eManager

SMART ENERGY CONTROLLER

USER MANUAL

Preface

Thank you for choosing SAJ products. We are pleased to provide you first-class products and exceptional service.

This manual provides information about installation, operation, maintenance, troubleshooting and safety. Please follow the instructions of this manual so that we can ensure delivery of our professional guidance and whole-hearted service.

Customer-orientation is our forever commitment. We hope this document proves to be of great assistance in your journey for a cleaner and greener world.

We make constant improvements on the products and their documentation. This manual is subject to change without notice; these changes will be incorporated in new editions of the publication. To access the latest documentation, visit the SAJ website at https://www.saj-electric.com/.

Guangzhou Sanjing Electric Co., Ltd.

TABLE OF **CONTENTS**

1. About this Document

1.1. Application scope

This user manual provides instructions and detailed procedures for installing, operating, and maintaining the SAJ product:

- eManager
- eManager-Pro (eManager with a Pro-Mate module)

1.2. Safety

CAUTION:

ONLY qualified and trained electricians who have read and fully understood all safety regulations contained in this manual can install, maintain, and repair the equipment. Access to the equipment is by the use of a tool, lock and key, or other means of security.

1.3. Safety levels

DANGER
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Indicates a hazardous condition which, if not avoided, could result in minor or moderate injury.

NOTICE
Indicates a situation which, if not avoided, can result in property damage.

1.4. Symbol explanation

Symbol	Description
	**Dangerous electrical voltage** This device is directly connected to public grid, thus all work to the device shall only be carried out by qualified personnel.
	No open flames Do not place or install near flammable or explosive materials.
	**Attention: Install the product out of reach of children.**
	**This device shall NOT be disposed of in residential waste.**
	**CE Mark** Equipment with the CE mark fulfills the basic requirements of the Guideline Governing Low-Voltage and Electro-magnetic Compatibility.
	**Recyclable**
	**Avoid liquid or moisture**

1.5. Safety instructions

Keep the manual for future reference.

To prevent personal injury and property damage and to ensure long-term operation of the product, be sure to read all the safety instructions in this section carefully prior to any works and observe the appropriate rules and regulations of the country or region where you install the device.

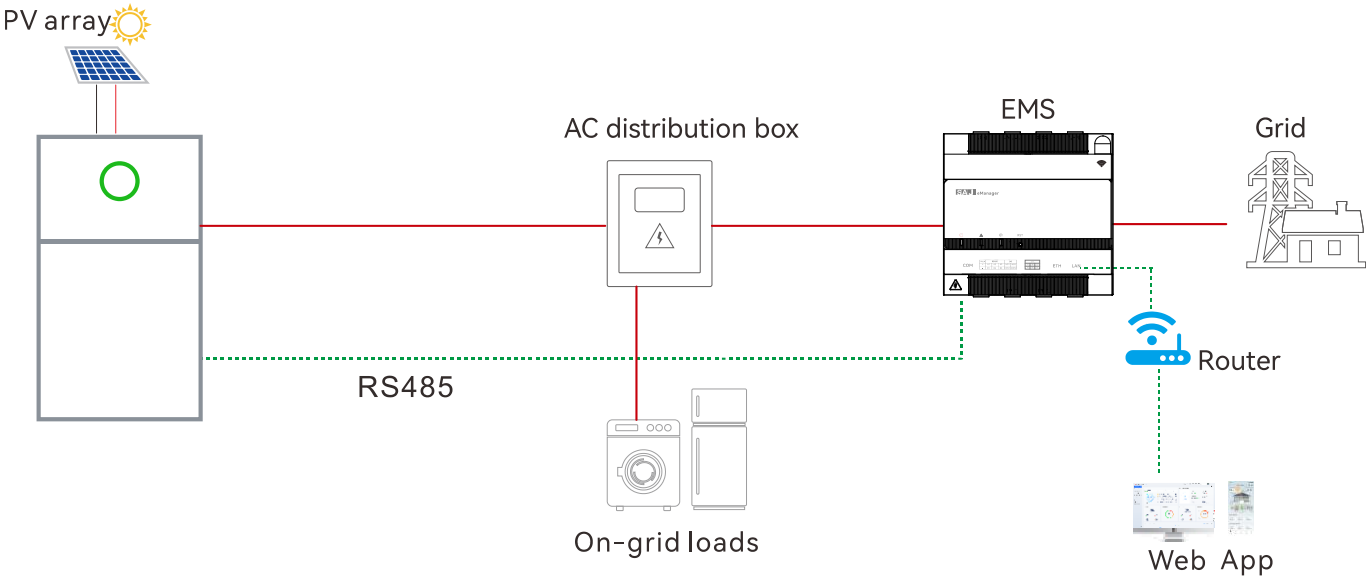
1.6. Safe handling

The product has been designed and tested strictly in accordance with international safety regulations. As an electrical and electronic equipment, it must be installed, commissioned, operated, and maintained in strict accordance with related safety instructions. Incorrect operation or misuse of this device may cause personal injury or device damage. This will void the limit warranty and SAJ will not be responsible for the loss caused by those behaviors.

- The eManager must be installed and maintained by authorized technicians based on local laws and regulations.
- Before installing or maintaining the eManager, make sure that it is disconnected from the grid.
- When the eManager is working, do not touch the internal component or cable to avoid electric shock.
- Before replacing an internal component within the eManager, make sure that the eManager is disconnected from the grid and the new component meets the usage requirement.
- When the eManager is working, do not plug in or out the cables.
- Make sure that the AC input voltage and current are compatible with the rated voltage and current of the eManager; otherwise, components might be damaged, or the device cannot work properly.

2. Product Information

2.1. Application topology diagram



2.2. Main features

SAJ eManager smart communication device (hereinafter called the eManager) is applied to the photovoltaic (PV) energy storage system (ESS). It can:

- Manage Energy scheduling: schedule the energy to the loads, batteries, and the grid based on user requirements.
- Provide same functions as the smart meter: power monitoring and energy metering.
- Collect and transmit data of inverters, batteries, and other equipment.

In addition, it provides the following functions:

- Smart and flexible support
  - Support for RS485, Ethernet, Wi-Fi, and Bluetooth communication
  - Support for communication and monitoring on a maximum of six hybrid inverters or ten solar inverters
- Convenient operation and maintenance

- Easy installation
- 24-hour local and remote monitoring
- Remote operation: PV-plant maintenance on App or Web

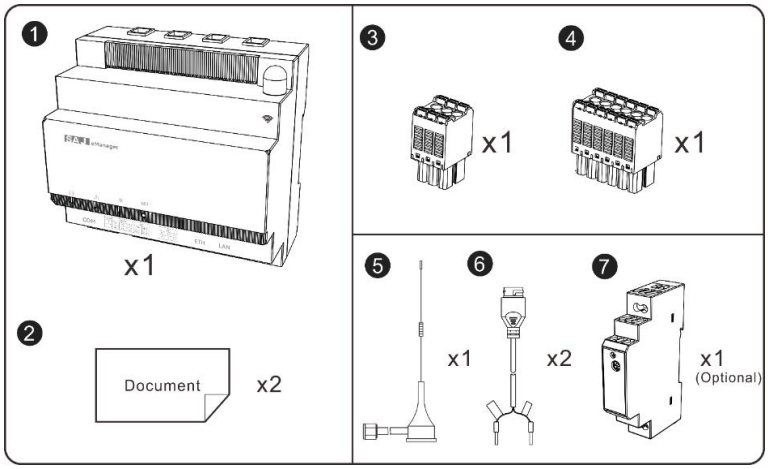
Working with the Pro-Mate module, SAJ eManager-Pro provides extra support:

- Demand response mode (DRM) connection in Australia and New Zealand
- Ripple control receiver (RCR) connection in Germany
- 4G communication

Working with the AC-DC power supply module, if the eManager needs to work during the off-grid time, the ESS can provide the power supply to the eManager.

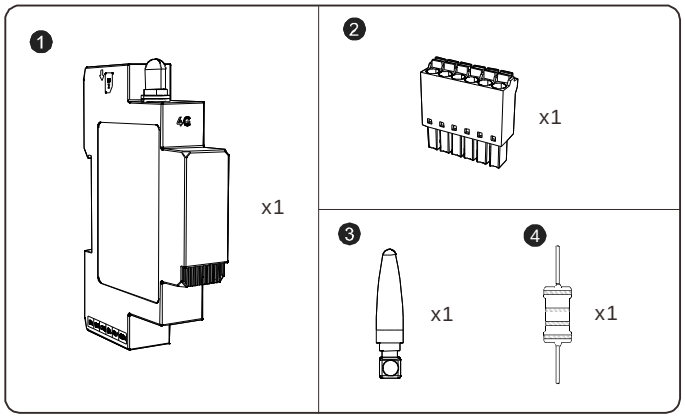
2.3. Package contents

2.3.1. eManager



Callout	Description	Quantity	Callout	Description	Quantity
❶	eManager	1	❷	Quick Guide	1
❸	6-pin connector	1	❹	12-pin connector	1
❺	Antenna	1	❻	Communication cable	2
❼	AC-DC power supply module (optional)	1	/	/	/

2.3.2. Pro-Mate

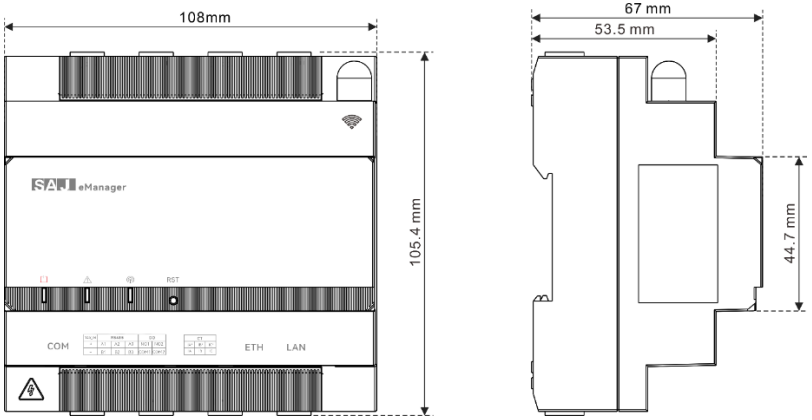


Callout	Description	Quantity	Callout	Description	Quantity
❶	Pro-Mate	1	❷	6-pin connector	1
❸	Antenna	1	❹	15 kΩ resistance	1

2.4. Product dimension

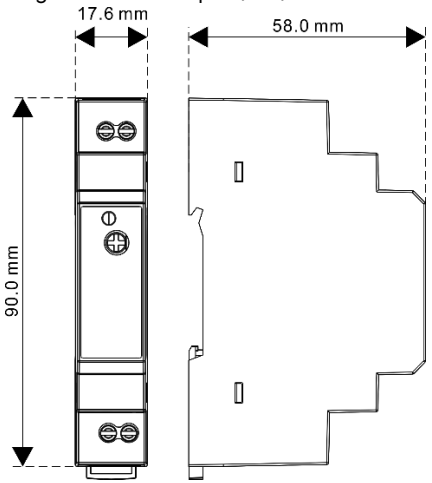
2.4.1. eManager

Height x Width x Depth (mm): 105.4 x 108 x 67



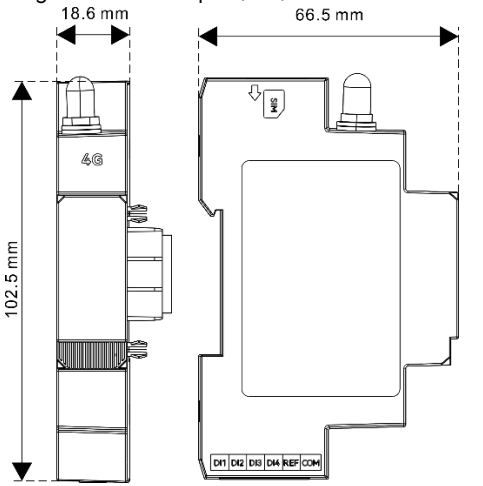
2.4.2. AC-DC power supply module

Height x Width x Depth (mm): 90 x 17.6 x 58

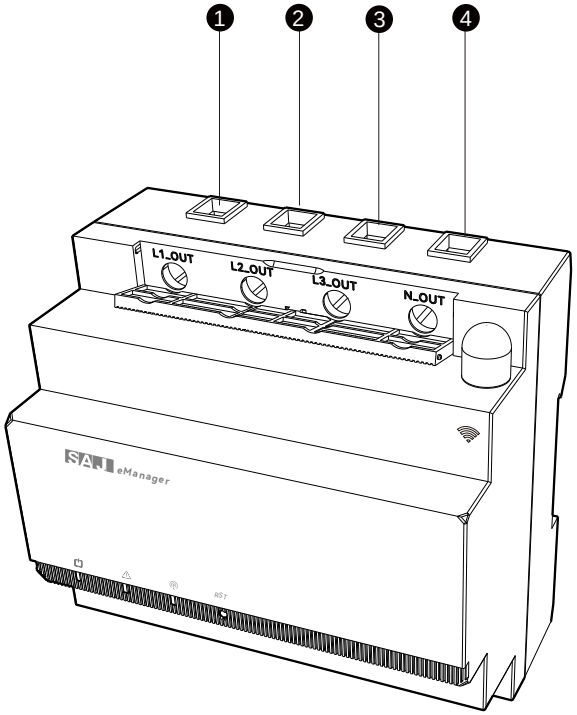


2.4.3. Pro-Mate module

Height x Width x Depth (mm): 102.5 x 18.6 x 66.5

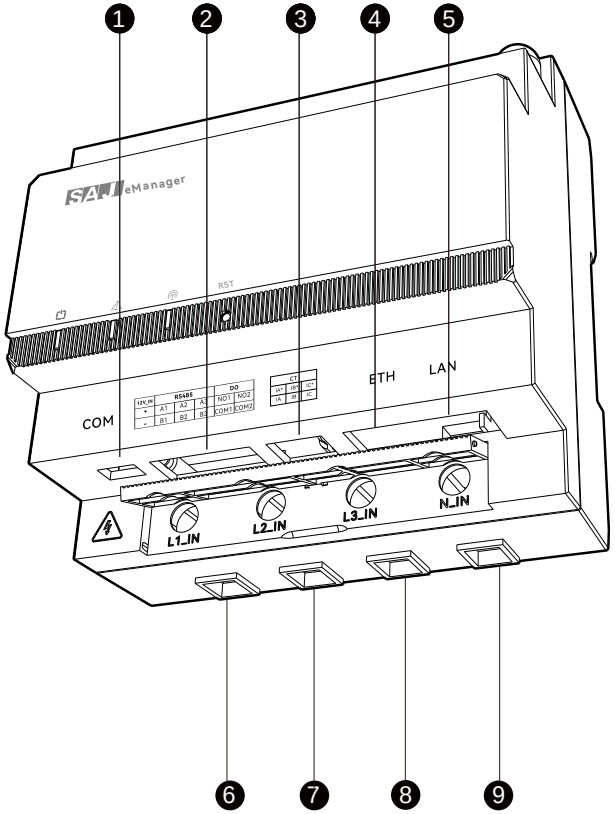


2.5. Upper view



Callout	Name	Description
❶	L1_OUT	ONLY applicable in internal CT connection scenario. For connecting the AC power cable for grid phase L1 and supplying power to loads.
❷	L2_OUT	ONLY applicable in internal CT connection scenario. For connecting the AC power cable for grid phase L2 and supplying power to loads.
❸	L3_OUT	ONLY applicable in internal CT connection scenario. For connecting the AC power cable for grid phase L3 and supplying power to loads.
❹	N_OUT	ONLY applicable in internal CT connection scenario. For connecting the AC power cable for grid phase N and supplying power to loads.

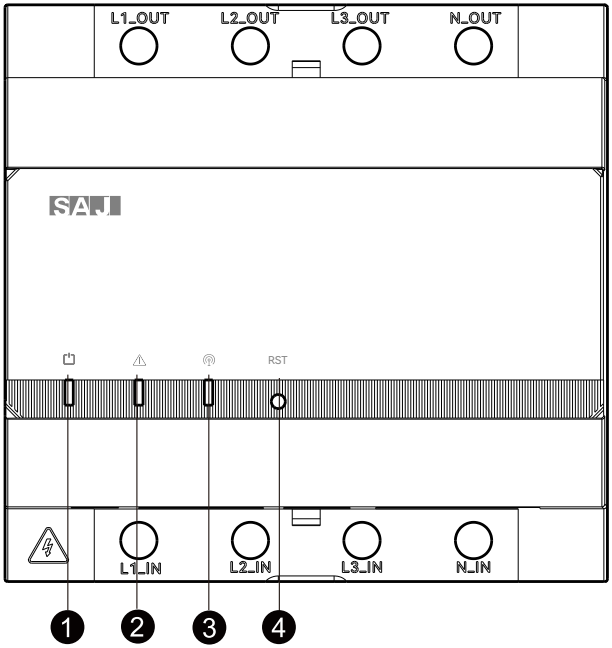
2.6. Bottom view



Callout	Name	Description
❶	COM	For debugging in maintenance.
❷	12V_IN+ and 12V_IN-	Input ports for eManager backup power supply. For connecting to the DC output of the AC-DC power supply module.
	RS485 A1 and RS485 B1 RS485 A2 and RS485 B2 RS485 A3 and RS485 B3	For communication with the inverter(s). **Notes:** ● You can use any pair of RS485 port combination to connect to the inverter(s). ● For optimal performance, one pair of RS485 port combination supports a maximum of two inverters.

	DO NO1 and DO COM1 DO NO2 and DO COM2	For connecting the DI terminals of external devices, so as to control the startup and shutdown of the connected external devices.
❸	CT IA* and CT IA CT IB* and CT IB CT IC* and CT IC	For connecting the wires of three CTs. **Note:** The asterisk (*) symbol indicates the positive wire of the CT.
❹	ETH	To connect to the router for data transmission in Ethernet network configuration mode
❺	LAN	For Modbus TCP communication. **Note:** For the supported devices, refer to the LAN communication connection diagrams in sections 4.1.1 and 4.1.2.
❻	L1_IN	AC power cable input for grid phase L1
❼	L2_IN	AC power cable input for grid phase L2
❽	L3_IN	AC power cable input for grid phase L3
❾	N_IN	AC power cable input for grid phase N

2.7. LED indicators



LED and button	Status	Color	Description
❶ Power status LED	On	Green	The eManager is powered on.
	Off	None	The eManager is powered off.
❷ Fault LED	On	Red	An error has occurred.
	Off	None	The eManager is working properly.
❸ Communication status LED	Blinking	Green	The eManager is connected to the monitoring platform.
	Off	None	The eManager is not connected to the monitoring platform.
❹ Reset button	/	/	You can use a clip to press the button to reset the system.

2.8. Product specifications

General parameters	
Application	Home usage
Communication	Bluetooth, Ethernet, Wi-Fi, RS485
Data collection interval (Min)	5 by default
Firmware update	Remote or local (Bluetooth) update
Data access	App or Web
Electrical parameters	
Input AC voltage	96 – 264 V AC
Input DC voltage	12 V DC
Input frequency	50/60 Hz
Max. power	3 W
Nominal current/limiting current per line conductor	63 A
Max. switching current of DO ports	4 A
Max. switching voltage of DO ports	250 V AC
Max. switching power of DO ports	125 VA / 120 W
Operating temperature range	-25℃ to +40℃ (-13℉ to +104℉)
Storage temperature range	-25℃ to +70℃ (-13℉ to +158℉)
Ambient humidity	0% – 95% (non-condensing)
Dimension (H x W x D) (mm)	105 x 108 x 67
Weight (g)	500
Ingress protection	IP20
Mounting	Rail-mounted
Warranty	Three years

3. Installation

About this task

The eManager, Pro-Mate module, and AC-DC power supply module need to be installed inside the AC distribution box.

Before you start

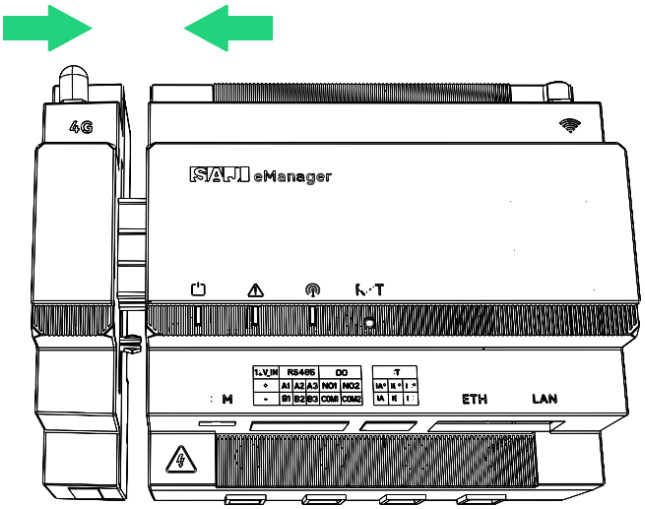
- Make sure that the AC distribution box meets the requirements:
  - It has a surge protective device configured.
  - It must be locked by a tool for safety, so that it cannot be opened easily.
- Make sure that the length of the rail meets the requirement:
  - If only the eManager needs to be installed, the length of the rail is not less than 108 mm.
  - If the AC-DC power supply module needs to be installed with the eManager, the length of the rail is not less than 126 mm. Alternatively, the module can be installed in another rail inside the AC distribution box.

3.1. Install the eManager

Procedure

Step 1. (Optional) Install the Pro-Mate module.

a. Remove the port cover on the left side of the eManager.

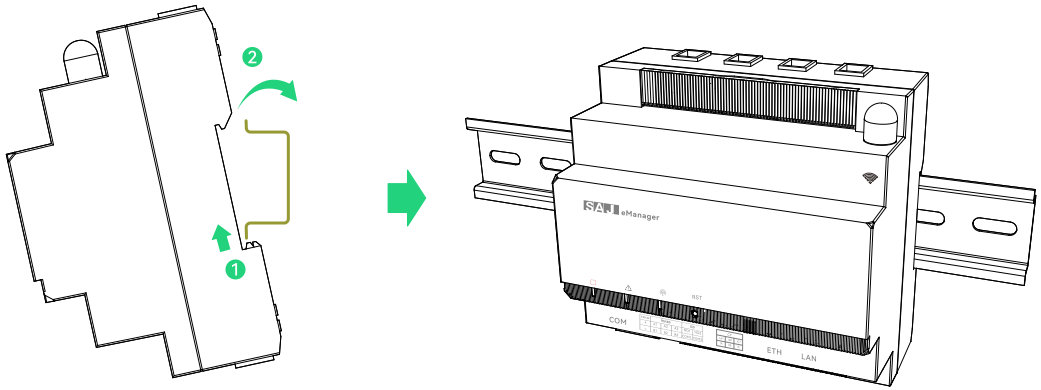


Step 2. Install the eManager to the rail.

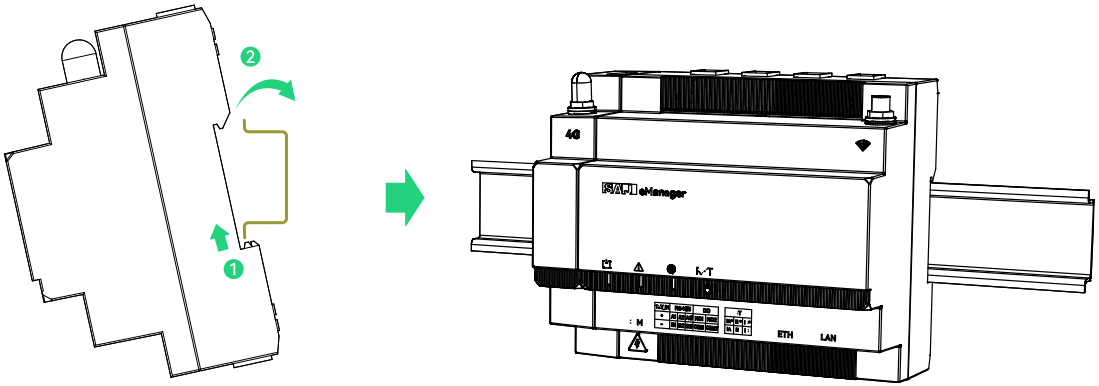
a. Insert the lower side of the rail into the lower slot on the back of the eManager. Push the eManager upwards until it is secured to the rail.

b. Pivot the eManager until the upper side of the rail is inserted into the upper slot of the eManager.

eManager



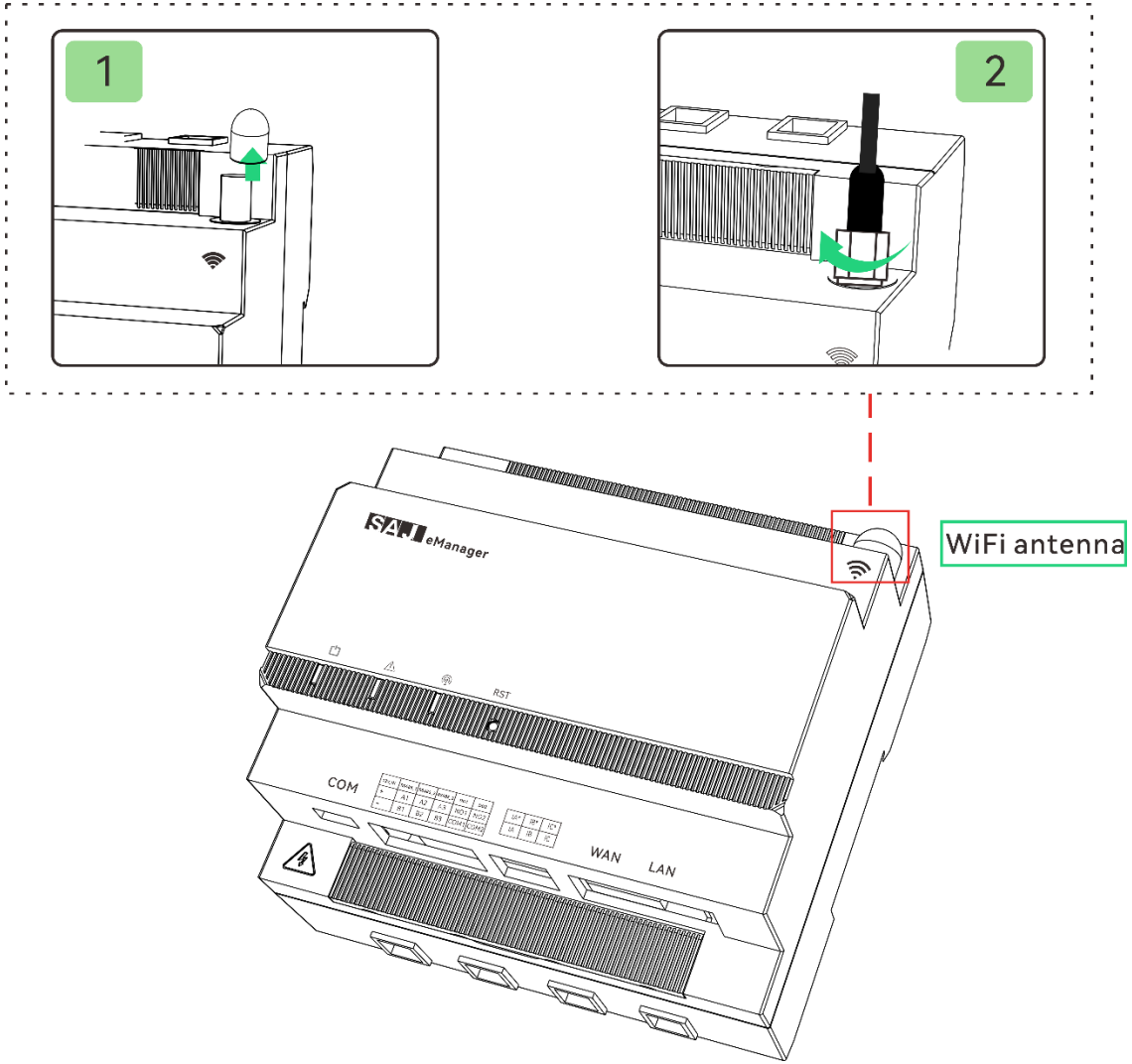
eManager-Pro



Step 3. Install the antenna to the eManager.

a. Remove the stud cap on the upper right corner of the eManager.

b. Install the antenna to the stud and tighten it.



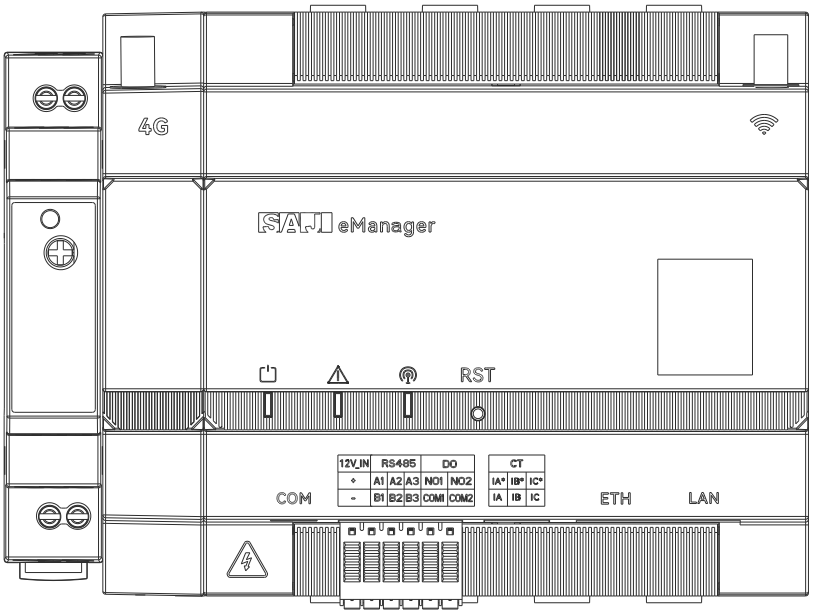
3.2. (Optional) Install the AC-DC power supply module

This module is required if the eManager needs to work during the off-grid time. By using this module, the ESS can provide the power supply to the eManager during off-grid time.

Procedure

Step 1. Install the AC-DC power supply module to the eManager or eManager-Pro.

Here takes the eManager-Pro as an example:



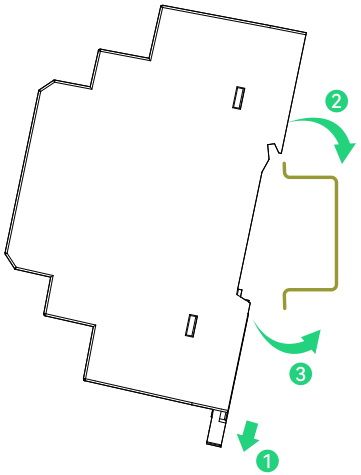
Step 2. Install the AC-DC power supply module to the rail.

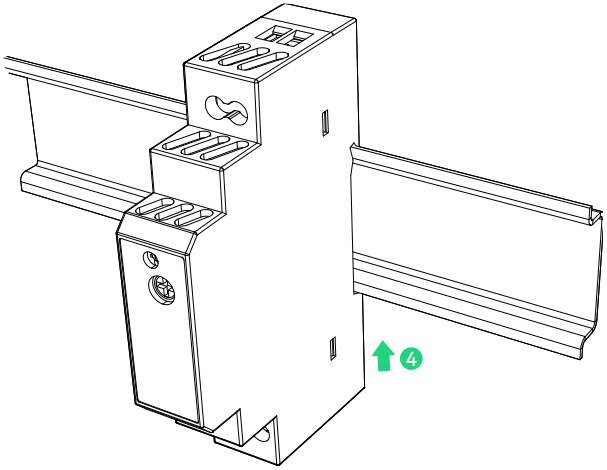
a. Pull the tab at the bottom of the module downwards.

b. Insert the upper side of the rail into the upper slot on the back of the module.

c. Pivot the module until the lower side of the rail is inserted into the lower slot of the module.

d. Push the tab at the bottom of the module upwards to secure module to the rail.





4. Electrical Connection

4.1. Connect devices to the EMS

The following two items are illustrated in the system connection diagrams in section 4.1 as examples. You can choose whether to connect them per your actual needs.

- Connection to the AC-DC power supply module (optional)

  This module is only required if the eManager needs to work during the off-grid time.

  The cables are connected to the ports on the AC-DC power supply module, inverter, and eManager, as listed below:

From	To
AC input of the AC-DC power supply module	BACKUP port on the inverter (any phase in three-phase grid connection)
DC output of the AC-DC power supply module	12V_IN port of the eManager **Note:** To locate the 12V_IN port, refer to 2.6 "Bottom view".

- Ethernet connection to the router (optional)

From	To
ETH port on the eManager **Note:** To locate the ETH port, refer to section 2.6 "Bottom view".	LAN port the router

  You can change the communication manner to one of the followings:

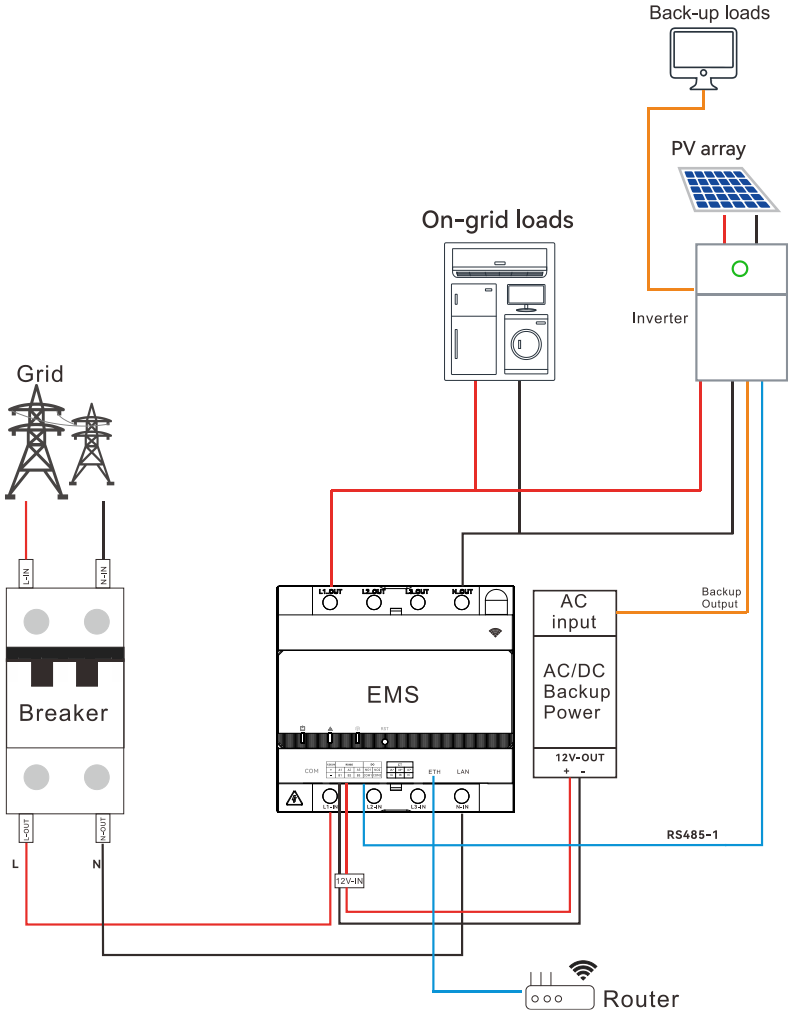
  - Wi-Fi connection manner to the router: The network name must be composed by letters and alphanumeric characters only, without any special characters.
  - 4G communication connection: It can be used only when the Pro-Mate module is installed.

Depending on your inverter model(s) and system connection scenario, choose one of the following connection manners:

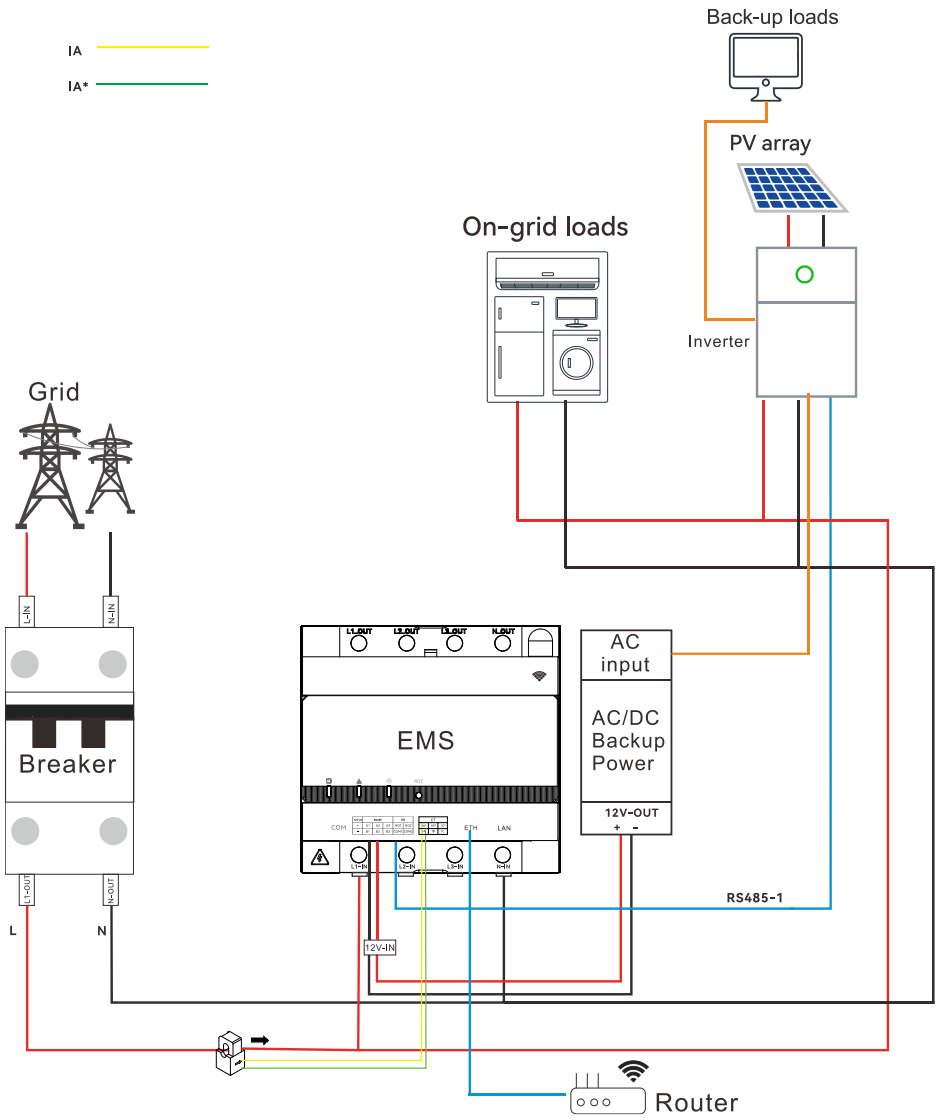
Inverter models	**Scenario**	
	Inverter quantity = 1	**Inverter quantity ≥ 2 (paralleling)**
H2-(3K-6K)-S2 HS2-(3K-6K)-S2 R5-(0.7K-3K)-S1 R5-(3K-8K)-S2 R6-(5K-10K)-(S2, S3)	Section 4.1.1.1 "Single-phase grid, internal CT connection, RS485 communication manner" Section 4.1.1.2 "Single-phase grid, external CT connection, RS485 communication manner"	Section 4.1.2.1 "Single-phase grid, internal CT connection (current ⩽ 63 A), RS485 communication connection" Section 4.1.2.2 "Single-phase grid, external CT connection (current > 63 A), RS485 communication connection"
H2-(5K-10K)-T2 HS2-(5K-10K)-T2 R6-(5K-15K)-T2 R6-(15K-50K)-(T2, T3, T4)	Section 4.1.1.3 "Three-phase grid, internal CT connection, RS485 communication manner" Section 4.1.1.4 "Three-phase grid, external CT connection, RS485 communication manner"	Section 4.1.2.3 "Three-phase grid, internal CT connection (current ⩽ 63 A), RS485 communication connection" Section 4.1.2.4 "Three-phase grid, external CT connection (current > 63 A), RS485 communication connection"
HS3-(3K-6K)-S2	Section 4.1.1.5 "Single-phase grid, internal CT connection, LAN communication manner" Section 4.1.1.6 "Single-phase grid, external CT connection, LAN communication manner"	Section 4.1.2.5 "Single-phase grid, internal CT connection (current ⩽ 63 A), LAN communication connection" Section 4.1.2.6 "Single-phase grid, external CT connection (current > 63 A), LAN communication connection"
HS3-(5K-12K)-T2 H2-(10K-30K)-(T2, T3)	Section 4.1.1.7 "Three-phase grid, internal CT connection, LAN communication manner" Section 4.1.1.8 "Three-phase grid, external CT connection, LAN communication manner"	Section 4.1.2.7 "Three-phase grid, external CT connection (current ⩽ 63 A), LAN communication connection" Section 4.1.2.8 "Three-phase grid, external CT connection (current > 63 A), LAN communication connection"

4.1.1. Scenario: inverter quantity = 1

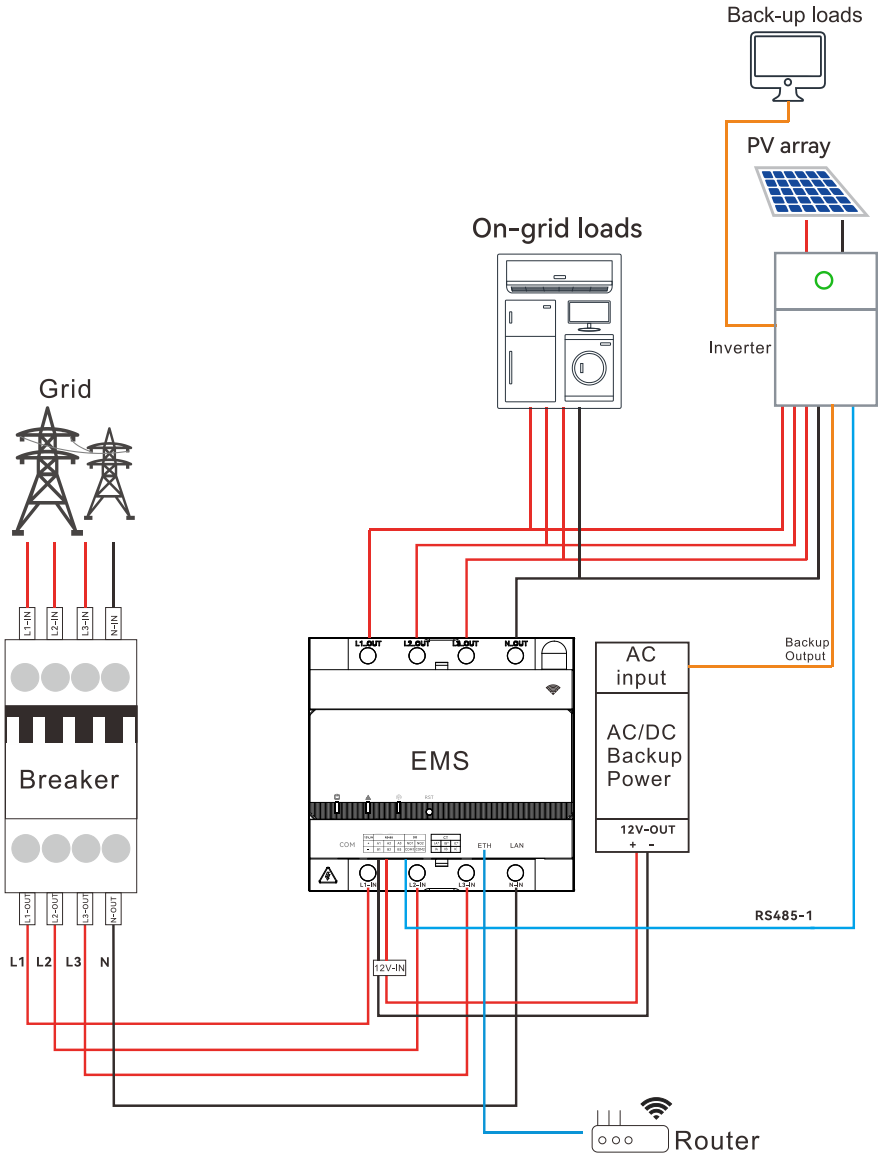
4.1.1.1. Single-phase grid, internal CT connection, RS485 communication manner



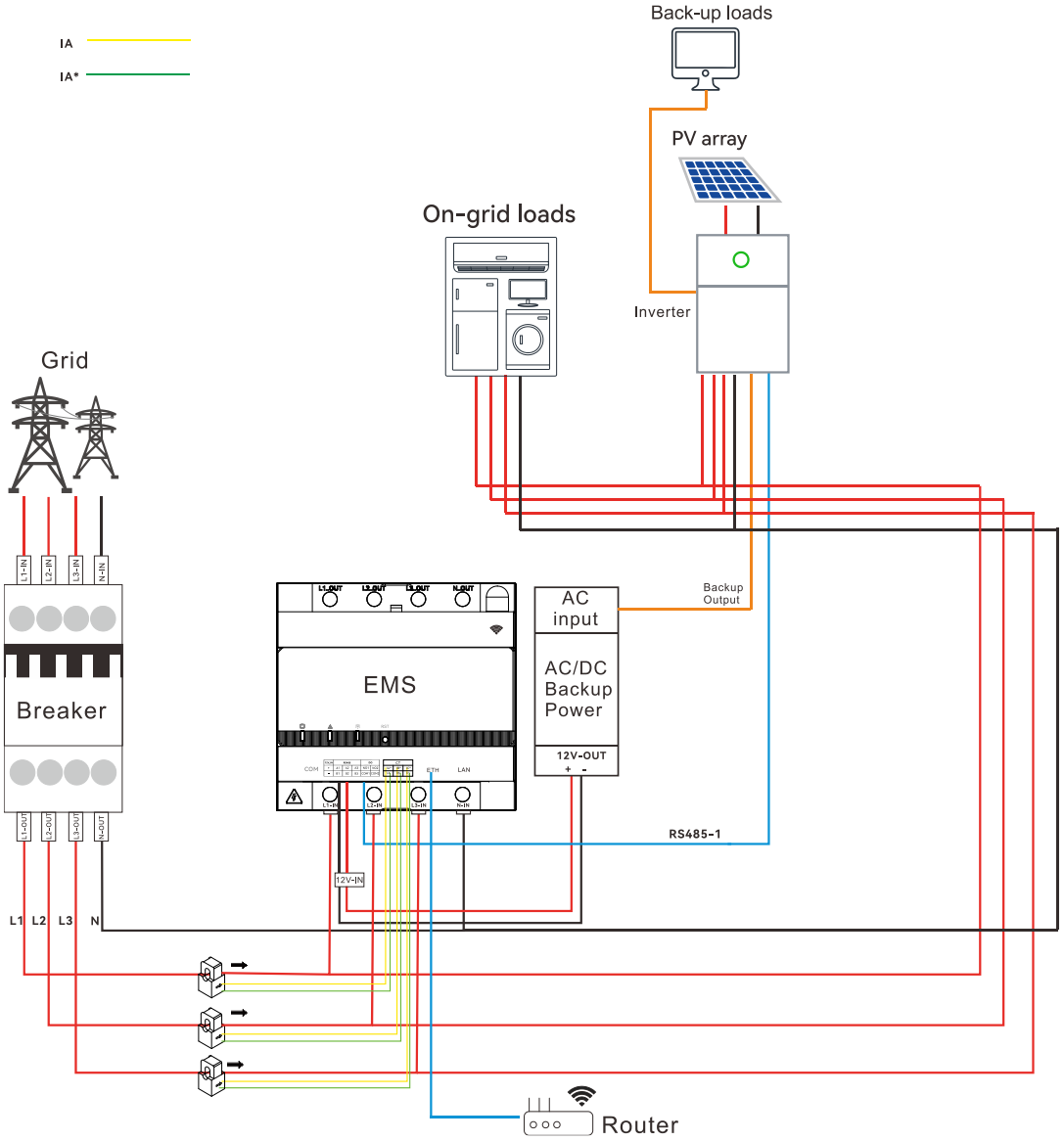
4.1.1.2. Single-phase grid, external CT connection, RS485 communication manner



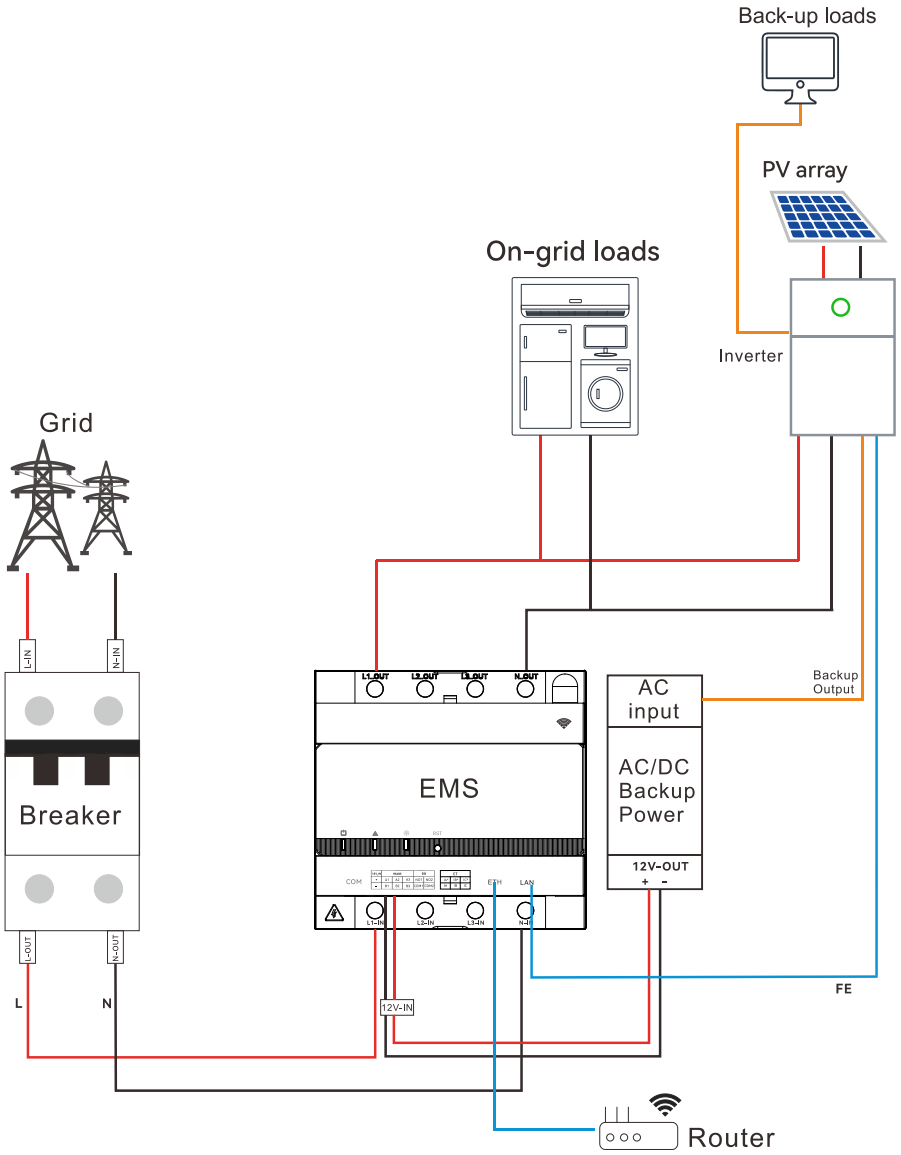
4.1.1.3. Three-phase grid, internal CT connection, RS485 communication manner



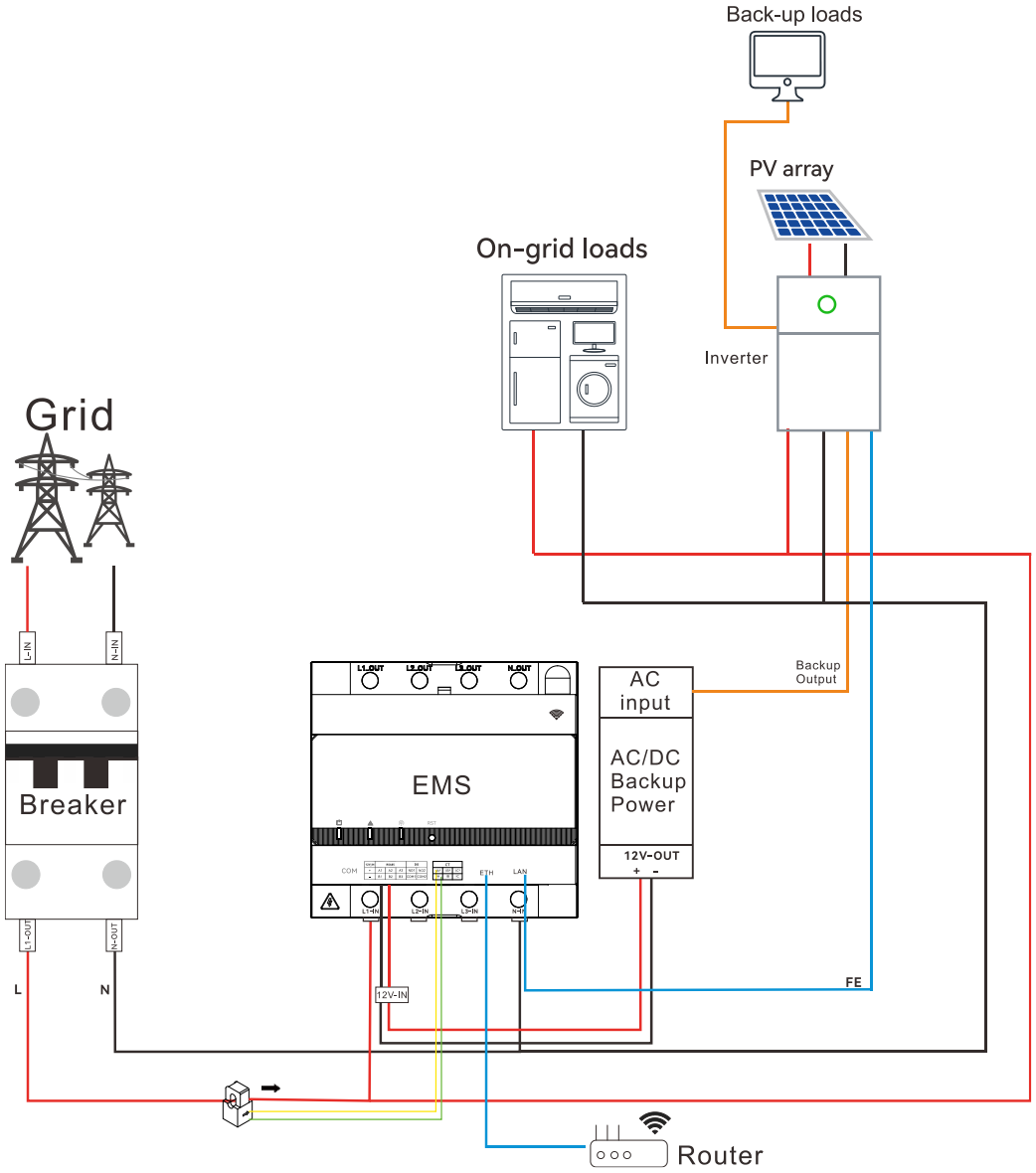
4.1.1.4. Three-phase grid, external CT connection, RS485 communication manner



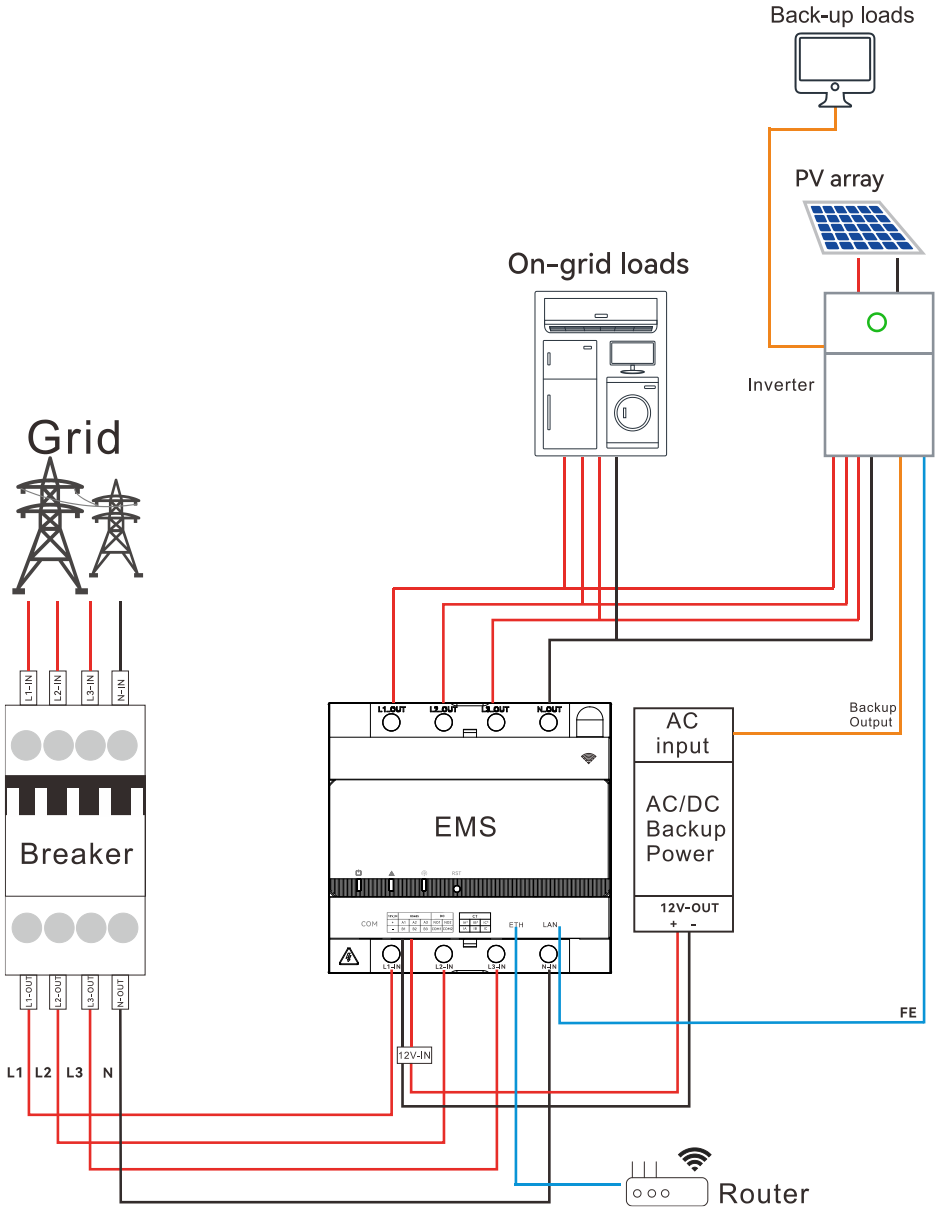
4.1.1.5. Single-phase grid, internal CT connection, LAN communication manner



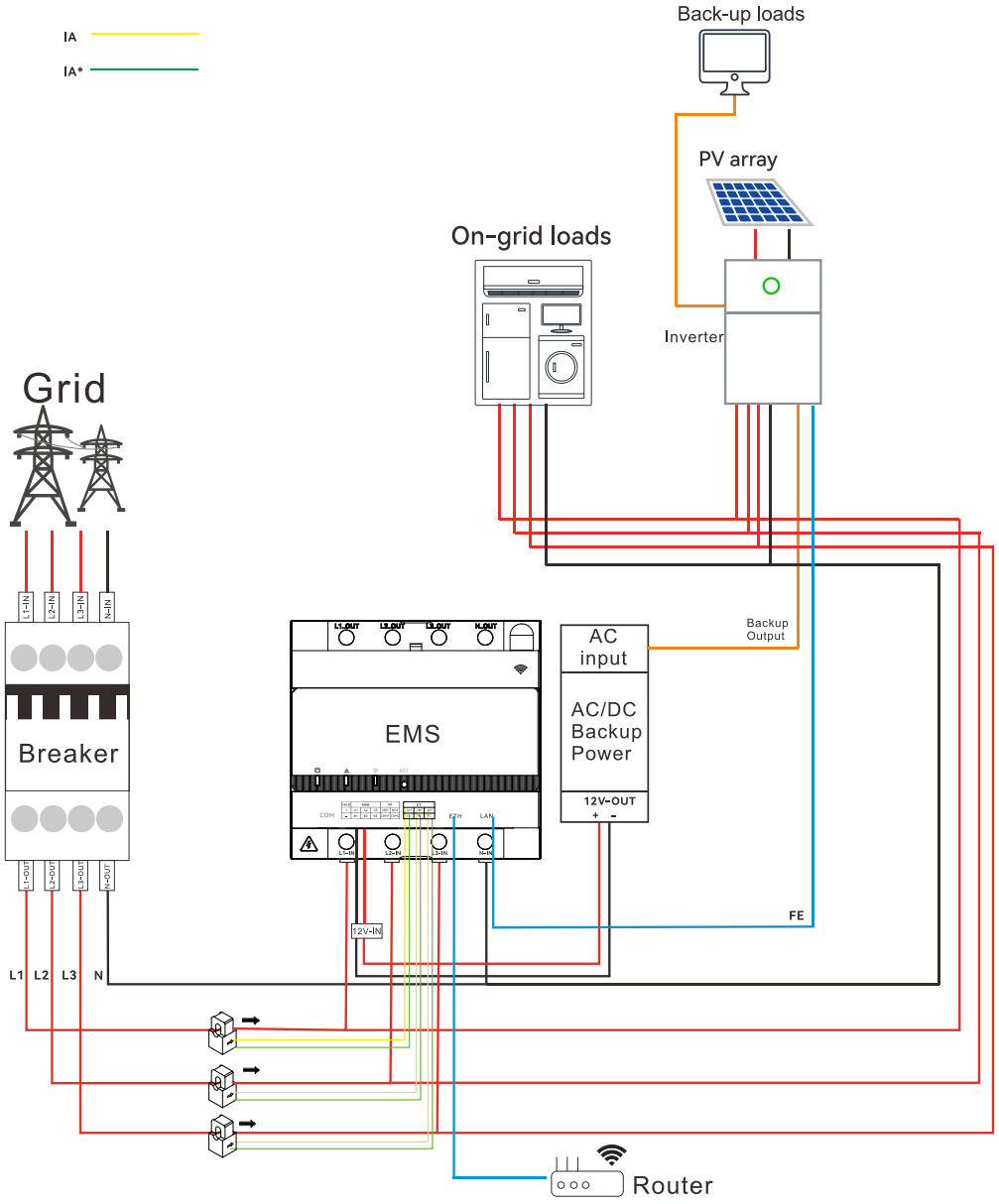
4.1.1.6. Single-phase grid, external CT connection, LAN communication manner



4.1.1.7. Three-phase grid, internal CT connection, LAN communication manner



4.1.1.8. Three-phase grid, external CT connection, LAN communication manner



4.1.2. Scenario: inverter quantity ≥ 2 (parallelling connection)

- **RS485 communication connection:**

A maximum of six inverters can be connected parallelled.

Connect the communication cables from the RS485 port on the inverter to the corresponding ports on the eManager, as listed below. If the RS485 port is not available on the inverter, use the EMS/Meter port.

From the RS485 or EMS/Meter port on the inverter	To the RS485 ports on the eManager
Pin 7	RS485-A
Pin 8	RS485-B

Notes:

The eManager provides three pairs of RS485 port combinations. To locate the ports, refer to section 2.6 "Bottom view".

- RS485 A1 and RS485 B1
- RS485 A2 and RS485 B2
- RS485 A3 and RS485 B3

The hybrid inverter is used as an example in the illustrations in this section. In actual conditions, you can connect the solar inverter or hybrid inverter to any pair of the RS485 port combination. However, for one pair of RS485 ports, make sure that:

- The inverters must be of the same type. A hybrid inverter and a solar inverter cannot be connected to the same pair of RS485 port combination.
- A maximum of two inverters are connected.

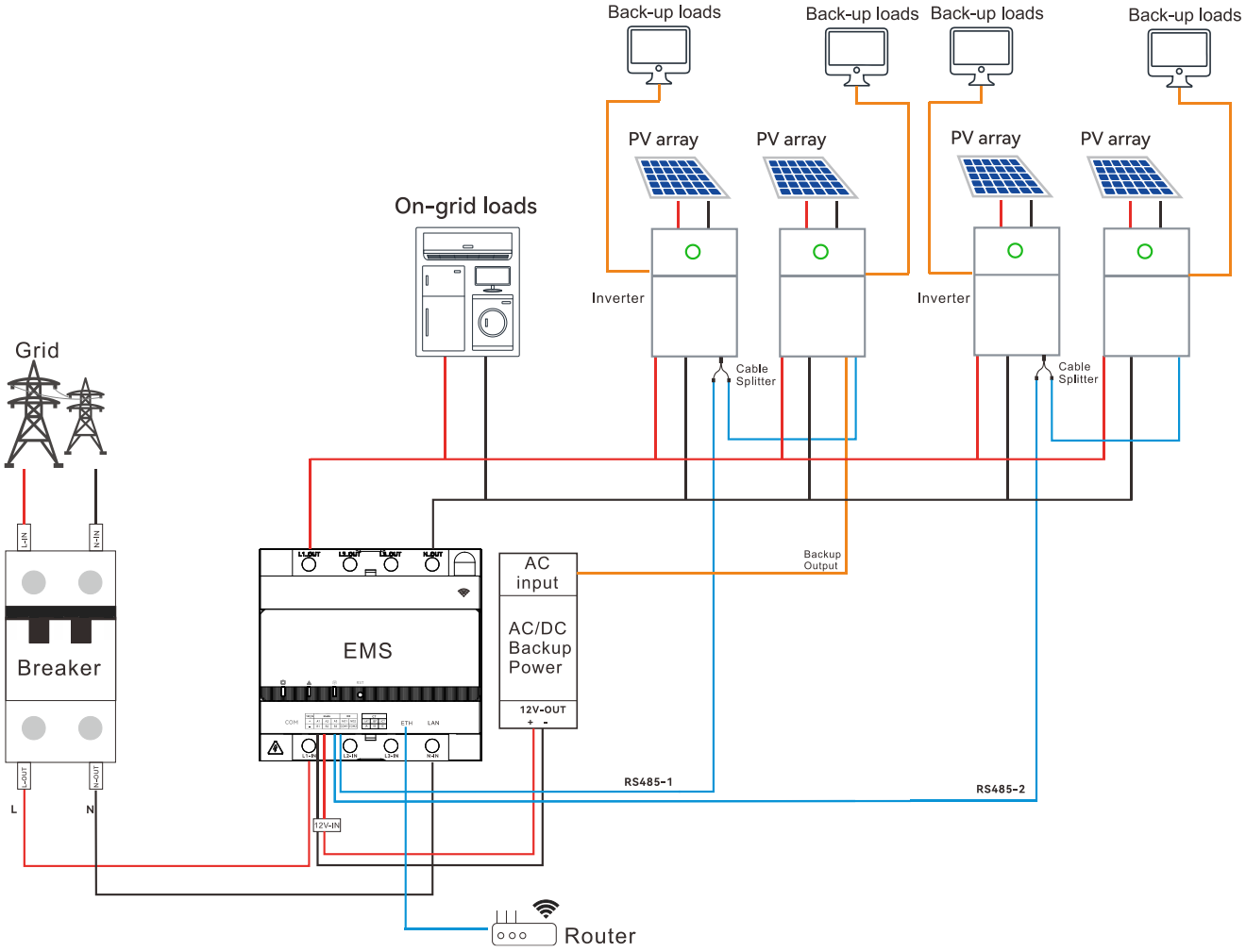
- **LAN communication connection:**

A maximum of ten inverters can be connected parallelled.

Connect all the communication cables from the LAN port on the eManager and the LAN port on the inverter to a switch.

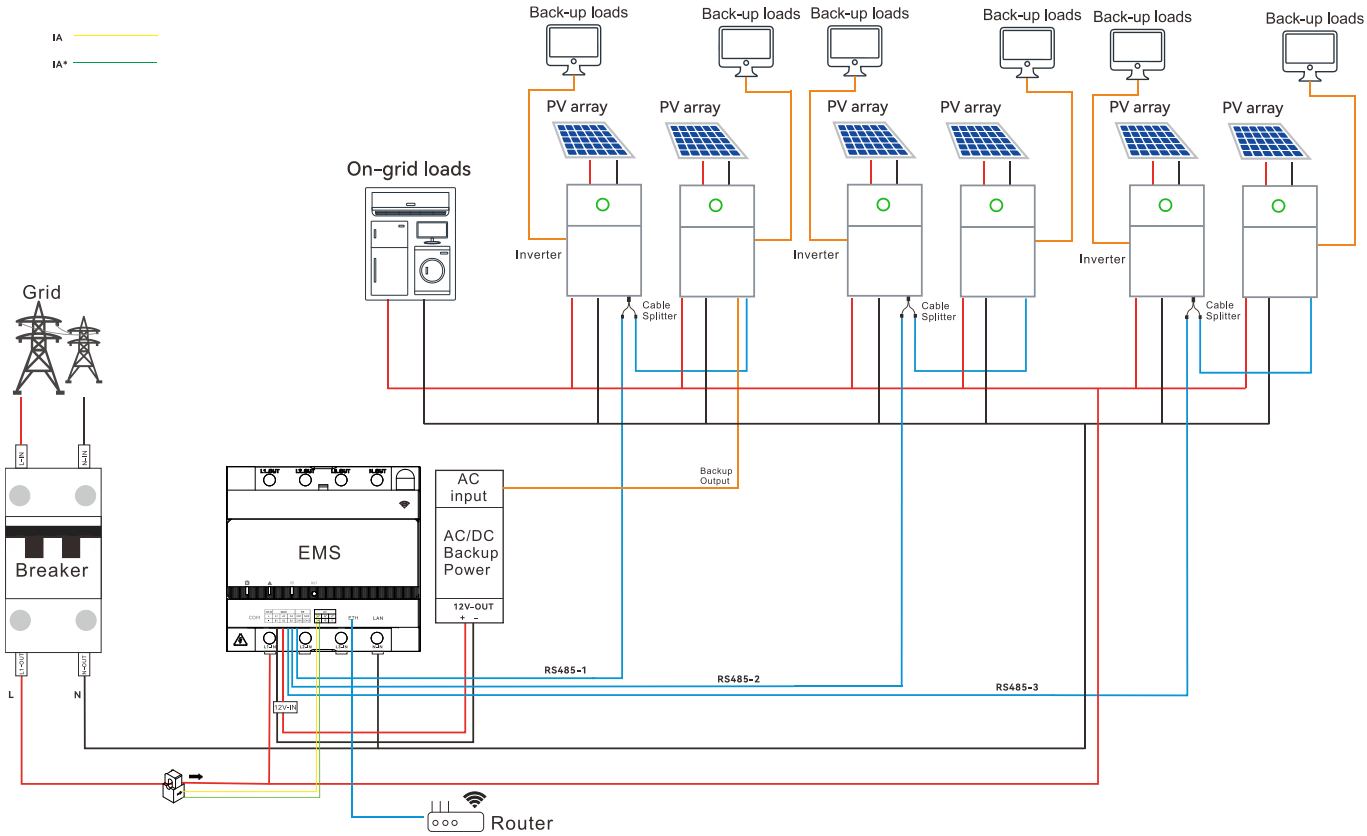
4.1.2.1. Single-phase grid, internal CT connection (current ⩽ 63 A), RS485 communication connection

If the current exceeds 63 A, use the external CT connection manner.



Note: For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

4.1.2.2. Single-phase grid, external CT connection (current > 63 A), RS485 communication connection

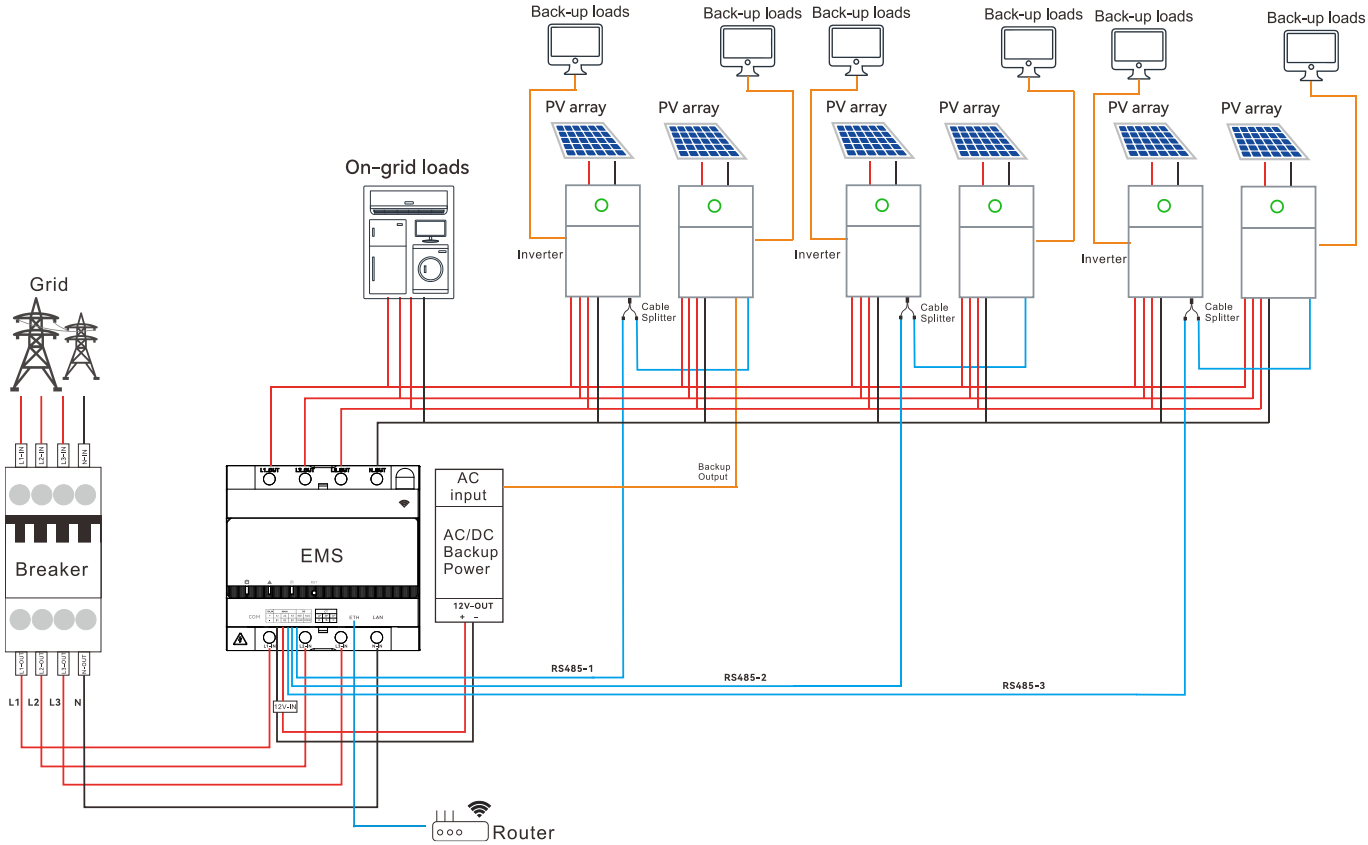


Notes:

- The arrow ➔ on the CT points to the inverter or on-grid loads. In the single-phase grid, the CT wires must be connected to IA* and IA.
- Depending on the plant capacity (the greater value of the total inverter power or the total on-grid load power), use 50x*N*A /50 mA CT, wherein *N* is equal to or greater than 2.
- For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

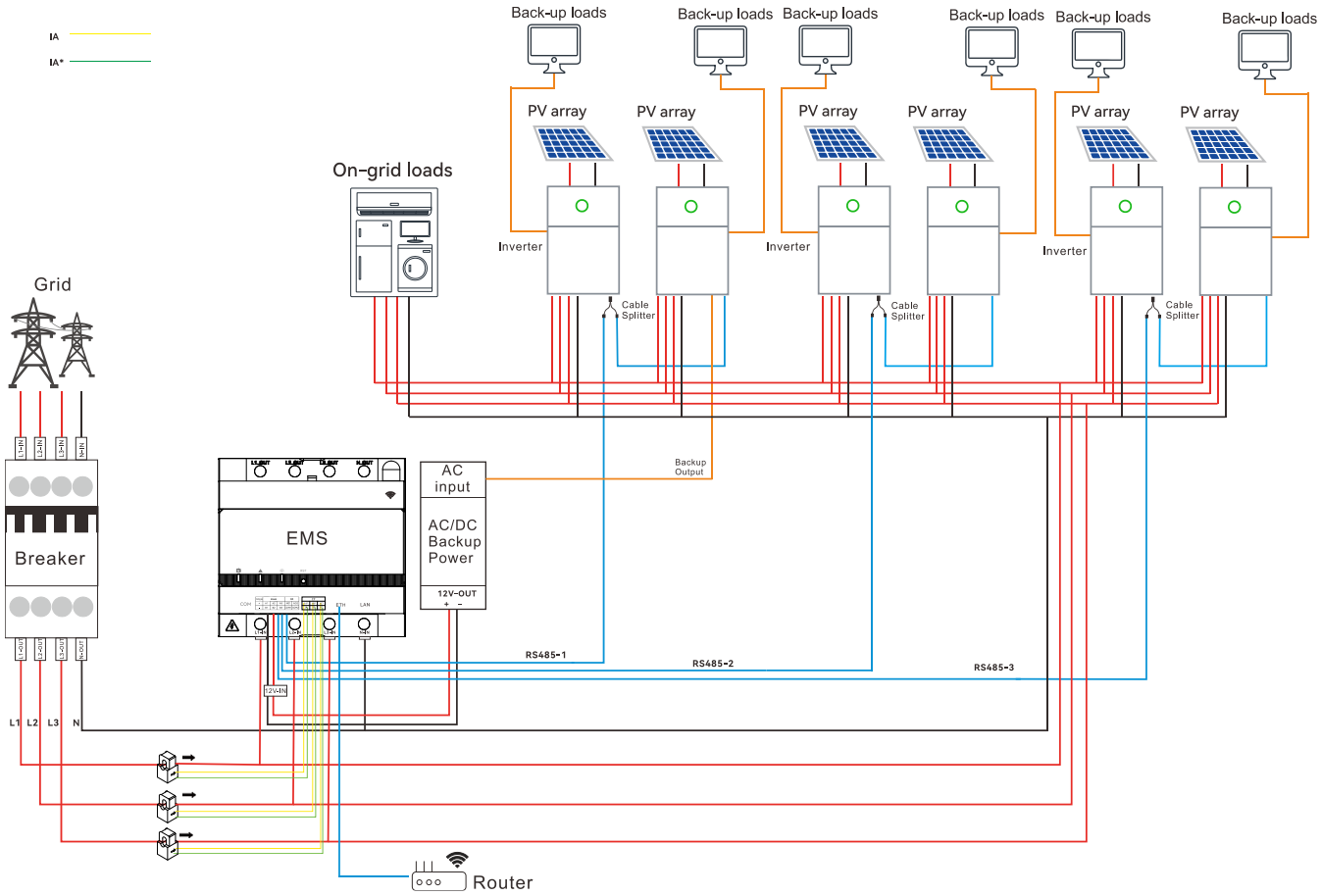
4.1.2.3. Three-phase grid, internal CT connection (current ⩽ 63 A), RS485 communication connection

If the current exceeds 63 A, use the external CT connection manner.



Note: For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

4.1.2.4. Three-phase grid, external CT connection (current > 63 A), RS485 communication connection

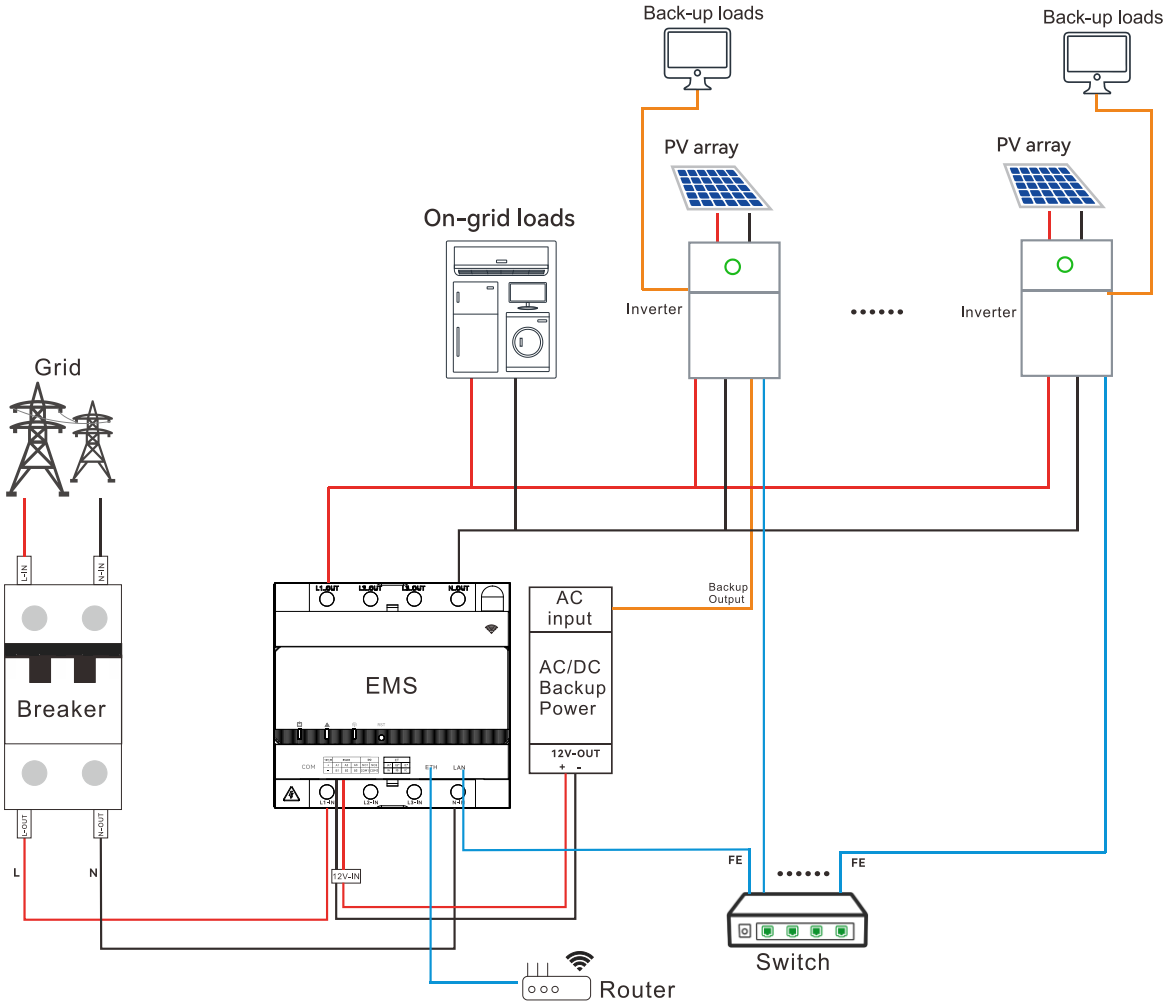


Notes:

- The arrow ➔ on the CT points to the inverter or on-grid loads. In the three-phase grid, the CT wires for the L1, L2, and L3 lines must be connected to the three pairs of CT ports in order: IA* and IA, IB* and IB, IC* and IC.
- Depending on the plant capacity (the greater value of the total inverter power or the total on-grid load power), use 50x*N*A/50 mA CT, wherein *N* is equal to or greater than 2.
- For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

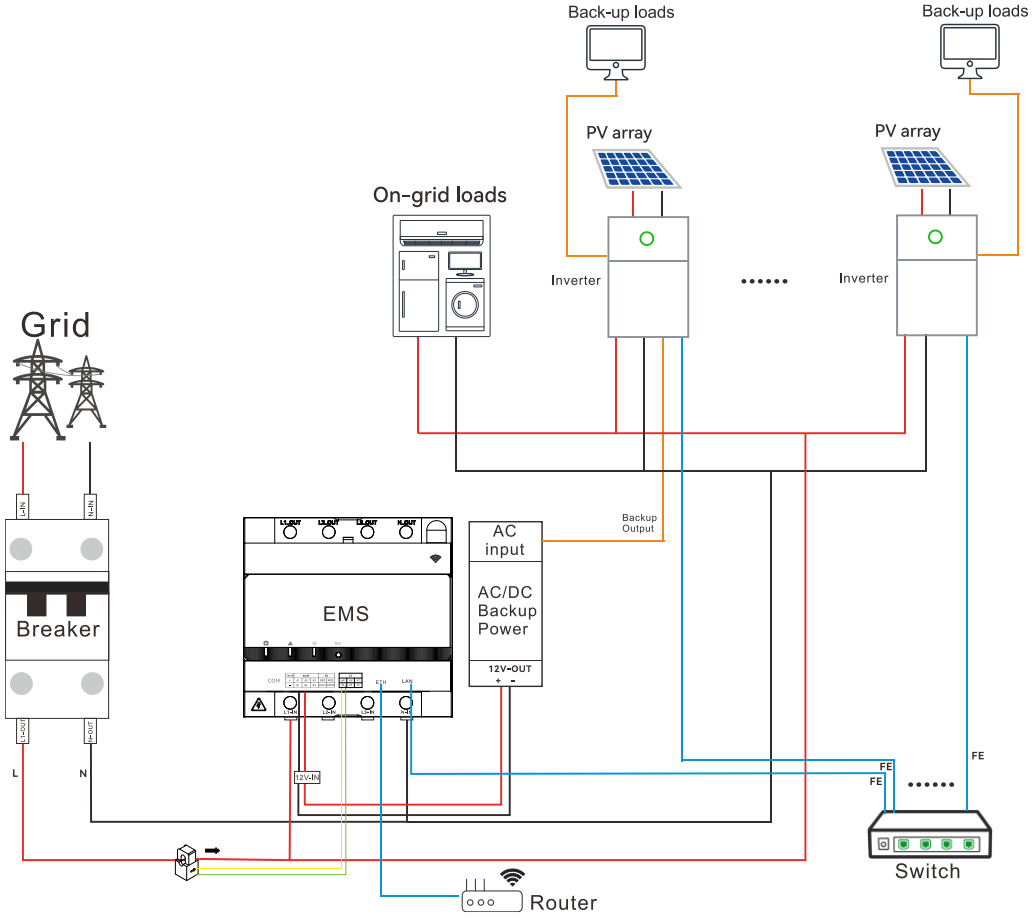
4.1.2.5. Single-phase grid, internal CT connection (current ⩽ 63 A), LAN communication connection

If the current exceeds 63 A, use the external CT connection manner.



Note: For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

4.1.2.6. Single-phase grid, external CT connection (current > 63 A), LAN communication connection

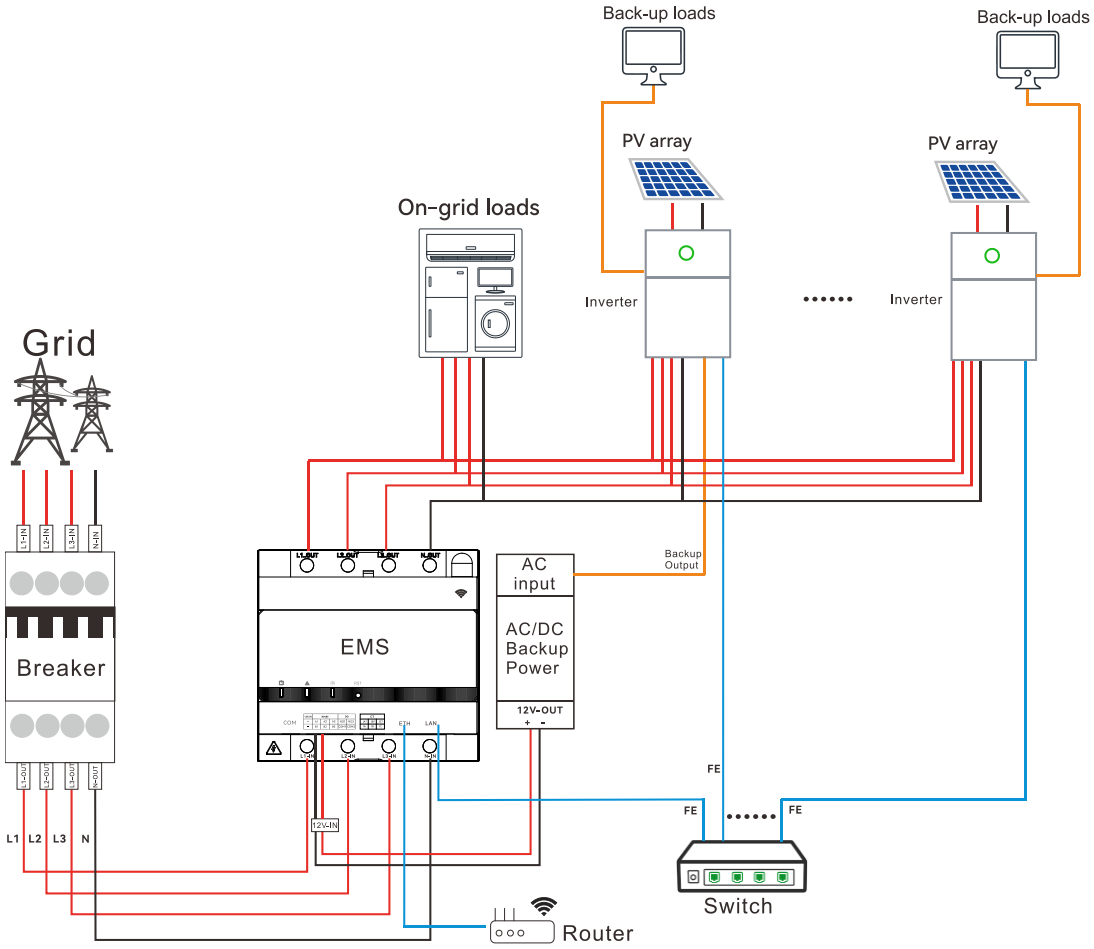


Notes:

- The arrow ➔ on the CT points to the inverter or on-grid loads. In the single-phase grid, the CT wires must be connected to IA* and IA.
- Depending on the plant capacity (the greater value of the total inverter power or the total on-grid load power), use 50x*N*A /50 mA CT, wherein *N* is equal to or greater than 2.
- For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

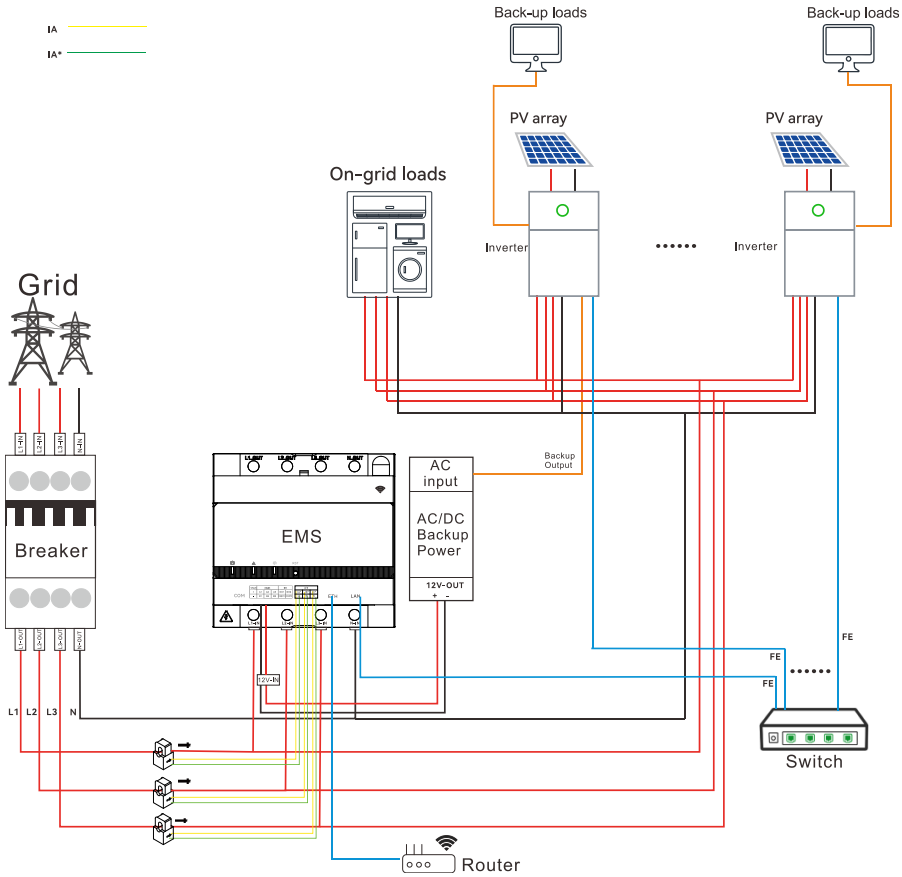
4.1.2.7. Three-phase grid, external CT connection (current ⩽ 63 A), LAN communication connection

If the current exceeds 63 A, use the external CT connection manner.



Note: For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

4.1.2.8. Three-phase grid, external CT connection (current > 63 A), LAN communication connection



Notes:

- The arrow ➔ on the CT points to the inverter or on-grid loads. In the three-phase grid, the CT wires for the L1, L2, and L3 lines must be connected to the three pairs of CT ports in order: IA* and IA, IB* and IB, IC* and IC.
- Depending on the plant capacity (the greater value of the total inverter power or the total on-grid load power), use 50x*N*A/50 mA CT, wherein *N* is equal to or greater than 2.
- For detailed connection of the AC-DC power supply module, refer to section 4.1 "Connect devices to the EMS".

4.2. (Optional) Connect the heat pump to the EMS

If a heat pump needs to be used, the eManager provides two pair of DO ports. You can use either pair of the ports.

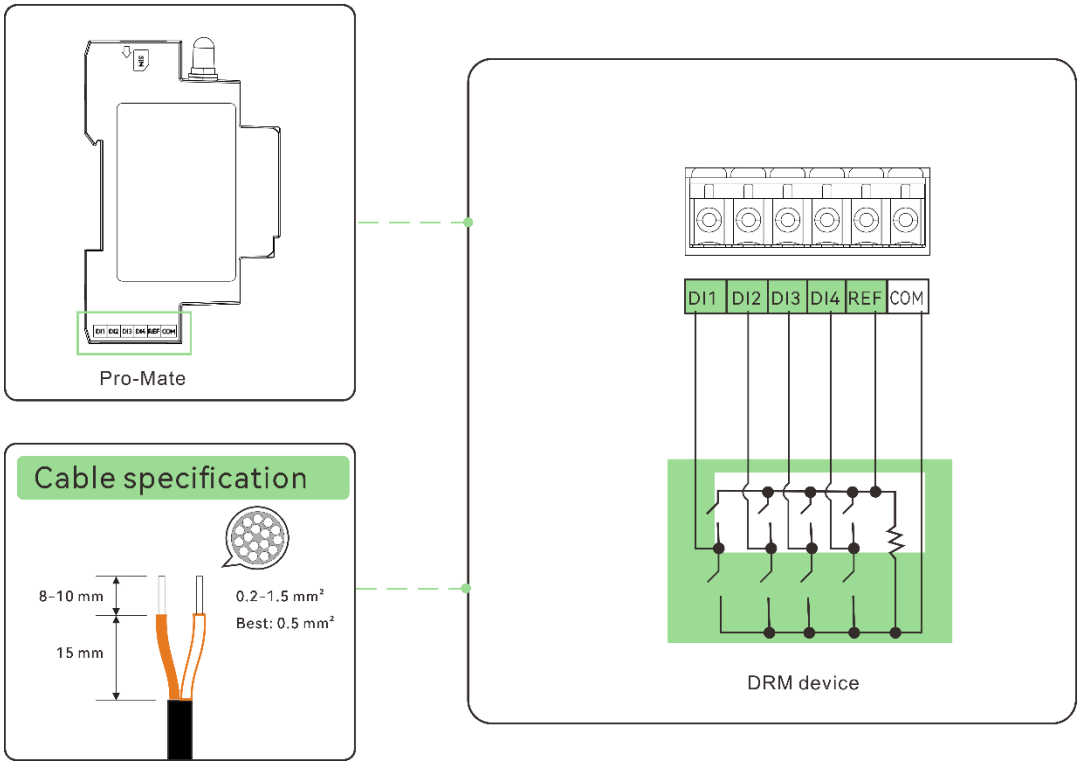
- NO1 and COM1
- NO2 and COM2

To locate the DO ports, refer to section 2.6 "Bottom view".

4.3. (In Australia and New Zealand) DRM connection

According to the local regulations in Australia and New Zealand, a DRM device is required.

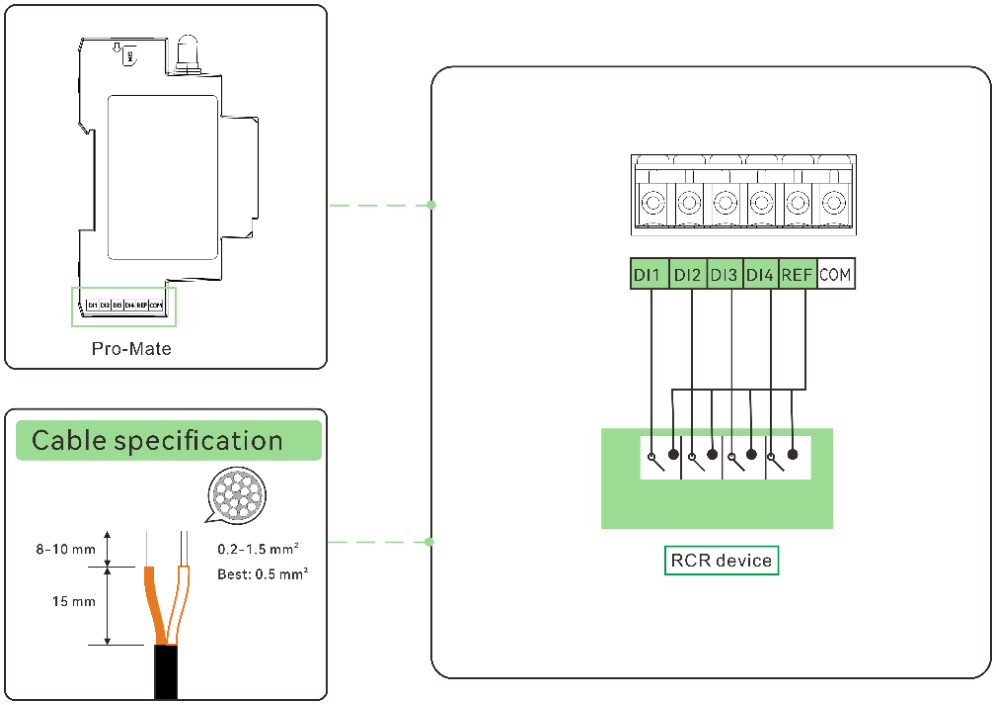
You can connect the DRM device to the following DI terminals (highlighted in green) at the bottom of the Pro-Mate module.



4.4. (In Germany) RCR connection

According to the local regulations in Germany, an RCR device is required.

You can connect the RCR device to the following DI terminals (highlighted in green) at the bottom of the Pro-Mate module.



5. Firmware Update (Optional)

This operation is only applicable when the inverter firmware version is not compatible with the EMS firmware version. In this case, you need to upgrade the current inverter firmware version to a compatible one.

1. Check whether your inverter firmware versions (DSP version and ARM version) is earlier than the below listed ones. For detailed operations, refer to section 6.6 "View the inverter firmware version".

Inverter model	DSP version	ARM version
H2-(3K-6K)-S2	V1.030	V6.040
H2-(5K-10K)-T2	V4.066	V1.070
HS2-(5K-10K)-T2	V4.066	V1.070
HS2-(3K-6K)-S2	V1.030	V6.040
R6-(5K-10K)-(S2, S3)	V1.041	V1.069
R6-(5K-15K)-T2	V2.318	V1.069
R6-(15K-50K)-(T2, T3, T4)	V2.580	V6.196
R5-(0.7K-3K)-S1	V1.234	V3.100
R5-(3K-8K)-S2	V1.524	V3.100
H2-(10K-30K)-(T2, T3)	V3.061	V8.035
HS3-(3K-6K)-S2	V1.135	V1.040
HS3-(5K-12K)-T2	V2.103	V2.030

2. If yes, choose one of the following upgrade procedures to upgrade the inverter firmware:

   - Remote upgrade (on the Elekeeper Web platform)
   - Local upgrade (on the Elekeeper Web platform and the Elekeeper App) (Bluetooth connection)

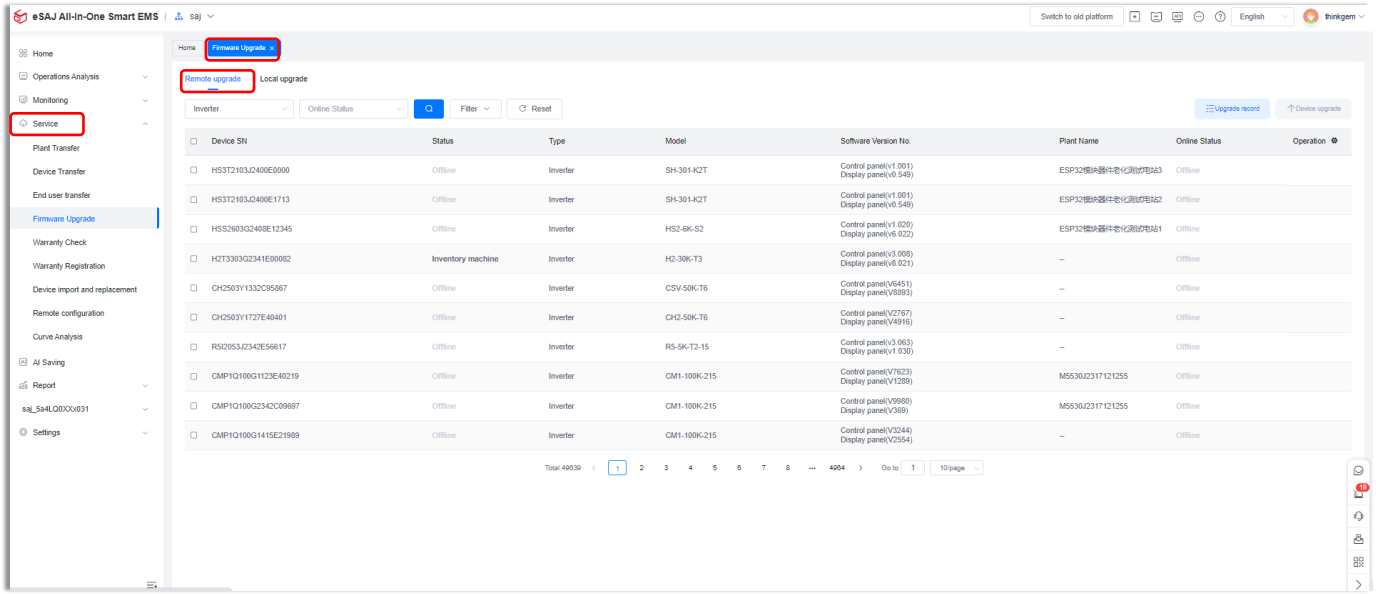
   Note: The operations on the App and Web platform might vary, depending on the versions that you are using.

5.1. Remote upgrade (Web platform)

Step 1. Log in to the Elekeeper Web platform:

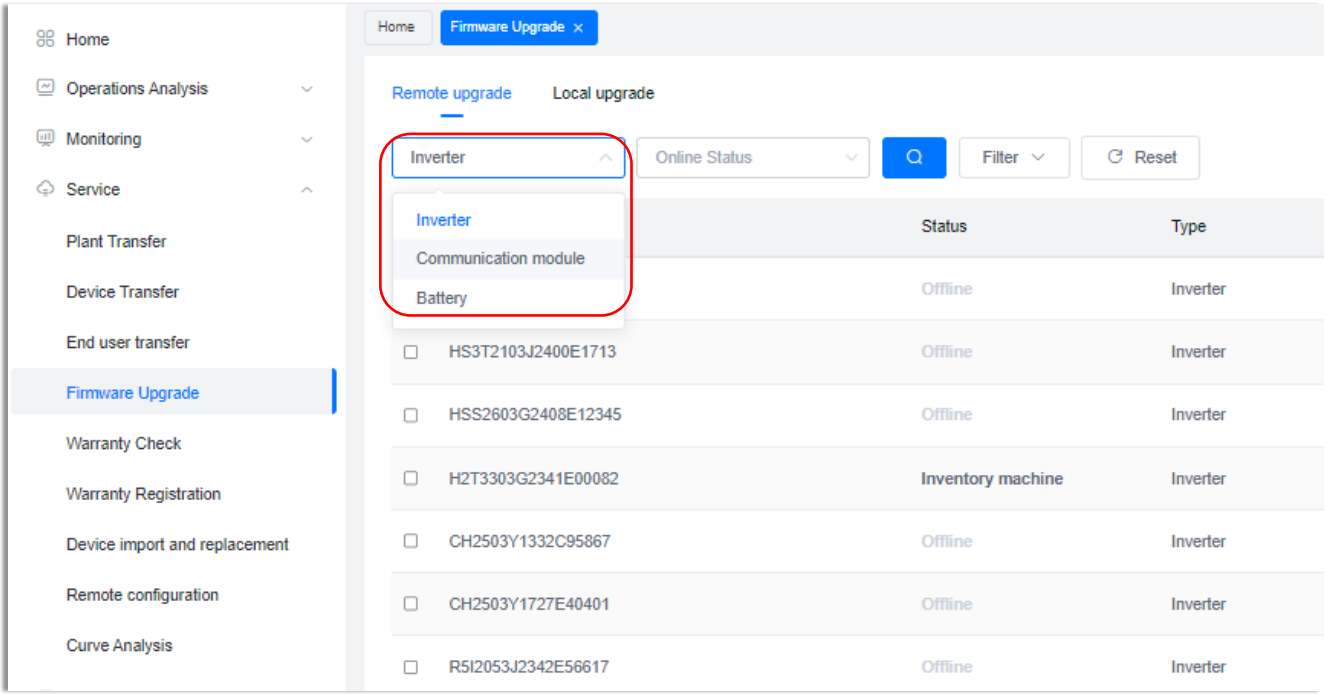
- Europe: https://eop.saj-electric.com
- China: https://op.saj-electric.cn
- Other countries or regions: https://iop.saj-electric.com/

Step 2. On the left navigation pane, choose **Service** > **Firmware Upgrade**. On the right pane, click **Remote upgrade**.

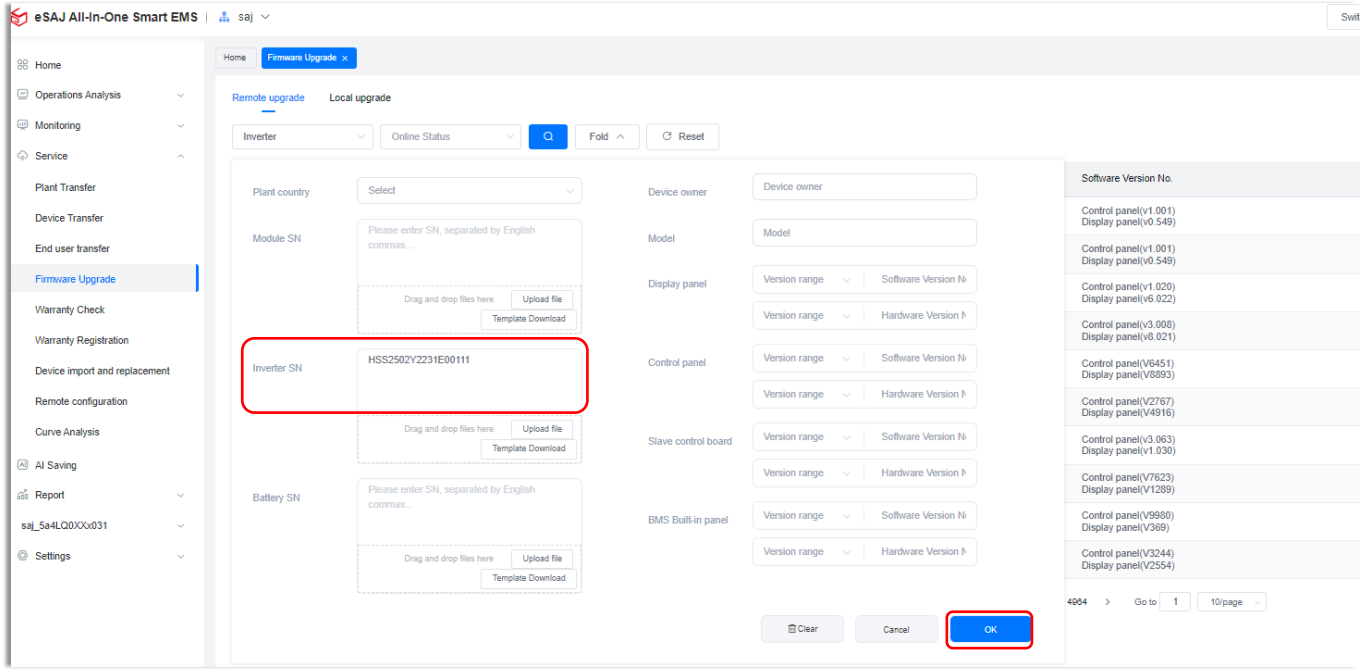


Step 3. Select **Inverter** or **Communication module** to display corresponding devices.

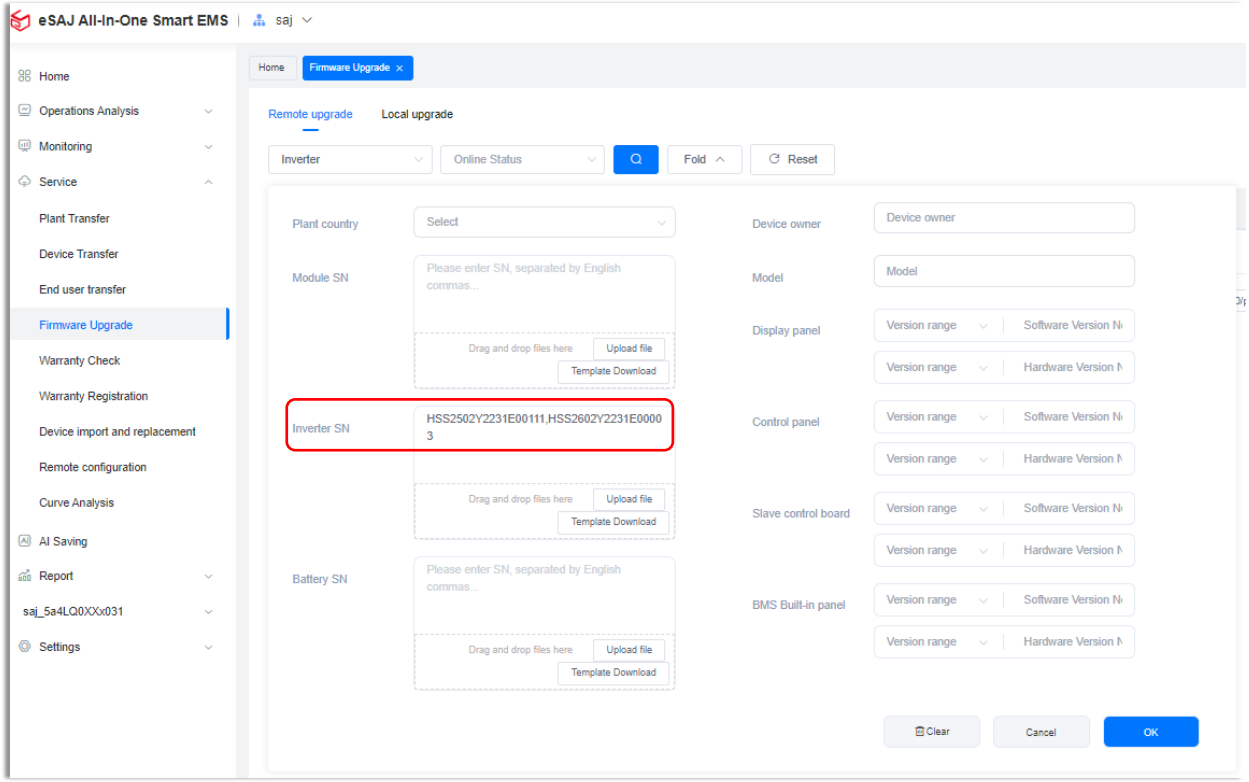
Note: No need to upgrade the battery.



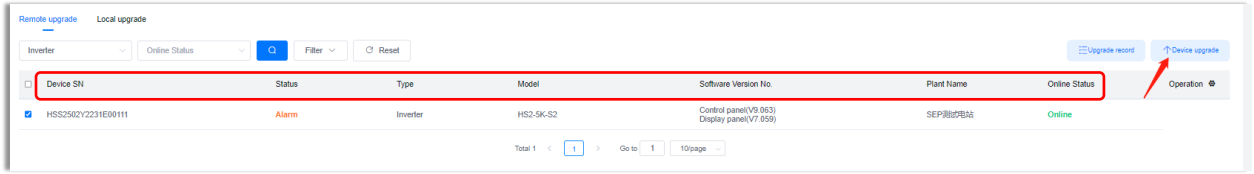
Alternatively, you can locate the required device based on its SN: Click **Filter** to display the detailed search box. Input the SN and click **OK**.



Note: For batch upgrade, separate the device SNs by using the comma (,).



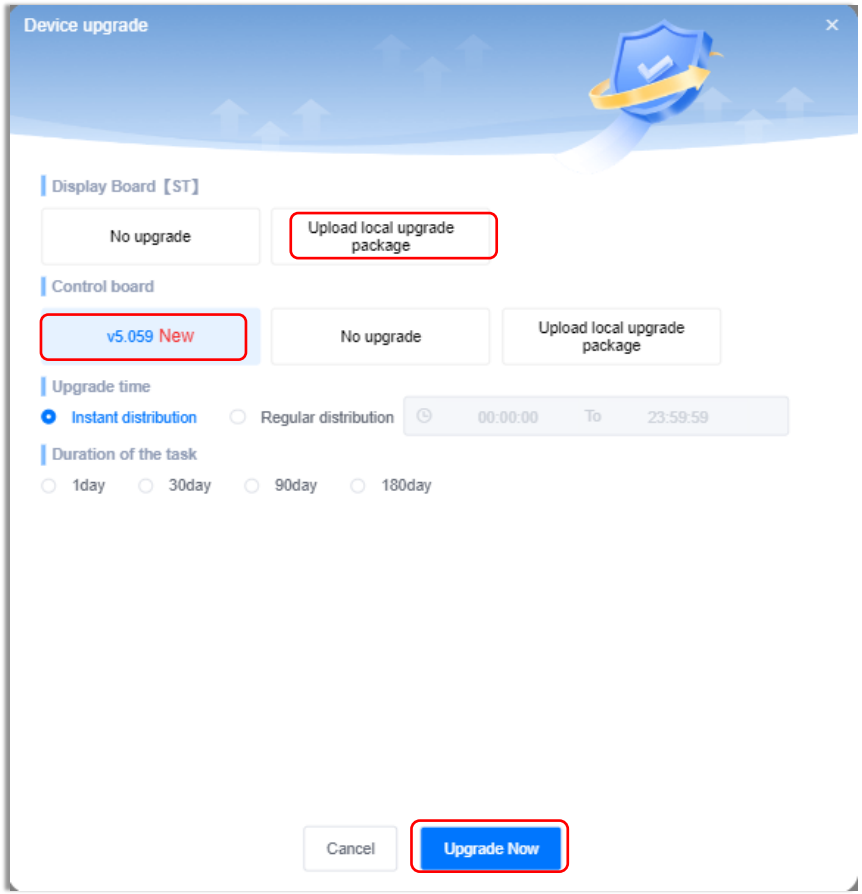
Step 4. Select the required device and click **Device upgrade**.



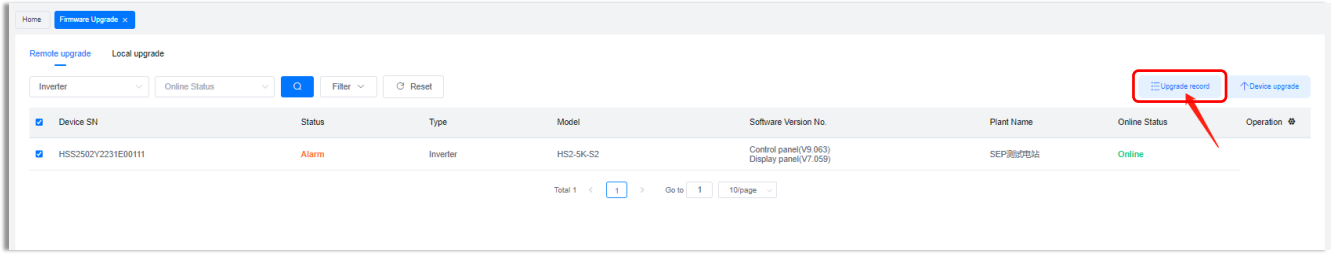
Step 5. Select the firmware version: To upgrade to the up-to-date firmware version, select the latest firmware version; to upgrade to a specific firmware version, click **Upload local upgrade package** to upload the local upgrade file.

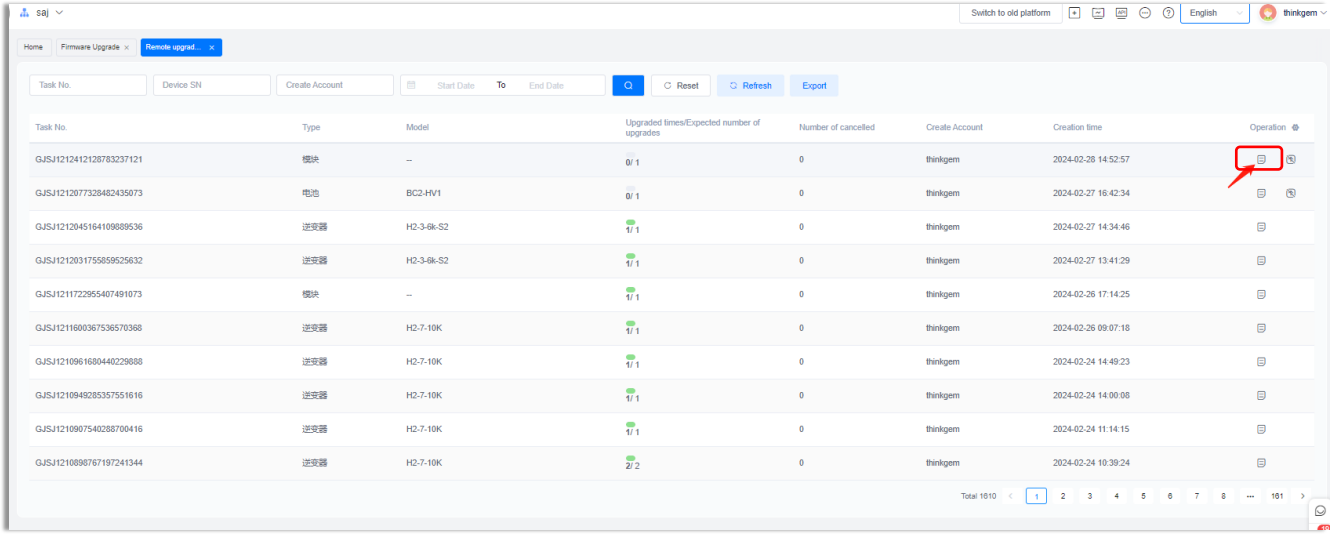
Set the upgrade time: Depending on your needs, upgrade the firmware right now or in a specific time:

- Upgrade now: Select **Instant distribution** and click **Upgrade Now**.
- Upgrade later: Select **Regular distribution**, set the specific upgrade time, and click **Upgrade Now**. The upgrade will start according to the configured time.



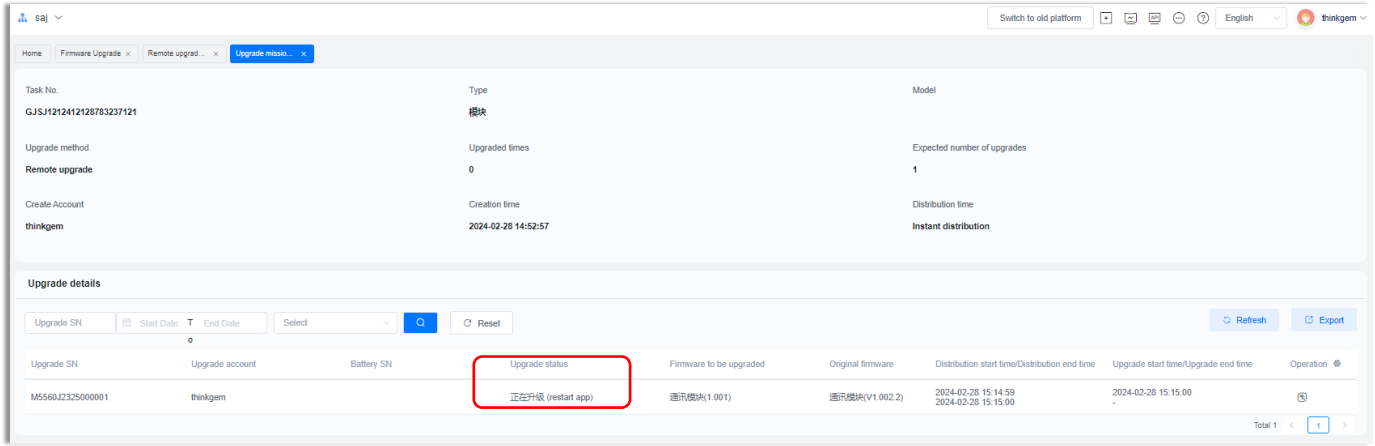
Step 6. Click **Upgrade record** and then click the icon under **Operation** to view the upgrade details (including the upgrade status and result).





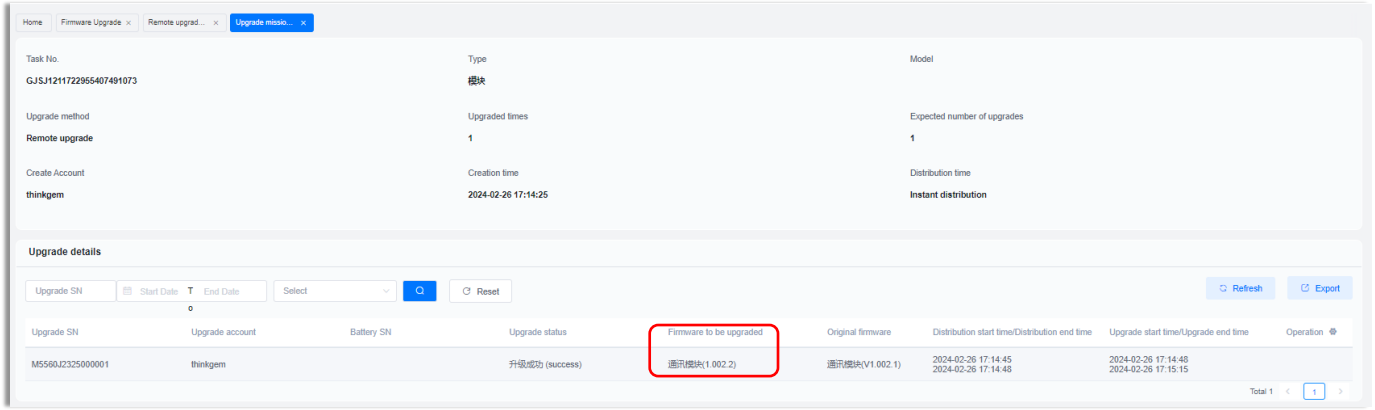
Upgrade status: Being upgraded.

Note: Here takes the communication module as an example.



Upgrade status: Upgrade successfully.

Note: Here takes the communication module as an example.



5.2. Local Upgrade (Web page and App) (Bluetooth connection)

Before you start

The firmware package has been uploaded. If any question, contact SAJ technical support.

Procedure

Step 1. Log in to the Elekeeper Web platform:

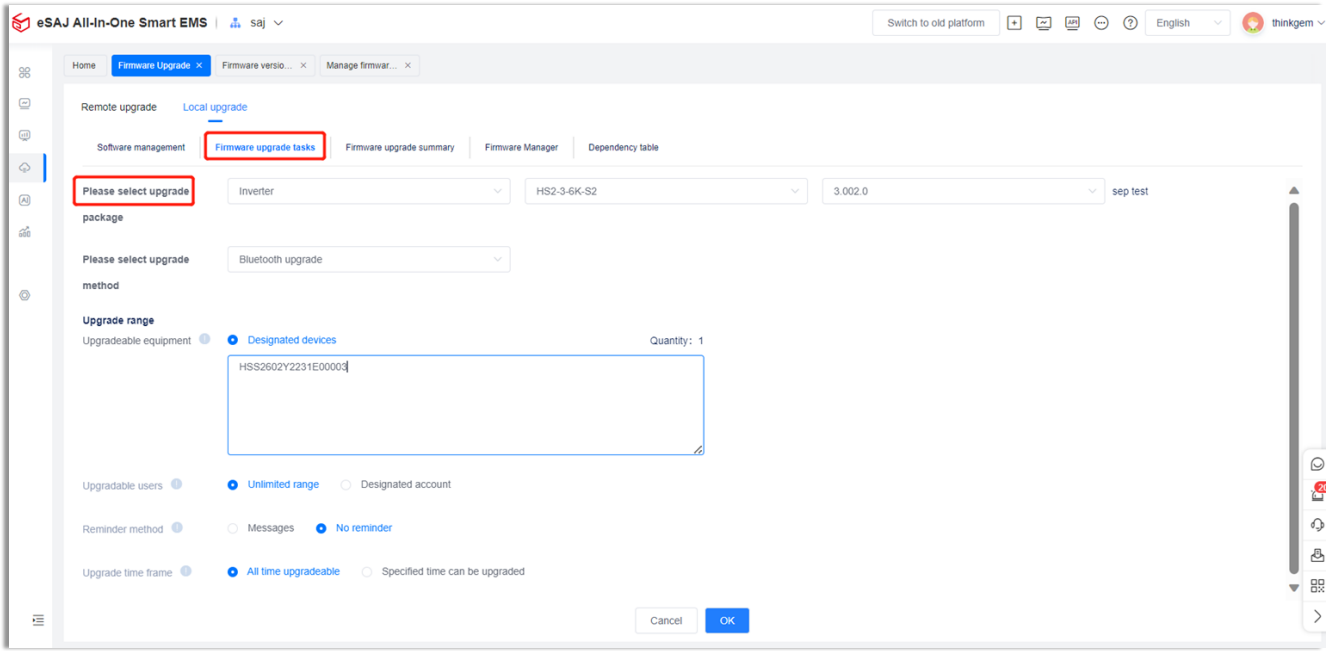
- Europe: https://eop.saj-electric.com
- China: https://op.saj-electric.cn
- Other countries or regions: https://iop.saj-electric.com/

a. On the left navigation pane, click the icon and choose **Local upgrade** > **Firmware upgrade tasks**.

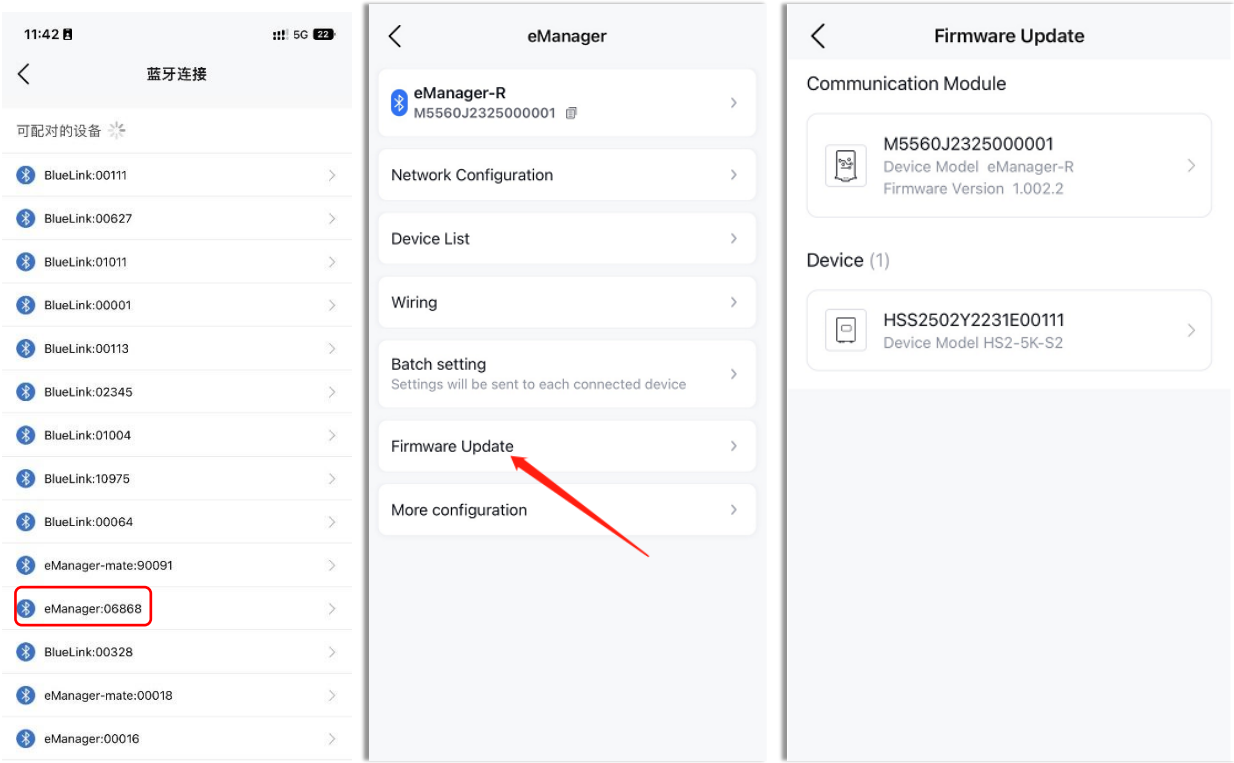
b. On the **Please select upgrade** section, select the device type, model name, and required firmware version.

c. On the **Upgradable equipment** section, input the device SN.

d. Click **OK**.



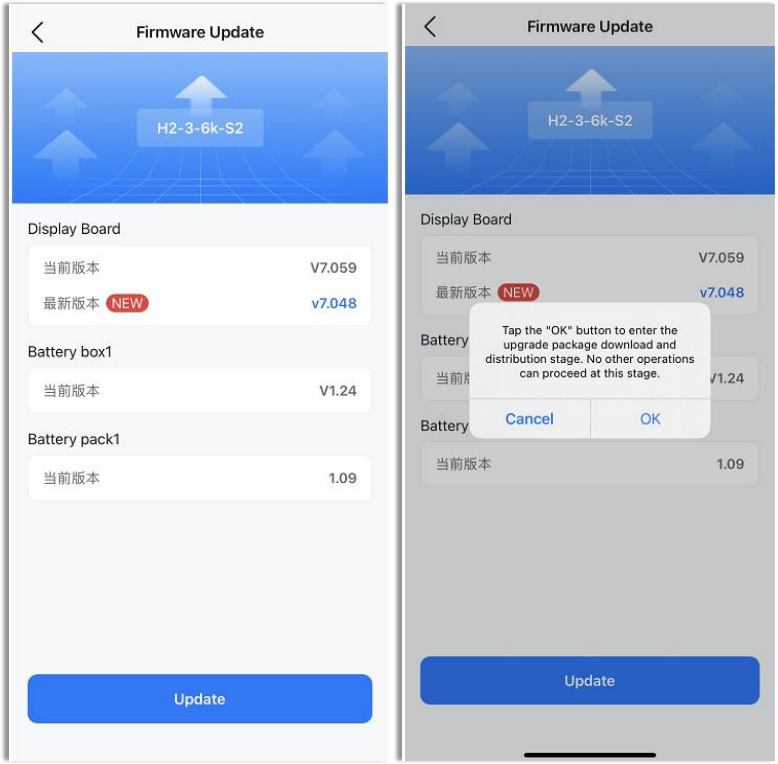
Step 2. Log in to the Elekeeper App. Select the required EMS device (eManager:*xxxxx*, wherein *xxxxx* indicate last five digits of the EMS device SN). Tap **Firmware Update** and then tap the device to be upgraded.



Step 3. On **Firmware Update**, select the latest version and tap **Update**. On the displayed dialog box, tap **OK** to confirm the upgrade.

During the upgrade, the Bluetooth connection will be disconnected.

After the upgrade, reconnect the Bluetooth and tap **Firmware Update** again to check the upgrade result.



5.3. Operations After the upgrade

Step 1. Use the AIO3 module installed on the inverter to make sure that all the following conditions are met:

a. the inverter is set to no meter status;

b. the parallelling mode is disabled; and

c. the export limit function is disabled.

Step 2. If the AIO3 module is installed on the inverter, remove it from the inverter. If the AIO3 module is embedded in the inverter, set it to Ethernet connection mode and then disconnect the Ethernet cable from the LAN port on the inverter.

6. Commissioning by the App

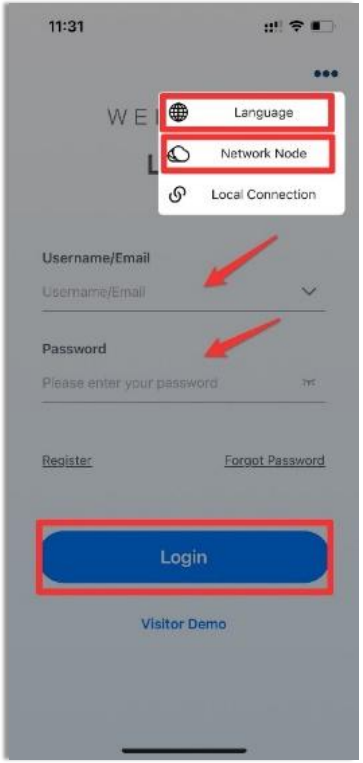
The Elekeeper App can be used for both nearby and remote monitoring. It communicates with different devices through Bluetooth or Ethernet connection.

The detailed operations on the App might vary, depending on the version you are using.

6.1. Install the App

On your mobile phone, search for “Elekeeper” in the App store. Download and install the App.

6.2. Log in to the App



Have an account? — Log in to the App.

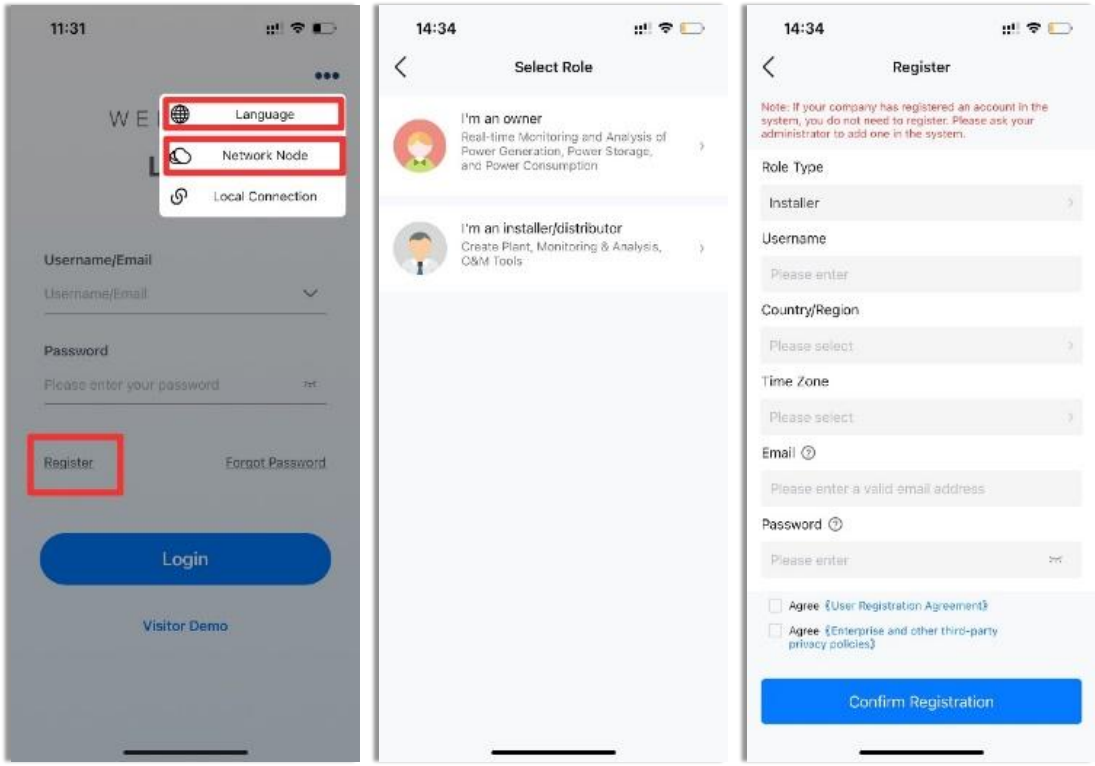
1. Tap the three-dot icon ••• on the top right corner. Choose the language and network node based on your needs.
2. Use your account and password for login.

No account? — Apply for a new account for login.

1. Tap the three-dot icon ••• on the top right corner. Choose the language and network node based on your needs.
2. Tap **Register.** Choose whether you are an owner, an installer, or a distributor.

   Note: For commissioning convenience, it is suggested that the install apply for the owner account.
3. Set your username, country/region, time zone, email, and password. Select the registration agreements and confirm the registration.

   Use the applied account and the password for login



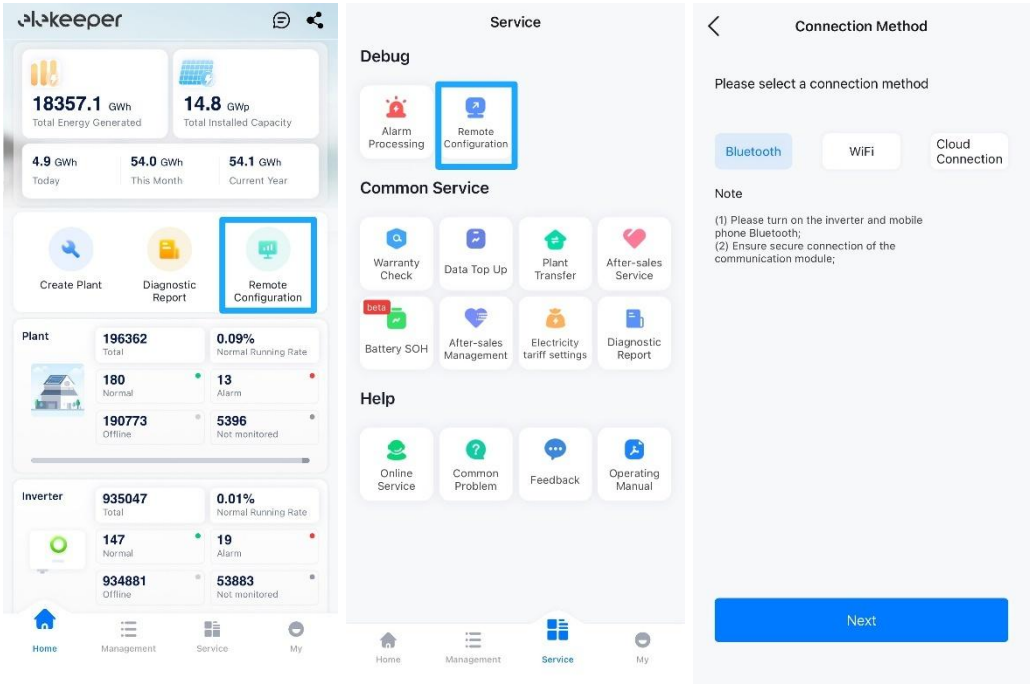
6.3. Perform the initialization settings

Before you start

Enable the Bluetooth function on your mobile phone.

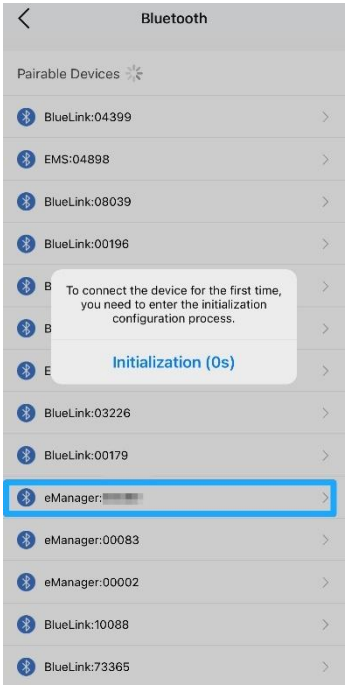
Procedure

1. On the **Home** or **Service** page, tap **Remote Configuration**. Tap **Bluetooth** and then **Next**.



2. Choose your EMS device (eManager:*xxxxx*) from the device list. Then, tap **Initialization**.

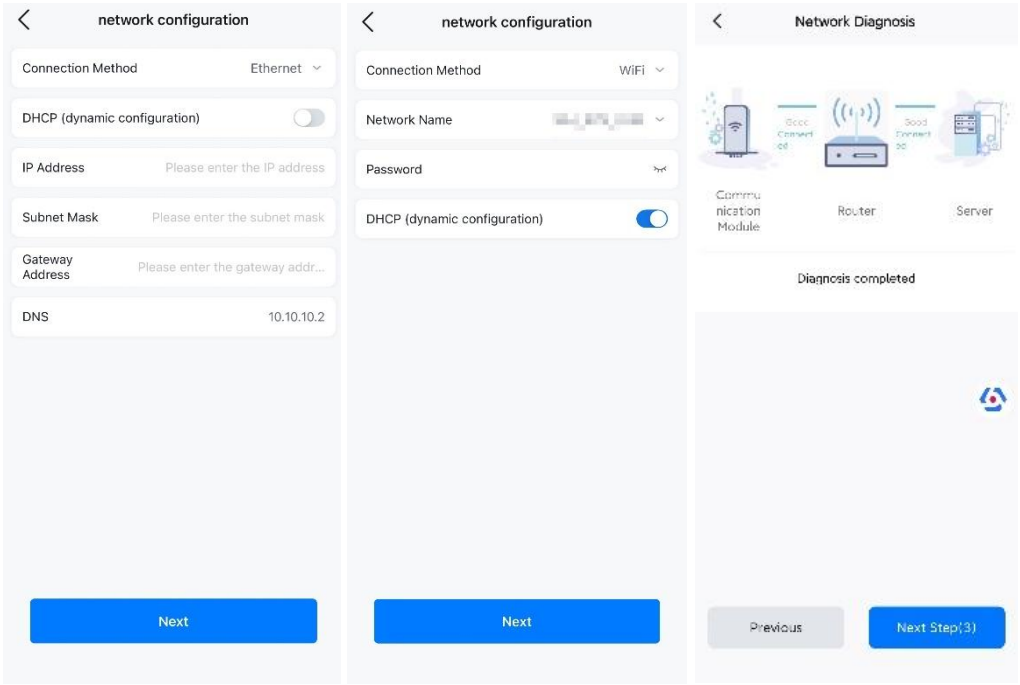
   Note: *xxxxx* are the last five digits of the serial number (SN) of your EMS device.



3. Network configuration

Select **Ethernet** or **WiFi** according to your needs. Set the related parameters.

Note: To use **Ethernet**, make sure that the Ethernet cable is connected from the ETH port on the eManager to the LAN port on the router.



4. Device configuration

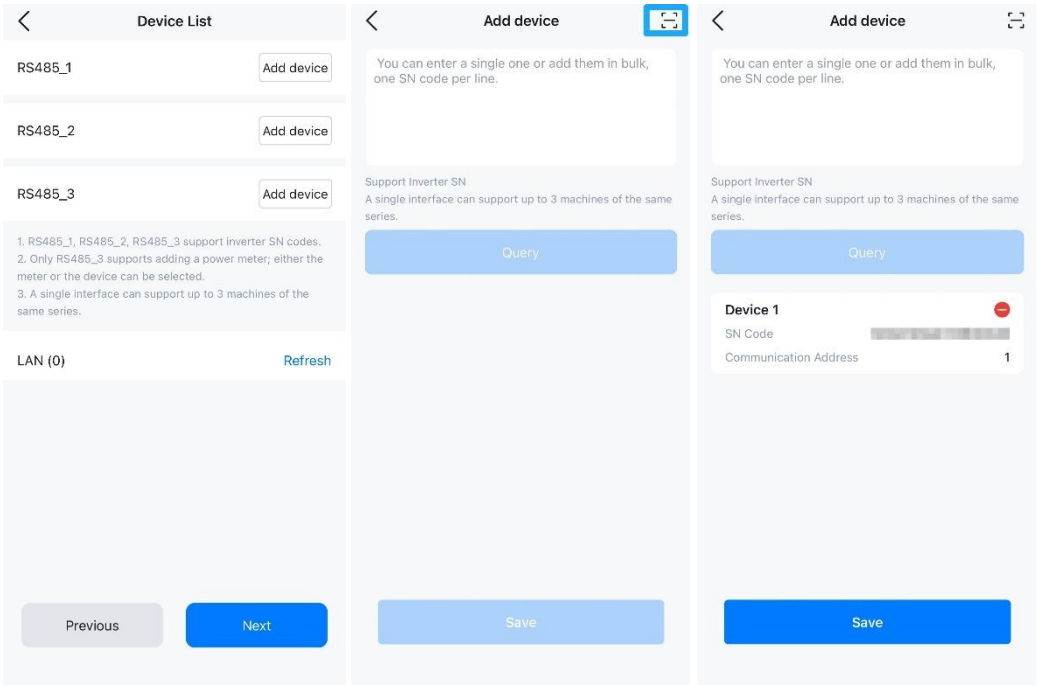
Depending on your inverter model, use one of the following connection manners.

- RS485 parallelling connection

To add an inverter, locate its RS485 connection (**RS485_1**, **RS485_2**, or **RS485_3**), tap **Add device**, and scan the SN barcode or input the SN manually.

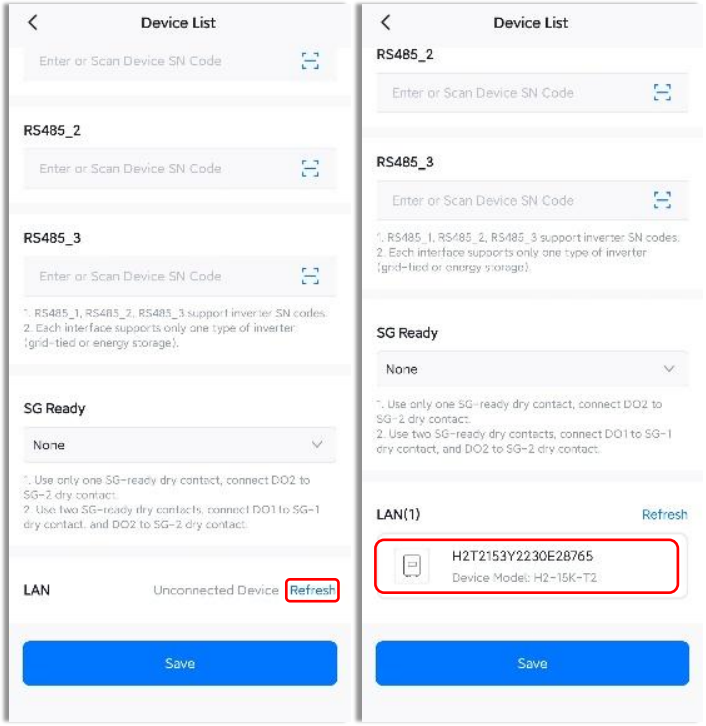
Notes:

- Make sure that all inverters are added in the corresponding RS485 connection setting area. For example, when two inverters are connected to the RS485_A1 and RS485_B1 ports of the eManager, both the two must be added to the **RS485_1** setting area.
- To remove an added inverter, tap ⛔.



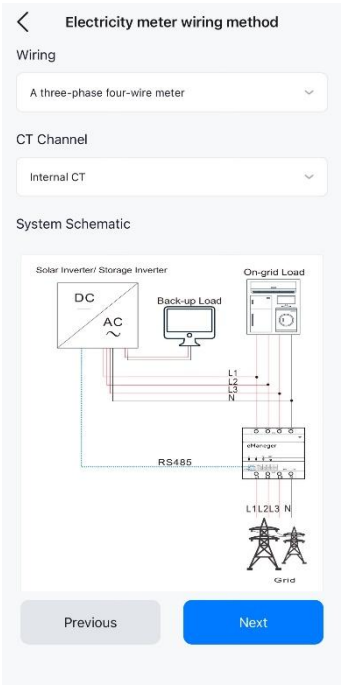
- LAN parallelling connection

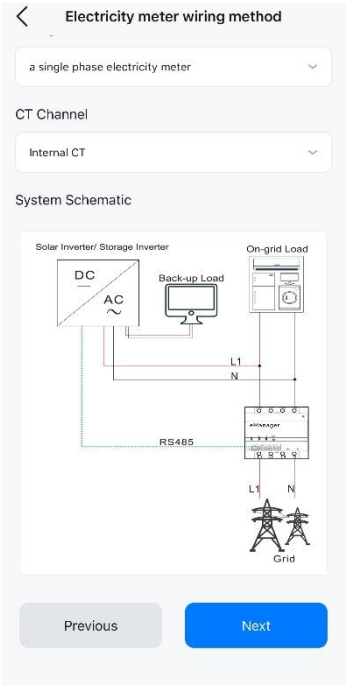
  Tap **Refresh** in the **LAN** setting area to display the connected devices.

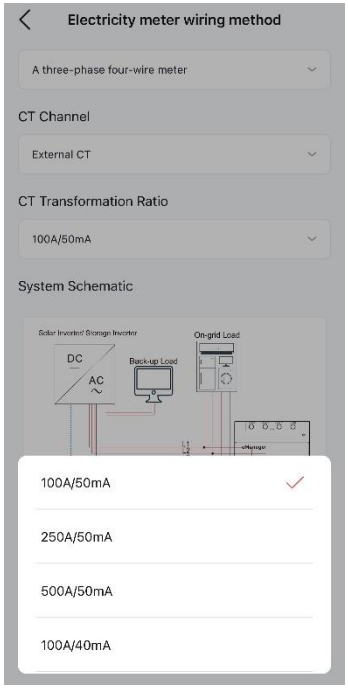


5. Wiring method

If you choose **External CT**, select the ratio of the CT(s) used in your system.

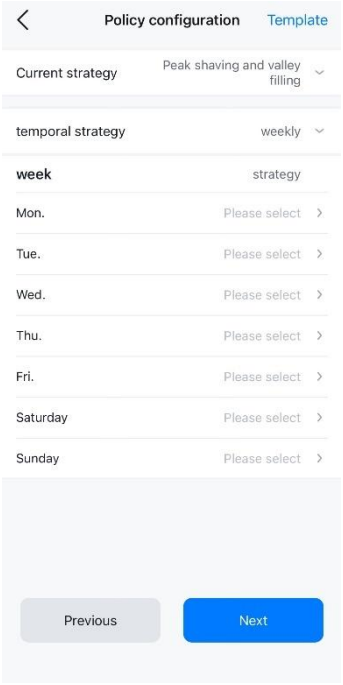




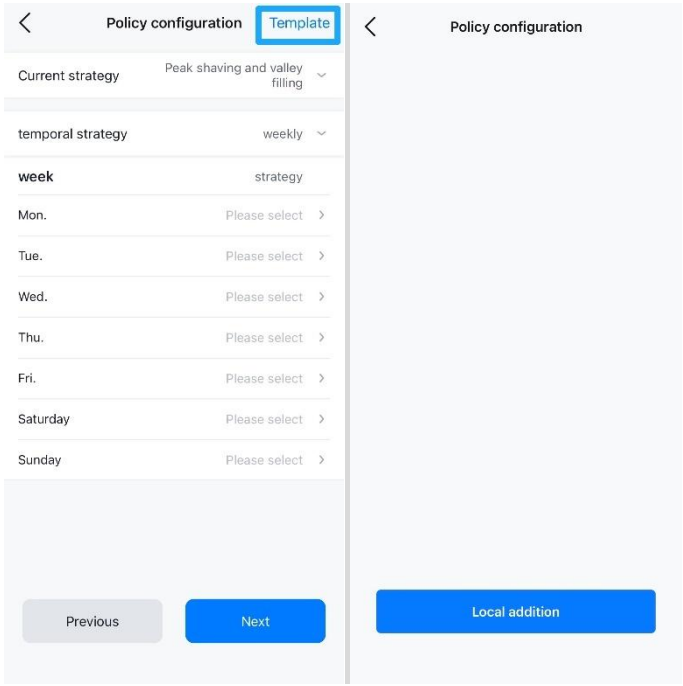


6. Policy configuration

By default, **Current policy** is set to **Peak clipping and valley filling**. If you need to change it, contact SAJ for consultation.



a. To create a policy, tap **Template** on the upper right corner. Tap **Local addition**.



I. Name the policy. In the following screenshot, **Test** is used as an example.

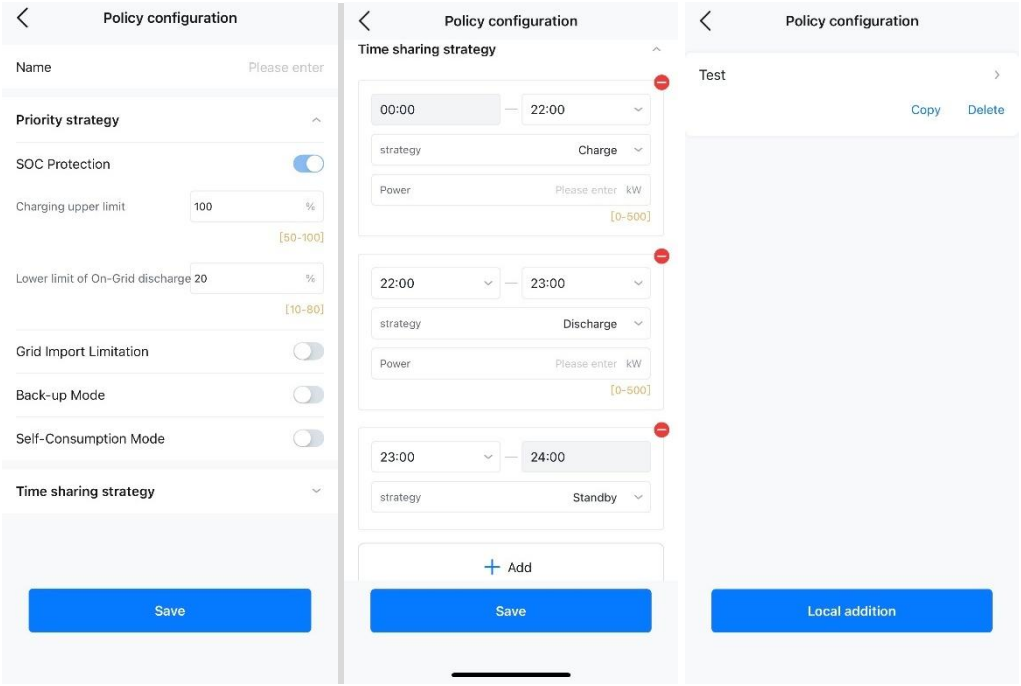
II. In the **Priority strategy** setting area, enable or disable the following functions:

- **SOC Protection**: If enabled, set the battery SOC (upper threshold for charging and lower threshold for discharging) to prevent battery over-charging or over-discharging.
- **Grid Import Limitation**: If enabled, set the upper threshold for the system input from the grid.
- **Back-up mode**: If enabled, set the backup SOC threshold, which must be higher than the lower threshold for discharging that you set in **SOC Protection**.
- **Self-Consumption Mode**: It is suggested that you enable this function.

III. In the **Time sharing strategy** setting area, per your needs, set **Charge**, **Discharge**, or **Standby** for different periods in each day.

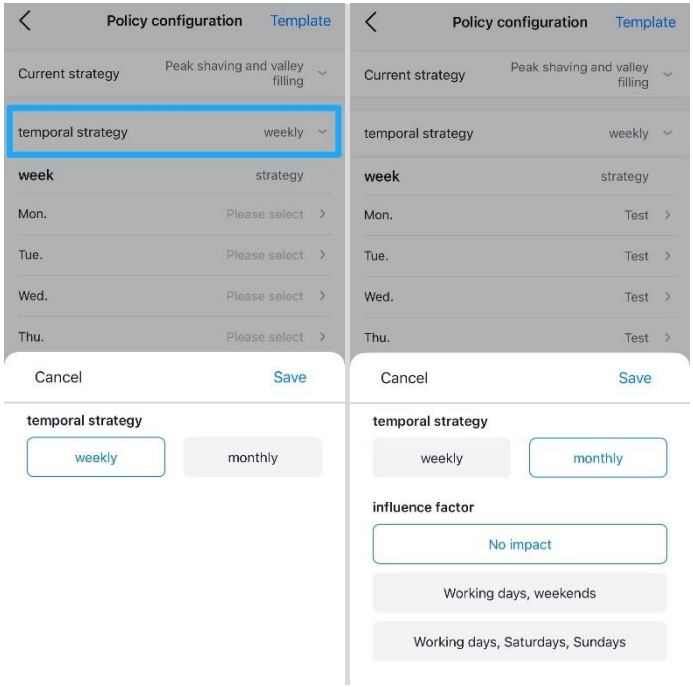
Notes:

- You can set a maximum of 12 periods for one day and set different work statuses (charging, discharging, and standby) for each period.
- The charging and discharging power set in this step will apply to the whole system.
- If **Self-Consumption mode** is enabled, the inverter works in the self-consumption mode in standby status.

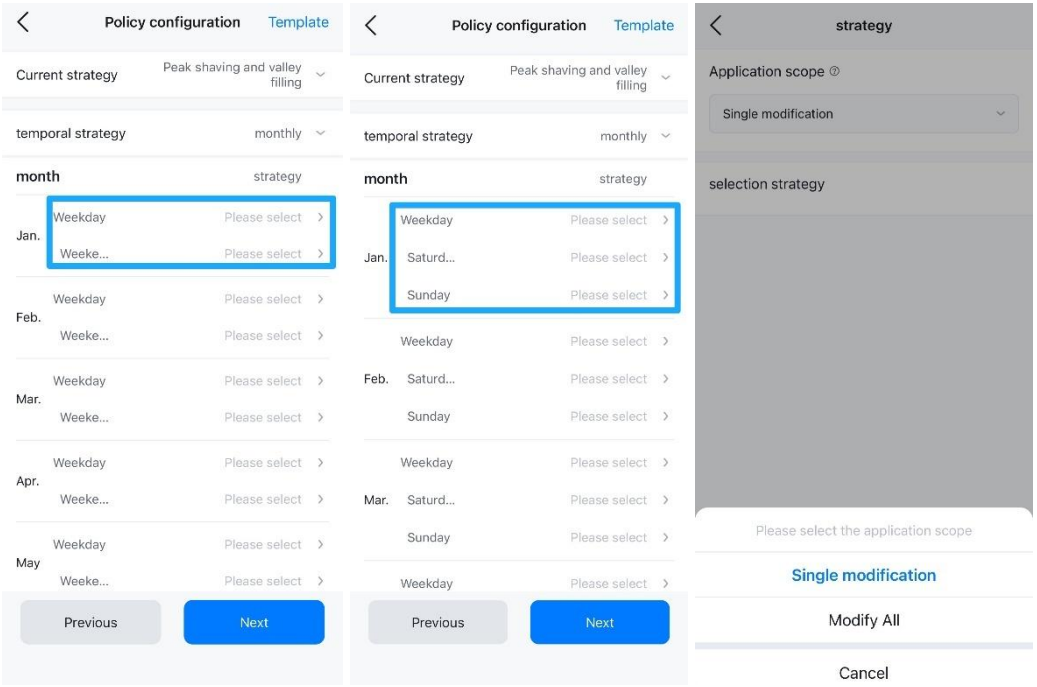


b. To apply policies, select **weekly** or **monthly** for **temporal strategy**.

- **weekly**: Set a policy for each week.
- **monthly**: Set a policy for each month.
  - **No impact**: One policy is used in working days and weekends for a month.
  - **Working days, weekends**: Different policies can be used in working days and weekends for a month.
  - **Working days, Saturdays, Sundays**: Different policies can be used in working days, Saturdays, and Sundays for a month.

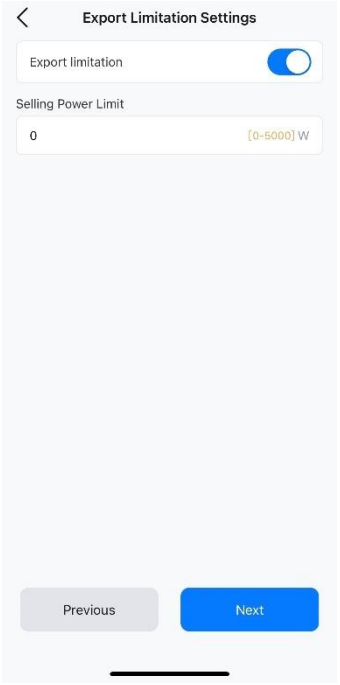


c. Tap a period to select the policy for it. You can select **Single modification** to set the policy for each period one by one; or you can select **Modify all** to apply the same policy to all periods.



7. Export limitation settings

If **Export limitation** is enabled, set **Selling Power Limit**.



8. Safety settings

a. Select **Country** and **Grid Compliance**.

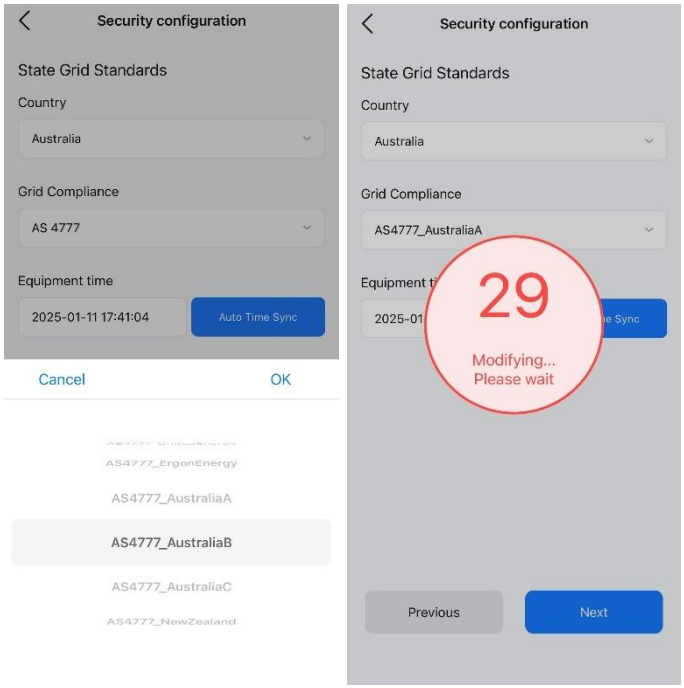
For **Grid Compliance**, select the value according to your setpoint (region of installation).

Taking Australia as an example:

- **AS4777_AustraliaA**: For large interconnected power systems. For example, all Australian networks other than those specified below.
- **AS4777_AustraliaB**: For small interconnected power systems. For example, Western Power.
- **AS4777_AustraliaC**: For isolated or remote power systems. For example, Horizon Power and TasNetworks.

b. Tap **Auto Time Sync** to set the device time to the time zone of the selected country or region.

c. Tap **Next** to wait for the initialization take effect.

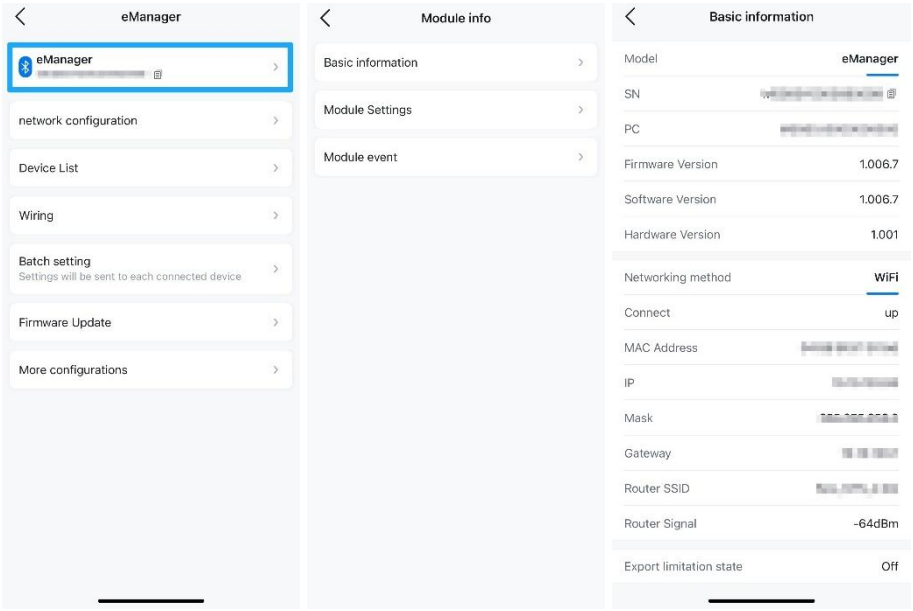


6.4. View the EMS settings

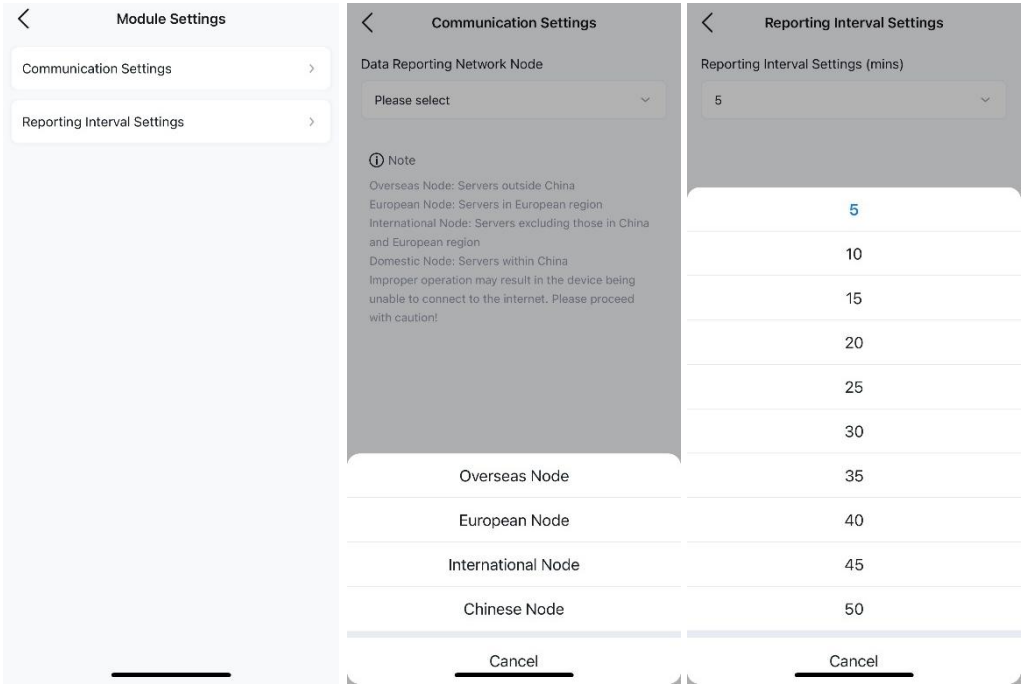
After the initialization is completed, view the EMS settings for double check, especially check the followings:

1. Tap the eManager to view its information.
   - **Basic information**: You can view the detailed information as shown below.

     Note: Make sure that **Connect** is **up**. If **Router Signal** is lower than -70 dBm, it is recommended to use Ethernet connection manner.
   - **Module event**: You can view the history events reported.

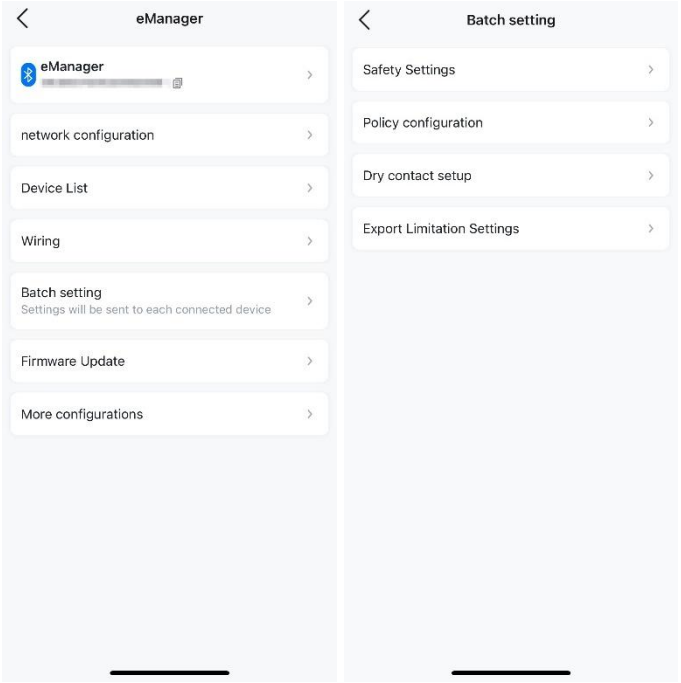


- **Module settings**: You can view or change the current node and the interval for reporting events.



2. Choose **Network configuration** > **Network Diagnosis** to verify that the network connection is normal.
3. Tap **Device List** and verify that all required devices are added.

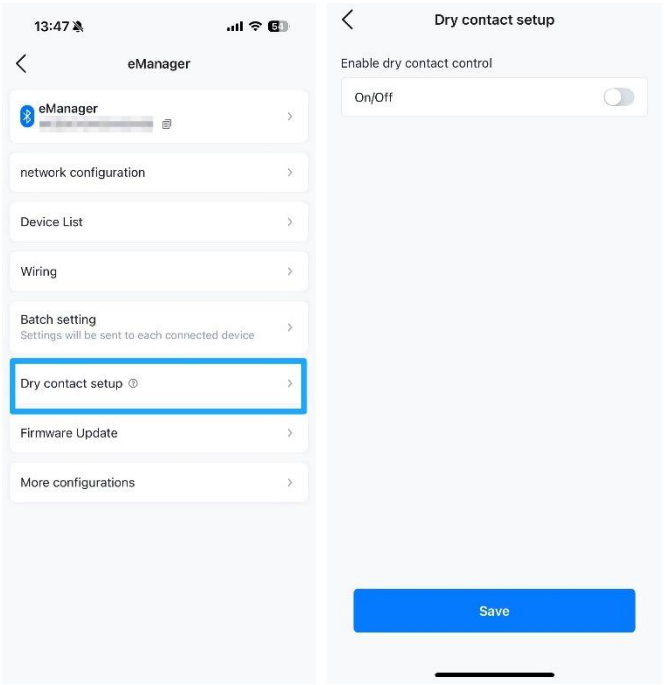
   If you need to change the default settings of the **Battery brand** and **Lower limit of battery charging capacitance (off-grid)** parameters, tap the required device in **Device list**, set the values, and save the changes.
4. Tap **Wiring** to view or change the connection manner.
5. Tap **Batch setting**.
   - **Safety Settings**: View or change the country and grid compliance.
   - **Policy configuration**: View or change the policies for each period.
   - **Export Limitation Settings**: View or change the export limitations.



6.5. Set the dry contact function

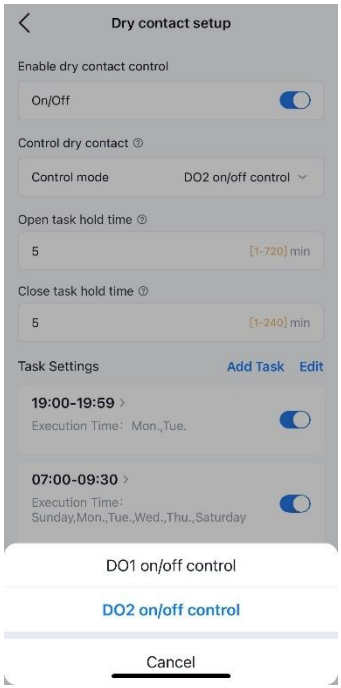
If you have connected an external device to a pair of DO ports on the eManager, enable the dry contact as follows:

1. On the eManager device page, tap **Dry contact setup**. Enable the dry contact function. Tap **Save**.



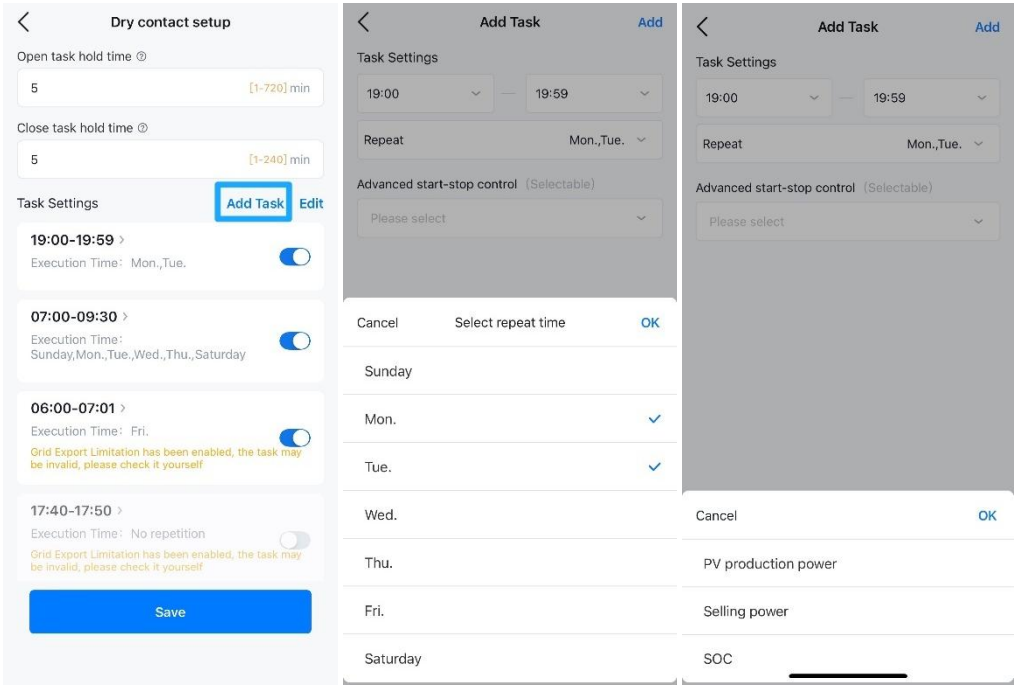
2. On the detailed setting page, select the required DO port pair:
   - **DO1 on/off control**: DO NO1 and DO COM1
   - **DO2 on/off control**: DO NO2 and DO COM2

   Note: The dry contact function can only be set for one pair of DO ports.

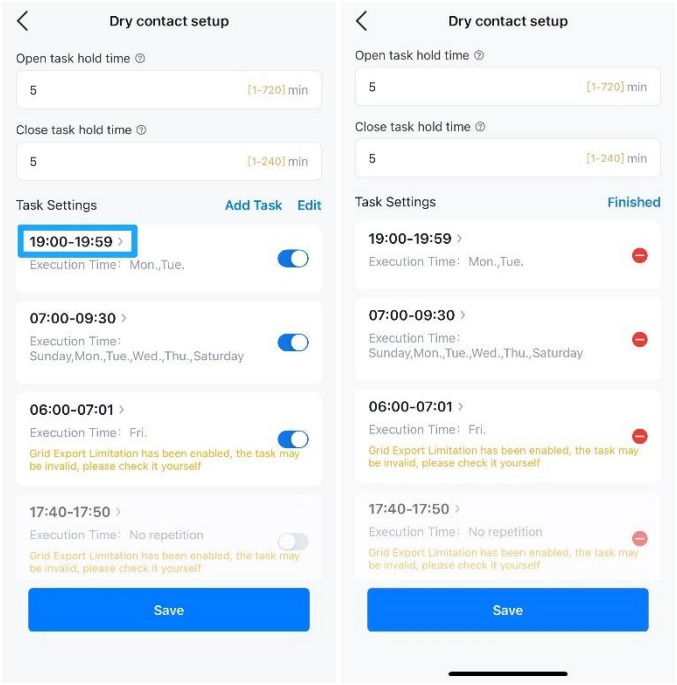


3. Task Settings

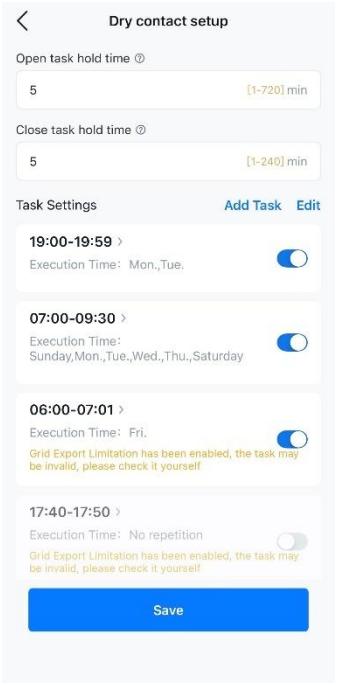
- To add a task, tap **Add Task** and set the time and start-stop control manner.



- To modify a task, tap the period to reset the time and start-stop control manner.
- To remove a task, tap the icon ⊖ of this task.
- To enable or disable a task, tap the icon ⊙ or ⊙ of this task.

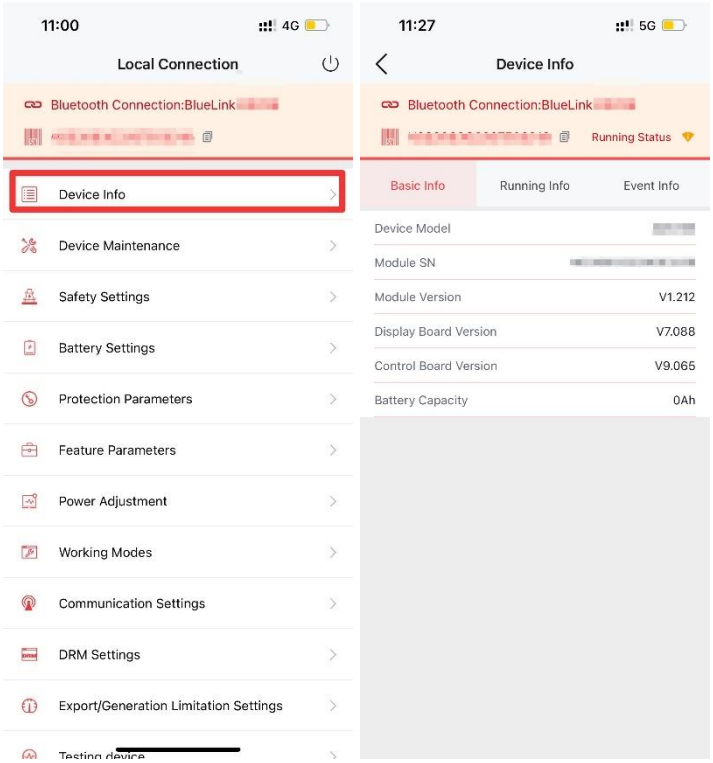


4. **Open task hold time:** Here takes the value **5 min** as an example.
   Once a task starts, even if it is detected that the execution conditions of this task fail to be met, the task will stop only after five minutes. (The task execution conditions were set in **Task settings**.)
5. **Close task hold time:** Here takes the value **5 min** as an example.
   After a task stops, even if the trigger conditions of any task are met, this task will not start until five minutes are passed. (The task trigger conditions were set in **Task settings**.)



6.6. View the inverter firmware version

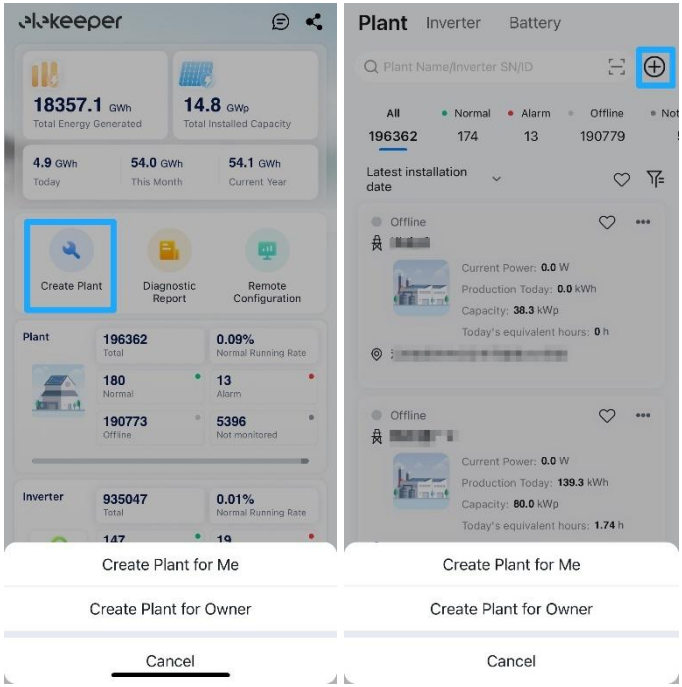
1. On the inverter main page, tap **Device info**.
2. On **Basic info**, view the values of **Display Board Version** (ARM) and **Control Board Version** (DSP).



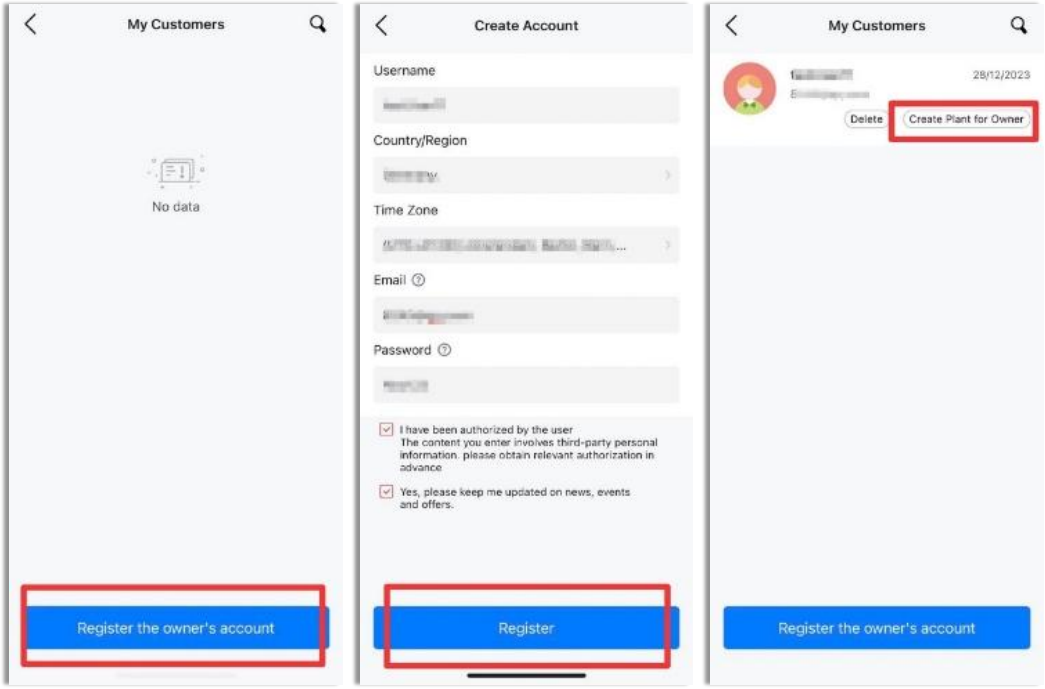
6.7. Create a plant

1. On the **Home** page, tap **Create Plant**. Select **Create Plant for Owner**.

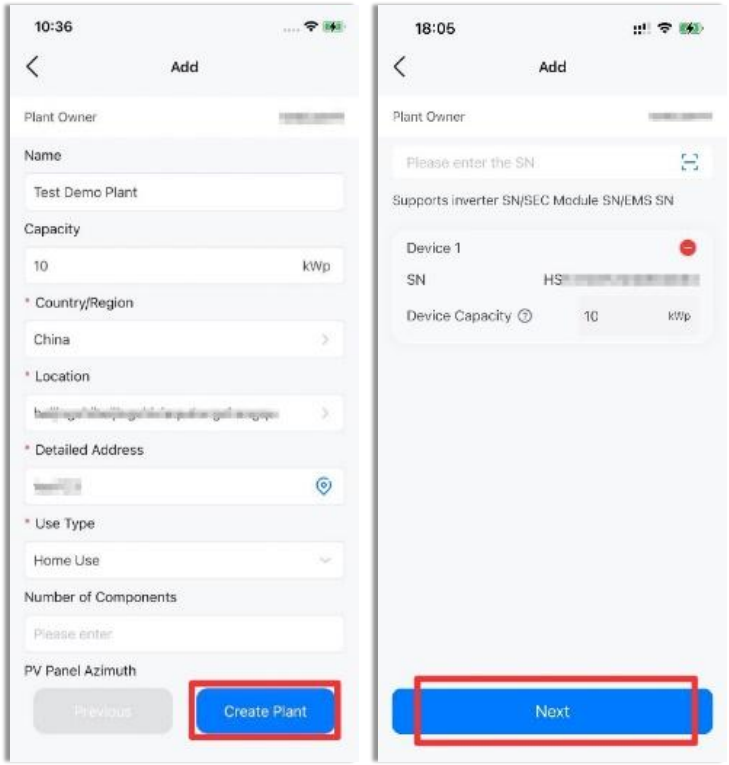
   Alternatively, on the **Management** page, tap the ⊕ icon on the top right corner and select **Create Plant for Owner**.



2. Apply for an account for the end user.
    a. Tap **Register the owner's account**.
    b. Set the required parameters based on the actual conditions of the end user.
    c. Tap **Register**, **Create Plant for Owner**, and then **Register the owner's account**.



3. Configure the plant details based on your actual conditions.
    a. Set the name, capacity, country or region, location, detailed address, user type, number of components, and PV panel azimuth. Tap **Create Plant**.
    b. Scan the EMS SN to add the device. Double check whether all devices added to this EMS are displayed. If not, check whether there is any communication error occurs between the EMS and the inverter. Then, tap **Next**.



7. Appendix

7.1. Recycling and disposal

This device should not be disposed as a residential waste.
The device that has reached the end of its operation life is not required to be returned to your dealer; instead, it must be disposed by an approved collection and recycling facility in your area.

7.2. Warranty

Check the product warranty conditions and terms on the SAJ website: https://www.saj-electric.com/

7.3. Contacting support

Guangzhou Sanjing Electric Co., Ltd.
Address: SAJ Innovation Park, No.9, Lizhishan Road, Guangzhou Science City, Guangdong, P.R.China.
Postcode: 510663
Website: https://www.saj-electric.com/
Technical Support & Service
Tel: +86-20-66608588
Fax: +86-20-66608589
E-mail: service@saj-electric.com
International Sales
Tel: +86-20-66608618/66608619/66608588/66600086
Fax: +86-20-66608589
E-mail: info@saj-electric.com
China Sales
Tel: 020-66600058/66608588
Fax: 020-66608589

7.4. Trademark

SAJ is the trademark of Sanjing.