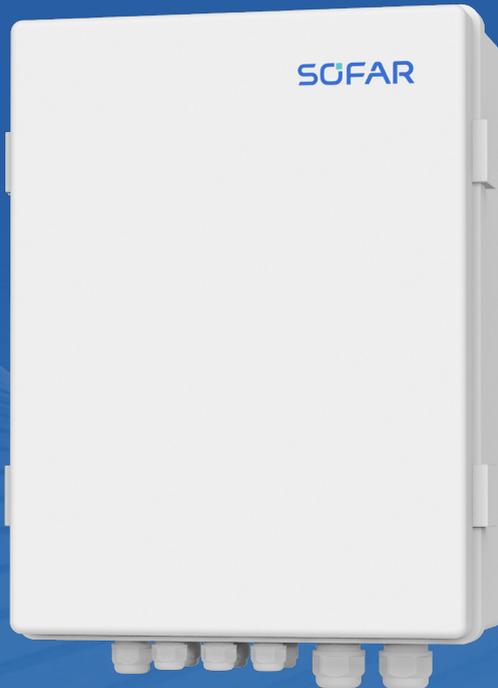


SOFAR

# USER MANUAL

SOFAR SAR-100



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# 1 About the Manual

## 1.1 About the Manual

This manual is intended for professional personnel who install and operate the SAR-100 Introduction

## 1.2 Interpretation of Symbols

### CAUTION

**Non-observance may result in minor injury.**

- Follow the warnings in order to prevent injury!

### NOTICE

- Provides tips essential to the optimal operation of the product.

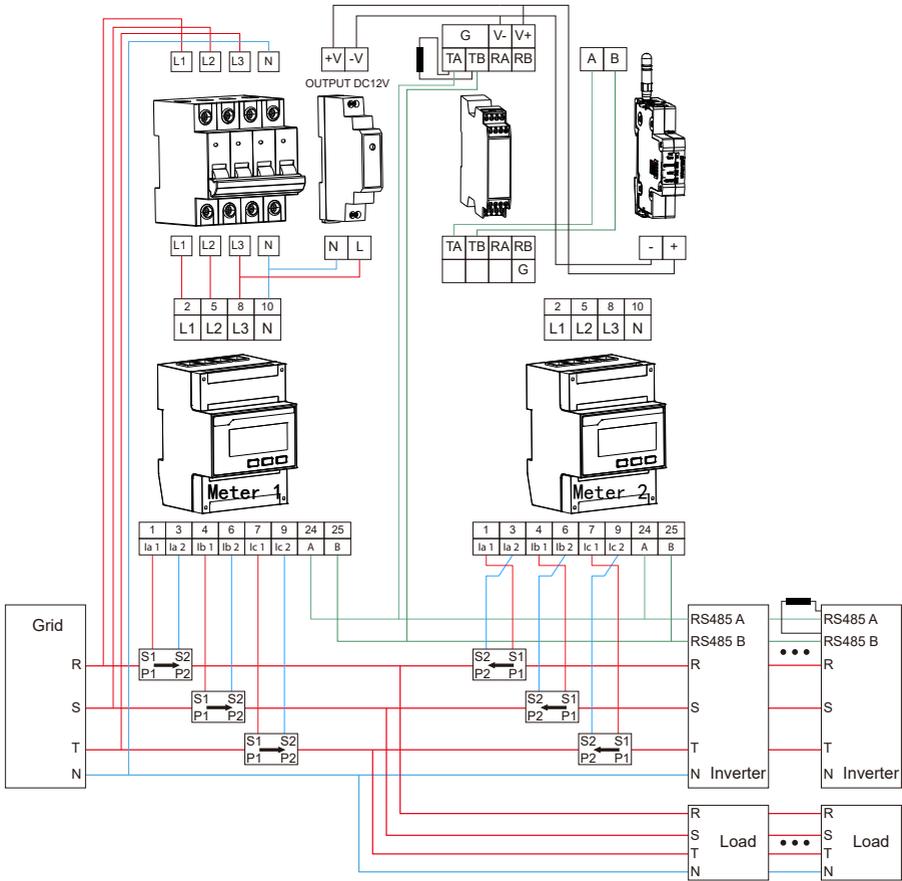
## 2 Introduction

Feed-in limitation box supports the feed-in limitation application of parallel-connected machine for SOFARSOLAR inverter. It enables the real-time monitoring of grid-tied situation through the integration of three-phase meter, logger and CT (Customers need to purchase CT by themselves according to on-site situation), which meets the requirement of real-time adjusting inverter output power at self-consumption scenario. It can connect to multiple inverters and support data transmission via WiFi&Ethernet.

# 3 Parameters

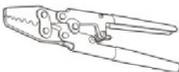
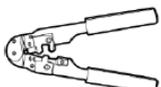
Parameter	Description
Product Model	SAR-100
Remote Communication	2.4G WiFi + Ethernet
Local Communication	RS485
No. of Connections	10
Accessing Method	Three-Phase Four-Wire
Working Voltage	3x230/400V 50/60Hz
Working Current	3x1.5(6)A
IP Grade	IP65
Working Temperature	-25°C~+60°C
Working Humidity	5%-95% (No Condensation)
Installation Method	Wall-Hanging
Size	400*300*170mm
Weight	4.1 kg

# 4 Feed-in Limitation System Diagram



# 5 Product Installation

## 5.1 Tool

Tool Name	Picture	Usage	Remark
Wire stripper		Strip cable insulation	
Cross screwdriver		Use to connect	
Wire cutter		Used to cut power cables	
Adjustable Wrench		Use to fix expansion screws	
Percussion Drill		Use to drill holes	
Wire crimper		Press line	
Crystal head wire pliers		Pressing crystal head	
Computer		Use to operate network configuration	
COM Line		RS485 Communication	(Shielded twisted pair) Diameter: 3-7mm
Voltage connection line		Use to connect voltage sampling signal and power supply	Specification: AWG 12-18, 105°/600V

Tool Name	Picture	Usage	Remark
Double-core cable		Use to connect CT signal	Specification: AWG 16-22, 105°/600V

## 5.2 Location

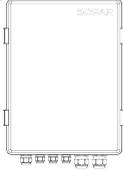
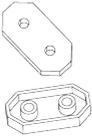
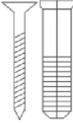
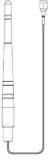
The installation location must meet the following requirements.

- Please install near the crossroad of grid side and grid-tie side. The wiring length of CT shall not exceed 10m.
- The location recommended is to avoid damp and dust environment. Direct sunlight and aggressive vapour should also be avoided. The ambient temperature range: -25°C ~ +60°C.
- The maximum communication distance to the inverter should be less than 500m. The communication line should be far away from strong electricity such as power lines.
- The installation position should be away from metal structures to ensure WiFi signal quality.

# 6 Device Installation

## 6.1 Check the Packing

Please ensure that the delivery list items are complete (list below):

 <p>Feed-in Limitation Box*1</p>	 <p>Mounting hook ×4</p>	 <p>Hook screw ×4</p>	 <p>Expansion screw ×4</p>	 <p>Resistance ×5</p>	 <p>Antenna ×1</p>
---	---	--	---	--	---

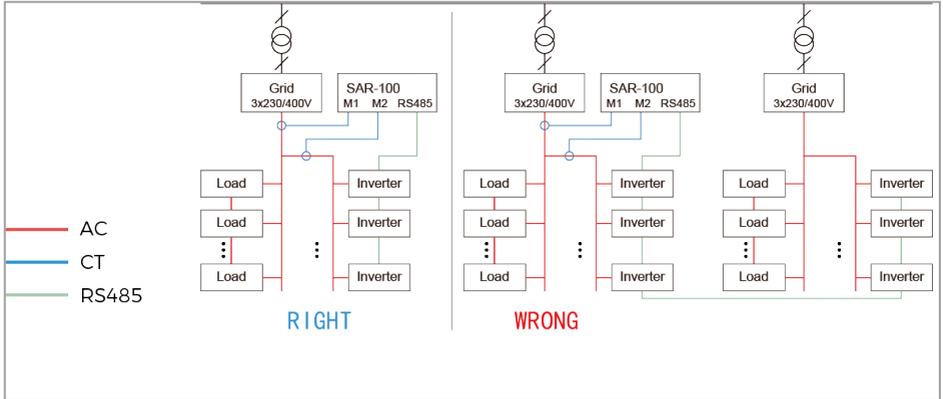
### NOTICE

- If any item is damaged or missing, please contact SOFARSOLAR.

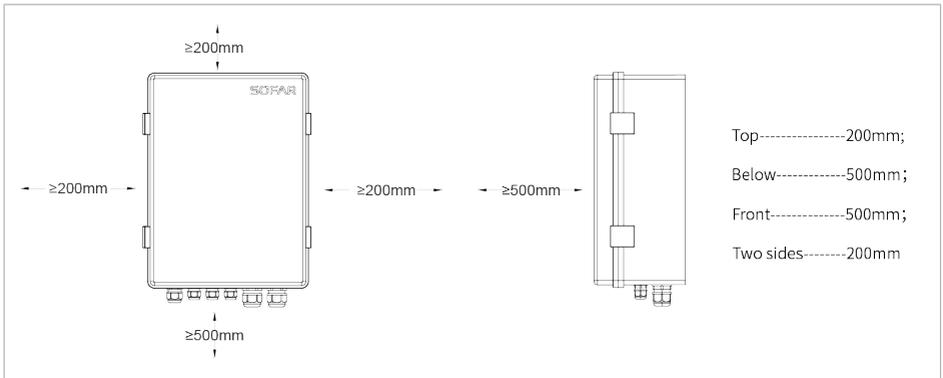
## 6.2 Device Installation

### Installation Precautions

- It is recommended to install the data logger of the inverter and connect it to the network.
- Power off the device before installation.
- Please use daisy-chain method when connecting the inverter through RS485.
- Feed-in limitation box only supports one low-voltage bus and only supports inverter access under the same low-voltage bus, which does not support different low-voltage buses (As shown in the picture below).

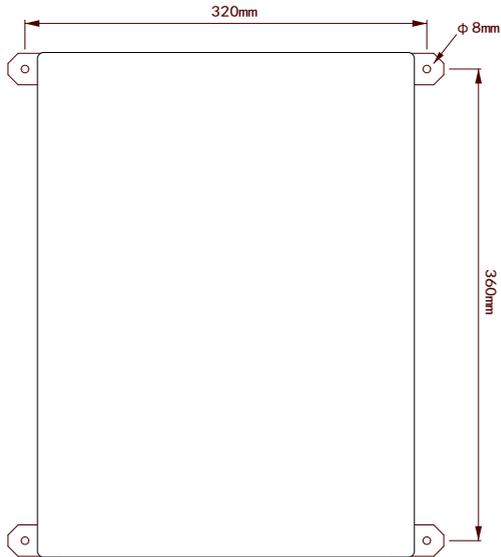


### Installation Clearance



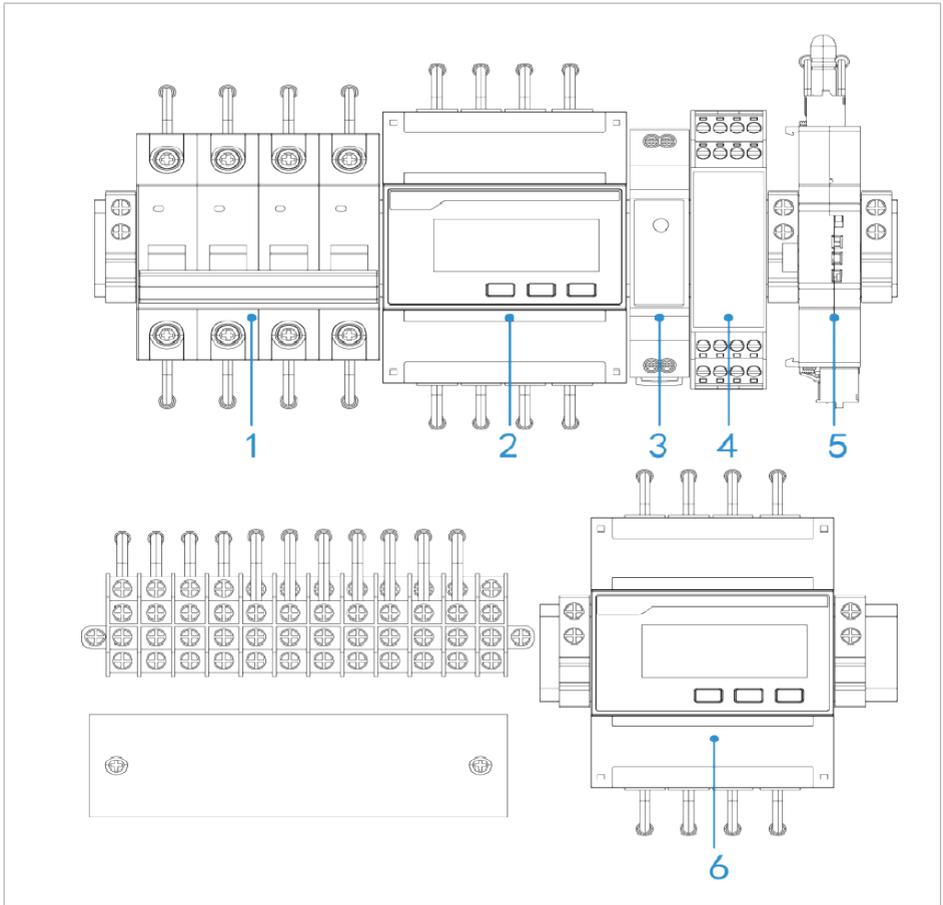
## Installation Steps

1. Select a right (firm & flat) place to install the device;
2. Determine the drilling hole positions according to hangers;



3. Fix the device using expansion screws.

### 6.3 Internal Structure



No.	Name	Description
1	Circuit Breaker	Protect system and maintenance power outage
2	Meter 1	Monitor grid side power
3	Power	Provide DC power for relay and DIN-Rail logger
4	Repeaters	Improve RS485 link communication stability
5	DIN-Rail Logger	Collect and upload meter and inverter data for feed-in limitation
6	Meter 2	Monitor power at generation side

## 6.4 Device Wiring

### ⚠ CAUTION

- All electrical installations must be in accordance with local electrical standards and permission must be obtained from the local electricity authority before the SAR-100 can be connected to the grid by a professional.
- When replacing components, ensure that the new replacement components meet the trial requirements of the SAR-100.
- Ensure that the AC input voltage and current match the rated voltage and current, otherwise the components will be damaged or will not work properly.
- Appropriate ESD measures should be taken
- Please ensure that the following wiring is carried out with the SAR-100 powered off.

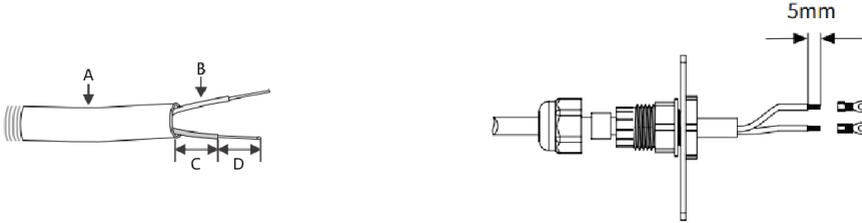
### 6.4.1 Wire Specification and Wire Pressing

#### 1 . Voltage line



Serial number	Description	Numerical value
A	Outer diameter of wire	Less than 13mm
B	Cross-sectional area of wire	recommend 1~3mm <sup>2</sup>
C	Conductor length	about 130mm ( 50mm for PE )
D	Bare copper wire length	6~8mm(5~6mm for PE)

## 2 . CT line



The diagram shows two parts: on the left, a wire with labels A (outer diameter), B (cross-sectional area), C (conductor length), and D (bare copper wire length); on the right, a connector assembly with a 5mm dimension for the wire length.

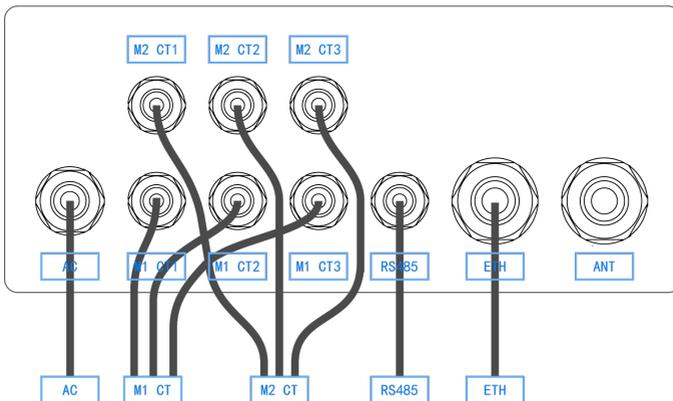
Serial number	Description	Numerical value
A	Outer diameter of wire	Less than 3mm
B	Cross-sectional area of wire	Recommend 0.35~1.3mm <sup>2</sup>
C	Conductor length	About 45mm
D	Bare copper wire length	About 5mm

## 3 . RS485 line

RS485 communication cables are recommended to use Shielded twisted pair cable with a conductor cross-sectional area of  $\leq 2\text{mm}^2$ .

### 6.4.2 Device Hole Diagram

It is recommended to thread according to the diagram, in case of twining and dislocation which might cause transmitting interference of RS485 communication and antenna (As shown in the picture below).

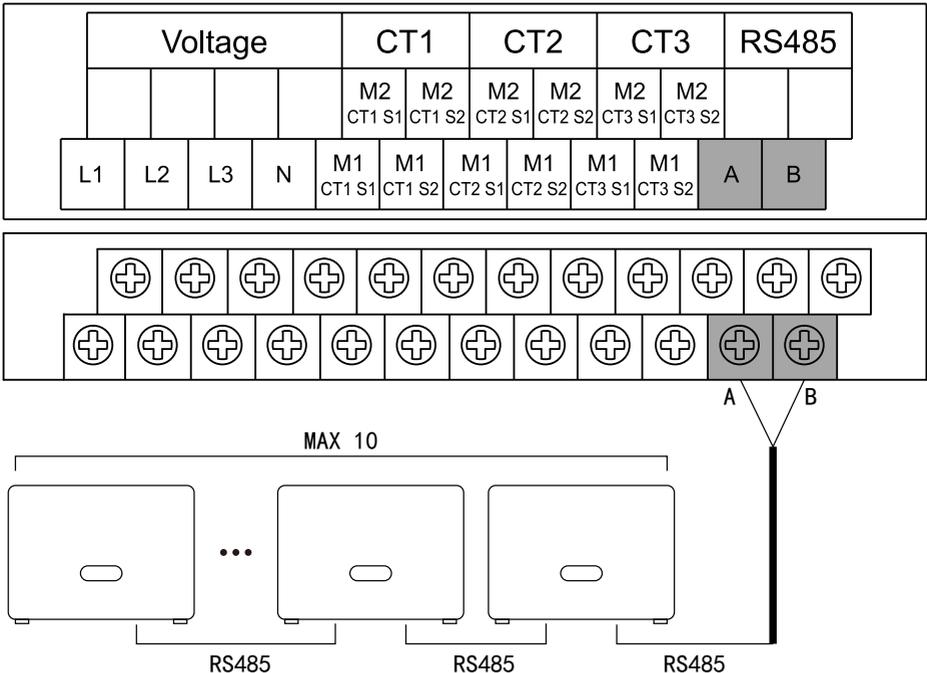


### 6.4.3 Connect to Inverter

The max. number of inverters that SAR-100 can connect to is 10. The A/B of the inverter RS485 line is connected to the A/B position in SAR-100(As shown in the picture below).

Baud rate for all inverters: 9600.

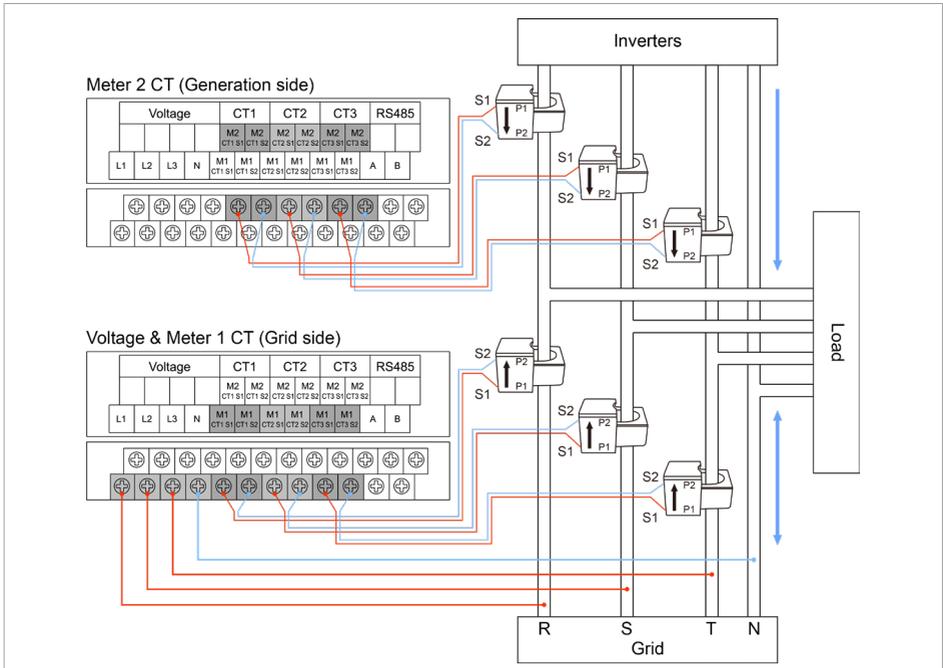
A is RS485+ and B is RS485-. If the RS485 link communication is abnormal, please connect a 120Ω resistor between A and B point of the last inverter.



#### Inverter address settings:

1. M1 i.e. Meter 1 (Grid side) address: 001, M2 i.e. Meter 2 (Generation side) address:100, which cannot be changed.
2. Inverter modbus address should be configured starting from 002, it is recommended to use continuous address as 002-011.Please refer to the corresponding inverter user’s manual for the inverter address setting procedure.
3. Please make sure inverter stand-alone feed-in limitation function: OFF. Disable feed-in limitation at LCD screen according to SOFARSOLAR user manual.

### 6.4.4 Connect to CT and AC Line



As shown in the picture above, the CT corresponding to Meter 1 should be installed on grid side. S1&S2 should be connected as the above picture shows. The arrow of CT installation should be from grid to inverter.

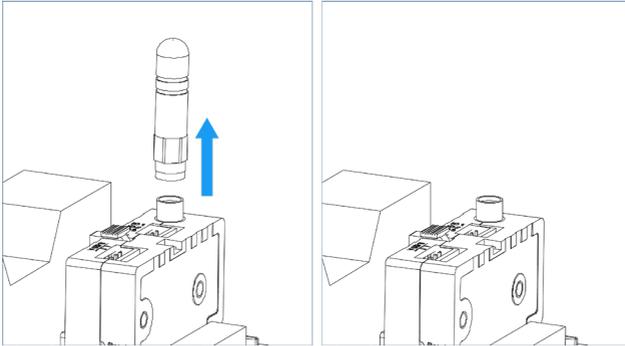
The CT corresponding to Meter 2 should be installed on generation side. S1&S2 should be connected as the above picture shows. The arrow of CT installation should be from inverter to grid.

- The length of voltage input connection line should be less than 100m. And connect to phase line R, S, T, N accordingly.
- Communication distance between CT and meter should be less than 10m.
- CT of Meter 1 should be selected according to the electricity consumption capacity. CT of Meter 2 should be selected according to the plant capacity.
- When the power is ON, it is prohibited to open the secondary side of the CT to prevent safety accidents and device damage.

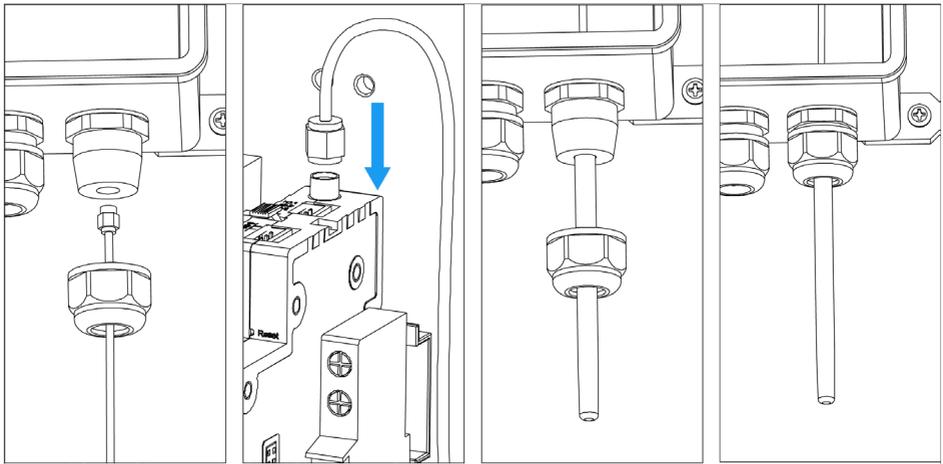
### 6.4.5 Replace External Antenna

WiFi network requires signal enhancement, an external antenna can be used. The replacement method for external antennas is as follows.

1. Unscrew the original small antenna of DIN-Rail logger and install the extension antenna.(As shown in the picture below).

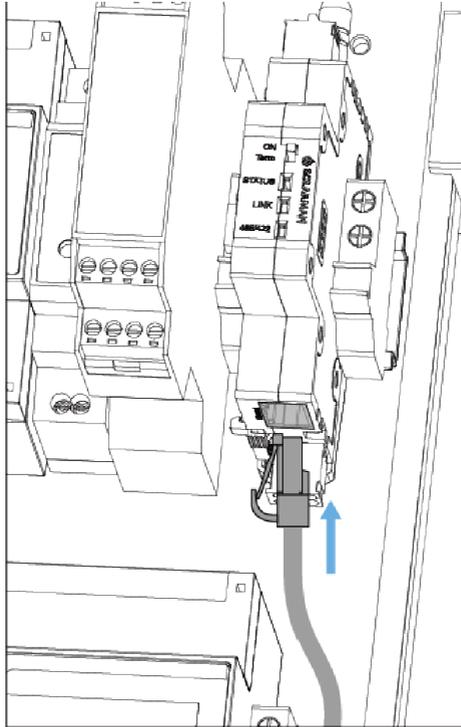


2. Thread the external antenna through the right-most waterproof joint, then put the antenna bottom into the rubber hole and tighten waterproof joint (As shown in the picture below).

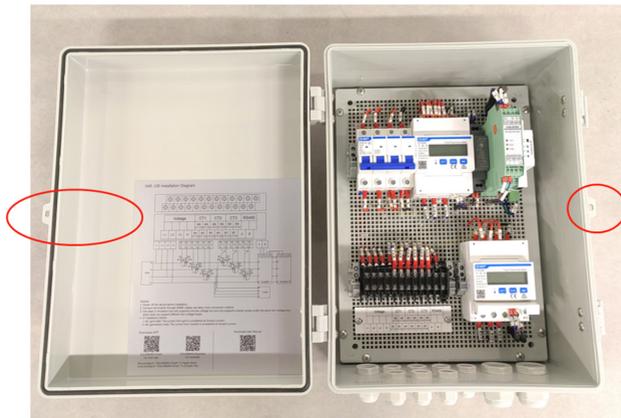


### 6.4.6 Ethernet Connection

If the networking method is a wired connection, connect the ethernet cable (As shown in the picture below).



After installation, have the installer lock the SAR-100 with the lock. Install the lock in the location shown below.



# 7 Parameter Configuration

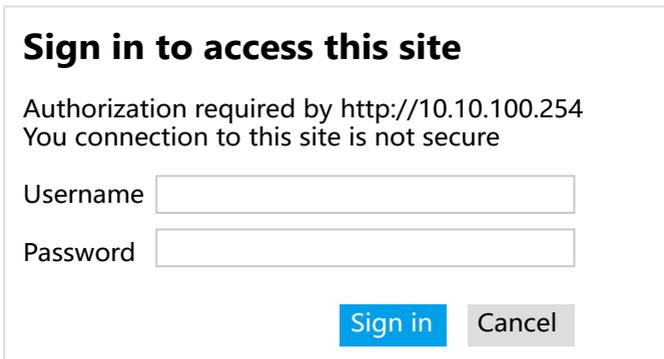
DIN-Rail logger supports WiFi & Ethernet access. Please select one method to access according to actual situation.

## 7.1 Login to Web Page

1. Prepare a computer/smart phone that can connect to wireless network.
2. Tap to connect to WiFi.
3. Connect WiFi with wireless name AP\_XXXXXXXX in the network list (XXXXXXXX means logger SN, and as shown in the picture below).



4. Open a browser and enter 10.10.100.254. Username is admin and password is admin (As shown in the picture below). Supported browser: IE 8+, Chrome 15+, Firefox 10+.

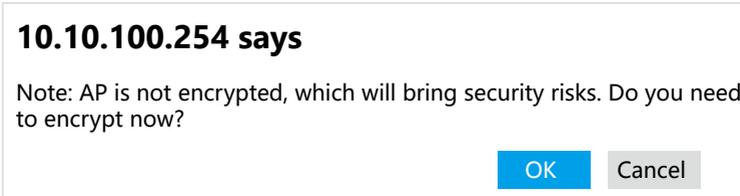


5. During the first login, the browser will remind you whether to save the password. You can decide according to your usage habit.

## 7.2 WiFi Encryption

The system will prompt that the WiFi is not encrypted when logging into the web page. At this time, you can choose whether to encrypt or not.

- If you cancel the WiFi encryption, please skip the following contents. Click “Cancel” in the picture below to go directly to section 7.3 Parameter Settings.



- If you want to encrypt your WiFi, perform the following steps.
  - Click “OK” in the picture above. You will go to “AP Encryption Modification”, you can select the encryption mode, encryption algorithm, enter the password and click “Save” according to actual situation.

- Status
- Wizard
- DataLogger
- System
- Feed-in Limitation Settings
- Wireless
- Cable
- Safety
- Upgrade
- Restart
- Reset

**Change the encryption mode for AP**

Encryption mode	WPA2-PSK
WPA encryption Encryption algorithm	<input type="radio"/> TKIP <input checked="" type="radio"/> AES <input type="radio"/> TKIP/AES
Password (8 to 63 characters)	12345678

[Save](#)

---

**Access point setting**

Network name(SSID)	AP_2501870460
Module MAC address	E8:FD:F8:E4:AE:CC
Transmission power	High

[Save](#)

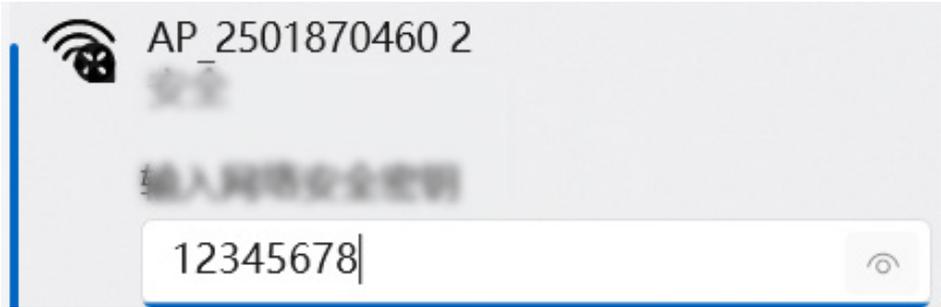
---

**Change the user name and password for Web server**

Current user name	admin
New user name (Max.15 characters)	admin
Re-enter user name	re-admin
New password (Max.15 characters)	*****
Re-enter password	*****

[Save](#)

- It requires to connect WiFi again after WiFi has been encrypted.



**NOTICE**

If you forget your password or want to cancel the encryption, please long press Reset button for 4s to reset which will get to reconfiguration process. WiFi password, network information and Feed-in limitation settings will restore factory settings at this time.

- ↳ Click "OK" after saving.
- ↳ Refresh the web page and log in again. Username is admin and password is admin.

- Status
- Wizard**
- DataLogger
- System

**Sign in to access this site**

Authorization required by http://10.10.100.254  
Your connection to this site is not secure

Username

Password

### 7.3 Set Parameter

- The feed-in limitation parameter settings include parameter settings and networking settings.

Before all configurations, make sure that the firmware for the SAR-100 and the inverter is up to date. Refer to the user manual for SAR-100 firmware upgrade operations.

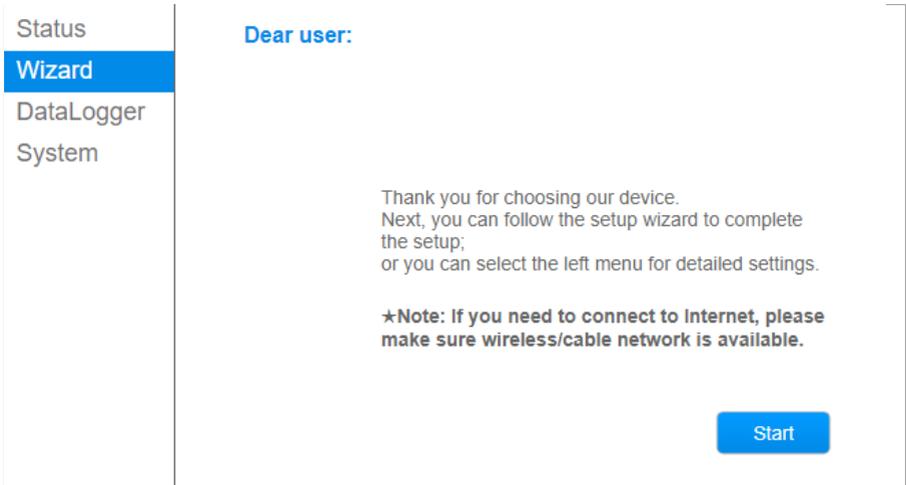
1. Enter the homepage (displaying SAR-100 connection status, there may be abnormal status during the first power on. Please set the "Wizard" and log in to the page again after 2-3 minutes to view the status).

<b>Status</b>	<b>System info</b>	
Wizard		
DataLogger		
System		
	<b>Installation status detection</b>	
	Notice: The detection cycle is 1 minute. It is recommended to refresh the page for obtaining the status after the logger restarts for 2-3 minutes. When power on and log in for the first time, the status determination may be abnormal. Please configure it in the "Setup Wizard". And log in again to check the status after the logger restarts 2-3 minutes.	
	Working Mode Setting	Zero-Feed-In Mode
	Zero-Feed-In Power Setting (unit:W)	0
	Number of inverter setting	6
	Number of actual read inverter	6
	Inverter number status	<b>correct</b>
	Meter 1 CT ratio (Grid-connected side)	40
	CT1 installation direction	<b>correct</b>
	CT2 installation direction	<b>correct</b>
	CT3 installation direction	<b>correct</b>
	Meter 2 CT ratio (Generation side)	40
	Three-phase balance setting	Three-phase unbalance
	<b>Communication stability</b>	
	RS485 bus	100% <b>Normal</b>
	RS485-Meter 1	100% <b>Normal</b>
	RS485-Meter 2	100% <b>Normal</b>
	RS485-Inverter (SS2ES106N5G218N5G218)	100% <b>Normal</b>
	RS485-Inverter (SS4CS025N77066N77066)	99% <b>Normal</b>
	RS485-Inverter (SQ1040015KC235150137)	100% <b>Normal</b>
	RS485-Inverter (SS5CS215P3N317P3N317)	100% <b>Normal</b>
	RS485-Inverter (SQ1036125KE236138888)	100% <b>Normal</b>
	RS485-Inverter (SH1040030KC237140026)	100% <b>Normal</b>
	Server connection	Unpingable
	Firmware version	H4.01.51MW.2.01W1.3.4(W512-23102401D)
	<a href="#" style="background-color: #0070C0; color: white; padding: 5px 10px; border-radius: 3px;">Refresh</a>	

If the communication stability is abnormal, please check the on-site communication settings:

1. RS485 com line should be shielded twisted pair and shield grounding. The wiring should be kept away from strong electricity and magnetic fields.
2. The firmware of feed-in limitation box should be H4.01.51MW.2.01W1.3.4(W512-23111701D)or above.
3. Inverter address starts from 002, it is recommended to use continuous address as 002-011. And the baud rate is 9600.
4. Supported inverter models and versions:  
25-50KTLC-G3: The version is V050001\_L01\_I302  
60-80KTLX-G3: The version is V020001\_01\_0402  
100-125KTL-G4: The version isV010010\_03\_0114

2. You can click “Wizard” to enter wizard page and click “Start”.



3. Depending on the situation, you can make feed-in limitation settings.

The settings is compulsory, otherwise it will cause feed-in limitation function failure.

Please set sequentially.

- “Working Mode Setting”

If grid feed-in is not allowed on site, please select Zero-Feed-In Mode.

If grid feed-in is allowed on site, please select Selling Power Limitation Mode.

- **“Zero-Feed-In Power Setting (unit:W)” or “Selling Power Settings (unit:W)”**

Zero-Feed-In Mode: Setting 500W in this mode means that 500W is allowed to purchase and avoids low-power feed-in; Do Not set negative values (Default: 0).

Selling Power Limitation Mode: Setting 500W in this mode means that max. energy selling is 500W; Do Not set negative values (Default: 0).

Notice: The power value is entered in units of W, if it is 2kW, please enter 2000.

- **“Number of inverter setting”**

Set according to the actual number of site inverters

- **“Meter 1 CT ratio (Grid-connected side)”**

CT installation direction: The purchasing power is positive, and feed-in power is negative.

CT ratio calculation example: If CT specification is 200/5, the ratio should be 40.

- **“Meter 2 CT ratio (Generation side)”**

CT installation direction: The generation power is positive.

CT ratio calculation example: If CT specification is 200/5, the ratio should be 40.

- **“Three-phase balance setting”**

Three-phase Imbalance: Feed-in limitation priority. Each phase has feed-in limitation.

Three-phase balance: Max. production power priority. Total three-phase power cannot exceed set value. (Some phase may not achieve feed-in limitation function.)

Status

**Wizard**

DataLogger

System

### Feed-in Limitation Settings

**Working Mode Setting** Zero-Feed-In Mode ▾  
If grid feed-in is not allowed on site, please select Zero-Feed-In Mode  
If grid feed-in is allowed on site, please select Selling Power Limitation Mode

**Zero-Feed-In Power Setting (unit:W)** 0  
Setting 500W in this mode means that 500W is allowed to purchase and avoids low-power feed-in; Do Not set negative values (Default: 0).

---

**Number of inverter setting** 6  
Set according to the actual number of site inverters

---

**Meter 1 CT ratio (Grid-connected side)** 40  
CT installation direction: The purchasing power is positive, and feed-in power is negative.  
CT ratio calculation example: If CT specification is 200/5, the ratio should be 40.

---

**Meter 2 CT ratio (Generation side)** 40  
CT installation direction: The generation power is positive.  
CT ratio calculation example: If CT specification is 200/5, the ratio should be 40.

---

**Three-phase balance setting** Three-phase imbalance ▾  
Three-phase Imbalance: Feed-in limitation priority. Each phase has feed-in limitation.  
Three-phase balance: Max. production power priority. Total three-phase power cannot exceed set value. (Some phase may not achieve feed-in limitation function.)

---

Meter 1 Address	0
Meter 2 address	0
Inverter Address Settings Range (Recommended)	2-11

Back Next

4. Choose one of the WiFi or Ethernet connections according to actual needs. If using WiFi networking, select "Wireless connection"; If using Ethernet connection, select "Cable connection"; If there is no network on site, you can also choose "No network required".

Status	<b>Connection Settings:</b>  <input checked="" type="radio"/> Wireless connection <hr/> <input type="radio"/> Cable connection <hr/> <input type="radio"/> No network required  <div style="text-align: right;"><input type="button" value="Back"/> <input type="button" value="Next"/></div>
<b>Wizard</b>	
DataLogger	
System	

- Router name and password do not support \ , ; , = ' " characters.
- Only 2.4G WiFi is supported. 5G WiFi is not supported.
- Router DHCP function: ON.
- Router can connect to a network.
- Please confirm whether the firewall has network restrictions. If there is network restriction, please add the following domain names to whitelist: Domain name 1: access1.solarmanpv.com, port 10000. Domain name 2: access2.solarmanpv.com, port 10000. Domain name 3: access3.solarmanpv.com, port 10000.

**Wireless Mode:**

- A. Select the name of the router you want to connect to, and fill in the password.

Status

Wizard

DataLogger

System

**Please select your current wireless network:**

<input type="radio"/> Junt1L	78:d3:8d:ee:f0:aa	15%	7
<input type="radio"/> sharemelinkSML_2_4G	54:a7:03:0a:6d:f1	39%	7
<input type="radio"/> sharemelink_2.4G	f4:2a:7d:50:47:fc	24%	7
<input type="radio"/> HUAWEI_B311_0C05	e2:8d:42:05:0c:02	96%	9
<input type="radio"/> ChinaNet-EXNF	e8:84:c6:1e:6d:dc	55%	11
<input type="radio"/> 04:f1:69:2a:ab:f1 WPA2PSK/AES	0	BELOW%	11
<input type="radio"/> DQA	b0:cc:fe:de:ef:5c	20%	11
<input type="radio"/> SofarSolar-Guest	e8:13:6e:ae:45:c2	29%	13
<input type="radio"/> SofarSolar-Office	e8:13:6e:ae:45:c3	34%	13
<input type="radio"/> SofarSolar-Guest	e8:13:6e:ae:44:82	20%	13
<input checked="" type="radio"/> SofarSolar-Office	e8:13:6e:ae:44:83	29%	13

★Note: When RSSI of the selected WiFi network is lower than 15%, the connection may be unstable, please select other available network or shorten the distance between the device and router.

Refresh

---

**Add wireless network manually:**

Network name (SSID)   
(Note: case sensitive)

Encryption method

Encryption algorithm

Back Next

Status

Wizard

DataLogger

System

**Please enter the wireless network password:**

Password (8-64 bytes)   
(Note: case sensitive)

Re-enter password

Show Password

B. The default value for “automatically obtaining IP address” is “Enable”. Then, click “Next” go to the next step.

Status	<p><b>Please fill in the following information:</b></p> <p>Obtain an IP address automatically <input type="button" value="Enable"/> ▾</p> <p>IP address <input type="text" value="0.0.0.0"/></p> <p>Subnet mask <input type="text" value="0.0.0.0"/></p> <p>Gateway address <input type="text" value="0.0.0.0"/></p> <p>DNS server address <input type="text"/></p> <p><input type="button" value="Back"/> <input type="button" value="Next"/></p>
<b>Wizard</b>	
DataLogger	
System	

If you want to set a static IP, please select "Disable" and set it according to the actual setting requirements.

Status	<p><b>Please fill in the following information:</b></p> <p>Obtain an IP address automatically <input type="button" value="Disable"/> ▾</p> <p>IP address <input type="text" value="0.0.0.0"/></p> <p>Subnet mask <input type="text" value="0.0.0.0"/></p> <p>Gateway address <input type="text" value="0.0.0.0"/></p> <p>DNS server address <input type="text"/></p> <p><input type="button" value="Back"/> <input type="button" value="Next"/></p>
<b>Wizard</b>	
DataLogger	
System	

C. If you have encrypted your WiFi in section 7.2 WiFi encryption, please click "Next" and "Cancel". Then, you can click "OK" and wait for the logger to

restart.

## Enhance Security

You can enhance your system security by choosing the following methods

Hide AP

Change the encryption mode for AP

Change the user name and password for Web server

Back

Next

10.10.100.254

1

Note: AP is not encrypted, which will bring security risks. Do you need to encrypt now?

OK

Cancel

Status	<h3>Configuration completed!</h3> <p>Click OK, the settings will take effect and the system will restart immediately.</p> <p>If you leave this interface without clicking OK, the settings will be ineffective.</p> <p><a href="#">Back</a> <a href="#">OK</a></p>
<b>Wizard</b>	
DataLogger	
System	

**Wired Mode:**

A. You can select “Cable connection” on the Wired page.

Status	<h3>Connection Settings:</h3> <p><input type="radio"/> Wireless connection</p> <hr/> <p><input checked="" type="radio"/> Cable connection</p> <hr/> <p><input type="radio"/> No network required</p> <p><a href="#">Back</a> <a href="#">Next</a></p>
<b>Wizard</b>	
DataLogger	
System	

B. The default “Automatically Obtain IP Address” is “Enable”. Then, click “Next” go to the next step.

Status	<p><b>Please fill in the following information:</b></p> <p>Obtain an IP address automatically <input type="button" value="Enable"/> ▼</p> <p>IP address <input type="text" value="0.0.0.0"/></p> <p>Subnet mask <input type="text" value="0.0.0.0"/></p> <p>Gateway address <input type="text" value="0.0.0.0"/></p> <p>DNS server address <input type="text"/></p> <p><input type="button" value="Back"/> <input type="button" value="Next"/></p>
<b>Wizard</b>	
DataLogger	
System	

If you want to set a static IP, please select “Disable” and set it according to the actual setting requirements.

Status	<p><b>Please fill in the following information:</b></p> <p>Obtain an IP address automatically <input type="button" value="Disable"/> ▼</p> <p>IP address <input type="text" value="0.0.0.0"/></p> <p>Subnet mask <input type="text" value="0.0.0.0"/></p> <p>Gateway address <input type="text" value="0.0.0.0"/></p> <p>DNS server address <input type="text"/></p> <p><input type="button" value="Back"/> <input type="button" value="Next"/></p>
<b>Wizard</b>	
DataLogger	
System	

C. If you have encrypted your WiFi in section 7.2 WiFi encryption, please click "Next" and "Cancel". Then, you can click "OK" and wait for the logger to restart.

The screenshot shows a configuration window titled "Enhance Security". It contains three options, each with a checkbox:

- Hide AP
- Change the encryption mode for AP
- Change the user name and password for Web server

Below these options are "Back" and "Next" buttons. A dialog box is overlaid on the "Next" button, displaying the IP address "10.10.100.254" and the message: "Note: AP is not encrypted, which will bring security risks. Do you need to encrypt now?". The dialog box has "OK" and "Cancel" buttons. A blue line with the number "1" points to the dialog box.

Status	<p><b>Configuration completed!</b></p> <p>Click OK, the settings will take effect and the system will restart immediately.</p> <p>If you leave this interface without clicking OK, the settings will be ineffective.</p> <p><a href="#">Back</a> <a href="#">OK</a></p>
<b>Wizard</b>	
DataLogger	
System	

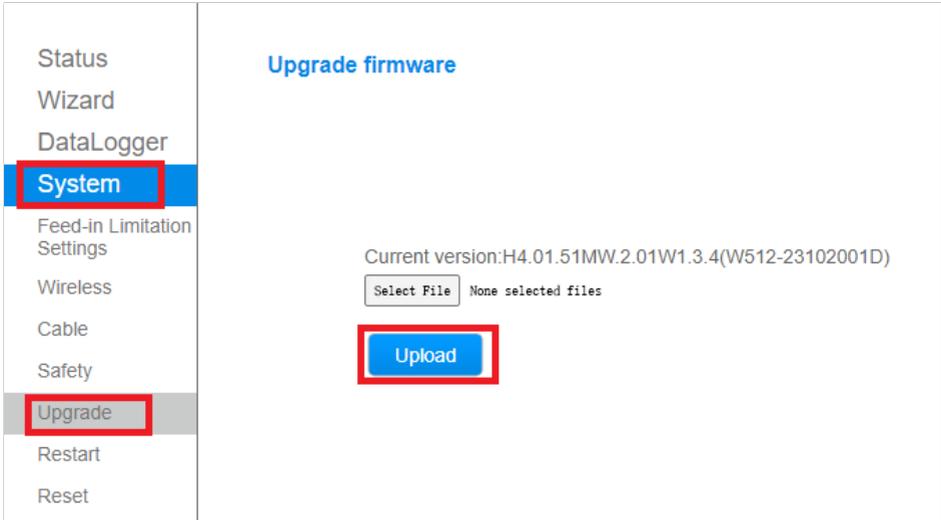
**No Network Required:**

You can click "OK" and wait for the logger to restart.

Status	<p><b>Configuration completed!</b></p> <p>Click OK, the settings will take effect and the system will restart immediately.</p> <p>If you leave this interface without clicking OK, the settings will be ineffective.</p> <p><a href="#">Back</a> <a href="#">OK</a></p>
<b>Wizard</b>	
DataLogger	
System	

## 7.4 Firmware Upgrade

1. Before firmware upgrade, please scan the QR code of the product file on the last page of this user manual to download the latest firmware resources.
2. Log in to the local web page (please refer to section 7.1 of this user manual for login user name and password), and click “Upgrade” in “System”, as shown in the following figure. Click “Select File” and select the firmware resource you downloaded in step 1.



3. Click “Upload” on the above page, and then click “OK” when the confirmation dialog box pops up.

- The firmware upgrade should be imported on sunny day.
- In upgrade progress, the power and network connection between SAR-100 and the router should be stable, and with good wireless signal.
- Once the upgrade is complete, please log in again and recheck the firmware version on the System Information screen.

# 8 Instruction for Indicator Light, Dial Switch and Reset Button

## 8.1 Indicator Light

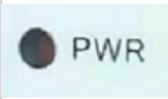
You can check the status of STATUS light, LINK light, 485/422 light after DIN-Rail logger connected to the device and networking is normal.

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

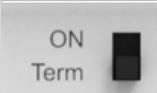
Light	Implication	Instruction
STATUS 	Logger working status	1.OFF : DIN-Rail logger works abnormally. 2.ON : DIN-Rail logger works normally. 3.ON after 5s : DIN-Rail logger starts/re-starts.
LINK 	Logger running status	1.Flashing: DIN-Rail logger heartbeat status normal.
485/422 	Communication status with logger and inverter	1.ON/Fast Flash : DIN-Rail logger connected to inverter and communicate normally. 2.OFF: DIN-Rail logger not connected to inverter and communicate abnormally.

## 8.2 Relay Light

Light	Implication	Instruction
 TXD	RS485 IN	1.OFF : No data transmission 2.Flash : Data transmitting 3.ON : Abnormal
 RXD	RS485 OUT	1.OFF : No data transmission 2.Flash : Data transmitting 3.ON: Abnormal

Light	Implication	Instruction
	Power	1.ON : Normal power-on 2.OFF : Fail to power on

### 8.3 DIN-Rail Logger Switch

Light	Implication	Instruction
	RS485 terminal 120Ω matching resistance switch	Default: Term

### 8.4 DIN-Rail Logger Reset Button

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

# 9 SOLARMAN Monitoring

If the SAR-100 is only used for feed-in limitation purpose, networking is not required, you can skip this step directly.

## 9.1 Register

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>. The web operation procedure is similar to the APP operation procedure described below.



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>. The web operation procedure is similar to the APP operation procedure described below.

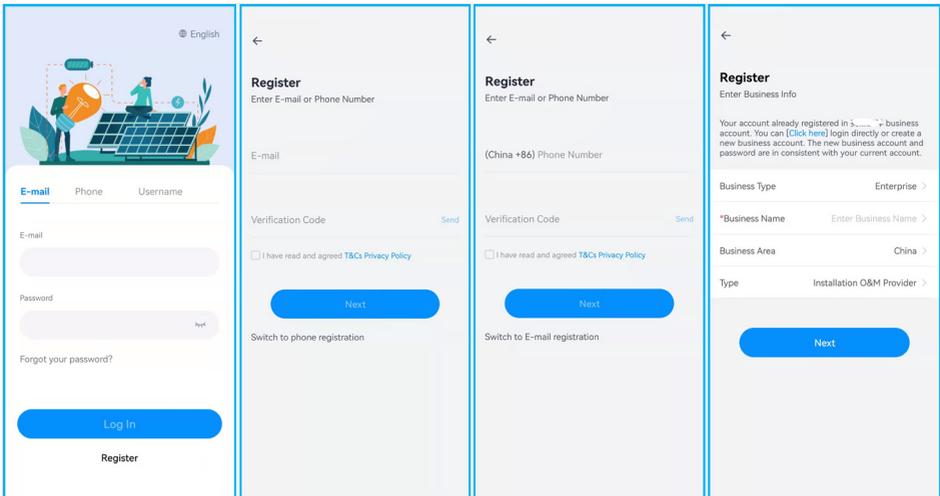


## 9.2 SOLARMAN Business APP

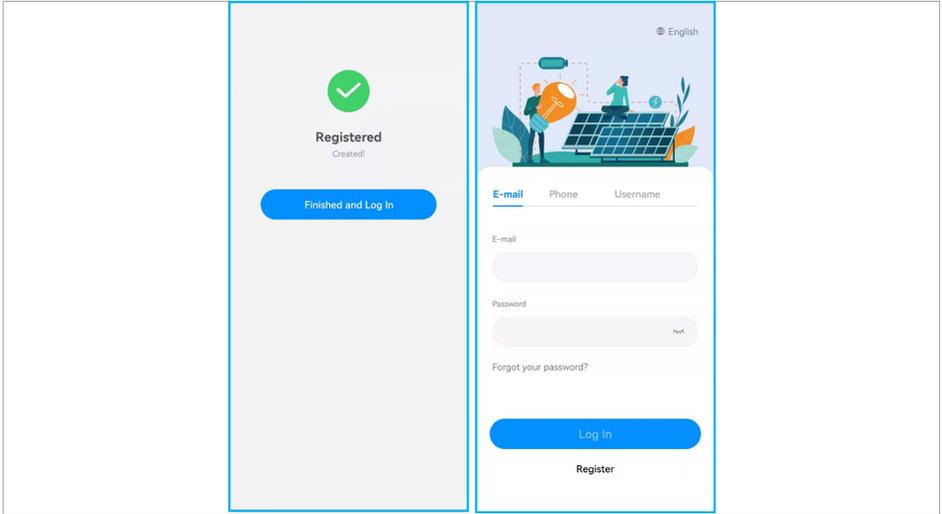
### 1. Registration:

1. You can go to SOLARMAN Business APP and click “Register”.
2. You can choose either E-mail registration or phone number registration.
3. You can fill in the email or phone number, and then fill in the verification code after choosing the registration method.
4. You can tick “T&Cs”, click “Next”, select “Business Type”, enter “Business Name”, select “Business Area” and select “Type”.
5. You can click “Next”.

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

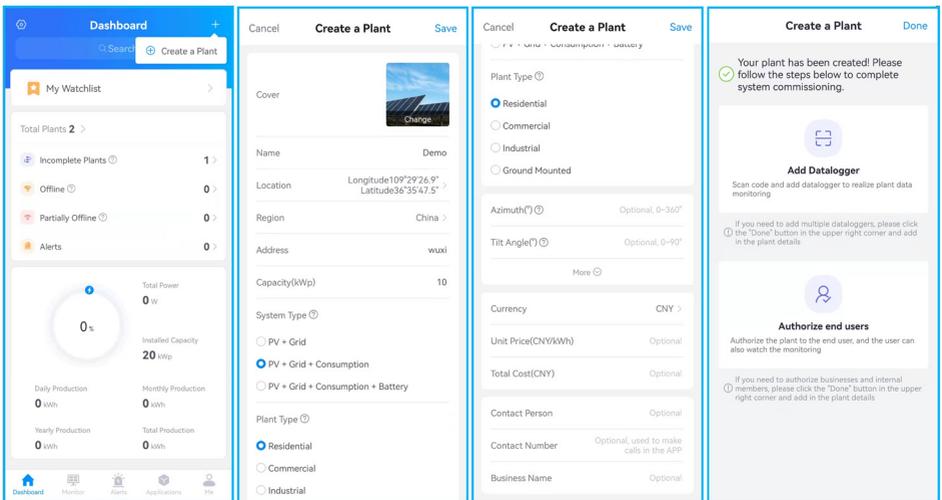


Then, the following page will display and click “Finished and Log In” to return to login page. Enter information and click “Log In”.



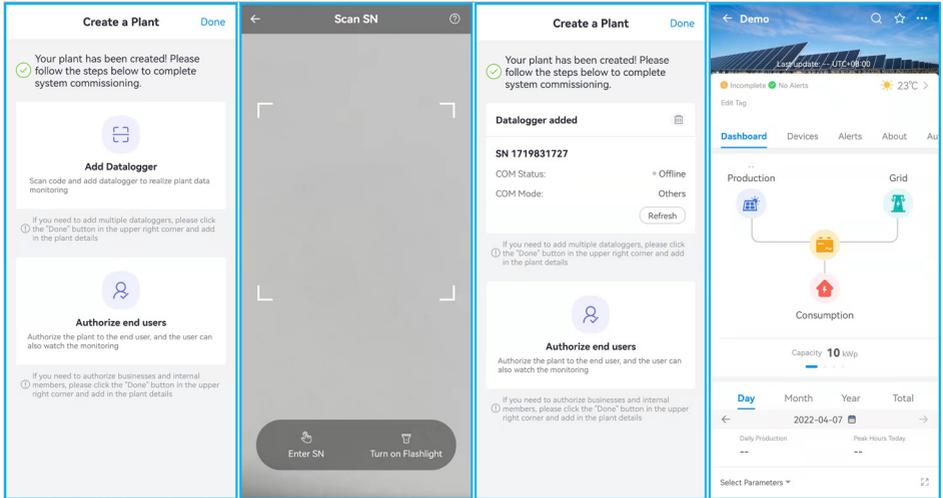
## 2. Create a plant:

1. You can click “+” in the upper right corner, and select “Create a Plant” and enter plant information.
2. You can select system type as “PV+ Grid+ Consumption”. Finally, you can click “Save”.

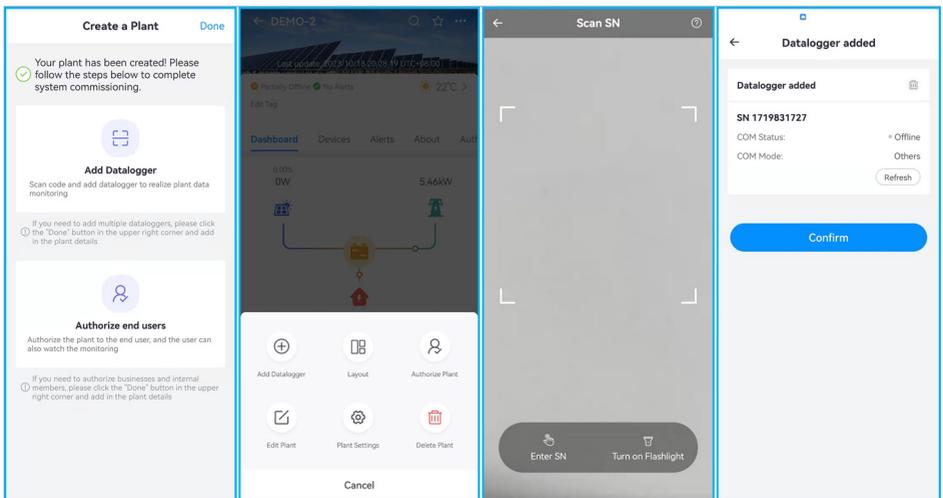


### 3. Add a logger:

1. You can click “Add Data logger”, and enter SN manually or scan bar code.
2. You can click “Done” to go to “Dashboard” page.



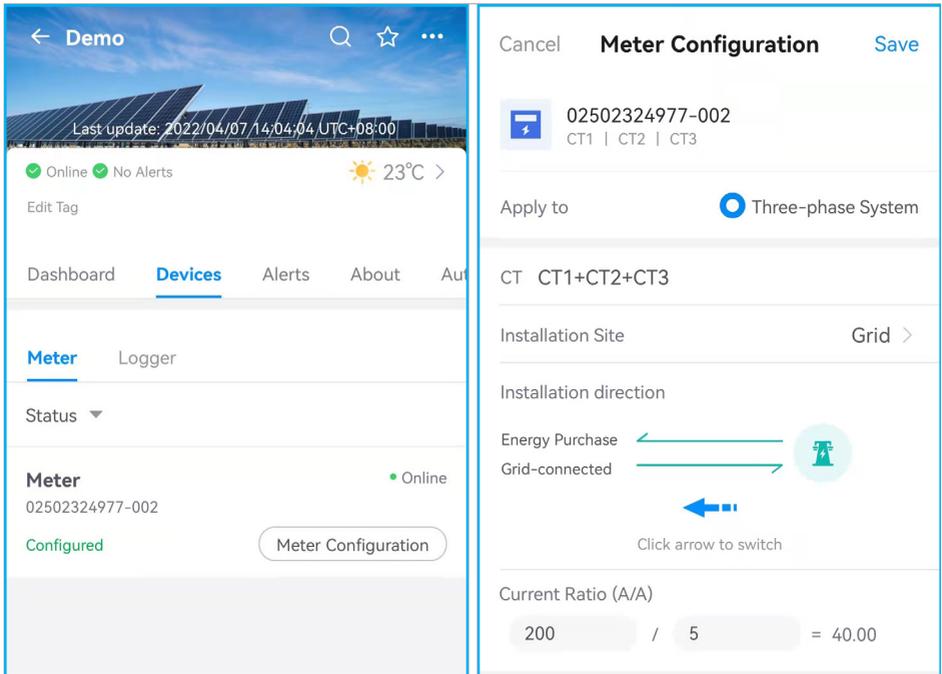
Another way to add a data logger: You can click “...” in the upper right corner in “Dashboard” page, and click “Add Data logger”. Then, you can enter SN manually or scan bar code. Finally, you can click “Confirm”.



Data logger SN will be displayed in the device list after 10 minutes.

### 4 . Meter configuration:

1. You can click “Devices” to go to “Devices” page, and choose target meter.
2. You can click “Meter configuration” to go to “Meter configuration” page, and select “Grid”.
3. You can click a blue arrow in CT direction and change to “Energy Purchase”.
4. Current ratio can set according to CT specification. (e. g. If you choose 200/5A CT, set current ratio as 200/5).
5. You can click “Save” to return to “Devices” page. (System will use three-phase/single-phase system in default).

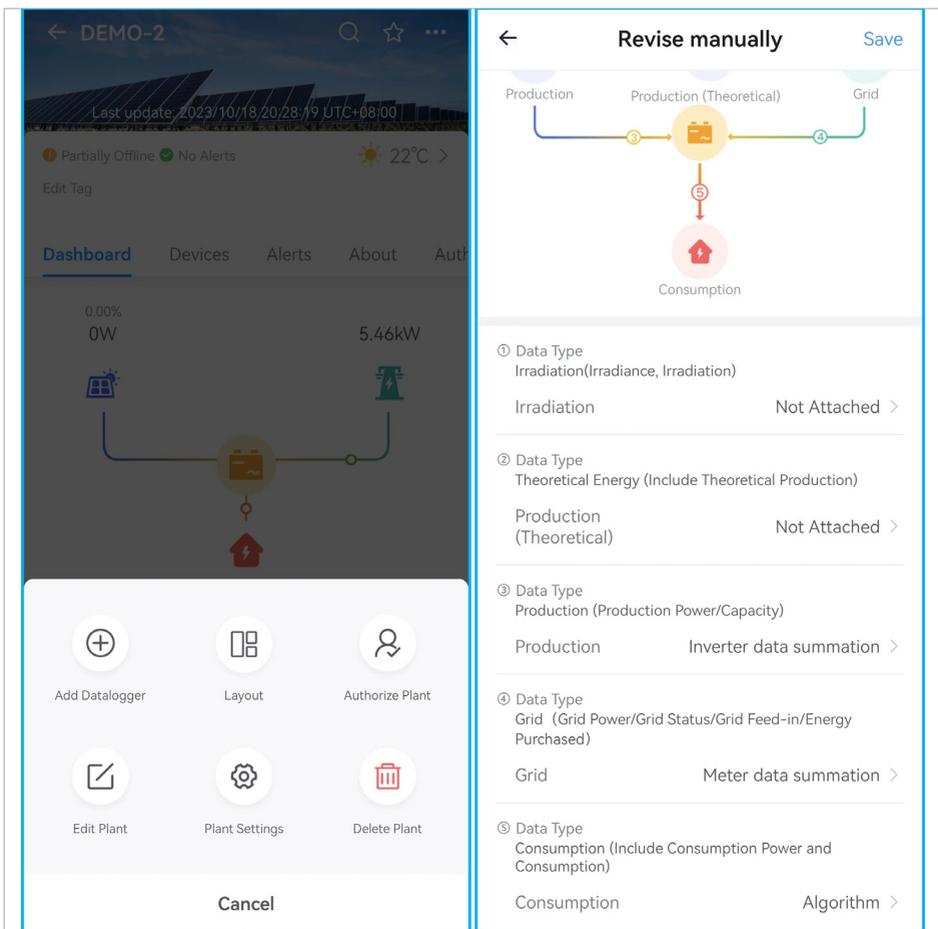


## 5 . Plant Settings:

Set power calculation method, data sourcing and non-operating hours

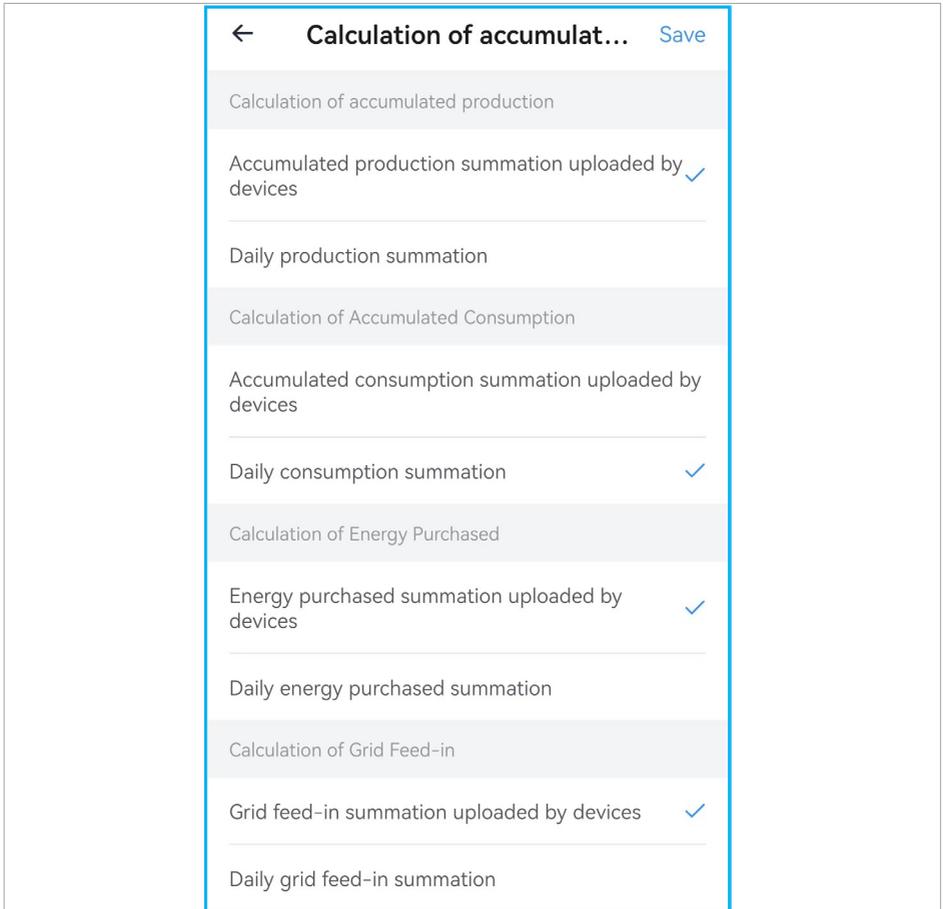
### Data sourcing

1. You can click “...” in the upper right corner in “Dashboard” page, and click “Plant Settings”.
2. You can click “Data sourcing” and select “Manual Revise”.
3. You can select “Inverter data summation” for production, select “Meter data summation” for grid and select “Algorithm” for consumption.
4. You can click “Save”.



### Calculation of accumulated electricity Setting

1. You can click “Calculation of accumulated electricity Setting”.
2. You can select “Accumulated production summation uploaded by devices” for calculation of accumulated production.
3. You can select “Daily consumption summation” for calculation of accumulated consumption.
4. You can select “Energy purchased summation uploaded by devices” for calculation of energy purchased.
5. You can select “Grid feed-in summation uploaded by devices” for calculation of grid feed-in.
6. You can click “Save”.



## Plant Non-Working hours Setting

1. You can click “Non-operating hours settings” and enable it.
2. You can select “From sunrise to sunset” for Effective time.
3. You can click “Save”.

You can set the time according to actual situation.

← **Plant Non-Working Time...** Save

The plant non-working time setting is only used to solve the problem that the plant with the grid type of "self-consumption" cannot calculate the electric power or grid power through algorithms because the inverter does not work at night.

On

Effective Time

From Sunset to Sunrise  Customized Time

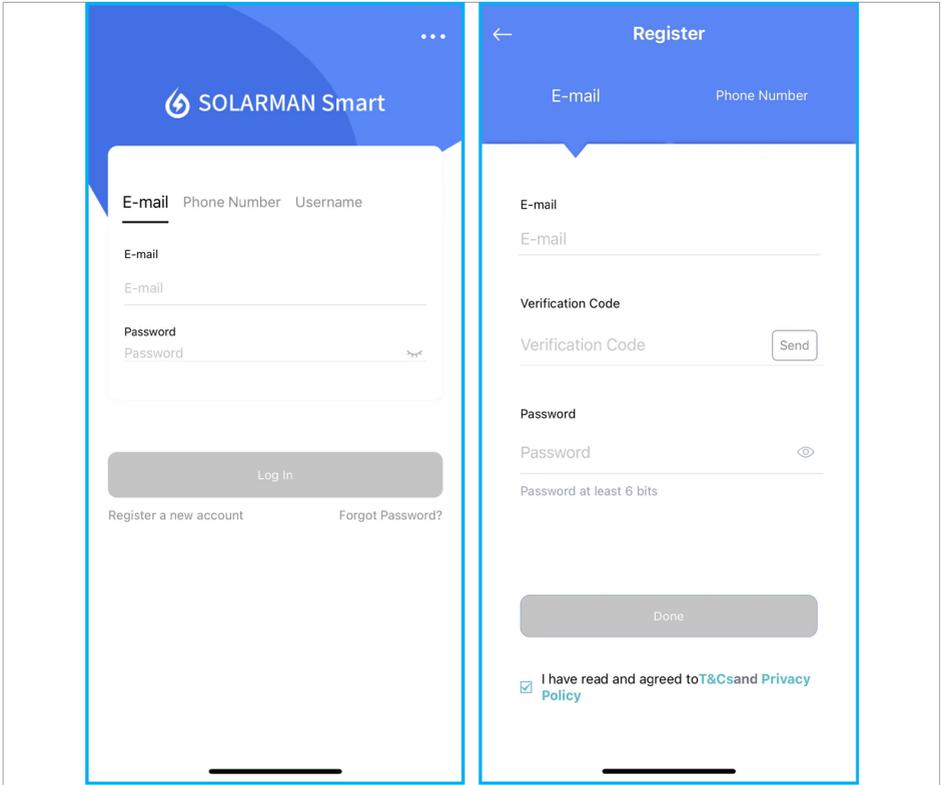
If there is no production power within 1 hour before sunset and 1 hour after sunrise, the system will also automatically make the production power to zero.

**Back to plant details to check data.**

## 9.3 SOLARMAN Smart APP

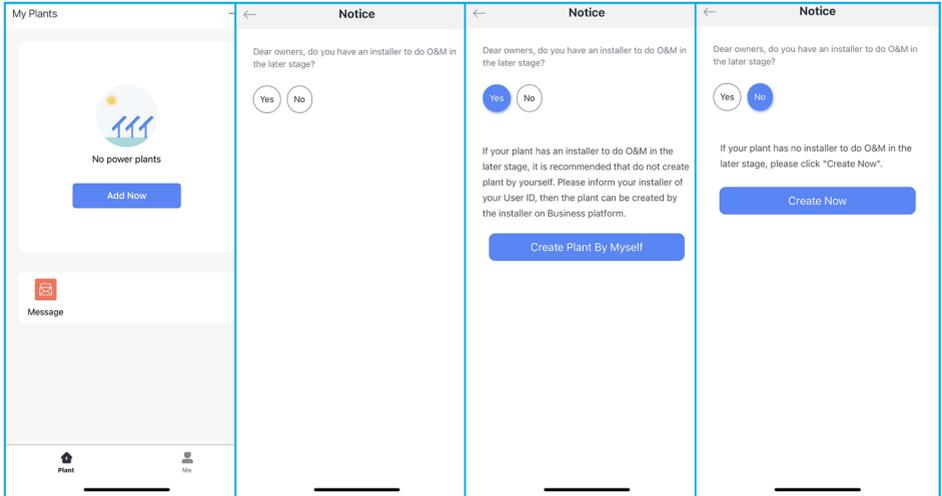
### 1.Registration:

You can go to “SOLARMAN Smart APP” and click “Register a new account” and select “E-mail” or “Phone Number” to register.

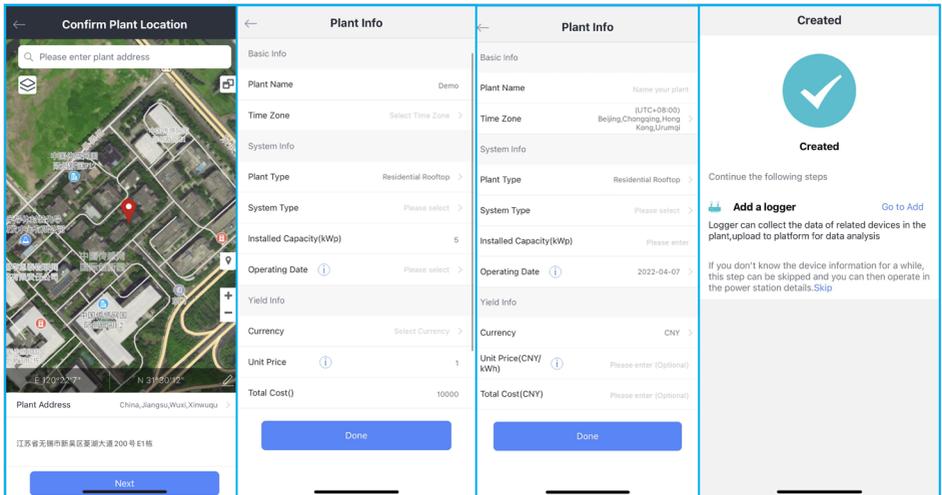


## 2. Create a plant:

You can click "Add Now". Choose "Yes" to select "Create Plant By Myself". Choose "No" to select "Create Now".

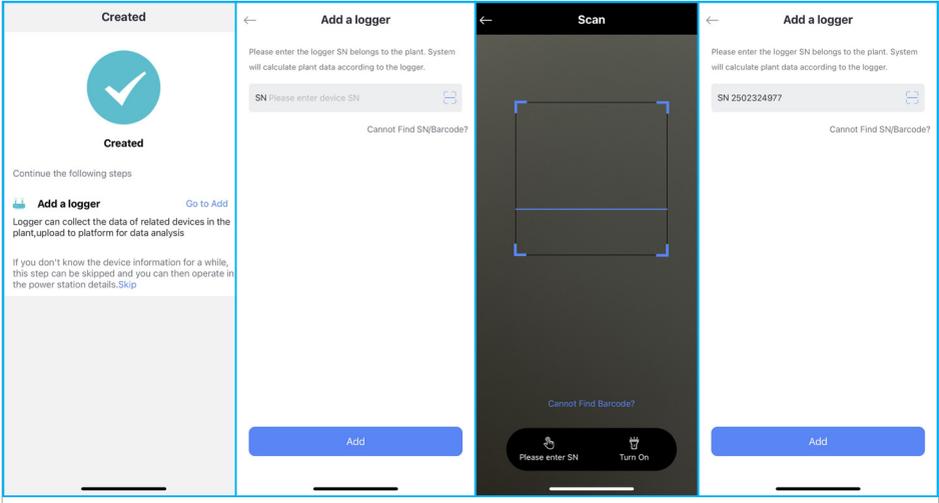


You can select plant location automatically or enter plant location manually. Then you can click “Next”. Please select “System type” as “Self-consumption”. Finally, you need to enter plant information here, and click “Done” to complete.

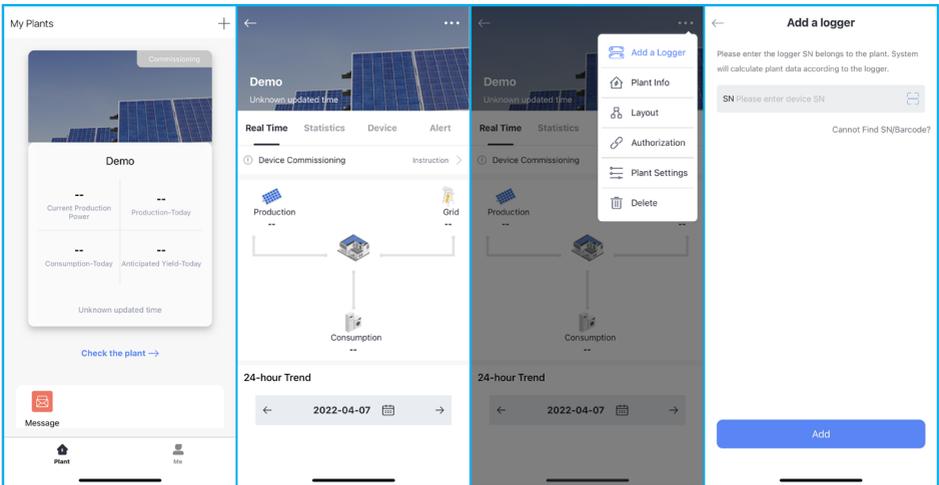


### 3. Add a logger:

You can click “Add a logger”. Then, you can enter SN manually or scan bar code. Finally, you can click “A

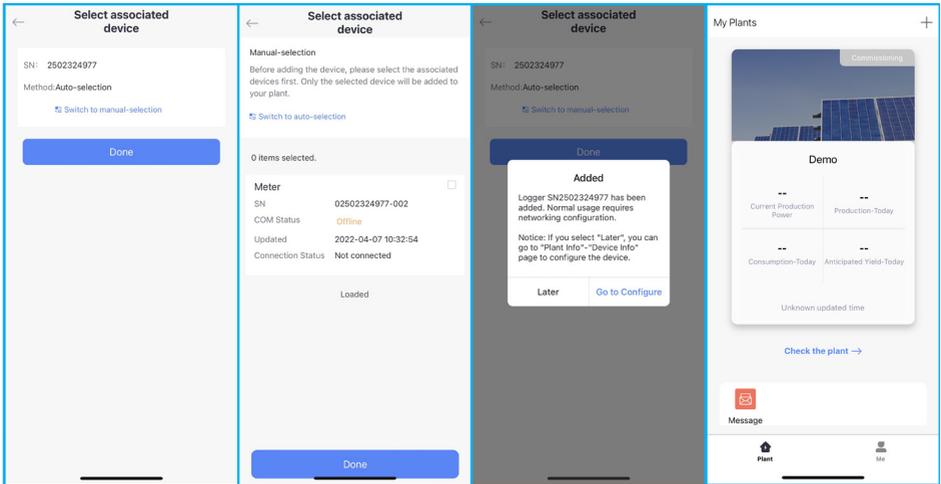


**Another way to add a data logger:** You can click “Skip” to return “home” page and click on the name of the plant you just created. Then, you can go to the “Real Time” page and click “...” in the upper right corner. Finally, you can click “Add a logger” and enter SN manually or scan bar code.



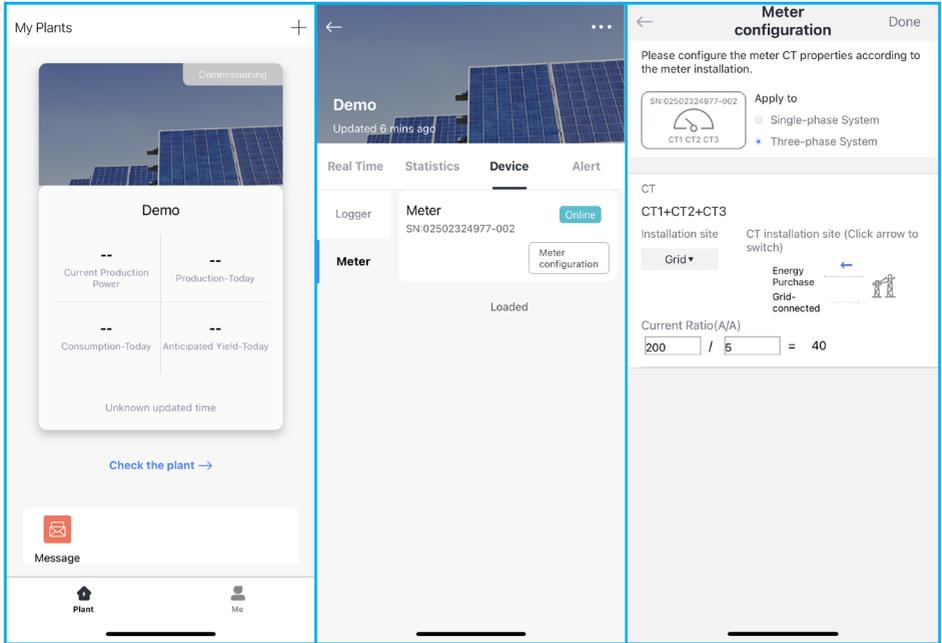
**Select associated device:** The system will go to “Select associated device” after the logger is added. You can click “Done” if you will not change associated method. If you are going to change associated method, you can click “Switch to manual-selection”.

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



### 4. Meter configuration:

1. You can click on the name of the plant you just created (If you are in plant details page, you can click "Device" directly).
2. You can click "Meter" on the "Device" page to enter the "Meter" page.
3. You can click "Meter configuration" and select "Three-phase System" and "Grid" in the "Meter configuration" page.
4. You can click a blue arrow in CT direction and change to "Energy Purchase".
5. Current ratio can set according to CT specification. (e. g. If you choose 200/5A CT, set current ratio as 200/5).
6. You can click "Save" to return to "Devices" page. (System will use three-phase/single-phase system in default).

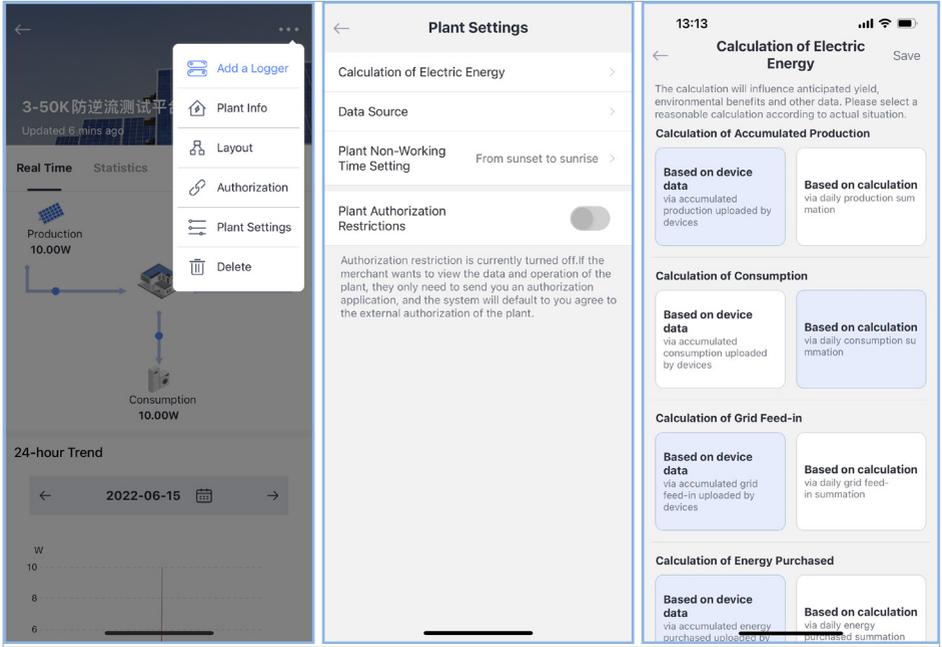


## 5. Plant Settings:

Set power calculation method, data sourcing and non-operating hours

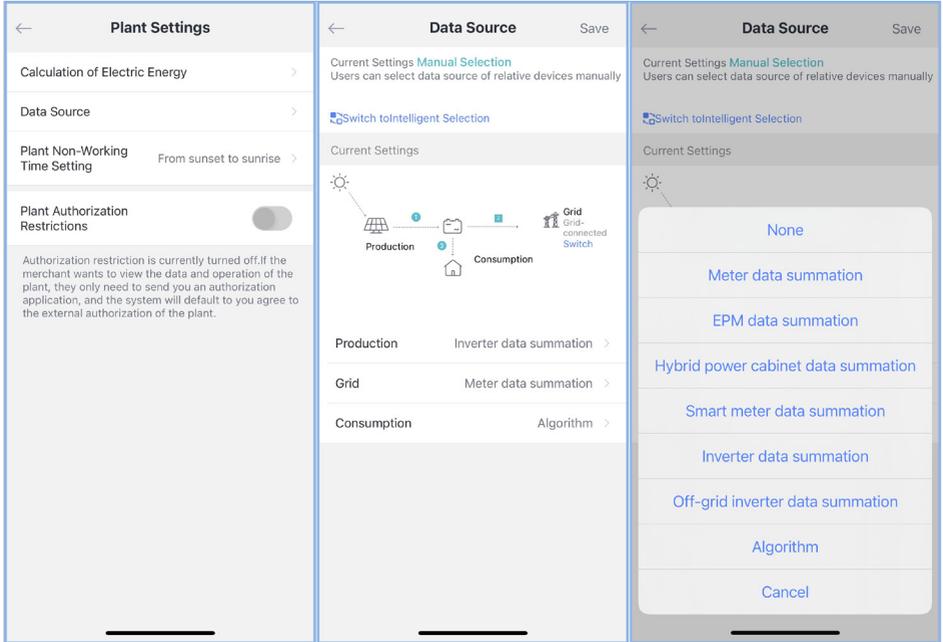
### 1. Power calculation method

- a. You can click “...” in the upper right corner and select “Plant Settings”.
- b. You can click “Calculation of Electric Energy” in the plant settings page.
- c. You can set “Based on device data” for calculation of accumulated production, set “Based on calculation” for calculation of consumption, set “Based on device data” for calculation of grid feed-in, set “Based on device data” for calculation of energy purchased. You can click “Save”.
- d. You can click “Save”.



2. Data sourcing

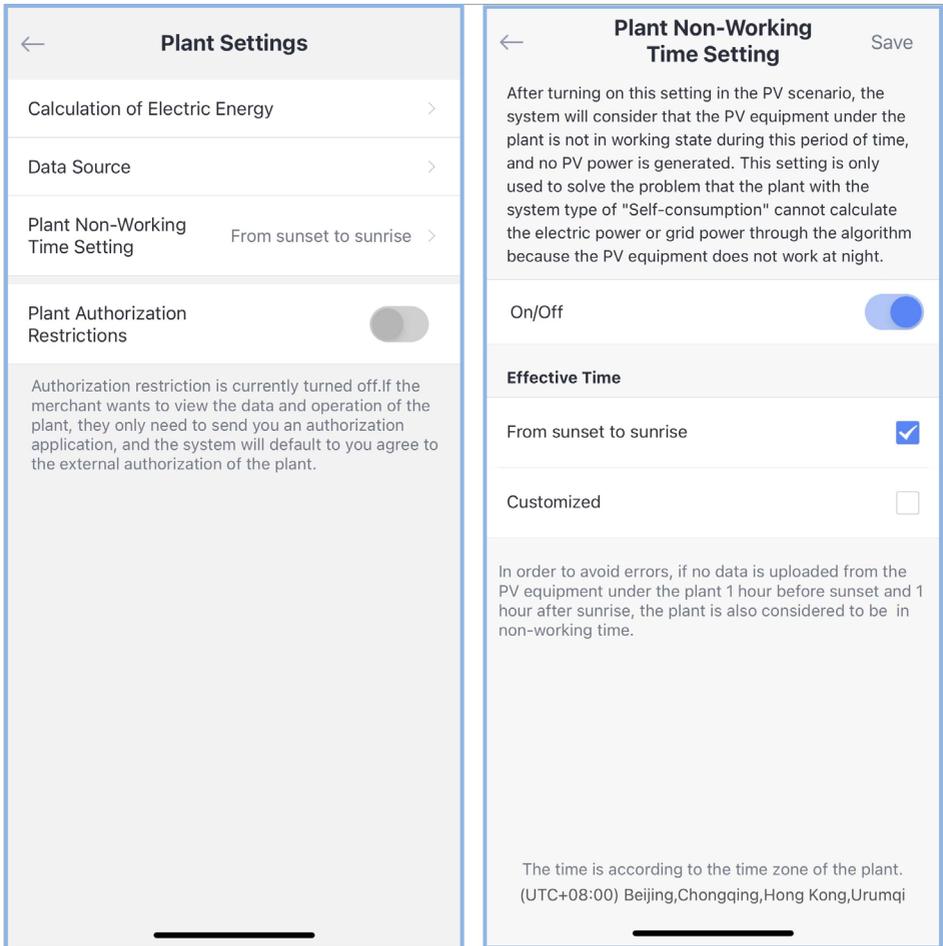
- a. You can click “Data sourcing” in the plant settings page.
- b. You can click “Switch to manual-selection”.
- c. You can select “Grid-tie” for grid side, select “Inverter data summation” for production, select “Meter data summation” for grid and select “Algorithm” for consumption in the manual-selection page.
- d. You can click “Save”.



3. Non-operating hours

- a. You can click “Non-operating hours settings” and enable it.
- b. You can select “From sunrise to sunset” for Effective time.
- c. You can click “Save”.

You can set the time according to actual situation.



4. Back to plant details to check data.

# 10 Q&A

Q: What should I do if the web page prompts CT installation direction wrong?

A: Please turn on the load first. If after turning on the load, the page still prompts CT installation direction wrong. Please reverse the CT installation direction. .

Q: What should I do if the web page prompts RS485 communication stability abnormal?

A: Make sure the RS485 is using daisy-chain method and the RS485 terminals of each inverter are connected correctly.

Q: How to judge whether the feed-in limitation is effective?

A: Login to Solarman APP. When the sun is strong, the power of generation would be limited to a specified value according to setting on the local web pages.

Q: How to check if the feed-in limitation is not working properly?

A: Make sure each terminal is tightly pressed and will not be loosened; make sure there is no abnormal prompt in status page; set CT ratio correctly; set number of inverters correctly.

Q: Feed-in Limitation box is offline.

A: It is recommended that you use an Ethernet cable to connect the SAR-100 to the router and check that the router's Internet access is functioning properly. Please confirm whether the firewall has network restrictions. If there is network restriction, please add the following domain names to whitelist: Domain name 1: access1.solarmanpv.com, port 10000. Domain name 2: access2.solarmanpv.com, port 10000, Domain name 3: access3.solarmanpv.com, port 10000.

# 11 Contact US

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Product documents



After-sales service



ENERGY TO POWER YOUR LIFE

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