User Manual

PV Pro Mobile App

Contents

1. Brief Introduction

1.1. Purpose

    This manual gives a brief introduction to the main functions of "PV Pro" APP account registration, plant creation, Wi-Fi configuration etc. Provide reference and help for uses to quickly familiarize themselves with the APP.

1.2. Scope

    This manual is suitable for users, pattern vendors and device maintenance personnel who use our inverter.

2. Install APP

2.1. iOS: Search "PV Pro" in the App Store

2.2. Android: Search "PV Pro" in the Google Play Store

iOS/Android

3. User Registration

3.1. Register Account

1. When installing "PV Pro" for the first time, you should register an account, please click the "Sign Up" button, follow the steps to complete the operation。

3.2. Mailbox registration:

If you do not receive the verification code, check whether the email address is correct, whether the network is abnormal, and whether the verification code has been sent to the spam mailbox.

3.3. Mobile number registration:

If you do not receive the verification code, please check whether the mobile phone number is correct.
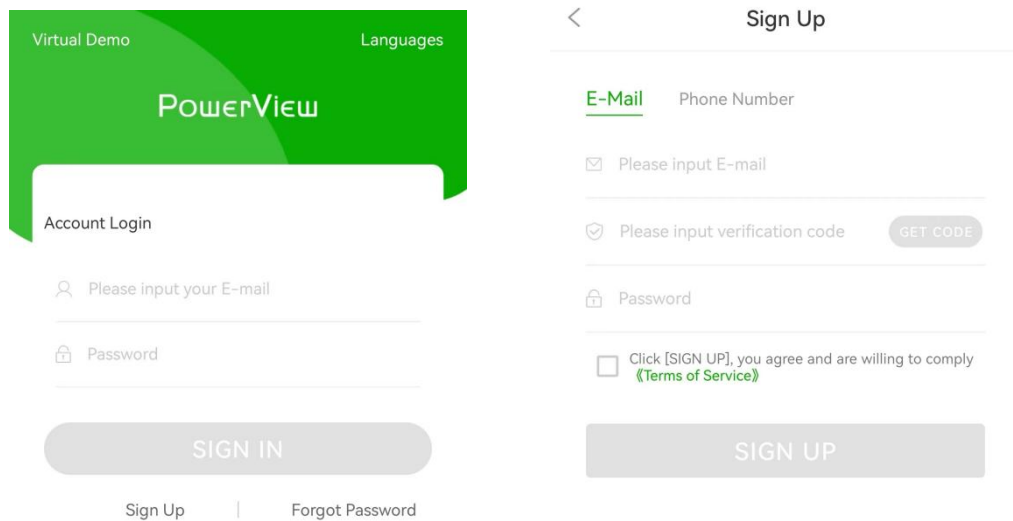
Figure3-1 Account registration

3.2. Reset Password

1. If you forgot your password, you can click "Forgot password" on the login screen to retrieve your password by email or mobile phone number, as shown in Figure 3-2.
2. If you cannot receive the verification code, refer to section 3.1

Figure 3-2 User login

4. Create Plant

4.1. Add Device

1.Press the "Plants" button at the bottom, and press the " ⋯ " button in the upper right corner to enter the screen. Scan the QR code of the device, or manually enter the serial number and registration code to add the device, as shown in Figure 4-1.

Figure 4-1 Create plant

You need to authorize the App to use the camera permission.

4.2. Fill information

1. Complete the creation process, as shown in 4-2 below。
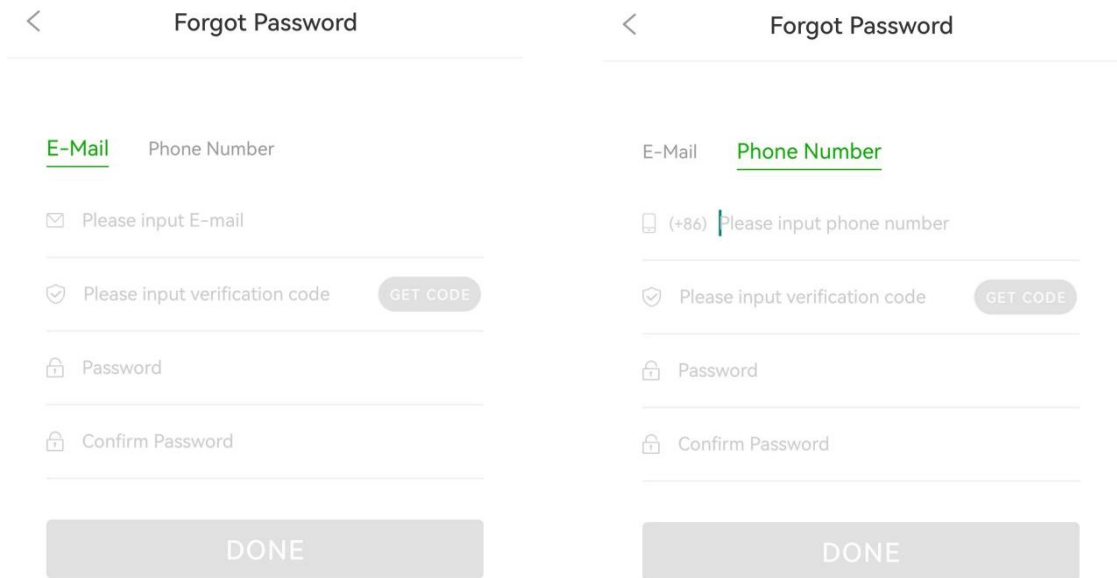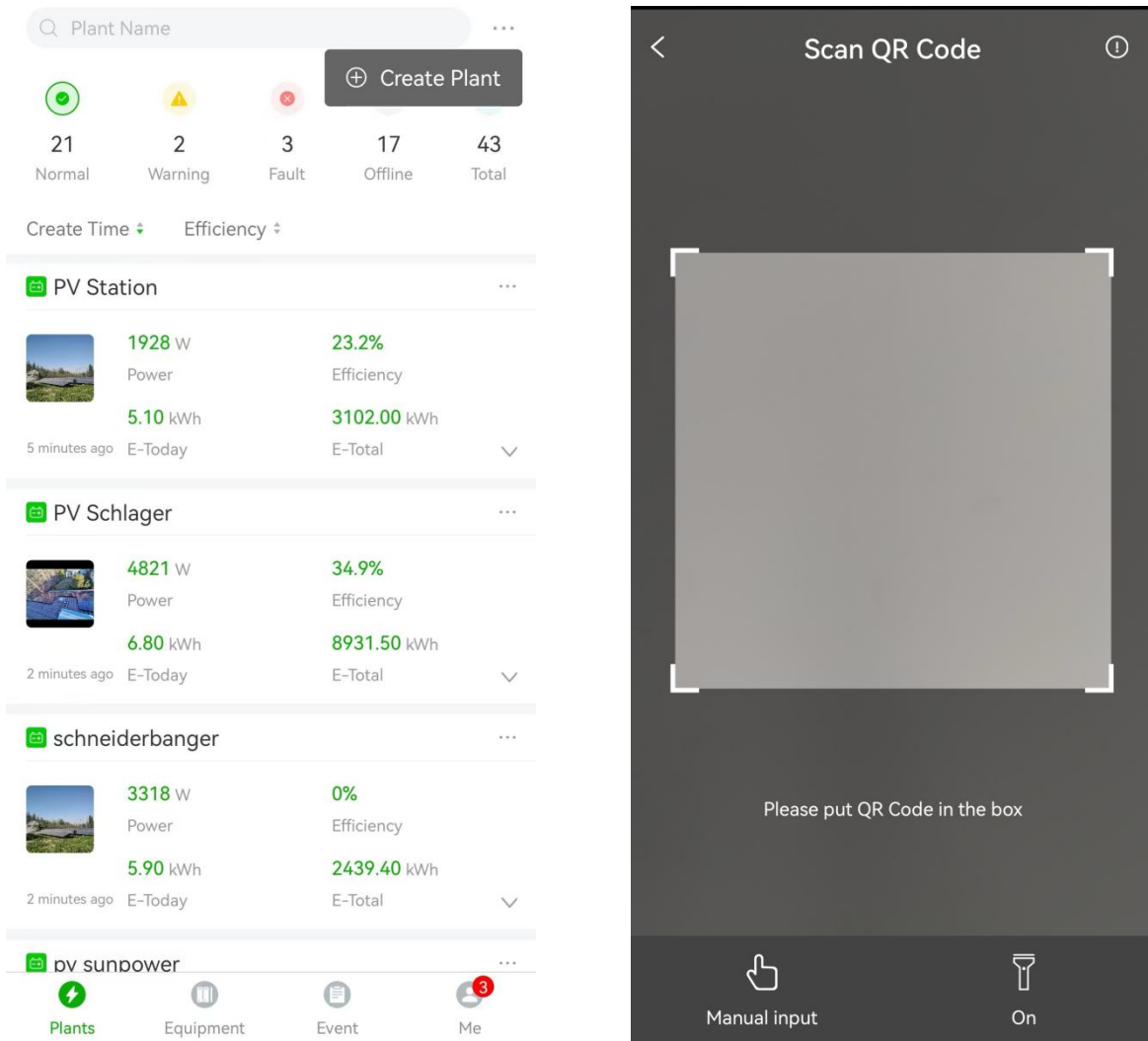2. Enter the correct plant capacity.
3. Choose the right currency.
4. Input the correct benefit factor.
5. Check the time zone where the plant is located. (Incorrect time zone may cause statistical exceptions.).
6. Make sure the plant address is correct (if you need to change it, please click the map to select it manually).
7. Enter the phone number of the plant contact
8. Click "CREATE", and the APP is successfully created, as shown in Figure 4-3.
9. Click the "Done" button and the APP will return to the home page.
10. Click "DISTRIBUTION NETWORK" APP to jump to the guidance interface of Configuring network in Section 5 (see Section 5 for details)

Figure 4-2 Creating plant information

The location service needs to be enabled and the App needs to be authorized to use the location permission.

Create Plant Done

Congratulations, Created successfully

DISTRIBUTION NETWORK

ⓘ You can click the button 'Done' in the upper right corner to complete the creation or to configure the network for the collector

• **Device power up**

Please make sure that the gateway is powered on. When the gateway is powered on, the red LED is always on

• **Network coverage**

Please make sure that the installation location of the collector is within the signal coverage of the router you need to connect to, and place your mobile phone close to the collector. The router only supports 2.4G Wi-Fi networks
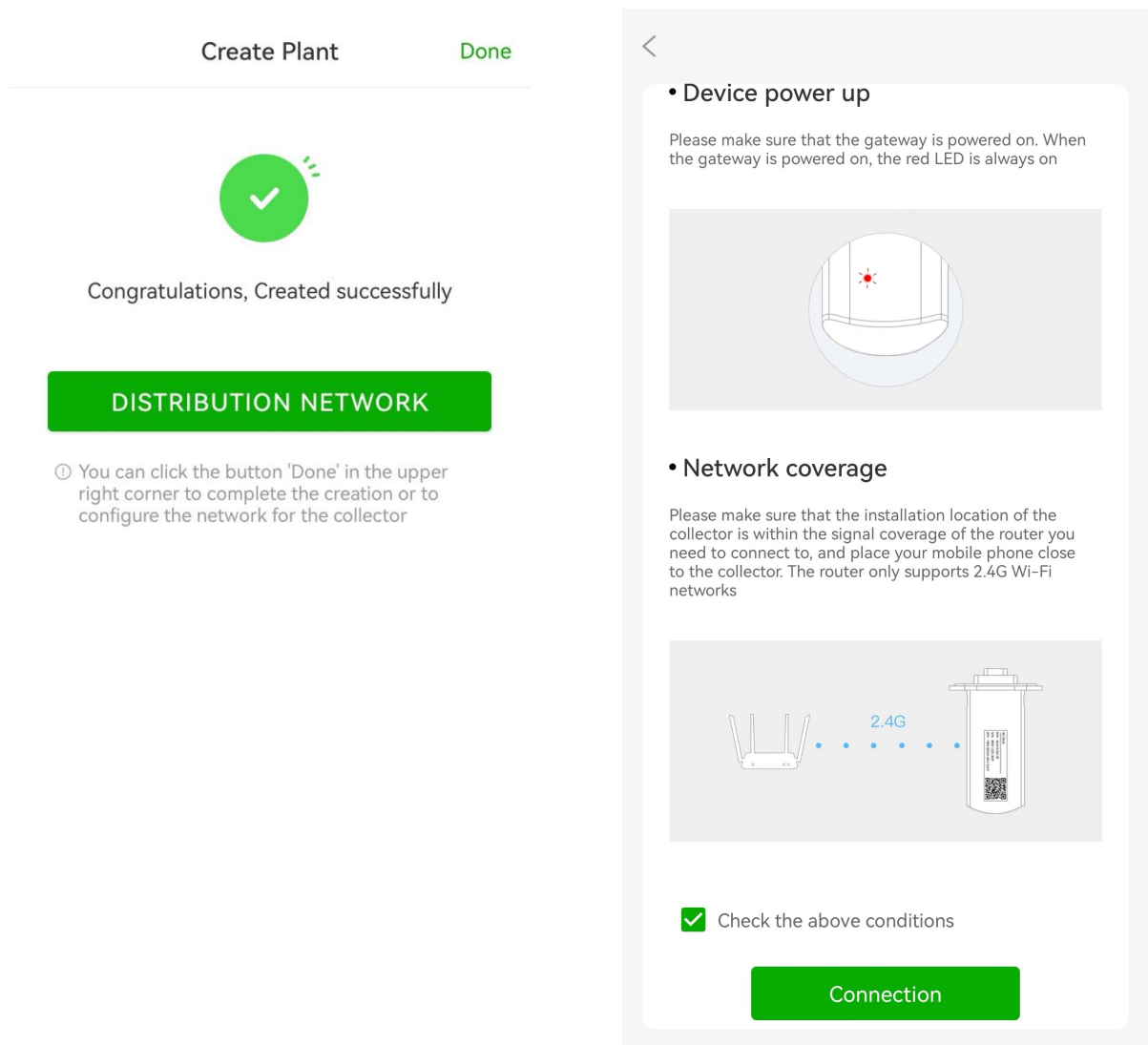
2.4G

☑ Check the above conditions

Connection

Figure 4-3 Create plant

5. Wi-Fi Setting

5.1. Equipment Distribution Network (Android)

1．Click the Tools bar on the "Me" page to enter the "Tools" page, select "Wi-Fi configuration". The APP provides two methods for connecting to Wi-Fi devices, find device and Scan QR code, as shown in
Figure 5-1.

Figure 5-1 Wi-Fi Setting
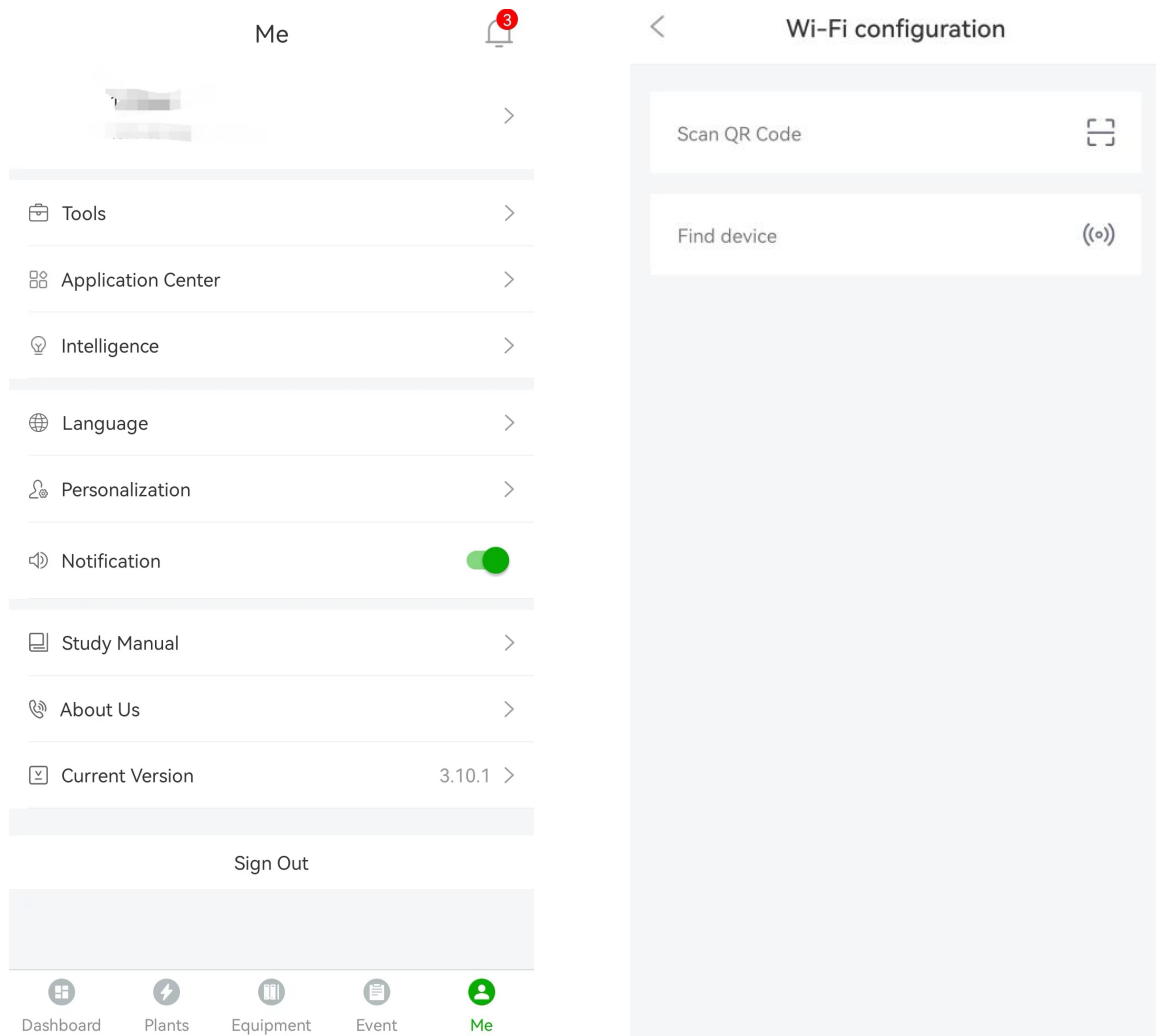
5.2. Find Device

1. Click "Find device", the APP will pop up a guidance interface, and then click the "Connection" button. The APP will search for nearby Wi-Fi devices that can be configured List them as a list (if the list is empty, check whether the prerequisites of the guidance interface are met, and then click the "SCAN" button), as shown in Figure 5-2.
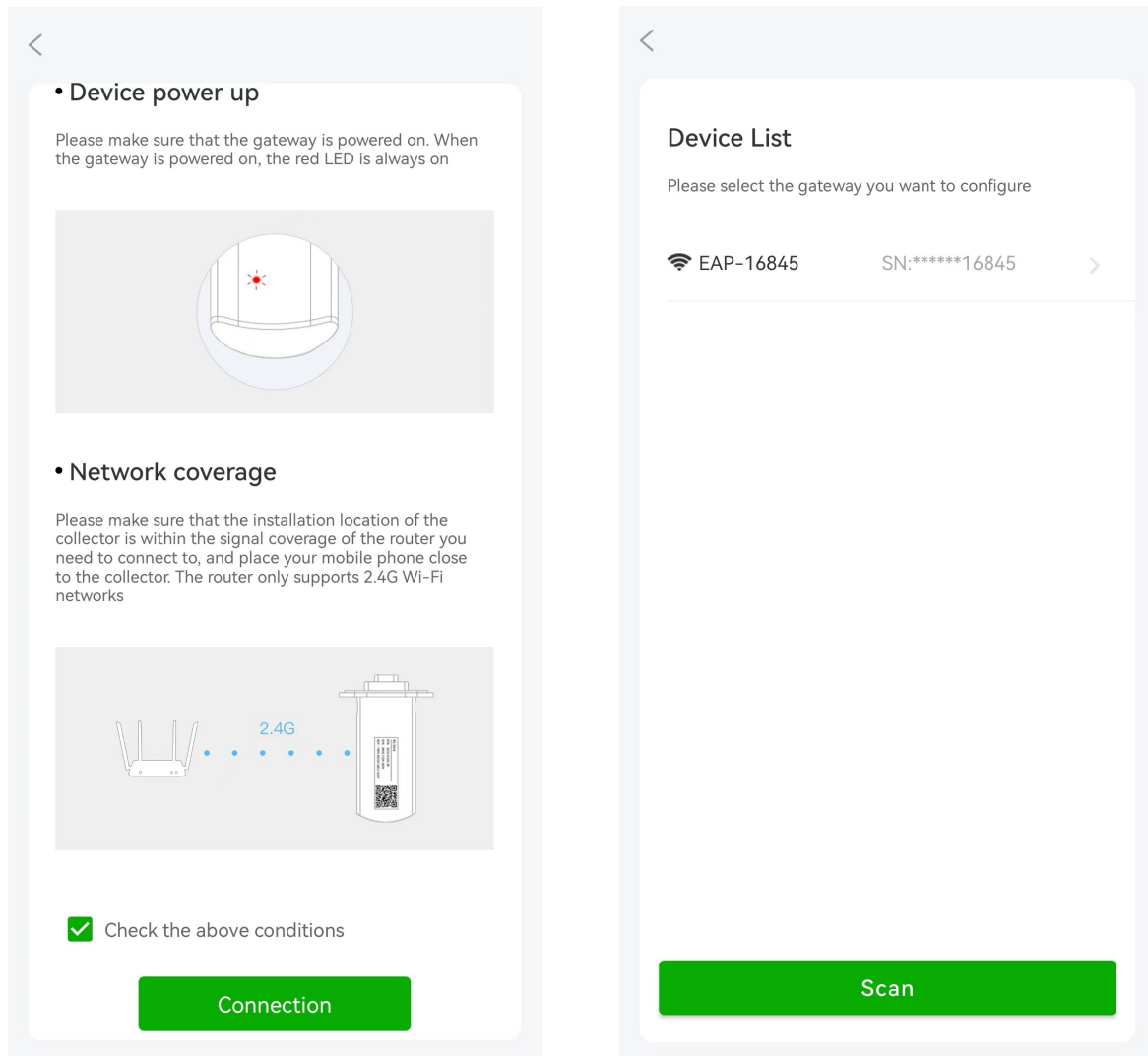
Figure 5-2 Find equipment

2. Select a network starting with "EAP-*****" with "*" as the last 5 digits of the device serial number. The APP switches to the "Choose a router" interface and choose the router to be connected to the gateway. as shown in Figure 5-3.
3. Enter the router password, as shown in Figure 5-3.
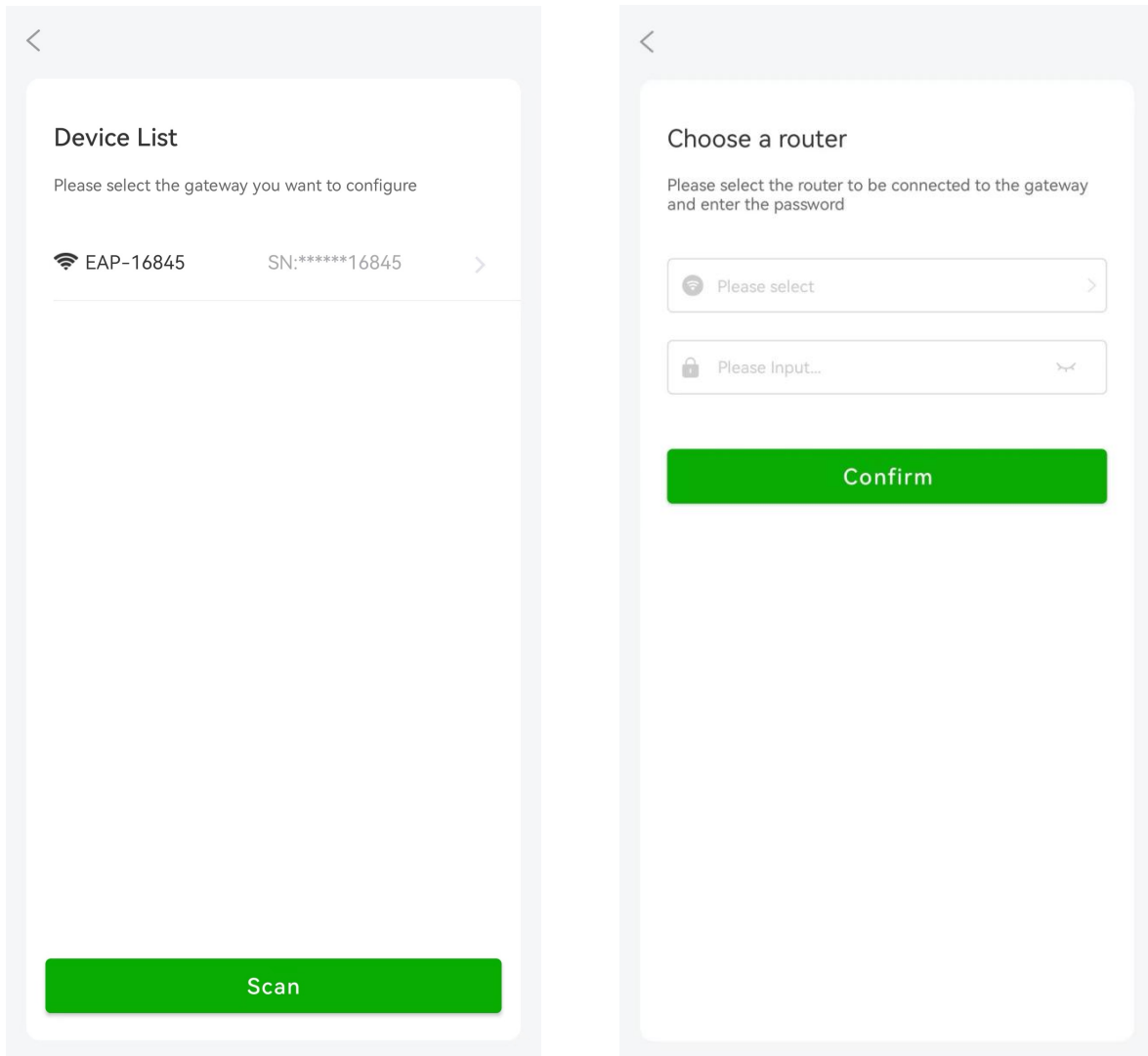
Figure 5-3 Connected devices

4. Click "Confirm" button (Figure 5-3) to jump to the successful interface of APP.
5. If the connection fails, click "Retry" to check whether the Wi-Fi password and gateway are within the signal coverage range of the router.
6. Click the "Confirm" button to return to the home page of APP.
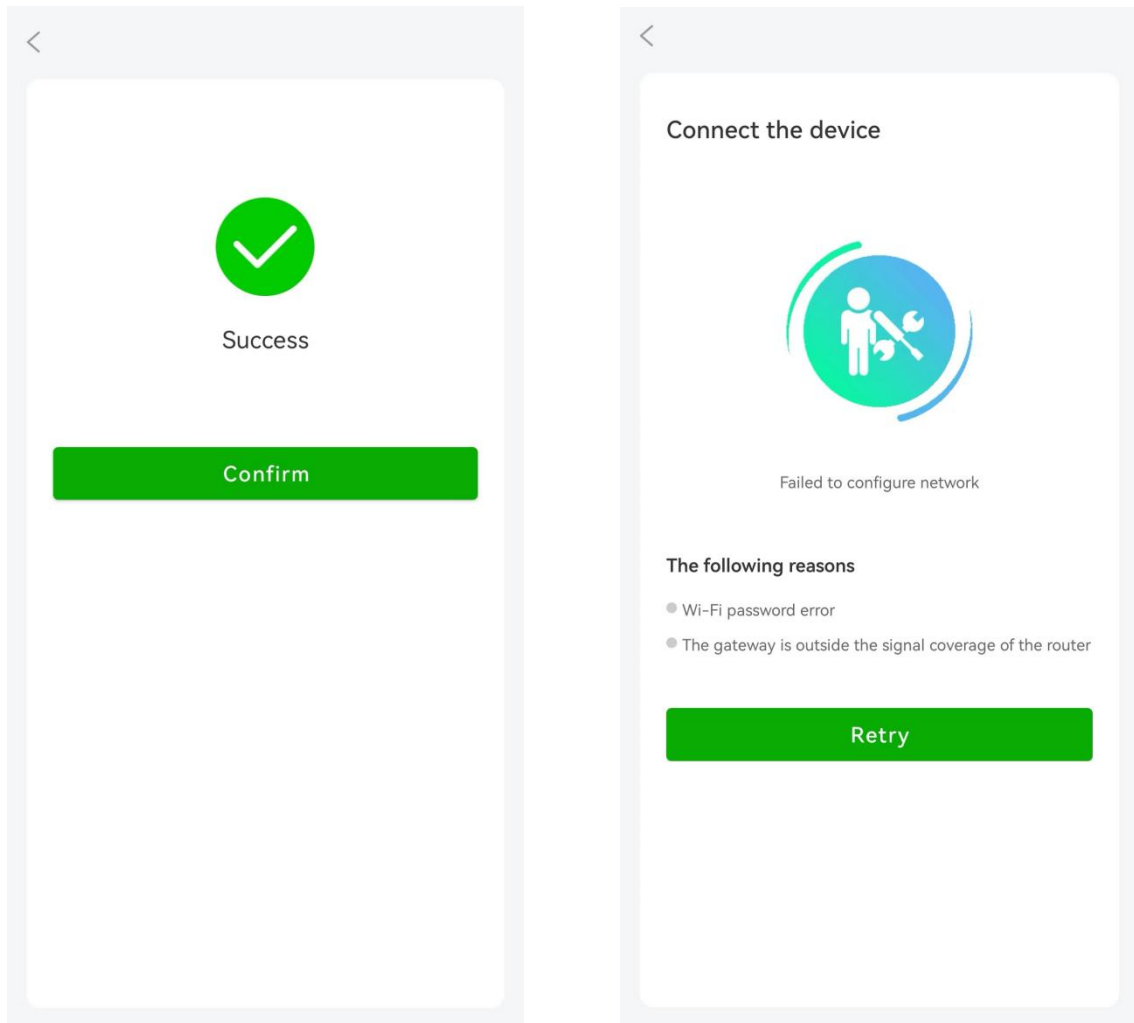
Figure 5-4 The connection is successful

> ⚠️ Prerequisites: Wi-Fi and location service must be enabled in advance. Ensure that the device is powered on. When the device is powered on, red LED lights are always on around the device.

7. You can quickly connect to the device by scanning the QR code (if the connection fails, see Section 5.1 to check the prerequisites), as shown in Figure 5-5.

5.3. QR code
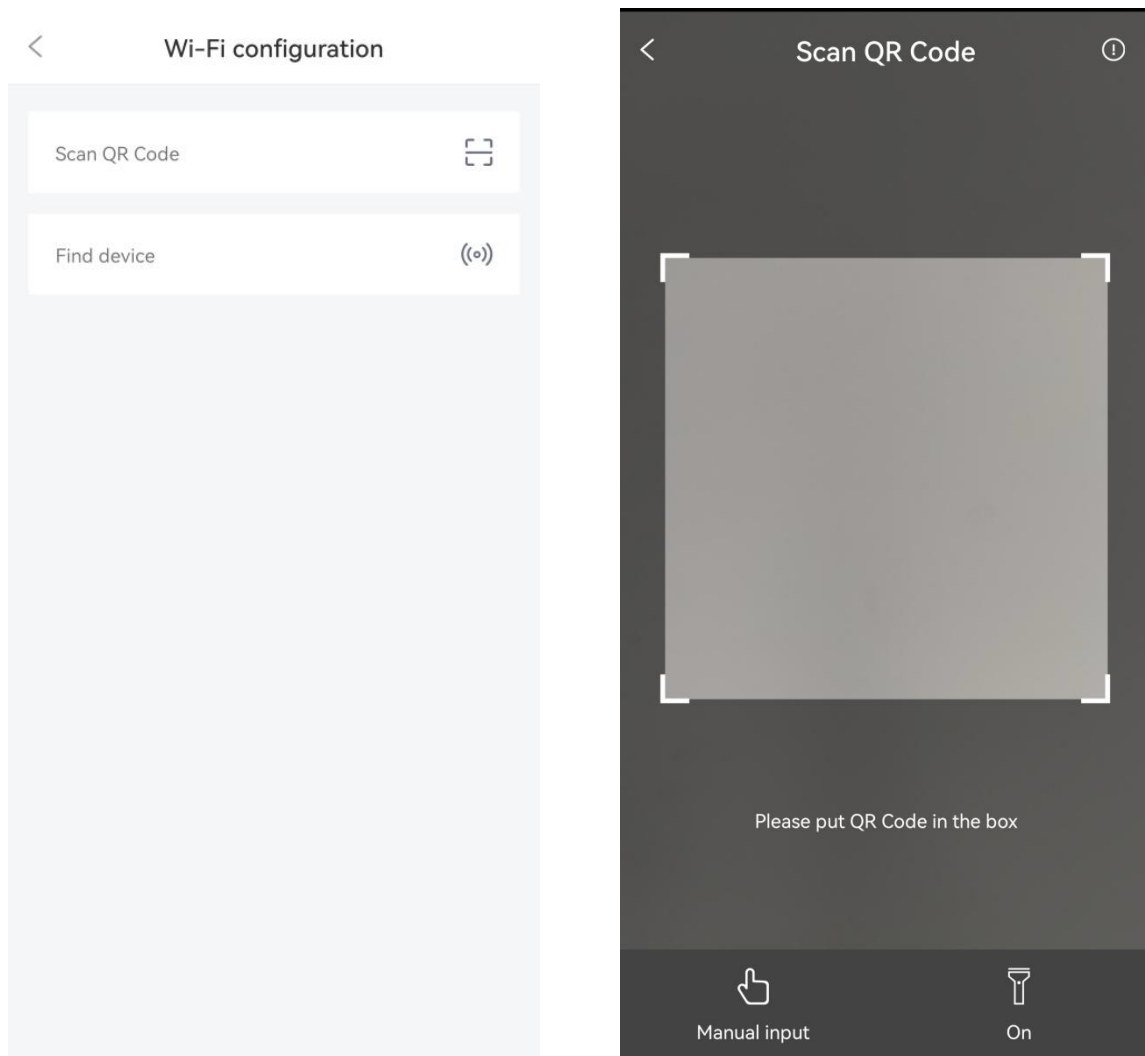
Figure 5-5 Scan the QR code of the device

You need to authorize the App to use the camera permission.

6. Plant Management

6.1. Overview

1. Click "Plants" at the bottom and click in the red box to view the detailed information of the plant, as shown in Figure 6-1.
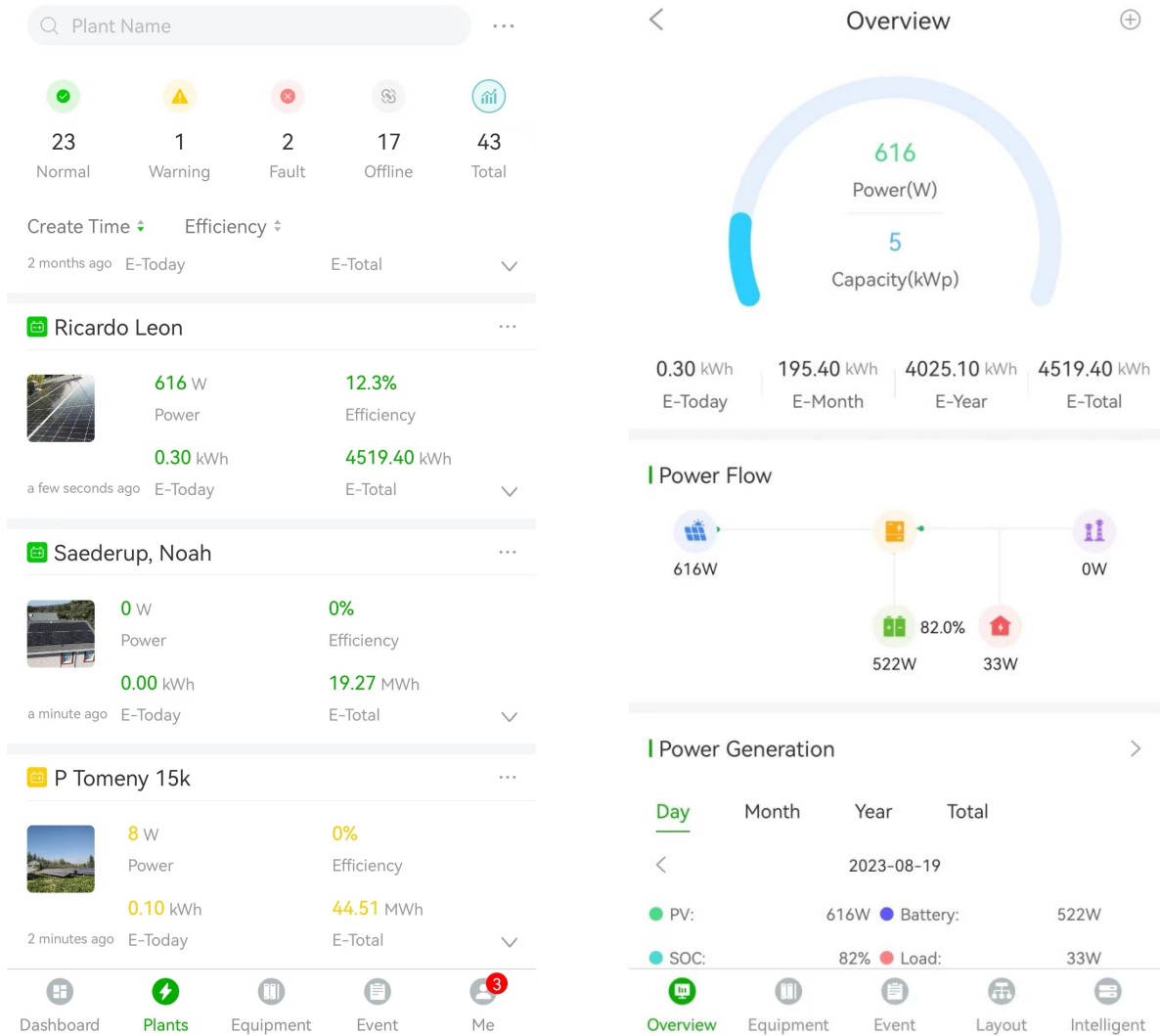
Figure 6-1 Plant overview

2. Figure 6-2 shows the details about the plant.
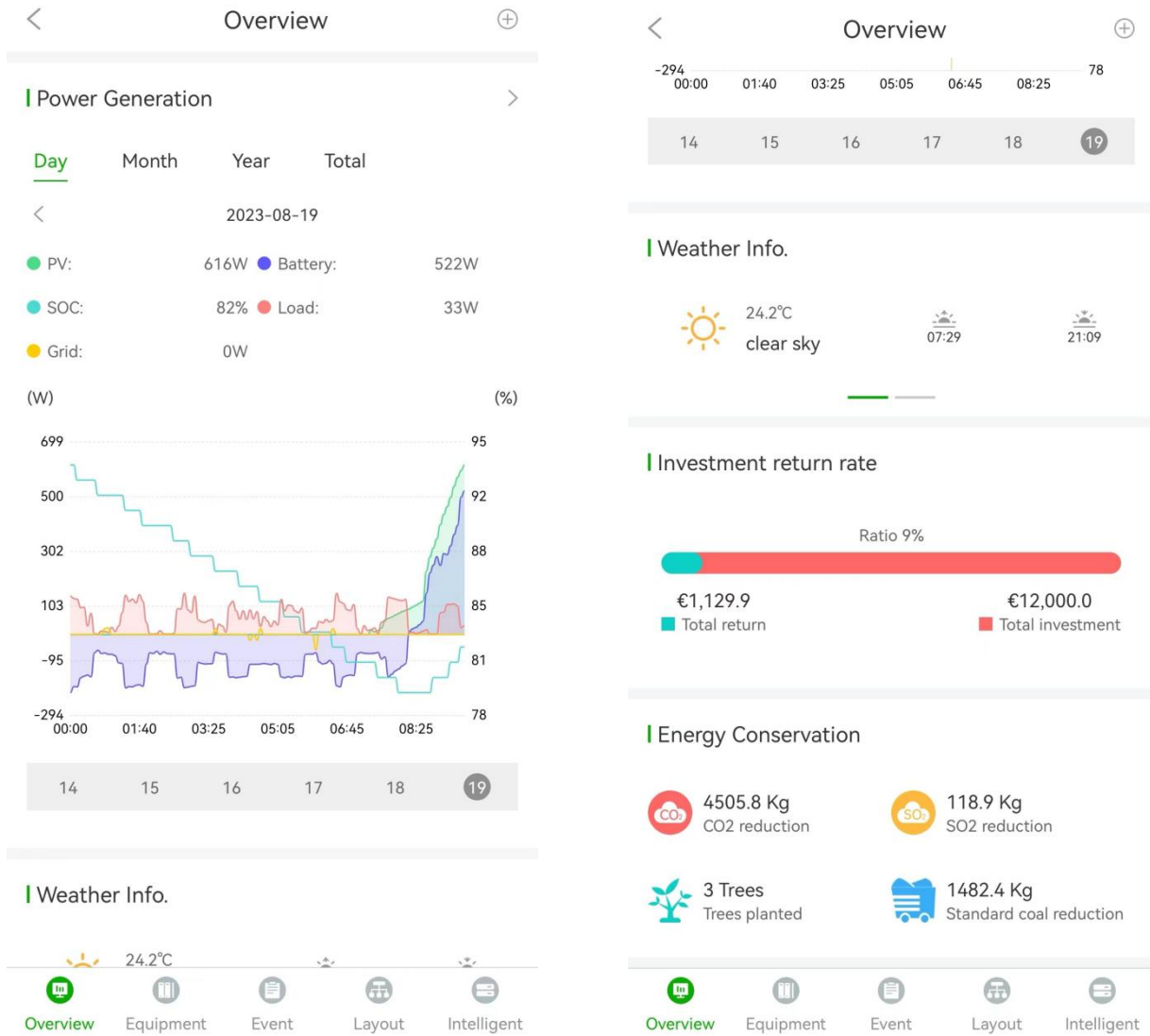
Figure 6-2 Plant overview

6.2. Remove Plant

1. Click "Plants" at the bottom, click "..." at the upper right corner of the plant, and select Delete, as shown in Figure 6-3.
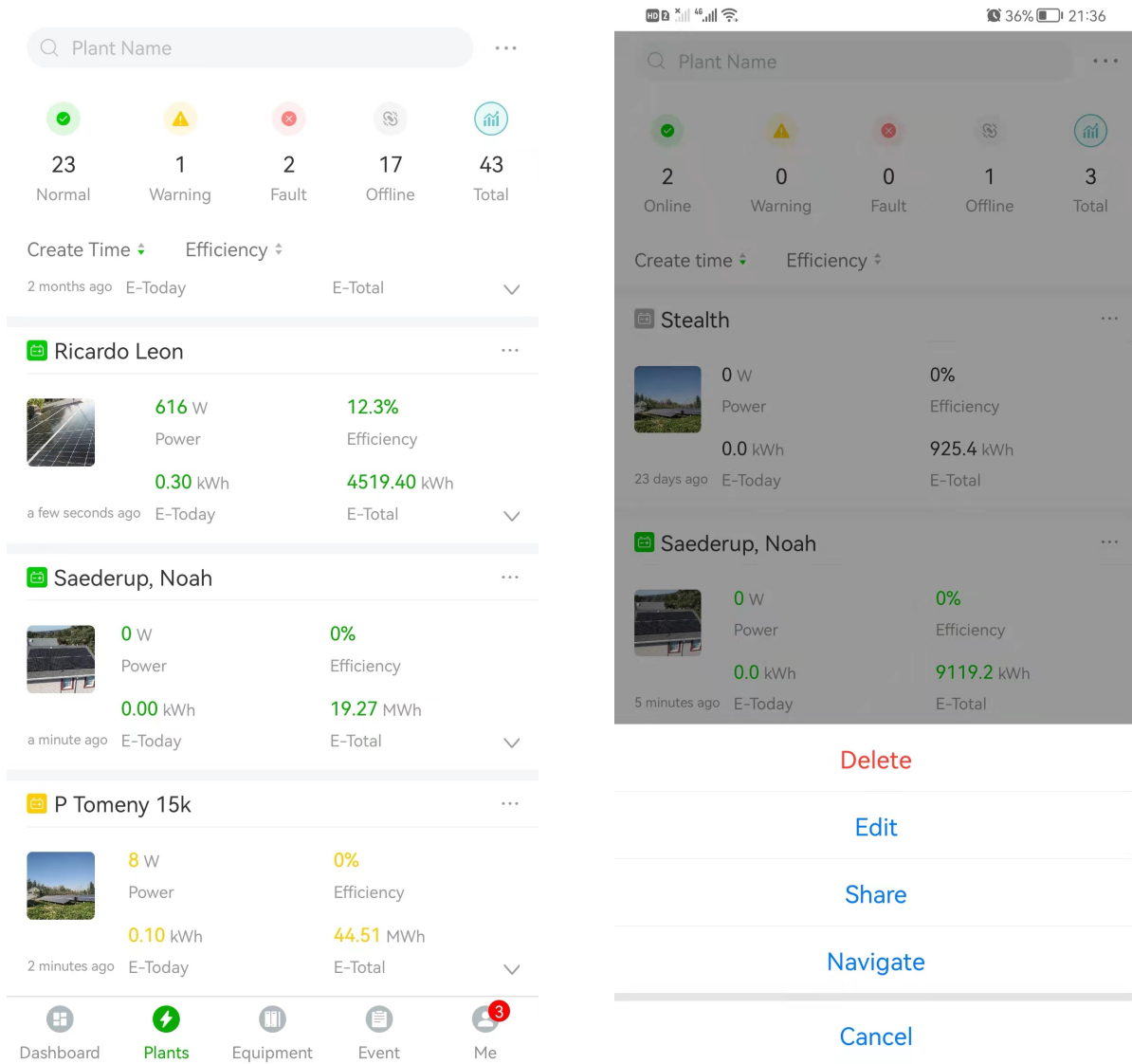
Figure 6-3 Remove plant

6.3. Modify Plant

1. Click "Plants" at the bottom, click "..." at the upper right corner of the plant, and click "Edit" to modify the plant, as shown in Figure 6-4.
2. The share account is PV Pro's registered account (email or mobile phone number in Mainland China).
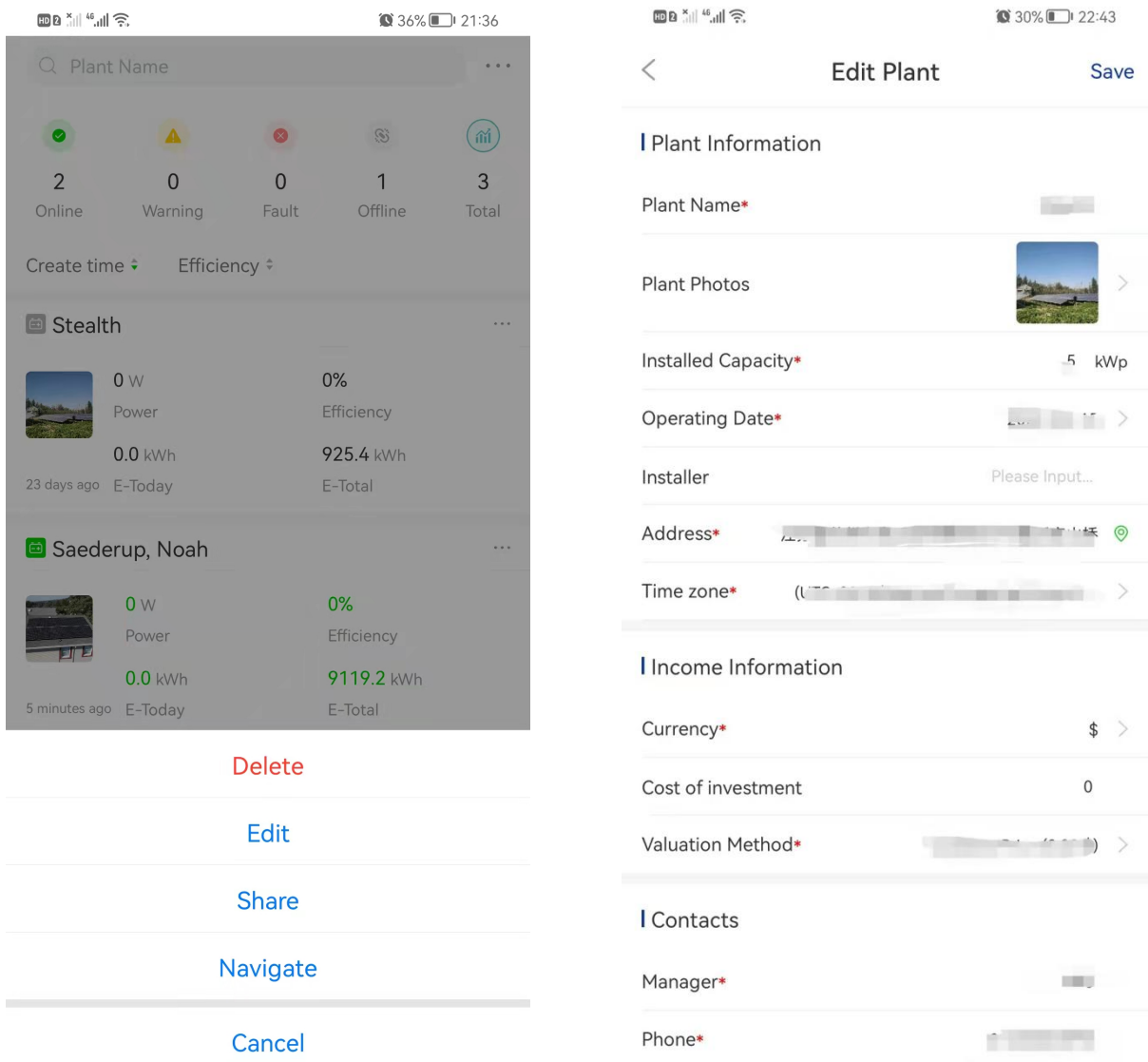
Figure 6-4 Edit plant

6.4. Share Plant

1. Click "..." on the upper right corner of the station, and select "Share" button to share the station.
2. The shared account is the registered account of PV Pro (email address or mobile phone number in Mainland China), as shown in the picture below.
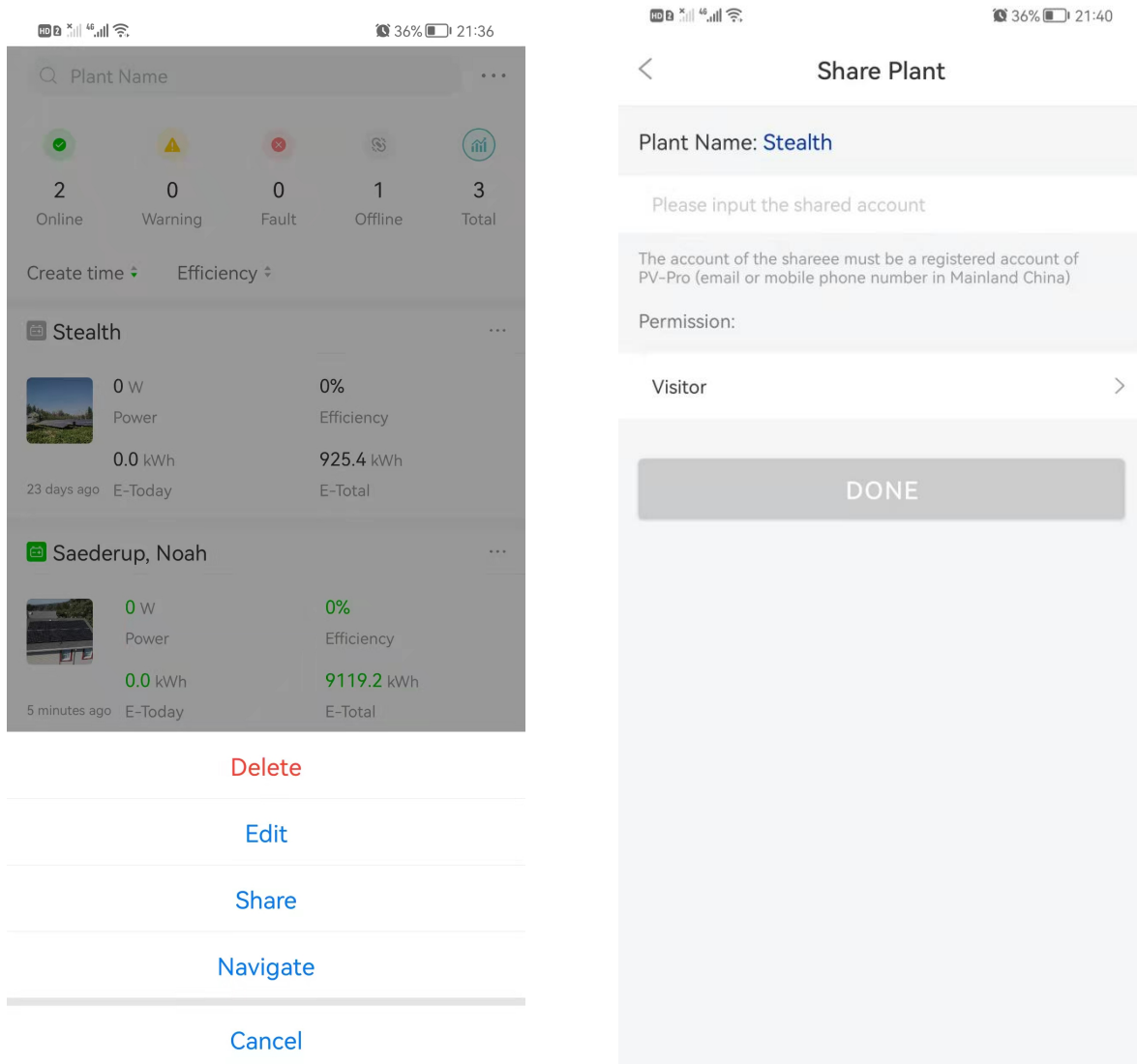
Figure 6-5 Share Plant

7. Device Management

7.1. Overview

1.Click "Equipment" at the bottom to view information about the inverter and the gateway.

2.Click "..." in the upper right corner of the device to set aliases, parameter setting, and delete the device (once deleted, it cannot be restored).
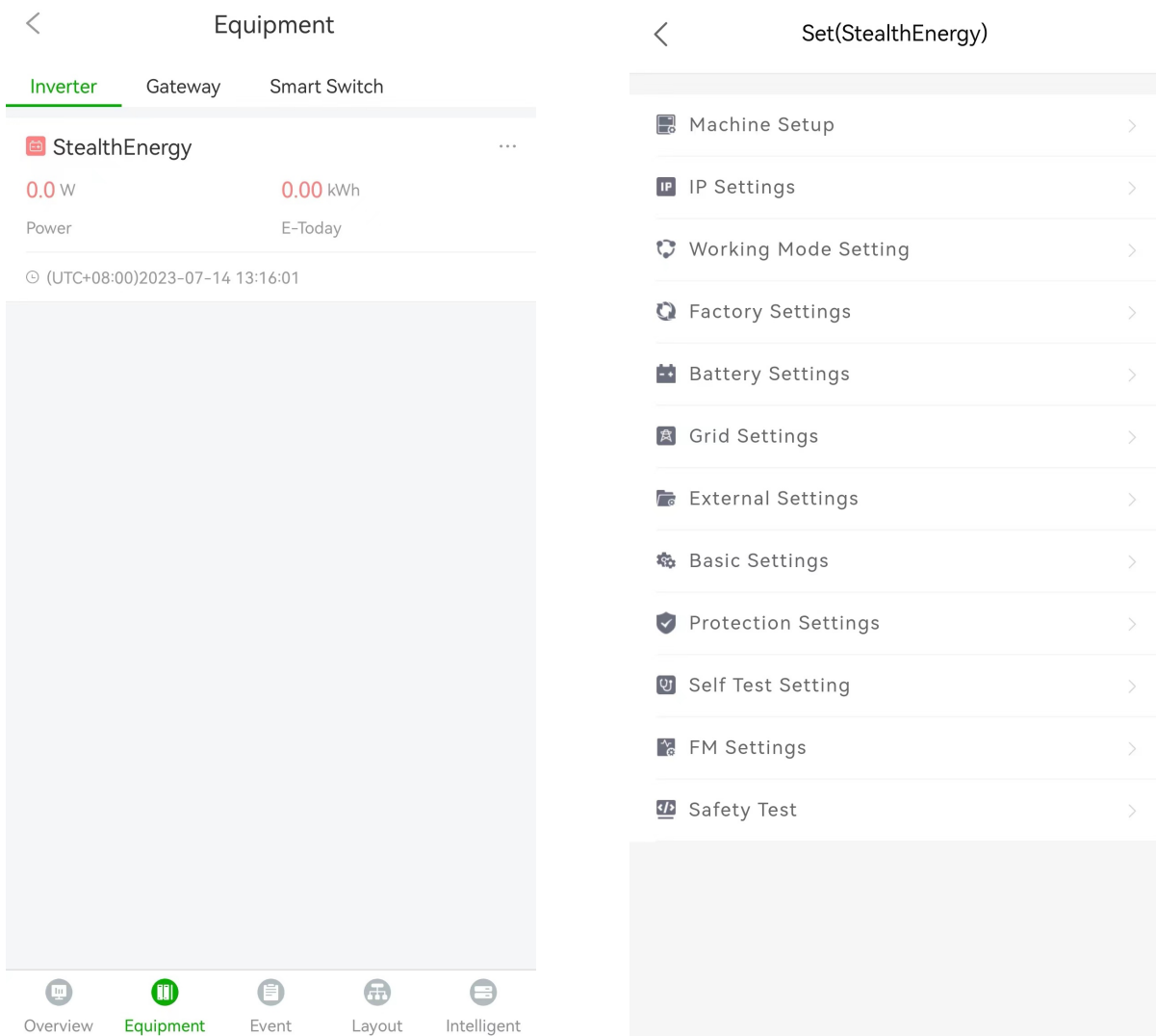
Figure 7-1 Device parameter setting

3. You can click any device to view device information, as shown in Figure 7-2.
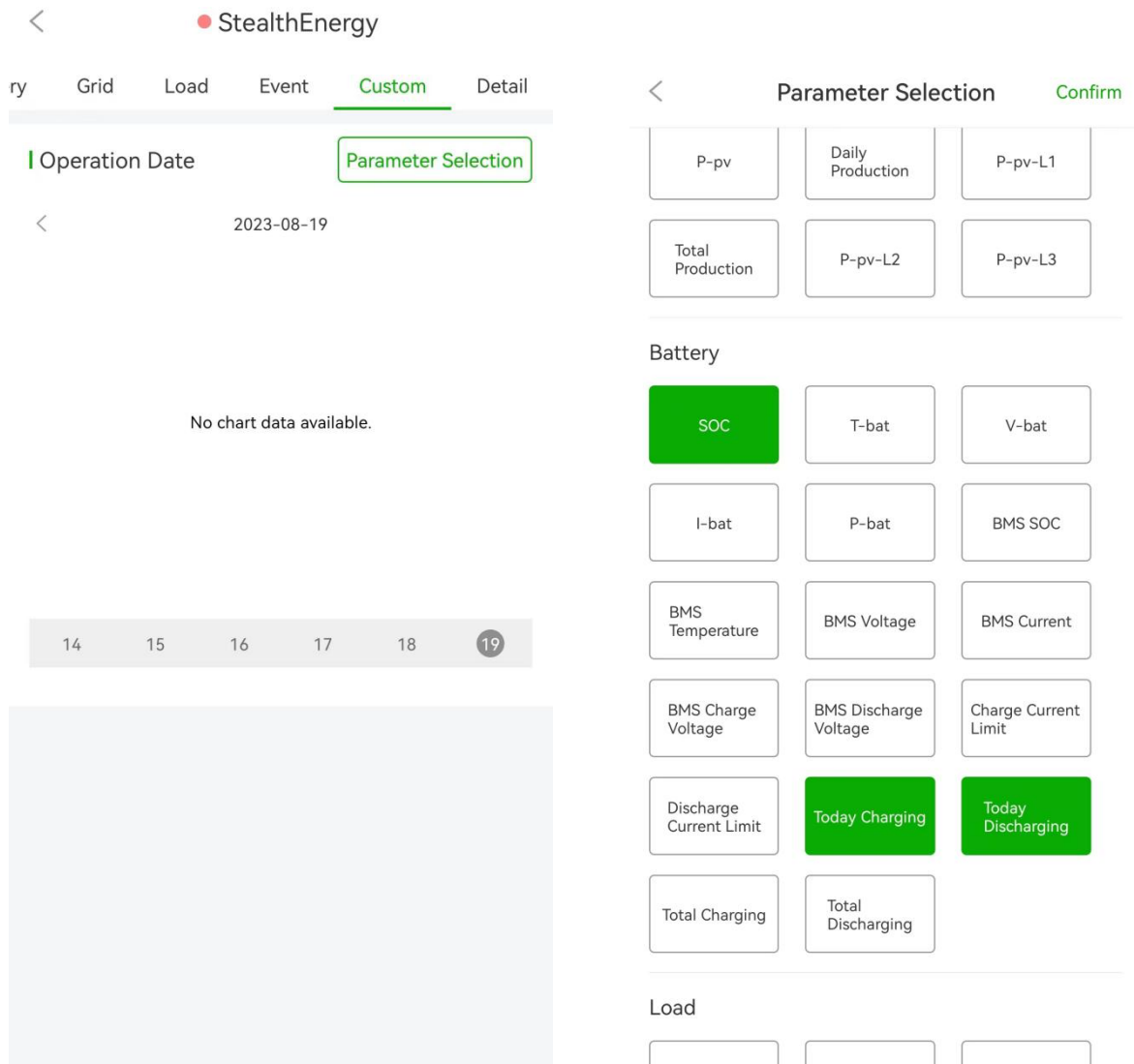
Figure 7-2 Equipment information

4. You can click "Detail" to view Inverter firmware version, "V01.10.27" is FW, "ST-INV-S5.0" is model, as shown in Figure 7-3.
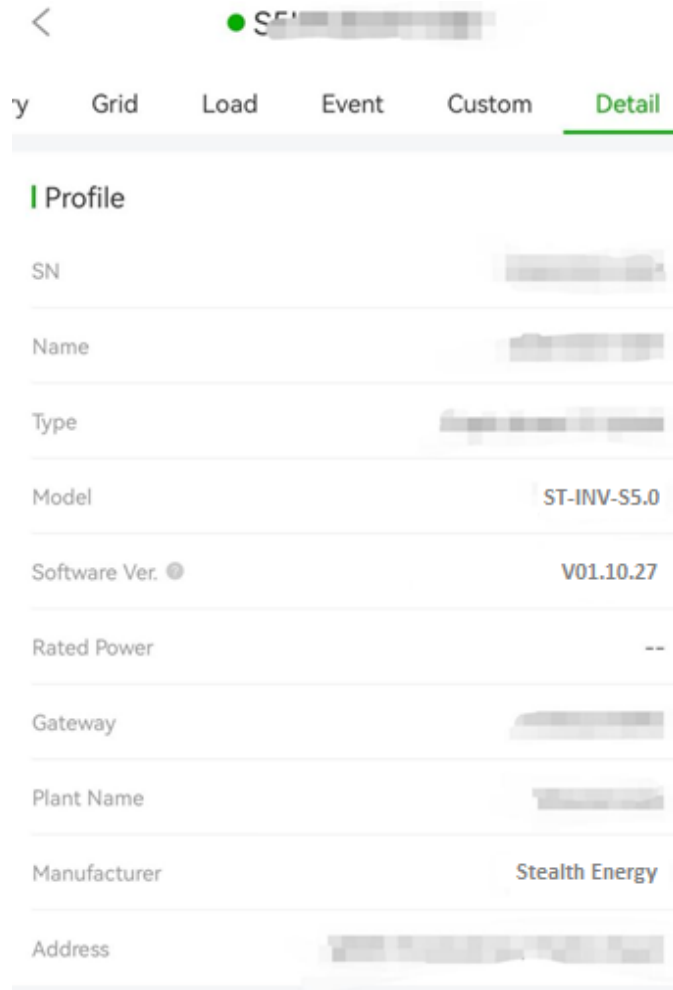
Figure 7-3 firmware version and model

8. Events

1. Click the "Event" button at the bottom to query the event list. Click an event to view the event information, as shown in Figure 8-1.
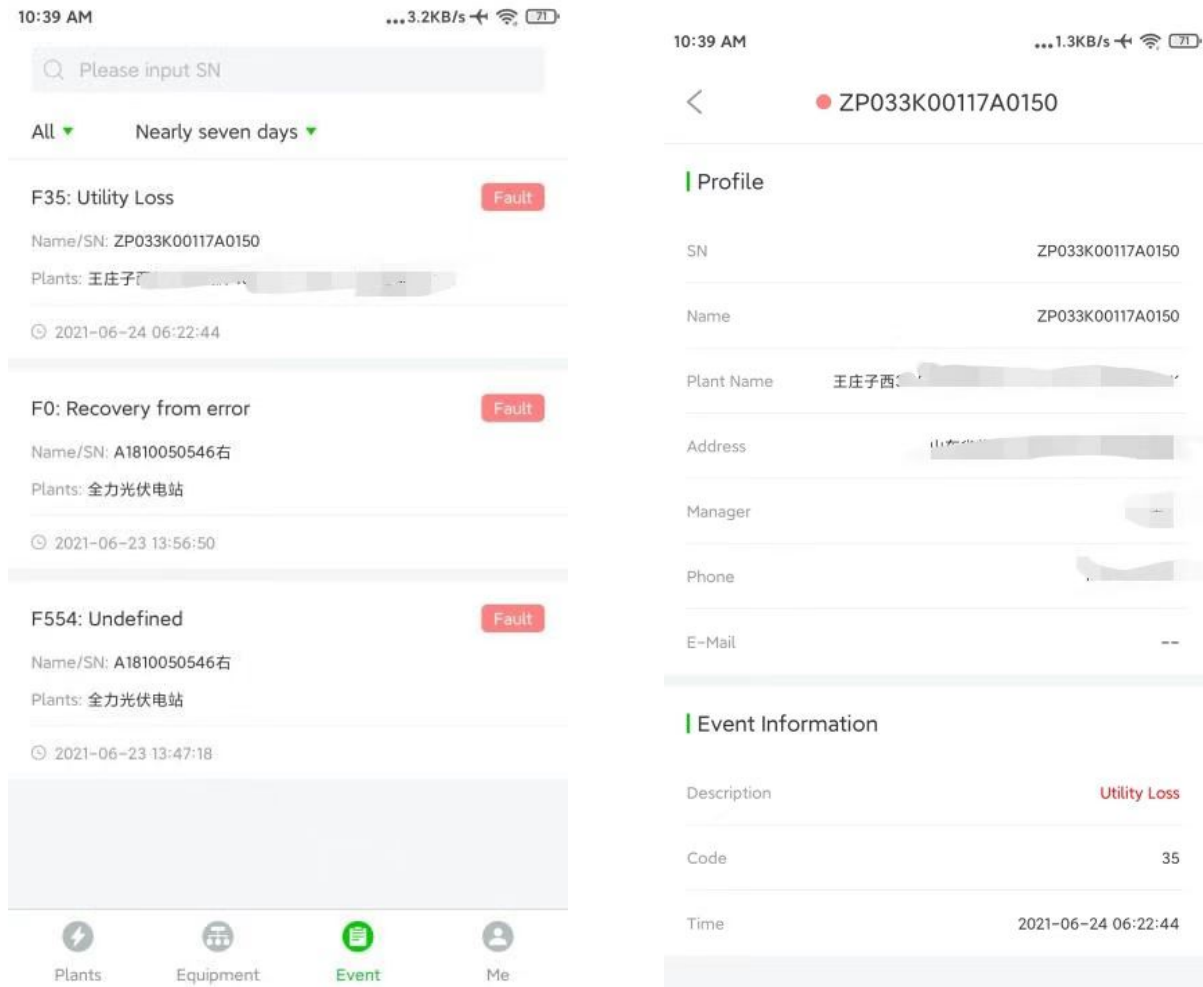
Figure 8-1 Event information

9. Parameter Setting

NOTICE
AS/NZS 4777.2:2020 requires power quality response modes and grid protection settings to be protected against inadvertent or unauthorised changes. (unless with Password, the password please contact your installer). Once settings are selected at commissioning they are locked to view only. Applicable to power quality response modes and grid protection, please refer to local grid requirements.

9.1. Overview

1. Click "Equipment" at the bottom to view information about the inverter and the gateway.
2. Click "..." in the upper right corner of the device to set aliases, parameter setting (as shown in Figure 9-1), and delete the device (once deleted, it cannot be restored).
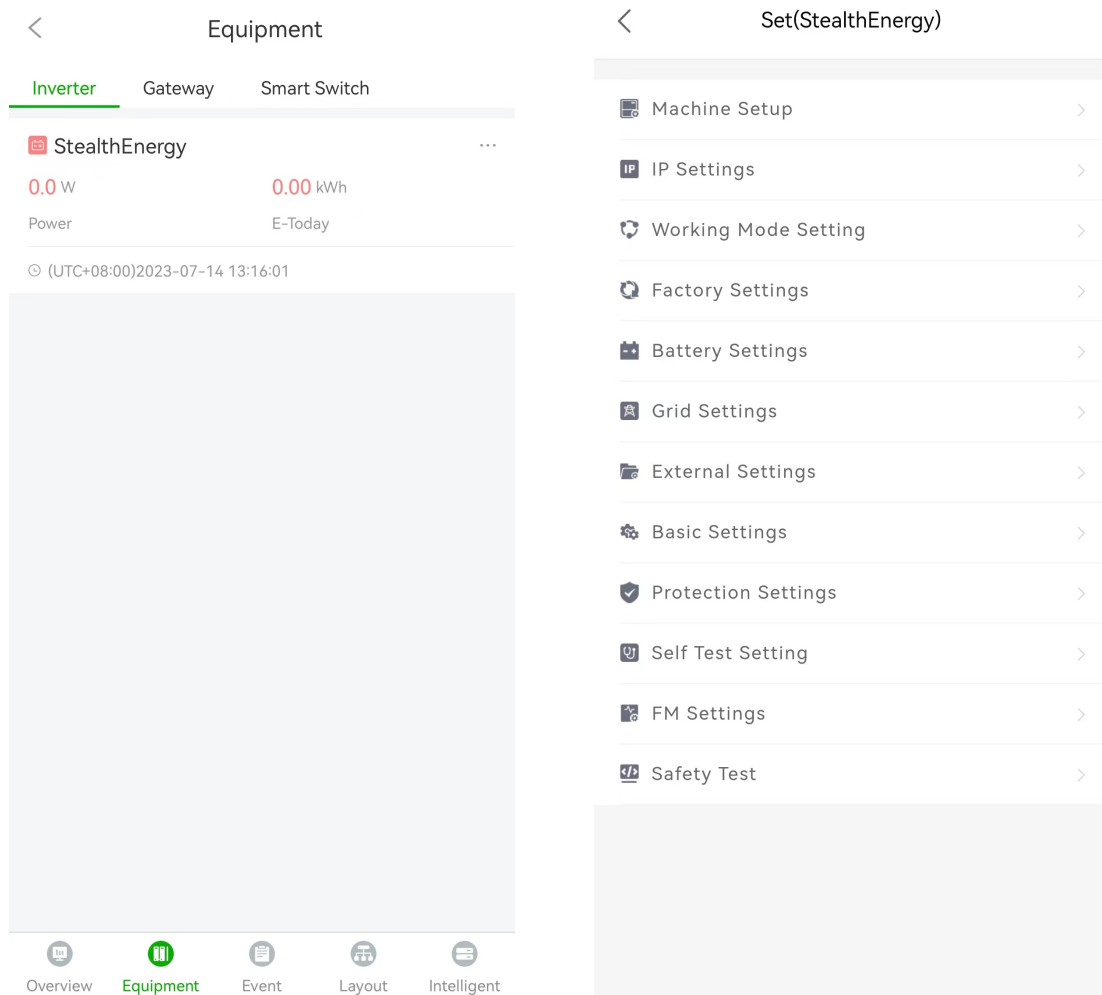
Figure 9-1 parameter setting

9.2. Country Grid Code/Region settings

Click "Grid Settings"-> "Production Compliance Type" to select/activate country grid code, press "Save" button to pop up the password box, enter the correct password to save "Production Compliance Type" parameters.

NOTICE
For Australian customers please select from Australia Region A/B/C to comply with AS/ NZS 4777.2:2020. Contact local grid operator to see which Region to select. After setting the safety region
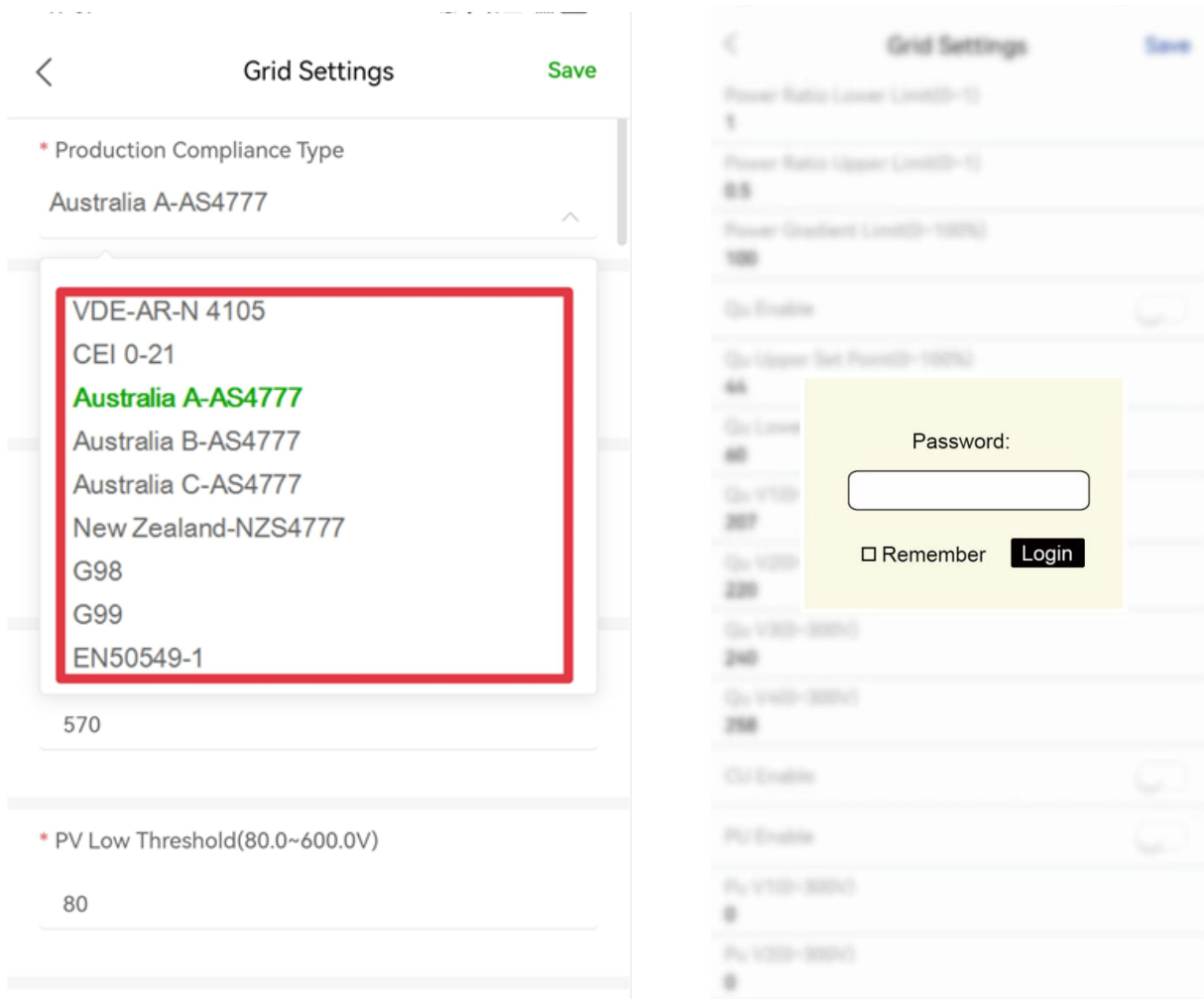
Figure 9-2 Country Grid Code/Region settings

User can set safety standard according to different countries and grid Standards as shown in Table 9-1

Item	Region/Code	Country
1	VDE-AR-N 4105	Germany
2	CEI 0-21	Italy
3	Australia A-AS4777	Australia
4	Australia B-AS4777	Australia
5	Australia C-AS4777	Australia
6	New Zealand-NZS4777	New Zealand
7	G98	United Kingdom
8	G99	United Kingdom
9	EN50549-1	European
10	EN50549-NL	the Netherlands
11	EN50549-CZ	Czech Republic
12	EN50549-PL	Poland
13	EN50549-SE	Sweden
14	EN50549-NO	Norway
15	EN50549-DK	Denmark
16	EN50549-TUR	Turkey
17	EN50549-GR	Greece
18	EN50549-IE	Ireland
19	EN50549-LUX	Luxembourg
20	EN50549-PT	Portugal
21	EN50549-RO	Romania
22	EN50549-SK	Slovakia
23	C10/11	Belgium
24	RD 647,413,1699…	Spain

Table 9-1 Grid Standards

9.3. Power quality response modes

The inverter shall have the following power quality response modes:
(a) Volt-watt response mode (Clause 9.3.1)
(b) Volt-var response mode (Clause 9.3.2)
(c) Fixed power factor (Clause 9.3.3)
(d) Reactive power mode (Clause 9.3.4)
(e) Power rate limit (Clause 9.3.5)

9.3.1 Volt–watt response mode:

Click "Grid Settings"-> "Volt–watt response mode"-> press "enabled" button-> enter the suitable parameters-> press "Save" button to pop up the password box, enter the correct password to save "Volt–watt response mode".

Figure 9-3 Enabling/disabling and adjusting the Volt-Watt settings
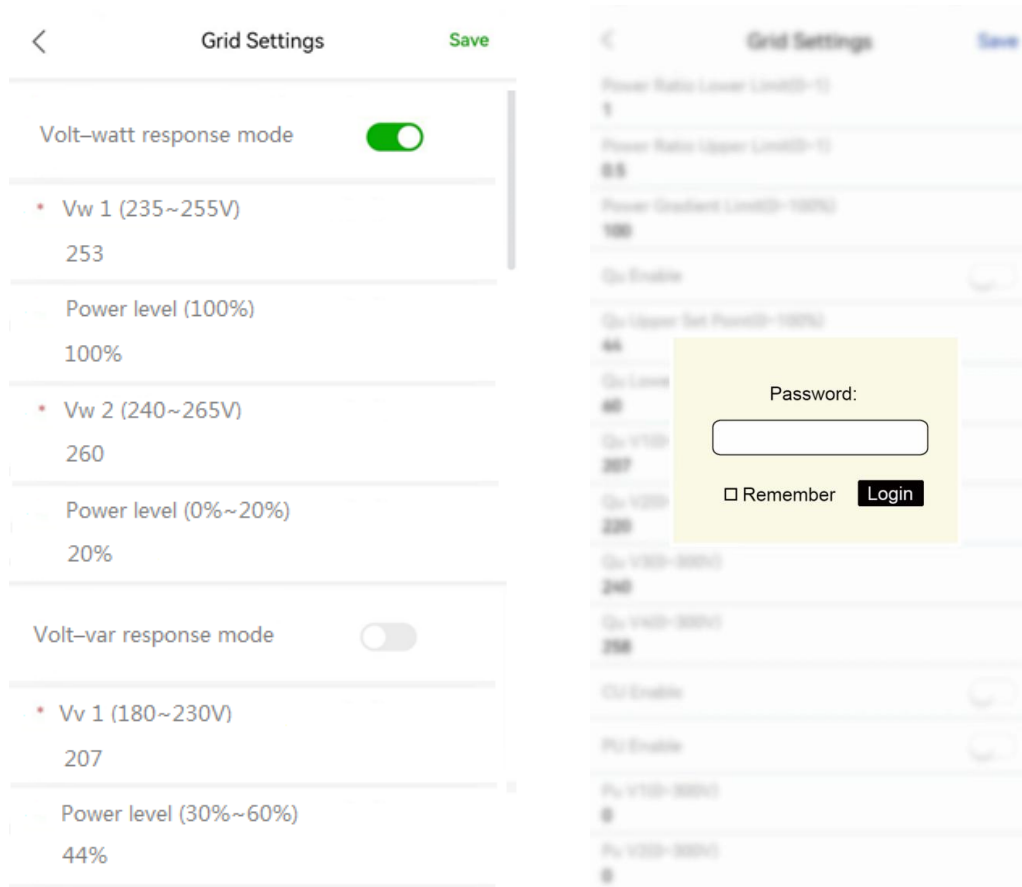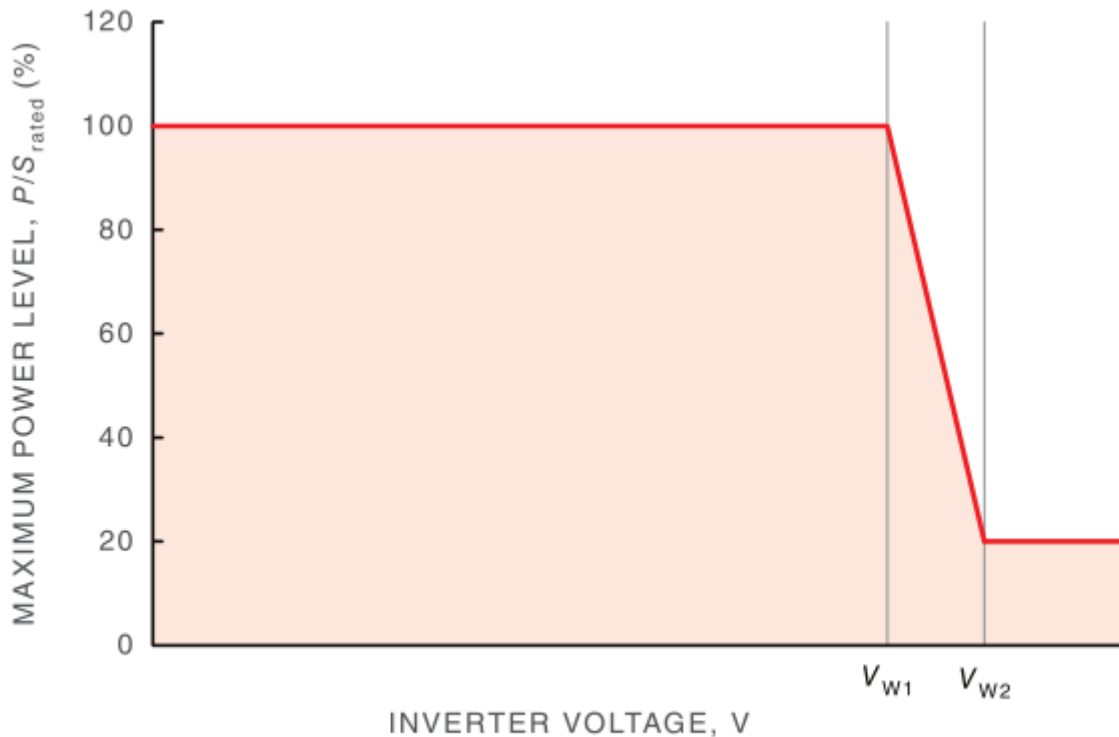
Explain: Volt-watt response mode

The volt-watt response mode varies the maximum active power output level of the inverter in response to the voltage at its grid-interactive port. The volt-watt response mode shall be enabled by default.

The response curve required for the volt-watt response mode is defined by two-volt response reference values and corresponding maximum active power output levels, the default values are listed in Table 3.6. Above V_{W2}, the maximum active power output shall not exceed the limit specified at V_{W2}. An example volt-watt response mode is shown in Figure 3.1.

Table 3.6 — Volt–watt response default set-point values

Region	Default value	V_{W1}	V_{W2}
Australia A	Voltage	253 V	260 V
	Inverter maximum active power output level (P) % of S_{rated}	100 %	20 %
Australia B	Voltage	250 V	260 V
	Inverter maximum active power output level (P) % of S_{rated}	100 %	20 %
Australia C	Voltage	253 V	260 V
	Inverter maximum active power output level (P) % of S_{rated}	100 %	20 %
New Zealand	Voltage	242 V	250 V
	Inverter maximum active power output level (P) % of S_{rated}	100 %	20 %
Allowed range	Voltage	235 to 255 V	240 to 265 V
	Inverter maximum active power output level (P) % of S_{rated}	100 %	0 % to 20 %

NOTE   Australia C parameter set is intended for application in isolated or remote power systems.

Figure 3.1 — Example curve for the volt–watt response mode

9.3.2 Volt-var response mode:

Click "Grid Settings"-> "Volt-var response mode"-> press "enabled" button-> enter the suitable parameters-> press "Save" button to pop up the password box, enter the correct password to save "Volt-var response mode".
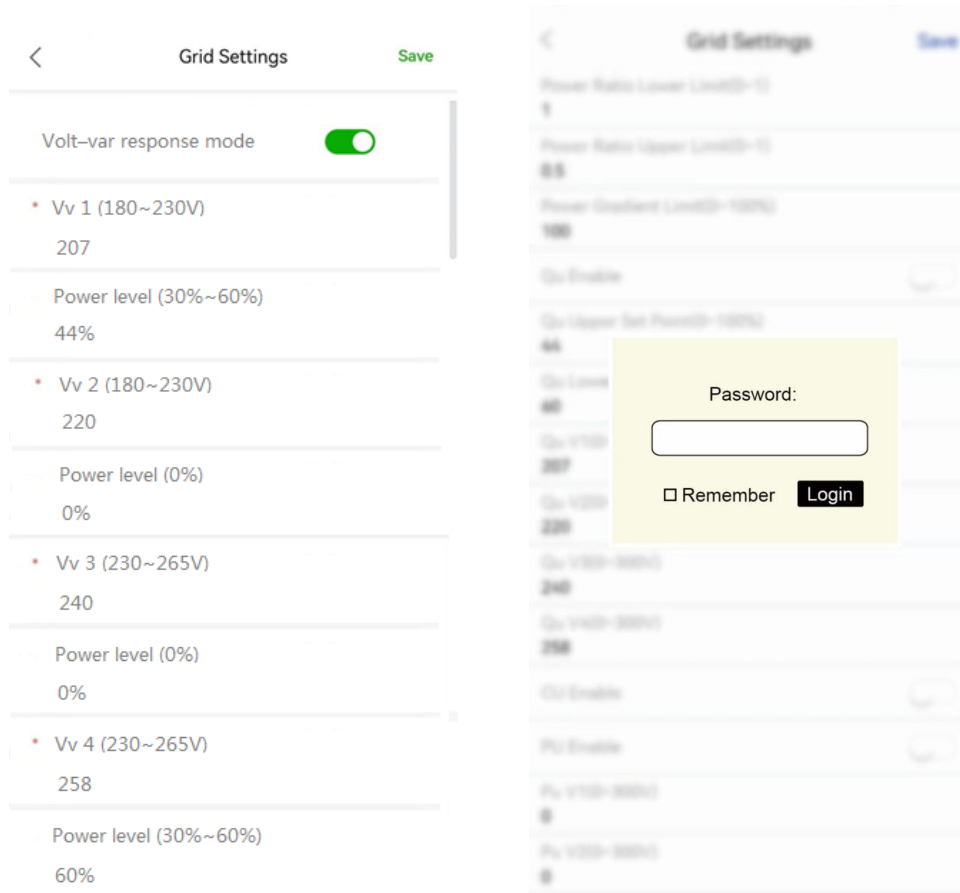
Figure 9-4 Enabling/disabling and adjusting the Volt-Var settings

Explain: Volt-var response mode

The volt-var response mode varies the reactive power absorbed or supplied by the inverter in response to the voltage at its grid-interactive port. The volt-var response mode shall be enabled by default.

The response curve required for the volt-var response is defined by four-volt response reference values and corresponding reactive power levels, the default values are listed in Table 3.7. Below V_{V1}, reactive power shall be maintained at the level specified for V_{V1}. Above V_{V4}, reactive power shall be maintained at the level specified for V_{V4}. An example volt-var response mode is shown in Figure 3.2.

Table 3.7 — Volt–var response set-point values

Region	Default value	V_{V1}	V_{V2}	V_{V3}	V_{V4}
Australia A	Voltage	207 V	220 V	240 V	258 V
	Inverter reactive power level (Q) % of S_{rated}	44 % supplying	0 %	0 %	60 % absorbing
Australia B	Voltage	205 V	220 V	235 V	255 V
	Inverter reactive power level (Q) % of S_{rated}	30 % supplying	0 %	0 %	40 % absorbing
Australia C	Voltage	215 V	230 V	240 V	255 V
	Inverter reactive power level (Q) % of S_{rated}	44 % supplying	0 %	0 %	60 % absorbing
New Zealand	Voltage	207 V	220 V	235 V	244 V
	Inverter reactive power level (Q) % of S_{rated}	60 % supplying	0 %	0 %	60 % absorbing
Allowed Range	Voltage	180 to 230 V	180 to 230 V	230 to 265 V	230 to 265 V
	Inverter reactive power level (Q) % of S_{rated}	30 to 60 % supplying	0 %	0 %	30 to 60 % absorbing

NOTE 1   Inverters may operate at a reactive power level with a range up to 100 % supplying or absorbing.

NOTE 2   Australia C parameter set is intended for application in isolated or remote power systems.
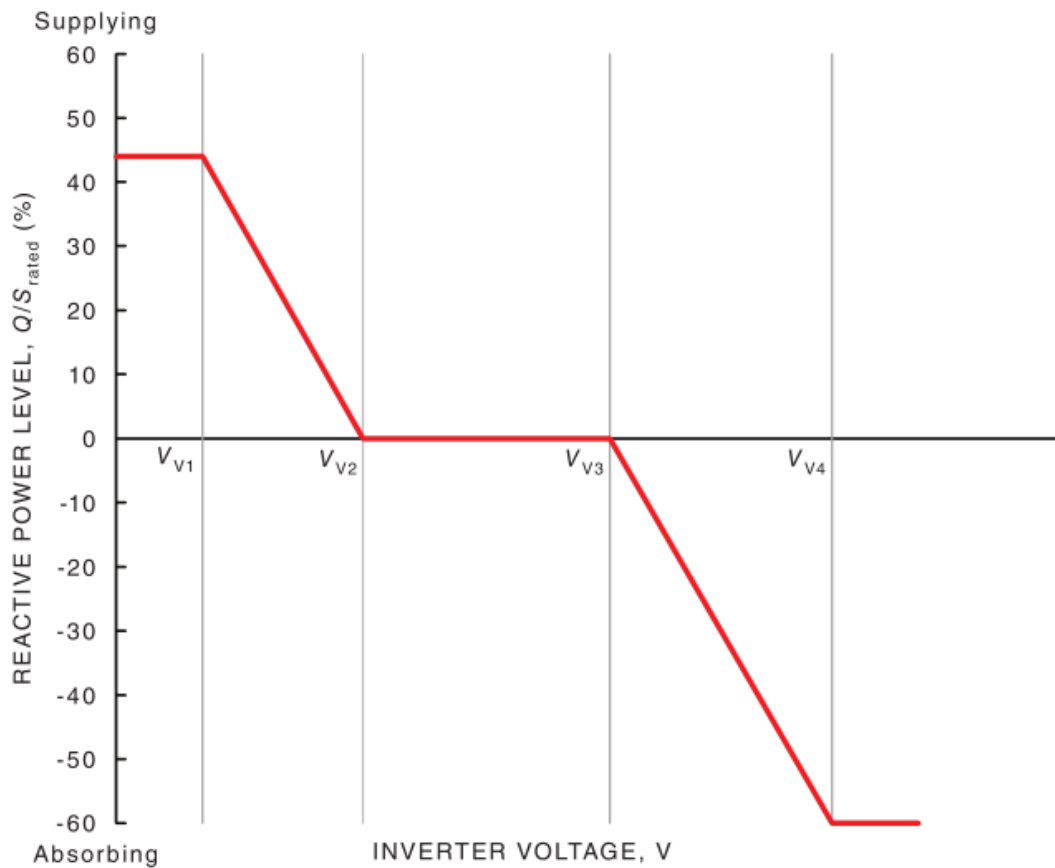
Figure 3.2 — Example curve for the volt–var control mode

9.3.3 Fixed power factor:

Click "Grid Settings"-> "Fixed power factor mode"-> press "enabled" button-> enter the suitable parameters-> press "Save" button to pop up the password box, enter the correct password to save "Fixed power factor mode".

The PF ranges from 0.8leading (+) to 0.8 lagging (-), with the default value of 1.0
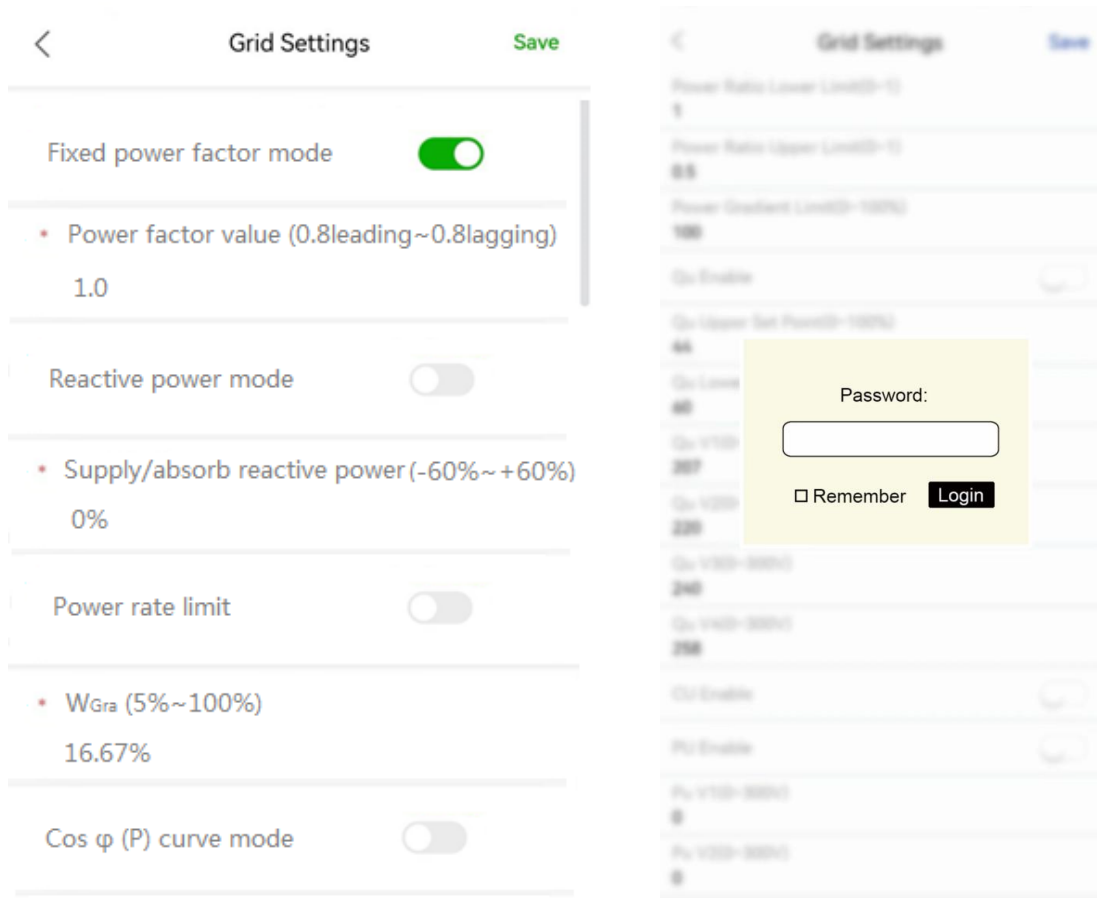

Figure 9-5 Enabling/disabling and adjusting the PF settings

9.3.4 Reactive power mode:

Click "Grid Settings"-> "Reactive power mode"-> press "enabled" button-> enter the suitable parameters-> press "Save" button to pop up the password box, enter the correct password to save "Reactive power mode".
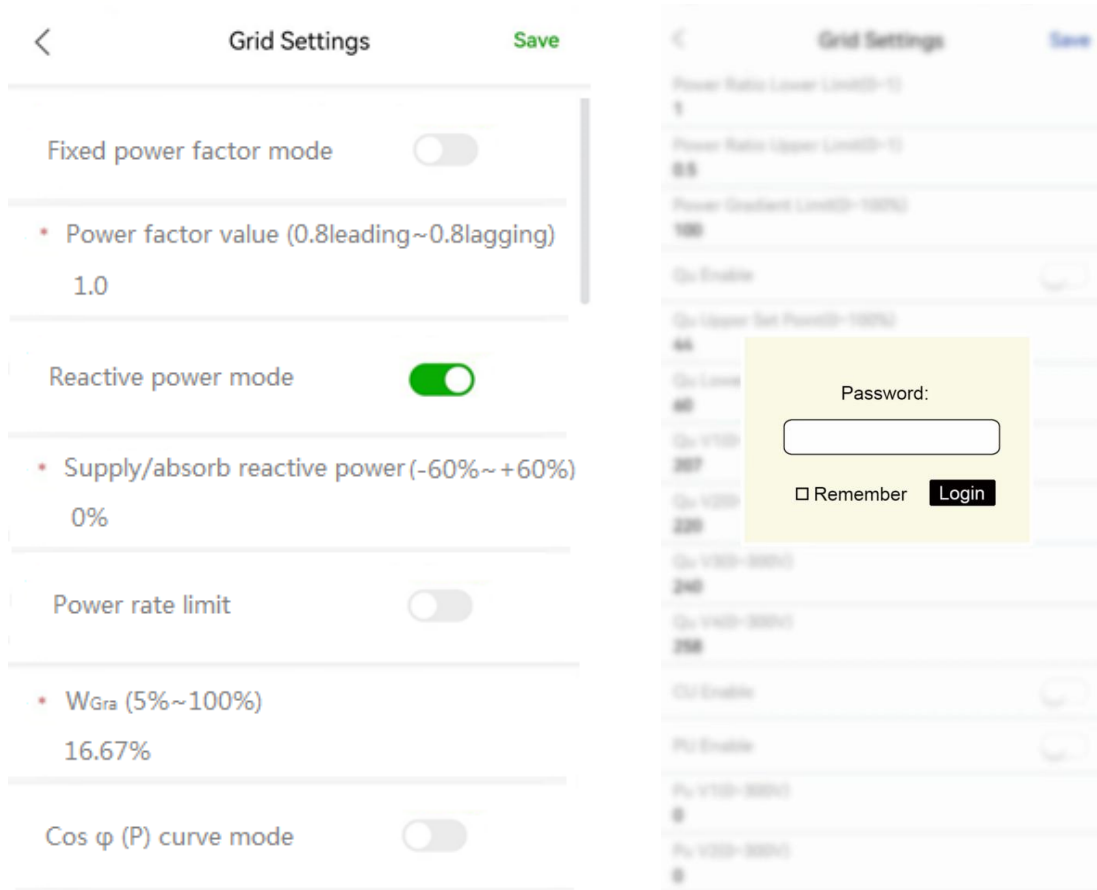

Figure 9-6 Enabling/disabling and adjusting the Reactive power mode settings

Explain: Fixed power factor mode and reactive power mode

The fixed power factor mode or the reactive power mode may be enabled in some situations by the electrical distributor to meet local grid requirements, one of these modes shall be enabled if the volt-var mode is disabled. These modes shall be disabled by default.

For the fixed power factor mode, the minimum range of settings shall be 0.8 to 1.0 supplying reactive power, and 1.0 to 0.8 absorbing reactive power, the default power factor setting shall be 1.0. The fixed power factor mode is for control of the displacement power factor over the range of inverter power output.

The volt–watt mode and fixed power factor mode shall be able to operate concurrently.

For the fixed power factor mode, the measurement of power factor shall be the displacement power factor of the inverter treated as a load from the perspective of the grid.

For the reactive power mode, the minimum setting range for ratio of reactive power (vars) to rated apparent power shall be at least 60 % absorbing to 60 % supplying, the default reactive power setting shall be 0 %.

The volt–watt mode and reactive power mode shall be able to operate concurrently

9.3.5 Power rate limit:

Click "Grid Settings"-> "Power rate limit"-> press "enabled" button-> enter the suitable parameters-> press "Save" button to pop up the password box, enter the correct password to save "Power rate limit".
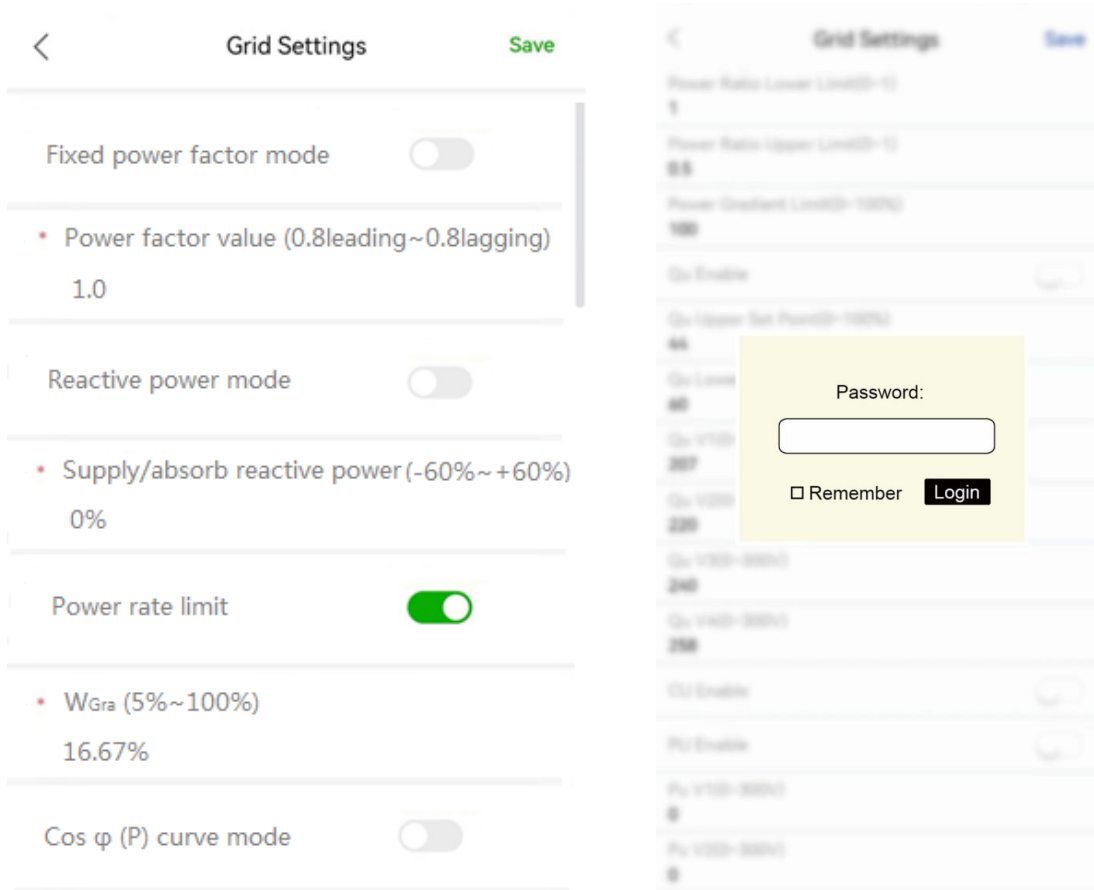

Figure 9-7 Enabling/disabling and adjusting the Power rate limit settings

Explain: Power rate limit

The power rate limit for an inverter is a power quality response mode. The inverter shall have the capability to rate limit changes in power generation through the grid-interactive port. Inverters capable of multiple mode operation shall have the capability to rate limit changes in power level (for example increasing/decreasing of charging rates of connected energy storage).

The power rate limit (W_{Gra}) is the ramp rate of active power output in response to changes in power and is defined as a percentage of rated power per minute. The nominal ramp time (T_n) is the nominal time for a 100 % change in power output with a power rate limit of W_{Gra}. An inverter shall have an adjustable power rate limit (W_{Gra}) which limits the change in power output to the set power rate limit. The default setting for the power rate limit (W_{Gra}) for increase and decrease shall be 16.67 % of rated power per minute which is a nominal ramp time of 6 min.

The power rate limit (W_{Gra}) shall be adjustable within the range 5 % to 100 % of rated power per minute. It is permitted to have two separate power rate limits for increase and decrease in power level, as follows:
(a) to rate limit an increase in power ($W_{Gra}+$); and
(b) to rate limit a decrease in power ($W_{Gra}-$).
The default setting of $W_{Gra}+$ and $W_{Gra}-$ shall be the same as W_{Gra}.

The nonlinearity (NL) of the power rate limit (W_{Gra}) in response to a change of the inverter power level, as defined by the characteristic curve depicted in Figure 3.3, shall be less than 10 %.

Key
— Desired ramp rate
—·— Linearity Boundary (High)
— Linearity Boundary (Low)
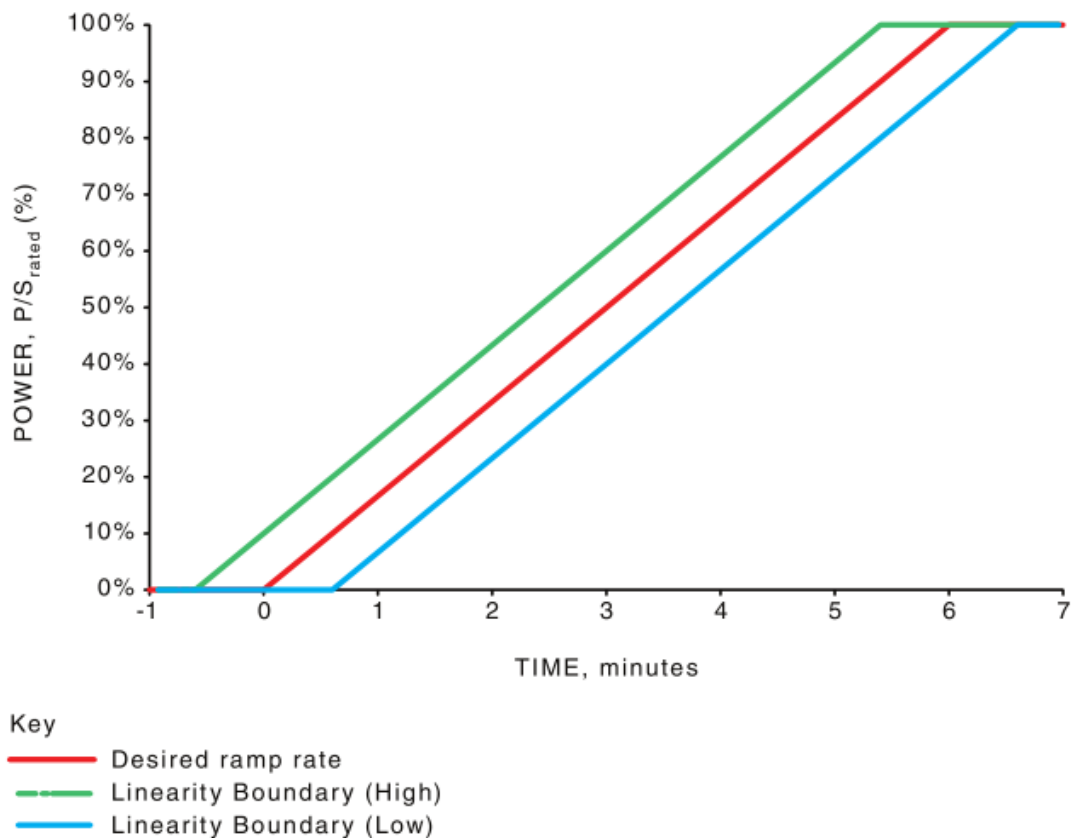
Figure 3.3 — Nonlinearity of ramp rate (W_{Gra}, T_n = default values)

9.4. Grid protection points

Click "Protection Settings"-> input suitable value, press "Save" button to pop up the password box, enter the correct password to save "Grid protection" parameters.
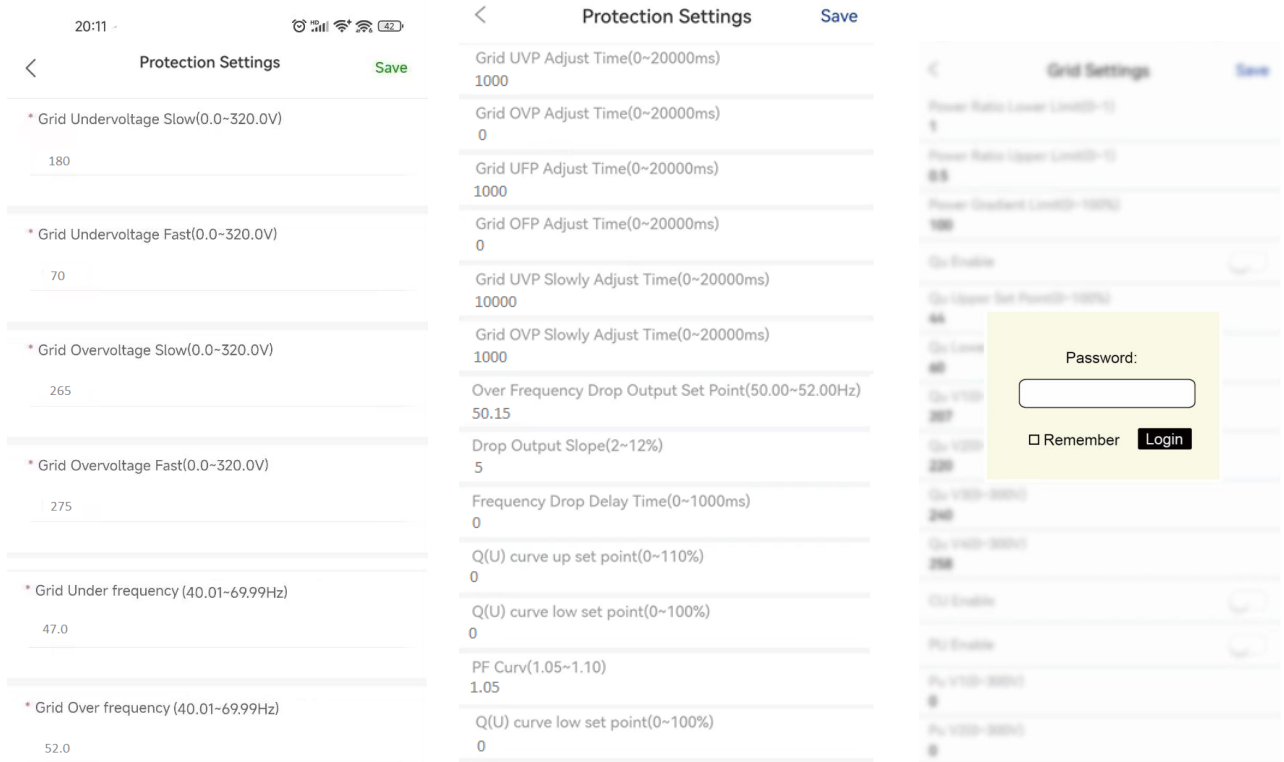
as shown in Figure 9-8.

Figure 9-8 Protection settings

NOTICE
Once settings are selected at commissioning they are locked to view only.

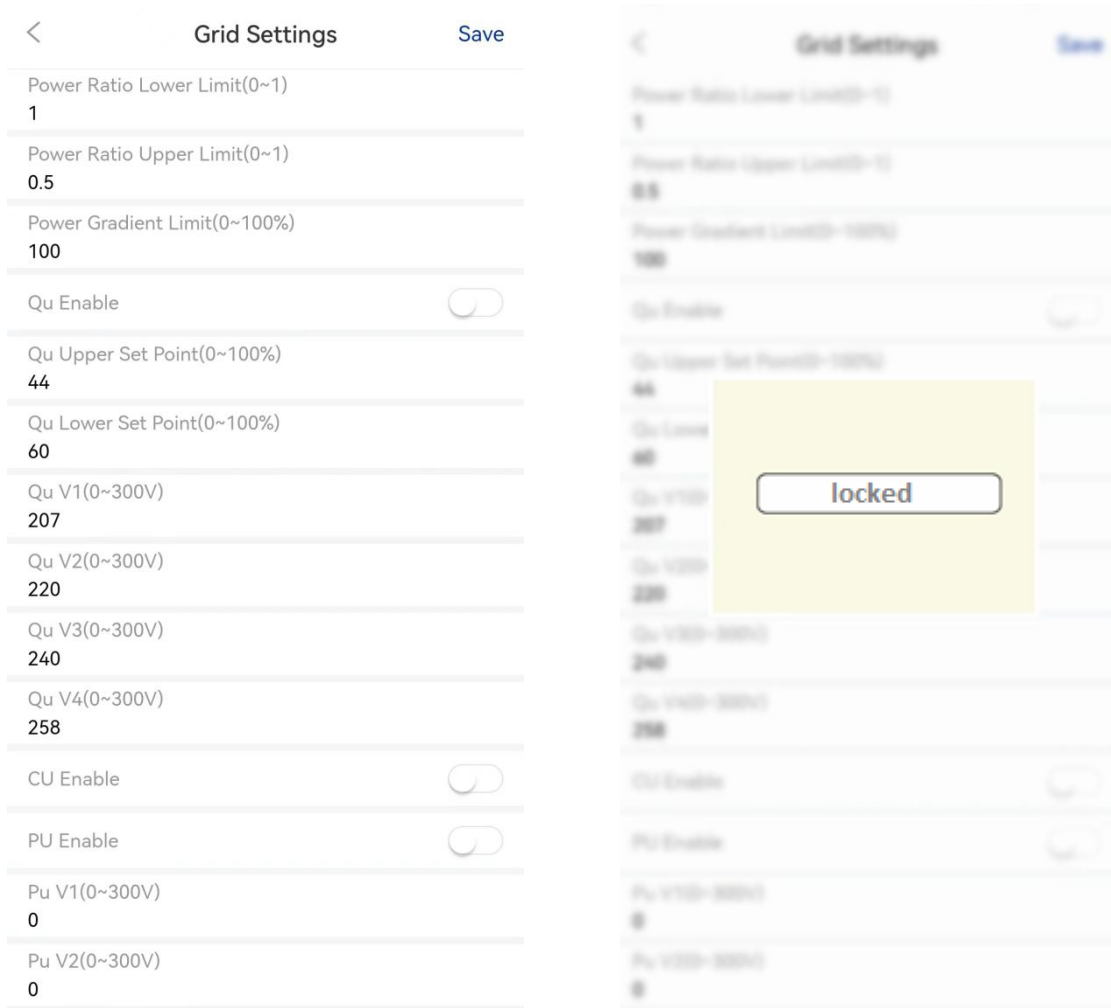Figure 9-9 Locked

10. Personalization

10.1 Language

1.Click the "Me" button at the bottom to enter the personal center and select the language, as shown in Figure 10-1.
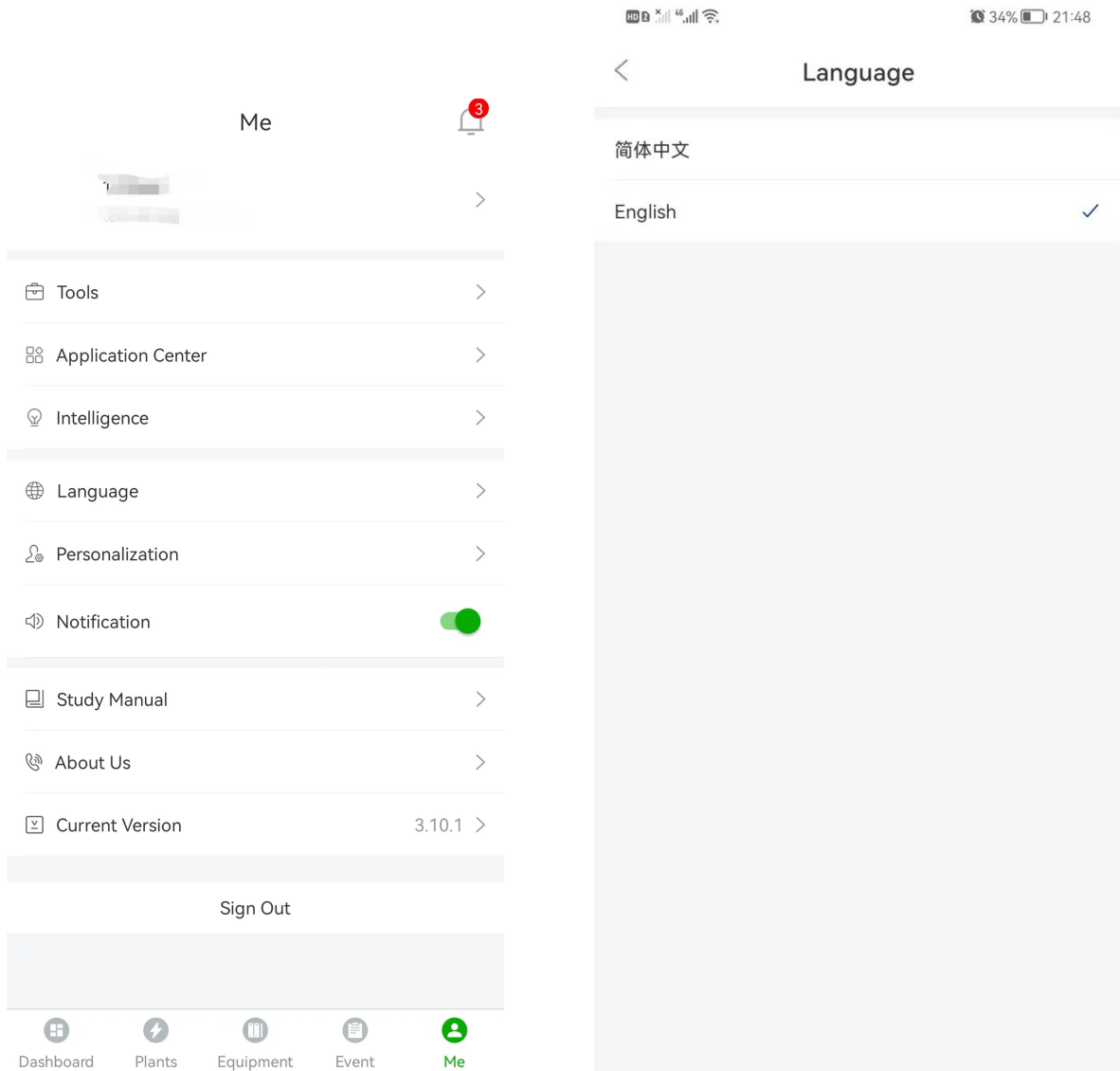

Figure 10-1 Language settings

10.2 Personalization

1.If you choose the "Personalization", you can change the temperature unit, as shown in Figure 10-2.
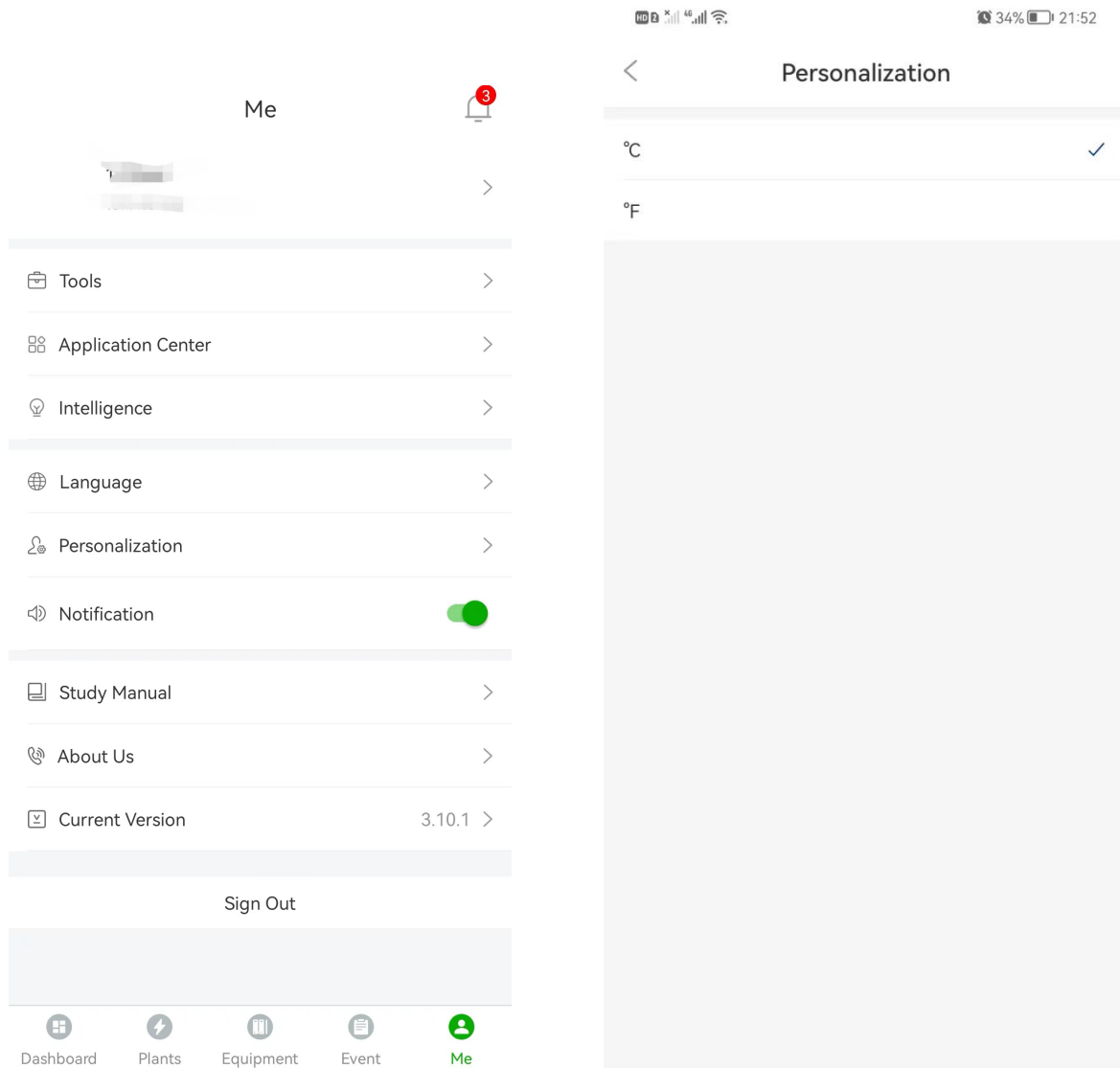

Figure 10-2 Personalization

11. Appendix: Parameter specification

Module	Field Name	Description
AC	Running Mode	Running Mode
	V-Inv	AC Voltage
	F-Inv	AC Frequency
	I-Inv	AC Current
	P-Inv	AC Output Power
	P-grid	Meter Active Power
	P-load	Load Power
PV	V-Pv1	PV1 Input Voltage
	V-Pv2	PV2 Input Voltage
	I-Pv1	PV1 Input Current
	I-Pv2	PV2 Input Current
	P-Pv	Pv Input Power
	P-Pv1	PV1 Input Power
	P-Pv2	PV2 Input Power
BMS	P-bat	Battery Power
	SOC	BMS Battery Capacity
	V-Charge-Limit-BMS	BMS Charging Protecting Voltage
	V-DisCharge-Limit-BMS	BMS Discharging Protecting Voltage
	I-Charge-Limit-BMS	BMS Max. Charging Current
	I-DisCharge-Limit-BMS	BMS Max. Discharging Current
	V-BMS	BMS Battery Voltage
	I-BMS	BMS Battery Current
	T-H-BMS	BMS Cell High Temp
	T-L-BMS	BMS Cell Low Temp
	Num-Sub-BMS	BMS Subsystem Num
	Aux-Power-Bat	Battery Auxiliary Power State
Energy	Total-Feed-in	Total Grid Feed-in (Inverter)
	Total-PV	Total PV Production
	Total-Charging	Total Battery Charging Quantity
	Total-Discharging	Total Battery Discharging Quantity
	Total-Charging-grid	Total Battery Charging Quantity From Grid
	Total-Charging-PV	Total Battery Charging Quantity From PV
	Total-purchase	Total purchase Quantity
	Cumulative-Consumption	Total Load Quantity
	Total-Yeild-Inv	Total Inverter Yeild
	Total-Input-Inv	Total Inverter Input
Temperature	T-Inv	Inverter Temp
	T-H-BMS	BMS Cell High Temp
	T-L-BMS	BMS Cell Low Temp
	T-Charger	Charger Temp
	T-Controller	Controller Temp
Breaker	Time-Conn-Inv	Connection Time
	Switch-Output	Output Switch
Version	Rev-Inv	Inverter Version
	Rev-BMS	Charger Version
	Rev-ARM	ARM Version
	Rev-EMS	EMS Version