

Guide for Solar Battery Hybrid Controller

REV 1.0.2 2025-06-09

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1. Introduction

EMA App is an energy monitoring application for smart phones, designed for end users of APstorage Products. Users can check the real-time performance, historical energy data, and environmental benefits of their APstorage.

1.1 About this Guide

This document introduces the Solar Battery Hybrid Controller.

1.2 Need to Know

Before using the EMA APP to assist in configuring the device, please ensure that the device has been correctly assembled and connected to the power source. It takes time for the device to respond to the APP settings. For the actual situation, please refer to the LCD display on the device.

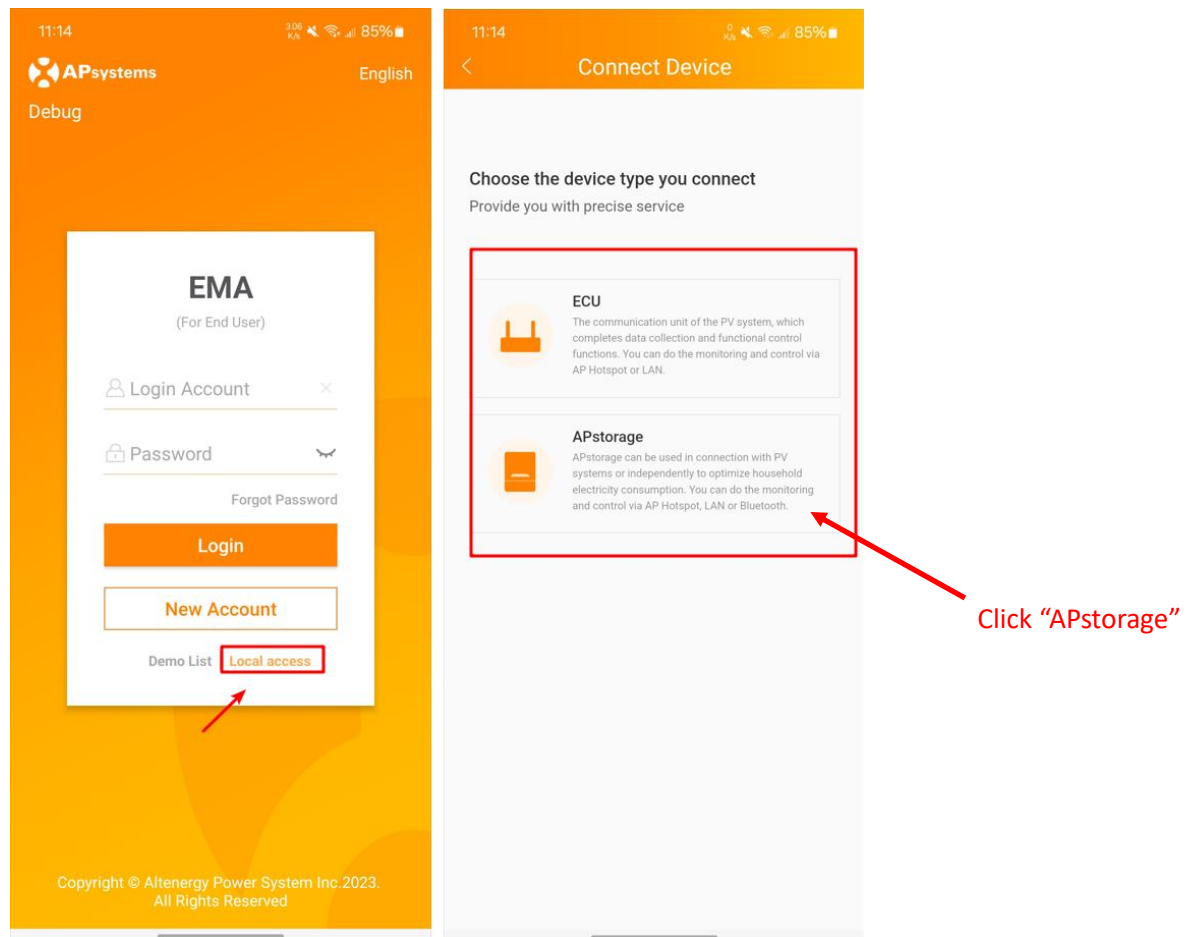
2. Local Control and Monitoring

The Solar Battery Hybrid Controller AHS-6.3 model has been designed with local connection and management functionality. You can access this local functionality through EMA APP.

2.1 Connect Device

Click **“Local access”** to enter this function.

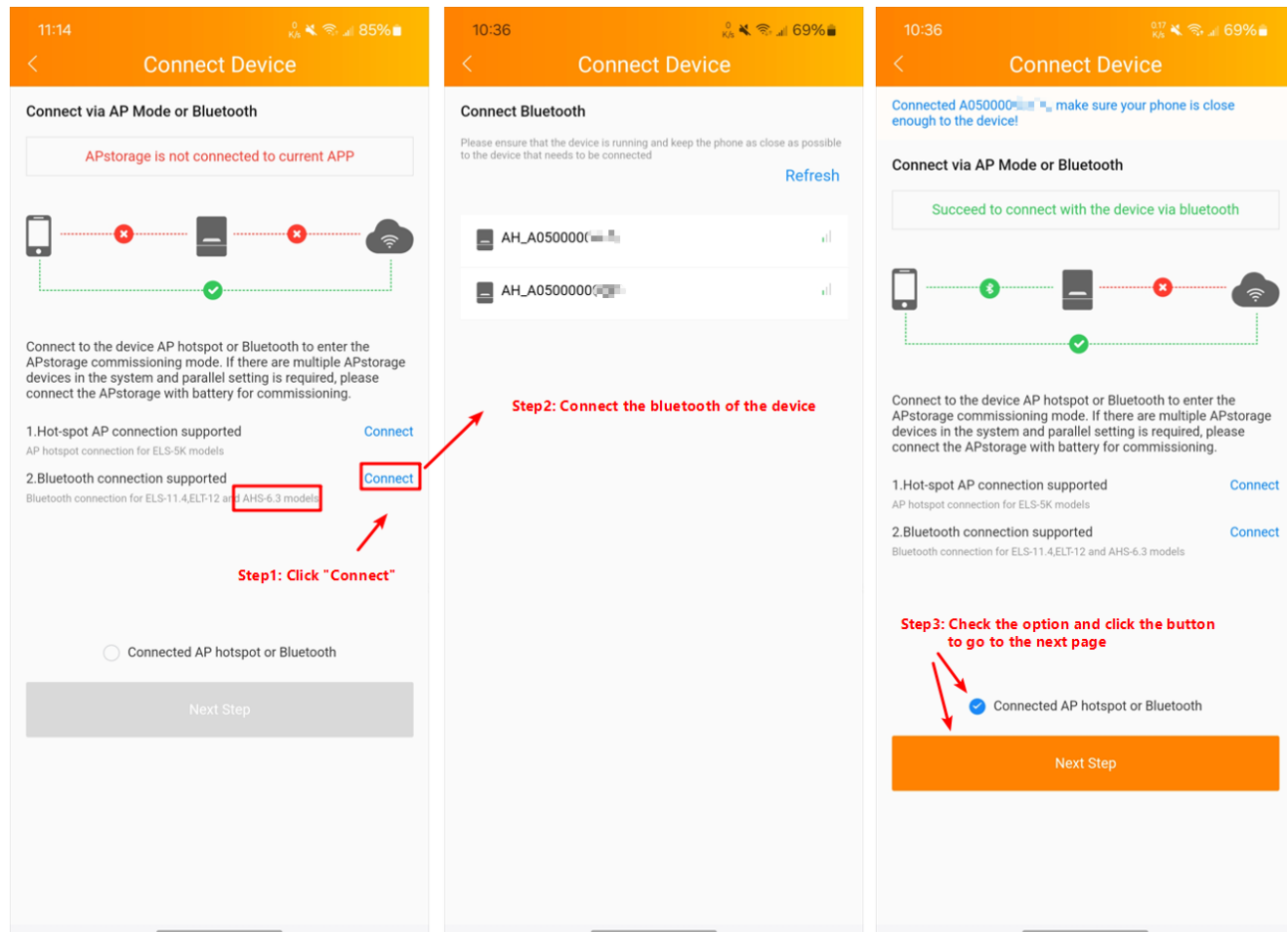
On the **[Connect Device]** page, you can see two entrances for connecting devices, which respectively correspond to devices of ECU and devices of APstorage. Here, please click on the **“APstorage”** to connect APstorage devices.



2.1.1 Bluetooth connection supported

- Step 1: Click **“Connect”** as indicated in the picture to enter the device's Bluetooth list.
- Step 2: Choose the Bluetooth of the APstorage device to connect to, the format of the Bluetooth is AH_A05XXXXXXXXXX, A05XXXXXXXXXX being the device ID.
- Step 3: Wait for the device connection status to be updated. Once successful, check the option **“Connected AP hotspot or Bluetooth”** and then you can click **“Next Step”** to the **[Home]** page.

- **Note:** If the device fails to connect, please check whether the device is working properly and then repeat the above operation.




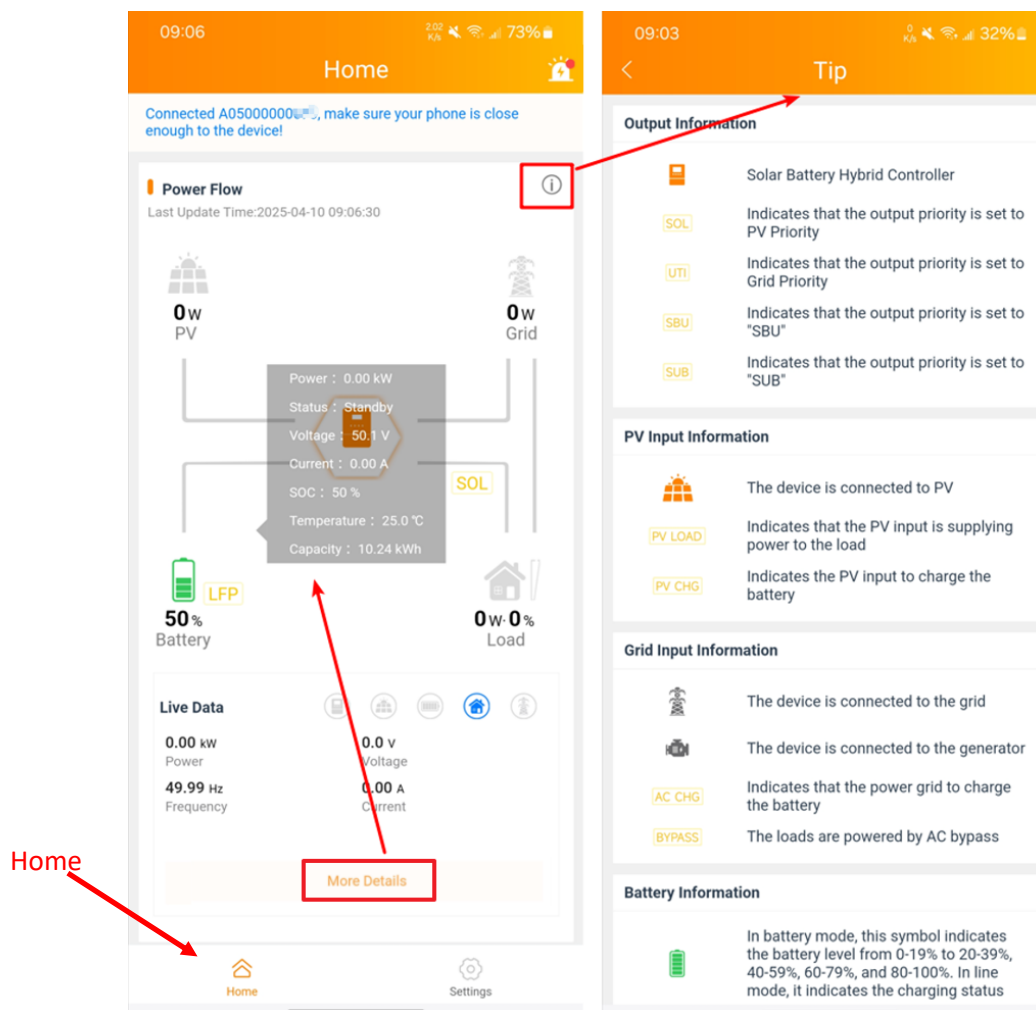
2.2 Home Page

On the **[Home]** page, you can visualize:

- The connection situation between the mobile phone and APStorage.
- Power flow of the system with AHS-6.3 model.
- Live data of the system.
- Total energy including consumption, production, grid or generator, charge and discharge.

Note

- ◆ There is a **[Tip]** page entered by clicking the icon “”, which displays the meanings of each icon on the **[Power Flow]**.
- ◆ Within the **[Live Data]** area, after clicking the button “**More Details**”, you will see more relevant data in the **[Power Flow]** area.



2.2.1 Alarm

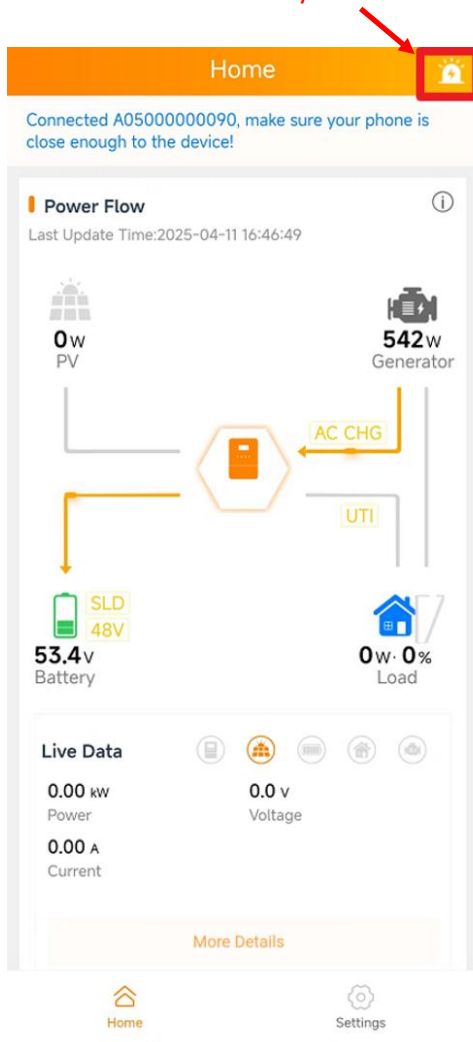


Note

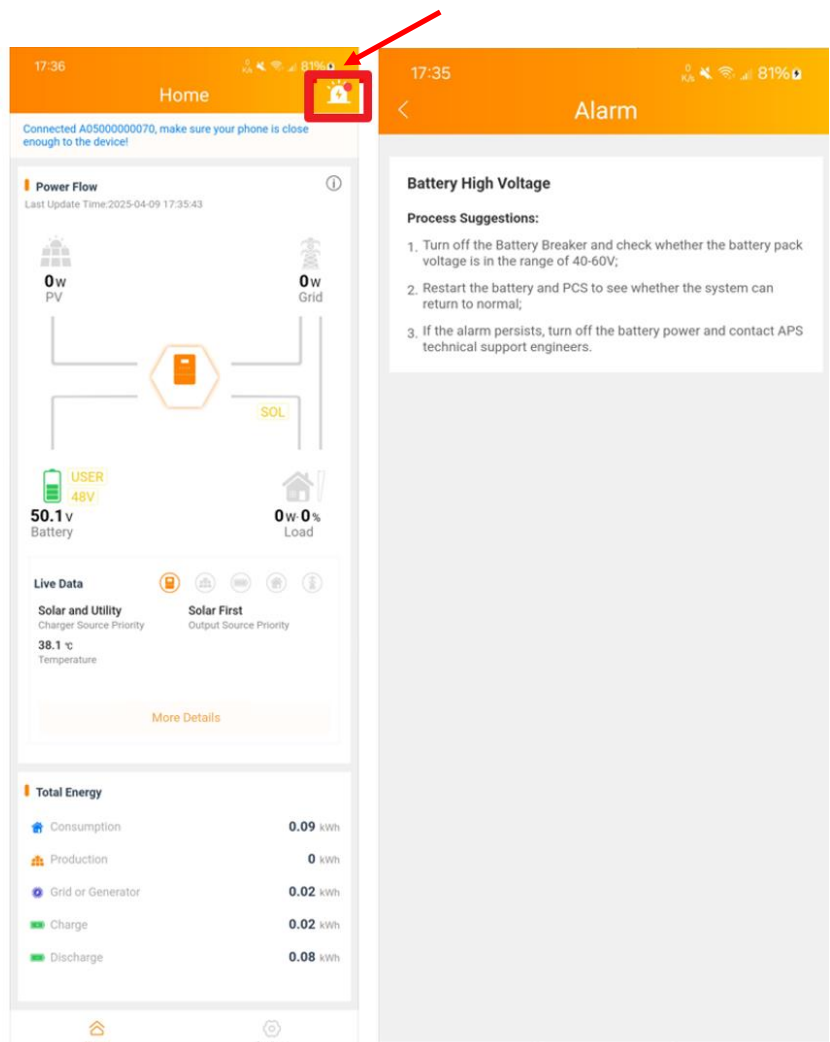
- ◆ Click on the icon “🔔” to enter the **[Alarm]** page, which displays the detailed alarm list and process suggestions.

This page displays the current alarm information of the device. If the actual alarm of the device has disappeared, the page will be updated accordingly. If the device is operating normally, the alarm indicator will be shown as “🔔” without the red dot.

Device runs normally

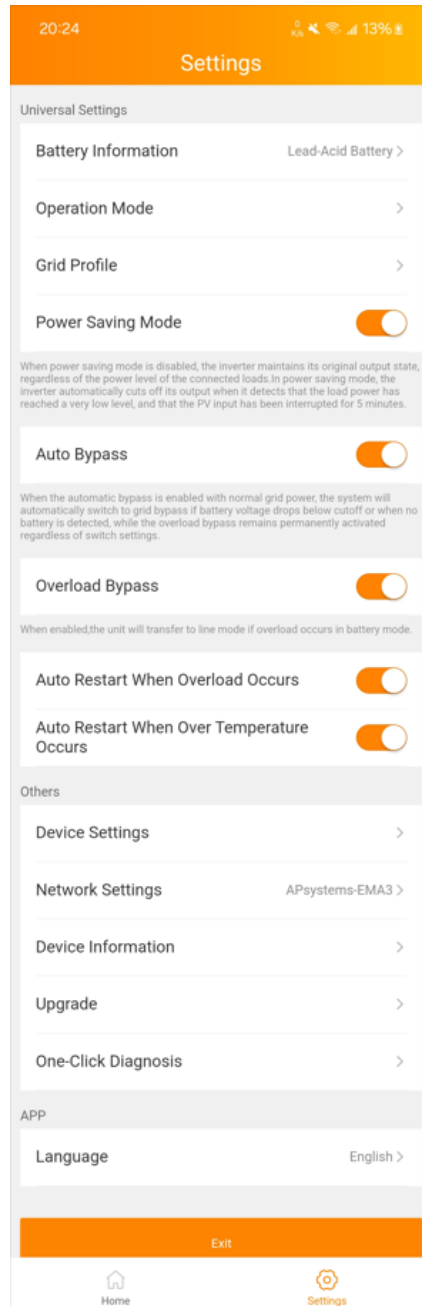


Device in alarm



2.3 Settings Page

In this view, you can manage the AHS-6.3' system information.



2.3.1 Battery Information



Note

- ◆ In the **“Battery Type”** option, selecting the **“Lead-Acid Battery”** type battery and the **“Lithium Battery”** type battery will result in different categories of interface settings.
- ◆ When setting functions that cause the device to automatically restart (such as battery type, battery voltage type, output voltage, etc), the APP will display a pop-up prompt. Please independently choose whether to send the settings.

< Battery Information

Battery Type

Lead-Acid Battery >

Battery Voltage Type

48V >

Battery Mode

Sealed Lead Acid Battery(SLD) >

Maximum Charging Current(A)

—

128

+

10A-130A

To configure total charging current for solar and utility chargers.(Max. charging current = utility charging current+solar chargingcurrent)

Maximum Utility Charging Current(A)

—

64

+

10A-130A

OK

< Battery Information

Battery Type

Lithium Battery >

Battery Company

UZ >

Battery Model

PLPA-L1-5K1 >

Battery Serial Number

+

Maximum Utility Charging Current(A)

—

65

+

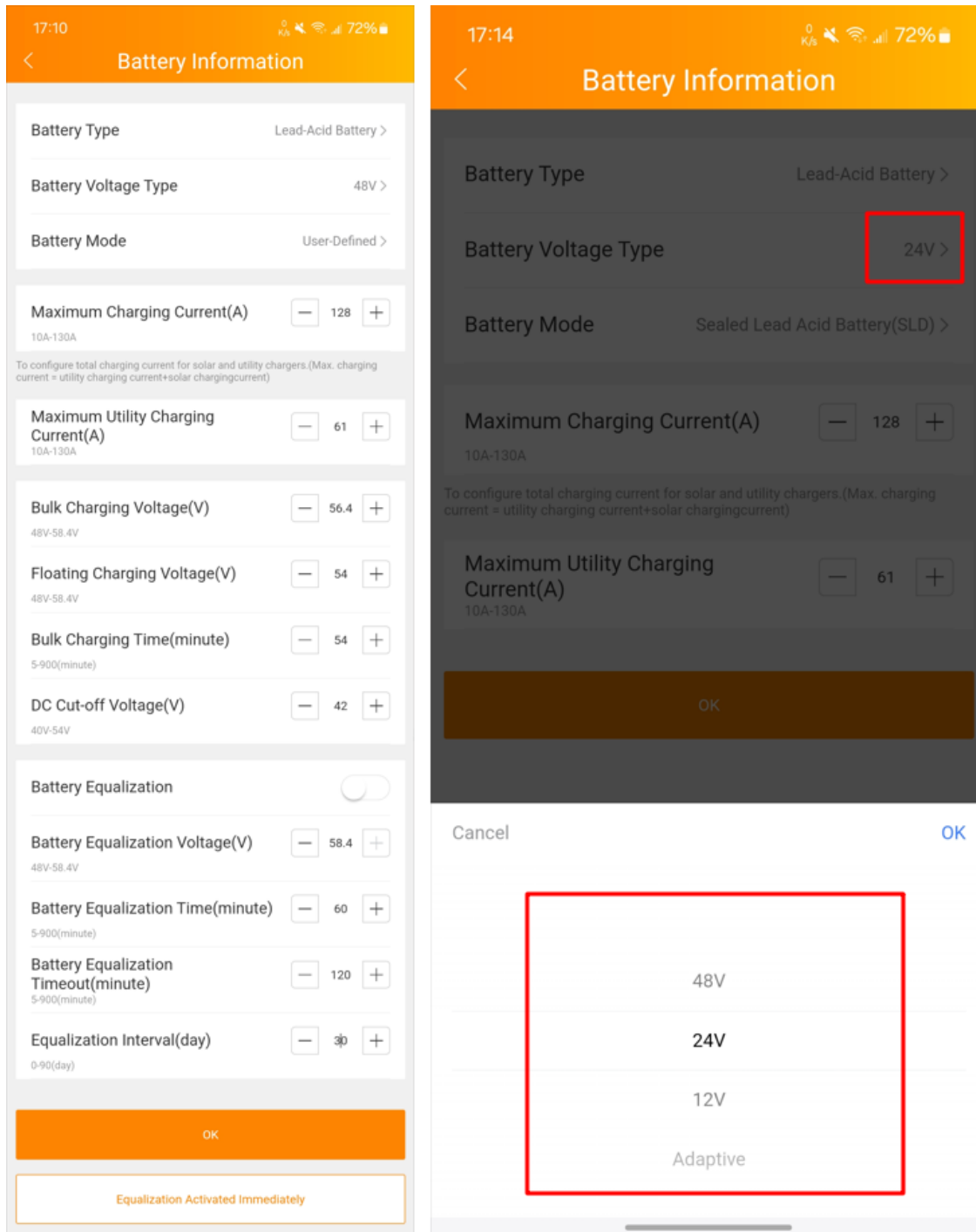
10A-130A

OK

2.3.1.1 Battery Type: Lead-Acid Battery

➤ Battery Voltage Type

This option determines the input range of the settable items in the graph.

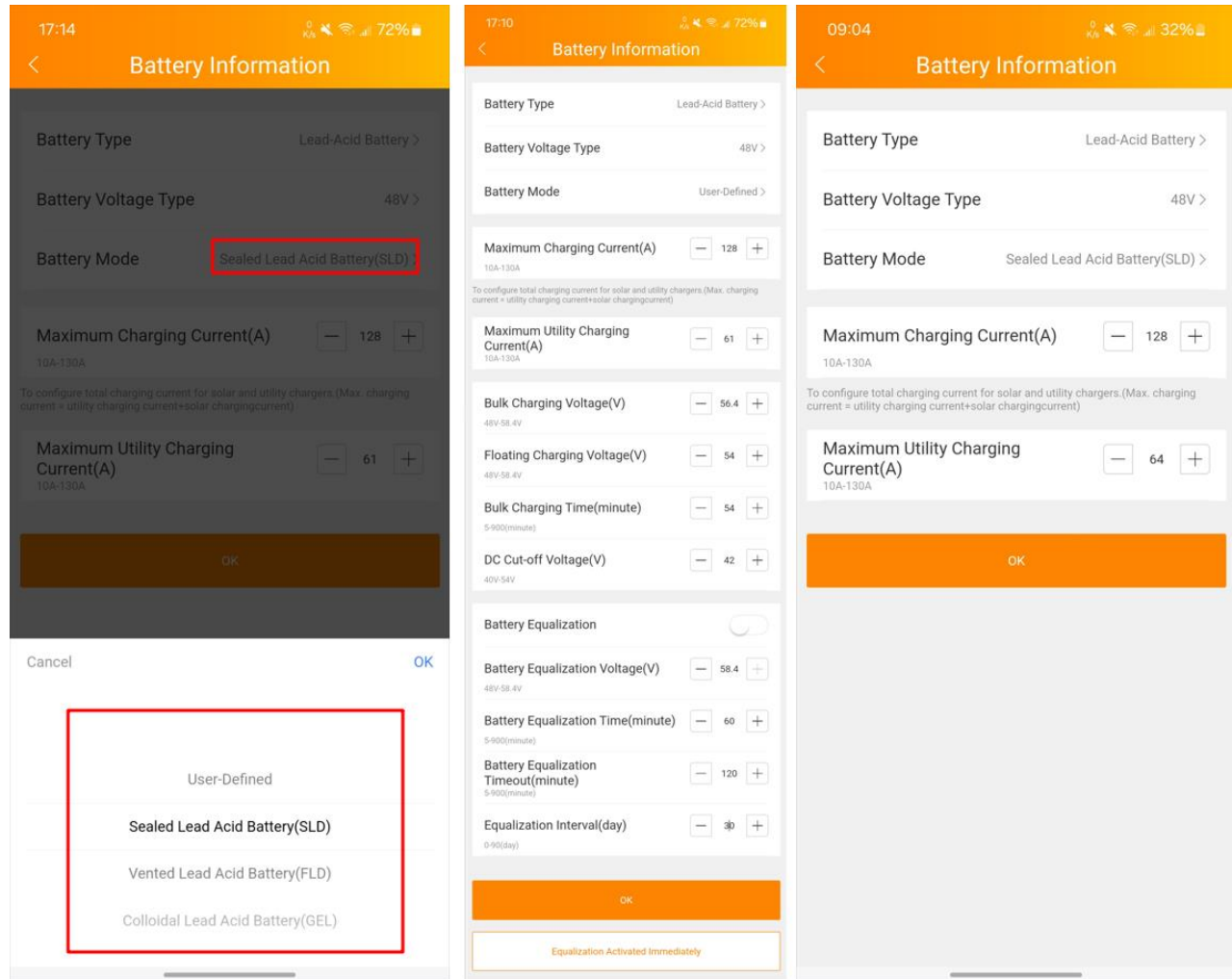


The options you can choose from are:

- 48V (default)
- 24V

- 12V
- Adaptive: If this option is selected, the inverter can automatically recognize the voltage type of the connected lead-acid battery and set all default parameters accordingly, while the user-defined setting range is also adjusted simultaneously.

➤ Battery Mode



The options you can choose from are:

- User-Defined(User)
- Sealed lead acid battery(SLD) (default)
- Vented lead acid battery(FLD)
- Colloidal lead acid battery(GEL)

➤ Maximum Charging Current

Default value: 130 A. Value range: 10 to 130 A.

➤ Maximum Utility Charging Current

Default value: 130 A. Value range: 10 to 130 A.

Note: If the setting value in “*Maximum Charging Current*” is less than 130 A, the current program setting maximum value is the setting value of “*Maximum Charging Current*”.

2.3.1.2 Battery Type: Lithium Battery

Select “*Lithium Battery*” to obtain the detailed configuration of the battery in terms of company, model and serial number.



Note

- ◆ There are two ways to add the serial number, namely manual input and scanning the Barcode or QR code.
- ◆ Only 16 batteries can be added at most.

09:05 32%

< Battery Information

Battery Type Lithium Battery >

Battery Company UZ >

Battery Model PLPA-L1-5K1 >

Battery Serial Number +

Maximum Utility Charging Current(A) 10A-130A - 65 +

OK

- Select “*Battery Company*”,
- Select “*Battery Model*”,
- Click “+” to add battery serial number by scanning or manual input,
- Click “*OK*” to complete.
- Maximum Utility Charging Current
Default value: 130 A. Value range: 10 to 130 A.

2.3.2 Operation Mode

Including Off-Grid Mode and Grid-Tied Mode.

2.3.2.1 Off-Grid Mode

Note

- ◆ In the **“Output Source Priority”** function option of Off-Grid Mode, if **“Solar First”** or **“SBU”** is selected, different options will be displayed depending on the previously selected battery type.

The figure displays three screenshots of the Off-Grid Mode configuration interface, showing the settings for Operation Mode, Charger Source Priority, and Output Source Priority.

Operation Mode: The interface shows two options: "Charger Source Priority" (Solar and Utility) and "Output Source Priority" (Utility First). The "OK" button is visible at the bottom.

Charger Source Priority: The interface shows three options: "Solar First", "Utility First", and "Solar and Utility". The "Solar and Utility" option is selected (indicated by a checkmark). The "Save" button is visible at the bottom.

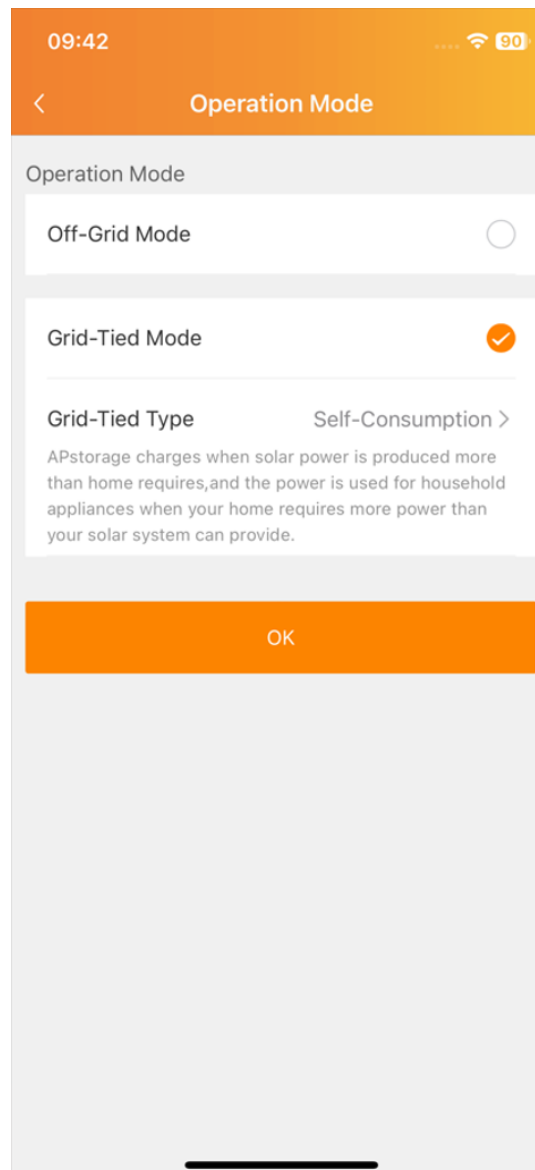
Output Source Priority: The interface shows three options: "Solar First", "Utility First", and "SBU". The "Utility First" option is selected (indicated by a checkmark). The "Save" button is visible at the bottom.

- Charge Source Priority: To configure charger source priority
 - Solar First
 - Utility First
 - Solar and Utility (default)
 - Solar only

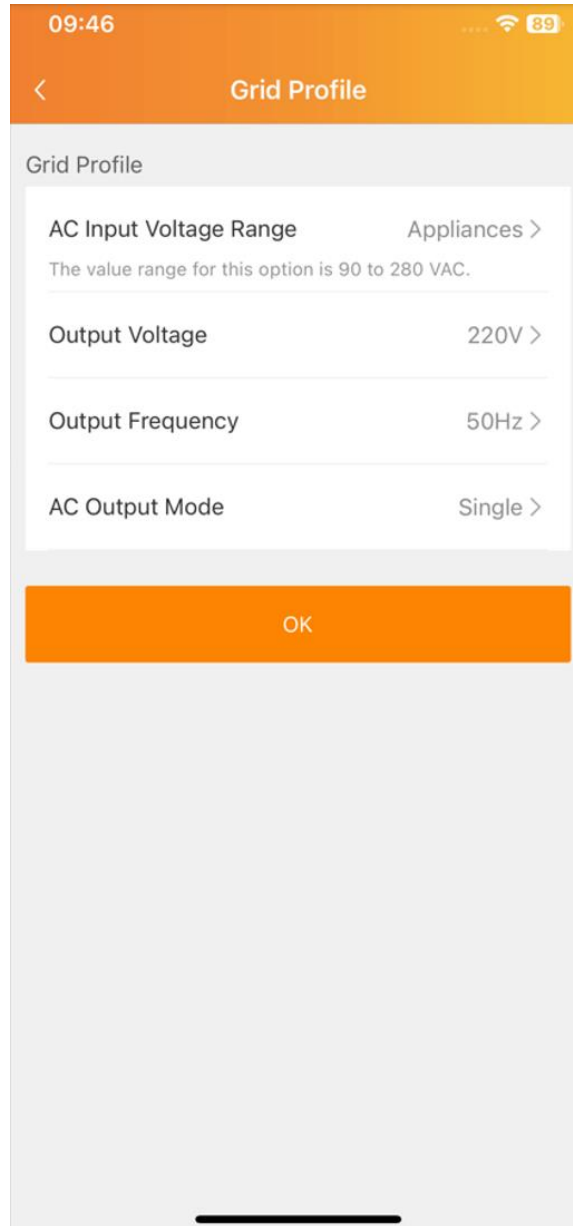
- Output Source Priority: To configure load power source priority
 - Solar First
 - Utility First (default)
 - SBU
 - SUB

2.3.2.2 Grid-Tied Mode

For compatible devices, two operating modes are available: Self-Consumption and Backup Power.



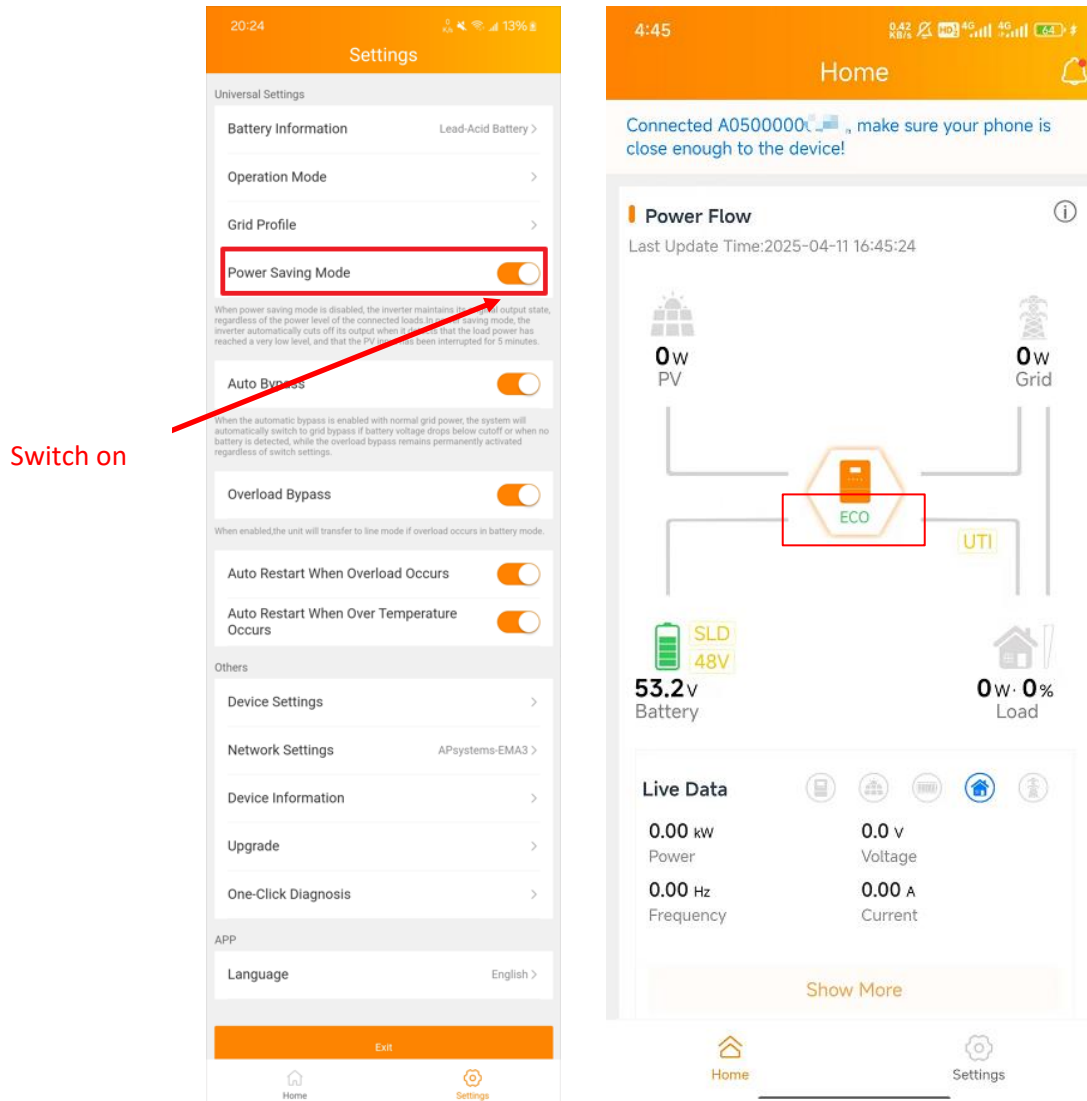
2.3.3 Grid Profile



- AC input voltage range
 - Appliances (default)
 - UPS
 - Generator
- Output Voltage
 - 220V
 - 230V (default)
 - 240V
- Output Frequency

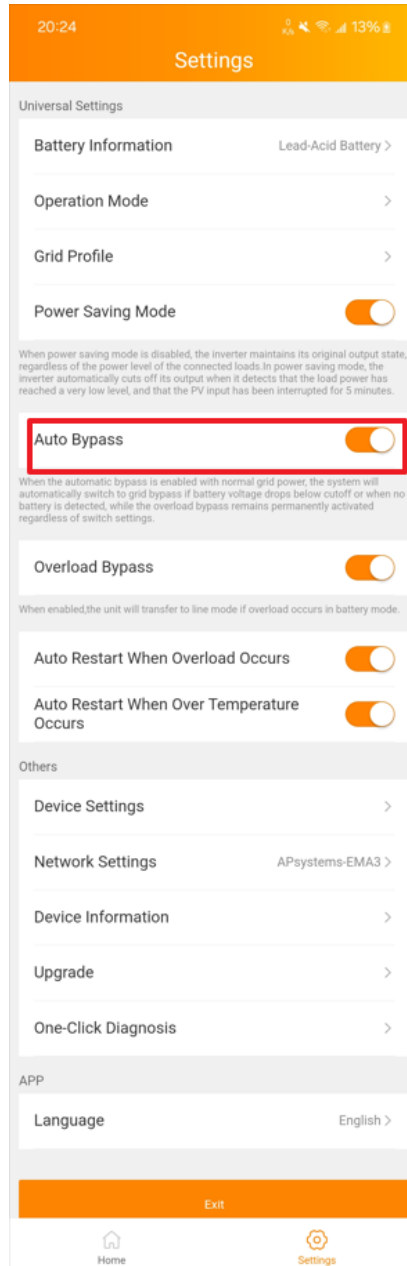
- 50Hz (default)
- 60Hz
- AC Output Mode
 - Single
 - L1
 - L2
 - L3

2.3.4 Power Saving Mode



- Switch off **“Power Saving Profile”** (default):
 - When power saving mode is disabled, the inverter maintains its original output state, regardless of the power level of the connected loads.
- Switch on **“Power Saving Profile”**:
 - When the device is actually in power saving mode, the inverter automatically cuts off its output when it detects that the load power has reached a very low level, or that the PV input has been interrupted for 5 minutes.
 - There will be an **“ECO”** logo within the [Power Flow] area on the [Home] page.

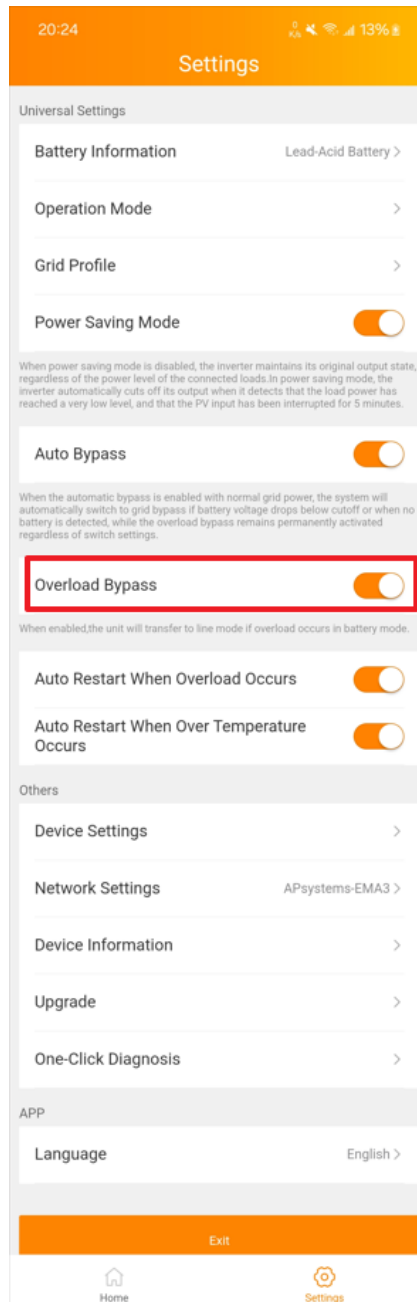
2.3.5 Auto Bypass



- Switch off (default): Manual.
- Switch on: Automatic.

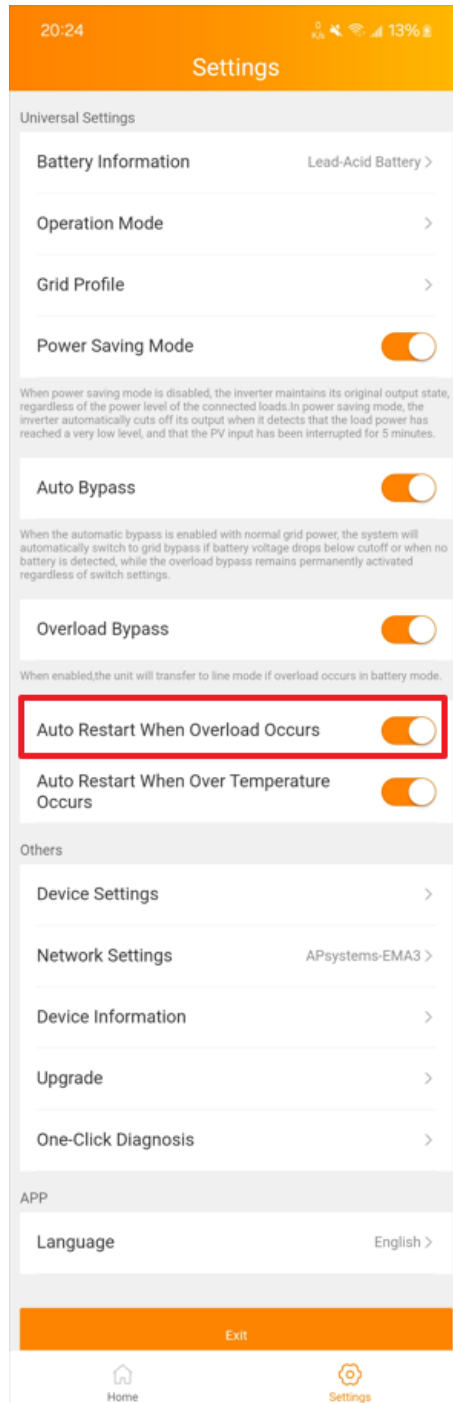
Note: If automatic bypass is enabled and the utility power is normal, the system can automatically switch to bypass mode even if the bypass function is disabled.

2.3.6 Overload Bypass



- Switch off (default): Overload bypass disabled.
- Switch on: Overload bypass enabled, when enabled, the unit will transfer to line mode if overload occurs in battery mode.

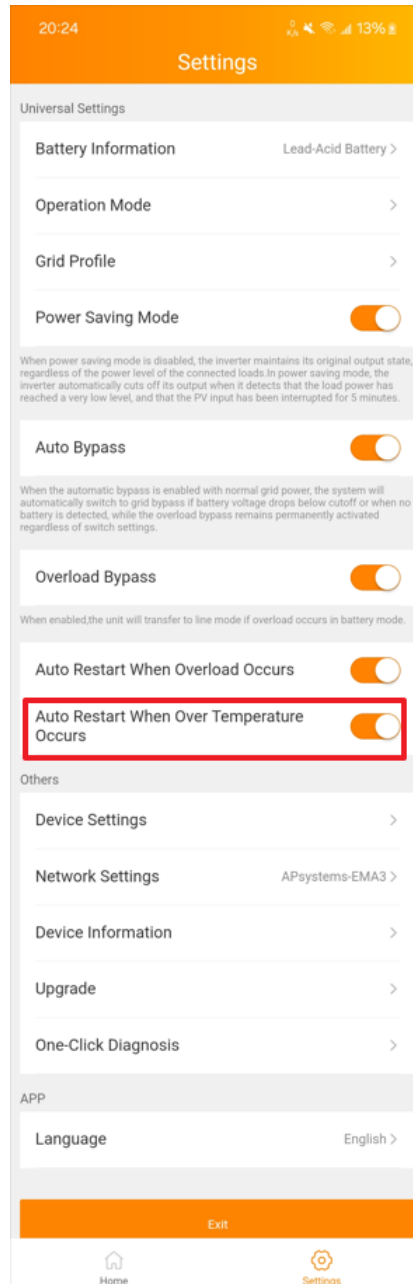
2.3.7 Auto Restart When Overload Occurs



Switch on

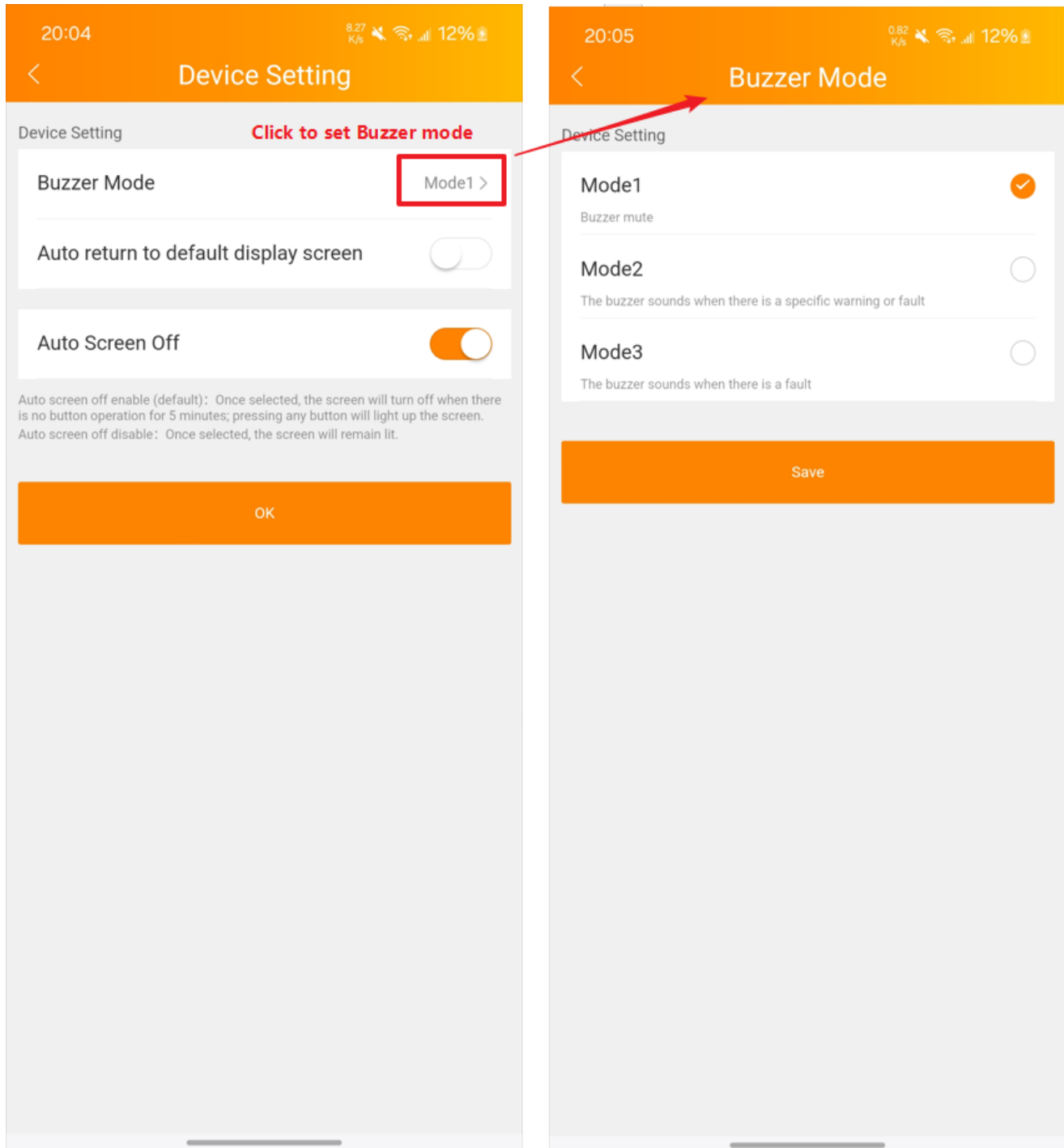
- Switch off: Disabled.
- Switch on (default): Enabled.

2.3.8 Auto Restart When Over Temperature Occurs



- Switch off: Disabled.
- Switch on (default): Enabled.


2.3.9 Device Settings



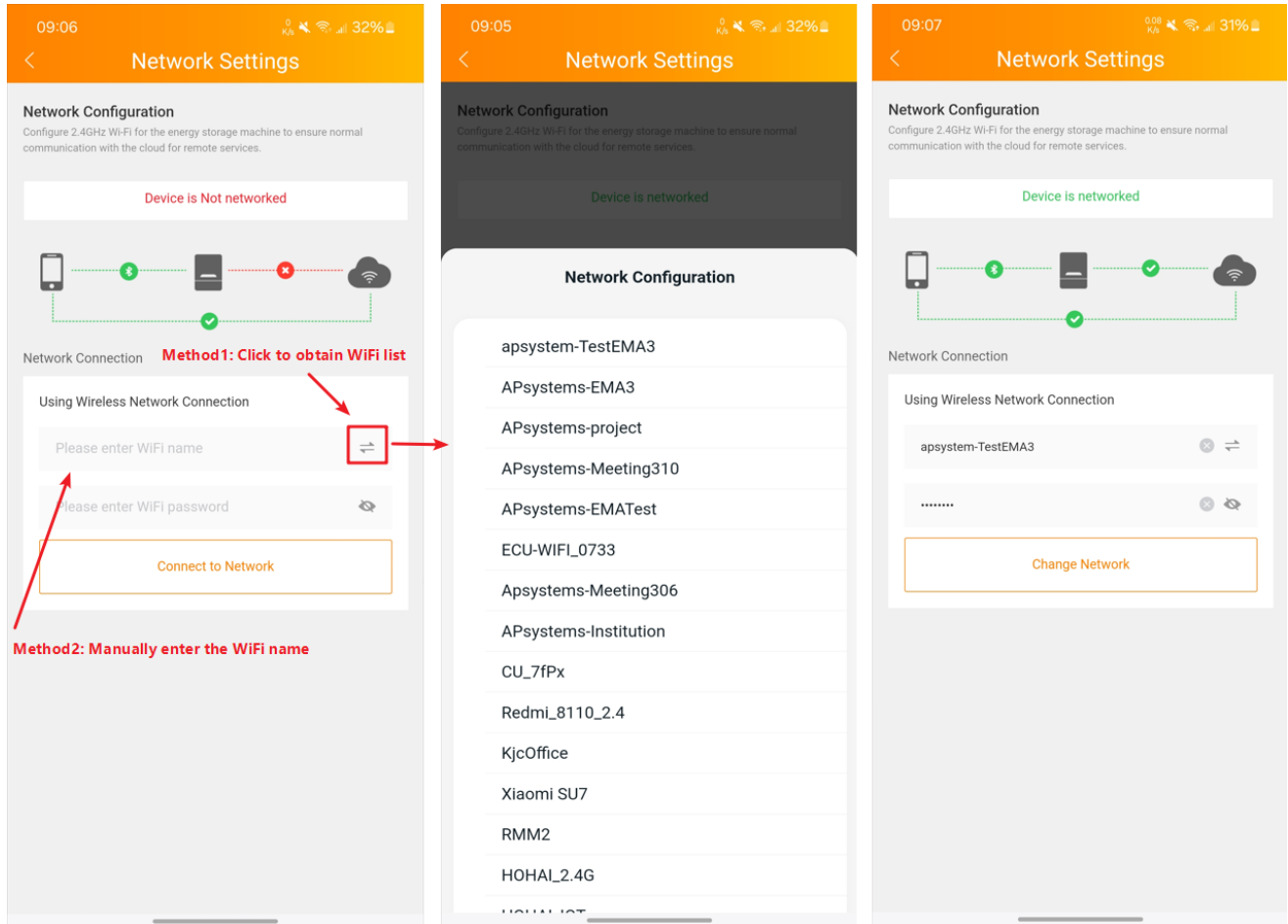
- Buzzer Mode
 - Mode1: Buzzer mute.
 - Mode2: The buzzer sounds when there is a specific warning or fault.
 - Mode3(default): The buzzer sounds when there is a fault.
- Auto return to default display screen

- Switch off: Stay on the current page. If this option is selected, the system stays on the page of the last operation.
 - Switch on (default): Back to home. If this option is selected and the screen is not tapped for 1 minute, the system automatically returns to the home page.
- Auto Screen Off:
- Switch off: Auto screen off disable. Once selected, the screen will remain lit.
 - Switch on (default): Auto screen off enable. If this option is selected, the system stays on the page of the last operation. Once selected, the screen will turn off when there is no button operation for 5 minutes; pressing any button will light up the screen.

2.3.10 Network Settings

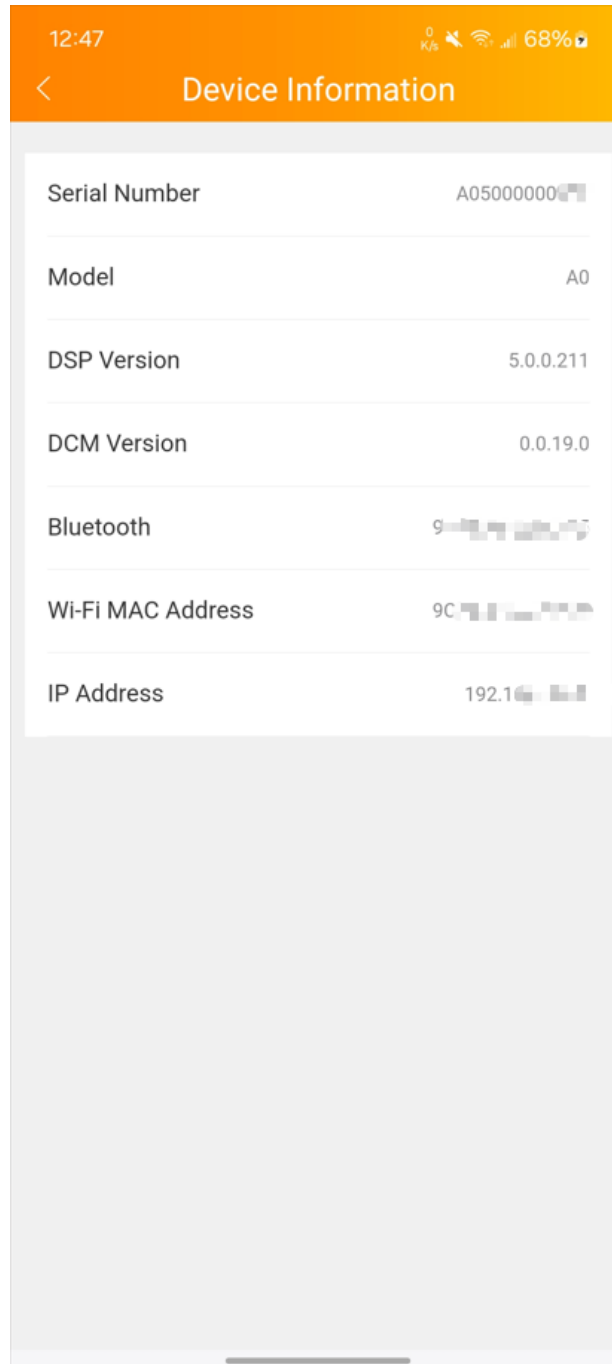
The page will show up APstorage's wireless connection status. Click the “” and choose the available Wi-Fi to connect, also, you can manually input the Wi-Fi name.

- Step1: Enter the Wi-Fi name.
- Step2: Enter the password.
- Step3: Click “**Connect to Network**”.



2.3.11 Device Information

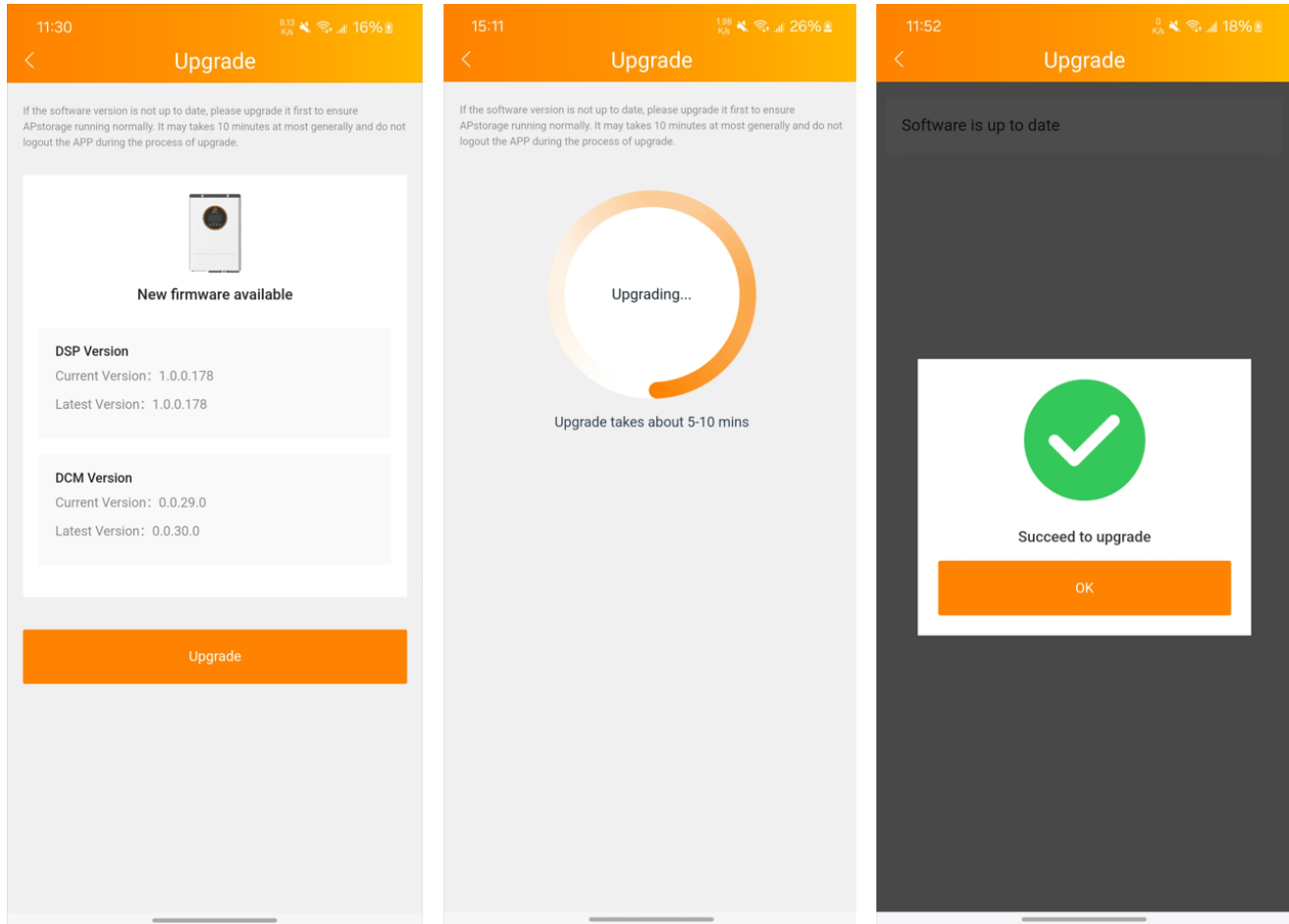
The device information page displays the serial number, model, DSP version, DCM version, bluetooth, Wi-Fi MAC address, and currently connected IP address.



2.3.12 Upgrade

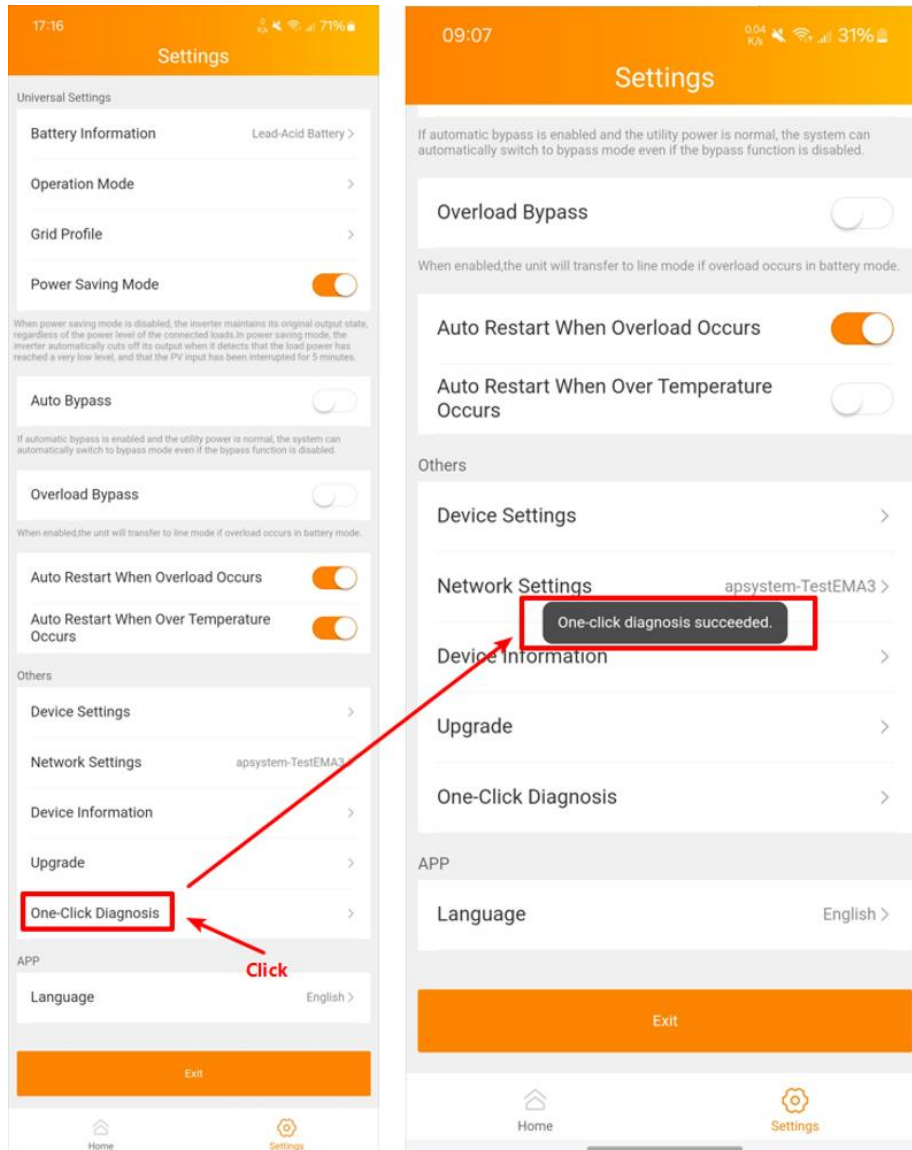
When an update is available, you can click the **“Upgrade”** button to upgrade.

Note: You need to reconnect your smart phone to the APStorage’s Bluetooth if the connections fail once the signals disappeared during upgrading.



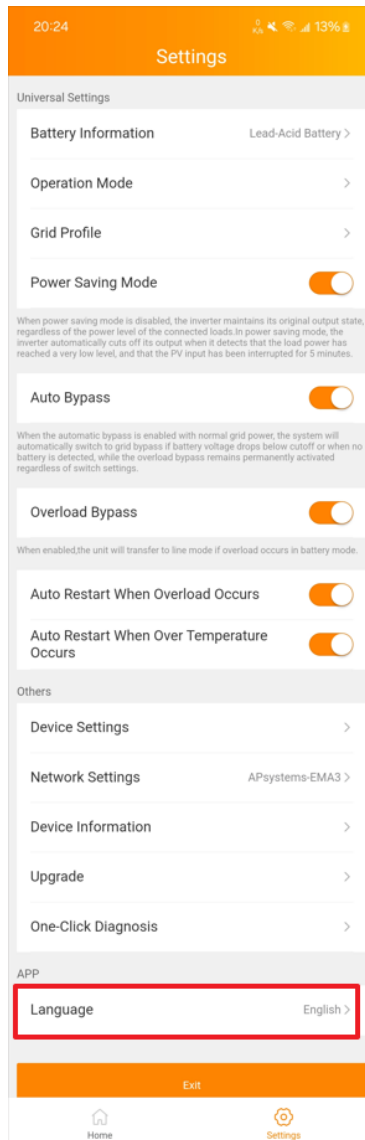
2.3.13 One-Click Diagnosis

Click to upload the diagnostic information of the device to the server.



2.3.14 Language

Select "**Language**" to set the APP language.



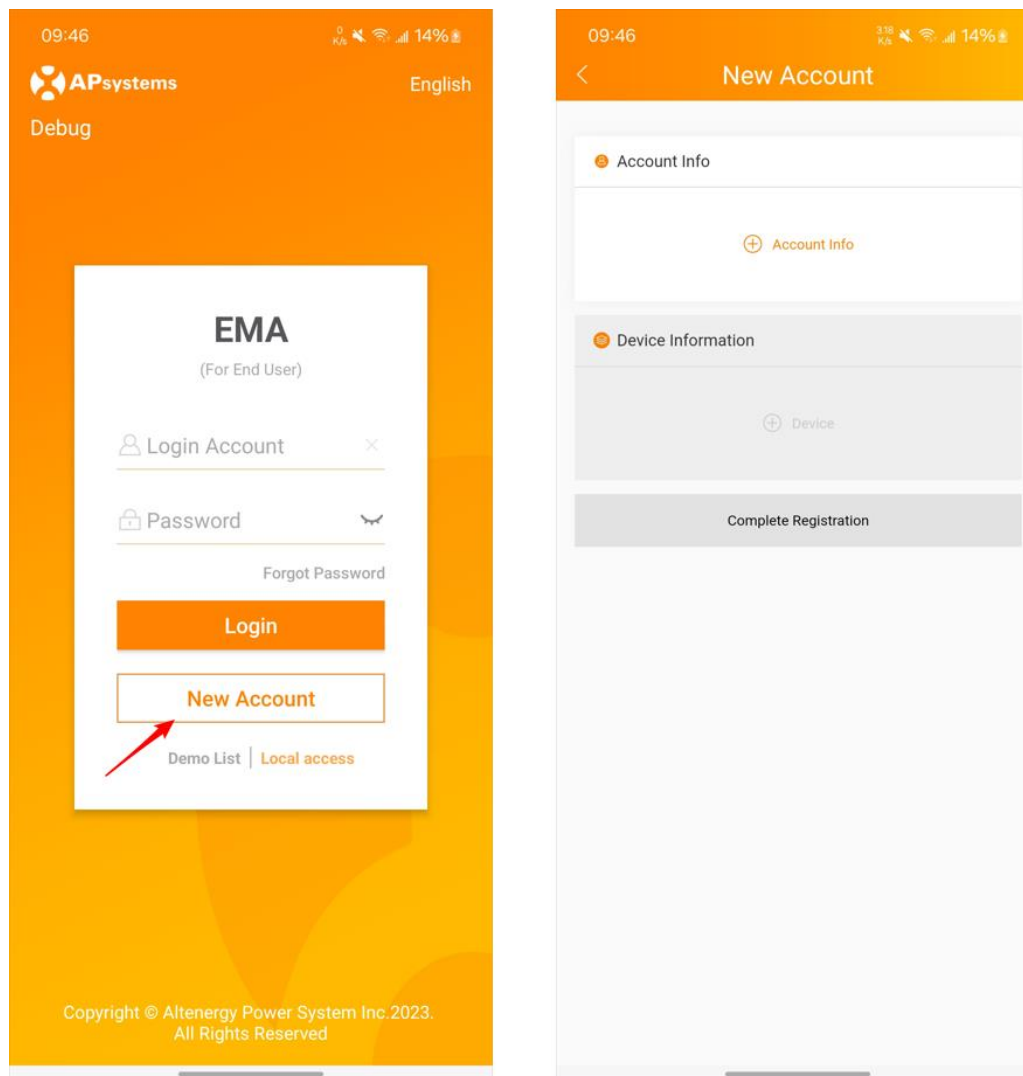
3. Remote Control and Monitoring

The EMA APP will allow you to register for remote monitoring and configuration of your systems. After logging in with your account, you can view system-level overview information and the device list. For specific devices, there are also independent data monitoring and operation entry points.

3.1 Register Account

If you don't have an EMA account yet, you can register through the EMA APP. The following introduction takes the example of registering an account for Solar Battery Hybrid Controller.

- Register is divided into the following steps:
 - Step1: Click **"New Account"** to enter the registration navigation page.
 - Step2: Account Information (Required)
 - Step3: Device Information (Required)



3.1.1 Account Information

On this page, please fill in the information related to your account. Required fields are marked with "*".

- To complete account information:
 - Click "Account Info",
 - Enter the necessary information according to the prompts on the page and tick the relevant agreements,
 - Click "OK" to complete.

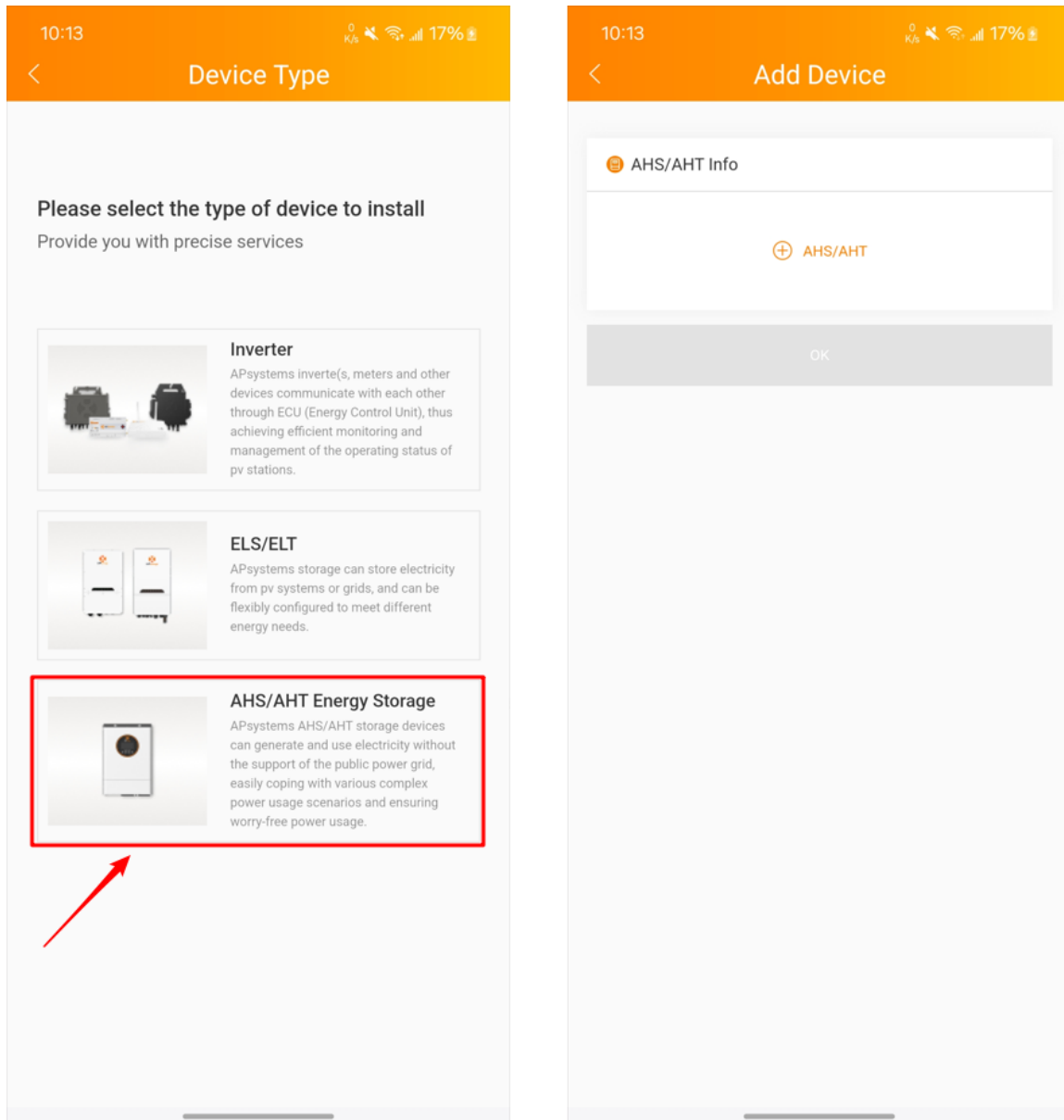
The first screenshot shows the 'Account Info' page with the following fields: Login Account (required), Password (required), Name (required), Country / Region (required), State / Province (required), City (required), Contact Email (required), and Contact Phone (optional). The second screenshot shows the 'Account Info' page with the same fields, but with the 'Company Code' field added under 'Installer Information'. The third screenshot shows the 'New Account' page with the 'Account Info' section filled out, a 'Device Information' section with a '+ Device' button, and a 'Complete Registration' button at the bottom.

Note

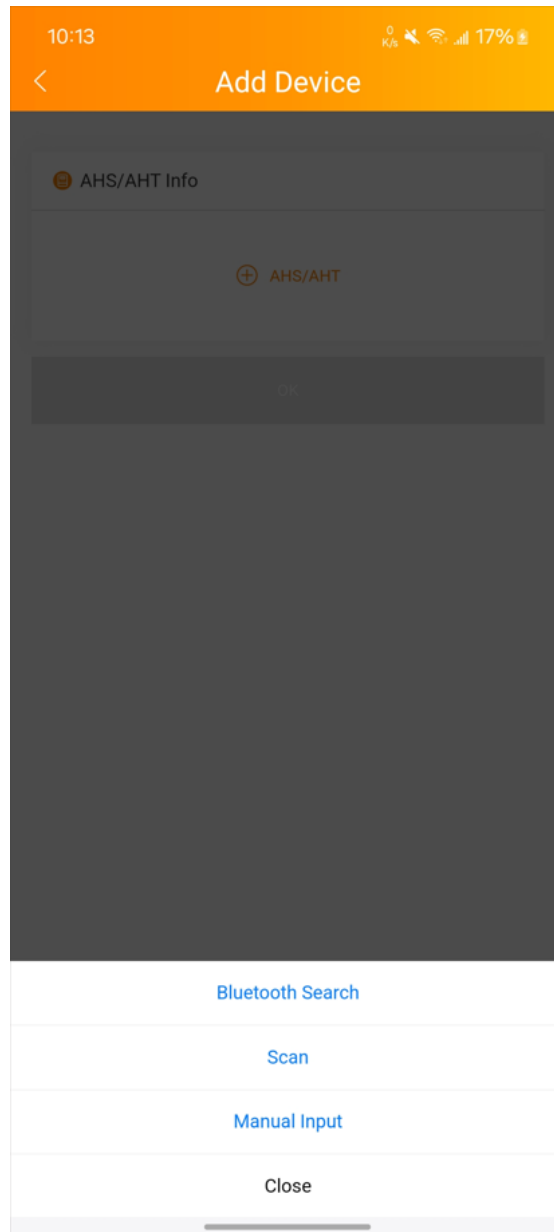
- ◆ You can enter the **company code** to make the link to your installer/retailer. This field is optional.
- ◆ Installer/retailer can login EMA Manager or EMA web portal and get the **company code** in the "Setting" page.

3.1.2 Device Information

We provide the addition of the following types of equipment: “Inverter”, “ELS/ELT” and “AHS/AHT energy storage”. Here, we will focus on introducing how to add the AHS/AHT energy storage.



There are several ways to add devices: Bluetooth search, scan QR code, and manual input.

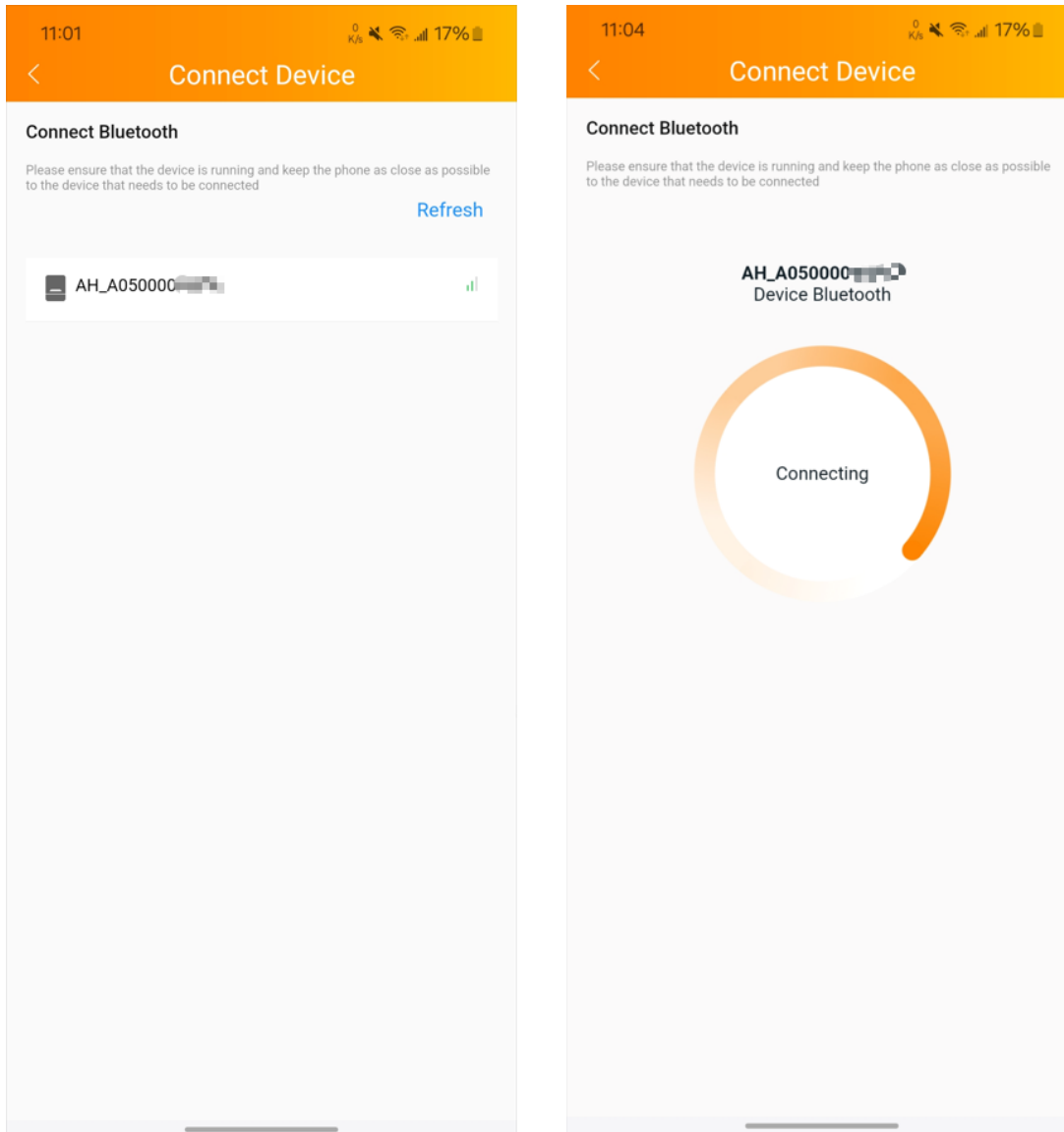


Note

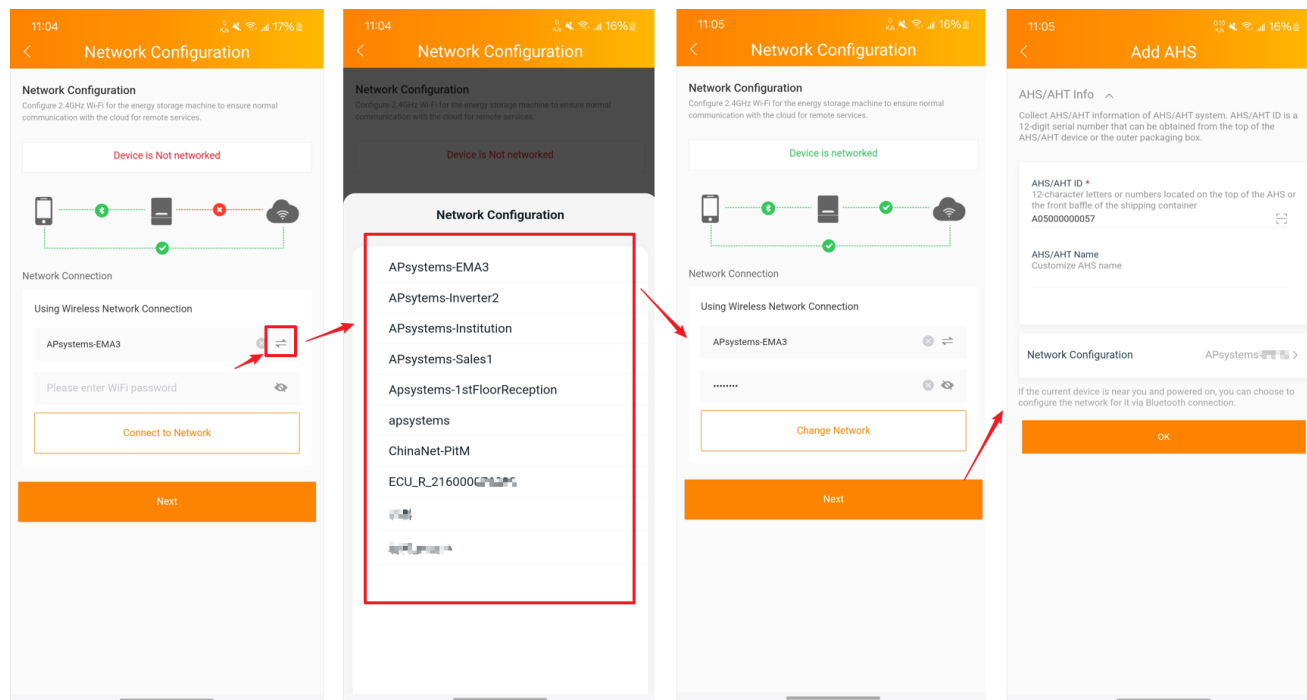
- ◆ If using the Bluetooth search method, please ensure that the device is online and its Bluetooth is discoverable and connectable.
- ◆ For the scan QR code and manual input methods, offline devices can be added.

3.1.2.1 Bluetooth Search

- Add device via Bluetooth:
 - Click **"Bluetooth search"**,
 - Select the Bluetooth of the device you want to connect.



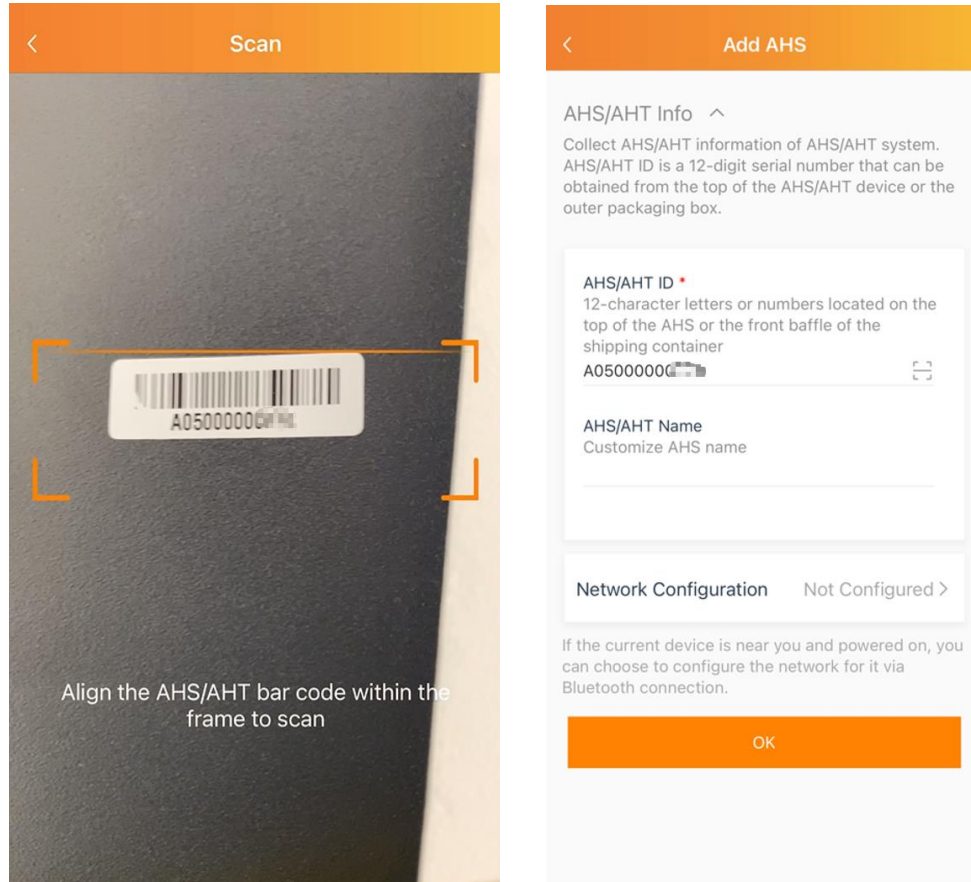
- Configure the network for the device:
 - Select the network to connect,
 - Enter the correct password,
 - Click the **"Connect to Network"** button to configure the network.



3.1.2.2 Scan and Manual Input

➤ Add device via Scanning:

- Click "Scan"



➤ Add device via Manual Input:

- Enter the corresponding AHS/AHT information according to the page prompts (the AHS/AHT entry method is divided into "scan code entry" and "manual entry"),

14:40

22%

<

Add AHS

AHS/AHT Info ^

Collect AHS/AHT information of AHS/AHT system. AHS/AHT ID is a 12-digit serial number that can be obtained from the top of the AHS/AHT device or the outer packaging box.

AHS/AHT ID *

12-character letters or numbers located on the top of the AHS or the front baffle of the shipping container

A0500000

AHS/AHT Name

Customize AHS name

test

Network Configuration

Not Configured >

If the current device is near you and powered on, you can choose to configure the network for it via Bluetooth connection.

OK



Note

- ◆ To configure the device network via Bluetooth, ensure the device is online and enable Bluetooth discovery.

3.1.3 Complete Registration

After completing the above [Account information] and [Device Information], you can click "**Complete Registration**".

The image displays two side-by-side screenshots of a mobile application interface for device registration.

Left Screenshot: 'Add AHS' Screen

- Header:** A yellow bar with a back arrow and the text 'Add AHS'.
- Section: AHS/AHT Info**
 - Text: 'Collect AHS/AHT information of AHS/AHT system. AHS/AHT ID is a 12-digit serial number that can be obtained from the top of the AHS/AHT device or the outer packaging box.'
 - AHS/AHT ID ***
 - Text: '12-character letters or numbers located on the top of the AHS or the front baffle of the shipping container'
 - Input field: Contains 'A050000' with a green checkmark icon on the right.
 - AHS/AHT Name**
 - Text: 'Customize AHS name'
 - Input field: Contains 'test' with a green checkmark icon on the right.
- Network Configuration**
 - Text: 'Not Configured >'
 - Text: 'If the current device is near you and powered on, you can choose to configure the network for it via Bluetooth connection.'
 - Orange button: 'OK'

Right Screenshot: 'New Account' Screen

- Header:** A yellow bar with a back arrow and the text 'New Account'.
- Section: Account Info**
 - Text: 'Login Account : tes' with a greyed-out field.
 - Text: 'Address : Others, United States'
- Section: AHS/AHT Energy Storage**
 - Text: 'AHS : A050000' with a greyed-out field and a red 'X' icon on the right.
 - Text: '+ AHS/AHT Energy Storage' with a plus icon.
- Section: Component Information**
 - Text: '>'
- Bottom:** A large orange button labeled 'Complete Registration'.



Note

- ◆ It's optional to fill in the [Component Information].

3.2 System Level

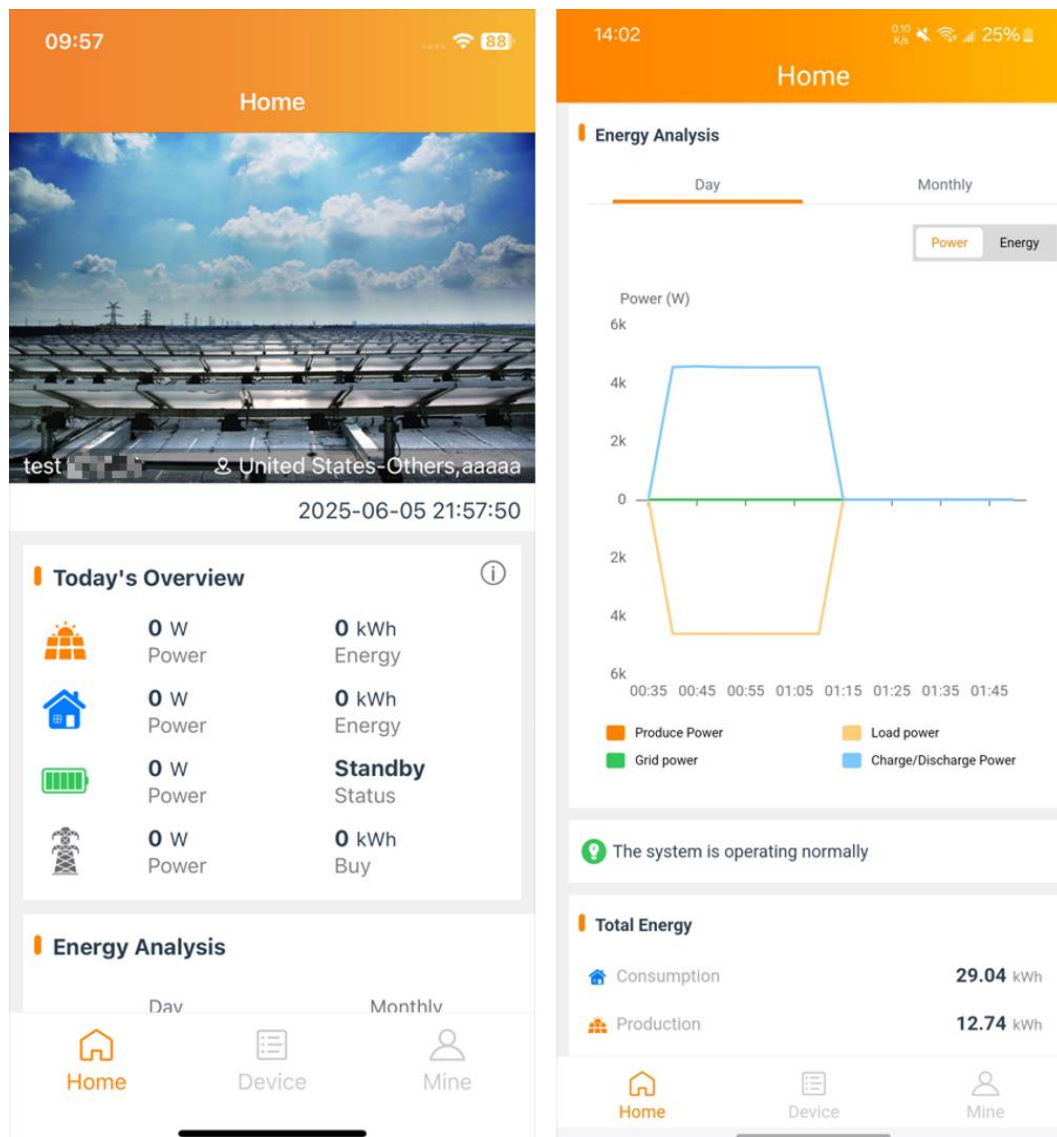
Enter your “Login Account” and “Password” correctly to start the journey of remote controlling and monitoring devices.

3.2.1 Home

Displays the operation status of the system, data and total data generated by the operation of the system.

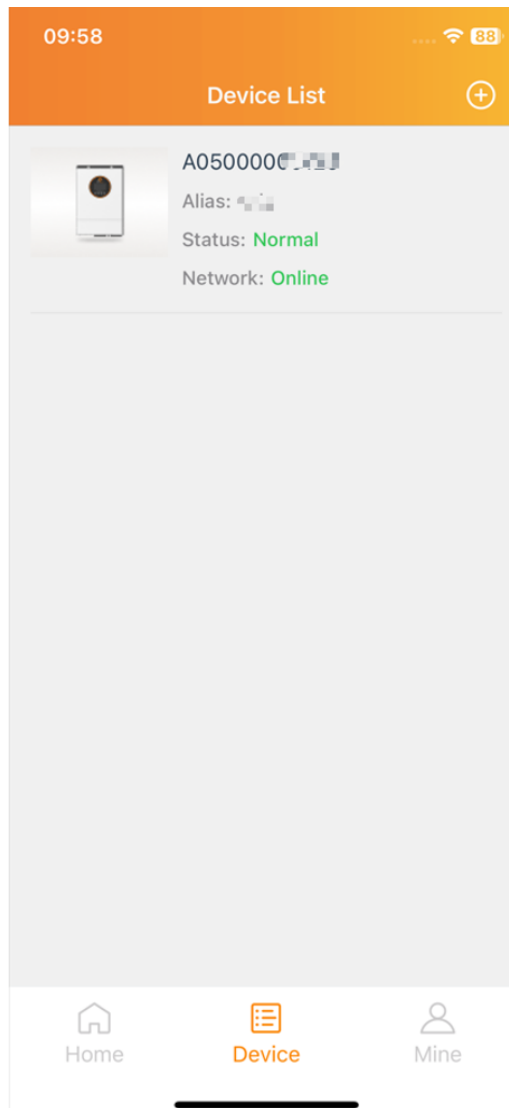
On the [Home] page, you can visualize:

- Today's overview data of your system.
- Energy analysis of the system with AHS-6.3 model.
- Total energy including consumption, production, grid or generator, charge and discharge.



3.2.2 Device

Device list shows registered devices' information (Status/Network) .



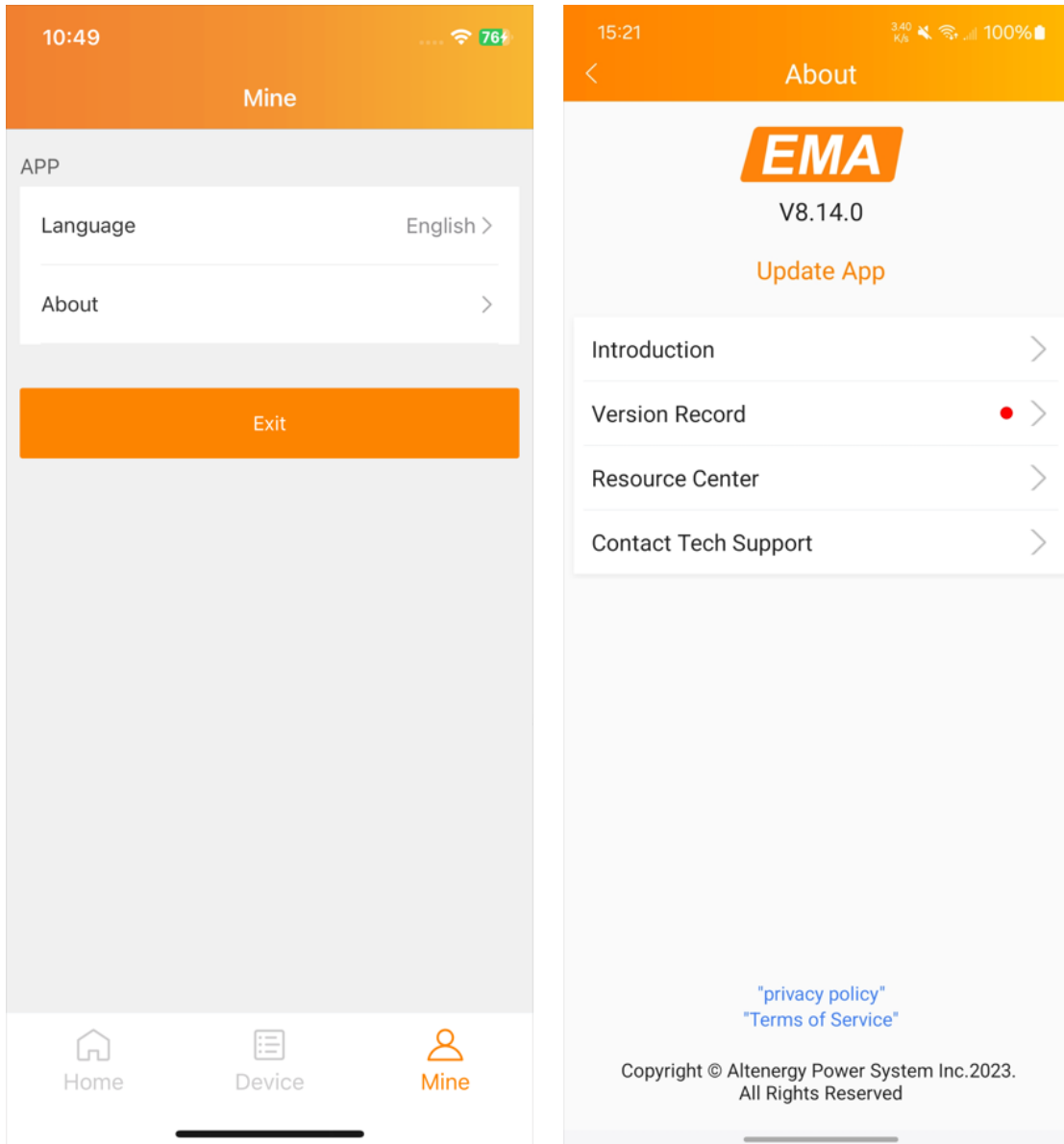
Note

- ◆ It's allowed to click the "+" to add new devices.
- ◆ You can click the device information card in the list to view detailed information about the corresponding device. For the specific page, refer to ["3.3 Device Level"](#).

3.2.3 Mine

You can switch the language and check APP information on the **[Mine]** page.

- Select **"Language"** to set the APP language.
- Click **"About"** to view app information, including the version number and other details, as shown in the figure below.



3.3 Device Level


Includes pages: Home, Data and Settings. The remote monitoring pages ([Home] and [Settings]) are synchronized with local functions.

3.3.1 Home

On the [Home] page, you can visualize:

- The connection situation between the mobile phone and APStorage.
- Power flow of the system with AHS-6.3 model.
- Live data of the system.
- Total energy including consumption, production, grid or generator, charge and discharge.

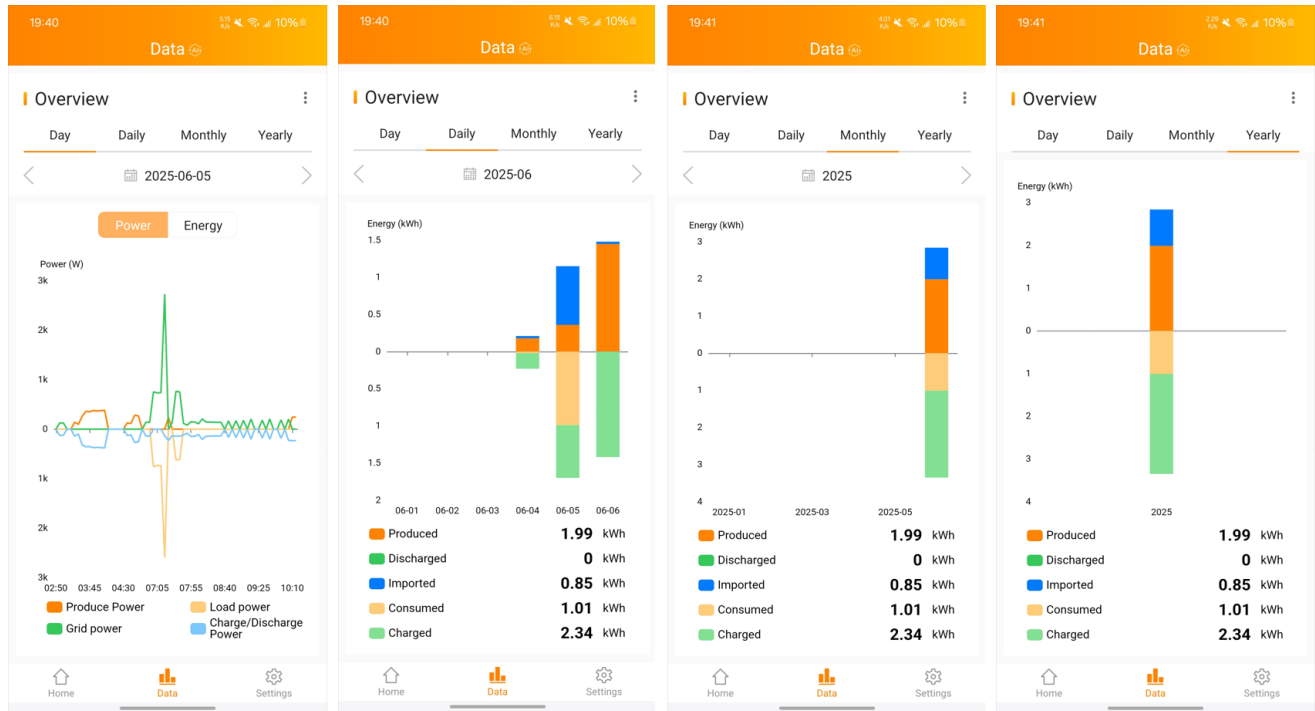
Note

- ◆ There is a [Tip] page entered by clicking the icon “”, which displays the meanings of each icon on the [Power Flow].
- ◆ Within the [Live Data] area, after clicking the button “**More Details**”, you will see more relevant data in the [Power Flow] area.



3.3.2 Data

On this page, you can switch to view day, daily, monthly, and yearly data.



3.3.3 Settings

3.3.3.1 Battery Information

Note

- ◆ In the **"Battery Type"** option, selecting the **"Lead-Acid Battery"** type battery and the **"Lithium Battery"** type battery will result in different categories of interface settings.

<

Battery Information

Battery Type

Lead-Acid Battery >

Battery Voltage Type

48V >

Battery Mode

Sealed Lead Acid Battery(SLD) >

Maximum Charging Current(A)

-

128

+

10A-130A

To configure total charging current for solar and utility chargers.(Max. charging current = utility charging current+solar chargingcurrent)

Maximum Utility Charging Current(A)

-

64

+

10A-130A

OK

<

Battery Information

Battery Type

Lithium Battery >

Battery Company

UZ >

Battery Model

PLPA-L1-5K1 >

Battery Serial Number

+

Maximum Utility Charging Current(A)

-

65

+

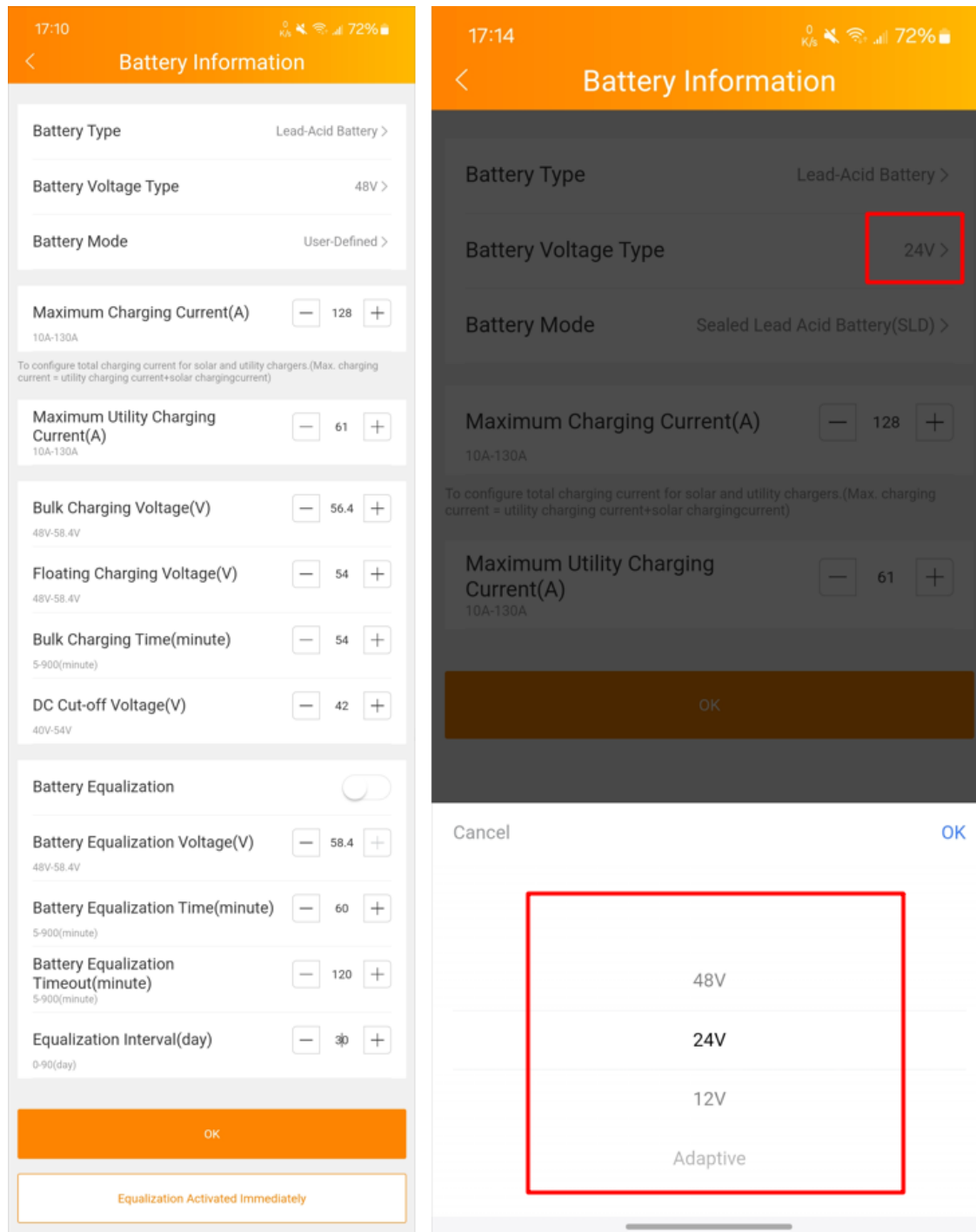
10A-130A

OK

3.3.3.1.1 Battery Type: Lead-Acid Battery

➤ Battery Voltage Type

This option determines the input range of the settable items in the graph.

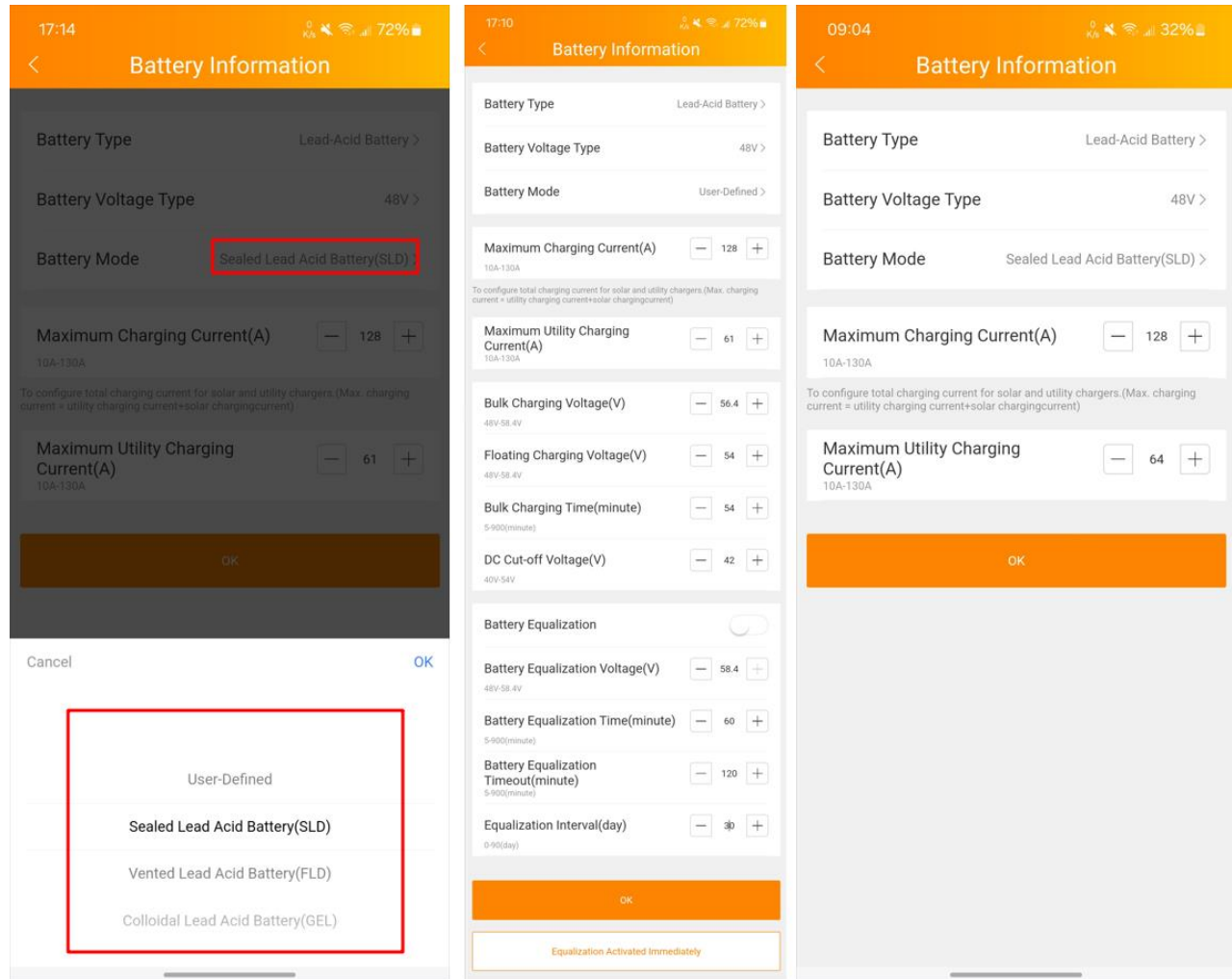


The options you can choose from are:

- 48V (default)
- 24V

- 12V
- Adaptive: If this option is selected, the inverter can automatically recognize the voltage type of the connected lead-acid battery and set all default parameters accordingly, while the user-defined setting range is also adjusted simultaneously.

➤ Battery Mode



The options you can choose from are:

- User-Defined(User)
- Sealed lead acid battery(SLD) (default)
- Vented lead acid battery(FLD)
- Colloidal lead acid battery(GEL)

➤ Maximum Charging Current

Default value: 130 A. Value range: 10 to 130 A.

➤ Maximum Utility Charging Current

Default value: 130 A. Value range: 10 to 130 A.

Note: If the setting value in “**Maximum Charging Current**” is less than 130 A, the current program setting maximum value is the setting value of “**Maximum Charging Current**”.

3.3.3.1.2 Battery Type: Lithium Battery

Select “**Lithium Battery**” to obtain the detailed configuration of the battery in terms of company, model and serial number.



Note

- ◆ There are two ways to add the serial number, namely manual input and scanning the Barcode or QR code.
- ◆ Only 16 batteries can be added at most.

- Select “**Battery Company**”,
- Select “**Battery Model**”,
- Click “**+**” to add battery serial number by scanning or manual input,
- Click “**OK**” to complete.
- Maximum Utility Charging Current
Default value: 130 A. Value range: 10 to 130 A.

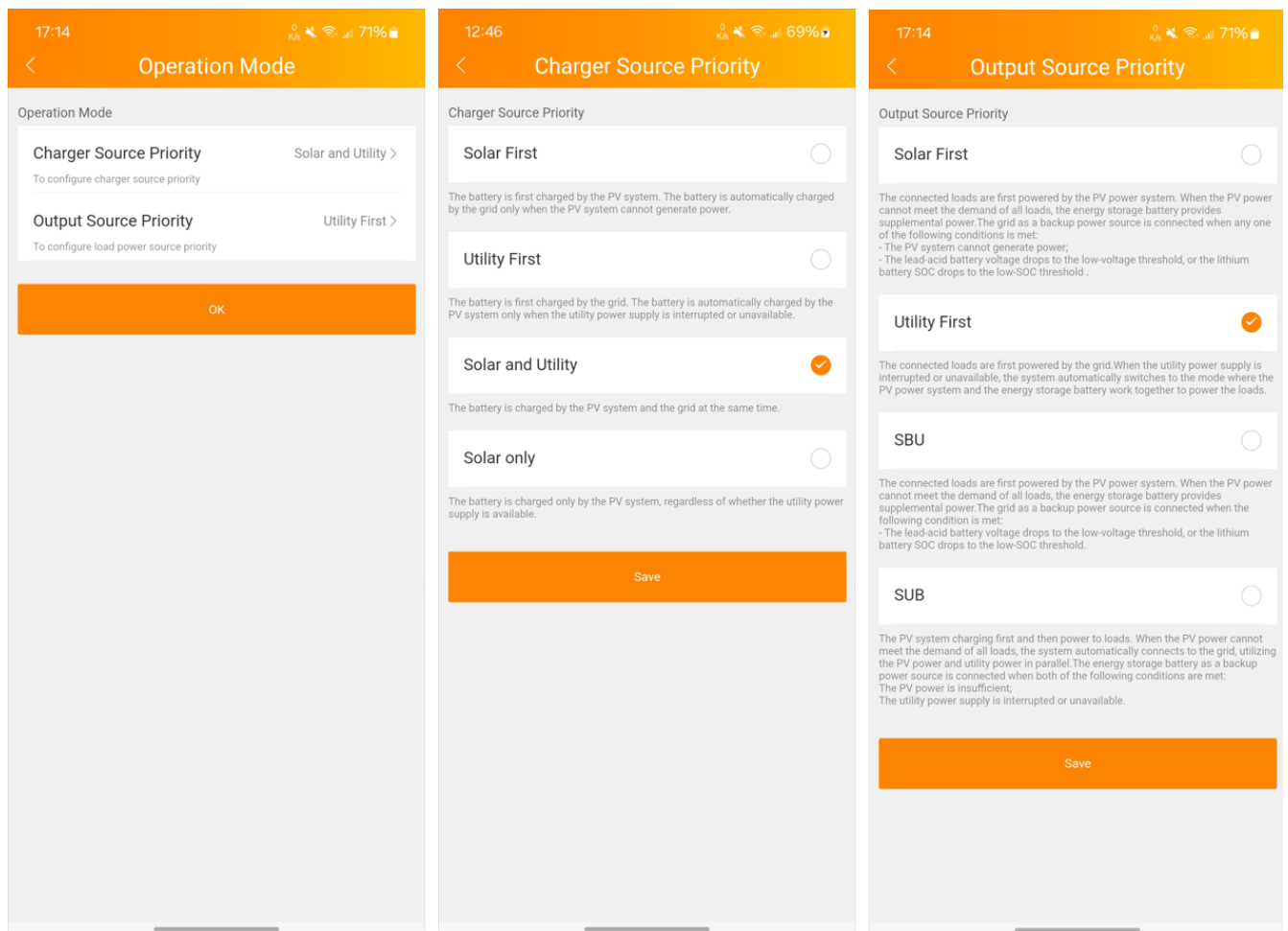
3.3.3.2 Operation Mode

Off-Grid Mode



Note

- ◆ In the “**Output Source Priority**” function option of Off-Grid Mode, if “**Solar First**” or “**SBU**” is selected, different options will be displayed depending on the previously selected battery type.

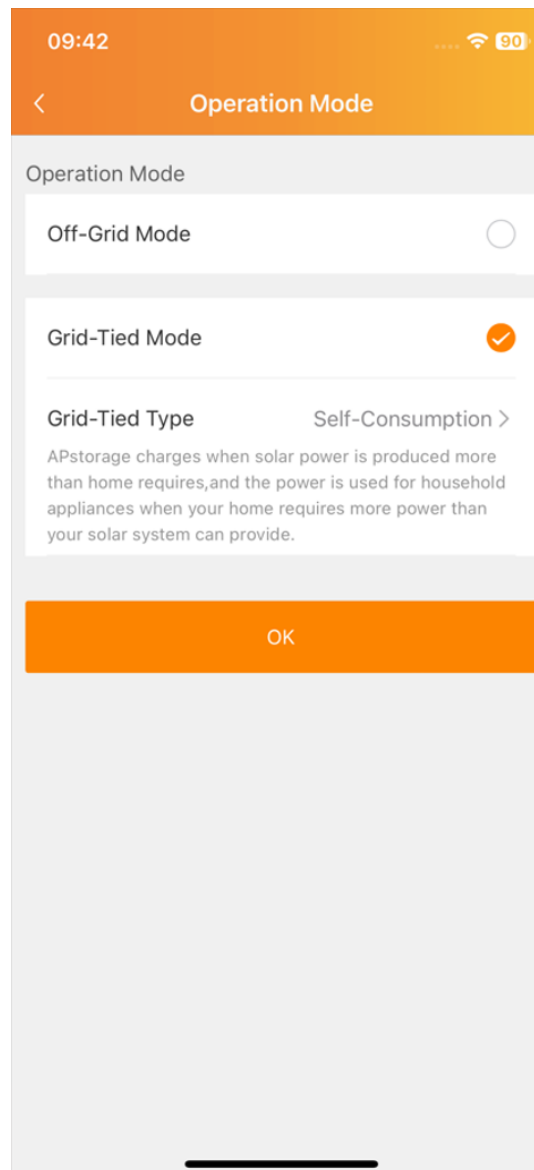


- **Charge Source Priority:** To configure charger source priority
 - Solar First
 - Utility First
 - Solar and Utility (default)
 - Solar only
- **Output Source Priority:** To configure load power source priority

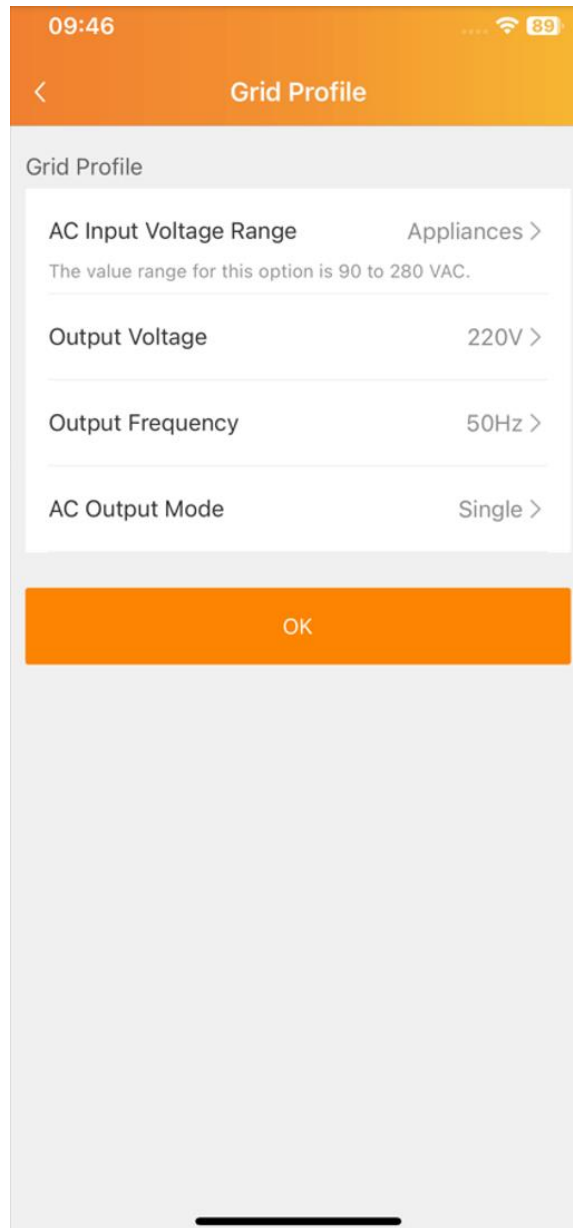
- Solar First
- Utility First (default)
- SBU
- SUB

Grid-Tied Mode

For compatible devices, two operating modes are available: Self-Consumption and Backup Power.



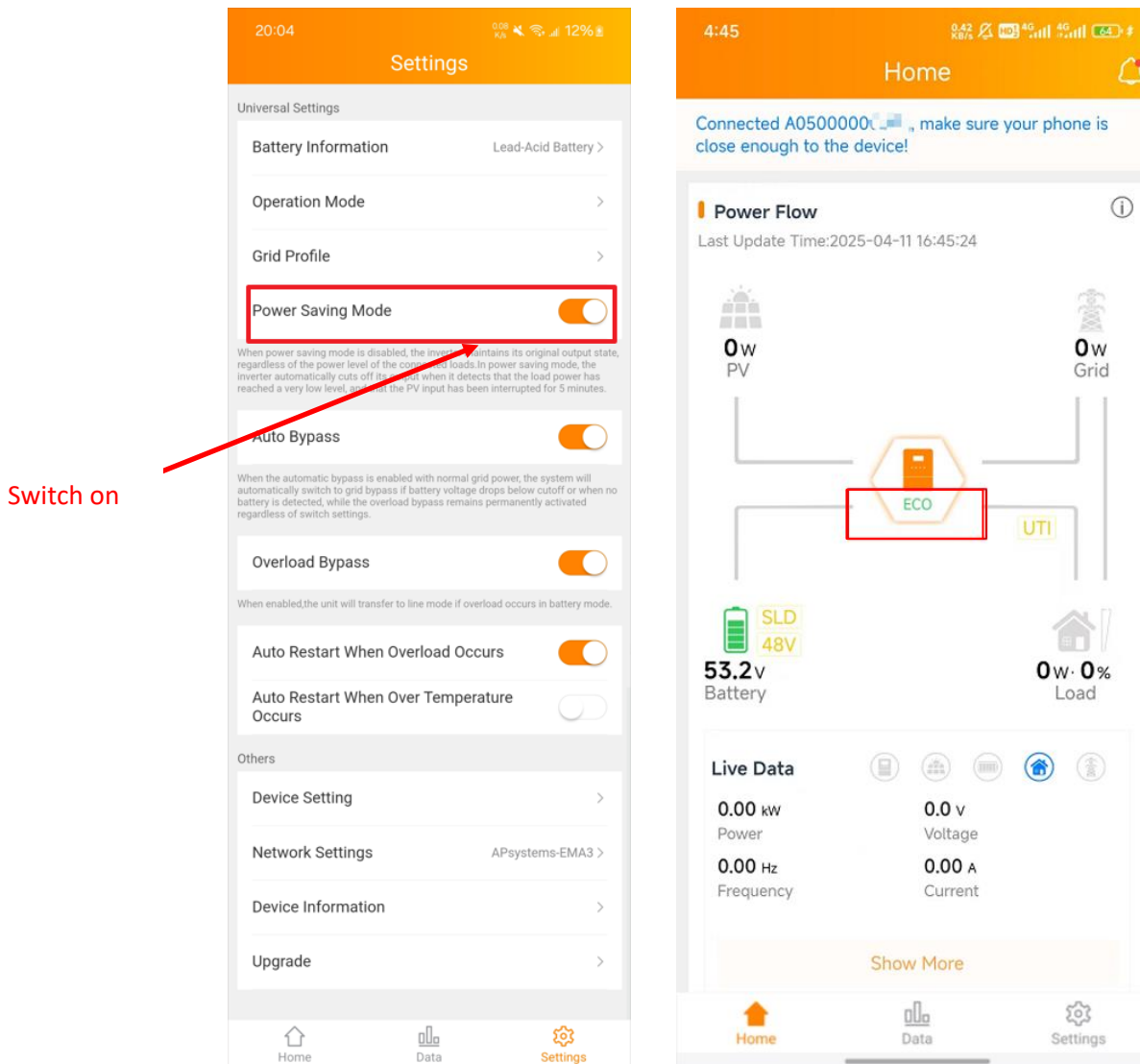
3.3.3.3 Grid Profile



- AC input voltage range
 - Appliances (default)
 - UPS
 - Generator
- Output Voltage
 - 220V
 - 230V (default)
 - 240V
- Output Frequency

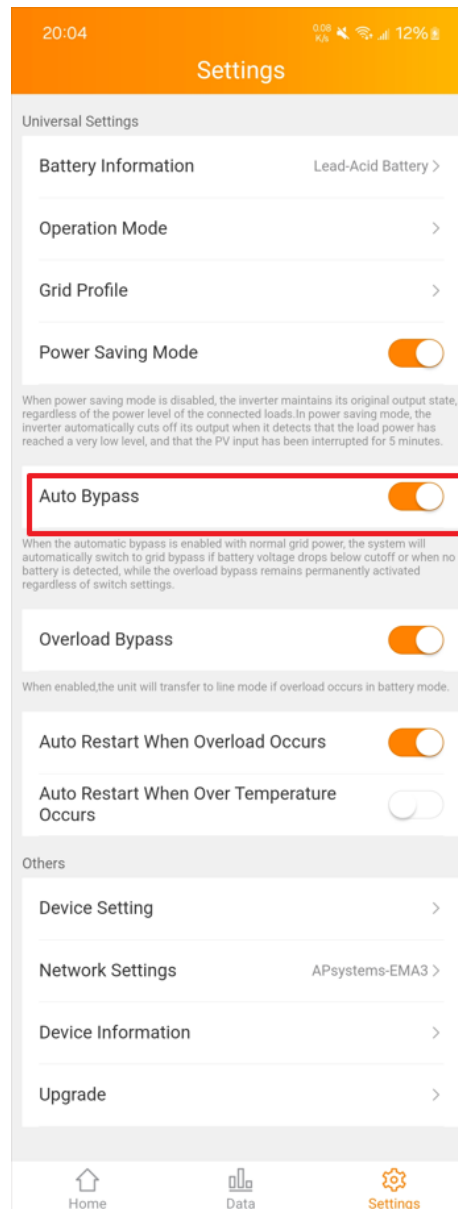
- 50Hz (default)
- 60Hz
- AC Output Mode
 - Single
 - L1
 - L2
 - L3

3.3.3.4 Power Saving Mode



- Switch off **“Power Saving Profile”** (default):
 - When power saving mode is disabled, the inverter maintains its original output state, regardless of the power level of the connected loads.
- Switch on **“Power Saving Profile”**:
 - When the device is actually in power saving mode, the inverter automatically cuts off its output when it detects that the load power has reached a very low level, or that the PV input has been interrupted for 5 minutes.
 - There will be an **“ECO”** logo within the **[Power Flow]** area on the **[Home]** page.

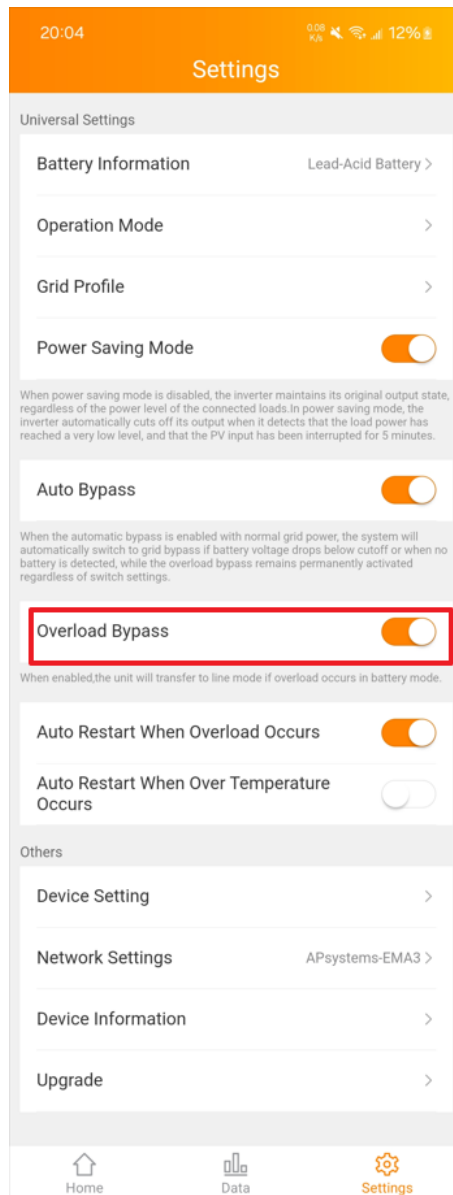
3.3.3.5 Auto Bypass



- Switch off (default): Manual.
- Switch on: Automatic.

Note: If automatic bypass is enabled and the utility power is normal, the system can automatically switch to bypass mode even if the bypass function is disabled.

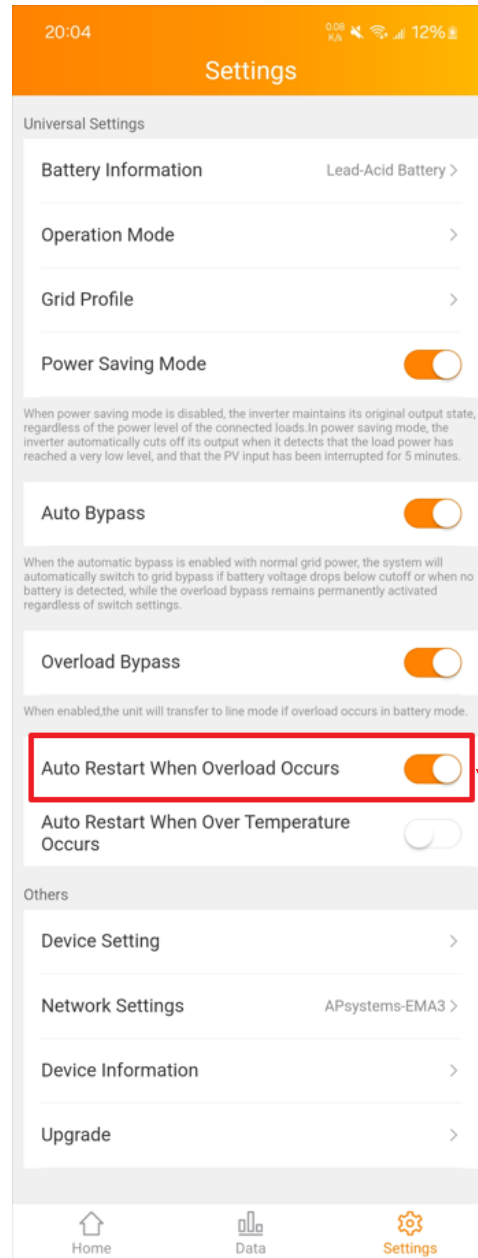
3.3.3.6 Overload Bypass



Switch on

- Switch off (default): Overload bypass disabled.
- Switch on: Overload bypass enabled, when enabled, the unit will transfer to line mode if overload occurs in battery mode.

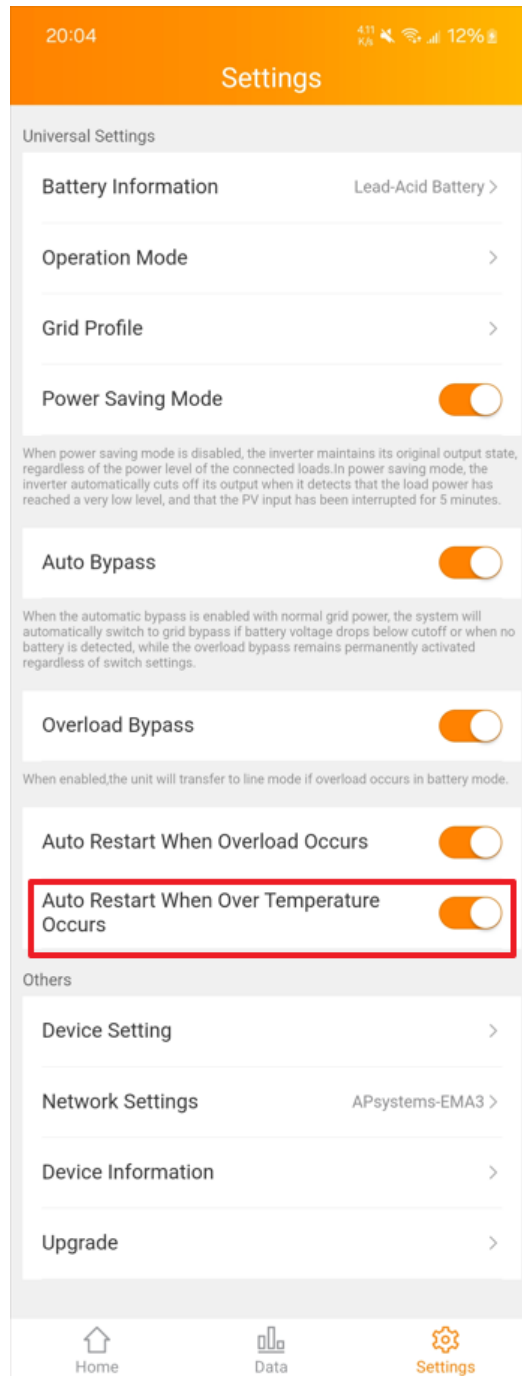
3.3.3.7 Auto Restart When Overload Occurs



Switch on

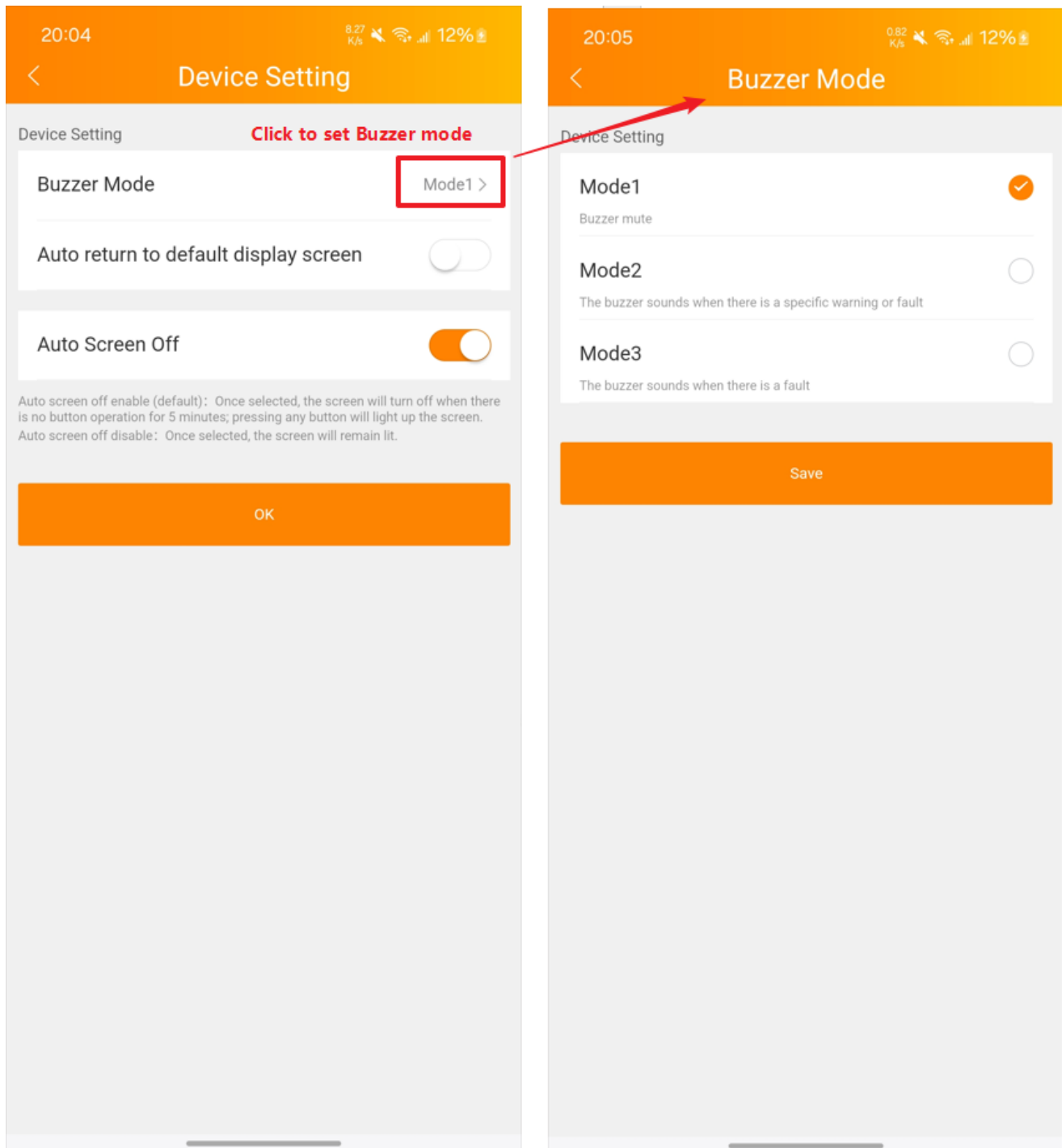
- Switch off: Disabled.
- Switch on (default): Enabled.

3.3.3.8 Auto Restart When Over Temperature Occurs



- Switch off: Disabled.
- Switch on (default): Enabled.


3.3.3.9 Device Settings



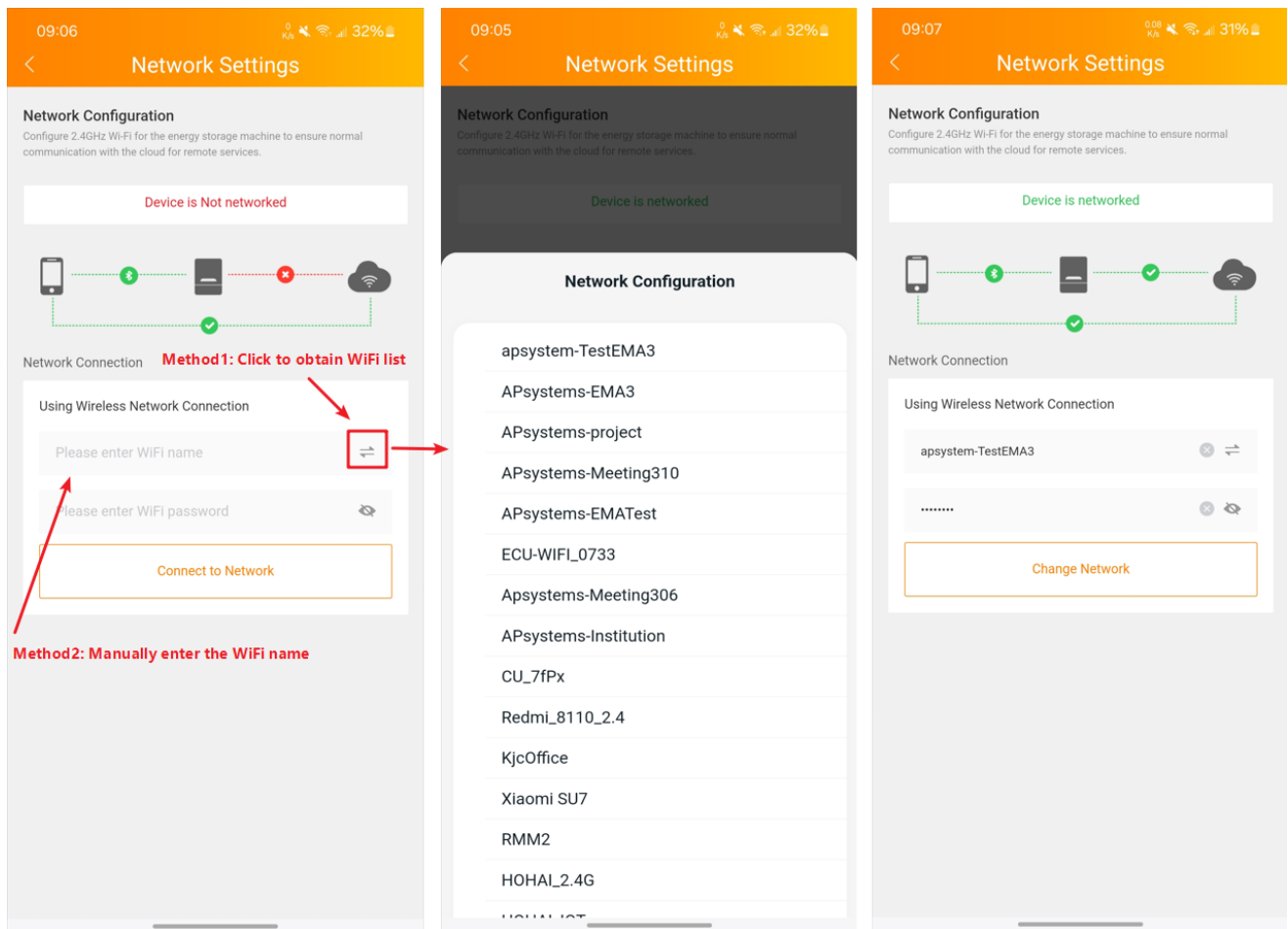
- Buzzer Mode
 - Mode1: Buzzer mute.
 - Mode2: The buzzer sounds when the input source changes or there is a specific warning or fault.
 - Mode3: The buzzer sounds when there is a specific warning or fault.

- Auto return to default display screen
 - Switch off: Stay on the current page. If this option is selected, the system stays on the page of the last operation.
 - Switch on (default): Back to home. If this option is selected and the screen is not tapped for 1 minute, the system automatically returns to the home page.
- Auto Screen Off:
 - Switch off: Auto screen off disable. Once selected, the screen will remain lit.
 - Switch on (default): Auto screen off enable. If this option is selected, the system stays on the page of the last operation. Once selected, the screen will turn off when there is no button operation for 5 minutes; pressing any button will light up the screen.

3.3.3.10 Network Settings

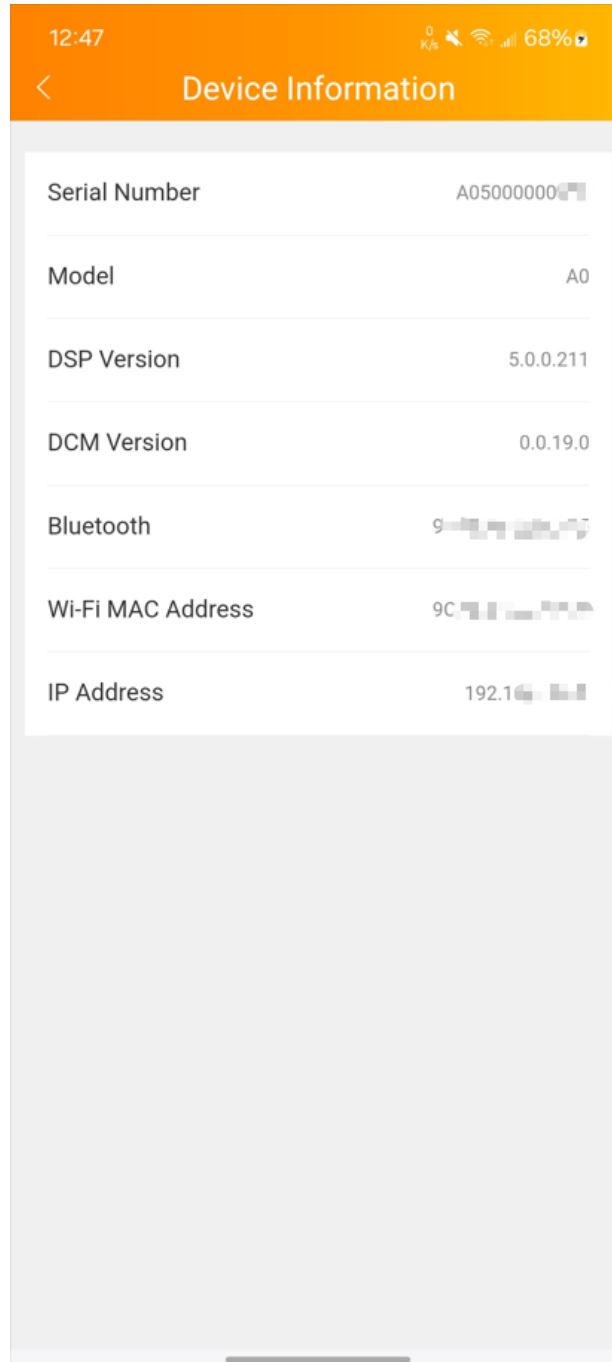
The page will show up APstorage's wireless connection status. Click the “” and choose the available Wi-Fi to connect, also, you can manually input the Wi-Fi name.

- Step1: Enter the Wi-Fi name.
- Step2: Enter the password.
- Step3: Click “**Connect to Network**”.



3.3.3.11 Device Information

The device information page displays the serial number, model, DSP version, DCM version, bluetooth, Wi-Fi MAC address, and currently connected IP address.



3.3.3.12 Upgrade

When an update is available, you can click the **“Upgrade”** button to upgrade.

Note: You need to reconnect your smart phone to the APStorage’s Bluetooth if the connections fail once the signals disappeared during upgrading.

