SOLARMAN
Monitored Analyzed Networked

Anti-Reflux Box (WiFi/ETH)

Product Model:

SAR-100

Contact

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Product Introduction

SOLARMAN anti-reflux box enables the real-time monitoring of grid-tied situation through the integration of three-phase meter, logger and CT, which meets the requirement of real-time adjusting inverter output power at power consumption scenario. It can connect to many inverters and support data transmission via WiFi&Ethernet.

Parameters

Parameter	
Product Model	SAR-100
Remote Communication	2.4G WiFi+Ethernet
Local Communication	RS 485
No. of Connections	5/10 (Select according to the number of parallel machines)
Accessing Method	Three-Phase Four-Wire
Working Voltage	3x230/400V 50/60Hz
Working Current	3x1.5(6)A
CT (Regular)	250/5A, 600/5A, 800/5A, 1000/5A, 1500/5A, 2000/5A
IP Grade	IP65
Working Temperature	-25℃~+60℃
Working Humidity	5%-95% (No Condensation)
Installation Method	Wall-Hanging
Size	~400*300*170mm
Weight	~3.3kg

Product Installation

3.1 Tool

Tool Name	Picture	Usage	Note
Wire stripper		Strip cable insulation	
Cross screwdriver		Use to connect	
Cable		Connect logger with router	Shielded twisted pair
Expansion screw		Use to install anti-reflux box	Specification: M6*60
Adjustable wrench		Use to fix expansion screws	
Percussion drill		Use to drillholes	
Computer with network port		Use to operate network configuration	
COM line		RS485 communication	(Shielded twisted pair) Diameter: 3-7mm
Voltage-sampling cable		Use to connect voltage sampling signal	Specification: AWG 12-18, 105°/600V
Double-core cable		Use to connect CT signal	Specification: AWG 16-22, 105°/600V

3.2 Location

The installation location must meet the following requirements.

3.2.1 The logger should be installed in doors, avoiding damp and dust environment. Direct sunlight and aggressive vapour should also be avoided.

3.2.2 Environment temperature: -25℃～+60℃.

3.2.3 Max. communication distance for RS485 should be less than 500m. Away from other wiring routes or pipes in doors, such as gas pipe, water pipe, electric wire and etc.

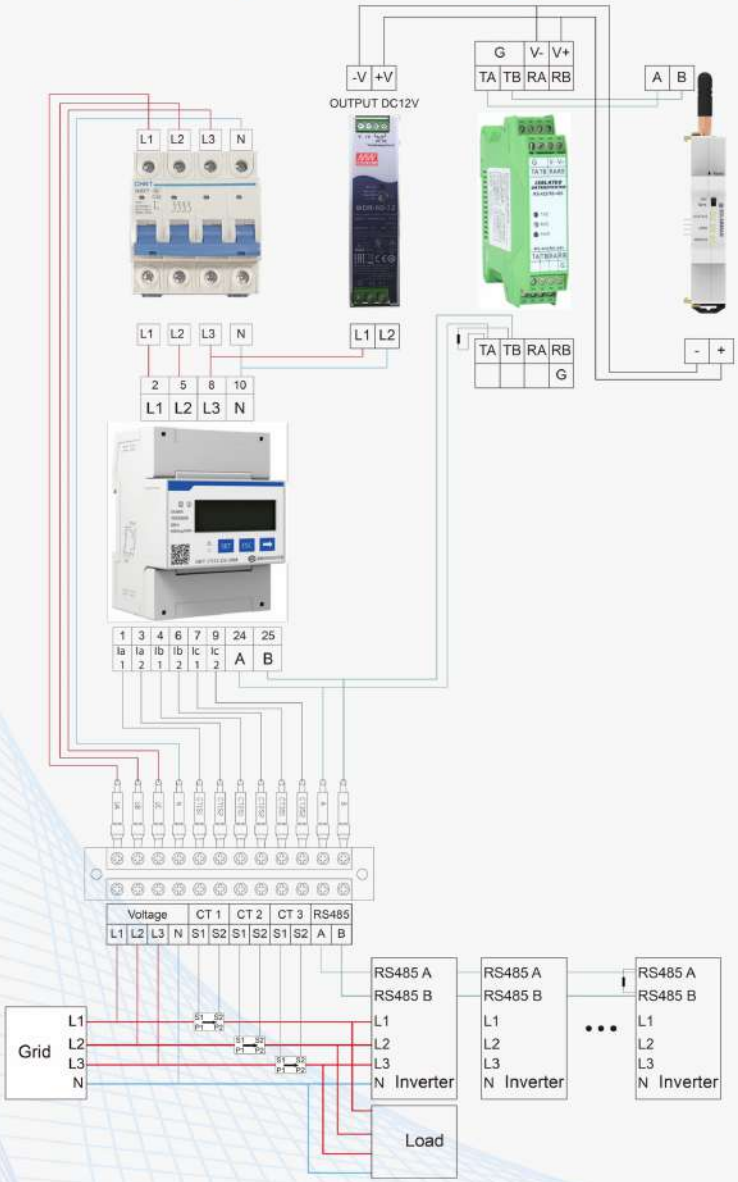
3.2.4 Away from metal structure to ensure wireless signal strength.

3.3 Notice

3.3.1 Power off the device before installation.

3.3.2 Double check the connection before power on the device.

Anti-reflux System Diagram

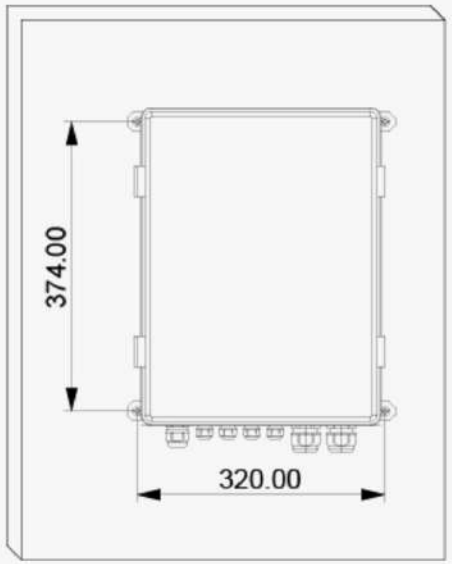


If 485 link communication is not successful for some inverters, please connect a 120Ω resistance with repeater and A&B point of the last inverter.

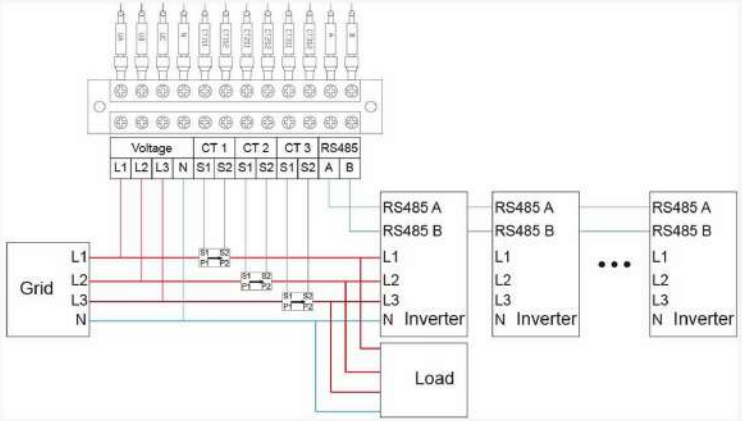
Device Installation

5.1 Installation

1. Select a right (firm&flat) place to install the device
2. Determine the drilling hole positions according to hangers (Refer to Fig. 5.1)
3. Fix the device using expansion screws



5.2 Device wiring



Notice：

1. Connect inverter output to the grid. Connect to phase line R ,S, T, N accordingly.
2. Connect voltage-sampling signal line, communication distance should be less than 100m. Connect to phase line R ,S, T, N accordingly.
3. Connect CT, communication distance should be less than 100m. CT direction should be from grid to load and make sure R-phase CT connect to CT1-1/2, S-phase CT connect to CT2-1/2, T-phase CT connect to CT3-1/2.

[Phase sequence of CT should be consistent with the phase sequence of voltage-sampling signal. ±1/2 cannot be reversed. (Select current sensor according to the device capacity.)]

4. RS485A-B cannot be reversed.
5. All devices can connect to ground line.

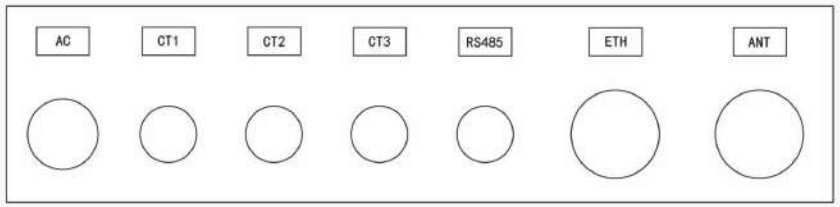
Inverter address settings

1. Meter address: 1
2. For one inverter, inverter address: 2
3. For multiple inverters, inverter address: 2, 3, 4, 5.....

Tip: Address cannot be the same.

4. There's no need to set anti-reflux function: ON.

Notice: Please make sure local anti-reflux function: OFF.



Double check the wiring and power on the device

WiFi Configuration

Notice:

1. DIN-Rail logger supports WiFi&Ethernet access. Please select one method to access according to actual situation.

6.1 WiFi Access

Go to DIN-Rail logger configuration page

Step 1 Prepare a computer/smart phone that can connect to wireless network

Step 2 Connect to logger AP (Please do Not connect the cable when configuring the logger)

Select and connect AP XXXXXXXXX in the network list (XXXXXXXXX means logger SN)

Step 3 Log in to logger WEB page

Open a browser and enter 10.10.100.254.

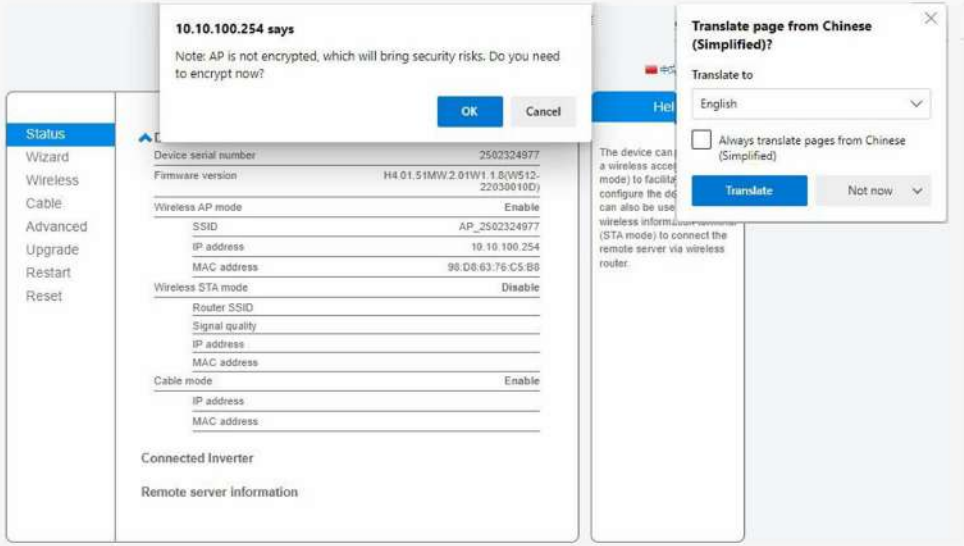
Username: admin

Password: admin

Notice:
Supported browser: IE 8+, Chrome 15+, Firefox 10+

Step 4 During the first login, the browser will remind you whether to save the password. You can decide according to your usage habit.

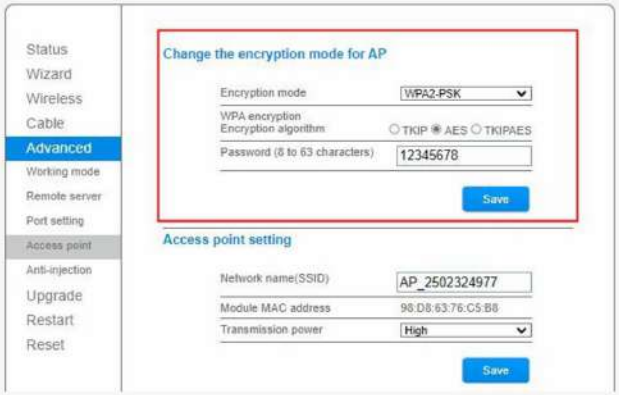
Step 5 During the first login, the system will prompt that the AP is not encrypted. Click OK to encrypt it, click Cancel if not.

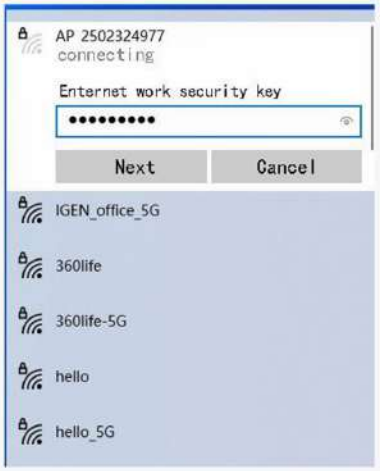


Step 6 If you choose to encrypt AP, you will go to "AP Encryption Modification", enter your password and click Save. Example: choose WPA2-PSK as encryption mode, AES as encryption algorithm, password: 1234578 (Please remember the password.)

Users can select encryption mode according to actual situation. After AP has been encrypted, it requires to connect AP again.

(If you forget your password or want to cancel the encryption, please long press Reset button for 4s to reset which will got to reconfiguration process. AP password, network information and anti-rejection settings will restore factory settings at this time.)

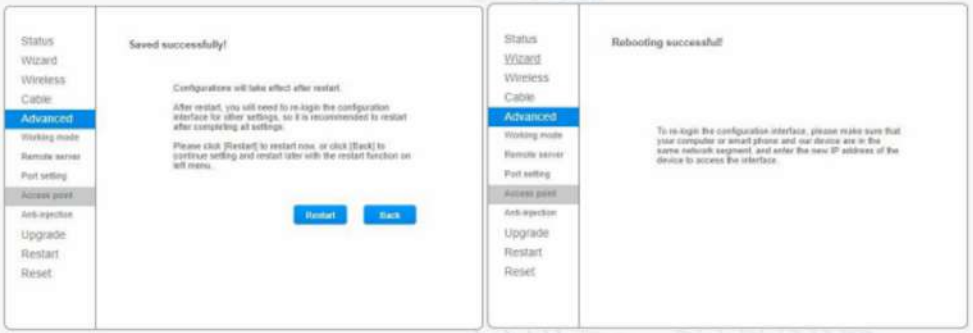




After AP encryption has been set, you will be reminded again during network settings.

If the following prompt shows, you can select "AP encryption modification" accordingly.

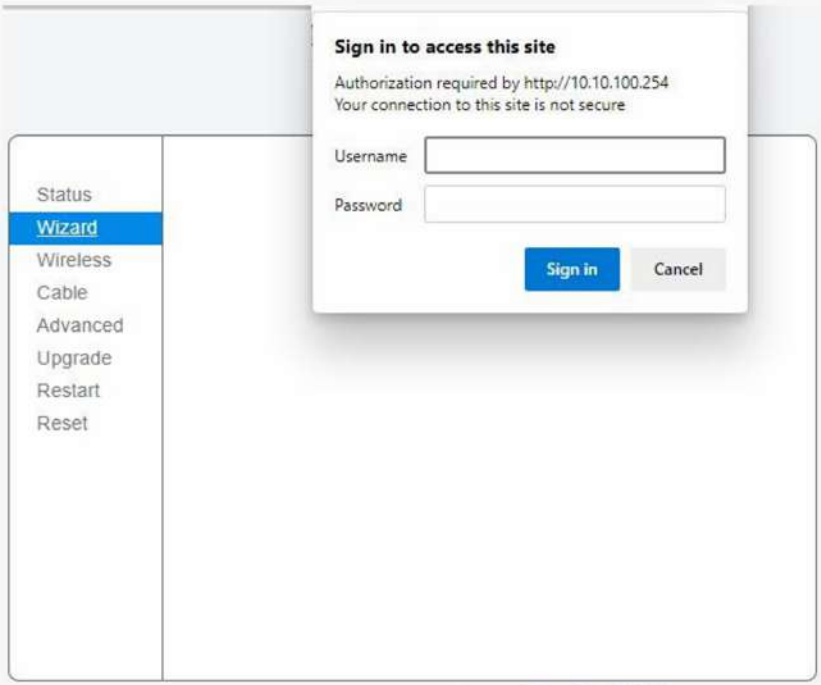
Step 7 Click Reboot after saving.



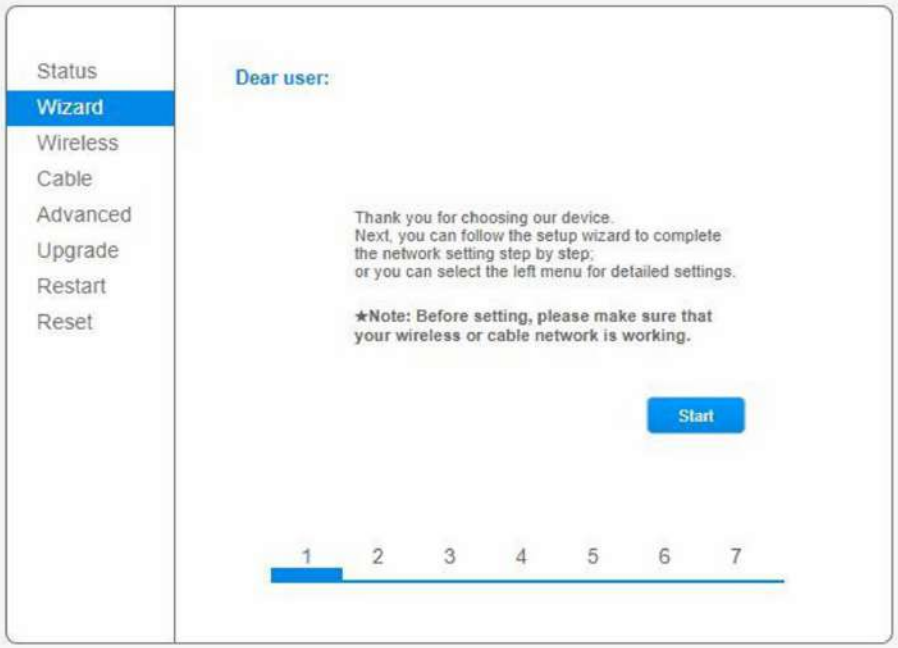
Step 8 Refresh the WEB page and log in again.

Username: admin

Password: admin



Step 9 Go to setup guide page. Click Start



Notice:

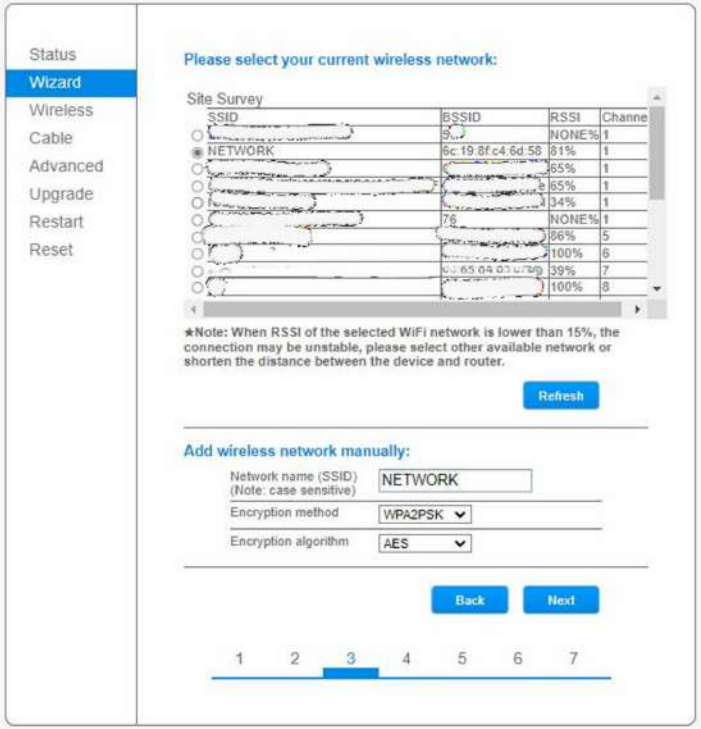
1. Step 6-8 are for AP encryption. If you will not select AP encryption, skip step 6-8, click cancel in step 5 and go to step 9 directly.

Step 10 Select Wireless connection and click Next

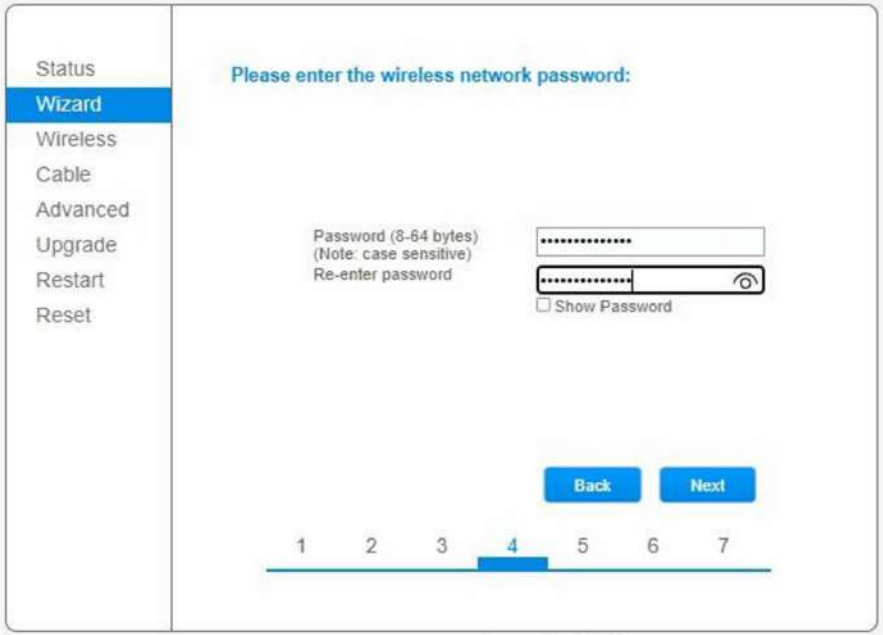
Step 11 Select router name and click Next, refresh the page if no target router listed

Notice:

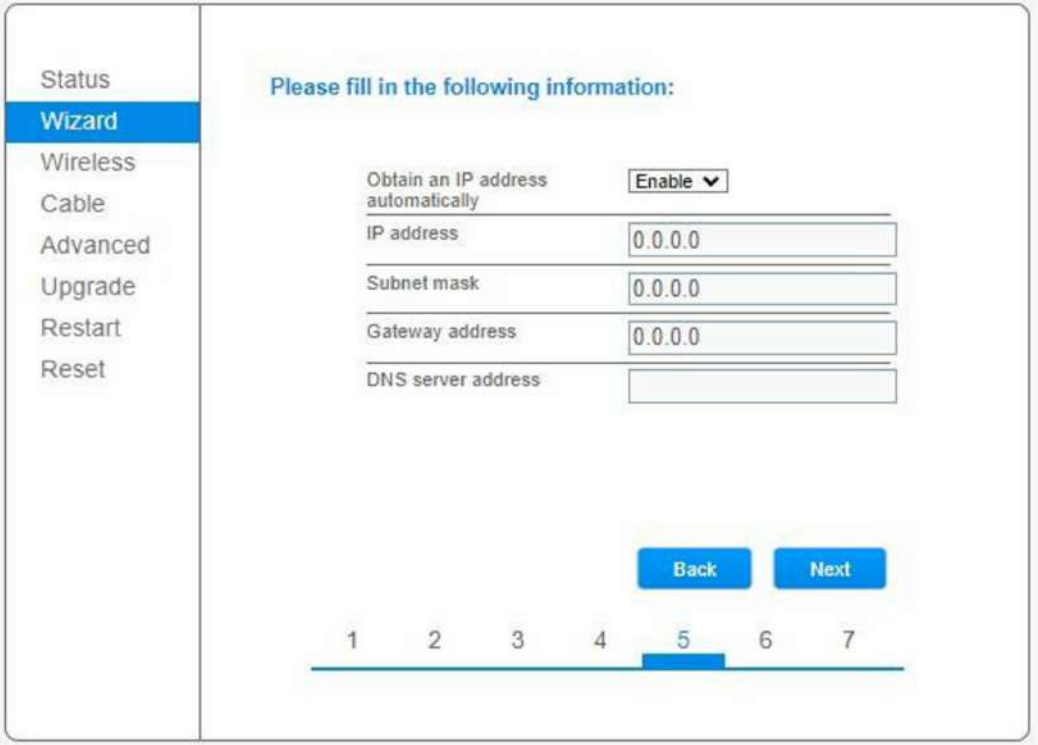
1. Router name and password do not support 、 ; , = ' " characters.
2. 5G WiFi is not supported.
3. Router DHCP function: ON.
4. Router can connect to a network.



Step 12 Set router password and click Next

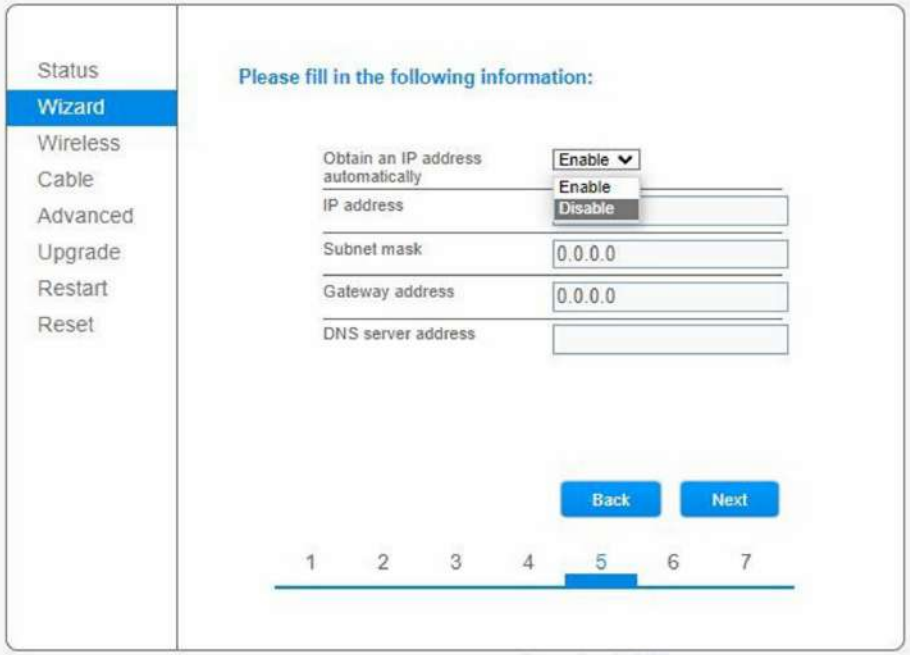


Step 13 If allocating fixed IP address is not required, select Obtain an IP address automatically: Enable (Recommended) and click Next



Step 14 If allocating fixed IP address is required, select Disable

Enter the target IP address and click Next



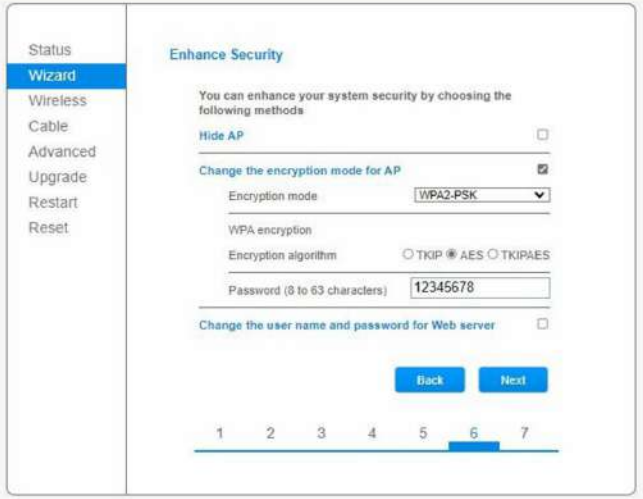
Step 15.1 If you wish to enhance safety, you can choose " Hide AP " or " AP Encryption Modification ".

"AP Encryption Modification" is recommended.

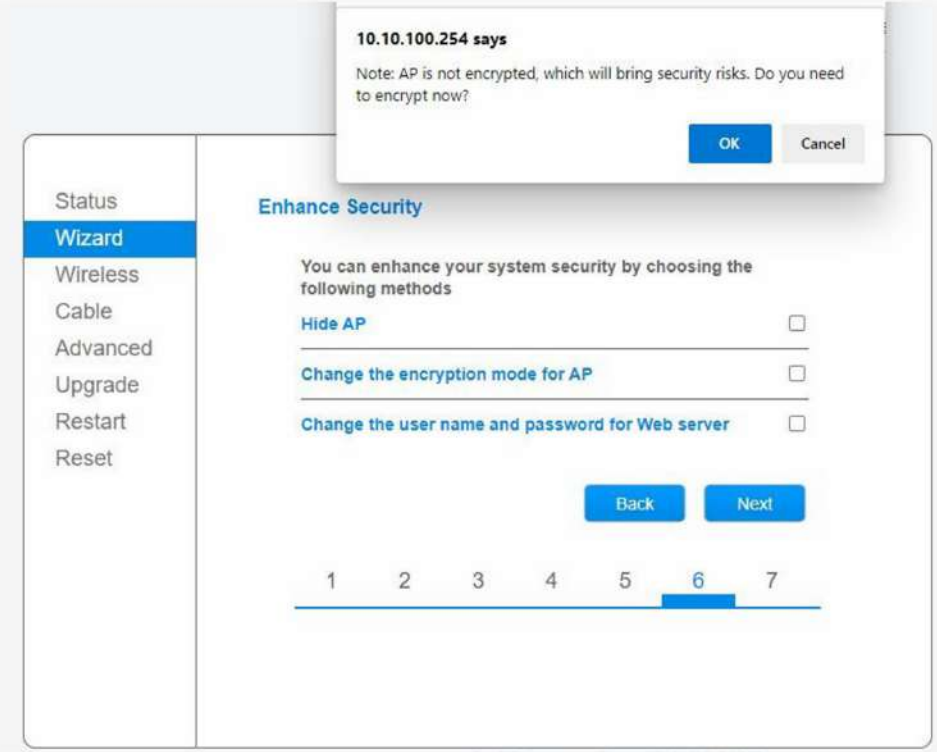
If you already set AP encryption, please refer to previous steps.

Notice:

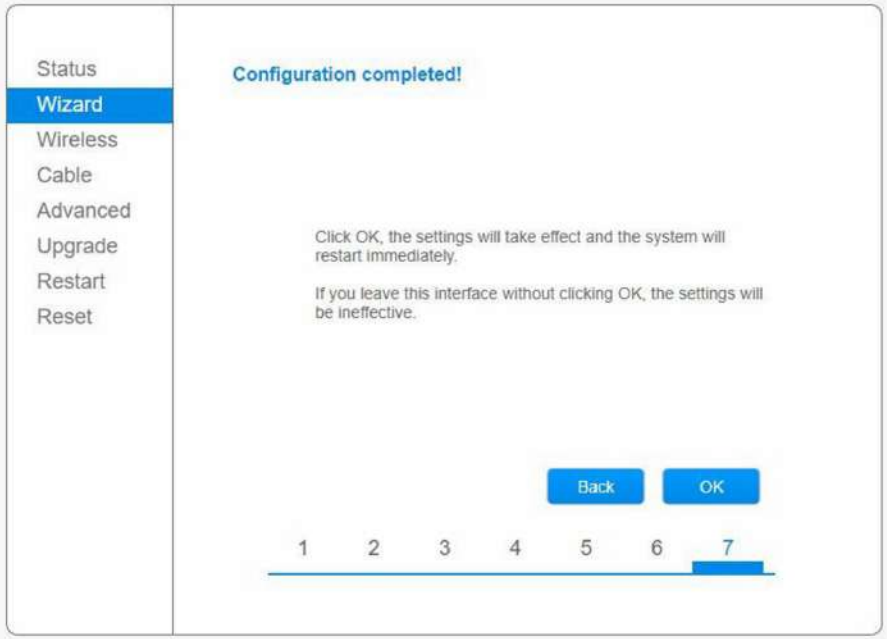
If you select "Hide AP", AP will be hided automatically. If you wish to open again, please long press Reset button for 4s to reset which will got to reconfiguration process. AP password, network information and anti-reflux settings will restore factory settings at this time.)



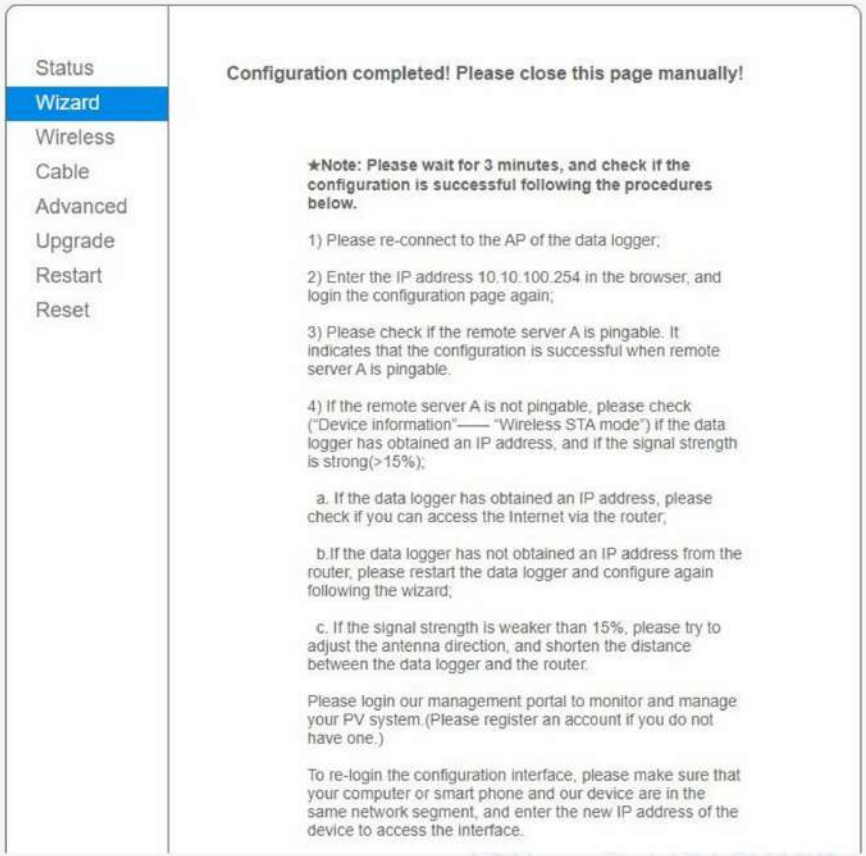
Step 15.2 If enhancing safety is not required, click Next. System will remind you to encrypt AP, click Cancel.

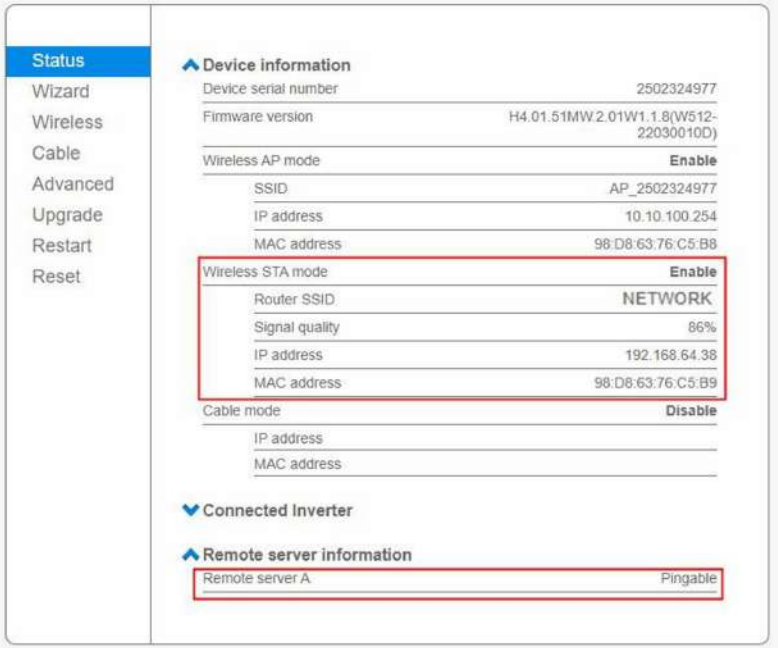


Step 16 Click OK to complete WiFi configuration



Step 17 Connect AP again according to the notification around 40s. Log in to WEB page and check if the network is successful.





6.2 Ethernet Access

Use cable to connect DIN-Rail logger and router

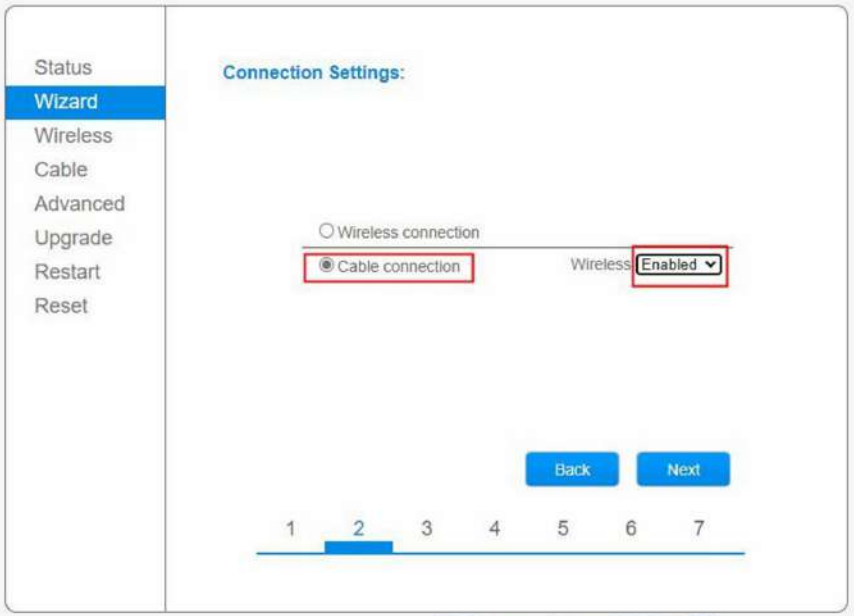
Notice:

1. Ethernet port of DIN-Rail logger has no lighting function
2. Router DHCP function: ON

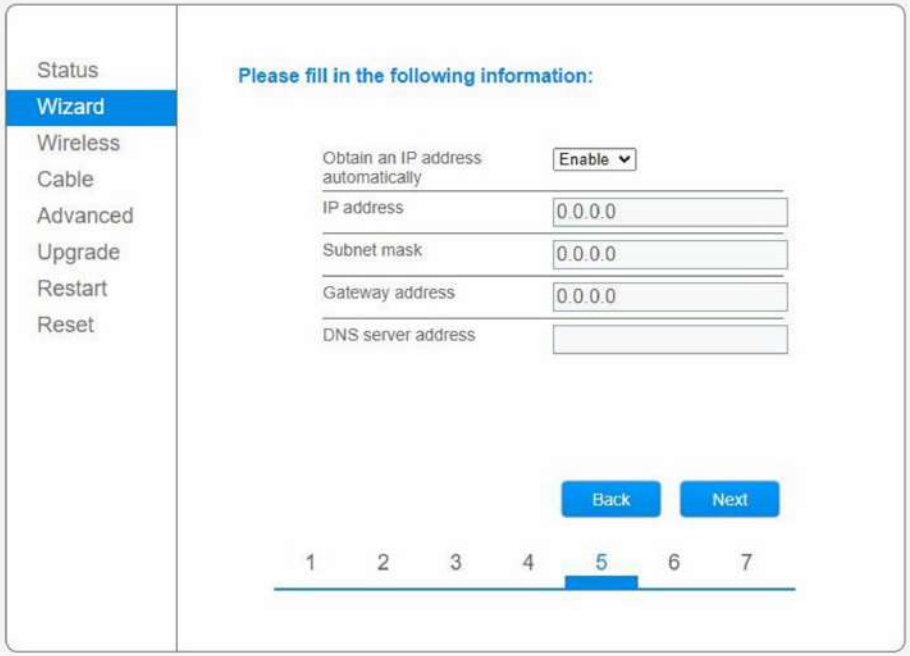
Step 1 Select " Cable connection ", and set Wireless function: Enable.

Click Next.

(Otherwise, you can't connect to AP through mobile phone or computer for web page setting)

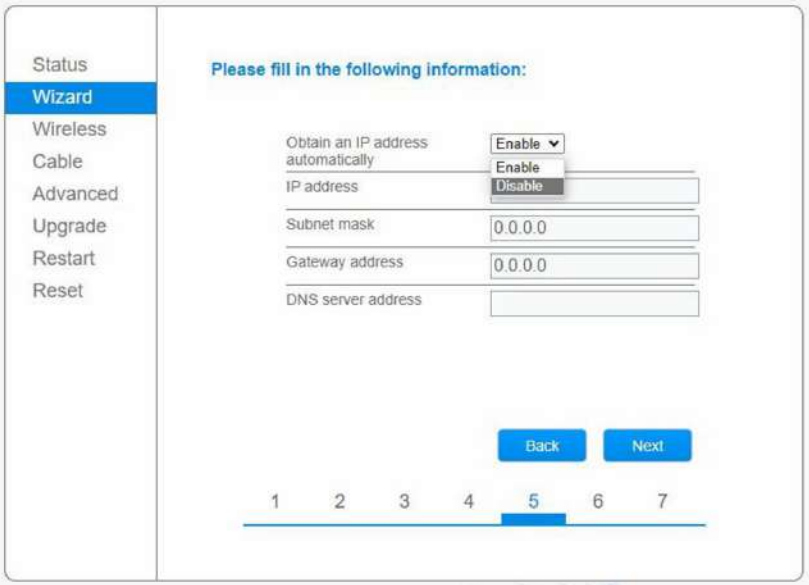


Step 2 If allocating fixed IP address is not required, select Obtain an IP address automatically: Enable (Recommended)and click Next



Step 3 If allocating fixed IP address is required, select Disable

Enter the target IP address and click Next



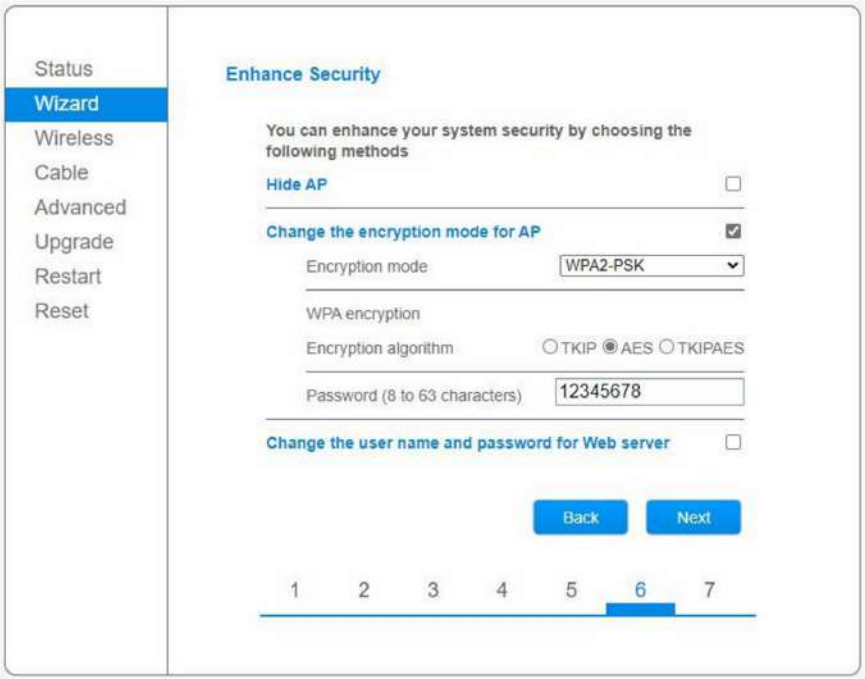
Step 4 If you wish to enhance safety, you can choose " Hide AP " or " AP Encryption Modification ".

"AP Encryption Modification " is recommended.

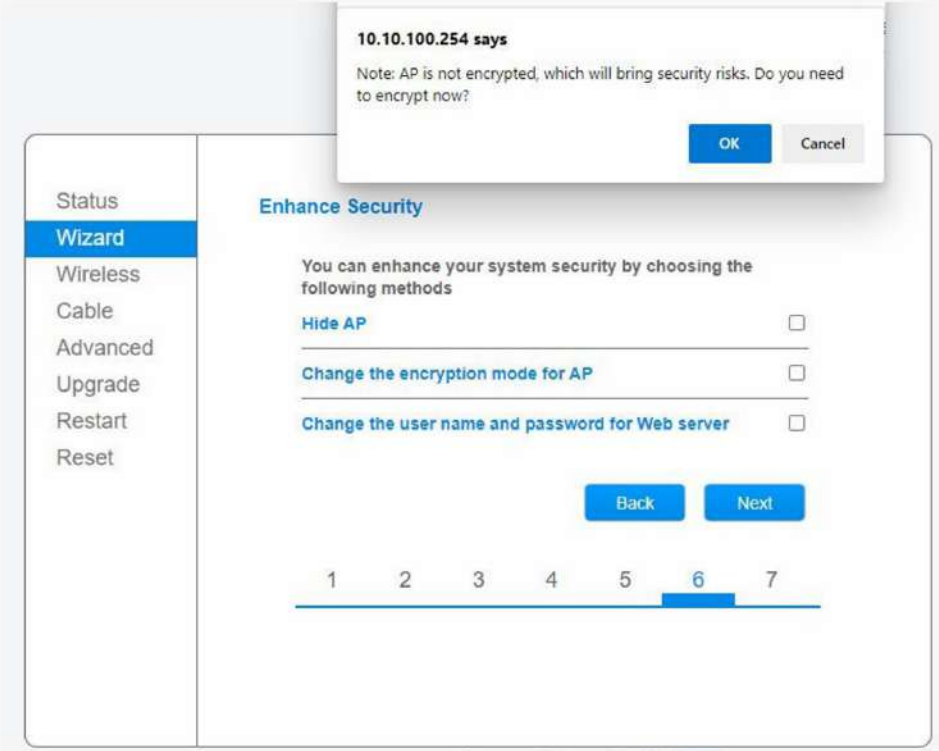
If you already set AP encryption, please refer to previous steps.

Notice:

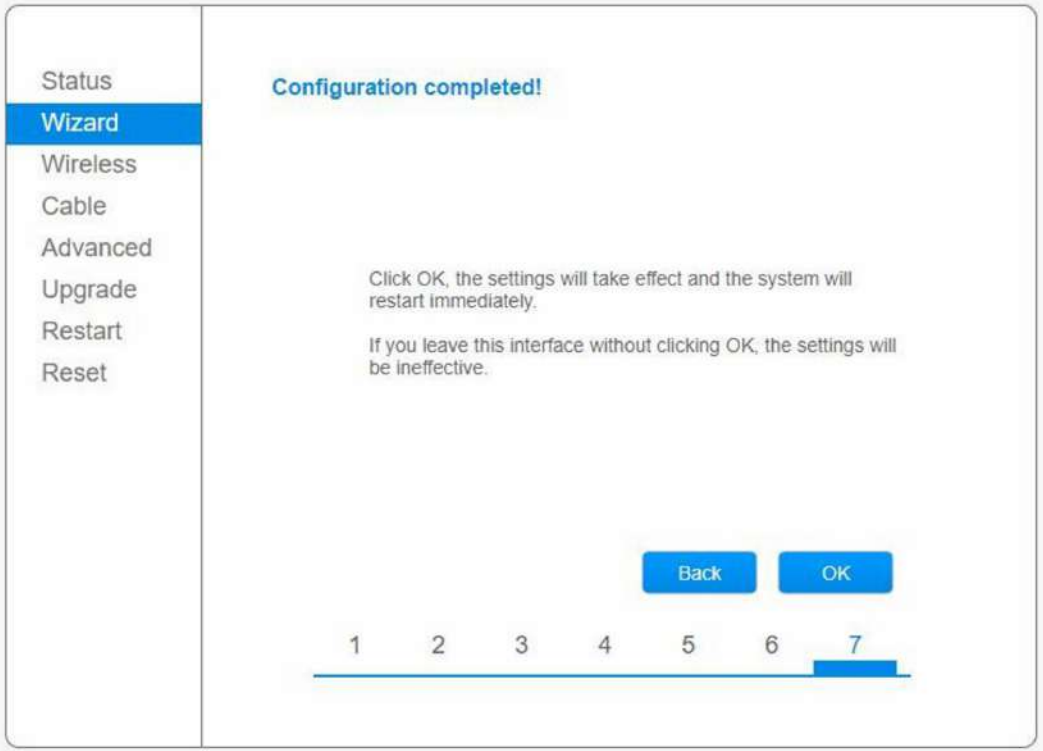
If you select "Hide AP", AP will be hided automatically. If you wish to open again, please long press Reset button for 4s to reset which will got to reconfiguration process. AP password, network information and anti-reflux settings will restore factory settings at this time.)



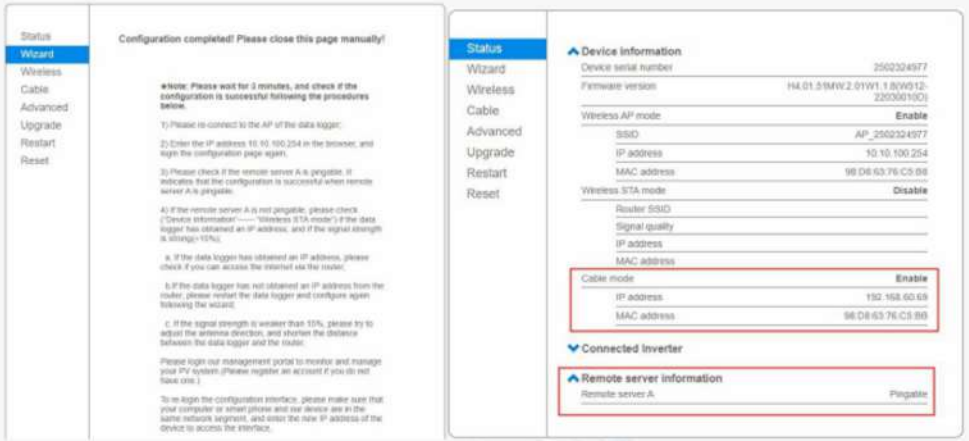
Step 5 If enhancing safety is not required, click Next. System will remind you to encrypt AP, click Cancel.



Step 6 Click OK to complete Ethernet configuration.



Step 7 Connect AP again according to the notification. Log in to WEB page and check if the network is successful.If you need to enter the web page through IP address via LAN, please remember the actual IP address in " Wireless Mode ".



After the network setting is completed, you can enter the web page through two methods to set up anti-reflux.

Method 1 (Recommended): If AP is visible, connect AP via computer, mobile and other devices. Open a browser and enter 10.10.100.254 to go.

Method 2: If AP is hided, AP cannot be connected via computer, mobile and other devices. You need to keep the computer or mobile in the same LAN with the logger, and enter the assigned IP address by the logger in the browser to enter the web page.

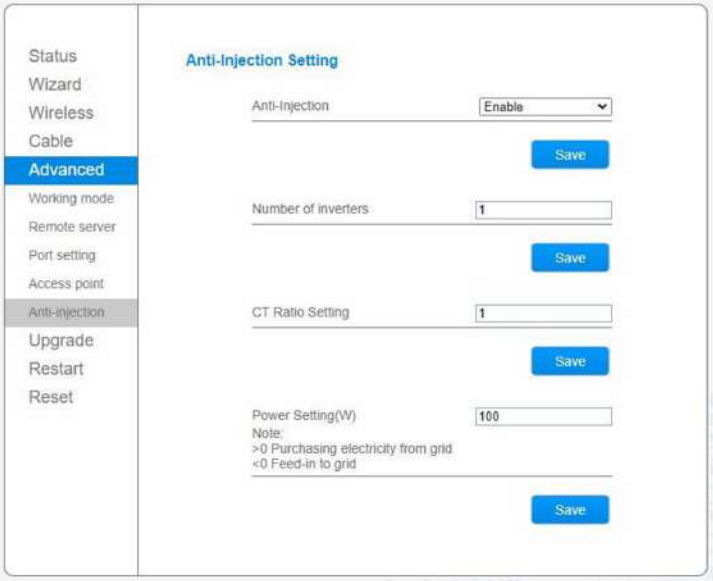
Anti-reflux Settings

7.1 Anti-reflux setup

Step 1 Click Advanced Setup- Anti-reflux setup

> Notice：
> Default: Anti-reflux Function: ON

Step 2 If anti-reflux function is required, select "Enable", set inverter number, CT ratio and power



Inverter Number Instruction

Inverter number: 10, and click save. (Set according to actual situation on site.)

CT Ratio Setup Instruction

If CT is 200/5A, please enter 40 and save.

After CT ratio is set, the logger will automatically send the ratio to the meter after restarting, and the power and energy displayed on the meter screen will be converted into the real value multiplied by the ratio. However, the original value transmitted by the meter to the logger through RS485 is still the original value without ratio conversion, so after adding the plant, the meter data is still the original value in the "Device Details".

Power Setup Instruction

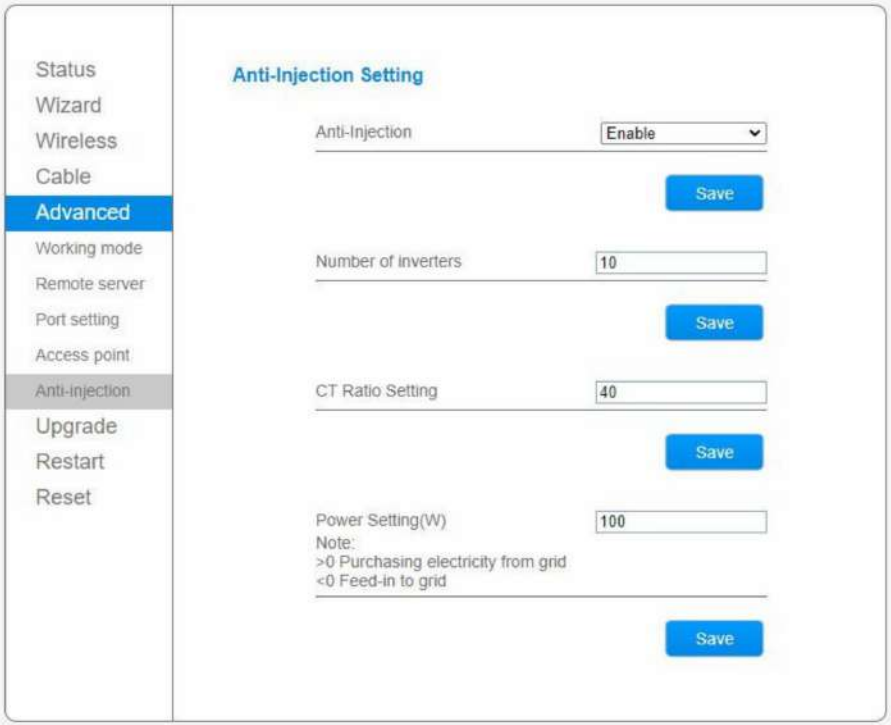
Set power according to actual situation. (Default: 100W.)

E.g. If you set 100W, which means inverter adjustable production power is 100W less than load power and will continue to buy 100W from the Grid.

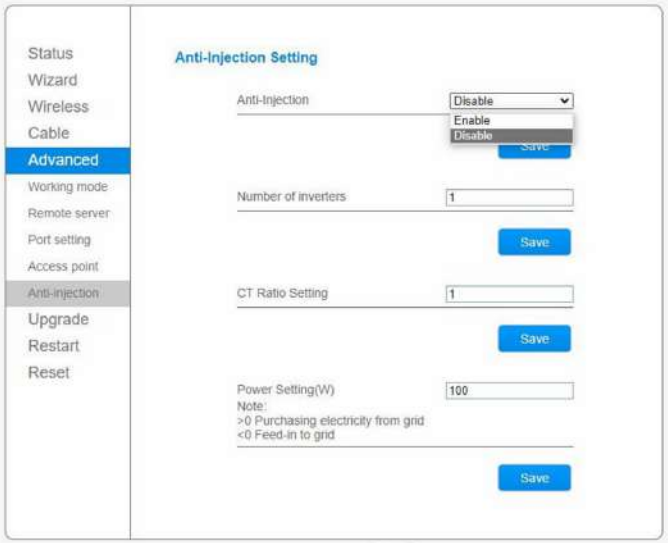
If you set 0W, which means all inverter production power is used for load and grid-tie power is 0W.

(Due to there is a certain time difference between the power reduction command issued by the logger and the power reduction command executed by the inverter, it might encounter the situation of the fluctuation of actual grid-tie power when the inverter power is set to 0.)

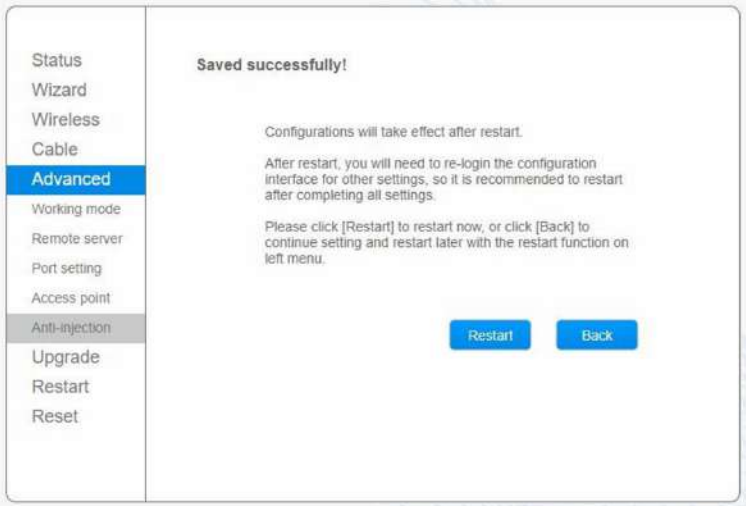
If you set -100W, which means inverter production is used for load and there is still 100W for grid-tie.Please Note: If the inverter load power is less than min. production power, the surplus power will go on grid.



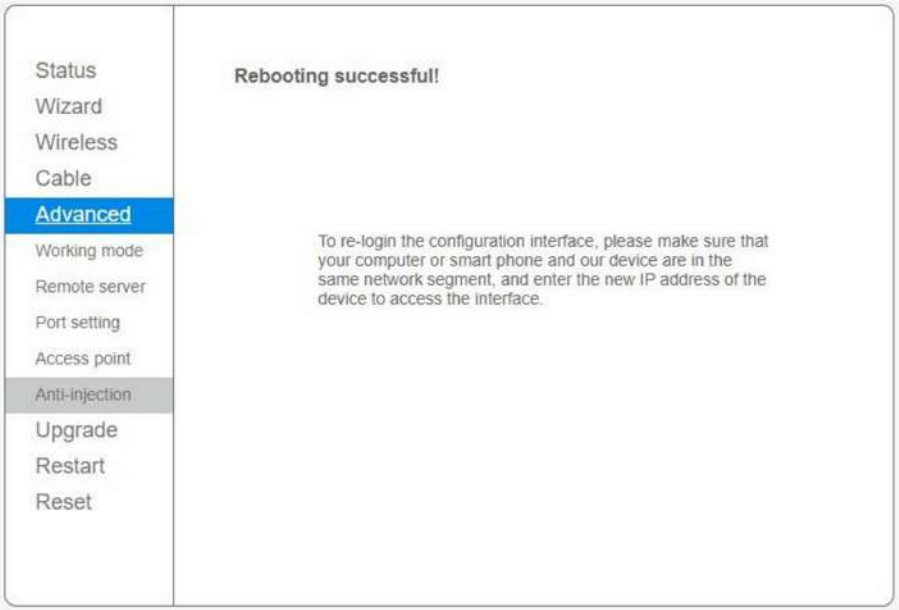
Step 2.1 If anti-reflux function is not required, select “Disable” and click Save.



Step 3 Click Restart



Step 4 If the successful page is displayed, it means the anti-reflux setting is successful.



Instruction for Indicator Light, Dial Switch and Reset Button

8.1 Indicator Light

After DIN-Rail logger (WiFi/ETH) connected to the device and networking is normal, check the status of STATUS light, LINK light, 485/422 light.

(There is only one light for each STATUS light, LINK light, 485/422 light.)

Logger light

Light	Implication	Instruction
	Logger working status	1. OFF: DIN-Rail logger (WiFi/ETH) works abnormally. 2. ON: DIN-Rail logger (WiFi/ETH) works normally. 3. ON after 5s: DIN-Rail logger (WiFi/ETH) starts/restarts.
	Communication status with logger and router	1. Flashing: Network configuration is not conducted after first power on or reset. 2. Configure to WiFi and connect to router: Light: ON; If not, Light: OFF 3. Configure to Ethernet and connect to router: Light: Flash; If not, Light: Flash
	Communication status with logger and inverter	1. ON/Fast Flash: DIN-Rail logger (WiFi/ETH) connected to inverter and communicate normally. 2. OFF: DIN-Rail logger (WiFi/ETH) not connected to inverter and communicate abnormally.

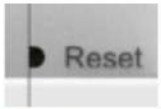
Repeater light

Light	Implication	Instruction
	RS485 IN	1. OFF: No data transmission 2. Flash: Data transmitting 3. ON: Abnormal
	RS485 OUT	1. OFF: No data transmission 2. Flash: Data transmitting 3. ON: Abnormal
	Power	1. ON: Normal power-on 2. OFF: Fail to power on

8.2 Dial Switch

Light	Implication	Instruction
	RS485 terminal 120Ω matching resistance switch	Default:Term ON:A problem with 485 link when there are various inverte on site (Turn on one dial switch either for logger or inverter; If a repeater is connected,there is no needto turn on this switch)

8.3 Reset Button

Light	Implication	Instruction
	Reset button	Long press for 4s to reset the logger and restore factory settings.

SOLARMAN Monitoring

9.1Register and create a plant

If you have a household PV plant, it is recommended to use SOLARMAN Smart.Scan the QR code below to download or go to Android/App Store searching for SOLARMAN Smart.

For web: https://home.solarmanpv.com

SOLARMAN Smart

If you are a distributor, O&M provider, manufacturer in PV field, it is recommended to use SOLARMAN Business. Scan the QR code below to download or go to Android/App Store searching for SOLARMAN Business.

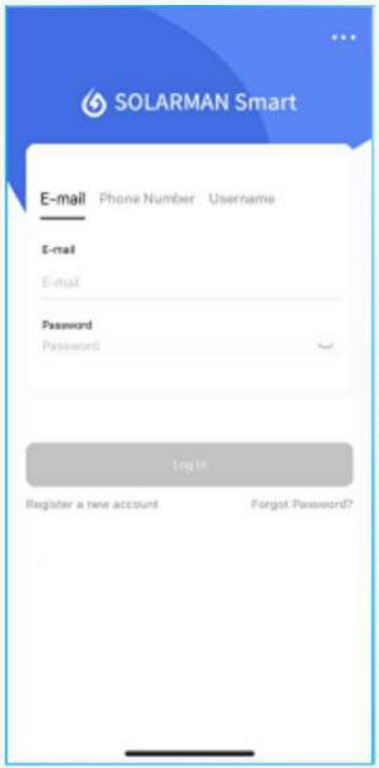
For web: https://pro.solarmanpv.com

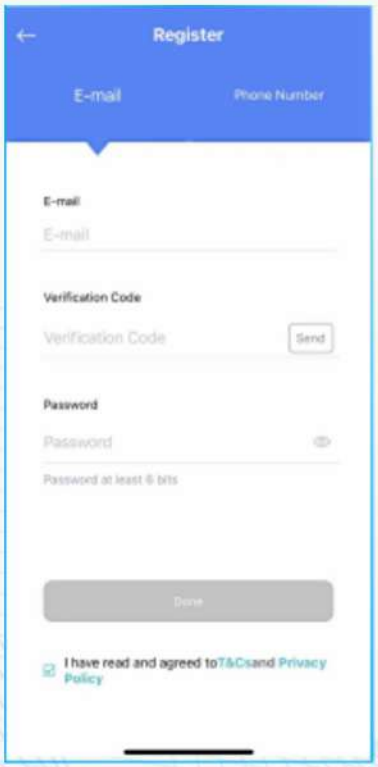
SOLARMAN Business

SOLARMAN Smart APP

Step 1 Registration

Go to SOLARMAN Smart APP and click " Register a new account " and select " E-mail " or " Phone Number " to register.



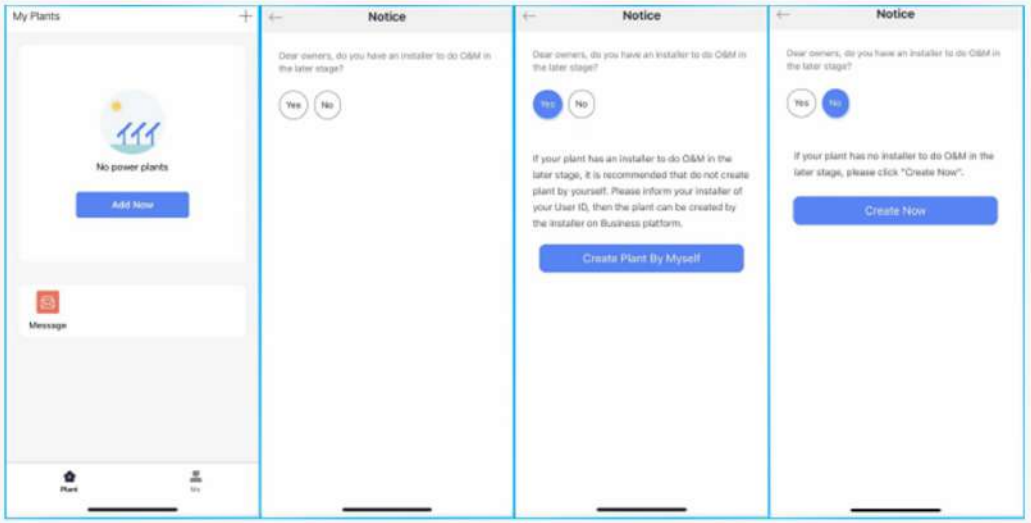


Step 2 Create a plant

Click "Add Now".

Choose "Yes" to select " Create Plant By Myself ".

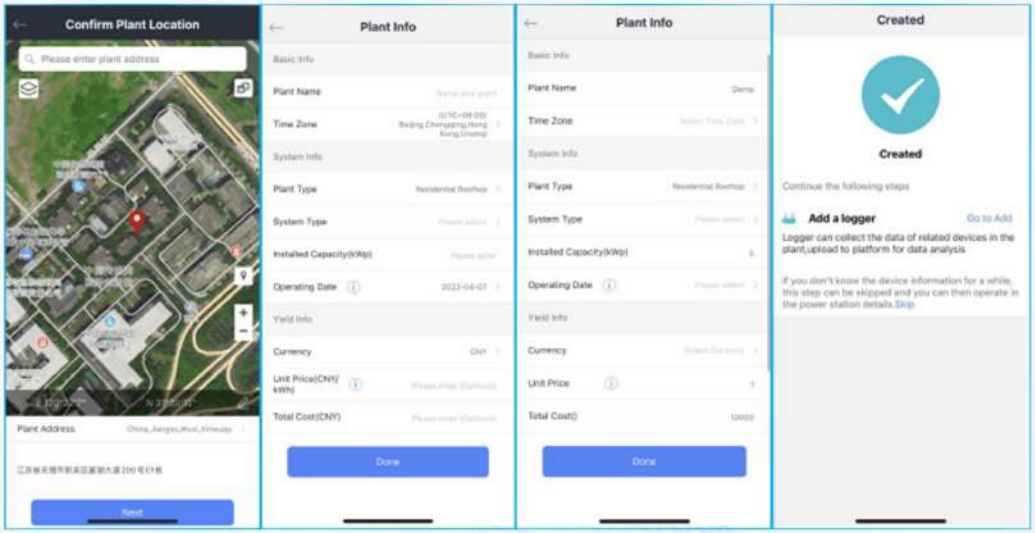
Choose "No" to select "Create Now ".



Step 2.1

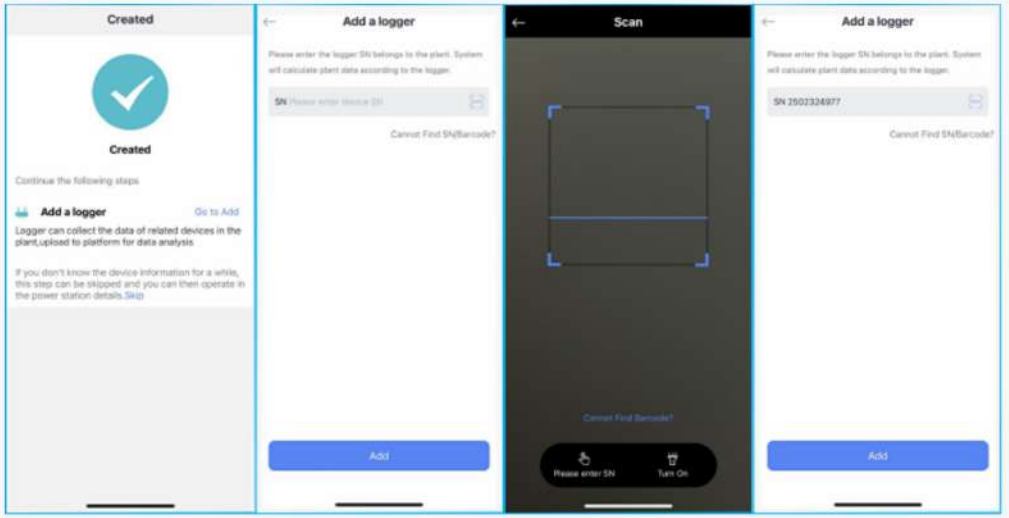
Users can select plant location automatically or enter plant location manually, then click “Next ”.

Users need to enter plant information here, click “Done” to complete.



Step 3 Add a logger

Click “Go to Add”, enter SN manually or scan bar code, then click “Add”.

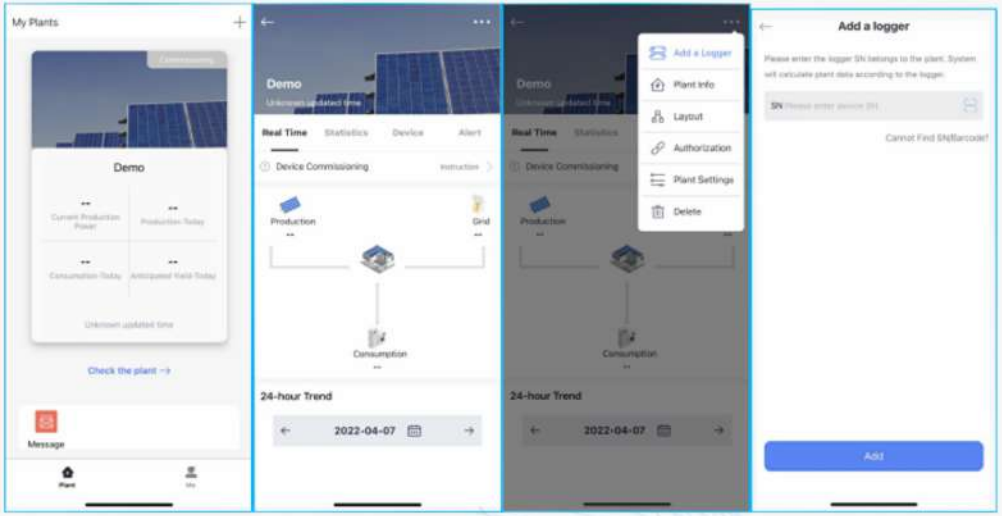


Step 3.1

Click “Skip” to return homepage and click plant name to visit a plant.

User can click “...” in the upper right corner and click “Add a logger ”.

(Please follow step 3)

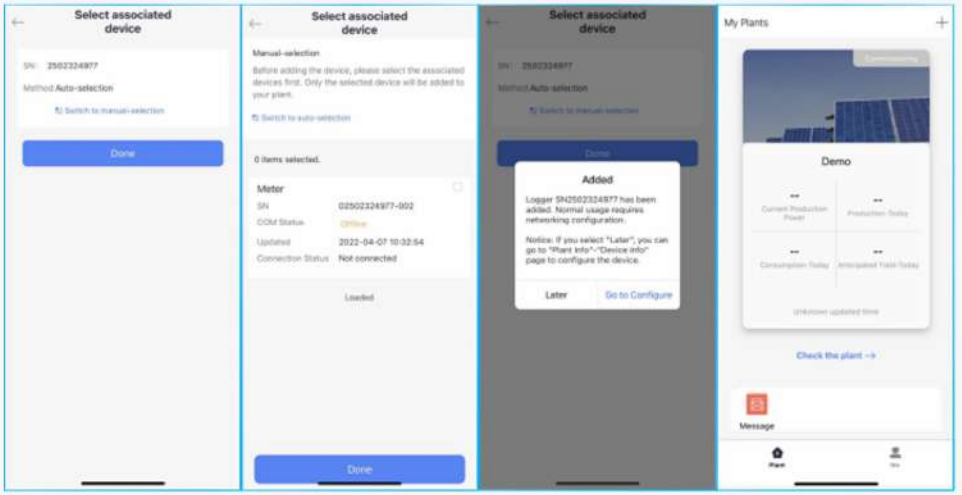


Step 4 Select associated device

After the logger is added, system will go to “Select associated device”, if you will not change associated method, click “Done”. If you are going to change associated method, click “Manual selection”.

(Network configuration has been done at step 6)

Click “Later” to return to homepage.



Notice：

Logger SN will be displayed in the device list after 10 mins.

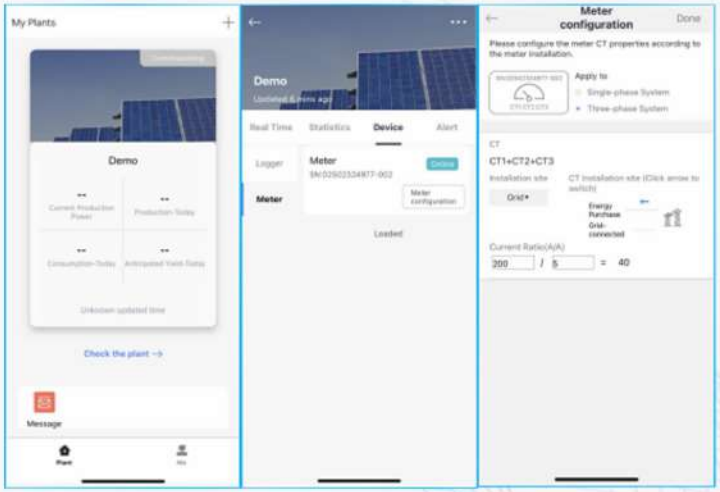
Step 5 Meter configuration

Click plant name to visit a plant. (If you are in plant details page, you can click “Device”directly)

Click “Device-Meter-Meter configuration”, go to select "Three-phase System-Grid ”, click a blue arrow in CT direction and change to “Energy Purchase”.

Current ratio can set according to CT specification. (e.g. If you choose 200/5A CT, set current ratio as 200/5)

Click “Done” to return to “Device” page.



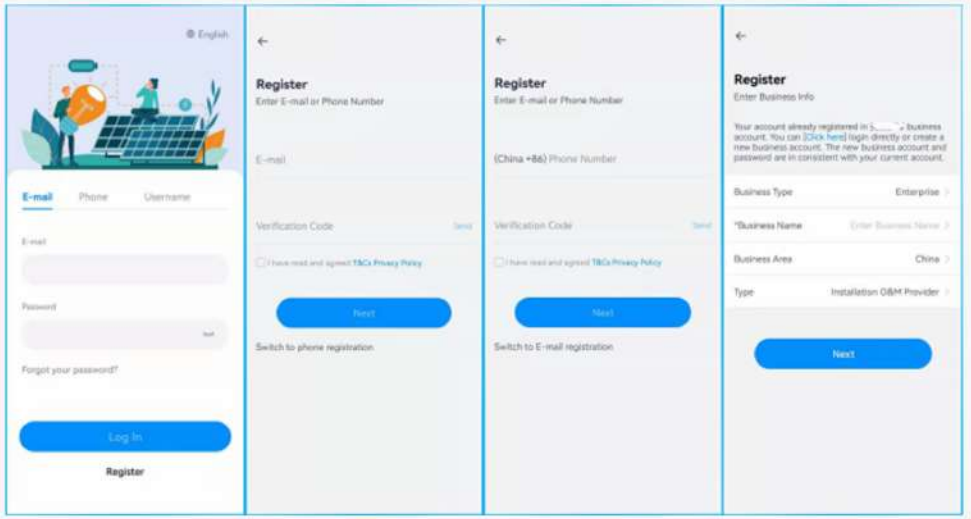
SOLARMAN Business APP

Step 1 Registration

Go to SOLARMAN Business APP and click “Register”- “Switch to E-mail registration”. Tick “T&Cs” and click “Next”.

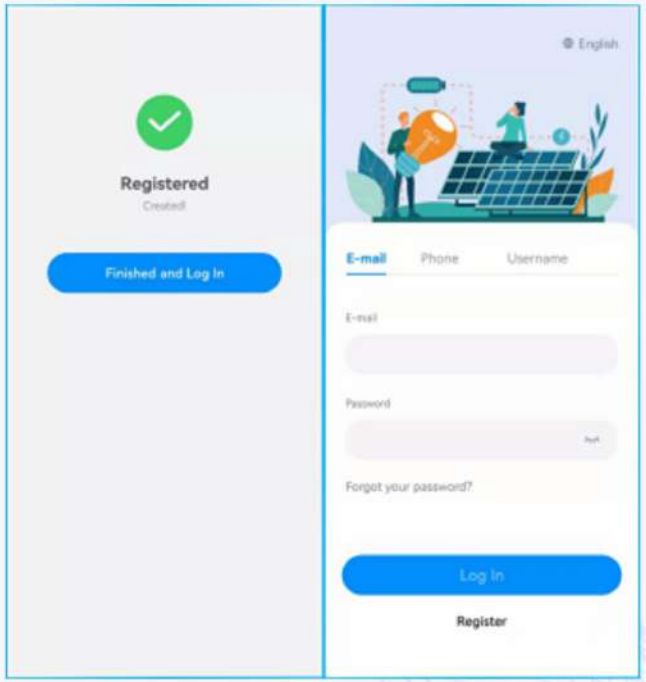
Select “Business Type”, enter “Business Name”, select “Business Area”, select “Type” and click “Next”.

If you already have an account, click “Click here” to return to login page.



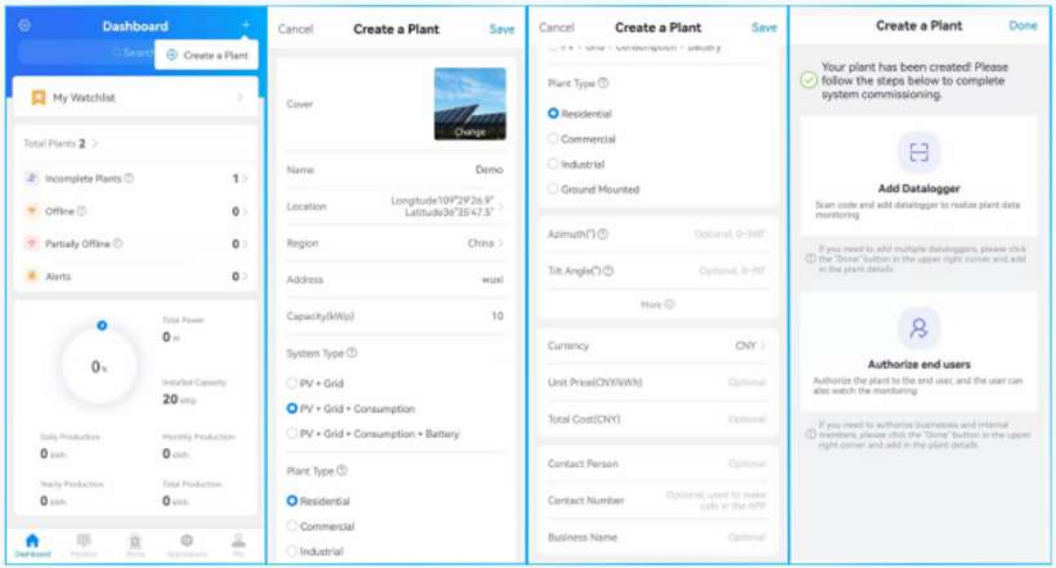
The following page will display and click “Finished and Log In” to return to login page.

Enter information and click “Log In ” .



Step 2 Create a plant

Click “ +” in the upper right corner, select “ Create a Plant ” and enter plant information, then click “ Save ” .

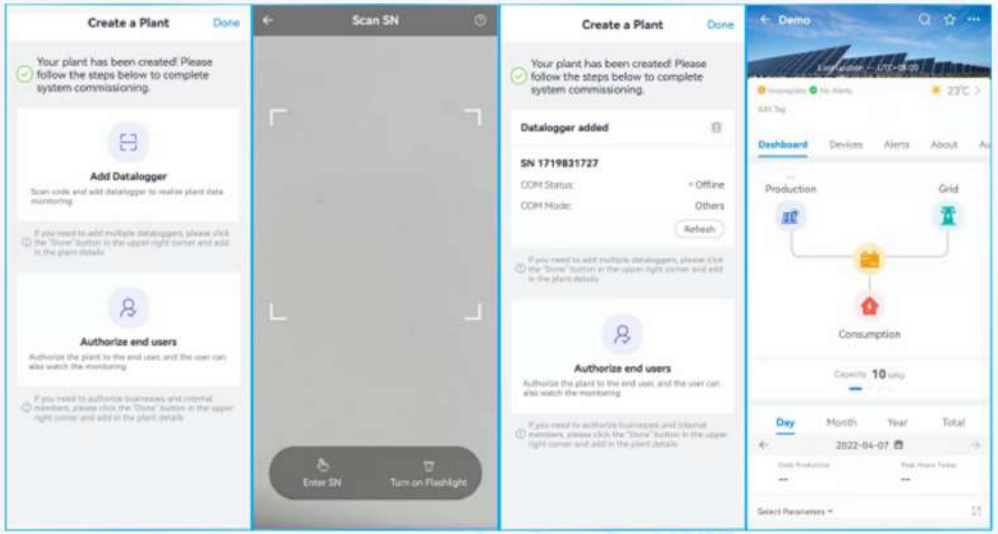


Notice：

Logger SN will be displayed in the device list after 10 mins.

Step 3 Add a logger

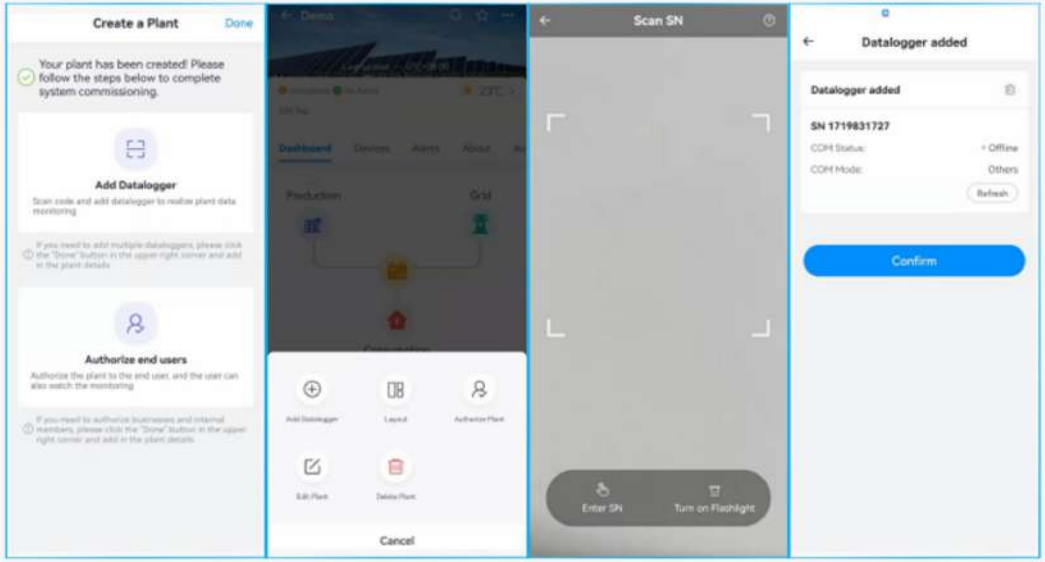
Click “Add Data logger”, enter SN manually or scan bar code, then click “Done”.



Step 3.1

If not, click “ Done ”to return to “ Dashboard ”.

Click “...” in the upper right corner in “Dashboard” page, click “Add Data logger ” , enter SN manually or scan bar code, then click “ Confirm ”.



Step 4 Meter configuration

Click “Devices”, choose target meter and click “Meter configuration”, go to select “Grid”, click a blue arrow in CT direction and change to “Energy Purchase”.

Current ratio can set according to CT specification. (e.g. If you choose 200/5A CT, set current ratio as 200/5)

Click “Save” to return to “Devices” page.

(System will use three-phase/single-phase system in default.)