600 bit/s.
- Set the protocol supported by the RS485 port based on either the protocol supported by the connected device or the status of the device in the network. When the SmartLogger serves as a slave node to interconnect with a third-party device over Modbus-RTU, set **Protocol** to **Modbus-Slave**. When the connected solar inverter performs rapid power grid scheduling using both MBUS and RS485, set **Protocol** to **Modbus-Control**.
- **Parity**, **Protocol**, and **Stop bit** must be set to the same values for all devices connected to the same RS485 port.
- The baud rate for the RS485 ports of the SmartLogger must be the same as the baud rate for the device that communicates with the SmartLogger.
- $1 \leq \text{Start address} \leq \text{End address} \leq 247$. The address range of the ports can overlap. Set the address range as required. A larger address range requires a longer searching time. The start and end addresses have no impact on the devices that have been connected.

Step 3 On the **RS485** screen, tap **Night Communication Settings** to set the parameters for communication at night.

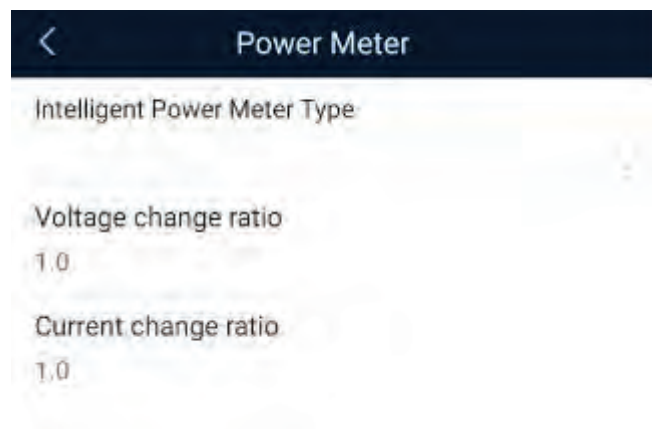
----End

7.3.6.2 Setting Modbus-RTU Power Meter Parameters

Procedure

Step 1 Choose **Settings > Power Meter** to access the parameter setting screen.

Figure 7-125 Power Meter



Step 2 Tap target parameters. On the displayed screen, enter relevant information.

----End

7.3.6.3 Maintenance

7.3.6.3.1 Device Inspection

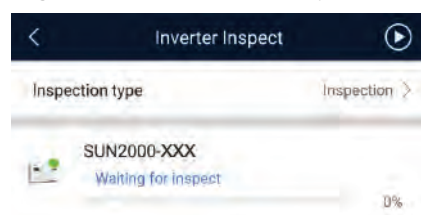
Context

After a solar inverter is put into use, it should be inspected periodically to detect any potential risks and problems.

Procedure

Step 1 On the home screen, choose **Maintenance > Inspection** to access the inspection screen.

Figure 7-126 Device inspection




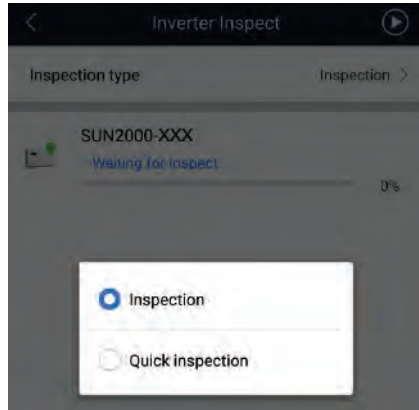
Step 2 Choose **Inspection type**, tap  in the upper-right corner of the screen to start solar inverter inspection.

Figure 7-127 Inverter Inspect



----End

7.3.6.3.2 System Maintenance

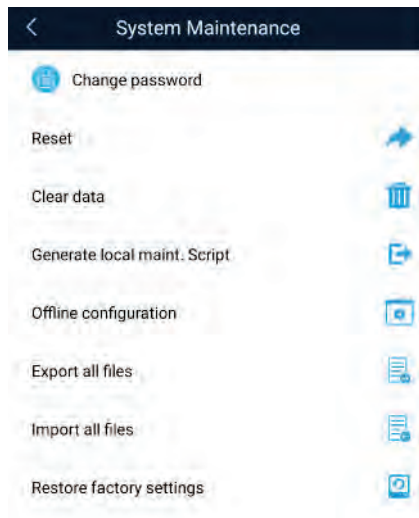
You can choose **Maintenance** to change the SmartLogger password and reset the system.

?1. Changing a User Password

Procedure

Step 1 Choose **Maintenance** > **Change Password** to access the password change screen.

Figure 7-128 Change Password



 **NOTE**

The password must meet the following requirements:

- Contains 6–20 characters.
- Contains at least two of the following types: lowercase letters, uppercase letters, and digits.

----End

7.2. Resetting the System

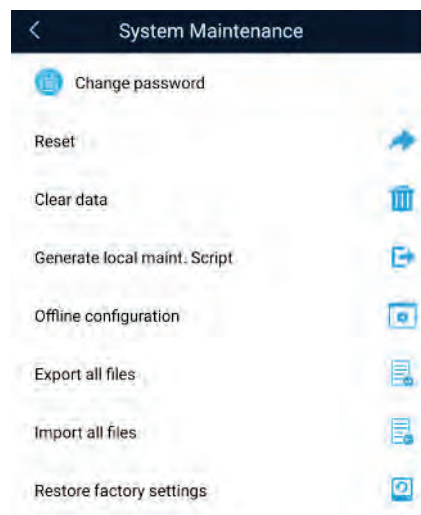
Context

After the system resets, the SmartLogger restarts.

Procedure

Step 1 Choose **Maintenance > Reset**. A dialog box for resetting the system is displayed.

Figure 7-129 Reset



Step 2 Enter the password for logging in to the app, and tap **OK**.

----End

7.3. Clearing Data

Context

Clear data if the SmartLogger is relocated and its historical data needs to be deleted.

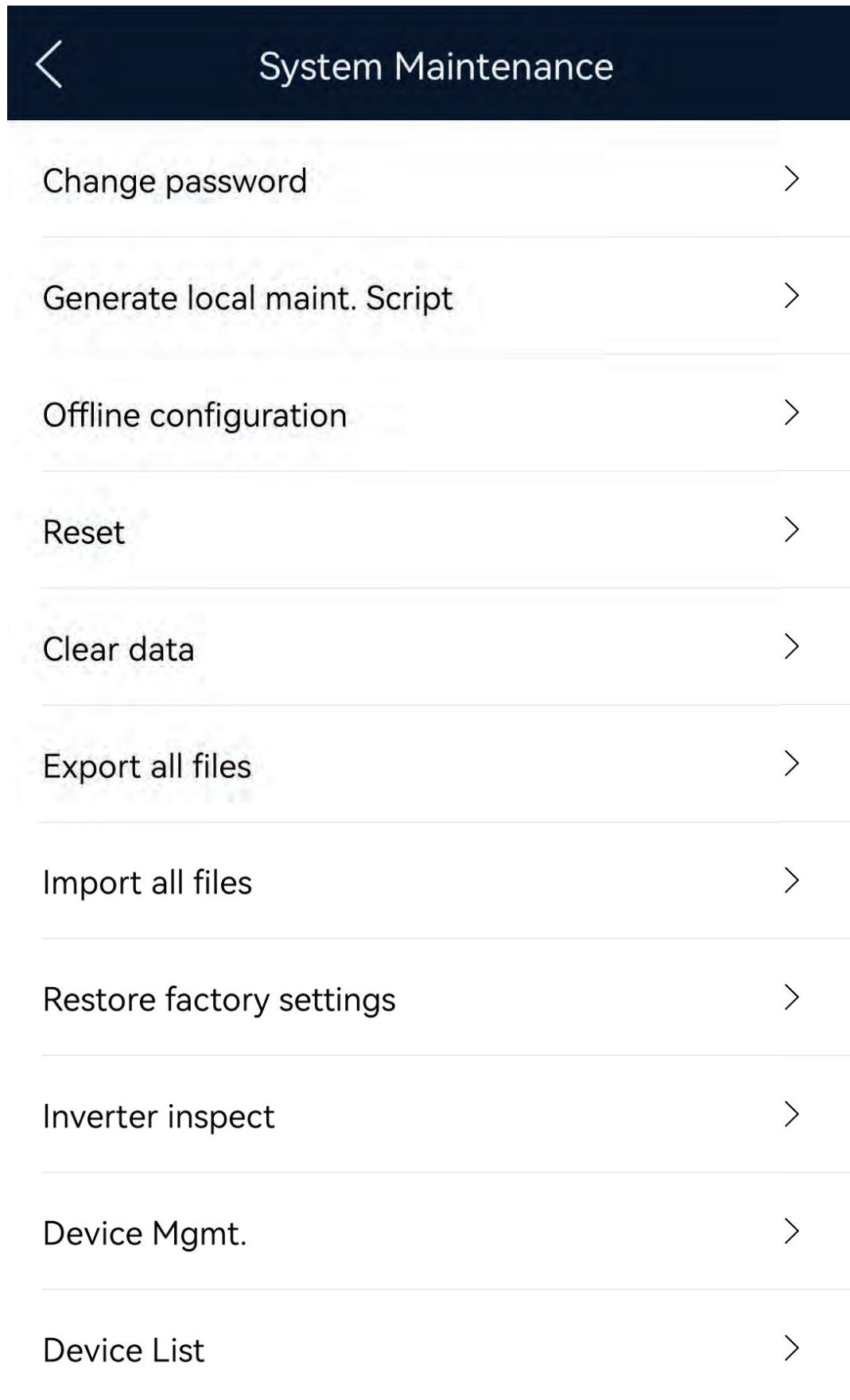
NOTICE

- After you perform **Clear Data**, electric energy yield data, performance data, and alarms are cleared from the SmartLogger.
 - After you perform **Clear Data**, the devices connected to the SmartLogger are not removed. If the original device will no longer connect to the SmartLogger, remove the device.
 - If you perform **Clear Data** on the SmartLogger, you also have to perform **Reset Alarms** on the NMS. Otherwise, the alarm information collected by the NMS and SmartLogger will be different.
-

Procedure

- Step 1** Choose **Maintenance > Clear Data**. A dialog box for clearing data is displayed.

Figure 7-130 System Maintenance



Step 2 Enter the password for logging in to the app, and tap **OK**.

----End

4. Restoring Factory Settings

Context

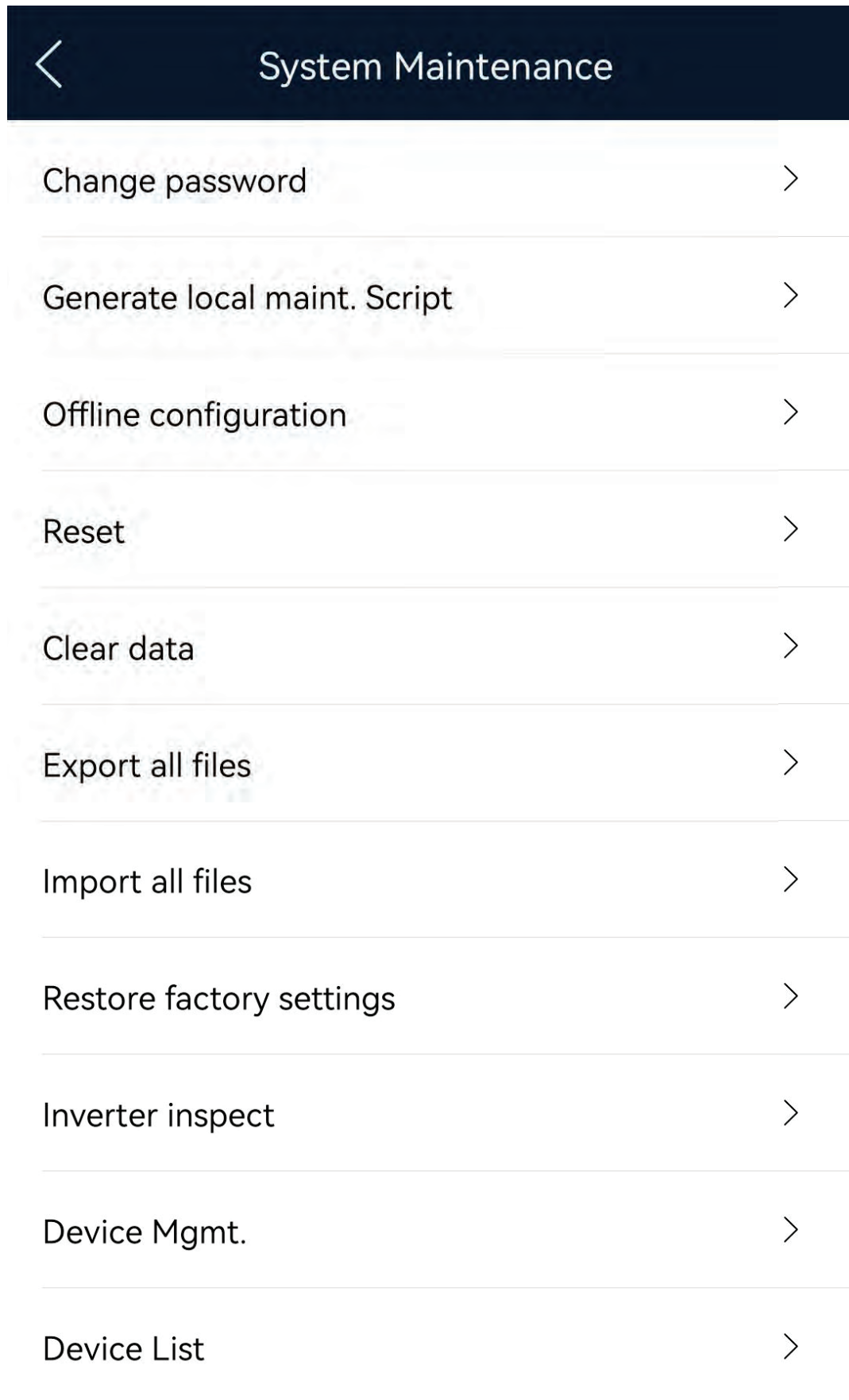
NOTICE

Perform this operation with caution because all configured parameters except the current date, time, baud rate, and address will be restored to their factory default values. This operation will not affect operating information, alarm records, or system logs.

Procedure

Step 1 Choose **Maintenance > Restore factory settings**. The **Restore factory** dialog box is displayed.

Figure 7-131 System Maintenance



Step 2 Enter the password for logging in to the app, and tap **OK**.

----End

7.3.6.3.3 Device Management

You can choose **Maintenance** > **Device Mgmt** to manage all devices connected to the SmartLogger.

?1. Changing a Device Name

Procedure

Step 1 Choose **Maintenance** > **Device Mgmt.** to access the **Device Mgmt.** screen.

Step 2 Tap a device name to change it.

Figure 7-132 Changing a device name



NOTE

The name of the SmartLogger cannot be changed.

----End

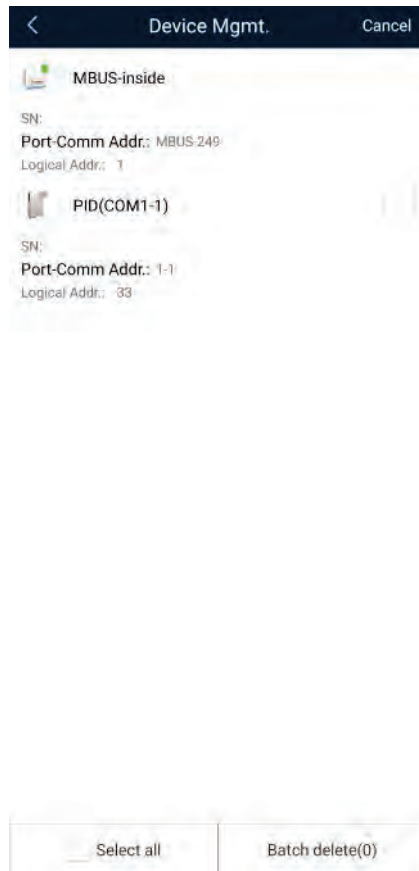
?2. Deleting Devices

Procedure

Step 1 Choose **Maintenance** > **Device Mgmt.** to access the **Device Mgmt.** screen.

Step 2 Hold down a device name, select the devices to be deleted, and tap **Batch delete** to delete them.

Figure 7-133 Deleting devices



NOTE

Deleted devices are not displayed on the **Monitor** screen.

----End

?.3. Automatically Searching for Devices

Context

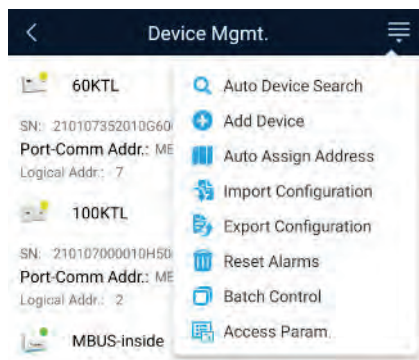
The SmartLogger can automatically detect and connect to devices.

The EMI, power meter, slave SmartLogger, and third-party devices cannot be automatically detected. You need to add them manually. For details, see [Manually Adding a Device](#).

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-134 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Automatically searching for devices

----End

7.4. Manually Adding a Device

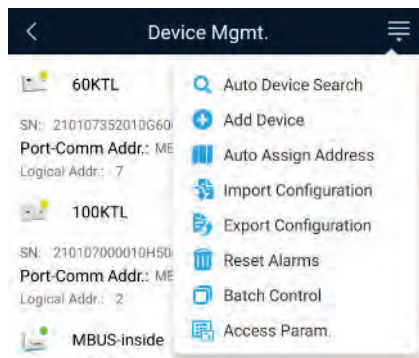
Context

The EMI, power meter, slave SmartLogger, and third-party devices cannot be automatically detected. You need to add them manually.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-135 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Add Device** and set device parameters.

NOTE

- **Comm. Protocol** is set to **Modbus RTU** by default. If you need to modify it, refer to [7.3.5.4.5 Setting RS485 Parameters](#).
- Before adding the EMI or power meter manually, set the EMI or power meter parameters. For details, see *SmartLogger3000 User Manual*, *SmartLogger2000 User Manual* or *SmartLogger1000A User Manual*.

----End

7.5. Automatically Allocating Addresses

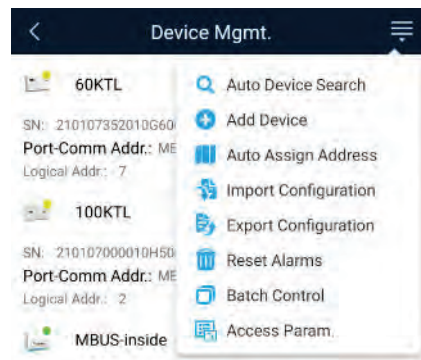
Context

The SmartLogger can automatically allocate addresses to the connected devices and adjust the addresses based on device sequence numbers.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-136 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Auto Assign Address**.

----End

7.6. Importing Configuration

Prerequisites

The name extension of the file to be imported must be **.cfg**. Otherwise, the file will be unavailable.

- The file to be imported is stored in the memory or SD card of the mobile phone.

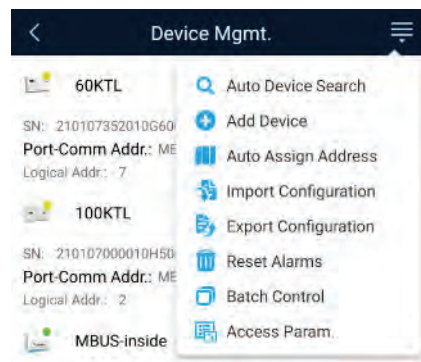
Context

When connecting to a user-defined device or the IEC103 device, import a configuration file and add a device manually. Then, the device can be queried on the **Monitor** screen.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-137 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Import Config** to import the **.cfg** file.

----End

?7. Exporting Configuration

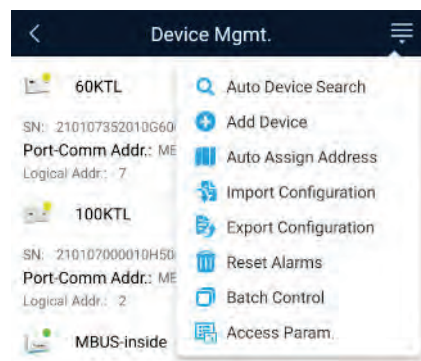
Context

After connecting to a third-party device, you can choose **Export Config** to view its configuration file.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-138 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Export Config**.

----End

?8. Resetting Alarms

Context

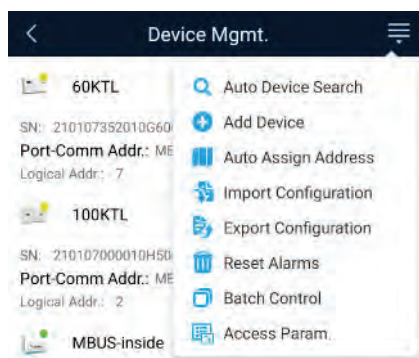
- If you reset alarms, all the active and historical alarms of the selected device are deleted and the SmartLogger starts to collect new alarm data.

- If data is deleted for a solar inverter, you must reset alarms on the SmartLogger and the NMS; otherwise, the SmartLogger cannot collect new alarm data from the solar inverter.
- If alarms are reset on the SmartLogger, you must reset alarms on the NMS; otherwise, the NMS cannot obtain the new alarm data collected by the SmartLogger from the solar inverter.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-139 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Reset Alarms** and select a device on the **Reset Alarms** screen.

Step 4 Tap **OK**.

----End

?9. Starting, Shutting down, and Resetting Solar Inverters in Batches

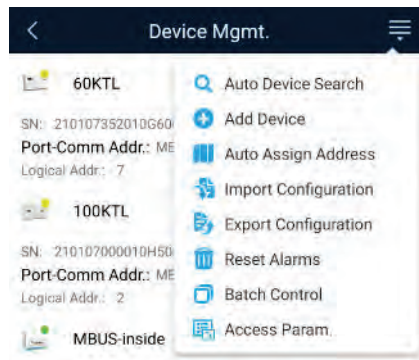
Context

Batch control operations allow the SmartLogger to start, shut down, and reset the connected solar inverters in batches. The solar inverters automatically restart after reset.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-140 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Batch Control**.

Step 4 Tap **Batch startup**, **Batch shutdown**, or **Batch reset**, enter the app login password, and tap **OK**.

----End

7.10. Setting Access Parameter

Context

Before connecting a device to the SmartLogger, configure access parameters correctly.

Procedure

Step 1 Choose **Maintenance > Device Mgmt.** to access the **Device Mgmt.** screen.

Figure 7-141 Device management



Step 2 Tap the drop-down list in the upper-right corner of the **Device Mgmt.** screen.

Step 3 Tap **Access Param.** to access the settings screen.

NOTE

If the SmartLogger communicates with the solar inverter over the MBUS, set **Embedded MBUS enable** to **Enable**.

----End

7.3.6.3.4 Managing the Device List

Context

On the device list screen, you can choose **Export Device Info > Edit Device Info File > Import Device Info** to modify device information in the information file.

Procedure

Step 1 Choose **Maintenance > Device List** to access the device list screen.

Figure 7-142 Device List



Step 2 Tap **Export Device Info** to export the device information file.

 **NOTE**

The exported device information file is in .csv format.

Step 3 Tap **Edit Device Info File** to modify the device information file.

1. In the path where the device information file is exported, tap the exported .csv file to access the screen for modifying the file.
2. Tap a parameter to be modified and enter or select target information.
3. After all modifications, tap **Save** in the upper-right corner of the screen.

Step 4 Tap **Import Device Info** to import the modified device information file to the SmartLogger.

----End

7.3.6.3.5 Exporting Device Logs

Prerequisites

A USB flash drive has been inserted into the USB port on the SmartLogger.

Procedure

Step 1 Choose **Maintenance > Device logs** to access the device log screen.


Step 2 Tap  in the upper-right corner of the screen, select a device whose logs are to be exported, and tap **Next**.

Figure 7-143 Exporting device logs



Step 3 Select the types of logs to be exported and tap **OK** to start exporting device logs.

NOTE

The downloaded device logs are saved at the storage path of the USB flash drive.

----End

7.3.6.3.6 Device Upgrade

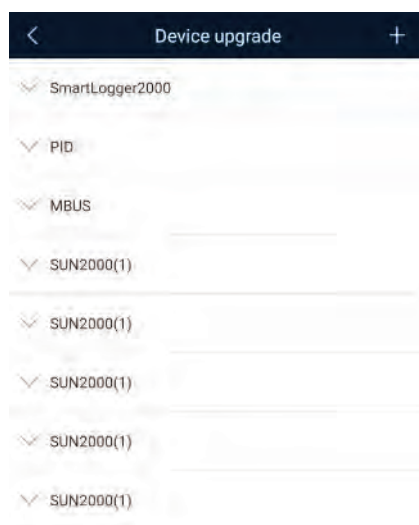
Prerequisites


- You have obtained the upgrade package with the help of the supplier or Huawei engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.
 - a. Log in to Huawei enterprise technical support website <http://support.huawei.com/enterprise>.
 - b. Browse or search for **PGP Verify**.
- Insert the USB flash drive where the upgrade package is saved into the USB port on the SmartLogger.

Procedure

Step 1 Choose **Maintenance > Upgrade** to access the device upgrade screen.

Figure 7-144 Device upgrade



- Step 2** Tap  in the upper-right corner, select a single device or devices of the same type, and tap **Next**.
- Step 3** Select the upgrade package and tap **Next**.
- Step 4** Confirm the upgrade package and the device to be upgraded, and tap **Finish** to start upgrading the device.

----End

7.3.6.3.7 Spot-Checking Solar Inverters

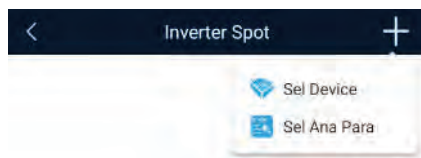
Context


You can perform spot-check for the solar inverter whose **Grid Code** is **Japan standard**.

Procedure

- Step 1** Choose **Maintenance > Inverter Spot** to access the solar inverter spot-check screen.


Figure 7-145 Inverter spot



- Step 2** (Optional) Tap  in the upper-right corner of the **Inverter Spot** screen, select **Sel Ana Para**, and tap **Finish** to set analog parameters.

NOTE

After the parameters on the **Sel Analog Para** screen are set, the analog parameters and their values are displayed on the solar inverter spot-check screen. You can also tap **Sel Device** to set parameters when the solar inverters are being spot-checked.

- Step 3** Tap  in the upper-right corner of the **Inverter Spot** screen and select **Sel Device** to access the **Sel Device** screen.
- Step 4** Select one or more devices to be spot-checked, and then tap **Finish** to start spot-check.

----End

7.3.6.3.8 Feedback

Context

Users can provide feedback in text, pictures, and files.

 **NOTE**

Do not add private data.

Procedure


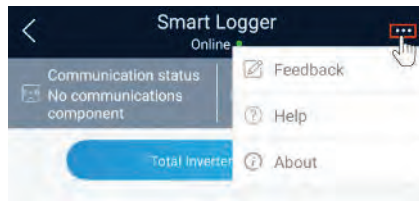
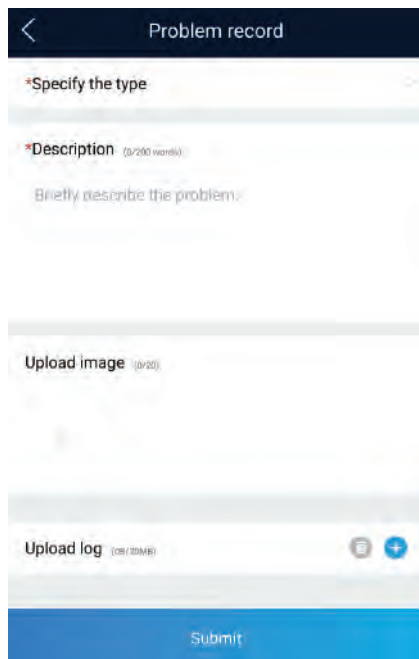
Step 1 Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-146 Feedback



Step 2 Tap **Specify the type** and select **Feedback** or **Suggestion**.

Figure 7-147 Problem record



Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.3.6.3.9 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


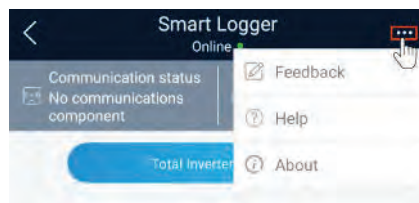
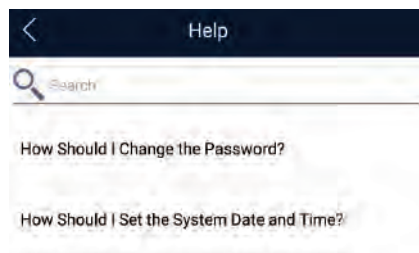
Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-148 Help 1



Step 2 Specify your question. A solution will be displayed.

Figure 7-149 Help 2



----End

7.3.6.3.10 About

Context

You can query the app version, connected product model, SN, firmware version, software version, technical support website, privacy policy (displayed only on the SUN2000 app), customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


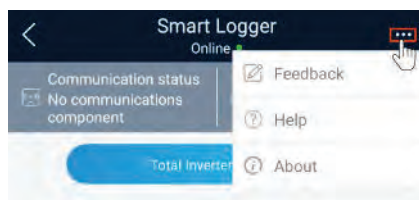
- Step 1** In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, firmware version, software version, and technical support website.

Figure 7-150 About



- Step 2** Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

7.3.6.4 Device Monitoring

A special user can tap **Monitor** to query the running information and alarms about the SmartLogger and the devices connected to it, set parameters, and send commands.

7.3.6.4.1 Query

- Step 1** On the home screen, tap **Monitor** to access the device monitoring screen.

Figure 7-151 Device monitoring



- Step 2** Select a target device to access the function menu screen of the device.
- Step 3** Tap **Alarm**, **Running Info.**, **Energy Yield**, or **About** to view the alarms, running information, energy yield, and version information about the device.

 **NOTE**

- The displayed information varies according to the device type.
- The SmartLogger can connect to third-party devices that support the Modbus-RTU protocol, such as the box-type transformer and EMI. The SmartLogger cannot automatically search user-defined devices. You need to manually add them.
- The SmartLogger can connect to a maximum of five types of user-defined devices and can connect to multiple devices of the same type.
- The SmartLogger can connect to a third-party device that supports IEC103, such as a relay protection or monitoring device like a box-type transformer. The SmartLogger cannot automatically search IEC103 devices. You need to manually add them.
- The SmartLogger can connect to a maximum of five types of IEC103 devices and can connect to multiple devices of the same type.

----End

7.3.6.4.2 Settings

Context

An advanced user can set only the running parameters of solar inverters.

Procedure

- Step 1** Tap **SUN2000** on the **Monitor** screen and select the target device to access the function menu screen of the solar inverter.
- Step 2** Tap **Settings** to access the settings screen.
- Step 3** Set parameters as required.
- Step 4** (Optional) Select parameters as required and tap **Batch set** to set running parameters for multiple solar inverters of the same series.

----End

7.3.6.4.3 Maintenance

?1. Log Download

Context

An advanced user can download only the logs of the SmartLogger, solar inverter, MBUS, and PID module.

Procedure

- Step 1** Select a device on the **Monitor** screen to access the function menu screen of the device.
- Step 2** Tap **Device Logs** to access the log download screen.
- Step 3** Download log files as required.

 **NOTE**

- By default, Android system logs are saved in the **Android/data/com.huawei.smartpvms/files/inverterapp** folder in the phone memory. You can change the save path by referring to "Setting a File Save Path".
- The downloaded solar inverter logs are saved at the **Device Log** directory in **File Manager** in your mobile phone. You can also send the logs to your mailbox for checking.


----End

7.2. Solar Inverter Maintenance

Procedure

Step 1 Tap **SUN2000** on the **Monitor** screen and select the target device to access the function menu screen of the solar inverter.

Step 2 Tap **Maintenance** to access the maintenance screen.

Step 3 Tap  next to **Power on** or **Power off** to perform the operation.

 **NOTE**

Tap **Performance Data** to view the performance data curve of the solar inverter.

Step 4 Enter the password for logging in to the app, and tap **OK**.

----End

7.3.6.5 Power adjustment

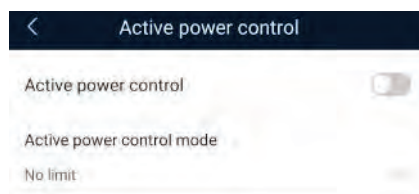
7.3.6.5.1 Active Power Control

Procedure

Step 1 Choose **Power adjustment > Active Power Control** to access the **Active Power Control** screen.

Step 2 Tap **Active power control mode** to set the active power control mode.

Figure 7-152 Active power control



----End

7.3.6.5.2 Setting Reactive Power Control

Procedure

- Step 1** On the home screen, tap **Power adjustment > Reactive Power control** to access the parameter setting screen.
 - Step 2** Tap **Reactive power control mode** to set the active power control mode.
- End

7.4 Operations on the Screen for Connecting to the Smart PCS

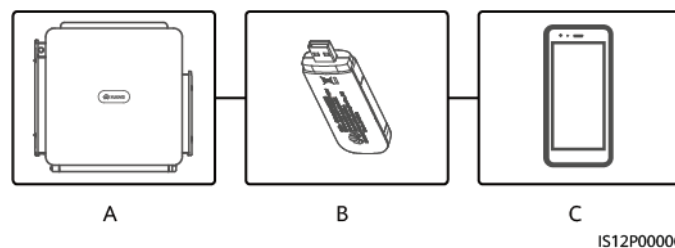
7.4.1 Connection Mode

After the DC or AC side of the Smart PCS is powered on, the app can connect to the Smart PCS through the WLAN module.

NOTICE

The USB-Adapter2000-C WLAN module is supported.

Figure 7-153 WLAN module connection



(A) Smart PCS

(B) WLAN module

(C) Mobile phone

NOTICE

- If the AC switch between the Smart PCS and the power grid is turned on, but the external switch on the DC side of the Smart PCS is turned off, some parameters cannot be set. Turn on the external switch on the DC side, and then reset the parameters.
- Changing the grid code will restore some parameters to factory defaults. After the grid code is changed, check whether the previously set parameters are affected.
- When the Smart PCS receives a reset, shutdown, or upgrade command, it may disconnect from the grid, affecting the energy yield.
- When the equipment is powered on for the first time, ensure that professional personnel set parameters correctly. Incorrect settings may result in inconsistency with local certification and affect the normal operation of the equipment.
- Only professionals are allowed to set the grid, protection, feature, and power adjustment parameters of the Smart PCS. If the grid, protection, and feature parameters are set incorrectly, the Smart PCS may disconnect from the grid. If the power adjustment parameters are set incorrectly, the Smart PCS may not connect to the power grid as required. In these cases, the energy yield will be affected.

NOTE

- Configurable parameters vary depending on the grid code.
- The parameter names, value ranges, and default values are subject to change. The actual display may vary.

7.4.2 Login

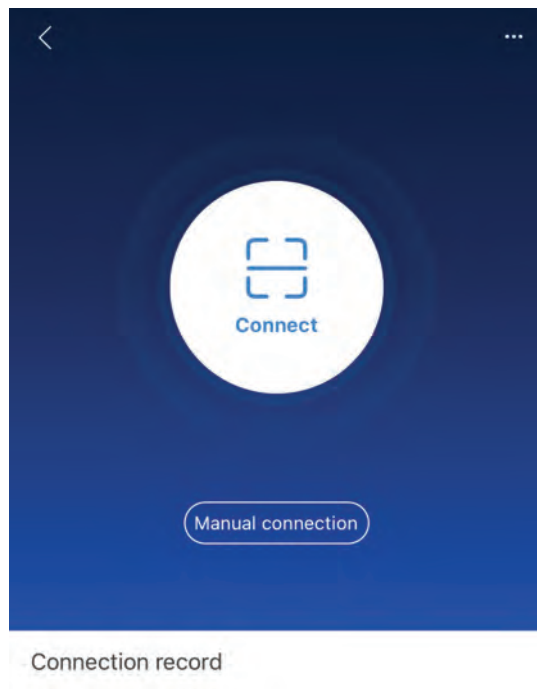
Prerequisites

- The Smart PCS has been powered on.
- The WLAN module has been inserted into the **USB** port of the Smart PCS.
- The WLAN function has been enabled on your phone.
- Keep the mobile phone within 5 m from the Smart PCS. Otherwise, the communication between them might be affected.

Procedure

- Step 1** Connect to the Smart PCS.

Figure 7-154 Connect



- Connection by scanning a QR code: Tap **Connect**. On the scanning screen, place the QR code of the WLAN module in the scanning box to automatically scan and connect to the device.
- Manual connection: Tap **Manual connection** and select a connection mode.

Figure 7-155 Manual connection



- Select **WLAN** and connect to the corresponding hotspot in the WLAN connection list of the app. The initial name of the WLAN hotspot is **Adapter-WLAN module SN**, and the initial password is **Changeme**.

NOTICE

- Use the initial password upon the first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, devices cannot be accessed. In these cases, you should be liable for any loss caused to the PV plant.
- If the **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 2 Select a login user and enter the password.

Figure 7-156 Login



NOTICE

- If the system prompts you to set a password upon the first power-on, set the password before login.
- Ensure account security by changing the password periodically. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, you should be liable for any loss caused to the PV plant.
- You will be locked out for 10 minutes after five failed consecutive password attempts at an interval not longer than two minutes.

Step 3 Log in to the app and access the main menu screen.

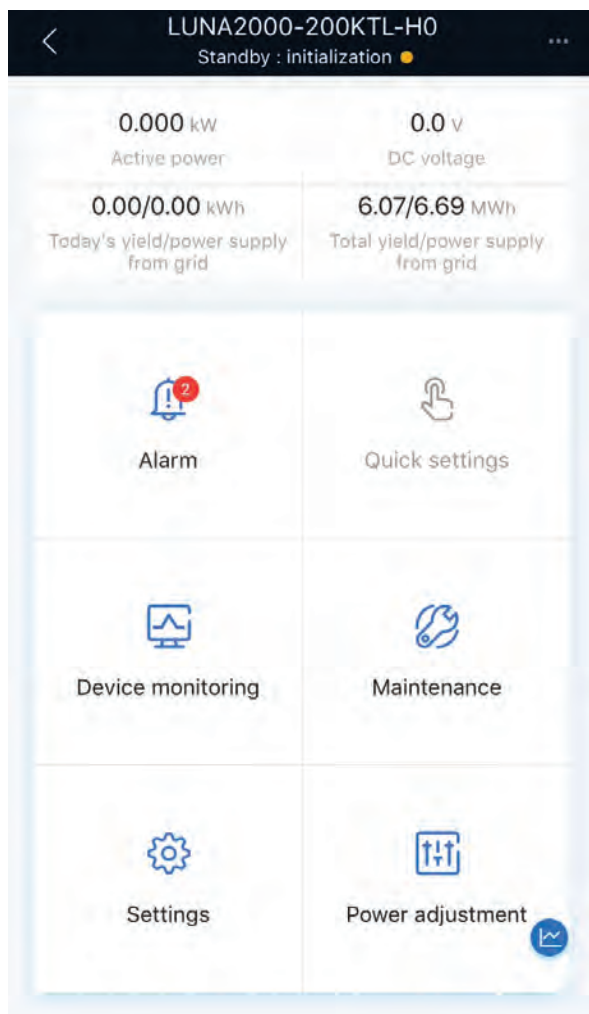
----End

7.4.3 Query

Procedure

- Step 1** After logging in to the app, you can view the active power and energy yield of the Smart PCS on the home screen.

Figure 7-157 Home screen



- Step 2** Tap **Alarms** or **Device Monitoring** to view active alarms, historical alarms, and Smart PCS running information.

On the **Alarms** screen, you can perform the following operations:

- Tap an alarm record and view the alarm details.
- Swipe left or right on the screen or tap **Active Alarms** or **Historical Alarms** to switch between active alarms and historical alarms.

On the **Device Monitoring** screen, you can perform the following operations:

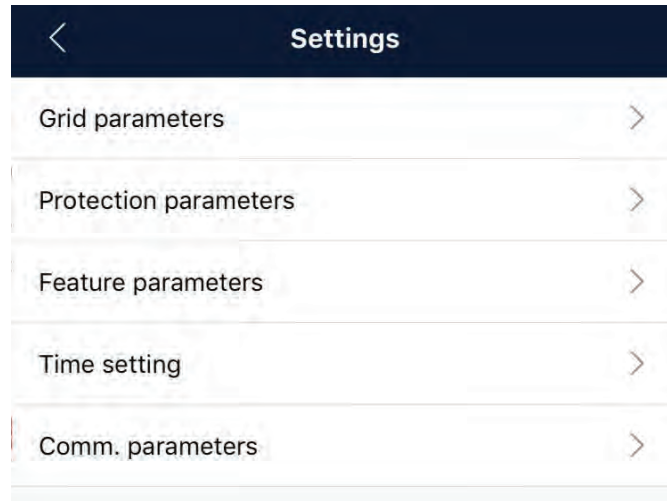
- Tap **Running Info** to view the device running information.
- Tap **Insulation Resistance** to view the insulation resistance of the device.

----End

7.4.4 Settings

On the home screen, tap **Settings** to set grid parameters, protection parameters, feature parameters, and other parameters.

Figure 7-158 Settings



NOTICE

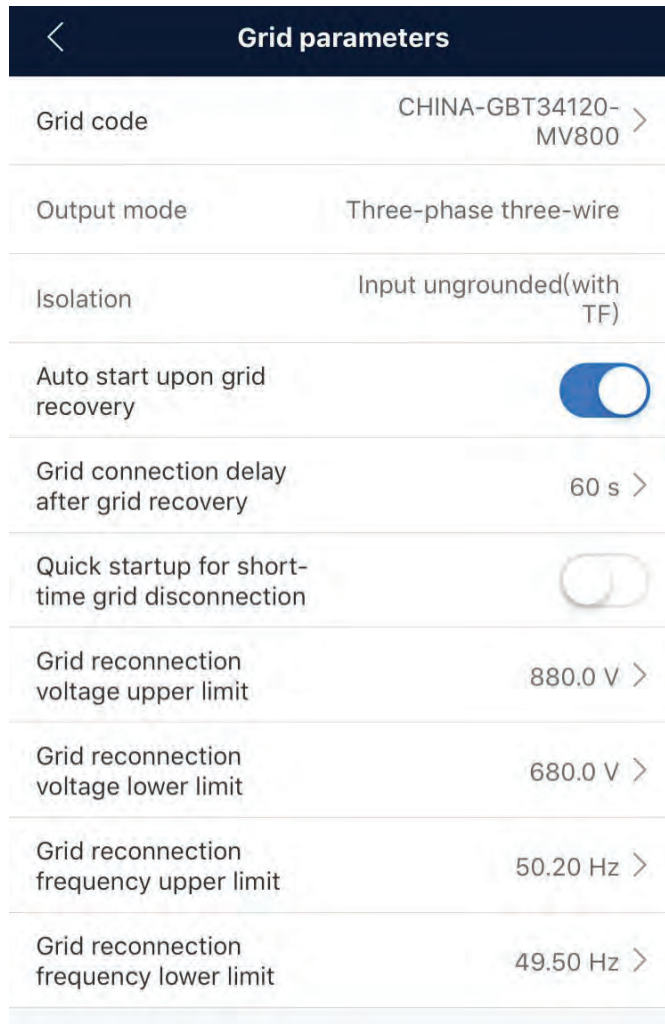
- The parameter ranges vary with the device model. The listed ranges are for reference only.
- The parameter names, value ranges, and default values are subject to change. The actual display may vary.

7.4.4.1 Setting Grid Parameters

Procedure

- Step 1** On the home screen, choose **Settings** > **Grid parameters** to access the parameter setting screen.

Figure 7-159 Grid parameters



----End

7.4.4.2 Setting Protection Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Protection parameters** to access the parameter setting screen.

Figure 7-160 Protection parameters

| Protection parameters | |
|--|------------|
| Insulation resistance protection threshold | 0.050 MΩ > |
| Anti-islanding protection | > |
| Voltage protection | > |
| Overvoltage protection | > |
| Undervoltage protection | > |
| Overfrequency protection | > |
| Underfrequency protection | > |

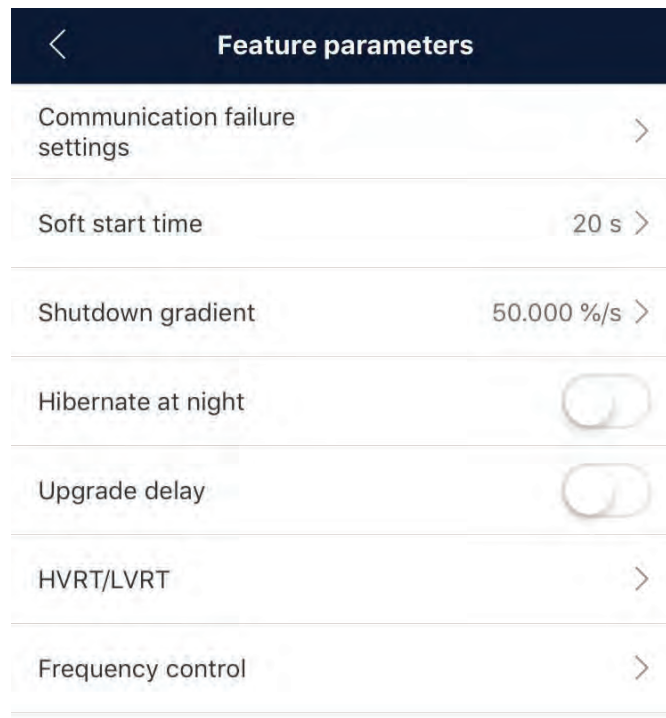
----End

7.4.4.3 Setting Feature Parameters

Procedure

- Step 1** On the home screen, choose **Settings** > **Feature parameters** to access the parameter setting screen.

Figure 7-161 Feature parameters



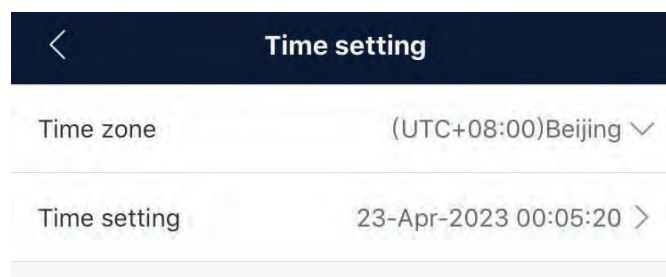
----End

7.4.4.4 Setting the Time

Procedure

Step 1 On the home screen, choose **Settings** > **Time settings** and set time parameters.

Figure 7-162 Time setting



----End

7.4.4.5 Setting a File Save Path

Prerequisites

This function is available only on the Android system.

Context

You can modify the save path for operation logs and Smart PCS logs and export logs from the path.

Procedure

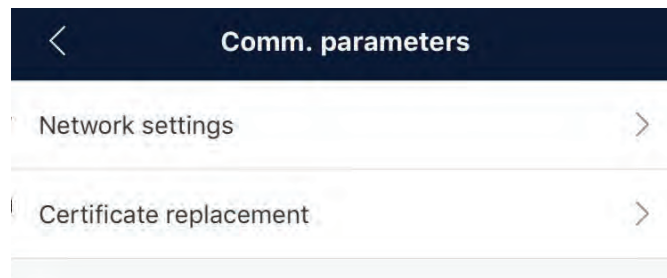
- Step 1** On the home screen, choose **Settings > File save path** to access the path setting screen.
 - Step 2** Tap **File save path** to set the save path.
- End

7.4.4.6 Setting Communications Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Comm. parameters** to access the parameter setting screen.

Figure 7-163 Comm. parameters

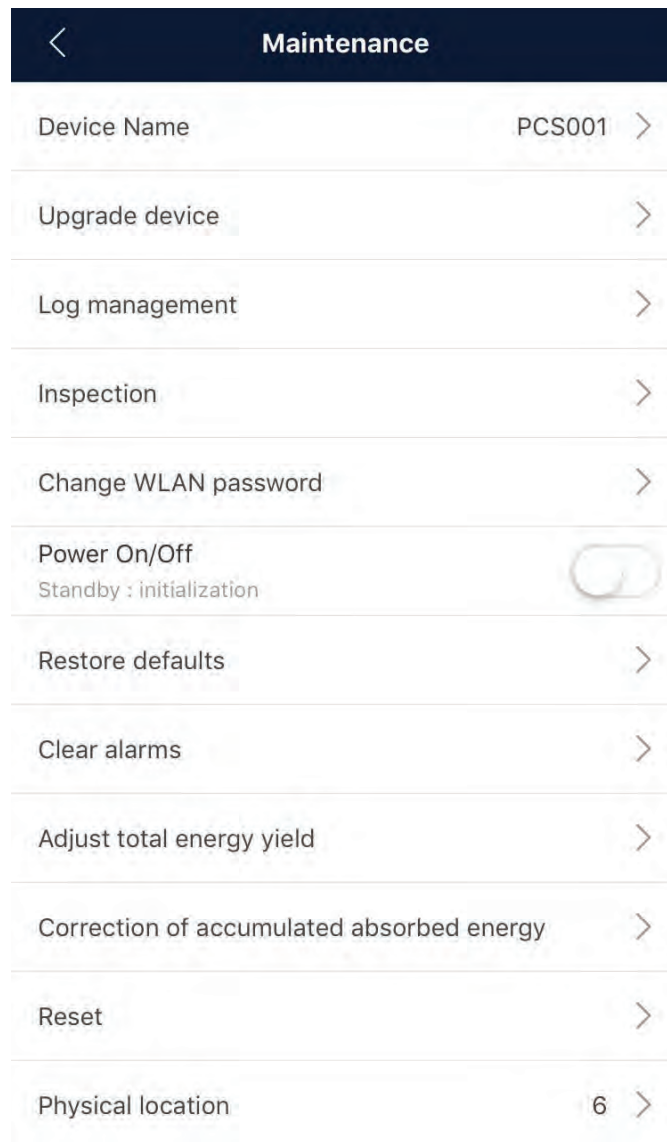


----End

7.4.5 Maintenance

On the home screen, tap **Maintenance**. The **installer** can perform maintenance operations on the Smart PCS, such as upgrade, inspection, power calibration, and power-on and power-off.

Figure 7-164 Maintenance



7.4.5.1 Device Upgrade

Prerequisites

- You have obtained the upgrade package from your supplier or engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.
 - a. Log in to <https://support.huawei.com/enterprise/en/index.html>.
 - b. Navigate to or search for **PGP Verify**.
- In the Android system, the upgrade package has been copied to the app directory **Android/data/com.huawei.smartpvms/files/inverterapp** on the mobile phone. The file name extension of the upgrade package must be .zip.

Procedure

Step 1 On the home screen, choose **Maintenance > Upgrade Device**.

Figure 7-165 Upgrading the Smart PCS



Step 2 Access the device upgrade screen and tap **Upgrade**.

Step 3 Perform operations as prompted.

----End

7.4.5.2 Log Management

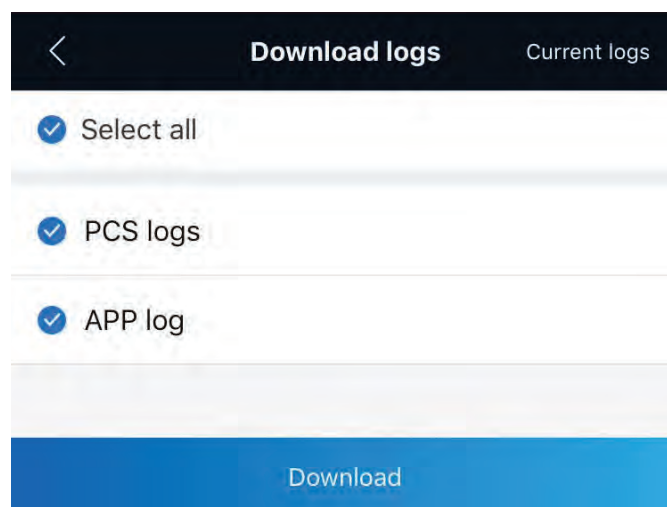
Context

Log management allows you to export operation logs, device alarms, and energy yield information on your mobile phone.

Procedure

Step 1 On the home screen, choose **Maintenance > Log Management** to access the log download screen.

Figure 7-166 Log download



Step 2 Select **PCS logs** or **APP log**.

 **NOTE**

- By default, Android system logs are saved in the **Android/data/com.huawei.smartpvms/files/inverterapp** folder in the phone memory. You can change the save path by setting **File save path**.
- The downloaded logs are saved in the **Device log** directory in **File Manager** on your mobile phone. You can also send the logs to your mailbox for checking.

----End

7.4.5.3 Device Inspection

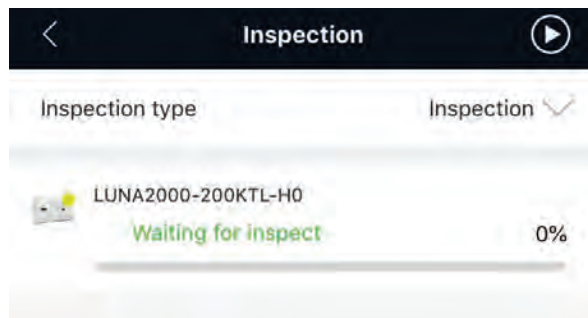
Context

After the Smart PCS is put into use, it needs to be inspected periodically to eliminate potential risks and detect potential problems in a timely manner.

Procedure

- Step 1** On the home screen, choose **Maintenance > Inspection** to access the inspection screen.

Figure 7-167 Device inspection




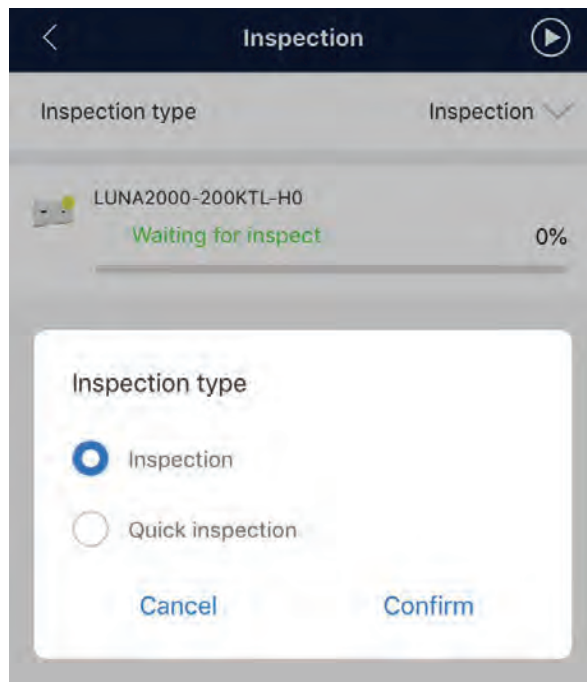
- Step 2** Set **Inspection type** and tap  in the upper right corner of the screen to start inspection for Smart PCS devices.

Figure 7-168 Inspection types



----End

7.4.5.4 Changing the WLAN Password

Context

To ensure account security, tap **Maintenance** on the home screen to change the WLAN password.

NOTE

If the communication between the app and Smart PCS is not implemented through a WLAN connection, the **Change WLAN Password** screen is not displayed.

Procedure

- Step 1** On the **Maintenance** screen, tap **Change WLAN Password** to access the password change screen.
- Step 2** Enter the old password, new password, and confirm password, and tap **OK**.

NOTE

The password must meet the following requirements:

- Contains 8 to 30 characters.
- Contains at least two types of lowercase letters, uppercase letters, and digits.

----End

7.4.5.5 Power-On/Off

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap  next to **On/Off**.

Step 3 Enter the app login password and tap **OK**.

----End

7.4.5.6 System Reset

Context

After the system is reset, the Smart PCS restarts.

Procedure

Step 1 Choose **Maintenance > Reset**. The **System Reset** dialog box is displayed.

Step 2 Enter the app login password and tap **OK**.

----End

7.4.5.7 Factory Setting Restoration

Context

NOTICE

Perform this operation with caution because all configured parameters except the current date, time, baud rate, and address will be restored to their factory default values. This operation will not affect operating information, alarm records, or system logs.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **Restore Factory Settings**.

Step 3 Enter the app login password and tap **OK**.

----End

7.4.5.8 Alarm Clearance

Context

After alarms are reset, all active and historical alarms of the Smart PCS connected to the app are cleared.

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap **Clear Alarms**.

Step 3 Enter the app login password and tap **OK**.

----End

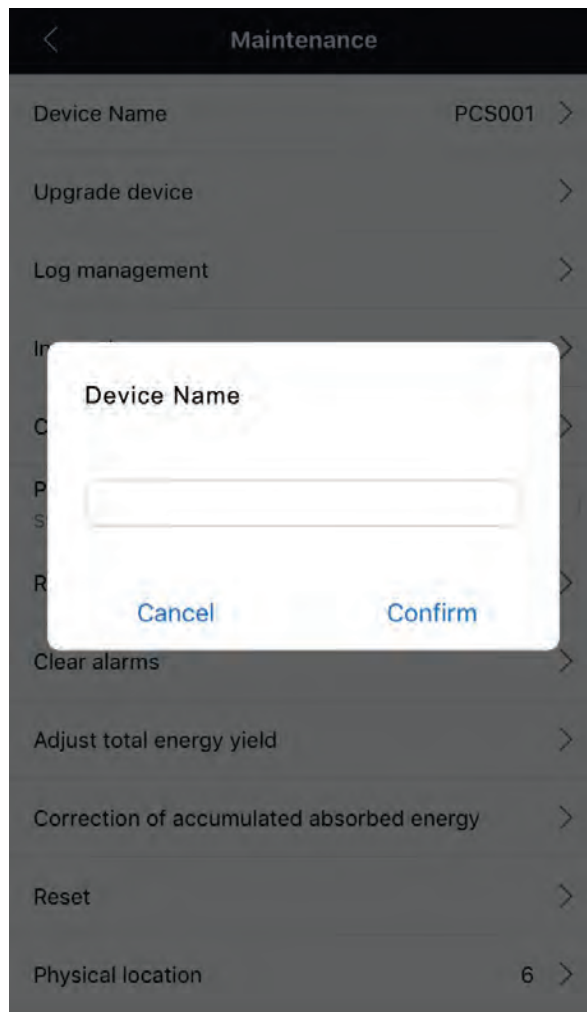
7.4.5.9 Device Name Change

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Step 2 Tap a device name to change it.

Figure 7-169 Changing a device name



----End

7.4.5.10 Total Energy Yield Adjustment

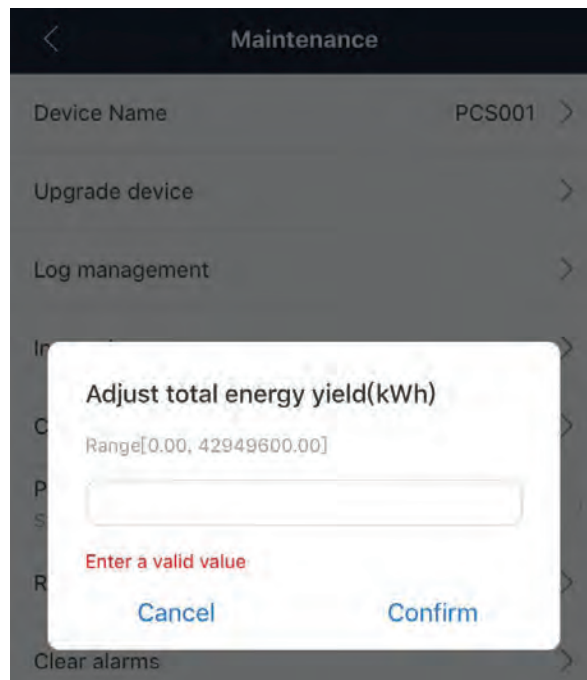
Context

Adjust the cumulative energy yield of the Smart PCS to ensure that the reported energy yield is consistent with the actual energy yield absorbed by the grid-tied point.

Procedure

1. On the home screen, tap **Maintenance** to access the maintenance screen.
2. Tap **Adjust total energy yield**.
3. Enter the app login password and tap **OK**.

Figure 7-170 Adjusting total energy yield



7.4.5.11 Correction of accumulated absorbed energy

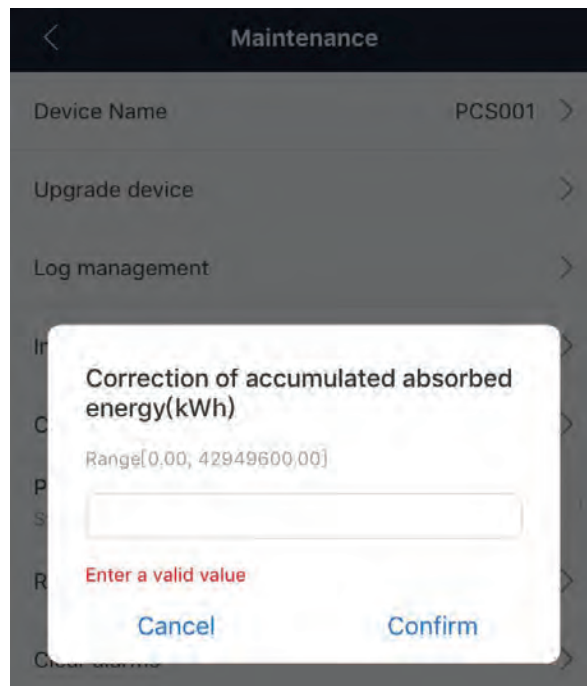
Context

Adjust the cumulative absorbed energy of the Smart PCS to ensure that the reported energy yield is consistent with the actual energy yield absorbed by the grid-tied point.

Procedure

1. On the home screen, tap **Maintenance** to access the maintenance screen.
2. Tap **Correction of accumulated absorbed energy**.

Figure 7-171 Correction of accumulated absorbed energy



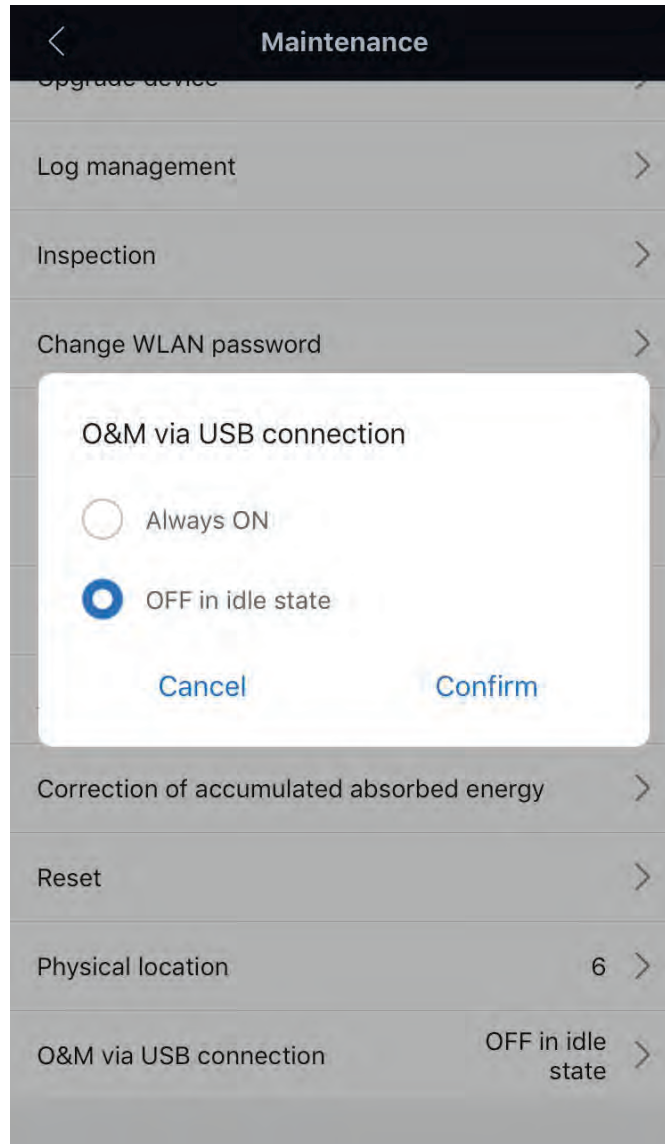
7.4.5.12 O&M via USB connection

Context

By default, the USB O&M policy is permanently enabled. After this function is enabled, you can perform local maintenance operations such as upgrading devices and exporting logs over the USB port.

Procedure

1. On the home screen, tap **Maintenance** to access the maintenance screen.
2. Tap **O&M via USB connection**.



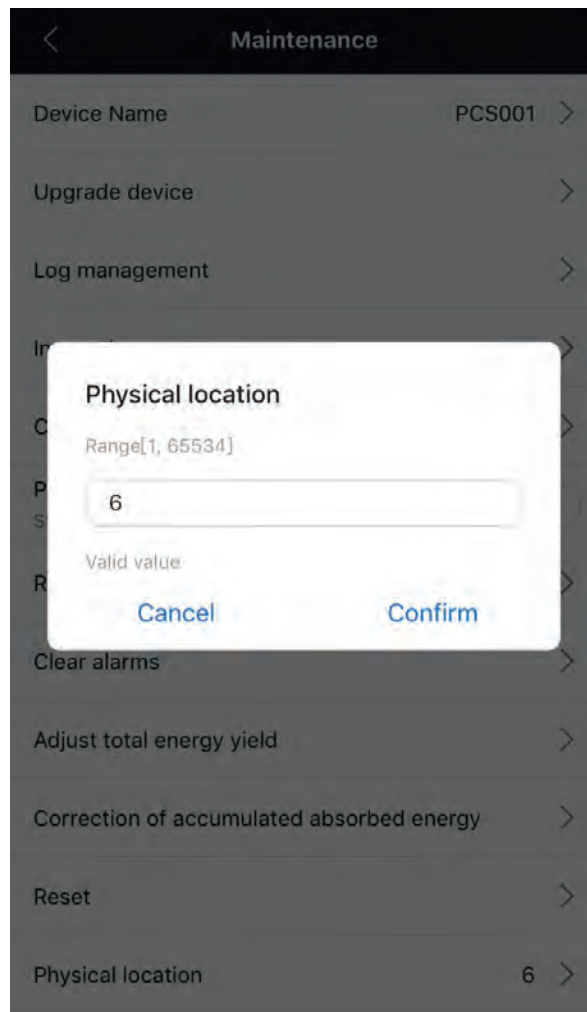
7.4.5.13 Physical Location

If there are multiple Smart PCSs in an ESS network, you can customize the physical location for each Smart PCS based on the installation scenario.

Procedure

1. On the home screen, tap **Maintenance** to access the maintenance screen.
2. Tap **Physical location**.

Figure 7-172 Physical location



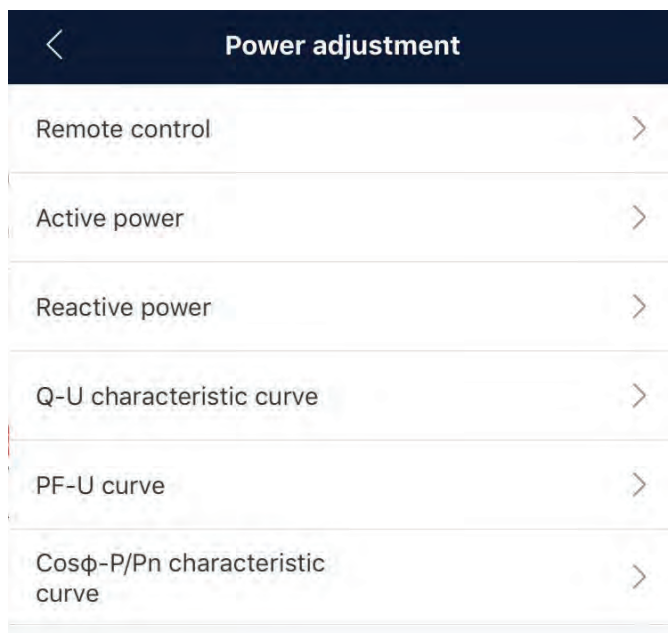
7.4.6 Power Adjustment

Context

The **installer** user can set parameters such as the active power and reactive power for the Smart PCS.

Procedure

Step 1 On the home screen, tap **Power adjustment**.

Figure 7-173 Power adjustment

Step 2 Set power control parameters based on the PV plant requirements.

----End

7.5 Operations on the Screen for Connecting to the Central Monitoring Unit

7.5.1 Connection Mode

After the central monitoring unit (CMU) is powered on, it can connect to the app over a built-in WLAN module.

7.5.2 Device Connection

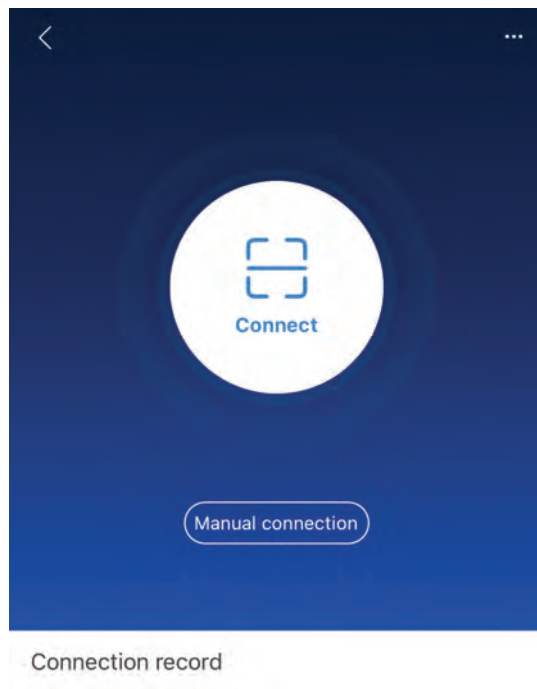
Prerequisites

- The CMU has been powered on.
- By default, the WLAN function of the CMU is disabled when the CMU is idle. Before connecting to the CMU, ensure that the WLAN function is enabled.
- The WLAN function has been enabled on your phone.
- Keep the mobile phone within 5 m away from the CMU. Otherwise, the communication signal quality between the app and the CMU will be affected.

Procedure

Step 1 Connect to the CMU.

Figure 7-174 Connect



- Manual connection: Tap **Manual connection** and select a connection mode.
- Connection by scanning a QR code: Tap **Connect**. On the scanning screen, place the QR code or bar code of the device in the scanning box to automatically scan and connect to the device.

Figure 7-175 Manual connection



- Select **WLAN** and connect to the corresponding hotspot in the WLAN connection list of the app. The initial name of the built-in WLAN is **Monitor_SN bar code**, and the initial password is **Changeme**.

NOTICE

- Use the initial password upon the first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, you need to restore the device to factory settings. In these cases, you should be liable for any loss caused to the PV plant.
- If the **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 2 Select a login user, enter the login password, and tap **Log In**.

Figure 7-176 Login



NOTICE

- If the system prompts you to set a password upon the first power-on, set the password before login.
 - Ensure account security by changing password periodically. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, you should be liable for any loss caused to the PV plant.
 - You will be locked out for 10 minutes after five failed consecutive password attempts at an interval not longer than two minutes.
-

Step 3 After the login is successful, check that the home screen is displayed.

----End

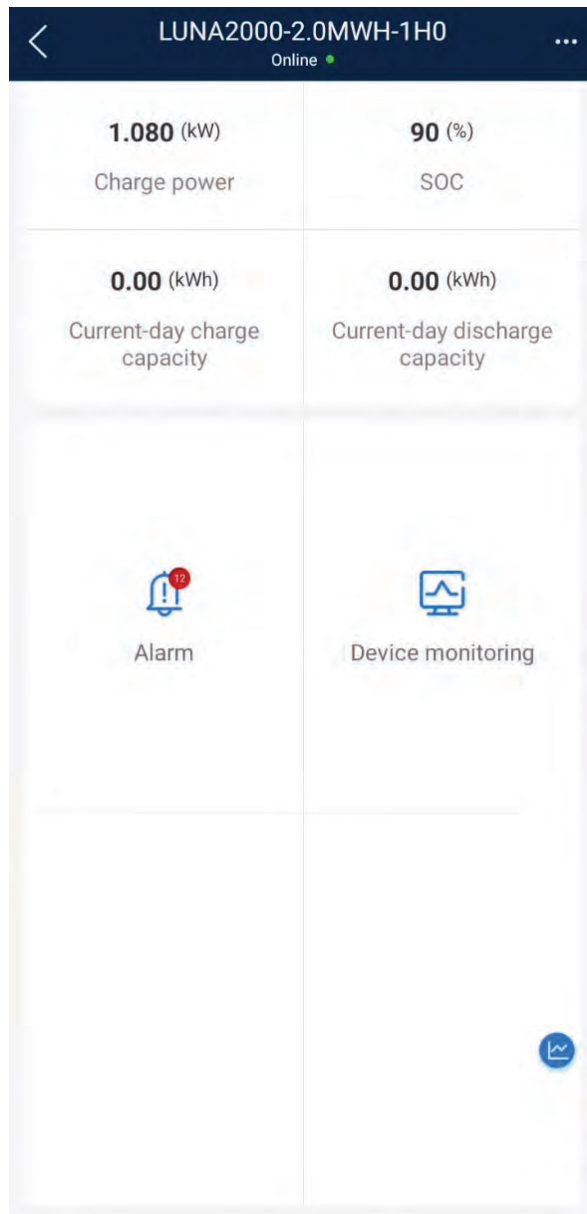
7.5.3 UI Operations (user)

7.5.3.1 Query

Procedure

- Step 1** After logging in to the app, you can view the running data of the connected CMU on the home screen.

Figure 7-177 Home screen



- Step 2** Tap **Alarm** to view active alarms and historical alarms.

On the alarm management page, you can perform the following operations:

- Tap an alarm record and view the alarm details.
- Swipe left or right on the screen or tap **Active Alarms** or **Historical Alarms** to switch between active alarms and historical alarms.

----End

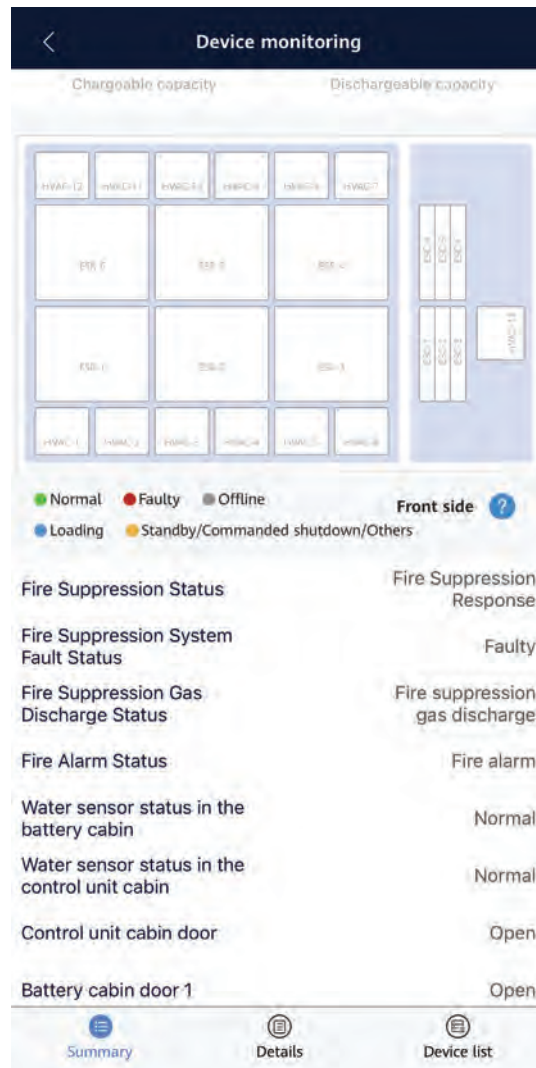
7.5.3.2 Device Monitoring

The **user** can view the device status and running status of the CMU and the devices connected to the CMU by using **Device monitoring**.

Procedure

Step 1 On the home screen, tap **Device monitoring**.

Figure 7-178 Device monitoring



Step 2 Tap **Overview** or **Detail** to view the device status and running information.

Step 3 Tap **Device list** and select the desired device to access its main menu screen.

Step 4 Tap **Running Info** to view the running information about the device.

NOTE

The displayed information varies depending on the device model or software version. The actual screen may vary.

----End

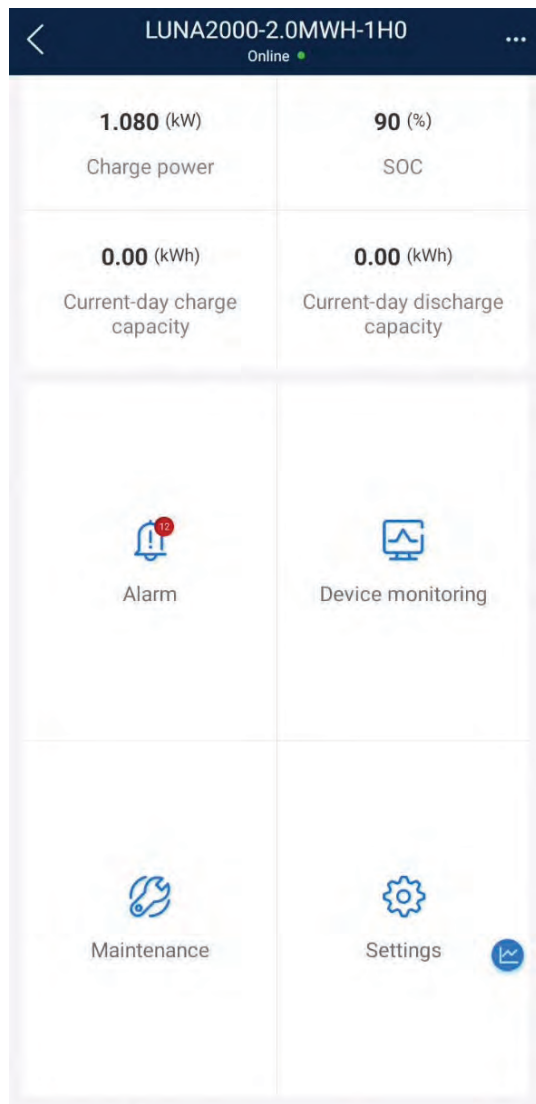
7.5.4 UI Operations (installer)

7.5.4.1 Query

Procedure

Step 1 After logging in to the app, you can view the running data of the connected CMU on the home screen.

Figure 7-179 Home screen



Step 2 Tap **Alarm** to view active alarms and historical alarms.

On the alarm management page, you can perform the following operations:

- Tap an alarm record and view the alarm details.
- Swipe left or right on the screen or tap **Active Alarms** or **Historical Alarms** to switch between active alarms and historical alarms.

----End

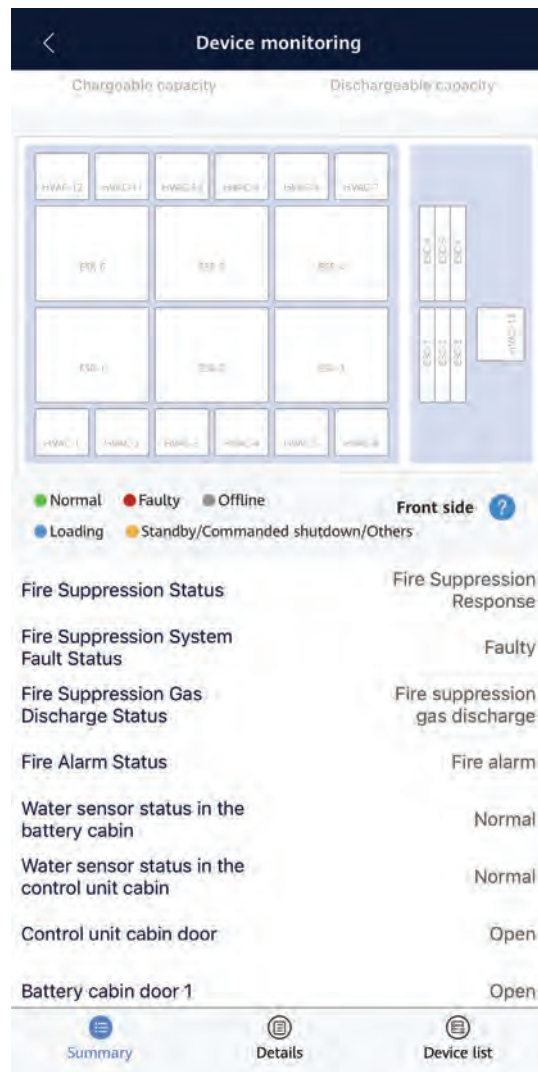
7.5.4.2 Device Monitoring

By using the **Device monitoring** function, the **installer** can view the running information and alarms about the CMU and the devices connected to the CMU, set parameters, and send commands.

7.5.4.2.1 Query

Step 1 On the home screen, tap **Device monitoring**.

Figure 7-180 Device monitoring



Step 2 Tap **Overview** or **Detail** to view the device status and running information.

Step 3 Tap **Device list** and select the desired device to access its main menu screen.

Step 4 Tap **Running Info**, **Maintenance**, or **Settings** to view device running information, maintain devices, and set device parameters, respectively.

 **NOTE**

The displayed information varies depending on the device model or software version. The actual screen may vary.

----End

7.5.4.2.2 Settings

Procedure

- Step 1** On the **Device monitoring** screen, tap **Device list** and select the desired device to access its main menu screen.
- Step 2** Tap **Settings** to access the settings screen.
- Step 3** Set parameters as required.

----End

7.5.4.2.3 Maintenance

Procedure

- Step 1** On the **Device monitoring** screen, tap **Device list** and select the desired device to access its main menu screen.
- Step 2** Tap **Maintenance** to access the maintenance screen.
- Step 3** Set parameters as required.

----End

7.5.4.3 Settings

On the home screen, tap **Settings** to set feature parameters.

NOTICE

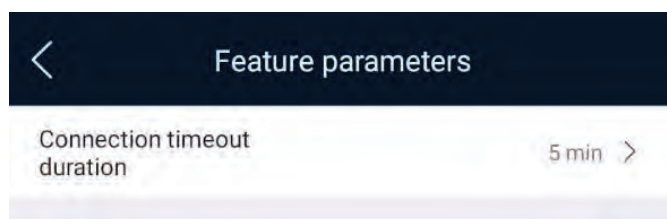
- The parameter ranges vary with the device model. The listed ranges are for reference only.
 - The parameter names, value ranges, and default values are subject to change. The actual display may vary.
-

7.5.4.3.1 Setting Feature Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Feature parameters** to access the parameter setting screen.

Figure 7-181 Feature parameters



----End

7.5.4.3.2 Setting the Time

Procedure

Step 1 On the home screen, choose **Settings > Time settings** and set time parameters.

Figure 7-182 Time setting

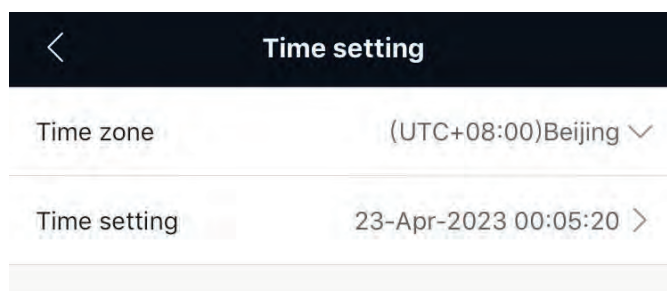


Table 7-11 Time setting

| Parameter | Setting |
|--------------|-------------------------------------|
| Time zone | Specifies the time zone. |
| Time setting | Specifies the system date and time. |

----End

7.5.4.3.3 Setting Communications Parameters

Procedure

Step 1 On the home screen, choose **Settings > Comm. parameters** to access the parameter setting screen.

Figure 7-183 Comm. parameters

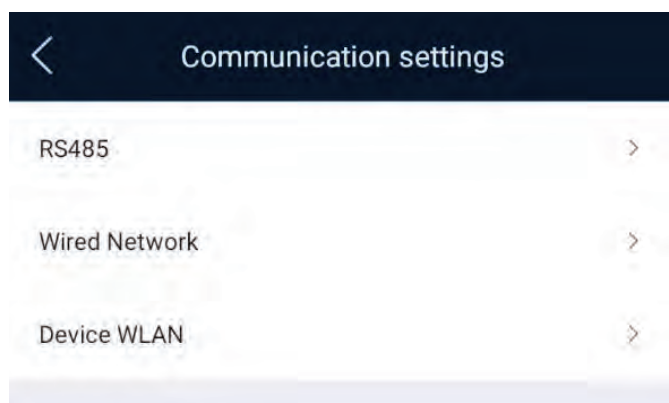


Table 7-12 Communications parameter settings

| Parameter | Setting |
|---------------|---------------------------------------|
| RS485 | Sets RS485 communications parameters. |
| Wired Network | Sets wired network parameters. |
| Device WLAN | Sets WLAN communication parameters. |

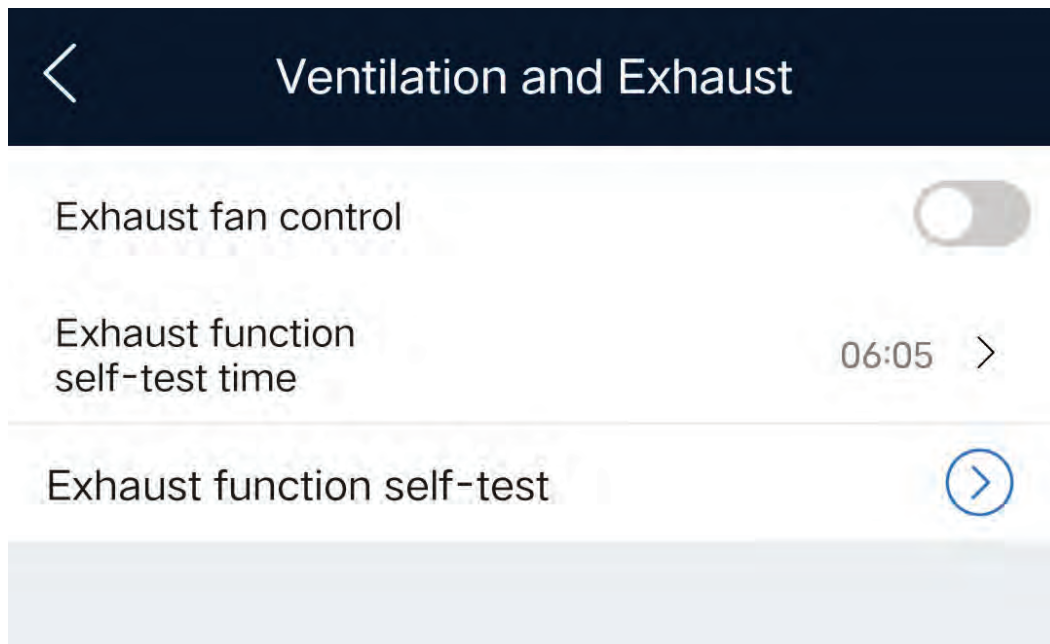
----End

7.5.4.3.4 Setting Ventilation and Exhaust

Procedure

Step 1 On the home screen, choose **Settings > Ventilation and Exhaust**.

Figure 7-184 Ventilation and Exhaust



----End

7.5.4.3.5 Setting Environment Parameters

Procedure

Step 1 On the home screen, choose **Settings > Environment parameters**.

Figure 7-185 Environment parameters



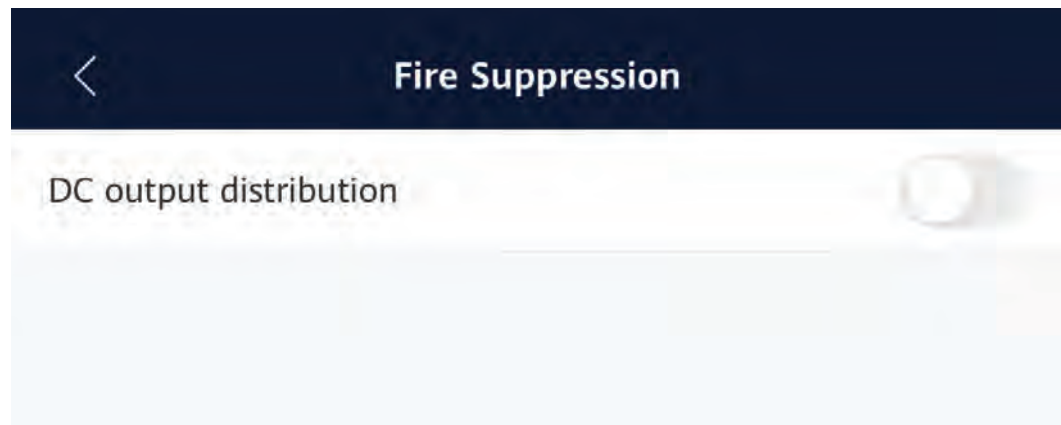
----End

7.5.4.3.6 Setting Fire Suppression

Procedure

Step 1 On the home screen, choose **Settings > Fire Suppression**.

Figure 7-186 Fire Suppression



----End

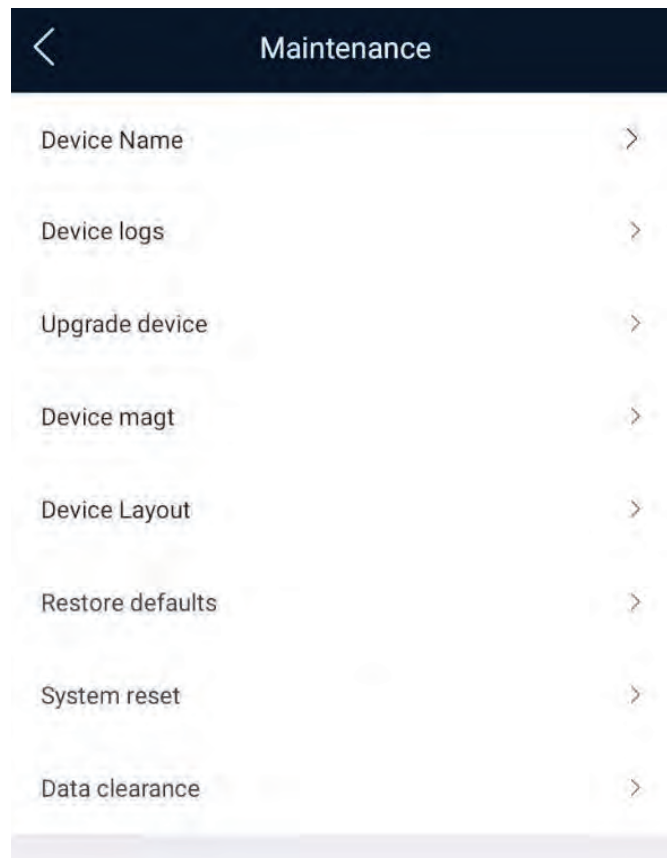
7.5.4.4 System Maintenance

7.5.4.4.1 Device Name Change

Procedure

- Step 1** Choose **Maintenance > Device Name** and follow the onscreen instructions to set or change the device name.

Figure 7-187 Device name




----End

7.5.4.4.2 Device Log Export

Prerequisites

A USB flash drive has been inserted into the USB port on the CMU.

Procedure

- Step 1** Choose **Maintenance** > **Device logs** to access the **Log download** screen.
- Step 2** Tap  in the upper right corner of the screen, select the device whose logs are to be exported, and tap **Next**.
- Step 3** Select the type of logs to be exported and tap **OK** to start exporting device logs.

NOTE

The successfully exported device logs are available in the storage path of the USB flash drive.

----End

7.5.4.4.3 Device Upgrade

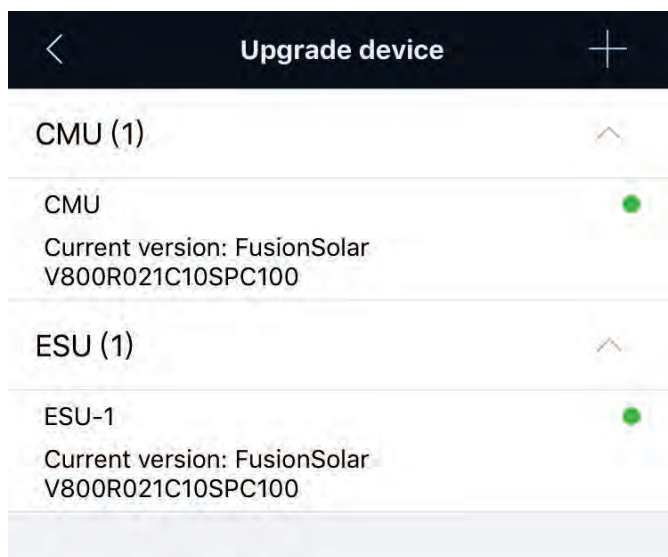
Prerequisites


- You have obtained the upgrade package with the help of the supplier or Huawei engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.
 - a. Log in to Huawei enterprise technical support website <http://support.huawei.com/enterprise>.
 - b. Browse or search for **PGP Verify**.
- You have inserted the USB flash drive where the upgrade package is saved into the USB port on the CMU.

Procedure

Step 1 Choose **Maintenance > Upgrade device**.

Figure 7-188 Upgrade device



Step 2 Tap  in the upper right corner of the screen, select a single device or devices of the same type, and tap **Next**.

Step 3 Select the upgrade package and tap **Next**.

Step 4 Confirm the upgrade package and the device to be upgraded and tap **Finish** to start upgrading the device.

----End

7.5.4.4.4 Device Management

7.1. Manually Adding a Device

Procedure


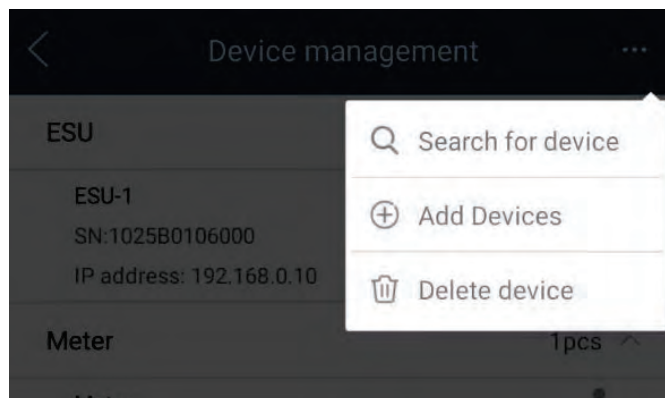
- Step 1** Choose **Maintenance > Device Management**.
- Step 2** Tap  in the upper right corner of the **Device Management** screen.
- Step 3** Tap **Add Devices** and set device parameters.

Figure 7-189 Add Devices



----End

7.2. Automatically Searching for Devices

Procedure


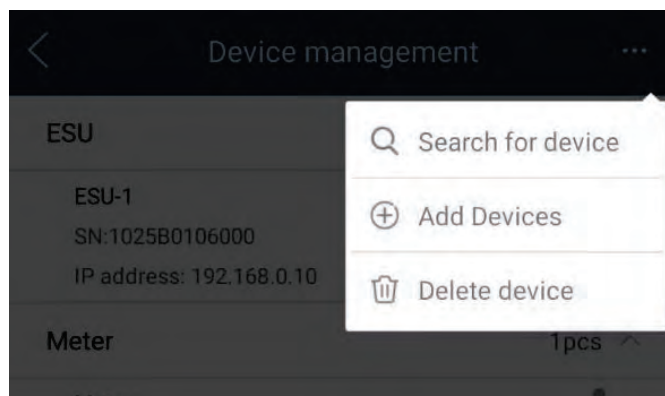
- Step 1** Choose **Maintenance > Device Management**.
- Step 2** Tap  in the upper right corner of the **Device Management** screen.
- Step 3** Tap **Search for device**.

Figure 7-190 Search for device



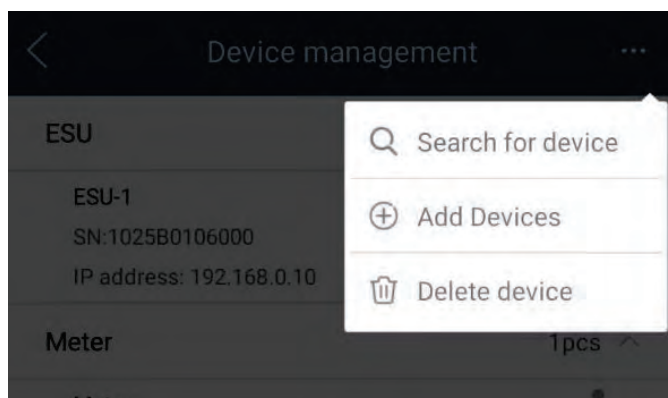
----End

7.3. Deleting a Device

Procedure

- Step 1** Choose **Maintenance > Device Management**.
- Step 2** Tap **⋮** in the upper right corner of the **Device Management** screen.
- Step 3** Tap **Delete device**.

Figure 7-191 Delete device



- Step 4** Select the device to be deleted and tap **Delete**.

NOTE

Deleted devices are not displayed on the **Device monitoring** screen.

----End

7.5.4.4.5 Device Layout

Context


After the device is powered on, if an air conditioner exists in the ESS, you need to manually bind the SN in the physical location. Otherwise, the running data of the air conditioner cannot be displayed on the monitoring screen.

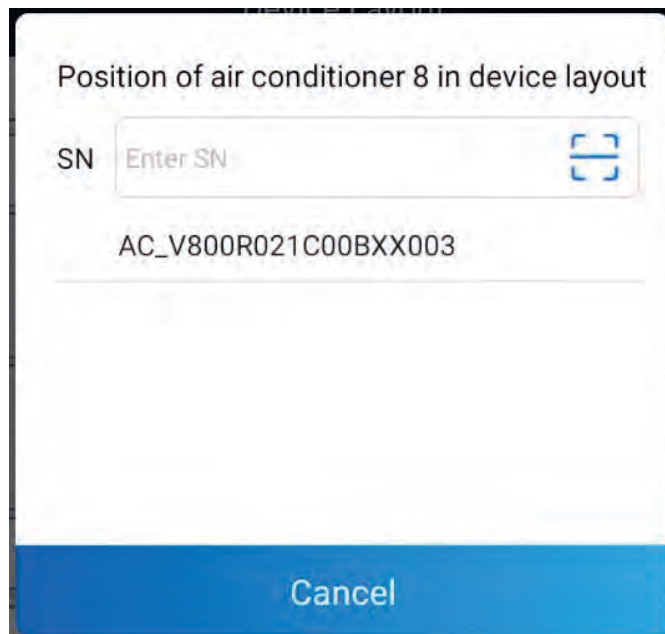
Procedure

- Step 1** Choose **Maintenance > Device Layout**.
- Step 2** Tap **Edit**, and tap **+** based on the physical location of the device.

Figure 7-192 Device Layout



Step 3 In the dialog box that is displayed, select the SN of the target air conditioner or tap  and scan the QR code on the air conditioner to add the SN, and then tap **OK**.



 **NOTE**

The device layout varies depending on the device model or software version. The actual screen prevails.

----End

7.5.4.4.6 Factory Setting Restoration

Context

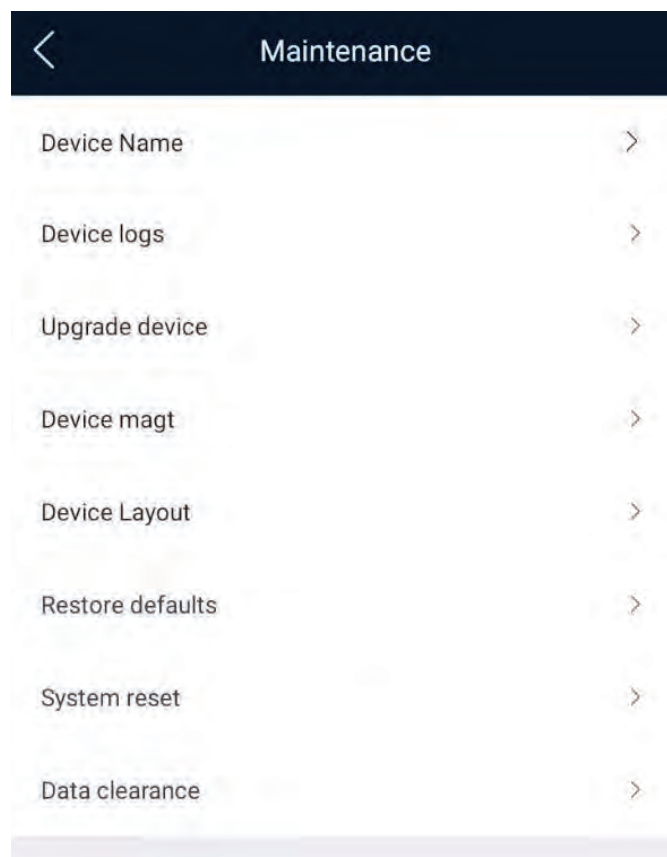
NOTICE

Perform this operation with caution because all configured parameters except the current date, time, baud rate, and address will be restored to their factory default values. This operation will not affect operating information, alarm records, or system logs.

Procedure

- Step 1** Choose **Maintenance > Restore defaults** and follow the onscreen instructions to restore the phone to its factory settings.

Figure 7-193 Restore defaults



----End

7.5.4.4.7 System Reset

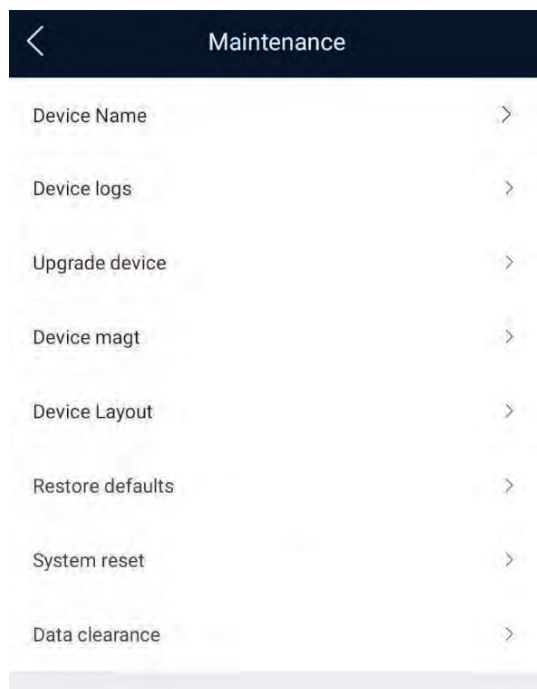
Context

The CMU will automatically restart after receiving the reset command.

Procedure

- Step 1** Choose **Maintenance > System reset** and follow the onscreen instructions to reset the system.

Figure 7-194 System reset



----End

7.5.4.4.8 Data Clearance

Context

Clear data if the CMU is relocated and its historical data needs to be deleted.

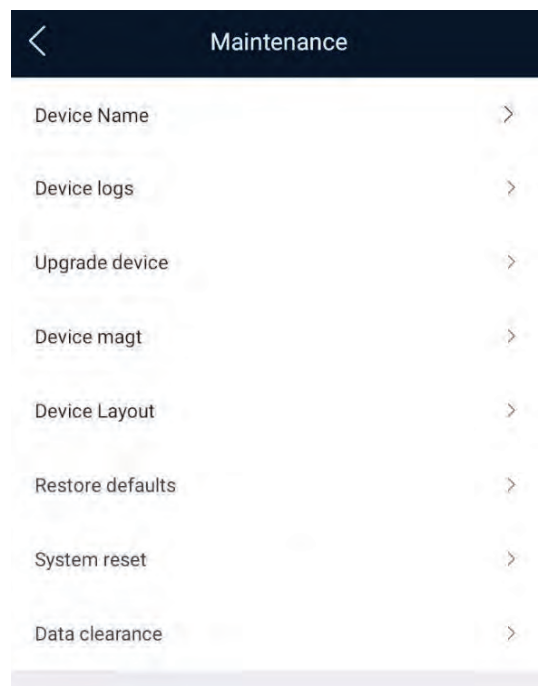
NOTICE

- The **Data clearance** operation clears all charge/discharge capacity, performance data, and alarms from the CMU.
 - The **Data clearance** operation does not delete the devices connected to the CMU. If a device is no longer required for the CMU, perform the **Remove device** operation.
 - If you tap **Data clearance** on the CMU, you must tap **Alarm reset** on the NMS. Otherwise, the alarm information collected by the NMS and CMU is inconsistent.
-

Procedure

- Step 1** Choose **Maintenance > Clear clearance** and follow the onscreen instructions to clear data.

Figure 7-195 Data clearance



----End

7.6 Operations on the Screen for Connecting to the PID Module

NOTICE

The figures and data displayed in this chapter are for reference only.

7.6.1 PID Module

Connection Modes

After the SmartPID2000 (PID module for short) is powered on, it can connect to the app over a WLAN module, a Bluetooth module, or a USB data cable.

Table 7-13 Product mapping (Android)

| PID Module | PID Module Version | App Version | Connection Mode | |
|--------------|---|-------------|--|----------------|
| | | | USB-Adapter2000-C WLAN Module/ USB-Adapter2000-B Bluetooth Module | USB Data Cable |
| SmartPID2000 | SmartPID2000 V100R001C00 and later versions | 3.2.00.005 | Supported | |

Table 7-14 Product mapping (iOS)

| PID Module | PID Module Version | App Version | Connection Mode | |
|--------------|---|-------------|---------------------------------------|----------------|
| | | | USB-Adapter2000-B Bluetooth Module | USB Data Cable |
| SmartPID2000 | SmartPID2000 V100R001C00 and later versions | 2.2.00.050 | Supported | Not supported |

7.6.2 Required Accessories

Mobile Phone

- Mobile phone operating system: Android 4.4 or later.
- Recommended phone brands: Huawei and Samsung.
- The mobile phone supports the access to the Internet over a web browser.
- WLAN/Bluetooth supported.

WLAN/Bluetooth Module

Purchase a WLAN/Bluetooth module that matches the PID module. A WLAN/Bluetooth module purchased from any other source may not support communication between the app module and the PID module.

Table 7-15 WLAN/Bluetooth module model

| Model | Module | Item Code | Purchased From |
|-------------------|------------------|-----------|------------------------------|
| USB-Adapter2000-C | WLAN module | 02312MCK | Can be purchased from Huawei |
| USB-Adapter2000-B | Bluetooth module | 02311NEA | |
| BF4030 | Bluetooth module | 06080358 | |

USB Data Cable

The USB data cable is delivered with the phone.

7.6.3 User Operation Permissions

The user accounts that can log in to the app are classified into common users, special users, and advanced users based on the responsibilities of PV plant operation personnel.

- Common user: Has the permissions of viewing PID module data and setting user parameters.
- Advanced users: Has the permissions of viewing PID module data, setting functional parameters, and maintaining devices.
- Special user: Has the permissions of viewing PID module data, setting user parameters, and maintaining devices (including starting and shutting down the PID module, clearing data, and upgrading devices).

Figure 7-196, **Figure 7-197** and **Figure 7-198** show the menu operation permissions of common users, advanced users, and special users respectively.

Figure 7-196 Operation permissions of common users

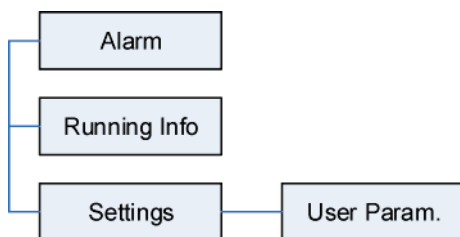
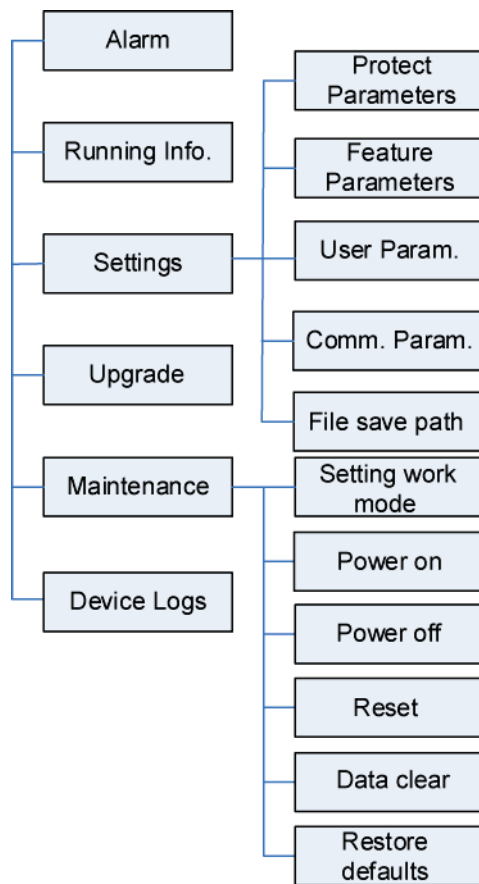


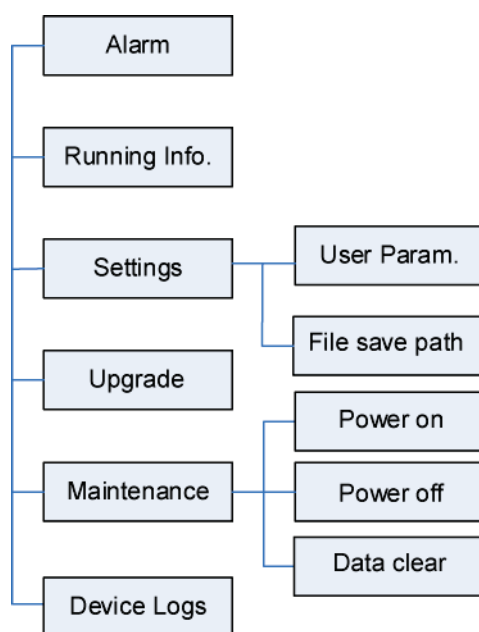
Figure 7-197 Operation permissions of advanced users



NOTE

File save path is available only for Android system.

Figure 7-198 Operation permissions of special users



 NOTE

File save path is available only for Android system.

7.6.4 Login the SUN2000 APP

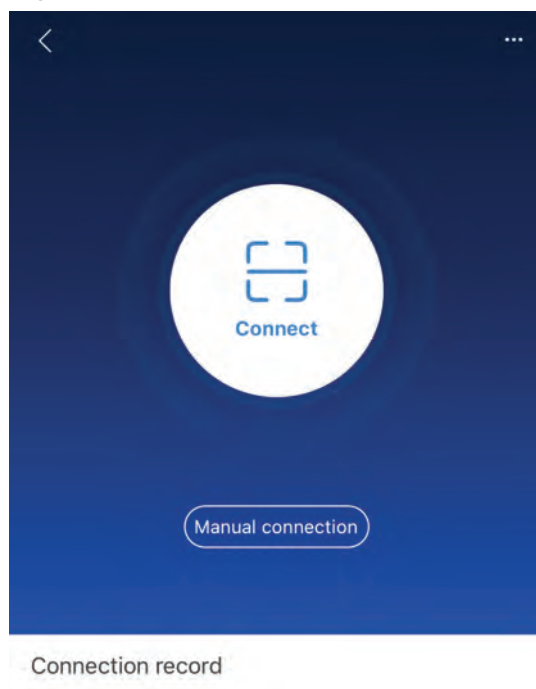
Prerequisites

- The PID module has been powered on.
- Connect over a Bluetooth module:
 - a. A WLAN/Bluetooth module is available and has been inserted into the USB port in the PID module maintenance compartment.
 - b. The WLAN/Bluetooth function is enabled on the mobile phone.
 - c. Keep the mobile phone within 5 m away from the PID module. Otherwise, communication between them would be affected.
- Connect over a USB data cable:
 - a. A USB data cable is available. One end of the USB data cable is connected to the USB port in the PID module maintenance compartment and the other end is connected to the USB port on the mobile phone.
 - b. After connecting the USB data cable, **Connected to USB Accessory** is displayed on the mobile phone, indicating that the PID module and the mobile phone have been successfully connected. Otherwise, the USB data cable connection is invalid.

Procedure

- Step 1** Start the app. Tap **Connect** to access the code scanning screen and connect to the PID module.

Figure 7-199 Connect



- Code scanning: Tap **Connect**, on the scanning screen, place the QR code or bar code of the WLAN/Bluetooth module in the scan frame. The device will be automatically connected after the code is identified.
- Manual connection: Tap **Manual Connection** and select a connection mode.

Figure 7-200 Manual connection



- Select **WLAN** and connect to the corresponding WLAN in the WLAN connection list of the APP. The initial name of the WLAN hotspot is **Adapter-WLAN module SN**, and the initial password is **Changeme**.

NOTICE

Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.

- Select **Bluetooth**, and tap **Search for device**. After a Bluetooth device is found, select the target Bluetooth device, and set up a connection. If the Bluetooth module is USB-Adapter2000-B, the connected Bluetooth device is named after last 8 digits of the SN barcode + HWAPP. The SN barcode can be obtained from the silk screen on the Bluetooth module.
- Select **USB**, and tap **OK** to allow the app to access the USB accessory. After you select **Use by default for this USB accessory**, the message will

not appear if you log in to the app again without removing the USB data cable.

Step 2 Select a login user and enter the password.

 **NOTE**

- The login password is the same as that for the PID module connected to the app and is used only when the PID module connects to the app.
- The initial passwords for **Common User**, **Advanced User**, and **Special User** are all **00000a**. If you log in to the system for the first time, use the initial password and change the password as soon as possible. After the password is used for a period of time, change it periodically to ensure account security.
- During the login, if five consecutive invalid password entries are made (the interval between two consecutive entries is less than 2 minutes), the account will be locked for 10 minutes. The password should consist of six characters.

Step 3 After successful login, the **Quick Settings** screen or **Function Menu** screen is displayed.

 **NOTE**

- If you log in to the app after the PID module powers on for the first time or factory defaults are restored, the **Quick Settings** screen will be displayed. You can set basic parameters for the PID module on the **Quick Settings** screen. After the settings take effect, you can access the **Function Menu** screen and modify the parameters on the **Settings** screen.
- If you do not set basic parameters for the PID module on the **Quick Settings** screen, the screen is still displayed when you log in to the app next time.

----End

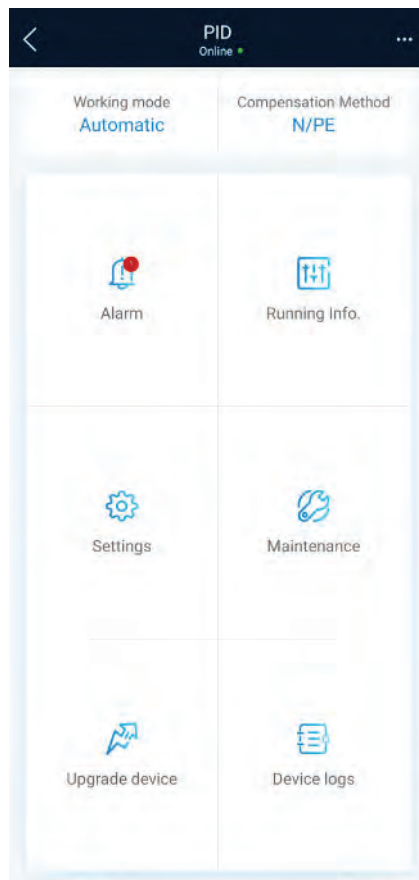
7.6.5 Screen Operations (Common User)

7.6.5.1 Query

Procedure

Step 1 After logging in to the app, you can view the PID module working mode and compensation mode on the home screen.

Figure 7-201 Home screen





Step 2 Tap **Alarms** or **Running Info.** to view active alarms, historical alarms, and PID module running information.

You can view the following information on the alarm information screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.

 **NOTE**

- Tap  to set the alarm sorting mode for active alarms or historical alarms.
- Tap  to set a time criterion. The historical alarms generated within the time segment are displayed.

----End

7.6.5.2 Settings

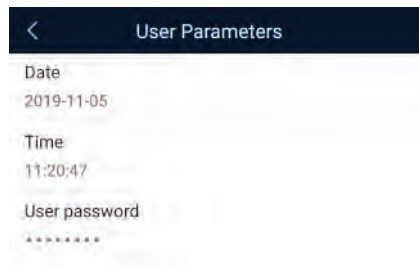
Prerequisite

Common users can set user parameters only for the PID module.

Procedure

- Step 1** On the home screen, choose **Settings > User Parameters** and set user parameters.

Figure 7-202 User parameters



NOTE

The password must meet the following requirements:

- Contains six characters.
- Contains at least two of the three types: lowercase letters, uppercase letters, and digits.

----End

7.6.5.3 Maintenance

7.6.5.3.1 Feedback

Context

Users can provide feedback in text, pictures, and files.

NOTE

Do not add private data.

Procedure


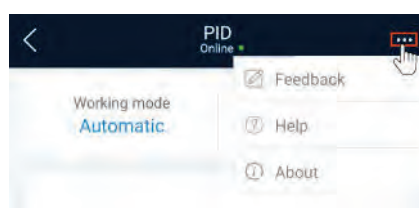
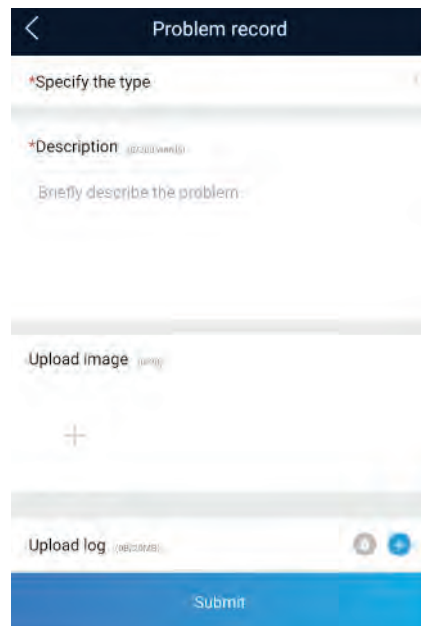
- Step 1** Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-203 Feedback



- Step 2** Tap **Specify the type** and select **Feedback** or **Suggestion**.

Figure 7-204 Problem record



Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures or logs.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.6.5.3.2 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


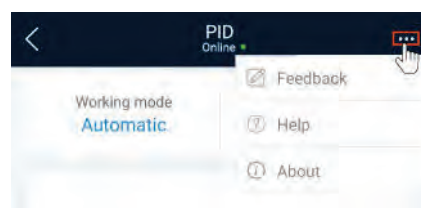
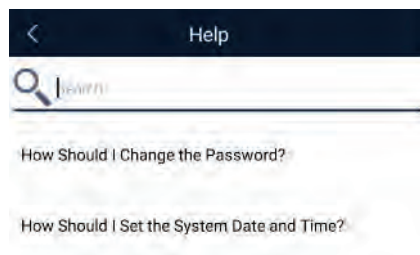
Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-205 Help



Step 2 Specify your question. A solution will be displayed.

Figure 7-206 Help 2

----End

7.6.5.3.3 About

Context

You can query the app version, connected product model, SN, firmware version, software version, technical support website, privacy policy, customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


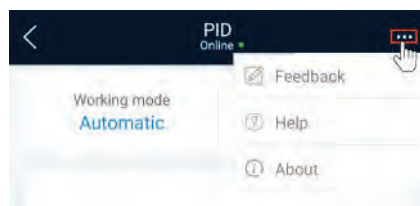
- Step 1** In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, firmware version, software version, and technical support website.

Figure 7-207 About

- Step 2** Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

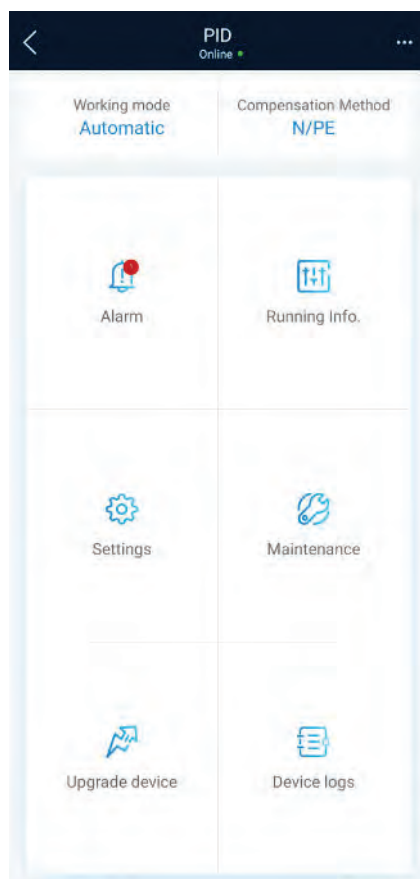
7.6.6 Screen Operations (Advanced User)

7.6.6.1 Query

Procedure

- Step 1** After logging in to the app, you can view the PID module working mode and compensation mode on the home screen.

Figure 7-208 Home screen





- Step 2** Tap **Alarms** or **Running Info.** to view active alarms, historical alarms, and PID module running information.

You can view the following information on the alarm information screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.

 **NOTE**

- Tap  to set the alarm sorting mode for active alarms or historical alarms.
- Tap  to set a time criterion. The historical alarms generated within the time segment are displayed.

----End

7.6.6.2 Settings

7.6.6.2.1 Setting Protection Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Protection Parameters** to access the parameter setting screen.

Figure 7-209 Protection parameters

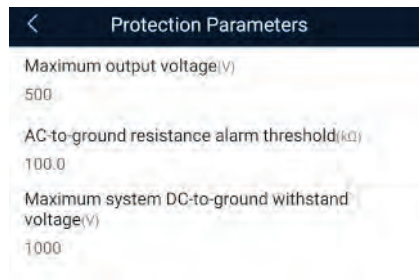


Table 7-16 Parameter description

| No. | Parameter | Description | Unit | Remarks |
|-----|------------------------|--|------|--|
| 1 | Maximum output voltage | Specifies the highest step-up voltage of the PID module in normal or commissioning mode. | V | <p>The default value is 500 V. For the 1500 V SUN2000, the recommended value is 800 V.</p> <ul style="list-style-type: none"> For the 1000 V/1100 V SUN2000, the value ranges from 0 V to 550 V. The parameter value indicates the maximum DC step-up voltage between PV and the ground. For the 1500 V SUN2000, the value ranges from 0 V to 800 V. The parameter value indicates the maximum DC step-up voltage between PV and the ground. |

| No. | Parameter | Description | Unit | Remarks |
|-----|---|--|------|--|
| 2 | AC-to-ground resistance alarm threshold | Specifies the alarm threshold for the impedance between the AC side of the PID module and the ground. | kΩ | You can set an alarm threshold for the impedance between the AC grid and the ground for the PID module. If the detected impedance is below the threshold, the PID module will generate an alarm. |
| 3 | Maximum system DC-to-ground withstand voltage | Specifies the voltages between the PV side and the ground and between the AC side and the ground in normal mode. | V | Specifies the lower threshold of the maximum voltage range between the solar inverter DC side (including the solar inverter, PV module, cable, SPD, and switch) and the ground. The default value is 1000 V. For the 1500 V SUN2000, the recommended value is 1500 V. |

----End

7.6.6.2.2 Setting Feature Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Feature Parameters** to access the parameter setting screen.

Figure 7-210 Feature parameters



Table 7-17 Parameter description

| No. | Parameter | Description | Unit | Remarks |
|-----|-----------------------------|---|------|---|
| 1 | Offset mode | Specifies the compensation mode of the PID module. | - | <ul style="list-style-type: none"> ● Select Disable if the PID module is not required. ● Select N/PE if the PID module is required to use voltage output from the power grid. |
| 2 | Compensation offset voltage | Specifies the compensation offset voltage between PV and the ground after the PID module operates stably. | V | <ul style="list-style-type: none"> ● If PV module compensation voltage direction is set to PV-positive offset, this parameter specifies the positive voltage between PV- and the ground. ● If PV module compensation voltage direction is set to PV+ negative offset, this parameter specifies the negative voltage between PV+ and the ground. <p>NOTE If Compensation offset voltage is set to 500 V, the PID module provides the maximum output to enhance the voltage compensation effect. The output voltage amplitude of the PID module is automatically capped to ensure the safety of a PV plant. The output voltage amplitude is also related to the maximum system DC-to-ground withstand voltage and maximum output voltage.</p> |

| No. | Parameter | Description | Unit | Remarks |
|-----|--|---|------|--|
| 3 | PV module compensation voltage direction | Specifies the offset direction of the PID module. | - | For the specific PV module compensation type, consult the PV module vendor. For example, P-type PV modules, HIT, CIS, thin-film PV modules, and CdTe PV modules meet the requirement for PV-positive offset. |
| 4 | Modbus version number | Specifies the version number of the Modbus protocol of the PID module. | - | - |
| 5 | IMD access | Specifies whether the PID module and insulation monitor device (IMD) can operate in cycle mode. | - | <ul style="list-style-type: none"> Select Enable if you allow the PID module and IMD to operate in cycle mode. Only the IMDs of mainstream suppliers such as DOLD and BENDER are supported, and the IMDs must have enabled dry contacts. <p>NOTICE You can set Periodic PID runtime and Periodic IMD runtime only when IMD access is set to Enable.</p> <ul style="list-style-type: none"> Select Disable if you forbid the access of IMDs. |
| 6 | Periodic PID runtime | Specifies the operating duration of the PID module when the PID module and IMD operate in cycle mode. | min | The IMD is shut down when the PID module is operating. |

| No. | Parameter | Description | Unit | Remarks |
|-----|----------------------|--|------|--|
| 7 | Periodic IMD runtime | Specifies the operating duration of the IMD when the PID module and IMD operate in cycle mode. | min | The PID module is standby when the IMD is operating. |

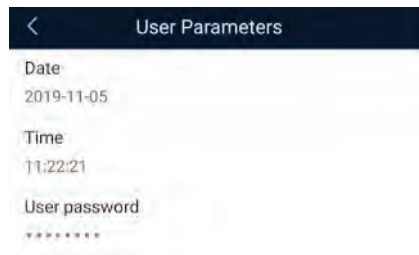
----End

7.6.6.2.3 Setting User Parameters

Procedure

- Step 1** On the home screen, choose **Settings > User Parameters** to access the parameter setting screen.

Figure 7-211 User parameters



 **NOTE**

The password must meet the following requirements:

- Contains six characters.
- Contains at least two of the three types: lowercase letters, uppercase letters, and digits.

----End

7.6.6.2.4 Setting Communications Parameters

Procedure

- Step 1** On the home screen, choose **Settings > Comm. Parameters** to access the parameter setting screen.
- Step 2** Tap **RS485** to set RS485 communications parameters.

Figure 7-212 Communications parameters



----End

7.6.6.2.5 Setting a File Save Path

Prerequisites

This function is available only on the Android system.

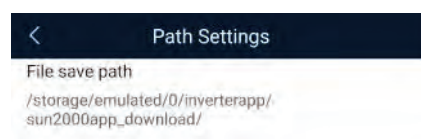
Context

You can modify the save path for operation logs and PID module logs and export logs from the path.

Procedure

- Step 1** On the home screen, choose **Settings** > **File Save Path** to access the path setting screen.

Figure 7-213 File save path



- Step 2** Tap **File save path** to set a file save path.

----End

7.6.6.3 Maintenance

7.6.6.3.1 Log Download

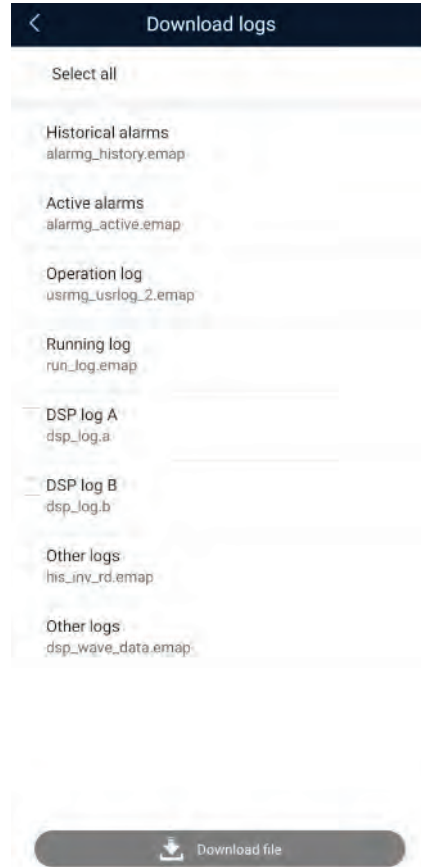
Context

On the **Device Logs** screen, you can export operation logs and PID logs from the mobile phone.

Procedure

Step 1 On the home screen, tap **Device Logs** to access the log download screen.

Figure 7-214 Downloading logs



Step 2 Download log files as required.

NOTE

- By default, Android system logs are saved in the **Android/data/com.huanwei.smartpvms/files/inverterapp** folder in the phone memory. You can change the save path by referring to "Setting a File Save Path".
- The downloaded solar inverter logs are saved at the **Device Log** directory in **File Manager** in your mobile phone. You can also send the logs to your mailbox for checking.

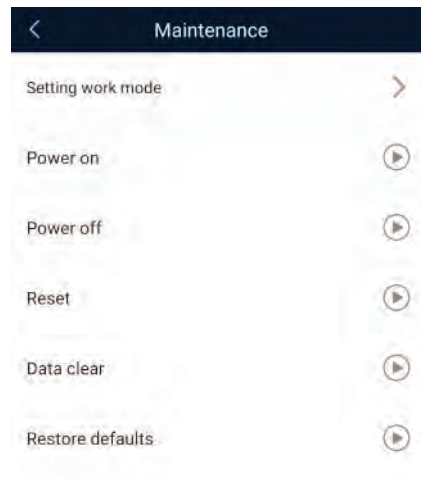
----End

7.6.6.3.2 System Maintenance

Procedure

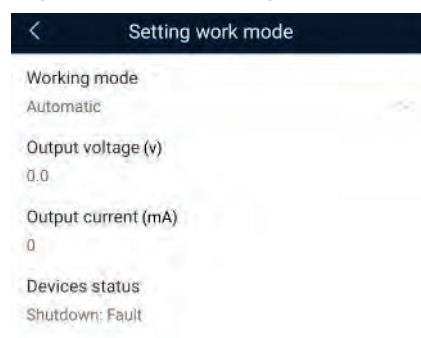
Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Figure 7-215 Maintenance



Step 2 Tap **Setting work mode** to set working mode parameters.

Figure 7-216 Setting work mode



Step 3 Tap  next to **Power on**, **Power off**, **Reset**, **Data clear**, or **Restore defaults** as required.

 **NOTE**

- If you clear data, active and historical alarms stored on the PID module will all be cleared.
- Tap **Performance Data** to view the performance data curve of the PID module.

Step 4 Enter the password for logging in to the app, and tap **OK**.

----End

7.6.6.3.3 Device Upgrade

Prerequisites

Obtain the upgrade package from your supplier or Huawei engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.

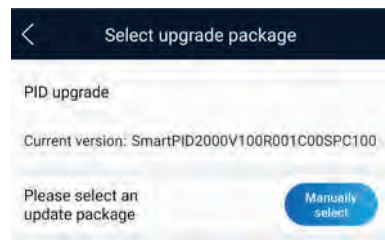
1. Log in to Huawei enterprise technical support website <http://support.huawei.com/enterprise>.

2. Browse or search for **PGP Verify**.

Procedure

- Step 1** Copy the upgrade package to your mobile phone without decompressing the package.
- Step 2** Tap **Upgrade** to access the PID module upgrade screen. Upgrade the software version of the device as required.

Figure 7-217 PID Upgrade



----End

7.6.6.3.4 Feedback

Context

Users can provide feedback in text, pictures, and files.

NOTE

Do not add private data.

Procedure


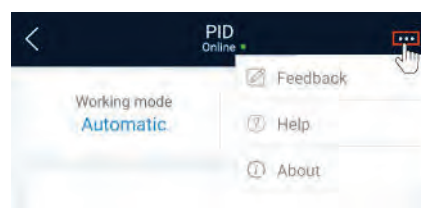
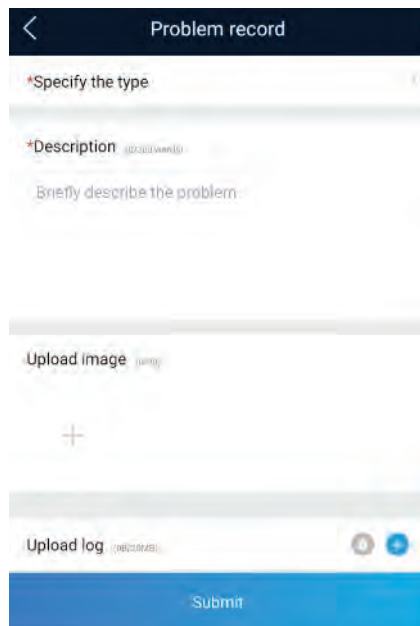
- Step 1** Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-218 Feedback



- Step 2** Tap **Specify the type** and select **Feedback** or **Suggestion**.

Figure 7-219 Problem record



Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures or logs.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.6.6.3.5 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


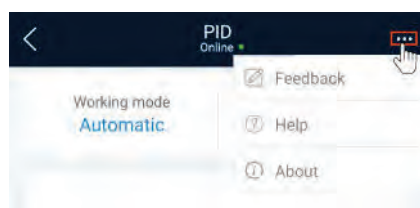
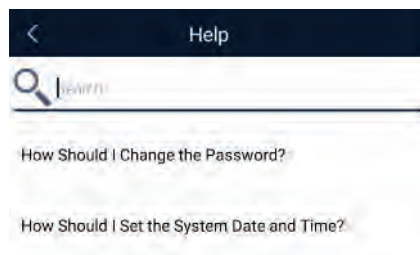
Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-220 Help



Step 2 Specify your question. A solution will be displayed.

Figure 7-221 Help 2

----End

7.6.6.3.6 About

Context

You can query the app version, connected product model, SN, firmware version, software version, technical support website, privacy policy, customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


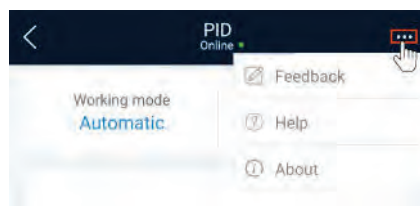
- Step 1** In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, firmware version, software version, and technical support website.

Figure 7-222 About

- Step 2** Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

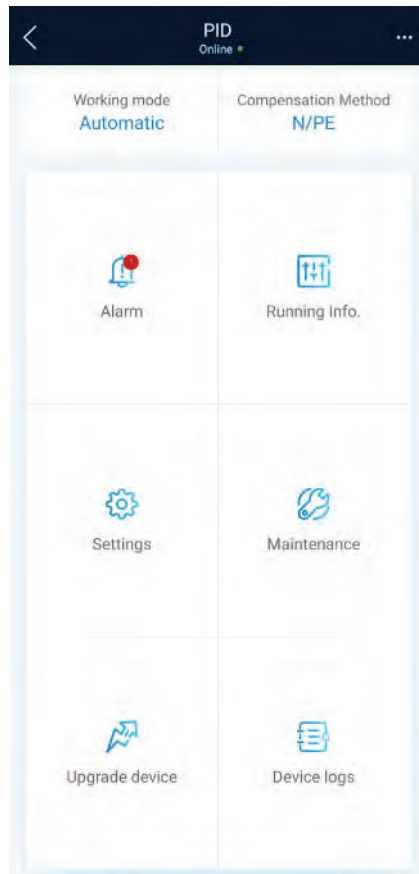
7.6.7 Screen Operations (Special User)

7.6.7.1 Query

Procedure

- Step 1** After logging in to the app, you can view the PID module working mode and compensation mode on the home screen.

Figure 7-223 Home screen





- Step 2** Tap **Alarms** or **Running Info.** to view active alarms, historical alarms, and PID module running information.

You can view the following information on the alarm information screen:

- Tap an alarm record and view the alarm details.
- Swipe right or left on the screen or tap either **Active Alarm** or **Historical Alarm** to display a list of active alarms or historical alarms.

 **NOTE**

- Tap  to set the alarm sorting mode for active alarms or historical alarms.
- Tap  to set a time criterion. The historical alarms generated within the time segment are displayed.

----End

7.6.7.2 Settings

7.6.7.2.1 Setting User Parameters

Procedure

- Step 1** On the home screen, choose **Settings** > **User Parameters** to access the parameter setting screen.

Figure 7-224 User parameters



NOTE

The password must meet the following requirements:

- Contains six characters.
- Contains at least two of the three types: lowercase letters, uppercase letters, and digits.

----End

7.6.7.2.2 Setting a File Save Path

Prerequisites

This function is available only on the Android system.

Context

You can modify the save path for operation logs and PID module logs and export logs from the path.

Procedure

- Step 1** On the home screen, choose **Settings** > **File Save Path** to access the path setting screen.

Figure 7-225 File save path



- Step 2** Tap **File save path** to set a file save path.

----End

7.6.7.3 Maintenance

7.6.7.3.1 Log Download

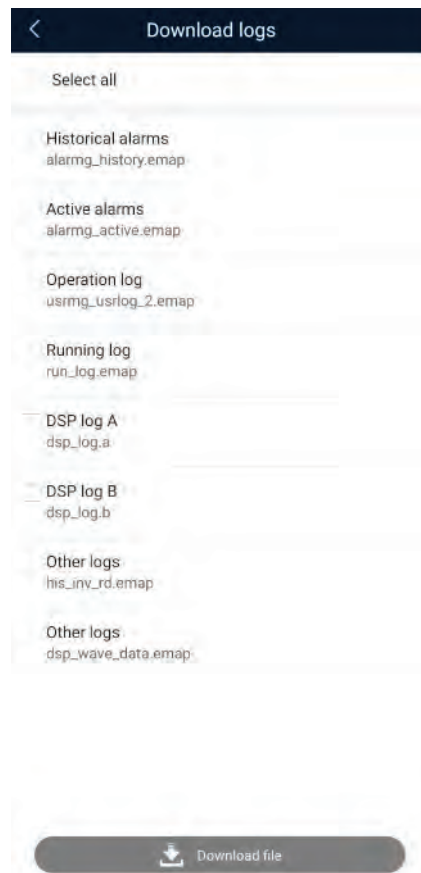
Context

On the **Device Logs** screen, you can export operation logs and PID logs from the mobile phone.

Procedure

Step 1 On the home screen, tap **Device Logs** to access the log download screen.

Figure 7-226 Downloading logs



Step 2 Download log files as required.

NOTE

- By default, Android system logs are saved in the **Android/data/com.huanwei.smartpvms/files/inverterapp** folder in the phone memory. You can change the save path by referring to "Setting a File Save Path".
- The downloaded solar inverter logs are saved at the **Device Log** directory in **File Manager** in your mobile phone. You can also send the logs to your mailbox for checking.

----End

7.6.7.3.2 System Maintenance

Procedure

Step 1 On the home screen, tap **Maintenance** to access the maintenance screen.

Figure 7-227 Maintenance



Step 2 Tap  next to **Power on**, **Power off**, or **Data clear** as required.

 **NOTE**

- If you clear data, active and historical alarms stored on the PID module will all be cleared.
- Tap **Performance Data** to view the performance data curve of the PID module.

Step 3 Enter the password for logging in to the app, and tap **OK**.

----End

7.6.7.3.3 Device Upgrade

Prerequisites

Obtain the upgrade package from your supplier or Huawei engineers. After the downloading is complete, use the digital certificate and verification tool available at Huawei technical support website to verify the digital signature of the software package.

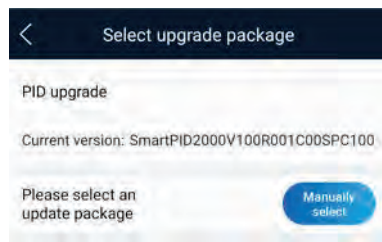
1. Log in to Huawei enterprise technical support website <http://support.huawei.com/enterprise>.
2. Browse or search for **PGP Verify**.

Procedure

Step 1 Copy the upgrade package to your mobile phone without decompressing the package.

Step 2 Tap **Upgrade** to access the PID module upgrade screen. Upgrade the software version of the device as required.

Figure 7-228 PID Upgrade



----End

7.6.7.3.4 Feedback

Context

Users can provide feedback in text, pictures, and files.

NOTE

Do not add private data.

Procedure


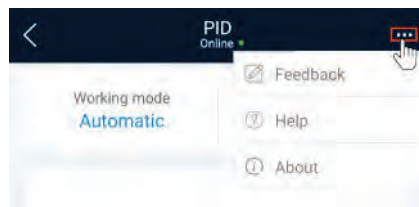
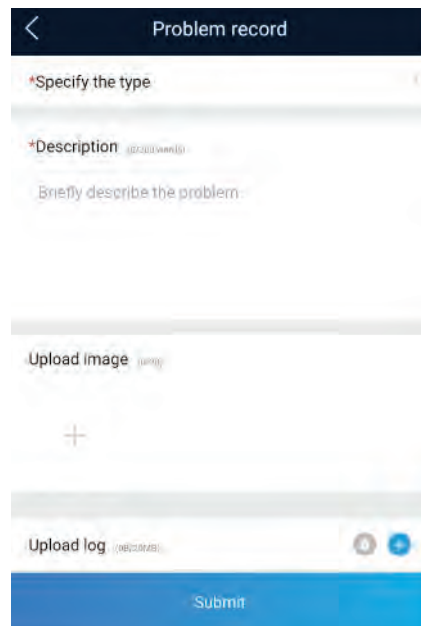
Step 1 Choose  > **Feedback** in the upper-right corner of the home screen.

Figure 7-229 Feedback



Step 2 Tap **Specify the type** and select **Feedback** or **Suggestion**.

Figure 7-230 Problem record



Step 3 Briefly describe the problem that you encounter in the **Description** column.

Step 4 (Optional) Tap  to upload pictures or logs.

Step 5 (Optional) Tap  to upload logs. Select device logs or app logs as required.

Step 6 Tap **Submit**.

----End

7.6.7.3.5 Help

Context

If you have any questions when using an involved device or the app, search for solutions in the help information.

Procedure


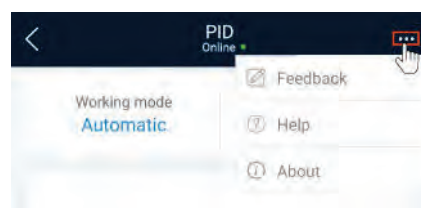
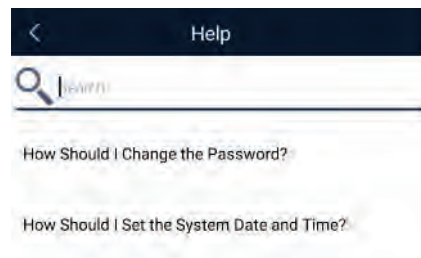
Step 1 Choose  > **Help** in the upper-right corner of the home screen.

Figure 7-231 Help



Step 2 Specify your question. A solution will be displayed.

Figure 7-232 Help 2



----End

7.6.7.3.6 About

Context

You can query the app version, connected product model, SN, firmware version, software version, technical support website, privacy policy, customer service contact information, and open source software policy.

NOTE

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure


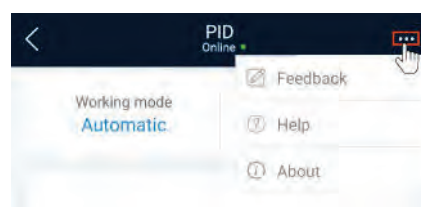
- Step 1** In the upper-right corner of the home screen, choose  > **About** to view the app version, connected product model, SN, firmware version, software version, and technical support website.

Figure 7-233 About



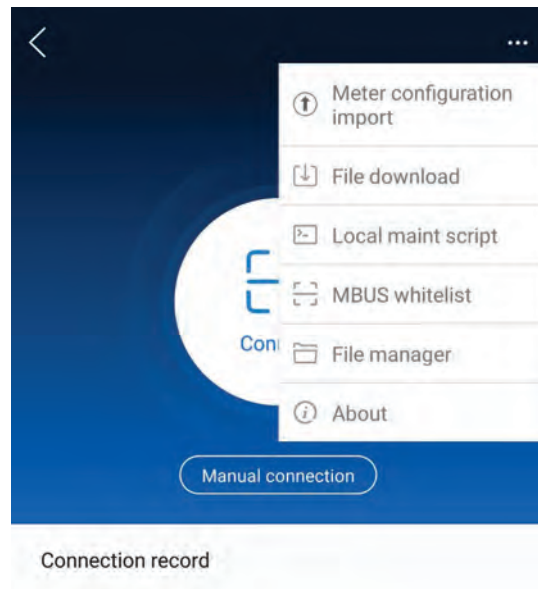
- Step 2** Tap **Privacy policy**, **Customer service contact information**, or **Open source software policy** to view the privacy policy, customer service contact information, and open source software policy.

----End

7.7 SUN2000 APP Tool Kit

You can download the upgrade package for the distributed solar inverter, scan the solar inverter SN bar code.

Figure 7-234 Tool kit



7.7.1 File download

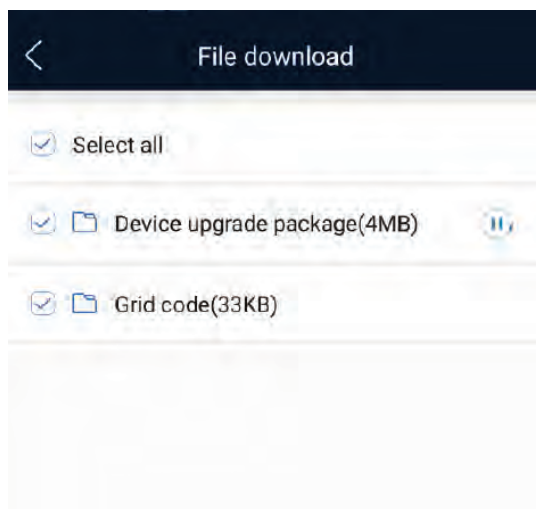
Context

Downloading app logs, inverter upgrade packages and grid codes is supported.

Procedure

Step 1 On the app connection screen, tap  > **File download** in the upper-right corner.

Figure 7-235 File download



Step 2 If an update of device upgrade package is detected, confirm to download it, Downloading device upgrade packages and grid codes is supported.

Step 3 Tap **Download** on the screen for downloading the upgrade package.

----End

NOTE

The SUN2000 app uses the ping solar.huawei.com command to check whether the mobile device is connected to the public network. The mobile phone automatically detects software updates when connected to the Internet. If the device upgrade package or grid code is updated, a message is displayed to prompt users to download the upgrade package or grid code. After the inverter is connected, the system prompts you to install the upgrade package. Perform operations as prompted.

7.7.2 MBUS Whitelist

Prerequisites

- Tools such as the diagonal pliers, grease pen, Android smartphone (with the SUN2000 app installed) are available.
- You have collected SN labels.

NOTICE

- The solar inverter without an LCD allows you to collect and scan the SN bar code.
- When using diagonal pliers to cut off the SN bar code label suspended under a solar inverter, mark its device name on the back of the label to ensure mapping between the solar inverter name and SN bar code. The SN label position of the SUN2000-33KTL is shown in [Figure 7-236](#), and that of the SUN2000-50KTL is shown in [Figure 7-237](#).

Figure 7-236 SN label position on the SUN2000-33KTL

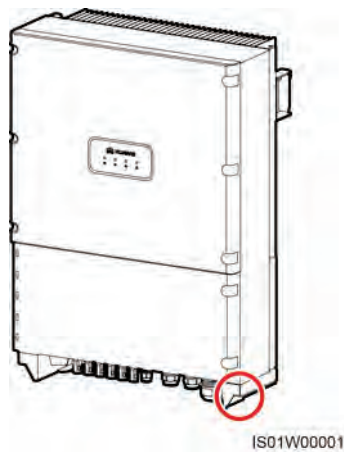
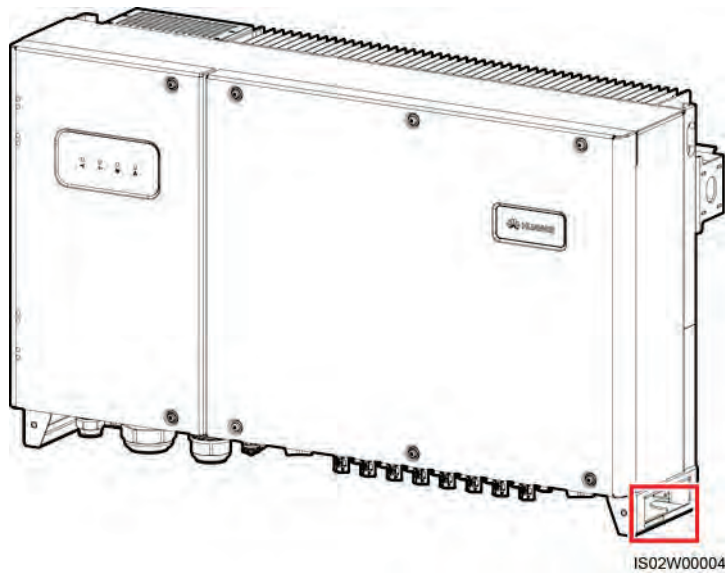


Figure 7-237 SN label position on the SUN2000-50KTL



Context

The SN bar codes of solar inverters are obtained in centralized mode. These bar codes help set up mapping between solar inverter names and SN bar codes on the SmartLogger and assist the SmartLogger to communicate with the solar inverters and commission them.

Procedure


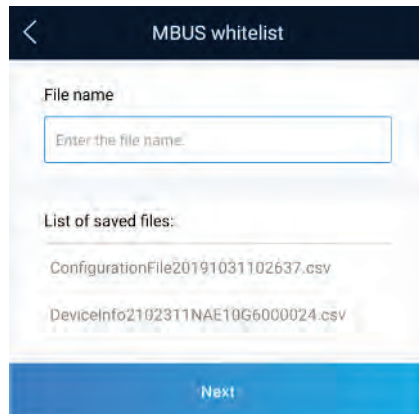
- Step 1** Choose  > **MBUS whitelist** on the app connection screen. On the **MBUS whitelist** screen, enter a user-defined file name and tap **Next**.

Figure 7-238 MBUS whitelist

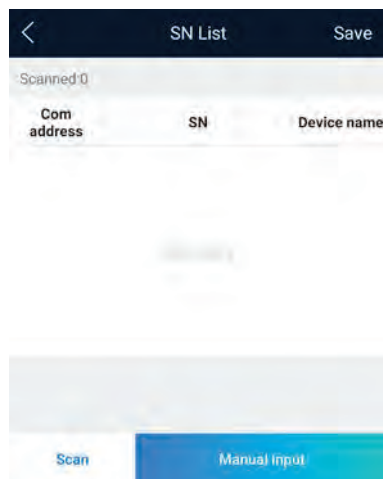


NOTE

If the SN file already exists, open and scan the file.


Step 2 On the **SN List** screen, tap **Scan** or **Manual input** to record SN bar codes or QR codes and device names.

Figure 7-239 SN list



- Method 1: Scan
 - a. Tap **Scan** and specify a scanning mode to start scanning. Ensure that the camera is about 15 cm away from the SN label or QR code.
 - b. After scanning, enter the device number at the back of the scanned label on the **SN Details** screen.
- Method 2: Manual input
 - a. Tap **Manual input**. On the **SN Details** screen, enter the SN bar code and the device name at the back of the label.
 - b. Tap **OK** to save the SN information.

 **NOTE**

You can choose  > **MBUS Whitelist** to find the saved SN information file on the list of saved files.

----End

Follow-up Procedure


- After scanning the SN bar code information file, you can choose **More > Device List** on the SmartLogger home page to modify the device information.
- Upload the scanned information file to the PC and rename the file as **DeviceInfo.csv**, which provides information when changing the device name and device address on the SmartLogger. For details, see *SmartLogger3000 User Manual*, *SmartLogger2000 User Manual* or *SmartLogger1000A User Manual*.

7.7.3 File Management

Context

The file management function manages app operation logs, device logs, and generated script files and configuration files. You can delete the logs and files, send them to your mailbox, or export them using a Mac.

Procedure

Step 1 On the app connection screen, tap  > **File manager** to access the **File manager** screen.

Step 2 On the **File manager** screen, the downloaded log files, generated scripts, and configuration files are displayed.

Step 3 To delete files, select one or more files and tap **Delete**.

Step 4 To send files to your mailbox, select one or more files and tap **Share**.

Step 5 Download app logs.

1. On the **File manager** screen, tap **Download** in the upper right corner. The **Download logs** screen is displayed.
2. Select **APP log** and tap **Download**.

After the logs are downloaded, you can tap **Share** to send the logs to your mailbox.

----End

7.7.4 About

Context

This screen is used to query the app version information, technical support website, privacy policy (displayed only on the SUN2000 app), customer service contact information, and open source software policy.

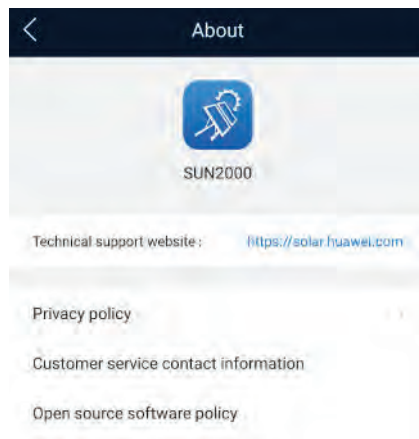
 **NOTE**

- When the app starts for the first time after being downloaded or updated, the privacy policy is displayed. You can use the app only after agreeing to the privacy policy, and the privacy policy will no longer appear. If you do not agree to the privacy policy, the app exits, and the privacy policy is still displayed when you start the app next time until you agree to the privacy policy.
- You can revoke the agreed privacy policy.

Procedure

- Step 1** On the app connection screen, tap  > **About** to view the app version information and technical support website.

Figure 7-240 About



- Step 2** Tap **Privacy policy** or **Open source software policy** to view the privacy policy and open source software policy.

----End

8 Account Security Settings

Account security settings include verifying email address and changing the passwords. The email address verification is performed to reset the password if a user forgets the login password. If a password is disclosed or remains unchanged for a long time, you can change the password to improve account security.

8.1 Verifying a email address

After an account is successfully registered, you are advised to associate the account with your email address by verifying the email address. After the verification, you can reset your password using the email if you forget the password.

Procedure

Method 1: When you log in to the system for the first time, the system automatically displays the **Personal Settings** screen, asking you to verify your email address.

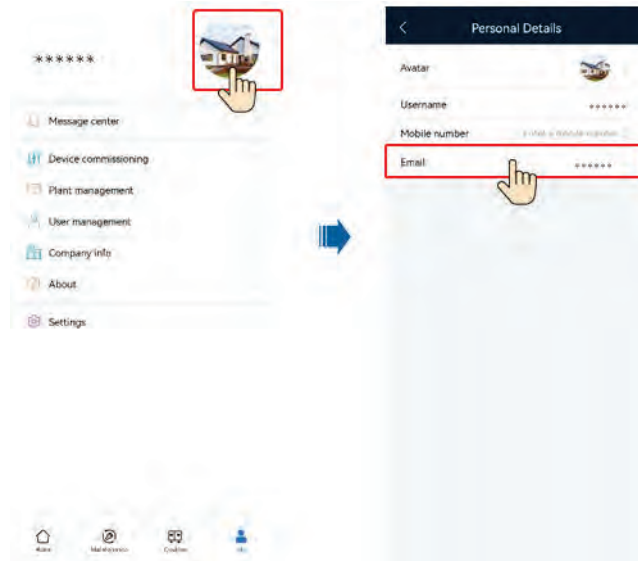
1. Enter the password for logging in to the FusionSolar and tap **Next**.
2. After confirming that the email address is correct, tap **Send Code** and enter the verification code to verify the email address.
3. Tap **Confirm**.

NOTE

If the user does not verify the email address, this dialog box is displayed each time the user logs in to the FusionSolar.

Method 2: Verify the email address on the **Personal Details** screen.

1. On the home screen, tap **Me** and tap your avatar.
2. Tap **Email**.
3. Enter the password for logging in to the FusionSolar and tap **Next**.
4. After confirming that the email address is correct, tap **Send Code** and enter the verification code to verify the email address.
5. Tap **Confirm**.



NOTICE

- When modifying personal data, such as mobile numbers and email addresses, you are obligated to take considerable measures, in compliance with the laws of the countries concerned and the user privacy policies of your company, to ensure that the user's personal information is fully protected.
- To ensure the security of personal information, such as mobile numbers and email addresses, the data is anonymized on the page, and HTTPS encryption transmission channels are used.

8.2 Changing Personal Passwords

If passwords are disclosed or remain unchanged for a long time, you can change the personal passwords. For security purposes, you are advised to change the password periodically (for example, every three months).

Context

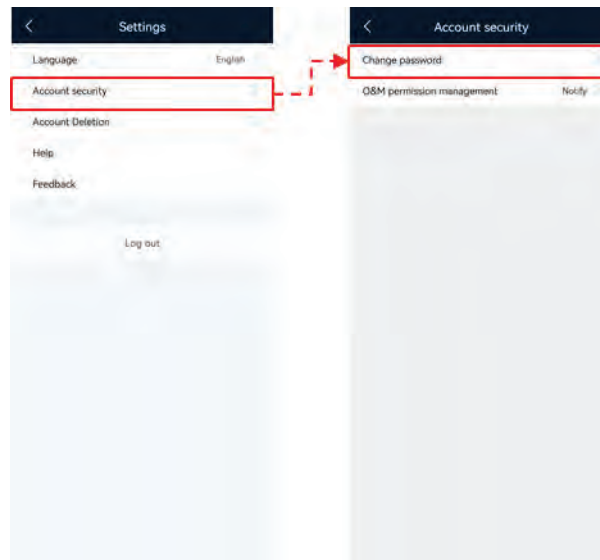
- When you use the password of a new account to log in to the system, change the initial password as prompted.
- If you cannot change your password, contact the administrator.

Procedure

1. On the home screen, tap **Me** > **Settings** > **Account security**.
2. Tap **Change password**.
3. On the **Change password** screen, enter the **Old password**, new password, and **Confirm password**.
4. Tap **Submit**.

 **NOTE**

User information is more secure if a password is changed more frequently. If a user forgets the password due to frequent password changes, the user needs to reset the password using the associated email address. For details, see [9.1 Resetting a Password Using the Associated email address](#).



8.3 Modifying Personal Information

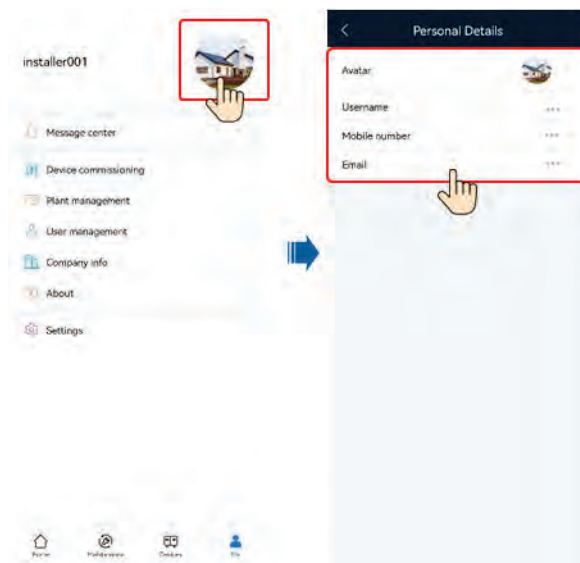
When personal information such as mobile numbers and email addresses changes or needs to be supplemented, you can periodically maintain personal information on the **Personal Details** screen to ensure the accuracy of personal information.

Procedure

1. On the home screen, tap **Me** and tap your avatar.
2. On the **Personal Details** screen, change the avatar and email address.
 - Changing the avatar
Tap the avatar, and take a photo or select an existing picture from your album as the new avatar.
 - Changing the mobile number or email address
Tap **Mobile number** or **Email** and change the mobile number or email address as prompted.

NOTICE

- When modifying personal data, such as mobile numbers and email addresses, you are obligated to take considerable measures, in compliance with the laws of the countries concerned and the user privacy policies of your company, to ensure that the user's personal information is fully protected.
- To ensure the security of personal information, such as mobile numbers and email addresses, the data is anonymized on the page, and HTTPS encryption transmission channels are used.



9 FAQs

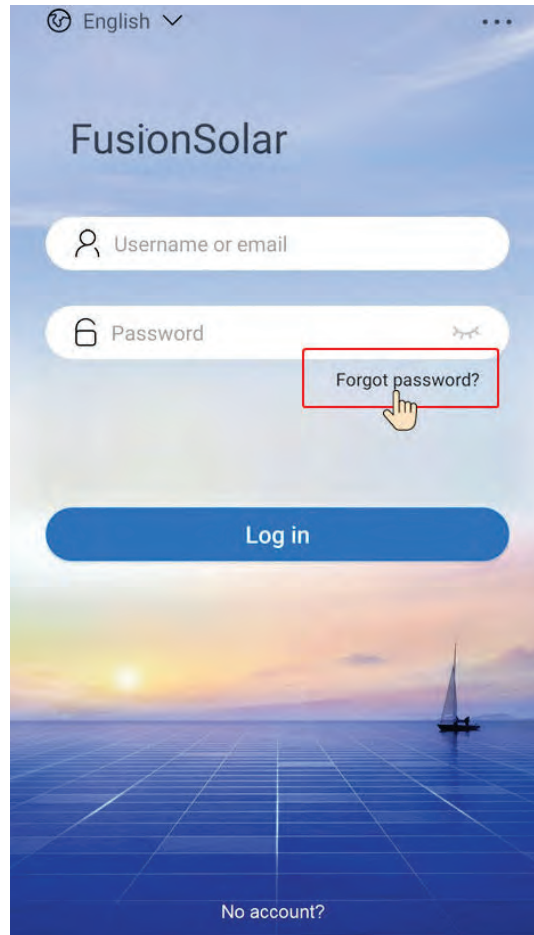
9.1 Resetting a Password Using the Associated email address

Prerequisites

The user's email address has been associated and verified. For details, see [8.1 Verifying a email address](#).

Procedure

1. On the app login screen, tap **Forgot Password?**
2. Enter the email address associated with the account and the verification code, and tap **Next**.
3. Tap **Send Code** and enter the verification code to verify the email address.
4. Tap **Next**.
5. Enter the new password as prompted and tap **Confirm**.

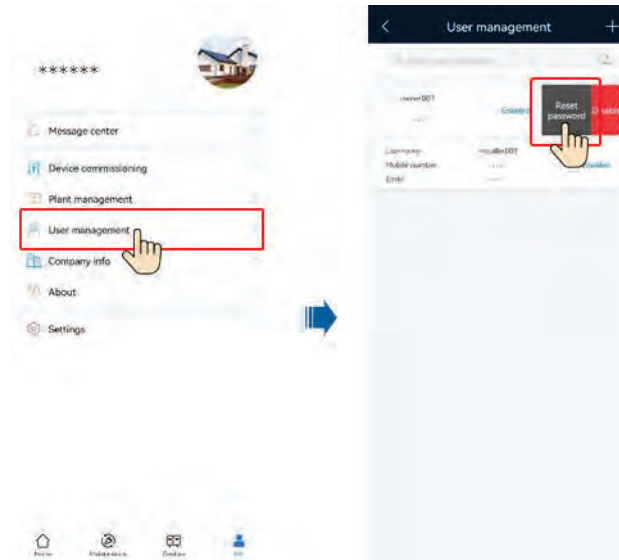


9.2 Resetting a User Password

When a user cannot reset a password by tapping **Forget Password?**, the user can authorize the installer to log in to the app to reset the password.

Procedure

1. Log in to the app as an installer and tap **Me** on the home screen.
2. Tap **User management**.
3. On the **User management** screen, select a user, slide left, and tap **Reset password**.
4. On the **Reset password** screen, set the new password.



9.3 Troubleshooting the No Data Fault After a User Logs In to App

Problem Description

After a user logs in to the FusionSolar, no data is displayed on the home screen.

Cause

The app is an earlier version and needs to be upgraded to the latest version.

Procedure

Method 1: Download and install the app from the app store.

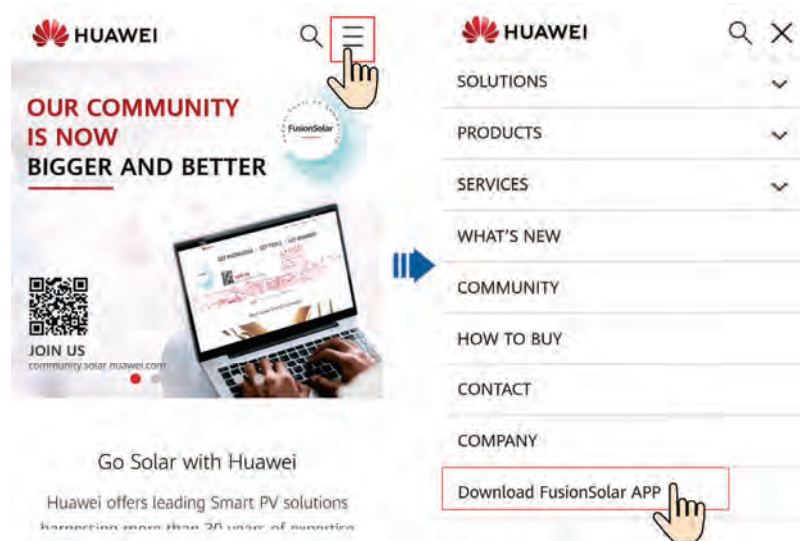
- Huawei mobile phone users: Search for **FusionSolar** in Huawei AppGallery.
- iPhone users: Search for **FusionSolar** in App Store.
- Other mobile phone users: Select method 2 or 3.



Method 2: Scan the QR code to download and install the app.



Method 3: Visit <https://solar.huawei.com> using a browser on your mobile phone to download and install the app.



NOTE

Users who select method 2 or 3 can select the download method based on the mobile phone type.

- Huawei mobile phone users: Download from Huawei AppGallery.
- Non-Huawei phone users: Download on a browser.
- iPhone users: Download from the App Store.

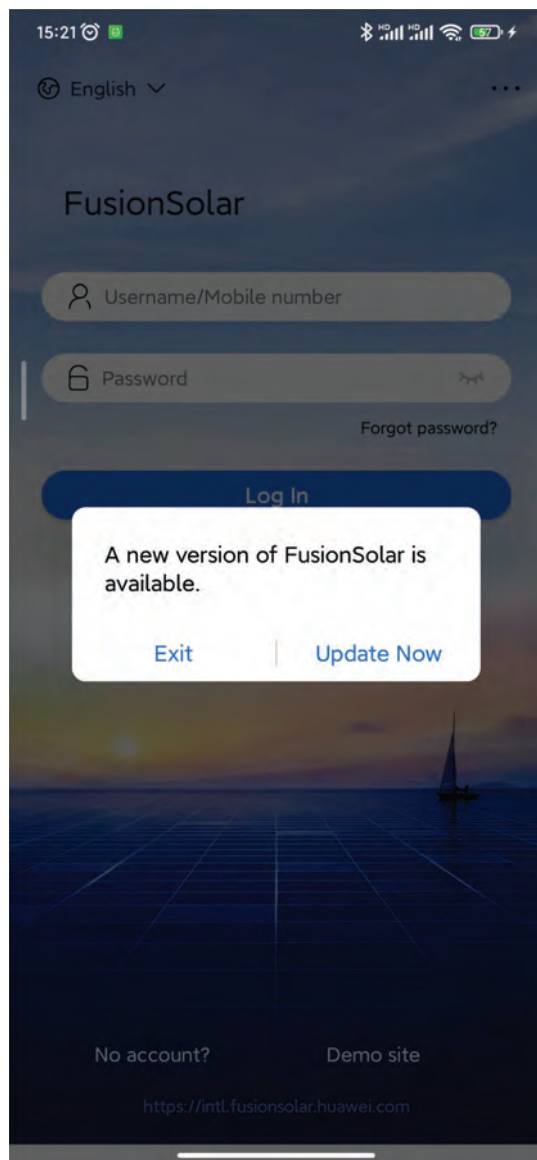
When you select **Download via the Browser**, if a security warning message is displayed indicating that the app is from an external source, tap **ALLOW**.

9.4 Handling a Version Update Message After a User Logs In to App

Problem Description

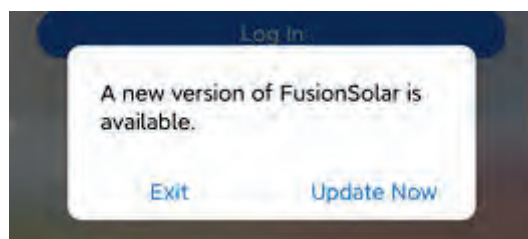
After logging in to the app, a user receives a version update message similar to that shown in [Figure 9-1](#).

Figure 9-1 Version update message



Procedure

Tap **Update Now** and upgrade the app to the latest version as prompted.




9.5 Handling a Network Exception When a User Logs In to App

Problem Description

When a user logs in to the FusionSolar, a message is displayed, indicating that the network is abnormal.

Solution


- Check whether the WLAN or mobile network connection is normal.
- Check whether the account is forcibly logged out on the SmartPVMS client.
- Check whether the network permission is enabled for the app.
- If the account and network are normal and the permission is granted, tap  in the upper right corner of the login screen and tap **Log Export**. The system will send the problem to technical support engineers for analysis.

10 Parameter Description

10.1 PV generation and carbon emissions

A **100 MW** PV plant can avoid **6.41** tons of CO₂ emissions every year, which is equivalent to planting **87,602** trees
(based on the assumption of 1350 sun hours per year)

How to Calculate Equivalent Trees Planted



Greenhouse gas emissions have increased global temperatures, leading to serious consequences such as sea level rise and extreme weather events (floods, droughts, hurricanes, etc.). Unlike thermal power plants, PV power plants generate electricity without CO₂ emissions, which is equivalent to planting trees.

How much CO₂ can be avoided for each kilowatt-hour of electricity generated from PV? How many trees are equivalent to the CO₂ emissions avoided?

Fossil fuels saved and CO₂ emissions avoided *

If fossil fuels are used, 1 kWh of electricity consumes 400 g coal (international standard value), generating about 475 g CO₂ (global average value). When PV is used, no CO₂ is emitted.

Formula:

- PV energy yield x Coefficient of CO₂ emissions avoided (0.475) = CO₂ emissions avoided (unit: kg)

Equivalent trees planted

For example, if the lifecycle of a tree is 40 years, the average CO₂ that can be absorbed each year reaches 18.3 kg.

Formula:

- CO₂ emissions avoided/Coefficient of equivalent trees planted (18.3)/40 = Equivalent trees planted

Example:

The total energy yield of a plant is 739,600 kWh.

Equivalent CO₂ emissions avoided

≈ 351.31 tons
739600 kWh x 0.475 = 351310 kg



Equivalent trees planted ≈ 480

351310 kg/18.3/40 = 480



How do I view the CO₂ emissions avoided and equivalent trees planted of a PV plant?

- Log in to the FusionSolar Smart PV Management System (Cloud), click the target PV plant, and choose **Monitoring** > **Overview**.
- Log in to the FusionSolar app, tap the target PV plant and then the **Statistics** tab, and scroll to the bottom of the screen.



* Formula for calculating the coal saved: PV energy yield x Coefficient of coal saved (0.4) = Coal saved (unit: kg)

10.2 Battery Control Parameters

Battery Control Parameters

| Parameter Type | Parameter Name | Description |
|---------------------------|-----------------------------------|---|
| Battery working mode | TOU charge/discharge parameters | Manually set the charge and discharge periods, for example, set the charge period to the low-price period at night. |
| | Redundant PV energy priority | <ul style="list-style-type: none"> Charge preference: When the PV power is greater than the load power, the excess PV energy is used to charge batteries. After the charge power reaches the maximum value or the battery is fully charged, the excess PV energy is fed to the grid. Fed to grid preference: When the PV power is greater than the load power, the excess PV energy is preferentially fed to the grid. After the inverter output power reaches the maximum value, the excess PV energy is used to charge batteries. (Applicable to scenarios where the FIT is higher than the electricity price. Batteries are used only for backup power.) |
| | Maximum charge power of grid (kW) | Specifies the maximum charge power allowed by the grid, which is determined by the local power grid company. If there is no requirement, the default maximum value configured on the ESS is used. |
| Battery parameter setting | End-of-charge SOC (%) | Set the end-of-charge SOC. |
| | End-of-discharge SOC (%) | Set the end-of-discharge SOC. |
| | Charge from AC | If this parameter is set to Enable, the ESS switches to the off-grid mode when the grid fails. To use this function, you must comply with the local regulations on charge from the grid. |

| Parameter Type | Parameter Name | Description |
|----------------------------|--------------------------|--|
| | AC charge cutoff SOC (%) | Set the cutoff SOC for charge from the grid. |
| Inverter feature parameter | Backup power SOC | If the battery SOC reaches the set value, the battery stops discharging. |

 **NOTE**

- You are advised not to set End-of-discharge SOC to 0.
- When the battery SOC drops to 0%, charge the battery in a timely manner.
- If the battery is not charged in a timely manner, the battery capacity will attenuate irreversibly. The resulting battery faults are not covered under warranty.

10.3 Environment Parameters

| Parameter | Unit | Definition | Formula | Remarks |
|-------------------------|--------------------|--|--|---------------------|
| Global irradiation | kWh/m ² | Total solar radiation energy measured by an environmental monitoring instrument (EMI). | / | An EMI is required. |
| Average temperature | °C | Average ambient temperature measured by the EMI in the plant. | / | |
| CO ₂ avoided | kg | Amount of CO ₂ emitted by burning fossil fuel to produce the same amount of power generated by the plant. 1 kWh of power is equivalent to about 475 g of CO ₂ emission (global average value). | Energy yield (kWh) of the plant x per kWh CO ₂ emission (0.475) | / |

| Parameter | Unit | Definition | Formula | Remarks |
|--------------------------|------|---|--|---------|
| Equivalent trees planted | N/A | Number of trees that can absorb the amount of CO ₂ avoided by the plant. A tree absorbs 18.3 kg of CO ₂ in one year and has a lifespan of 40 years. | CO ₂ avoided/CO ₂ absorbed by a tree in one year (18.3)/40 | |
| Standard coal saved | kg | Amount of standard coal needed to produce the amount of PV power generated by the plant. 0.4 kg of standard coal is needed to produce 1 kWh of power. | Energy yield (kWh) of the plant x Standard coal needed per kWh (0.4) | |

10.4 Power Parameters

| Parameter | Unit | Definition | Formula | Remarks |
|-----------------------|--------|--|--|---|
| Total string capacity | kWp | Total capacity of PV arrays installed in the PV plant. | Total capacity of the strings connected to all inverters | This parameter is configured during plant creation. |
| Power per MWp | kW/MWp | Power generated per MWp. | Active power/Total string capacity x 1000 | - |

| Parameter | Unit | Definition | Formula | Remarks |
|--|------|--|---|---------------------|
| Theoretical yield (daily/monthly/yearly) | kWh | Theoretical amount of power that can be generated by the PV arrays installed in a plant. | Hourly: Hourly global irradiation x String capacity Daily: Daily irradiation x String capacity Monthly: Total theoretical yield of each day in a month Yearly: Total theoretical yield of each month in a year | An EMI is required. |
| PV output power | kW | Total output power of PV arrays. | PV output power | - |
| PV yield | kWh | Total yield of PV arrays in a given reporting period. | Hourly: PV yield each hour Daily: PV yield each day Monthly: Total yield of each day in a month Yearly: Total yield of each month in a year | - |
| Inverter yield | kWh | Yield of a plant. | Hourly: Inverter output energy each hour Daily: Inverter output energy each day Monthly: Total inverter output energy of each day in a month Yearly: Total inverter output energy of each month in a year | - |
| Total yield | kWh | Total output energy of the PV plant throughout the lifetime. | Total PV energy yield | - |

| Parameter | Unit | Definition | Formula | Remarks |
|--|---------|--|--|--|
| Performance ratio | % | Ratio of measured output energy to total irradiation received by the plant. | $\text{PV energy yield} / \text{Theoretical energy yield}$ | - |
| Specific yield | kWh/kWp | Ratio of the energy yield to the total string capacity. | $\text{PV energy yield} / \text{Total PV string capacity}$ | - |
| Consumption (daily/monthly/yearly) | kWh | Power consumed by the loads during a given reporting period. | Daily: Amount of power consumed by the loads each day Monthly: Total amount of power consumed by the loads each day in a month Yearly: Total amount of power consumed by the loads each month in a year | - |
| Feed-in to grid (daily/monthly/yearly) | kWh | Amount of power fed to the power grid from the plant in a give reporting period. | Daily: Amount of power fed to the grid from the plant each day Monthly: Total amount of power fed to the grid from the plant each day in a month Yearly: Total amount of power fed to the grid from the plant each month in a year | A power meter is required. Otherwise, the amount of power purchased from or fed to the grid cannot be displayed. |

| Parameter | Unit | Definition | Formula | Remarks |
|--|------|---|---|---------|
| Supply from grid (daily/monthly/yearly) | kWh | Amount of power purchased from the grid in a given reporting period. | Daily: Amount of power purchased from the grid each day Monthly: Total amount of power purchased from the grid each day in a month Yearly: Total amount of power purchased from the grid each month in a year | |
| Self-consumption (daily/monthly/yearly) | kWh | PV energy consumed by loads and charged to batteries. It includes the amount of PV power consumed directly by loads and the amount of PV power stored in batteries. | Daily: Daily PV yield – Daily feed-in to grid Monthly: Total amount of self-consumed power of each day in a month Yearly: Total amount of self-consumed power of each month in a year | - |
| Self-supplied power (daily/monthly/yearly) | kWh | Load consumption from PV. It includes the amount of PV power consumed directly by loads and the amount of PV power discharged from batteries. | Daily: Daily power consumption – Daily supply from grid Monthly: Total amount of self-supplied power of each day in a month Yearly: Total amount of self-supplied power of each day month in a year | - |
| Load power | kW | Load consumption power. | Load consumption power | - |

| Parameter | Unit | Definition | Formula | Remarks |
|------------------------|------|--------------------------------------|---|--|
| Self-consumption power | kW | Power of PV energy consumed locally. | When feeding to the grid: PV output power – Feed-in power When purchasing power from the grid: PV output power | When the active power of the bi-directional meter is a positive value, the power is the feed-in power. When the active power of the bi-directional meter is a negative value, the power is the power of supply from the grid. |

| Parameter | Unit | Definition | Formula | Remarks |
|---------------------------------|------|---|--|--|
| Battery charge/discharge power | kW | Battery charge/discharge power. | Battery charge/discharge power | If the symbol before the power value is +, the battery is charging. If the symbol before the power value is -, the battery is discharging. |
| Yield loss due to curtailment | kWh | Energy yield loss caused by power limitation at the grid-connection point. | Theoretical yield x Performance ratio - Actual PV yield | An EMI is required. |
| Revenue loss due to curtailment | - | Loss of revenue due to power limitation. | Yield loss due to curtailment x Feed-in tariff | If the price unit is inconsistent with the local type, contact the company administrator to change the currency. For details, see |
| PV revenue | - | Revenues from photovoltaic power generation. It consists of two parts, which are revenue of power fed in to the grid and the saved electricity bills. Electricity prices need to be configured. | Revenue of power fed in to the grid (power fed to the grid x feed-in tariff) + Saved electricity bills (self-supplied power x electricity price) | |

| Parameter | Unit | Definition | Formula | Remarks |
|------------------|------|---|---|---|
| On-grid duration | h | The time period during which the inverter is connected to the power grid. | Daily: daily on-grid duration Monthly: total daily on-grid durations in a month Year: total monthly on-grid durations in a year | The string capacity needs to be configured. If the string capacity is not configured, the calculated on-grid duration will be inaccurate. |

 **NOTE**

Unless otherwise specified, the energy yield in this document refers to AC power yield.

11 User Personal Data Used by the SmartPVMS

For business purposes, the SmartPVMS may collect or require users to set personal data. Different functions require different data that will be processed in different ways. For details, see [Table 11-1](#).

Table 11-1 Personal Data Usage

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|-------------------|--|--|---|--|---|--|--|
| User registration | Company name, user name, email address, phone number, and password | Manually entered when an installer is registered or a user account is created. | The collected personal data is used to create an account. A user can use the created user name and password to log in to the system. If the user forgets the password, the administrator can reset the password. The user can also change the | 1. All user information is deleted when an administrator deletes a user account. 2. The administrator or the user deletes the phone number or email address on the user information | The data is deleted from the database when an account is deleted, or deleted and saved on the user information modification page. | 1. The data is exported to a CSV or XLSX file. 2. The data is exported in plaintext. | On the User Management page, select the user information to be exported and click Export Selected Users or Export All Users . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|---|---------------------|--|--------------|
| | | | password regularly. Security measures: 1. Private data is sent to the SmartPVMS server using HTTPS. 2. The company name and user name are stored in the database in plaintext. 3. Passwords are encrypted using PBKDF2. Phone numbers and email | modification page and saves the deletion. | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|-----------------------------|---------------------|--|--------------|
| | | | <p>addresses are encrypted using AES128 before being stored.</p> <p>4. Only administrators and users can view and modify the information.</p> | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|--------------------|---|---|--|--|--|--|--------------|
| Password retrieval | Email address, phone number, and password | Manually entered during password retrieval. | <p>A user can retrieve the password when forgetting it.</p> <p>Security measures:</p> <ol style="list-style-type: none"> 1. Private data is sent to the SmartPVMS server using HTTPS. 2. Phone numbers and email addresses are not stored. 3. Passwords are encrypted using PBKDF2 before | The phone number, email address, and password registered during account registration are permanently stored until the administrator deletes the account. | The data is deleted from the database when the account is deleted. | Export is not supported. | N/A |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|------------------------------|-----------------------------|---------------------|--|--------------|
| | | | being stored. | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|---------------------|------------------------------------|---|---|---|--|---|---|
| Report subscription | Report recipients' email addresses | Manually entered on the report subscription page. | <p>To receive report emails.</p> <p>Security measures:</p> <ol style="list-style-type: none"> 1. Private data is sent to the SmartPVMS server using HTTPS. 2. Email addresses are encrypted using AES128 before being stored. 3. Only users can view and modify the information. | The data is deleted when a user deletes the report subscription rule. | The data is deleted from the database when a user deletes the report rule. | <ol style="list-style-type: none"> 1. The data is exported to an XLSX file. 2. The data is exported in plaintext. | On the report subscription page, select the subscription rule and click Export . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|------------------|---|--|---|--|--|--|--|
| Plant management | Contact person, email address, phone number, plant image, plant address, plant longitude and latitude, and region | Manually entered on the page for creating a plant. | Used for plant maintenance and query over the northbound interface. Security measures: 1. Private data is sent to the SmartPVMS server using HTTPS. 2. The contact person, plant image, address, longitude, and latitude are stored in plaintext | The data is deleted when a user deletes the plant. | The data is deleted from the database when a user deletes the plant. | 1. The data is exported to an XLSX file. 2. The data is exported in plaintext. | On the Plant Management page, select the plant to be exported and click Export . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|-----------------------------|---------------------|--|--------------|
| | | | <p>in the database.</p> <p>3. Email addresses and phone numbers are encrypted using AES128 before being stored.</p> <p>4. Only authorized users can view and modify the data.</p> | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-----------------------------|---|--|---|---|--|--------------|
| Share Plant | Email address, phone number | Manually entered on the page for Share Plant. | Used for searching the recipient user. Security measures: Private data is sent to the SmartPVMS server using HTTPS. | Destroyed when the PV plant is successfully shared or the sharing page is closed. | Destroyed when the PV plant is successfully shared or the sharing page is closed. | Export is not supported. | N/A |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|-------------------|-------------------------------------|---|--|---|---|---|---|
| Device management | SIM card number, commissioning user | The server obtains the SIM card number, commissioning user from the device that communicates with it. | <ul style="list-style-type: none"> The SIM card number used to support communication of the device. The commissioning user used to identify device access users. <p>Security measures: 1. Private data is sent to the SmartPVMS server</p> | The data is deleted when a user deletes the device. | The data is deleted from the database when a user deletes the device. | <ol style="list-style-type: none"> The data is exported to an XLSX file. The data is exported in plaintext. | On the Device Management page, select devices and click Export Basic Info . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|--|-----------------------------|---------------------|--|--------------|
| | | | using HTTPS. 2. The SIM card number is stored in plaintext in the database. 3. Only authorized users can view and modify the data. | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|--------------------------------|---|---|--|---|---|--|---|
| Poverty alleviation management | Object, province, city, county, town, village, address, and contact information | Manually entered on the page for adding a poverty alleviation object. | To contact the management personnel of the poverty alleviation object. Security measures: 1. Private data is sent to the SmartPVMS server using HTTPS. 2. The user name, province, city, county, town, village, and address are stored in the | The data is retained until a user deletes the poverty alleviation object. | The data is deleted from the database when a user deletes the poverty alleviation object. | 1. The data is exported to an XLSX file. 2. The data is exported in plaintext. | On the poverty alleviation management page, select the poverty alleviation object and click Export . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|-----------------------------|---------------------|--|--------------|
| | | | <p>database in plaintext.</p> <p>3. The contact method is encrypted using AES128 before being stored.</p> <p>4. Only authorized users can view and modify the data.</p> | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|-----------------|---|--|--|---|---|--|--|
| User management | User name, full name, phone number, email address, password, and avatar | Users manually enter on the web page when creating or modifying account information. | If the user forgets the password, the administrator can reset the password. The user can also change the password regularly. Security measures: 1. Private data is sent to the SmartPVMS server using HTTPS. 2. User names, full names, and avatars | 1. All user information is deleted when an administrator deletes a user account. 2. The administrator or the user deletes the phone number or email address on the user information modification page. | The data is deleted from the database when an account is deleted, or deleted and saved on the user information modification page. | 1. The data is exported to a CSV or XLSX file. 2. The data is exported in plaintext. | On the User Management page, select the user information to be exported and click Export Selected Users or Export All Users . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|--|---|---------------------|--|--------------|
| | | | <p>are stored in plaintext.</p> <p>3. Passwords are encrypted using PBKDF2. Phone numbers and email addresses are encrypted using AES128 before being stored.</p> <p>4. Only administrators and users can view and modify the information.</p> | <p>ation page and saves the deletion.</p> | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|--------------------|---|---|--|--|--|--|--|
| Company management | Company name, contact information, email address, address, longitude and latitude, user name, password, phone number, and email address | Manually entered during company creation. | To manage company information. Security measures: 1. Private data is sent to the SmartPVMS server using HTTPS. 2. The company name and user name are stored in the database in plaintext. 3. Phone numbers and email addresses are encrypted | The data is deleted when a user deletes the company account. | The data is deleted from the database when a user deletes the company account, or a user deletes the data on the company information modification page and | 1. The data is exported to a CSV or XLSX file. 2. The data is exported in plaintext. | On the User Management page, select the user information to be exported and click Export Selected Users or Export All Users . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|-----------------------------|-----------------------------|--|--------------|
| | | | using AES128, and passwords are encrypted using PBKDF2 before being stored. 4. Only authorized users can view and modify the data. | | saves the deletion setting. | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|---|--|--|---|--|--|
| Log management | Client IP address | The server obtains the IP address from the client or app that communicates with it. | To perform IP-based log audit when recording security logs, system logs and operation logs. Security measures: 1. Private data is sent to the SmartPVMS server using HTTPS. 2. The IP address is stored in plaintext in the database. 3. Only administra | The data is deleted when the size of log data exceeds the threshold. | The client IP address is deleted when the log containing it is deleted. | 1. The data is exported to a CSV or XLSX file. 2. The data is exported in plaintext. | On the Log Management page, select the log information to be exported and click Export Selected or Export All . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|--|-----------------------------|---------------------|--|--------------|
| | | | tors, users with audit permissions, and users themselves can view IP addresses of historical logins. | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|---------------------|-------------------------|---|---|--|---|---|--|
| Alarm push settings | Email address | Manually entered during creation of an alarm push rule. | <p>To receive alarm notifications by email.</p> <p>Security measures:</p> <ol style="list-style-type: none"> 1. Private data is sent to the SmartPVMS server using HTTPS. 2. Email addresses are encrypted using AES128 before being stored. 3. Only authorized users can view and | Users with the alarm push rule permission can modify or delete alarm push rules. | The data is deleted from the database when a user deletes the alarm push rule, or a user deletes the data on the push configuration modification page and saves | <ol style="list-style-type: none"> 1. The data is exported to an XLSX file. 2. The data is exported in plaintext. | On the Push Configuration page, select push rules and click Export . |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|------------------------------|-----------------------------|-----------------------|--|--------------|
| | | | modify the data. | | the deletion setting. | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|------------------|--------------------------------|---|---|--|--|--|--------------|
| Alarm management | Email address and phone number | Manually entered by users when they manually send remote notifications on the current alarm page. | <p>The phone number and email address are used to receive alarms.</p> <p>Security measures:</p> <ol style="list-style-type: none"> 1. Private data is sent to the SmartPVMS server using HTTPS. 2. The stored phone numbers and email addresses are encrypted using AES128. 3. Only authorized users | Users with the alarm management privilege can delete the data. | Users can delete data on the page for manually sending remote notifications. | Export is not supported. | N/A |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|------------------------------|-----------------------------|---------------------|--|--------------|
| | | | can view the data. | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|--|--|--|--|---|--|--------------|
| App login | UUID hash value of the mobile terminal | The user obtains the mobile UUID hash value bound to the mobile terminal when logging in using a mobile terminal | Users obtain the UUID hash value of the user's mobile terminal to maintain persistent login. Security measures: 1. The data is sent to the SmartPVMS server using HTTPS. 2. The UUID hash value is stored in plaintext in the database. | The UUID hash value is deleted when the user logs out. | The data is destroyed when the user logs out. | Export is not supported. | N/A |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|---|--|---|---|--|--|--------------|
| Mobile O&M | GPS location information of a mobile terminal | Obtains the inspection route from the third-party map service based on the GPS location. | <ol style="list-style-type: none"> Administrators can view real-time locations of users on the O&M map, assign O&M tasks such as inspection and defect elimination, and audit the inspection results of users. When you | The cache is stored in the server memory. If the cache is not updated within 15 minutes or the user logs out, the cache is deleted. | The data is destroyed if the data is not updated within 15 minutes or the user logs out. | Export is not supported. | N/A |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|-----------------------------|---------------------|--|--------------|
| | | | perform device commissioning and site setup wizard, this function is used to locate the area where the terminal is located , recommend the device upgrade package and power | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|-----------------------------|---------------------|--|--------------|
| | | | <p>grid standard code that comply with the area, and set the longitude and latitude of the inverter so that the location of the inverter can be displayed on the management system.</p> <p>Security measures:</p> | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|-----------------------------|---------------------|--|--------------|
| | | | <p>1. The data is sent to the SmartPVMS server using HTTPS.</p> <p>2. The location information is cached in plaintext in the server memory.</p> | | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|---|--|---|--|---|--|---|---|
| Create an account , change the password of a user, and reset the password of a user | Name (given name and family name), Phone number, Email address, Password, and Account ID | <ol style="list-style-type: none"> 1. Personal information entered by administrators when they create accounts . 2. User name and password entered when the user changes the password. 3. User password reset by administrators. | <p>Purpose: Collected personal data is used to create an account. A user uses the created user name and password to log in to the system. If the user forgets the password, an administrator can reset the password. The user can also change the password</p> | <ol style="list-style-type: none"> 1. Configurable or not: Yes 2. Retention policy: After you select the Enable the user policy if no login within a period check box, the system automatically deletes the users | <ol style="list-style-type: none"> 1. Security administrators can directly delete a user account. 2. If you enable Enable the user policy if no login within a period , the system automatically | <ol style="list-style-type: none"> 1. The username and full name can be exported in plaintext, and the password cannot be exported. 2. Permission for backup packages in backup and restore must be properl | <p>On the User Management page, click ..., and then Export All Users. Alternatively, select one or more users, and click Export Selected Users. The passwords, mobile numbers, and email address</p> |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|---|--|--|--|
| | | | <p>periodically.</p> <p>Security measures:</p> <ol style="list-style-type: none"> 1. The TLSv1.2 secure communication protocol is used between the client and server to ensure secure transmission of customer data. 2. The username and full name are stored in plaintext. The mobile number and email address | <p>that meet the policy settings. In other cases, if security administrators do not delete a user, the user is valid permanently.</p> | <p>deletes the users that meet the policy settings.</p> <ol style="list-style-type: none"> 3. Data is deleted when the system is uninstalled. | <p>y managed. Personal data cannot be exported separately.</p> | <p>ses of the users are not exported, and the fields are left blank. Permission for backup packages in backup and restore must be properly managed. Personal data cannot be exported</p> |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|--|-----------------------------|---------------------|--|--------------|
| | | | <p>are encrypted using AES128, which uses the CBC.</p> <p>3. The user password is encrypted using PBKDF2 or SM3.</p> <p>4. Only security administrators can access the data.</p> | | | | separately. |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|---|--|--|--|---|--|---|---|
| Users log in to the management plane using the web client. Machine accounts log in to the management plane. | Phone number, Email address, IP address, and Account ID. | The IP address is obtained from the client PC of the user upon the login. Other information is entered manually. | Purpose: The username, mobile number, and email address are used to log in to the system. The IP addresses are used for auditing. Security measures: 1. The TLSv1.2 secure communication protocol is used between the client and server to ensure secure transmission. | 1. Configurable or not: Yes 2. Retention policy: The account name is permanently stored in the database without encryption. The mobile number and email addresses are encrypted. | 1. Security administrators can directly delete a user account. 2. Data is deleted when the system is uninstalled. | Permission for backup packages in backup and restore must be properly managed. Personal data cannot be exported separately. | Permission for backup packages in backup and restore must be properly managed. Personal data cannot be exported separately. |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|---|---------------------|--|--------------|
| | | | <p>on of customer data.</p> <p>2. The IP address is not encrypted. The SK in AK/SK, mobile number, and email address are encrypted using AES128.</p> <p>3. The user password is encrypted using PBKDF2 or SM3.</p> <p>4. Only security administrators can</p> | <p>ted and stored in the database permanently unless the user initiates a deregistration request. The IP address is stored in the log file of the service. The default retention period</p> | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|------------------------------|-----------------------------|---------------------|--|--------------|
| | | | access the data. | is 90 days. | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|---|---|--|--|---|--|--|---|
| Remote authentication, SSO authentication | Name (given name and family name), phone number, email address, and password. | <p>1. When a remote user logs in, the user's personal data is automatically synchronized.</p> <p>2. When a user logs in in SSO mode, the user's personal data is automatically synchronized.</p> | <p>Purpose: The collected personal data is used to create a user. The user can modify or view the personal data. The administrator can modify or view the user's phone number and email address.</p> <p>Security measures:</p> <p>1. The TLSv1.2 secure communication protocol is used</p> | <p>1. Configurable or not: Yes</p> <p>2. Password retention policy: If the function of local authentication upon remote authentication failures is disabled, the password saved locally will be</p> | <p>1. Security administrators can directly delete a user account.</p> <p>2. If you enable Enable the user policy if no login within a period, the system automatically</p> | <p>The username can be exported in plaintext. The phone number, email address, or password cannot be exported.</p> | <p>On the User Management page, click ..., and then Export All Users. Alternatively, select one or more users, and click Export Selected Users. The passwords, mobile numbers, and email address</p> |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|--|--|---|--|--|
| | | | <p>between the client and server to ensure secure transmission of customer data.</p> <p>2. The username and full name are stored in plaintext.</p> <p>3. The mobile number and email address are encrypted using Two-layer key mode: The mobile number and email address are</p> | <p>automatically deleted when the remote user logs in to the system next time.</p> <p>3. Account retention policy: After you select the Enable the user policy if no login within a period</p> | <p>deletes the users that meet the policy settings.</p> <p>3. Data is deleted when the system is uninstalled.</p> | | <p>ses of the users are not exported, and the fields are left blank.</p> |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|---|---|---------------------|--|--------------|
| | | | encrypt AES128/ AES256. 4. The user password is encrypted using PBKDF2 or SM3. 5. Only security administrators can access the data. | check box, the system automatically deletes the users that meet the policy settings. In other cases, if security administrators do not delete a user, the user is valid | | | |

| Usage Scenario | Collected Personal Data | Data Source and Collection Method | Purpose and Security Measure | Storage Duration and Policy | Destruction Measure | Export Method (Interface, Command, etc.) and Implementation Plan (Anonymization, Pseudonymization, etc.) | Export Guide |
|----------------|-------------------------|-----------------------------------|------------------------------|-----------------------------|---------------------|--|--------------|
| | | | | permanently. | | | |

A Commercial Smart Inverters Parameters

A.1 Grid parameters

Advanced User

| No. | Parameter | Description |
|-----|--------------------|--|
| 1 | Grid Code | Set this parameter based on the grid code of the country or region where the inverter is used and the inverter application scenario. |
| 2 | Isolation settings | Set the working mode of the inverter based on the grounding status at DC side and the connection to the power grid. |

Special User

| No. | Parameter | Description |
|-----|--------------------|---|
| 1 | Grid Code | Set this parameter based on the grid code of the country or region where the inverter is used and the inverter application scenario. |
| 2 | Isolation settings | Set the working mode of the inverter based on the grounding status at DC side and the connection to the power grid. |
| 3 | Output mode | Specifies whether the inverter output has a neutral wire based on the application scenario. |
| 4 | PQ mode | If this parameter is set to PQ mode 1 , the maximum AC output power equals the maximum apparent power. If this parameter is set to PQ mode 2 , the maximum AC output power equals the rated output power. |

| No. | Parameter | Description |
|-----|---|--|
| 5 | Automatically start upon grid recovery | Specifies whether to allow the inverter to automatically start after the power grid recovers. |
| 6 | Grid connected recovery time from grid faults (s) | Specifies the time after which the inverter begins restarting after the power grid recovers. |
| 7 | Startup voltage lower threshold of grid connection (V) | According to the standards of certain countries and regions, after the inverter is powered on for the first time for grid connection, if the power grid voltage is lower than Startup voltage lower threshold of grid connection , the inverter is not allowed to connect to the grid. |
| 8 | Startup frequency upper threshold of grid connection (Hz) | According to the standards of certain countries and regions, after the inverter is powered on for the first time for grid connection, if the power grid voltage is higher than Startup frequency upper threshold of grid connection , the inverter is not allowed to connect to the grid. |
| 9 | Startup frequency lower threshold of grid connection (Hz) | According to the standards of certain countries and regions, after the inverter is powered on for the first time for grid connection, if the power grid voltage is lower than Startup frequency lower threshold of grid connection , the inverter is not allowed to connect to the grid. |
| 10 | Grid reconnection voltage upper limit (V) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid voltage is higher than Grid reconnection voltage upper limit , the inverter is not allowed to reconnect to the grid. |
| 11 | Grid reconnection voltage lower limit (V) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid voltage is lower than Grid reconnection voltage lower limit , the inverter is not allowed to reconnect to the grid. |
| 12 | Grid reconnection frequency upper limit (Hz) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid frequency is higher than Grid reconnection frequency upper limit , the inverter is not allowed to reconnect to the grid. |
| 13 | Grid reconnection frequency lower limit (Hz) | The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid frequency is lower than Grid reconnection frequency lower limit , the inverter is not allowed to reconnect to the grid. |
| 14 | Reactive power compensation (cosφ-P) trigger voltage (%) | Specifies the voltage threshold for triggering reactive power compensation based on the cosφ-P curve. |
| 15 | Reactive power compensation (cosφ-P) exit voltage (%) | Specifies the voltage threshold for exiting reactive power compensation based on the cosφ-P curve. |

A.2 Protection Parameters

Advanced User

| No. | Parameter | Description |
|-----|---|---|
| 1 | Insulation resistance protection threshold (MΩ) | To ensure device safety, the inverter detects the insulation resistance of the input side with respect to ground when it starts a self-check. If the detected value is less than the preset value, the inverter does not connect to the grid. |

Special User

| No. | Parameter | Description |
|-----|--|--|
| 1 | Voltage unbalance protection threshold (%) | Specifies the inverter protection threshold when the power grid voltage is unbalanced. |
| 2 | Phase protection point (°) | The Japanese standard requires that during passive islanding detection, protection should be triggered if an abrupt voltage phase change is detected. |
| 3 | Phase angle offset protection | The standards of certain countries and regions require that the inverter needs to be protected when the phase angle offset of the power grid three phases exceeds a certain value. |
| 4 | 10-min overvoltage protection threshold (V) | Specifies the 10-minute overvoltage protection threshold. |
| 5 | 10-min overvoltage protection duration (ms) | Specifies the 10-minute overvoltage protection duration. |
| 6 | Level-1 overvoltage protection threshold (V) | Specifies the level-1 overvoltage protection threshold. |
| 7 | Level-1 overvoltage protection duration (ms) | Specifies the level-1 overvoltage protection duration. |
| 8 | Level-2 overvoltage protection threshold (V) | Specifies the level-2 overvoltage protection threshold. |
| 9 | Level-2 overvoltage protection duration (ms) | Specifies the level-2 overvoltage protection duration. |
| 10 | Level-3 overvoltage protection threshold (V) | Specifies the level-3 overvoltage protection threshold. |
| 11 | Level-3 overvoltage protection duration (ms) | Specifies the level-3 overvoltage protection duration. |

| No. | Parameter | Description |
|-----|---|---|
| 12 | Level-4 overvoltage protection threshold (V) | Specifies the level-4 overvoltage protection threshold. |
| 13 | Level-4 overvoltage protection duration (ms) | Specifies the level-4 overvoltage protection duration. |
| 14 | Level-5 overvoltage protection threshold (V) | Specifies the level-5 overvoltage protection threshold. |
| 15 | Level-5 overvoltage protection duration (ms) | Specifies the level-5 overvoltage protection duration. |
| 16 | Level-6 overvoltage protection threshold (V) | Specifies the level-6 overvoltage protection threshold. |
| 17 | Level-6 overvoltage protection duration (ms) | Specifies the level-6 overvoltage protection duration. |
| 18 | Level-1 undervoltage protection threshold (V) | Specifies the level-1 undervoltage protection threshold. |
| 19 | Level-1 undervoltage protection duration (ms) | Specifies the level-1 undervoltage protection duration. |
| 20 | Level-2 undervoltage protection threshold (V) | Specifies the level-2 undervoltage protection threshold. |
| 21 | Level-2 undervoltage protection duration (ms) | Specifies the level-2 undervoltage protection duration. |
| 22 | Level-3 undervoltage protection threshold (V) | Specifies the level-3 undervoltage protection threshold. |
| 23 | Level-3 undervoltage protection duration (ms) | Specifies the level-3 undervoltage protection duration. |
| 24 | Level-4 undervoltage protection threshold (V) | Specifies the level-4 undervoltage protection threshold. |
| 24 | Level-4 undervoltage protection duration (ms) | Specifies the level-4 undervoltage protection duration. |
| 26 | Level-5 undervoltage protection threshold (V) | Specifies the level-5 undervoltage protection threshold. |
| 27 | Level-5 undervoltage protection duration (ms) | Specifies the level-5 undervoltage protection duration. |
| 28 | Level-6 undervoltage protection threshold (V) | Specifies the level-6 undervoltage protection threshold. |
| 29 | Level-6 undervoltage protection duration (ms) | Specifies the level-6 undervoltage protection duration. |
| 30 | Level-1 overfrequency protection threshold (Hz) | Specifies the level-1 overfrequency protection threshold. |

| No. | Parameter | Description |
|-----|--|--|
| 31 | Level-1 overfrequency protection duration (ms) | Specifies the level-1 overfrequency protection duration. |
| 32 | Level-2 overfrequency protection threshold (Hz) | Specifies the level-2 overfrequency protection threshold. |
| 33 | Level-2 overfrequency protection duration (ms) | Specifies the level-2 overfrequency protection duration. |
| 34 | Level-3 overfrequency protection threshold (Hz) | Specifies the level-3 overfrequency protection threshold. |
| 35 | Level-3 overfrequency protection duration (ms) | Specifies the level-3 overfrequency protection duration. |
| 36 | Level-4 overfrequency protection threshold (Hz) | Specifies the level-4 overfrequency protection threshold. |
| 37 | Level-4 overfrequency protection duration (ms) | Specifies the level-4 overfrequency protection duration. |
| 38 | Level-5 overfrequency protection threshold (Hz) | Specifies the level-5 overfrequency protection threshold. |
| 39 | Level-5 overfrequency protection duration (ms) | Specifies the level-5 overfrequency protection duration. |
| 40 | Level-6 overfrequency protection threshold (Hz) | Specifies the level-6 overfrequency protection threshold. |
| 41 | Level-6 overfrequency protection duration (ms) | Specifies the level-6 overfrequency protection duration. |
| 42 | Level-1 underfrequency protection threshold (Hz) | Specifies the level-1 underfrequency protection threshold. |
| 43 | Level-1 underfrequency protection duration (ms) | Specifies the level-1 underfrequency protection duration. |
| 44 | Level-2 underfrequency protection threshold (Hz) | Specifies the level-2 underfrequency protection threshold. |
| 45 | Level-2 underfrequency protection duration (ms) | Specifies the level-2 underfrequency protection duration. |
| 46 | Level-3 underfrequency protection threshold (Hz) | Specifies the level-3 underfrequency protection threshold. |
| 47 | Level-3 underfrequency protection duration (ms) | Specifies the level-3 underfrequency protection duration. |
| 48 | Level-4 underfrequency protection threshold (Hz) | Specifies the level-4 underfrequency protection threshold. |
| 49 | Level-4 underfrequency protection duration (ms) | Specifies the level-4 underfrequency protection duration. |

| No. | Parameter | Description |
|-----|--|--|
| 50 | Level-5 underfrequency protection threshold (Hz) | Specifies the level-5 underfrequency protection threshold. |
| 51 | Level-5 underfrequency protection duration (ms) | Specifies the level-5 underfrequency protection duration. |
| 52 | Level-6 underfrequency protection threshold (Hz) | Specifies the level-6 underfrequency protection threshold. |
| 53 | Level-6 underfrequency protection duration (ms) | Specifies the level-6 underfrequency protection duration. |

A.3 Feature parameters

Advanced User

| No. | Parameter | Description | Remarks |
|-----|-------------------------------------|---|---|
| 1 | MPPT multi-peak scanning | When the inverter is used in scenarios where PV strings are greatly shaded, set this parameter to Enable , and then the inverter will perform MPPT scanning at regular intervals to locate the maximum power. | - |
| 2 | MPPT multi-peak scan interval (min) | Specifies the MPPT scanning interval. | This parameter is displayed when MPPT multi-peak scanning is set to Enable . |
| 3 | RCD enhancement | RCD refers to the residual current of the inverter to the ground. To ensure device and personal safety, RCD should be limited to the specified value in the standard. If an AC switch with a residual current detection function is installed outside the inverter, this function should be enabled to reduce the residual current generated when the inverter is running, thereby preventing the AC switch from misoperations. | - |
| 4 | Night-time reactive power output | In some specific application scenarios, a power grid company requires that the inverter can perform reactive power compensation at night to ensure that the power factor of the local power grid meets requirements. | This parameter is displayed when Isolation settings is set to Input ungrounded, with TF . |

| No. | Parameter | Description | Remarks |
|-----|-------------------------------------|---|---|
| 5 | PID protection at night | When the inverter outputs reactive power at night and this parameter is set to Enable , the inverter will shut down automatically if it detects abnormal status of the PID compensation. | - |
| 6 | Strong adaptability | If the power grid short-circuit capacity or PV plant installed capacity is less than 3, the power grid quality will be affected if the power grid impedance is too high, which may cause the inverter to malfunction. In this case, if the inverter is required to work properly, set this parameter to Enable . | - |
| 7 | Power quality optimization mode | If this parameter is set to Enable , the inverter output current harmonics will be optimized. | - |
| 8 | PV module type | This parameter is used to set different types of PV modules and the shutdown time of the concentration PV module. If the concentration PV modules are shaded, the power drops drastically to 0 and the inverter shuts down. The energy yield would be affected since it takes too long for the power to resume and inverter to restart. The parameter does not need to be set for crystalline silicon and filmy PV modules. | <ul style="list-style-type: none"> ● If this parameter is set to Crystalline silicon or Film, the inverter automatically detects the power of PV modules when they are shaded and shuts down if the power is too low. ● When concentration PV modules are used: <ul style="list-style-type: none"> - If this parameter is set to CPV 1, the inverter can quickly restart in 60 minutes if the input power of PV modules drops drastically due to shading. - If this parameter is set to CPV 2, the inverter can quickly restart in 10 minutes if the input power of PV modules drops drastically due to shading. |
| 9 | Built-in PID compensation direction | When the external PID module compensates the PID voltage for the PV system, set Built-in PID compensation direction to the actual compensation direction of the PID module so that the inverter can output reactive power at night. | This parameter is displayed when PV module type is set to Crystalline silicon . Select PV-positive offset for P-type PV modules. Select PV+ negative offset for N-type PV modules. |

| No. | Parameter | Description | Remarks |
|-----|--|--|--|
| 10 | PID running mode | Specifies the operation mode of the inverter built-in PID. | - |
| 11 | PID nighttime off-grid repair | Specifies whether to enable the PID nighttime off-grid repair. | If PID running mode is not set to Disable , the parameter can be set. |
| 12 | PID daytime off-grid repair | Specifies whether to enable the PID daytime off-grid repair. | |
| 13 | String connection mode | Specifies the connection mode of PV strings. | <ul style="list-style-type: none"> • When PV strings connect to the inverter separately (All PV strings separated), there is no need to set this parameter. The inverter can automatically detect the connection mode of the PV strings. • When PV strings connect to one another in parallel outside the inverter and then connect to it independently (All PV strings connected), set this parameter to All PV strings connected. |
| 14 | Automatic OFF due to communication interrupted | The standards of certain countries and regions require that the inverter must shut down after the communication is interrupted for a certain time. | If Automatic OFF due to communication interrupted is set to Enable and the inverter communication is interrupted for a specified time (set by Communication interruption duration), the inverter will automatically shut down. |
| 15 | Communication interruption duration (min) | Specifies the duration for determining communication interruption. Used for automatic shutdown for protection in case of communication interruption. | - |
| 16 | Automatic ON due to communication resumed | If this parameter is set to Enable , the inverter automatically starts after communication recovers. If this parameter is set to Disable , the inverter needs to be started manually after communication recovers. | This parameter is displayed when Automatic OFF due to communication interrupted is set to Enable . |
| 17 | Soft start/boot time (s) | Specifies the duration for the power to gradually increase when the inverter starts. | - |

| No. | Parameter | Description | Remarks |
|-----|--|--|---|
| 18 | Shutdown gradient (%/s) | Specifies the power change speed when the inverter shuts down. | - |
| 19 | AFCI | The North American standard requires that the inverter should have DC arc detection function. | - |
| 20 | AFCI detection adaptive mode | Adjusts the sensitivity of arc detection. | This parameter is displayed only when AFCI is set to Enable . |
| 21 | AFCI self-test | Send the AFCI self-check command manually. | - |
| 22 | Current error during the scan (A) | To prevent inaccurate scanning caused by sunlight change, the current change of PV strings operating properly should be monitored when the I-V curves of PV strings are being scanned. When the current exceeds the specified value, it is determined that the sunlight changes. The I-V curves should be scanned again. | - |
| 23 | OVGR associated shutdown | If this parameter is set to Enable , the inverter shuts down after receiving the OVGR signal. If this parameter is set to Disable , the inverter does not shut down after receiving the OVGR signal. | This parameter is displayed if the Japanese grid code is selected. |
| 24 | Dry contact function | Identifies the dry contact signals from the SmartLogger. | Set this parameter to OVGR for OVGR signals, and set it to NC for other signals. This parameter is displayed if the Japanese grid code is selected. |
| 25 | Commanded shutdown hold after power recovery | The standards of certain countries and regions require that if the inverter is shut down after receiving a command and powered on again after power recovers, it should still be in commanded shutdown state. | - |
| 26 | Night-time hibernation | The inverter monitors PV strings at night. If this parameter is set to Enable , the monitoring function of the inverter will hibernate at night to reduce power consumption. | - |

| No. | Parameter | Description | Remarks |
|-----|--|---|--|
| 27 | MBUS communication | For inverters that support RS485 communication and MBUS communication, you are advised to set this parameter to Disable to reduce power consumption. | - |
| 28 | RS485-2 communication | If this parameter is set to Enable , the RS485-2 port can be used. If the port is not used, you are advised to set this parameter to Disable to reduce power consumption. | - |
| 29 | Delay upgrade | This parameter is mainly used in the upgrade scenarios where the PV power supply is disconnected at night due to no sunlight or unstable at dawn or dusk due to poor sunlight. | After the inverter starts to upgrade, if Delay upgrade is set to Enable , the upgrade package is loaded first. After the PV power supply recovers and the activation conditions are met, the inverter automatically activates the upgrade. |
| 30 | String monitor | The inverter monitors PV strings in real time. If any PV string is abnormal (such as the PV string is shaded or the electric energy yield decreases), the inverter generates an alarm to remind maintenance personnel to maintain the PV string in a timely manner. | If PV strings are often shaded, you are advised to set String monitor to Disable to prevent false alarms. |
| 31 | String detection low power delay (min) | Specifies the delay time for generating abnormal string alarms when the inverter detects that a PV string is working with low power. This parameter is mainly used in the scenario where PV strings are shaded for a long time in the morning and evening, and is used to prevent false alarms. | This parameter is displayed when String monitor is set to Enable . |
| 32 | String detection high power delay (min) | Specifies the delay time for generating abnormal string alarms when the inverter detects that a PV string is working with high power. | |
| 33 | String detection power segment division percentage (%) | Specifies the thresholds for determining whether a PV string is working with high power or low power. This parameter is used to distinguish the working status of PV strings. | |

| No. | Parameter | Description | Remarks |
|-----|---|--|---|
| 34 | String detection reference asymmetric coefficient | Specifies the threshold for determining PV string exception. The false alarms caused by fixed shadow shading can be controlled by changing this parameter. | |
| 35 | String detection starting power percentage (%) | Specifies the threshold for starting PV string exception detection. The false alarms caused by fixed shadow shading can be controlled by changing this parameter. | |
| 36 | OFF at 0% power limit | If this parameter is set to Enable , the inverter shuts down after receiving the 0% power limit command. If this parameter is set to Disable , the inverter does not shut down after receiving the 0% power limit command. | - |
| 37 | Maximum apparent power (kVA) | Specifies the output upper threshold for the maximum apparent power to adapt to the capacity requirements of standard and customized inverters. | If the maximum active power equals the value of Smax_limit, this parameter is not displayed. |
| 38 | Maximum active power (kW) | Specifies the output upper threshold for the maximum active power to adapt to different market requirements. | For 1000 V inverters, this parameter is configurable only for the SUN2000-25KTL-US, and the maximum value is 27.5 kW. |
| 39 | Tracker controller | Selects a controller vendor. | - |
| 40 | Adjust total energy yield (kWh) | Specifies the initial energy yield of the inverter. This parameter is used in inverter replacement scenarios. Set the initial energy yield of the new inverter to the total energy yield of the old inverter to ensure continuous statistics of cumulative energy yield. | - |
| 41 | Duration for determining short-time grid disconnection (ms) | The standards of certain countries and regions require that the inverter should not disconnect from the power grid if the power grid experiences a short-time failure. After the fault is rectified, the inverter output power needs to be quickly restored. | - |

| No. | Parameter | Description | Remarks |
|-----|-----------|--|---------|
| 42 | Buzzer | If this parameter is set to Enable , the buzzer sounds when the DC input cable is incorrectly connected. If this parameter is set to Disable , the buzzer does not sound when the DC input cable is incorrectly connected. | - |

Special User

| No. | Parameter | Description | Remarks |
|-----|--|--|--|
| 1 | Automatic OFF due to communication interrupted | The standards of certain countries and regions require that the inverter must shut down after the communication is interrupted for a certain time. | If Automatic OFF due to communication interrupted is set to Enable and the inverter communication is interrupted for a specified time (set by Communication interruption duration), the inverter will automatically shut down. |
| 2 | Communication interruption duration (min) | Specifies the duration for determining communication interruption. Used for automatic shutdown for protection in case of communication interruption. | - |
| 3 | Automatic ON due to communication resumed | If this parameter is set to Enable , the inverter automatically starts after communication recovers. If this parameter is set to Disable , the inverter needs to be started manually after communication recovers. | This parameter is displayed when Automatic OFF due to communication interrupted is set to Enable . |
| 4 | Soft start/boot time (s) | Specifies the duration for the power to gradually increase when the inverter starts. | - |
| 5 | LVRT | LVRT is short for low voltage ride-through. When the grid voltage is abnormally low for a short time, the inverter cannot disconnect from the power grid immediately and has to work for some time. | - |
| 6 | Threshold for triggering LVRT (V) | Specifies the threshold for triggering LVRT. The threshold settings should meet the local grid standard. | This parameter is displayed when LVRT is set to Enable . |

| No. | Parameter | Description | Remarks |
|-----|---|--|---------|
| 7 | LVRT compensation power factor of reactive power in positive sequence | <p>During LVRT, the solar inverter needs to generate positive-sequence reactive power to support the power grid. This parameter is used to set the positive-sequence reactive power generated by the solar inverter.</p> <p>For example, if you set LVRT compensation power factor of reactive power in positive sequence to 2, the positive-sequence reactive current generated by the solar inverter is 20% of the rated current when the AC voltage decreases by 10% during LVRT.</p> | |
| 8 | LVRT compensation power factor of reactive power in negative sequence | <p>During LVRT, the solar inverter needs to generate negative-sequence reactive power to support the power grid. This parameter is used to set the negative-sequence reactive power generated by the solar inverter.</p> <p>For example, if you set LVRT compensation power factor of reactive power in negative sequence to 2, the negative-sequence reactive current generated by the solar inverter is 20% of the rated current when the AC voltage decreases by 10% during LVRT.</p> | |
| 9 | Percentage of LVRT reactive current limiting | <p>During LVRT, the solar inverter needs to limit the reactive current.</p> <p>For example, if you set Percentage of LVRT reactive current limiting to 50, the reactive current upper limit of the solar inverter is 50% of the rated current during LVRT.</p> | |
| 10 | Threshold of LVRT zero-current mode | <p>When Zero current due to power grid fault is enabled, if the power grid voltage is less than the value of Threshold of LVRT zero-current mode during LVRT, the zero current mode is used. Otherwise, the mode configured in LVRT mode is used.</p> | |

| No. | Parameter | Description | Remarks |
|-----|---|--|--|
| 11 | LVRT mode | Sets LVRT mode. The options are Zero-current mode , Constant current mode , Reactive power priority mode , and Active power priority mode . | |
| 12 | LVRT reactive power compensation factor | During LVRT, the inverter needs to generate reactive power to support the power grid. This parameter is used to set the reactive power generated by the inverter. | <ul style="list-style-type: none"> This parameter is displayed when LVRT is set to Enable. For example, if this parameter is set to 2, the reactive power generated by the inverter is 20% of the rated power when the AC voltage drops by 10% during LVRT. |
| 13 | LVRT characteristic curve | Specifies the low voltage ride-through capability of the inverter. | - |
| 14 | HVRT | HVRT is short for high voltage ride-through. When the grid voltage is abnormally high for a short time, the inverter cannot disconnect from the power grid immediately and has to work for some time. | - |
| 15 | Threshold for triggering HVRT (V) | Specifies the threshold for triggering HVRT. The threshold settings should meet the local grid standard. | This parameter is displayed when HVRT is set to Enable . |
| 16 | HVRT compensation power factor of reactive power in positive sequence | <p>During HVRT, the solar inverter needs to generate positive-sequence reactive power to support the power grid. This parameter is used to set the positive-sequence reactive power generated by the solar inverter.</p> <p>For example, if you set HVRT compensation power factor of reactive power in positive sequence to 2, the positive-sequence reactive current generated by the solar inverter is 20% of the rated current when the AC voltage increases by 10% during HVRT.</p> | |

| No. | Parameter | Description | Remarks |
|-----|---|--|--|
| 17 | HVRT compensation power factor of reactive power in negative sequence | <p>During HVRT, the solar inverter needs to generate negative-sequence reactive power to support the power grid. This parameter is used to set the negative-sequence reactive power generated by the solar inverter.</p> <p>For example, if you set HVRT compensation power factor of reactive power in negative sequence to 2, the negative-sequence reactive current generated by the solar inverter is 20% of the rated current when the AC voltage increases by 10% during HVRT.</p> | |
| 18 | HVRT compensation power factor of reactive power in positive sequence | <p>During HVRT, the inverter needs to generate reactive power to support the power grid. This parameter is used to set the reactive power generated by the inverter.</p> | |
| 19 | VRT exit hysteresis threshold | Specifies the LVRT/HVRT recovery threshold. | <ul style="list-style-type: none"> • This parameter is displayed when LVRT or HVRT is set to Enable. • LVRT recovery threshold = Threshold for triggering LVRT + VRT exit hysteresis threshold • HVRT recovery threshold = Threshold for triggering HVRT + VRT exit hysteresis threshold |
| 20 | LVRT undervoltage protection shield | Specifies whether to shield the undervoltage protection function during LVRT. | This parameter is displayed when LVRT is set to Enable . |
| 21 | Grid voltage protection shield during VRT | Specifies whether to shield the undervoltage protection function during LVRT or HVRT. | This parameter is displayed when LVRT or HVRT is set to Enable . |

| No. | Parameter | Description | Remarks |
|-----|--|---|---|
| 22 | Grid voltage jump triggering threshold (%) | Specifies the LVRT or HVRT threshold for triggering a transient voltage jump of a power grid. A transient voltage jump indicates that the inverter cannot immediately disconnect from the power grid when the power grid is abnormal due to transient changes. | This parameter is available when Grid code is set to VDE 4120 . |
| 23 | Zero current due to power grid fault | Certain countries and regions have requirements on the output current during high/low voltage ride-through. In this case, set this parameter to Enable . After this parameter is set to Enable , the output current is less than 10% of the rated current during high/low voltage ride-through. | This parameter is displayed when LVRT or HVRT is set to Enable . |
| 24 | Active islanding protection | Specifies whether to enable the active islanding protection function. | - |
| 25 | Passive islanding protection | Specifies whether to enable the passive islanding protection function. | This parameter is displayed if the Japanese grid code is selected. |
| 26 | Voltage rise suppression | The standards of certain countries and regions require that when the output voltage exceeds a certain value, the inverter must suppress voltage rise by outputting reactive power and reducing active power. | - |
| 27 | Voltage rise suppressing reactive power adjustment point (%) | The standards of certain countries and regions require that the inverter generate a certain amount of reactive power when the output voltage exceeds a certain value. | <ul style="list-style-type: none"> • This parameter is displayed when Voltage rise suppression is set to Enable. • The value of Voltage rise suppressing active power derating point must be greater than that of Voltage rise suppressing reactive power adjustment point. |
| 28 | Voltage rise suppressing active power derating point (%) | The standards of certain countries and regions require that the active power of the inverter be derated according to a certain slope when the output voltage exceeds a certain value. | |
| 29 | Voltage rise suppression P-U curve | The standards of certain countries and regions require that the P-U curve be set. | This parameter is displayed when Voltage rise suppression is set to Enable . |

| No. | Parameter | Description | Remarks |
|-----|---|--|--|
| 30 | Voltage rise suppression Q-U curve | The standards of certain countries and regions require that the Q-U curve be set. | |
| 31 | Frequency change rate protection | Set this parameter to Enable to protect the inverter when the grid frequency changes too fast. | - |
| 32 | Frequency change rate protection threshold (Hz/s) | Specifies the frequency change rate protection threshold. | This parameter is displayed if Frequency change rate protection is set to Enable . |
| 33 | Frequency change rate protection duration (s) | The inverter is protected when the grid frequency change duration exceeds the value. | |
| 34 | Soft start time after grid failure (s) | Specifies the time for the power to gradually increase when the inverter restarts after the power grid recovers. | - |
| 35 | TCP heartbeat interval (s) | Specifies the TCP link timeout period for the solar inverter to connect to the management system. | - |
| 36 | TCP frame length | Specifies the maximum length of the TCP frame sent by the northbound device to the solar inverter. | - |
| 37 | Heartbeat period at application layer (min) | Specifies the timeout period for the solar inverter to connect to the management system. | - |

A.4 Power adjustment parameters

Special User

| No. | Parameter | Description | Remarks |
|-----|-----------------------|--|---------|
| 1 | Remote power schedule | If this parameter is set to Enable , the inverter responds to the scheduling instruction from the remote port. If this parameter is set to Disable , the inverter does not respond to the scheduling instruction from the remote port. | - |

| No. | Parameter | Description | Remarks |
|-----|---|--|---|
| 2 | Schedule instruction valid duration (s) | Specifies the time for maintaining the scheduling instruction. | When this parameter is set to 0, the scheduling instruction takes effect permanently. |
| 3 | Maximum apparent power (kVA) | Specifies the output upper threshold for the maximum apparent power to adapt to the capacity requirements of standard and customized inverters. | If the maximum active power equals the value of Smax_limit, this parameter is not displayed. |
| 4 | Maximum active power (kW) | Specifies the output upper threshold for the maximum active power to adapt to different market requirements. | - |
| 5 | OFF at 0% power limit | If this parameter is set to Enable , the inverter shuts down after receiving the 0% power limit command. If this parameter is set to Disable , the inverter does not shut down after receiving the 0% power limit command. | - |
| 6 | Active power change gradient (%/s) | Specifies the change speed of the inverter active power. | - |
| 7 | Derated by fixed active power (kW) | Adjusts the active power output of the inverter by fixed value. | This parameter is displayed if Remote power schedule is set to Enable . For 1000 V inverters, the maximum value of this parameter for the SUN2000-25KTL-US is 27.5 kW. |
| 8 | Derated by active power % (%) | Adjusts the active power output of the inverter by percentage. | This parameter is displayed if Remote power schedule is set to Enable . If this parameter is set to 100 , the inverter outputs based on the maximum output power. |
| 9 | Reactive power change gradient (%/s) | Specifies the change speed of the inverter reactive power. | - |
| 10 | Plant active power gradient (min/100%) | Specifies the rate of active power rise due to sunlight changes. | - |

| No. | Parameter | Description | Remarks |
|-----|--|---|--|
| 11 | Average active power filtering time (ms) | Specifies the period of active power rise due to sunlight changes. This parameter is used with Plant active power gradient . | - |
| 12 | PF (U) voltage detection filtering time (s) | Specifies the time for filtering the grid voltage in the PF-U curve. | - |
| 13 | Reactive power adjustment time (s) | Specifies the adjustment time for the reactive power to reach the target value during reactive power adjustment. | - |
| 14 | Power factor | Specifies the power factor of the inverter. | This parameter is displayed if Remote power schedule is set to Enable . |
| 15 | Reactive power compensation (Q/S) | Specifies the reactive power output by the inverter. | |
| 16 | Night-time reactive power compensation (Q/S) | During the reactive power compensation at night, the reactive power is scheduled by percentage. | - |
| 17 | Night-time reactive power output | In some specific application scenarios, a power grid company requires that the inverter can perform reactive power compensation at night to ensure that the power factor of the local power grid meets requirements. | This parameter is displayed when Isolation settings is set to Input ungrounded, with TF . |
| 18 | Enable reactive power parameters at night | When this parameter is set to Enable , the inverter outputs reactive power based on the setting of Reactive power compensation at night . Otherwise, the inverter executes the remote scheduling command. | This parameter is displayed when Night-time reactive power output is set to Enable . |
| 19 | Fixed nighttime reactive power | During the reactive power compensation at night, the reactive power is scheduled by fixed value. | This parameter is displayed when Night-time reactive power output and Enable reactive power parameters at night are set to Enable . |
| 20 | Overfrequency derating | If this parameter is set to Enable , the active power of the inverter will be derated according to a certain slope when the grid frequency exceeds the frequency that triggers overfrequency derating. | - |

| No. | Parameter | Description | Remarks |
|-----|---|---|---|
| 21 | Frequency for triggering overfrequency derating (Hz) | The standards of certain countries and regions require that the output active power of inverters be derated when the power grid frequency exceeds a certain value. | <ul style="list-style-type: none"> This parameter is displayed when Overfrequency derating is set to Enable. When setting this parameter, ensure that the following condition is met: Frequency for exiting overfrequency derating \leq Frequency for triggering overfrequency derating $<$ Cutoff frequency of overfrequency derating. |
| 22 | Frequency for exiting overfrequency derating (Hz) | Specifies the frequency threshold for exiting overfrequency derating. | |
| 23 | Cutoff frequency of overfrequency derating (Hz) | Specifies the frequency threshold for cutting off overfrequency derating. | |
| 24 | Cutoff power of overfrequency derating (%) | Specifies the power threshold for cutting off overfrequency derating. | |
| 25 | Frequency detection filtering time (ms) | Specifies the frequency detection filter time. | |
| 26 | Overfrequency derating power drop gradient (%/s) | Specifies the decrease rate of the overfrequency derating power. | |
| 27 | Power recovery gradient of overfrequency derating (%/min) | Specifies the recovery rate of the overfrequency derating power. | |
| 28 | Voltage derating | If this parameter is set to Enable , the active power of the inverter will be derated according to a certain slope when the grid voltage exceeds the voltage that triggers overfrequency derating. | - |
| 29 | Voltage derating start point (V) | Specifies the start point for voltage derating. | <ul style="list-style-type: none"> This parameter is displayed when Voltage derating is set to Enable. When setting this parameter, ensure that the following condition is met: Voltage derating start point $<$ Voltage derating stop point. |
| 30 | Cut-off point of voltage derating (V) | Specifies the stop point for voltage derating. | |
| 31 | Voltage derating cut-off power (V) | Specifies the power threshold for cutting off voltage derating. | |

| No. | Parameter | Description | Remarks |
|-----|--|---|---|
| 32 | Communication disconnection fail-safe | In the inverter export limitation scenario, if this parameter is set to Enable , the inverter will perform active power derating by percentage when the communication between the inverter and the SmartLogger or Smart Dongle is disconnected for more than the time specified by Communication disconnection detection time . | N/A |
| 33 | Communication disconnection detection time (s) | Specifies the fail-safe detection time for the disconnection between the inverter and the SmartLogger or Smart Dongle. | This parameter is displayed when Communication disconnection fail-safe is set to Enable . |
| 34 | Active power output limit for fail-safe (%) | Specifies the derating value of the inverter active power by percentage. | |
| 35 | Apparent power baseline (kVA) | Adjusts the apparent output baseline of the inverter. | - |
| 36 | Active power baseline (kW) | Adjusts the active output baseline of the inverter. | - |
| 37 | Frequency modulation control | The standards of certain countries and regions require that if the power grid frequency fluctuates around a certain value, the inverter needs to fine-tune the active power output based on Frequency modulation control droop to help stabilize the power grid frequency. In this case, set this parameter to Enable | - |
| 38 | Adjustment ratio of frequency modulation control | Specifies the droop of the active power output. | This parameter is displayed when Frequency modulation control is set to Enable . |
| 39 | Underfrequency rise power | The standards of certain countries and regions require that if the power grid frequency is lower than Frequency for triggering of underfrequency rise power , the inverter needs to increase the active power output to help increase the power grid frequency. In this case, set this parameter to Enable . | - |
| 40 | Frequency for triggering of underfrequency rise power (Hz) | Specifies the frequency threshold of Underfrequency rise power . | This parameter is displayed when Underfrequency rise power is set to Enable . |

| No. | Parameter | Description | Remarks |
|-----|---|---|---------|
| 41 | Power recovery gradient of underfrequency rise (%/min) | Specifies the recovery rate of Underfrequency rise power . | |
| 42 | Cutoff frequency of underfrequency rise power (Hz) | Specifies the cutoff frequency of Underfrequency rise power . | |
| 43 | Cutoff power of underfrequency rise power (%) | Specifies the cutoff power of Underfrequency rise power . | |
| 44 | Frequency for exiting of underfrequency rise power (Hz) | Specifies the exit frequency of Underfrequency rise power . | |
| 45 | Q-U characteristic curve mode | Specifies the reactive power compensation mode of the inverter output. | - |
| 46 | Power percentage for triggering Q-U scheduling | Specifies the reference apparent power, in percentage. When the actual apparent power of the inverter is greater than the value of this parameter, the Q-U characteristic curve scheduling function is enabled. | - |
| 47 | Q-U characteristic curve | The inverter adjusts Q/S (the ratio of the output reactive power to apparent power) in real time based on U/Un(%) (the ratio of the actual power grid voltage to the rated power grid voltage). | - |
| 48 | Q-P characteristic curve | The inverter adjusts Q/Pn (the ratio of the output reactive power to the rated active power) in real time based on P/Pn(%) (the ratio of the actual active power to the rated active power). | - |
| 49 | Cosφ-P/Pn characteristic curve | The inverter adjusts the output power factor cosφ in real time based on P/Pn(%). | - |

A.5 Grid-tied control parameters

Special User

Table A-1 Grid-tied control parameters

| Parameter | Description |
|---------------------------------|---|
| Active power control mode | Specifies the active power output mode at the grid-tied point. |
| Closed-loop controller | Specifies the grid-tied power controller. Before setting the parameter, confirm the controller type. Incorrect setting will result in abnormal power output of the solar inverter. Solar inverter applies only to the scenario where a single solar inverter is used or where a single solar inverter is used with an SDongle. |
| Limitation mode | Specifies the active power limitation mode as required by the power grid. |
| PV plant capacity (kW) | Specifies the PV array capacity. |
| Maximum grid feed-in power (kW) | In Grid connection with limited power (kW) mode, set the maximum power fed to the power grid from the PV array. |
| Maximum grid feed-in power (%) | In Grid connection with limited power (%) mode, set the proportion of the maximum power fed to the power grid from the PV array to the capacity of the PV plant. |
| Power adjustment period (s) | Specifies the interval for sending adjustment commands. |
| Maximum protection time (s) | Specifies the protection duration to determine whether the communication between the external controller and the Smart Power Sensor is interrupted. |
| Power control hysteresis (kW) | Specifies the dead zone for adjusting the inverter output power. If the power fluctuation is within the power control hysteresis, the power is not adjusted. |

| Parameter | Description |
|--|--|
| Fail-safe power threshold (%) | When the communication between the SDongle/SmartLogger, power meter, and solar inverter is interrupted, the solar inverter generates power based on this threshold. |
| Reactive power control mode | Specifies the reactive power output mode at the grid-tied point. |
| Power factor | Specifies the target power factor of the power meter. |
| Adjustment period (s) | Specifies the interval for sending adjustment commands. |
| Adjustment deadband | Specifies the adjustment power factor precision. |
| Fail-safe power factor | When the communication between the SDongle/SmartLogger, power meter, and solar inverter is interrupted, the solar inverter generates power based on this threshold. |
| Communication disconnection fail-safe | When this parameter is set to Enable , and the communication between the solar inverter and the SDongle/SmartLogger is interrupted for a certain period (set by Communication disconnection detection time), the solar inverter generates power based on Fail-safe power . |
| Communication disconnection detection time (s) | Specifies the protection duration to determine whether the communication between the SDongle/SmartLogger and the solar inverter is interrupted. |

B Domain Name List of Management Systems

 **NOTE**

The list is subject to change.

Table B-1 Domain names of management systems

| Domain Name | Data Type | Scenario |
|--------------------------------|------------------------|--|
| intl.fusionsolar.huawei.com | Public network address | Global domain name of FusionSolar NOTE Compatible with the former FusionSolar hosting cloud domain name cn.fusionsolar.huawei.com for the Chinese mainland. |
| au7.fusionsolar.huawei.com | Public network address | Australia single-node server domain name |
| eu5.fusionsolar.huawei.com | Public network address | FusionSolar domain name of Europe |
| intlobt.fusionsolar.huawei.com | Public network address | FusionSolar domain name of Europe |
| jp5.fusionsolar.huawei.com | Public network address | FusionSolar domain name of Japan |
| la5.fusionsolar.huawei.com | Public network address | FusionSolar domain name of South America |
| kr5.fusionsolar.huawei.com | Public network address | FusionSolar domain name of South Korea |

| Domain Name | Data Type | Scenario |
|------------------------------------|------------------------|---|
| sg5.fusionsolar.huawei.com | Public network address | FusionSolar domain name of Asia-Pacific and Australia |
| region01eu5.fusionsolar.huawei.com | Public network address | Cluster Server 1 of Europe |
| region02eu5.fusionsolar.huawei.com | Public network address | Cluster Server 2 of Europe |
| region03eu5.fusionsolar.huawei.com | Public network address | Cluster Server 3 of Europe |
| region04eu5.fusionsolar.huawei.com | Public network address | Cluster Server 4 of Europe |
| neteco.alsoenergy.com | Public network address | Partner's management system |
| re-ene.kyuden.co.jp | Public network address | Remote output control server of Kyushu Electric Power Company |
| re-ene.yonden.co.jp | Public network address | Remote output control server of Shikoku Electric Power Company |
| au1.fusionsolar.huawei.com | Public network address | FusionSolar domain name of Australia |
| br1.fusionsolar.huawei.com | Public network address | FusionSolar domain name of Brazil |
| huawei.devicedataacquisition.com | Public network address | Third-party network management system Locus dedicated for the United States |

C Public URLs

Table C-1 Public URLs of the SUN2000 APP

| URL | Description |
|---|---|
| https://solar.huawei.com/~media/Solar/Device/invert.xml | The mobile phone automatically detects software updates when connected to the Internet. If the device upgrade package or grid code is updated, a message is displayed to prompt users to download the upgrade package or grid code. After the distributed solar inverter is connected, the system prompts you to install the upgrade package. |
| https://solar.huawei.com/~media/Solar/Device/DeviceUpgrade.zip | Download the device upgrade package. |
| https://solar.huawei.com/~media/Solar/Device/InverterGridCode.zip | Download the grid code update package. |
| https://support.huawei.com/enterprise/en/doc/EDOC1100054980 | View the app quick guide. |
| https://solar.huawei.com/na/appversion | The mobile phone automatically obtaining app version information when connected to the Internet. |

Table C-2 Public URLs of the FusionSolar APP

| URL | Description |
|---|---------------------|
| https://support.huawei.com/enterprise/ | View the app guide. |

| URL | Description |
|--------------------------------|---|
| *.apple.com | Official website of Apple. The iOS version of the FusionSolar app needs to connect to this website for upgrade. |
| *.pinnettech.com | Official website of Pinnet Technologies. The FusionSolar app needs to connect to this website for upgrade. |
| https://solar.huawei.com | FusionSolar SmartPVMS Official Website |
| eu_inverter_support@huawei.com | FusionSolar SmartPVMS Service Email |

D Acronyms and Abbreviations

| | |
|-------------|-------------------------------|
| A | |
| AFCI | arc-fault circuit-interrupter |
| APP | application |
| L | |
| LCD | liquid crystal display |
| M | |
| MBUS | monitoring bus |
| P | |
| PID | potential induced degradation |
| PV | photovoltaic |
| S | |
| SD | secure digital memory card |