Configuration Instructions

H2 Series

HS2/AS2 Series

HS3 Series

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.

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1. Required devices

- H2 series storage inverter and BU2 series battery; or BC2 series battery control unit
- HS2/AS2 series hybrid inverter and BU2 series battery
- HS3 series hybrid inverter and BU3 series battery; or BC3 battery combiner box

Equipment	One storage inverter or hybrid inverter	One storage inverter or hybrid inverter + Solar inverter (AC-coupling)	Multiple storage inverters or hybrid inverters (paralleling)	Multiple storage inverters or hybrid inverters + Solar inverter (paralleling + AC-coupling)
Inverter and batteries	● H2 + BC2 + BU2; ● HS2/AS2 + BU2; or ● HS3 + BU3 + BC3 (BC3 is required only in the multi-battery cascading scenario)			
Solar inverter	/	Yes	/	Yes
Meter	1	2*	/	Depending on the phase current of the solar inverter: ● Current ≤ 63A: 0 ● Current > 63A: 1
EMS	/	/	1	1
External CT	● 1-phase: 1 ● 3-phase: 3	● 1-phase: 2 ● 3-phase: 6	● Current ≤ 63A: Not required ● Current > 63A: ➢ 1-phase: 1 ➢ 3-phase: 3	
	Note: Not required if you use an 80 A meter which has CT integrated.		/	**Note:** If you use a meter because the phase current of the solar inverter exceeds 63A, the CT quantity here will be doubled.

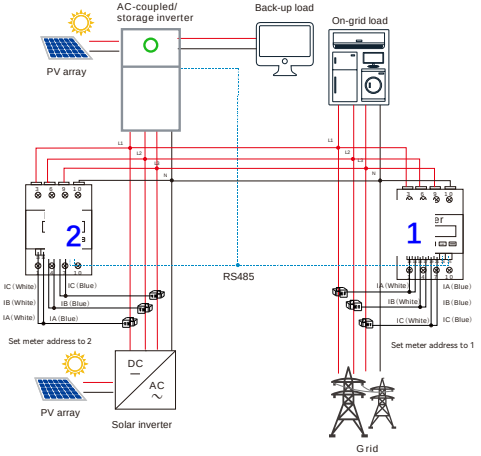
* If two meters are required, on the grid side, use Meter 1 (with preset address 1) in the brown package box; on the solar inverter side, use Meter 2 (with the preset address 2) in the white package box.

ATTENTION: Do NOT change the default addresses of the two meters.

2. Meter Address Settings

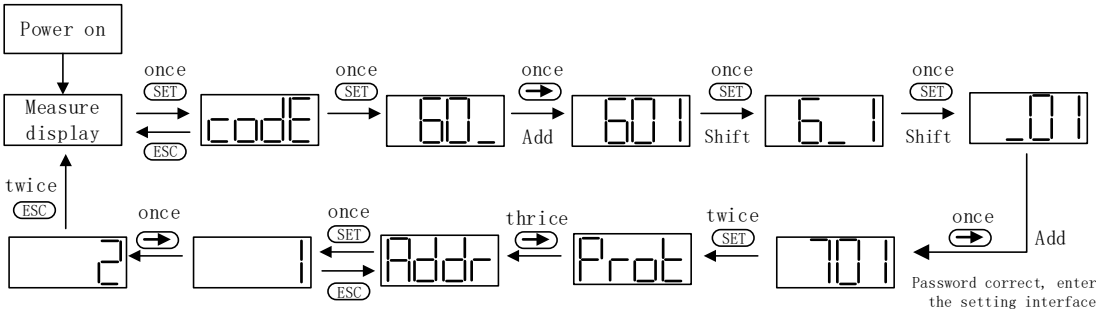
If two meters are used, set the address of the inverter-side meter to **2**. Do NOT change the default address 1 of the grid-side meter.

2.1. Three-phase meter



DTSU666		
	**Button**	**Description**
	SET	Confirmation or cursor shift (when input digits)
	ESC	Exit
	→	Add

To set a three-phase meter, perform the following operations:



a. Power on the meter and enter the “Measure display” interface, and then press SET twice to enter the password 701.

b. Press ⇒ once to adjust the value of the first digit. One increment per button pressing.

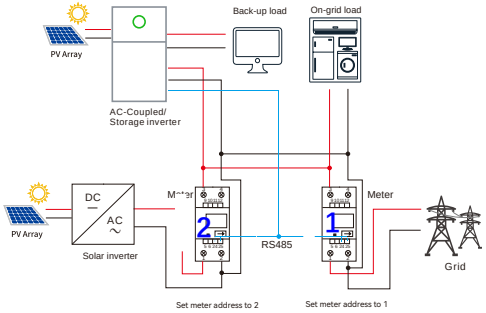
c. Pressing SET once to shift to the second digit and adjust the third digit in the same way. Set the default password to 701.

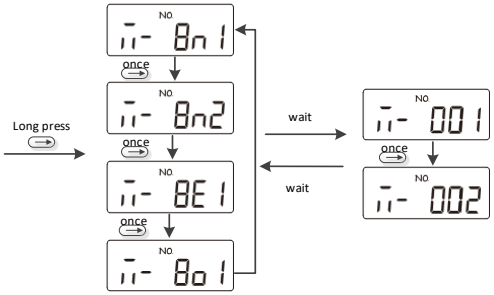
d. When the password is entered correctly, press SET twice to enter the port interface and press ⇒ for three times to enter the address page. Then, press SET once to start to set the meter address.

e. Press ⇒ to adjust the value of the address. One increment per button pressing.

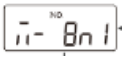
f. After the address is set successfully, press ESC twice to exit to the Measure display interface to get the meter work.

2.2. Single-phase meter





To set a single-phase meter, perform the following operations:

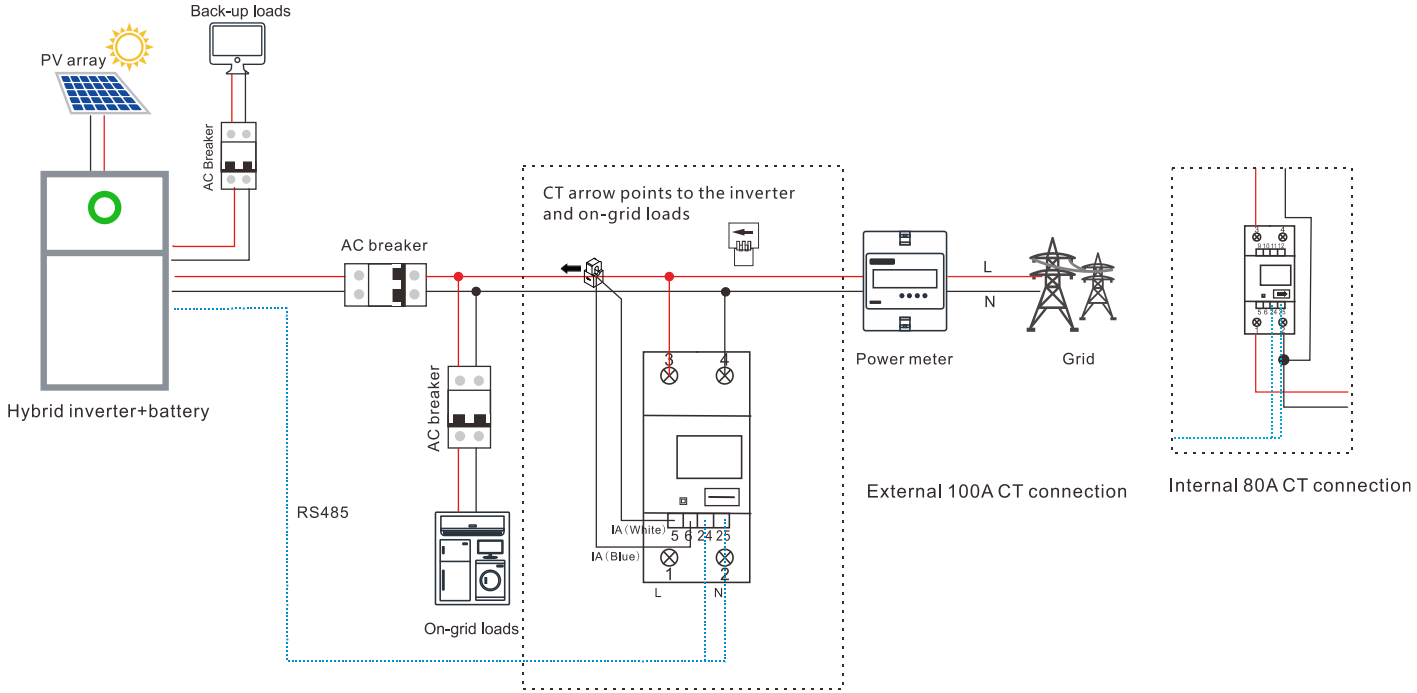
a. Power on the meter and enter the display interface and long press ⇒ to enter the meter switching interface. Select  and wait for 2s to enter the meter address page.

a. Press ⇒ to set the meter address.

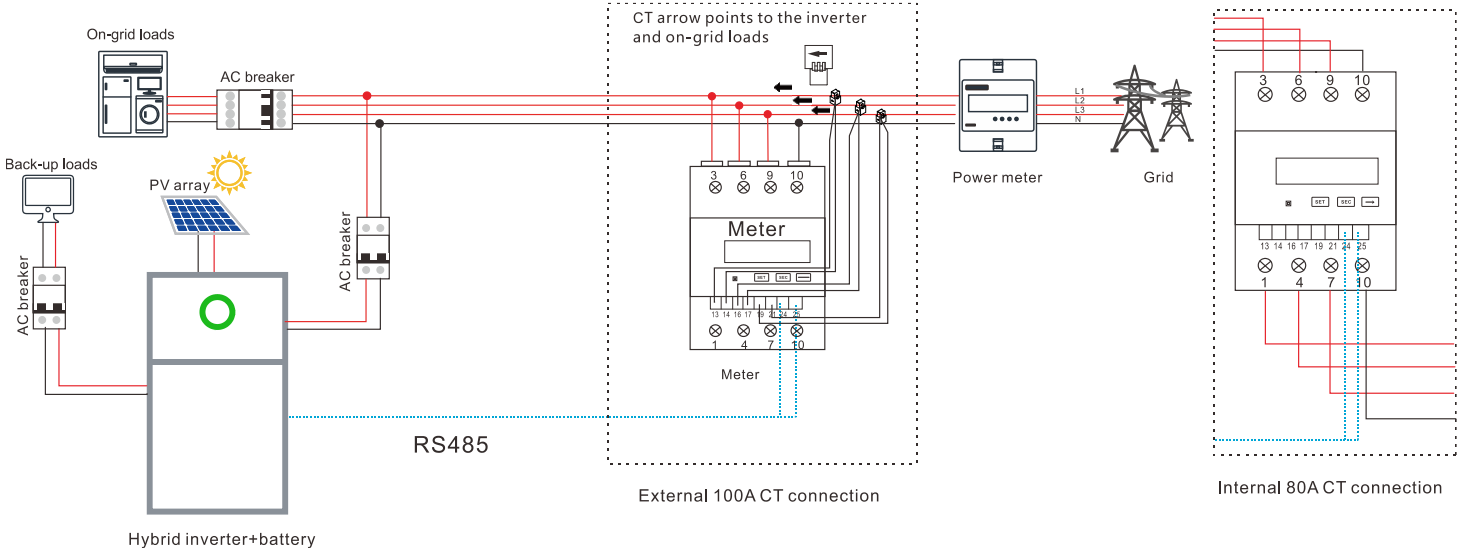
After the address is set, the initial display interface will be displayed. No further action is required.

3. System connection: single-phase hybrid inverter

3.1. One hybrid inverter in single-phase grid



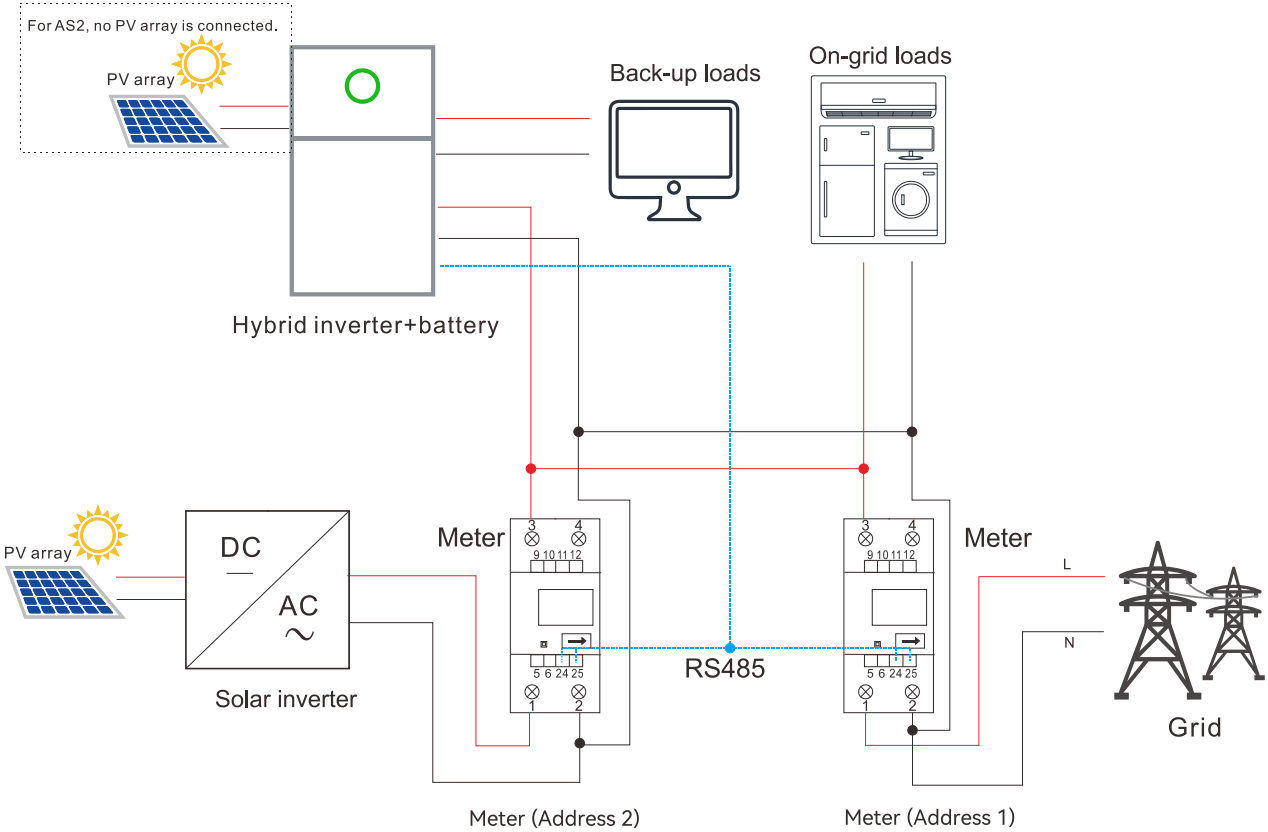
3.1.1. One hybrid inverter in three-phase grid



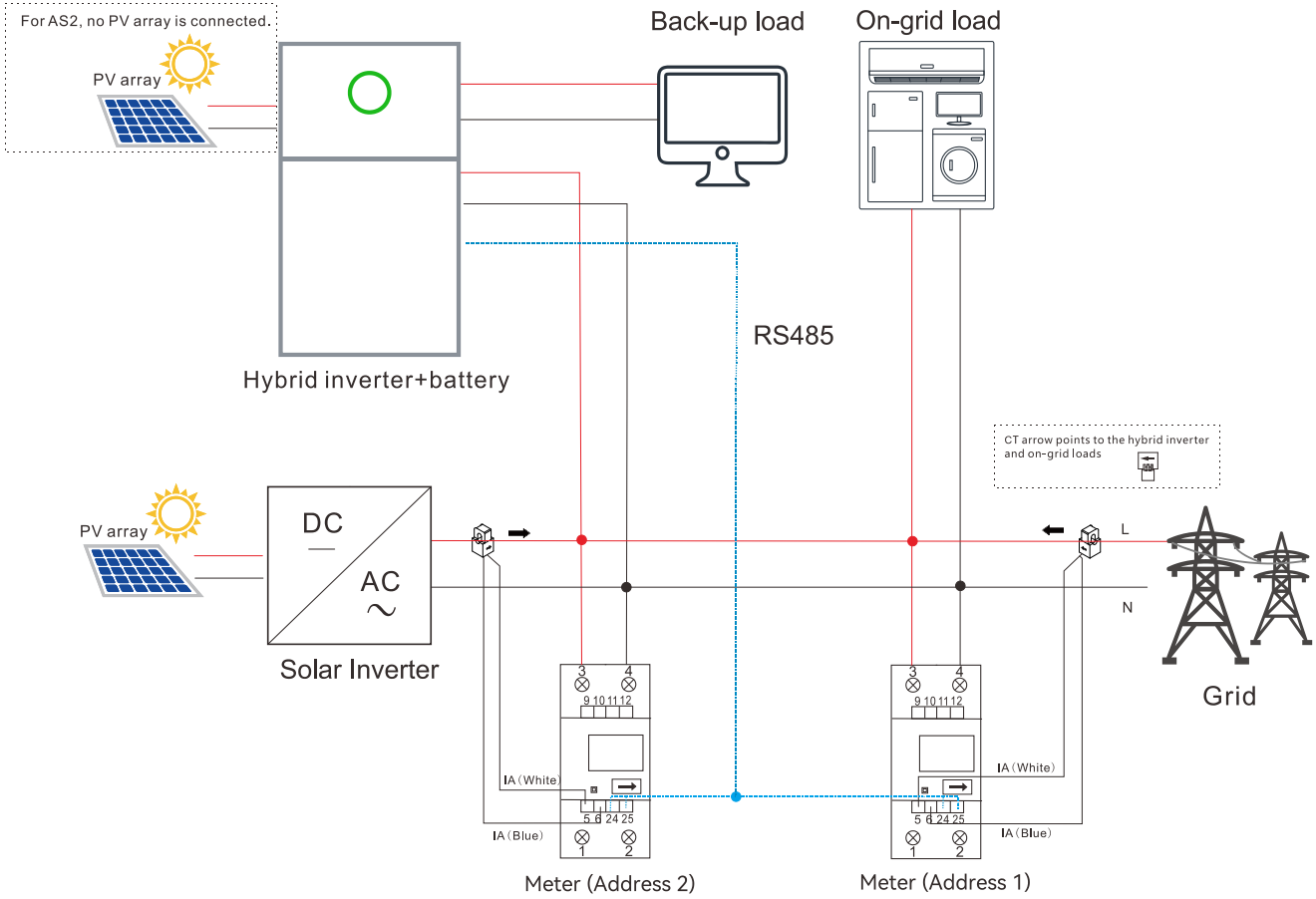
3.2. One hybrid inverter, solar inverter, single-phase grid (AC-coupling connection)

Before connection, contact SAJ technical support to check whether the connection is applicable to your inverter model.

3.2.1. Internal 80 A CT connection (current ≤ 80 A)



3.2.2. External 100 A CT connection (current ≤ 100 A)



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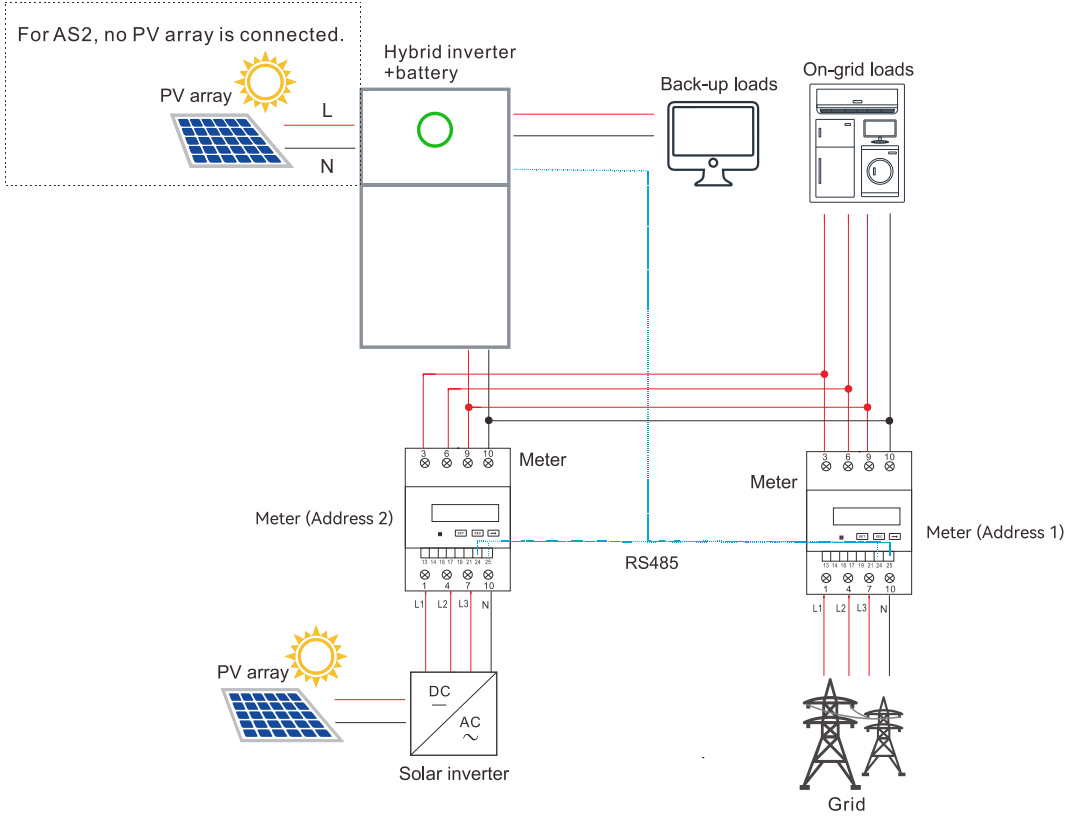

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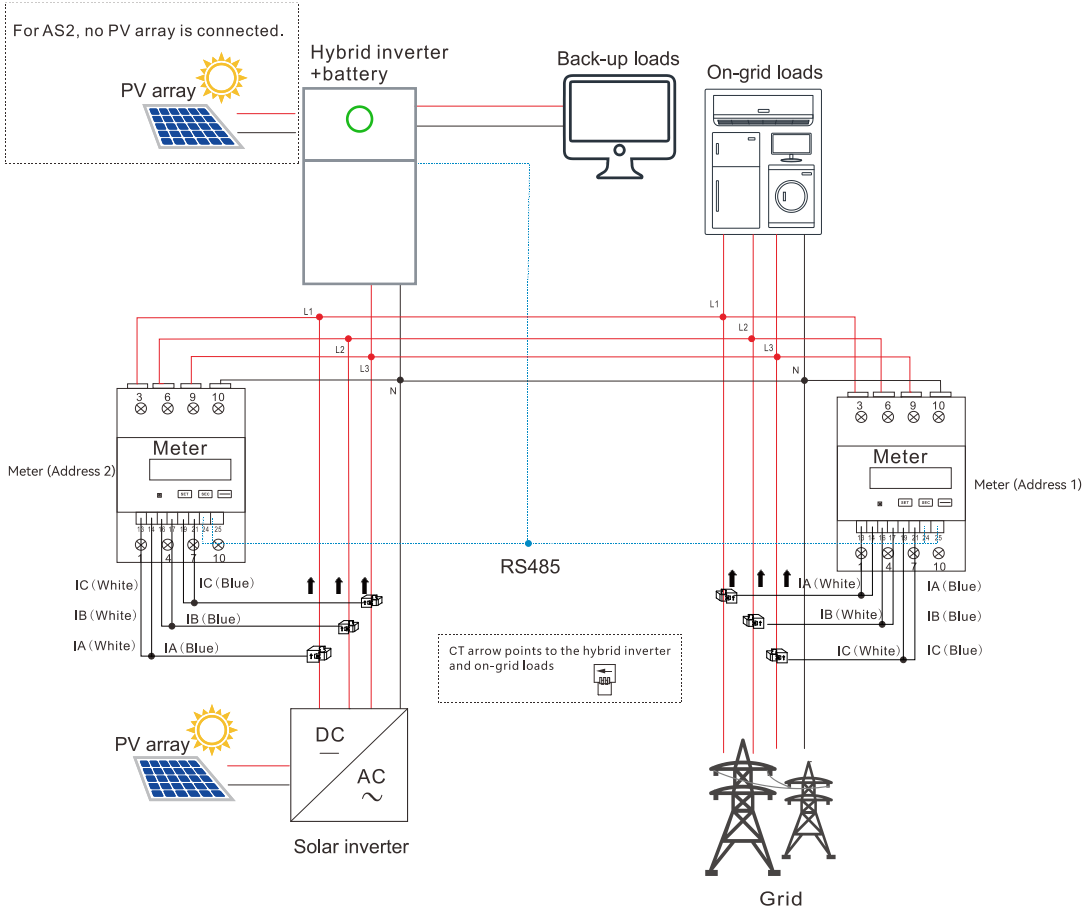


3.4. Multiple hybrid inverters, one EMS (paralleling connection)

Before connection, contact SAJ technical support to check whether the connection is applicable to your inverter model.

3.4.1. RS485 connection (up to 6 inverters)

Supported inverter models:

- H2-(3K-6K)-S2
- HS2-(3K-6K)-S2

Connect the communication cables from the RS485 port on the inverter to the corresponding terminals on the eManager. 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 terminals on the eManager
Pin 7	RS485-A
Pin 8	RS485-B

Notes:

The eManager provides three pairs of RS485 terminal combinations.

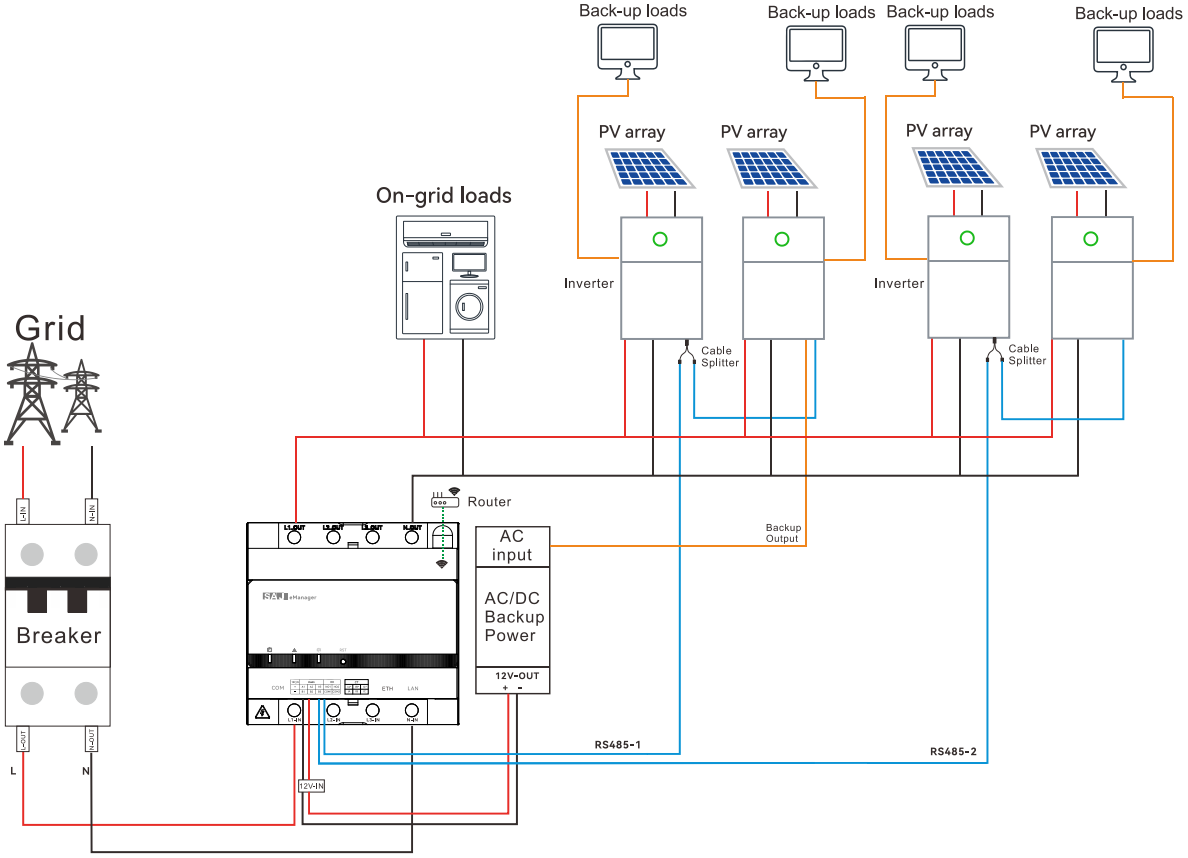
- RS485 A1 and RS485 B1
- RS485 A2 and RS485 B2
- RS485 A3 and RS485 B3

You can connect the inverter to any pair of the above combination. However, for one pair, make sure that:

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

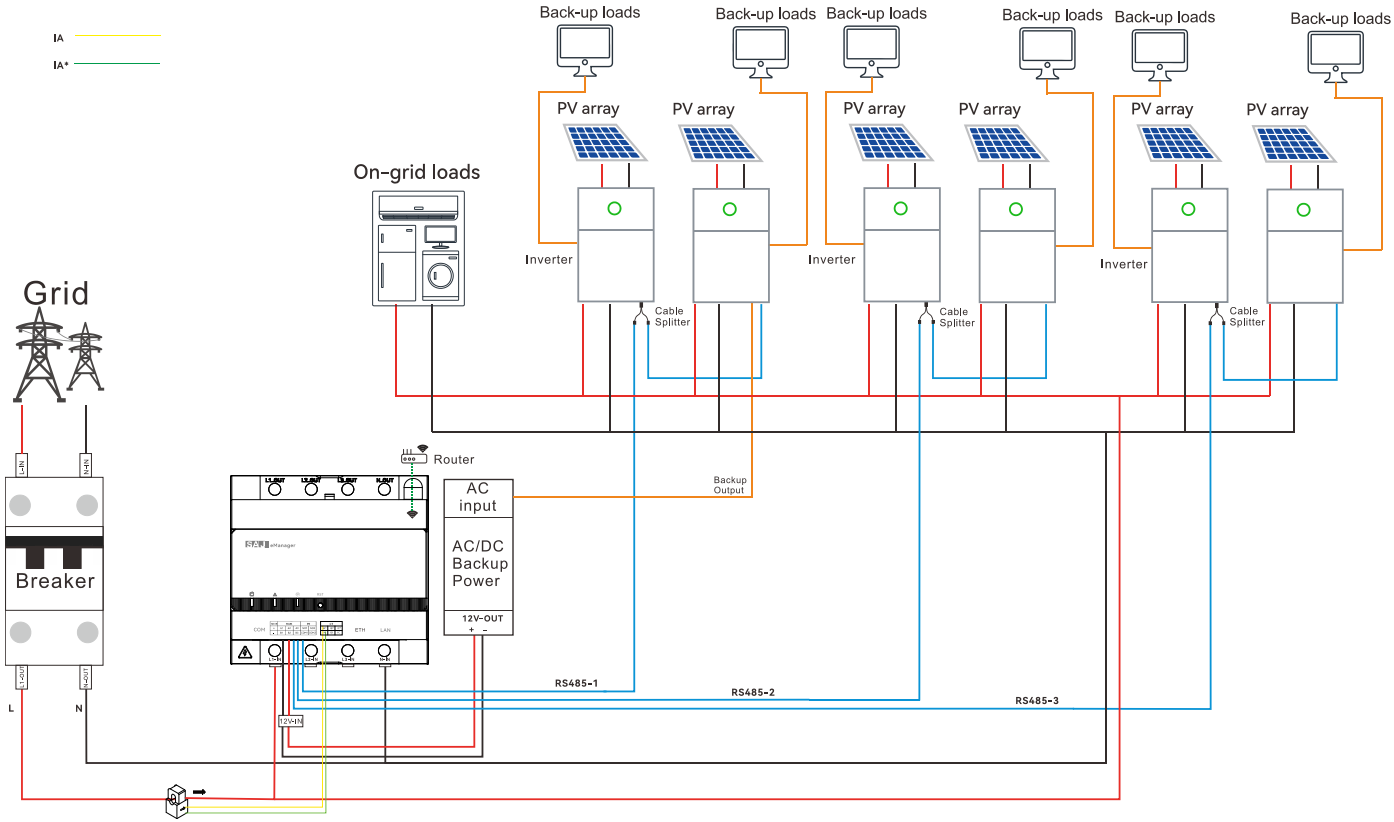
Internal CT connection (current ≤ 63 A) in the single-phase grid

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



External CT connection (current > 63 A) in the single-phase grid

You can use 100A/50mA or 250A/50mA CTs, depending on the plant capacity. (Plant capacity = The greater value of the total inverter power or the total on-grid load power)



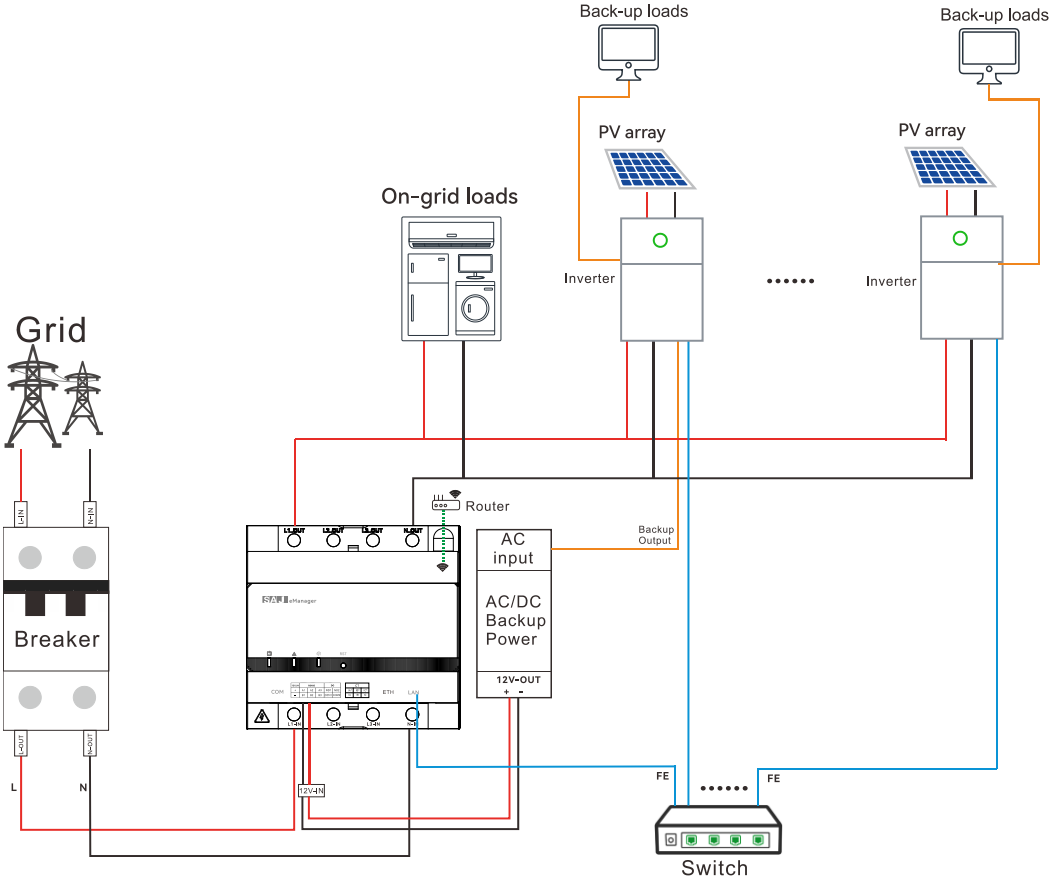
3.4.2. LAN connection (up to 10 inverters)

Supported inverter models:

- H2-(10K-30K)-(T2, T3)
- HS3-(5K-12K)-T2 (To construct the paralleling scenario for HS3 series, contact SAJ first.)
- HS3-(3K-6K)-S2 (To construct the paralleling scenario for HS3 series, contact SAJ first.)

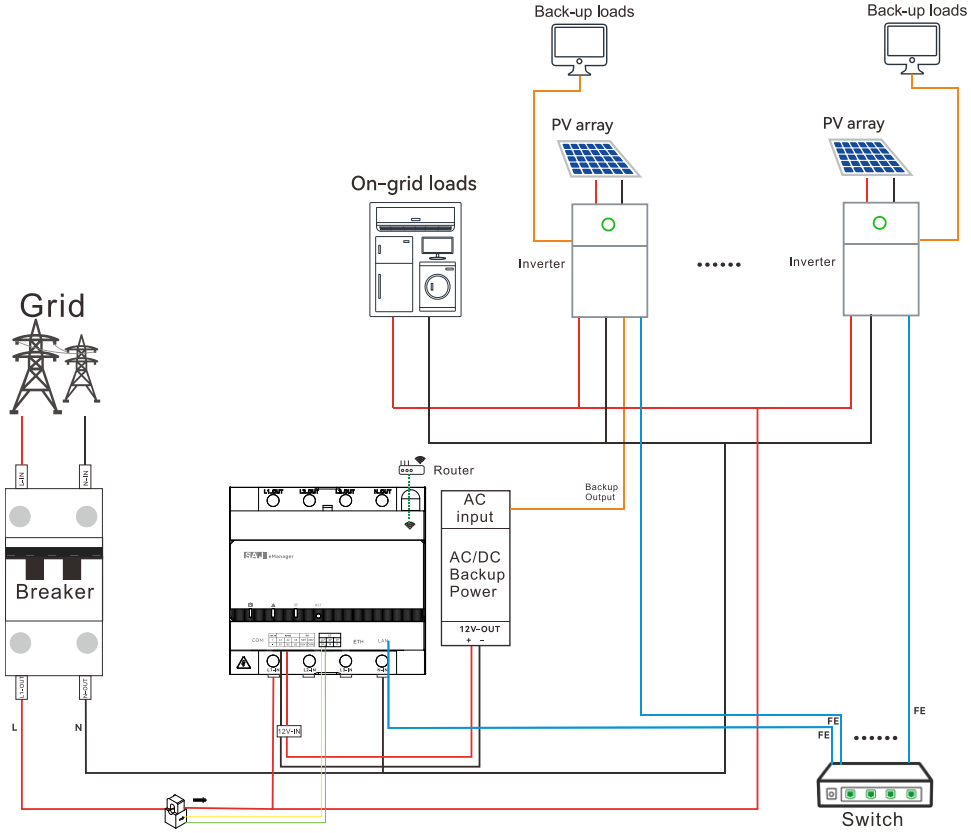
Internal CT connection (current ≤ 63 A) in the single-phase grid

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



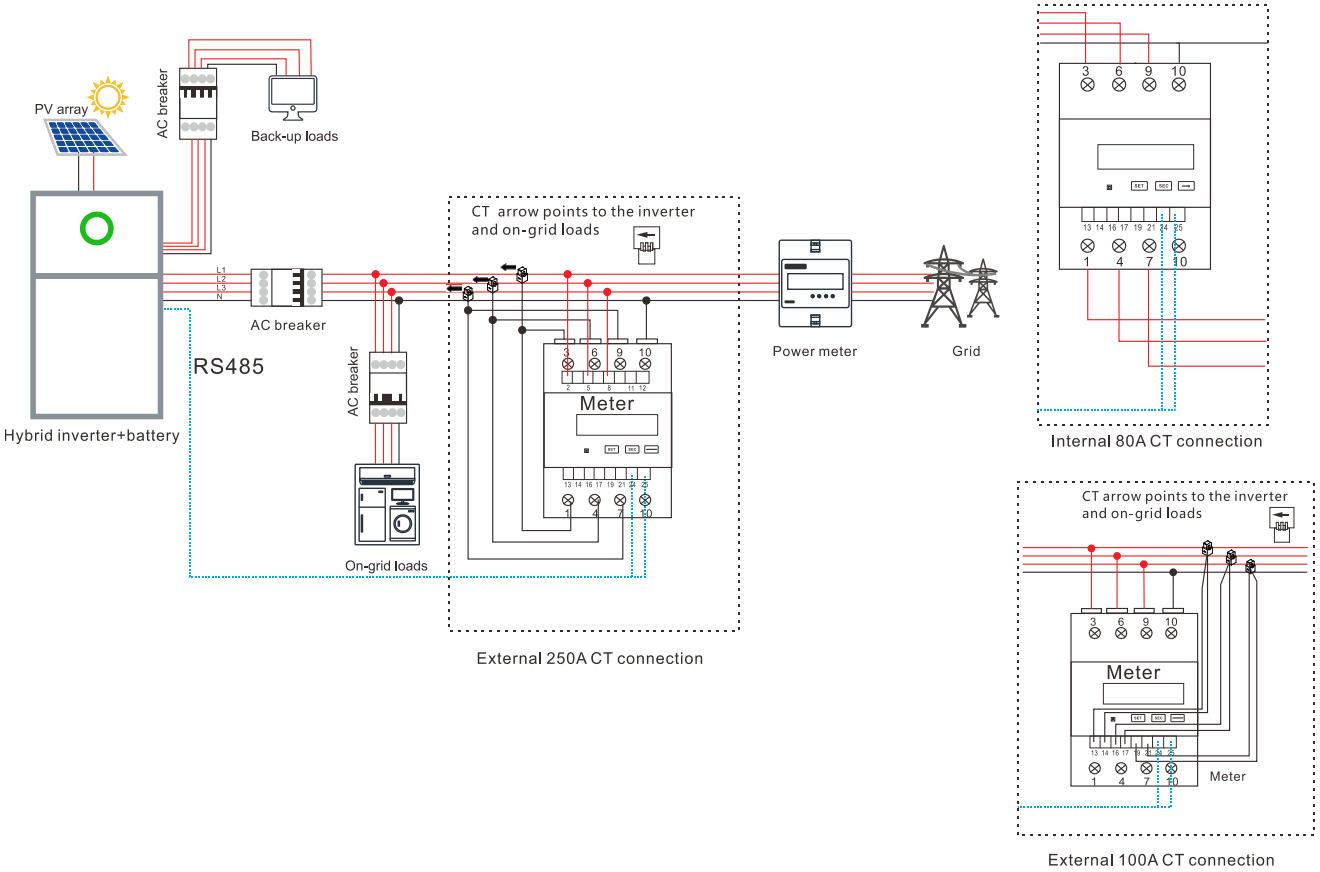
External CT connection (current > 63 A) in the single-phase grid

You can use 100A/50mA or 250A/50mA CTs, depending on the plant capacity. (Plant capacity = The greater value of the total inverter power or the total on-grid load power)



4. System connection: three-phase hybrid inverter

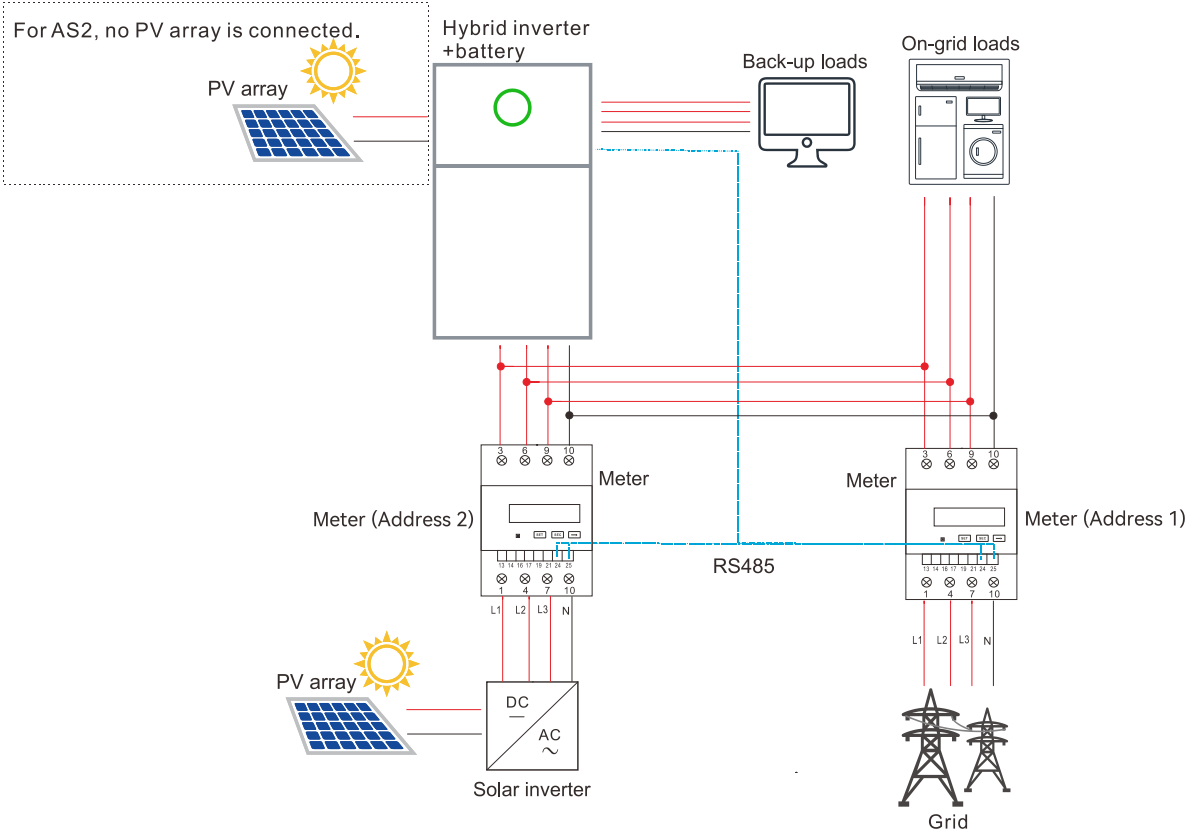
4.1. One hybrid inverter



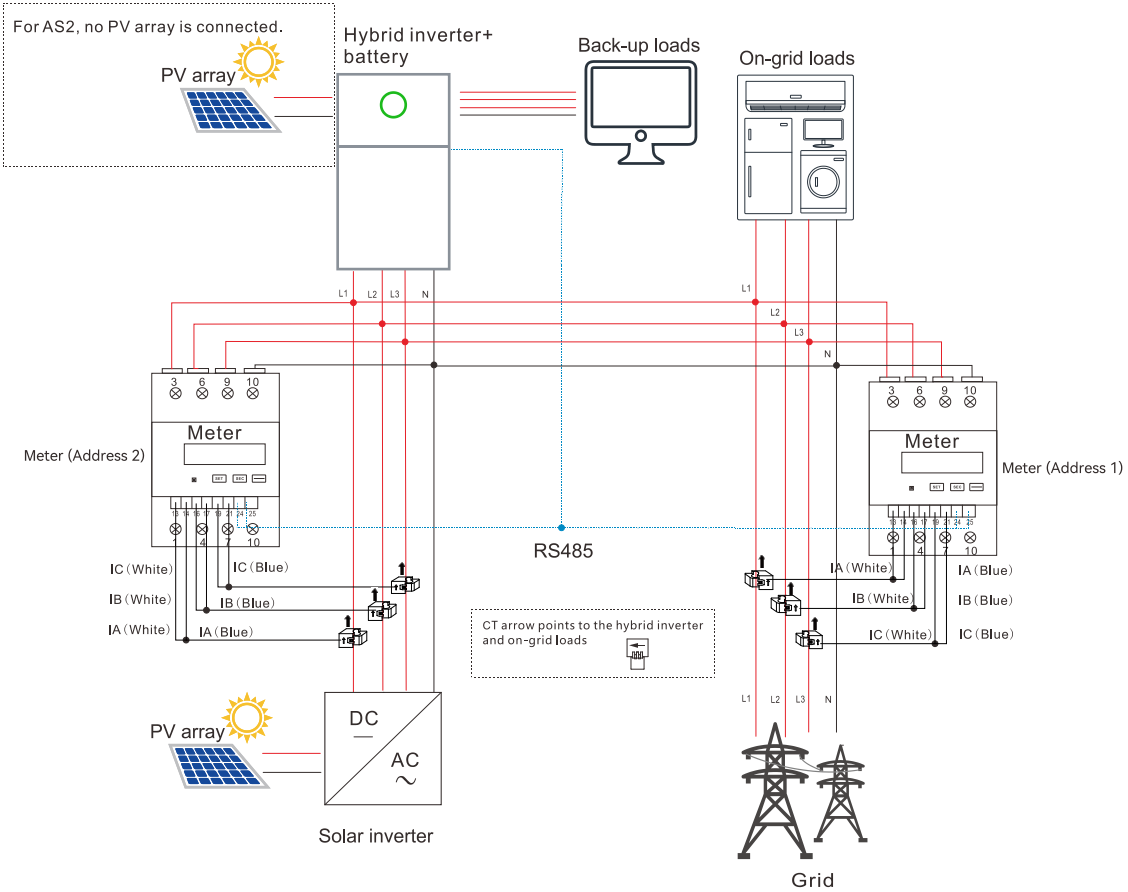
4.2. One hybrid inverter, one solar inverter (AC-coupling connection)

Before connection, contact SAJ technical support to check whether the connection is applicable to your inverter model.

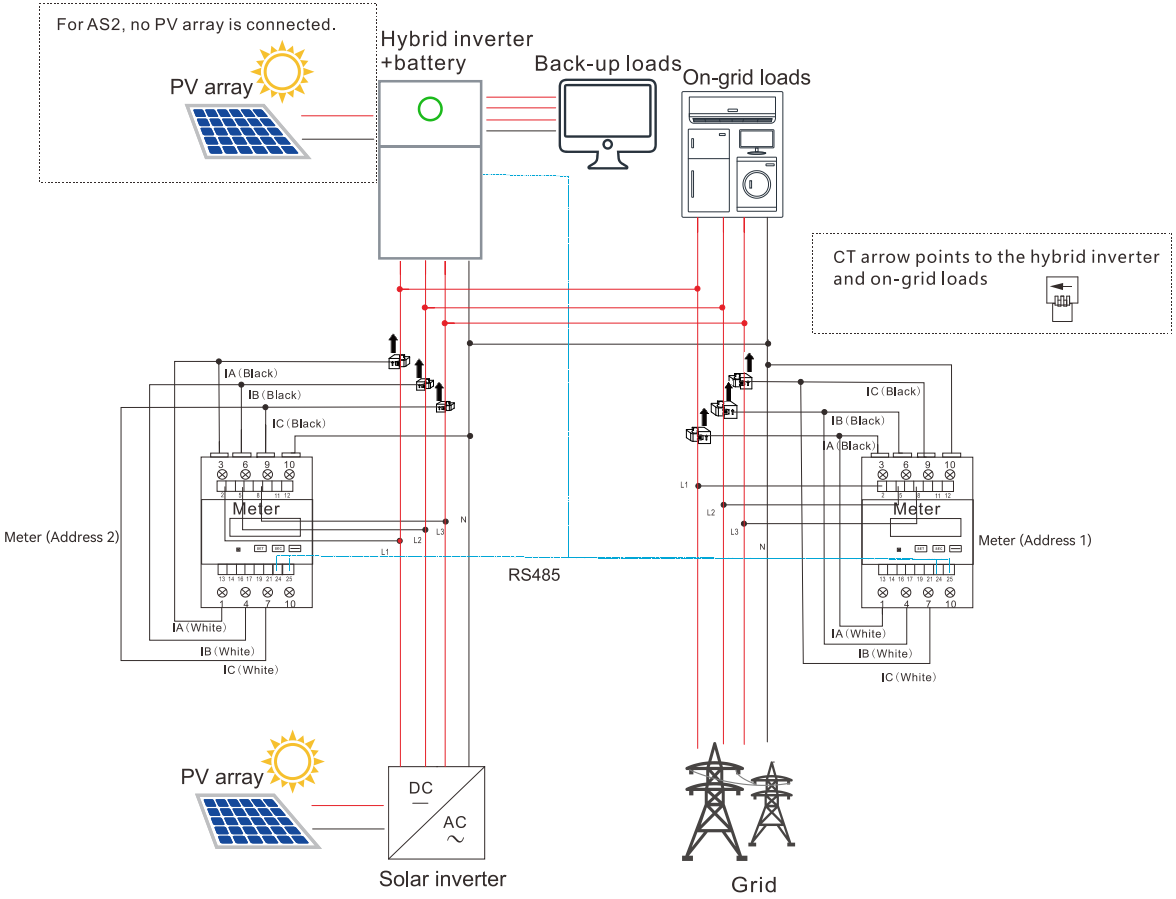
4.2.1. Internal 80A CT connection (current ≤ 80 A)



4.2.2. External 100A CT connection (current ≤ 100 A, CT prepared by users)



4.2.3. External 250A/500A CT connection (current > 100 A, CT prepared by users)



4.3. Multiple hybrid inverter, one EMS (paralleling connection)

Before connection, contact SAJ technical support to check whether the connection is applicable to your inverter model.

4.3.1. RS485 connection (up to 6 inverters)

Supported inverter models:

- H2-(5K-10K)-T2
- HS2-(5K-10K)-T2

Connect the communication cables from the RS485 port on the inverter to the corresponding terminals on the eManager. 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 terminals on the eManager
Pin 7	RS485-A
Pin 8	RS485-B

Notes:

The eManager provides three pairs of RS485 terminal combinations.

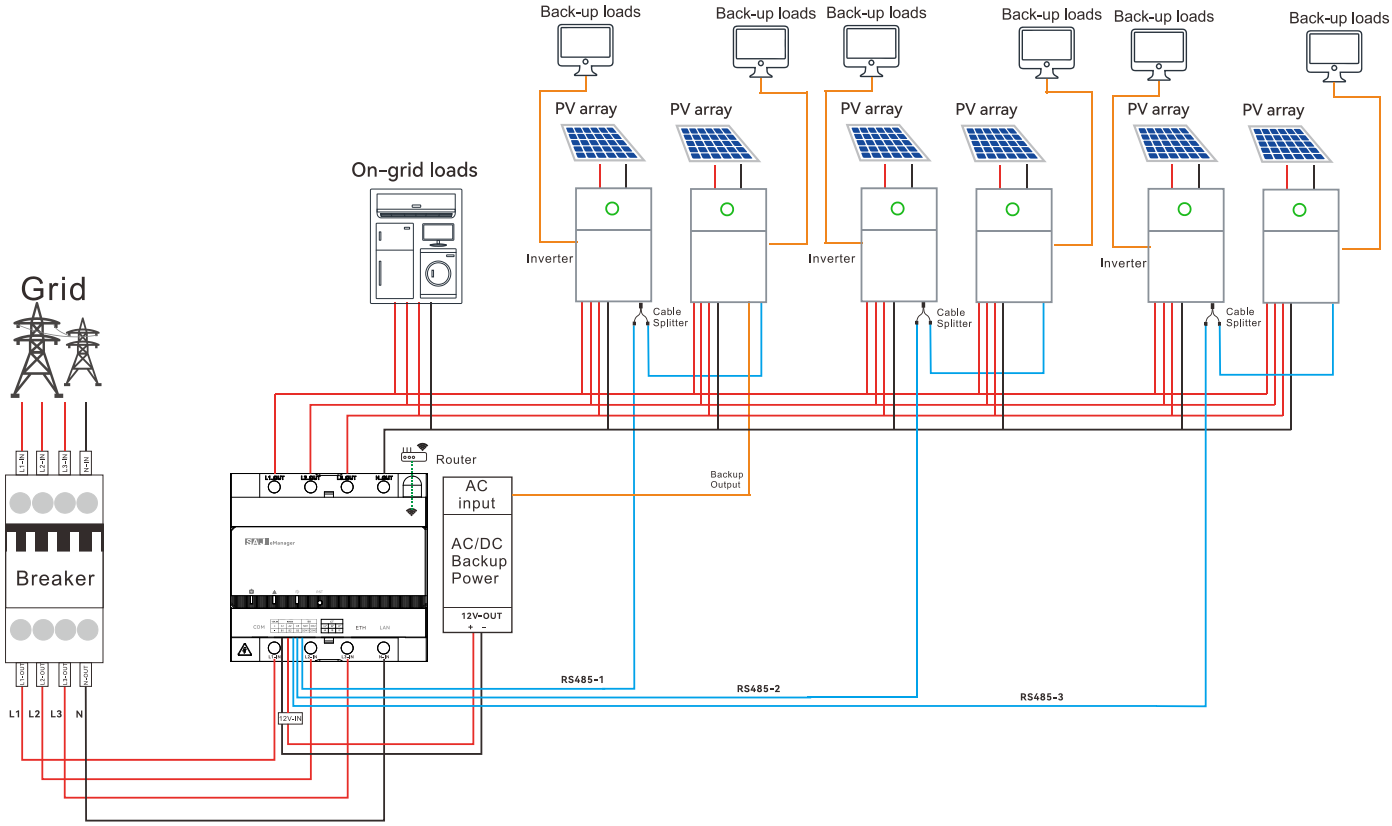
- RS485 A1 and RS485 B1
- RS485 A2 and RS485 B2
- RS485 A3 and RS485 B3

You can connect the inverter to any pair of the above combination. However, for one pair, make sure that:

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

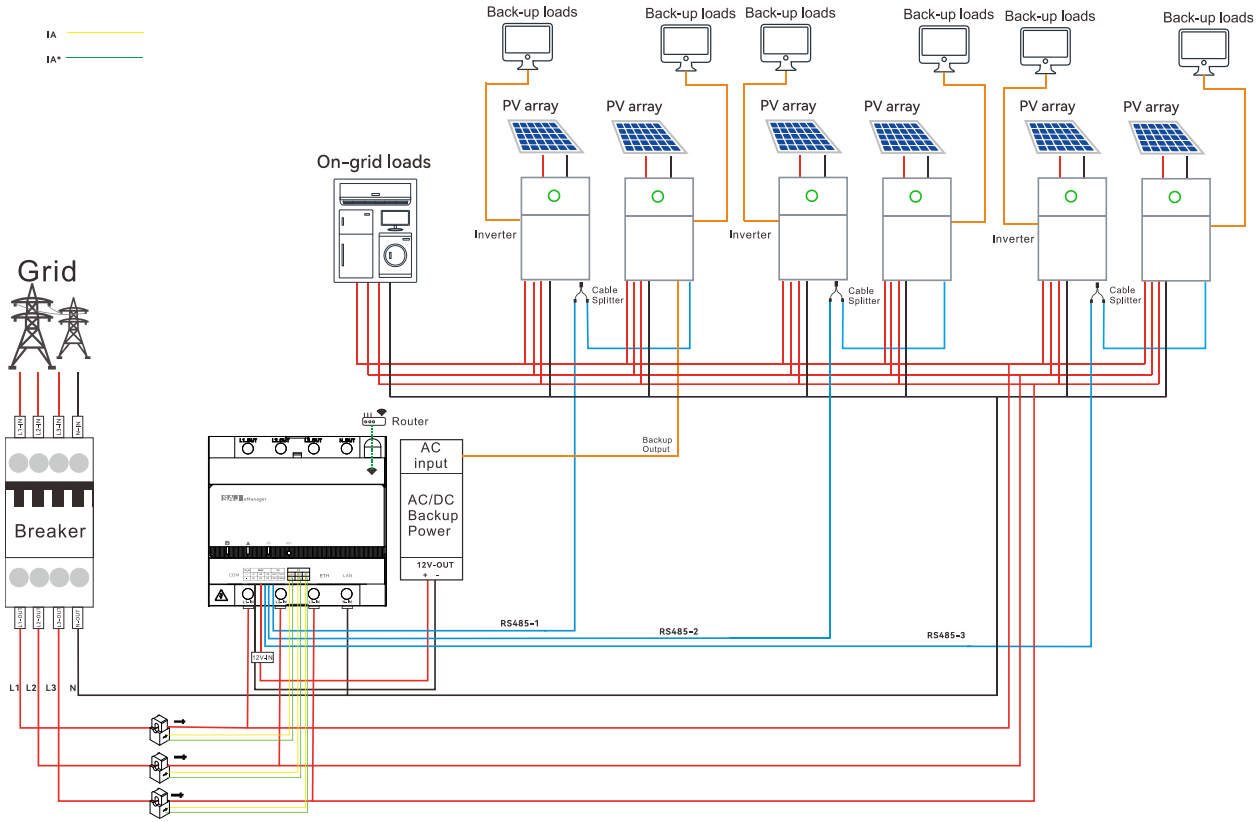
Internal CT connection (current ≤ 63 A) in the three-phase grid

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



External CT connection (current > 63 A) in the three-phase grid

You can use 100A/50mA or 250A/50mA CTs, depending on the plant capacity. (Plant capacity = The greater value of the total inverter power or the total on-grid load power)



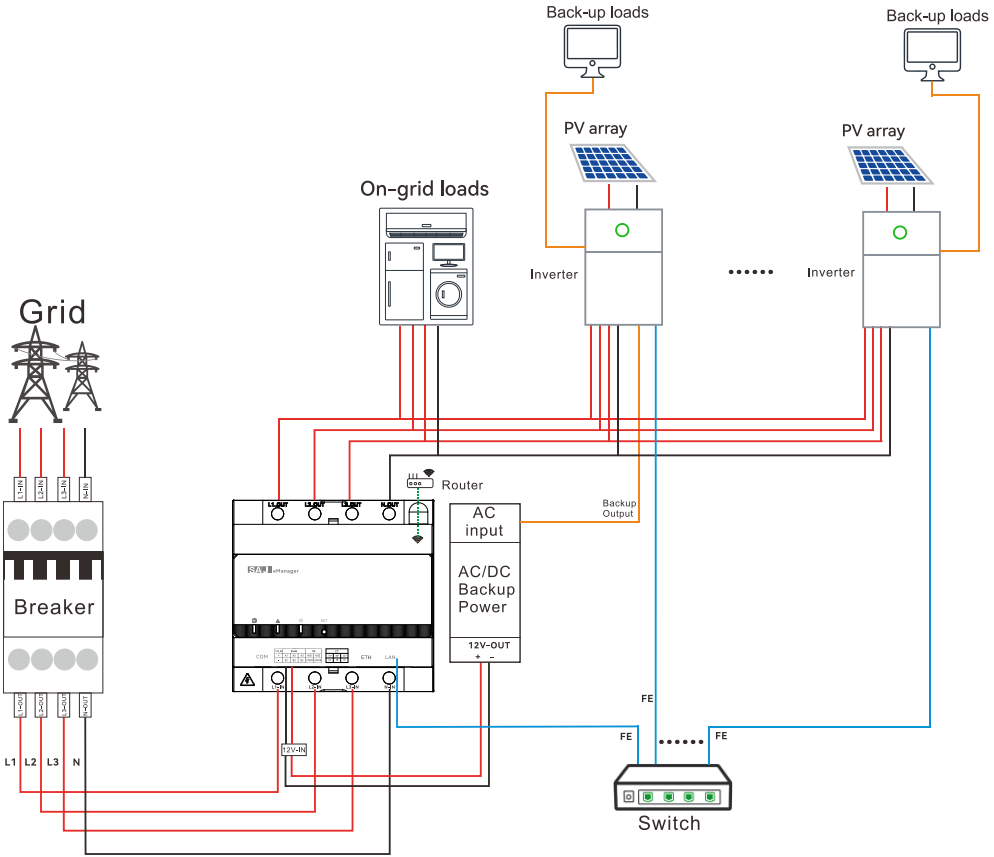
4.3.2. LAN connection (up to 10 inverters)

Supported inverter models:

- H2-(10K-30K)-(T2, T3)
- HS3-(5K-12K)-T2 (To construct the paralleling scenario for HS3 series, contact SAJ first.)
- HS3-(3K-6K)-S2 (To construct the paralleling scenario for HS3 series, contact SAJ first.)

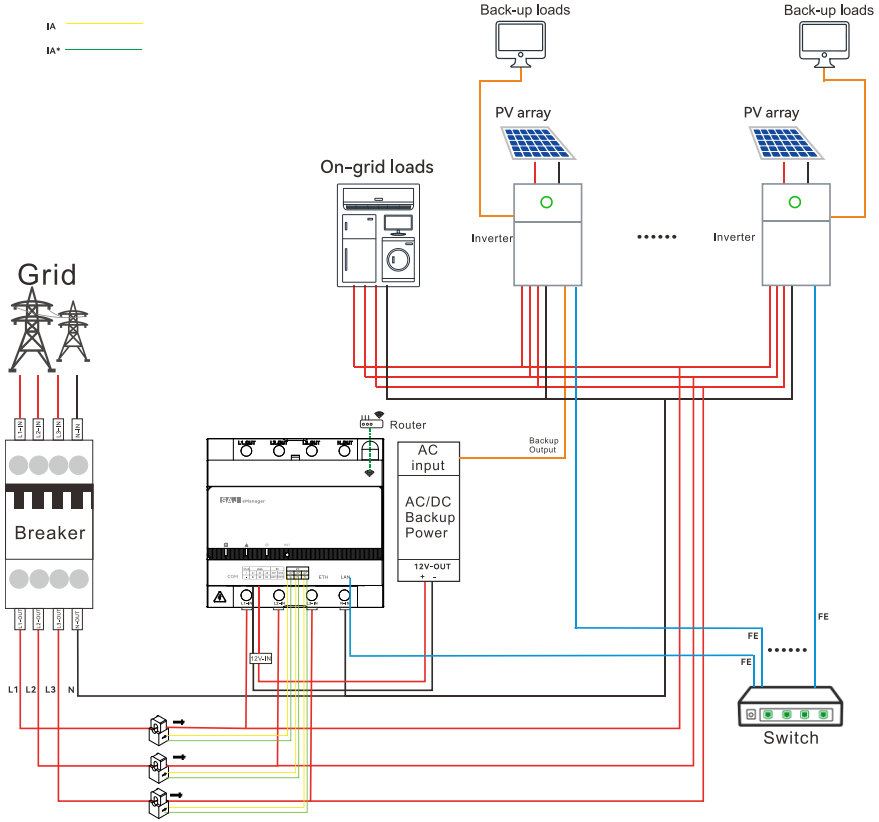
Internal CT connection (current ≤ 63 A) in the three-phase grid

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



External CT connection (current > 63 A) in the three-phase grid

You can use 100A/50mA or 250A/50mA CTs, depending on the plant capacity. (Plant capacity = The greater value of the total inverter power or the total on-grid load power)



5. System commissioning

The Elekeeper (used to be called eSAJ Home) App can be used for both nearby and remote monitoring. It communicates with different devices through Bluetooth or Ethernet connection.

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

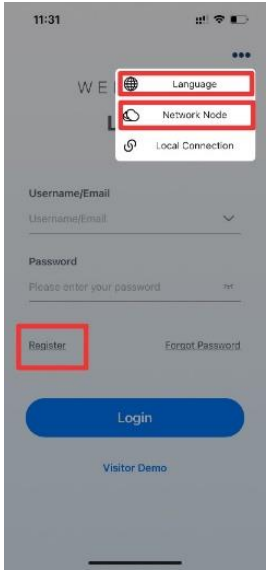
5.1. Install the App

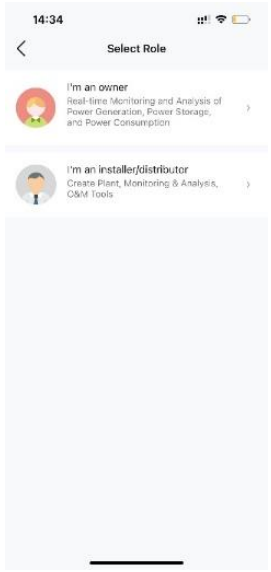
On your mobile phone, search for “Elekeeper” or “eSAJ Home” in the App store. Download and install the App.

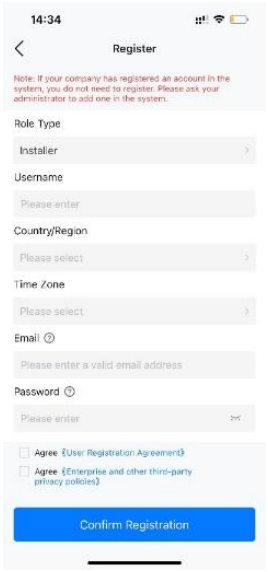
5.2. Log in to the App

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.

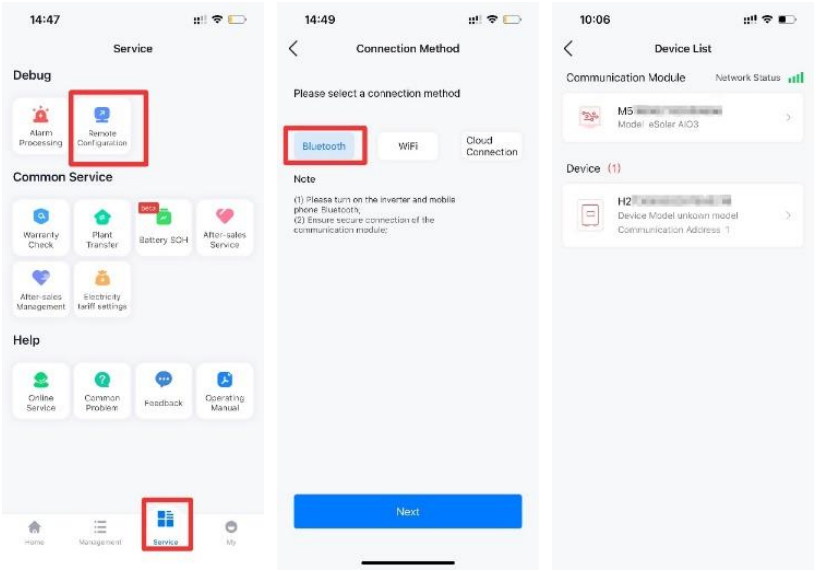
1. Tap the three-dot icon ••• on the top right corner. Choose the language and network node based on your needs.
2. Tap **Register.** Choose whether you are an owner, an installer, or a distributor.

   Note: For commissioning convenience, it is suggested that the owner account be applied by the installer.
3. Set your username, country/region, time zone, email, and password. Select the registration agreements and confirm the registration.
4. Use the applied account and the password for login.

5.3. Perform the Initialization Settings

Before you start

Enable the Bluetooth function on your mobile phone.

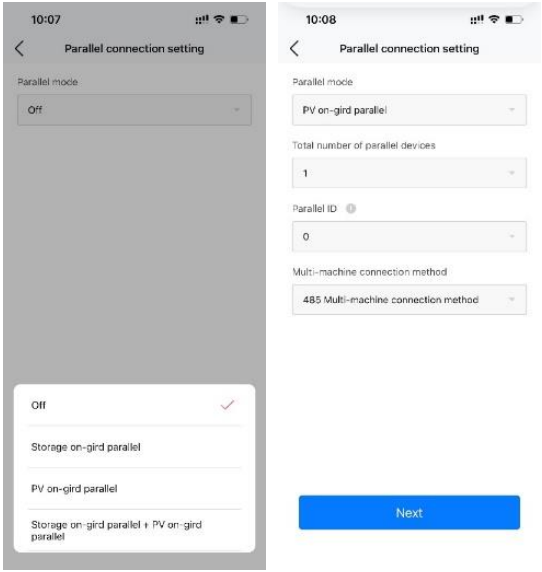


Start the initialization.

a. On the **Service** interface, select **Remote Configuration**.

b. Tap **Bluetooth** and tap **Next**.

c. Tap the inverter according to the last five number of the inverter serial number (SN).



Parallel connection settings

This task does not apply to the HS3 series inverters.

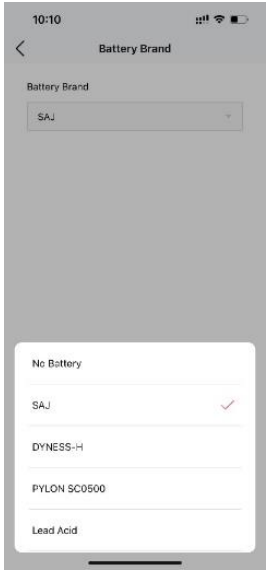
An EMS device (SAJ eManager) is used to implement parallelling for the HS3 series inverters.

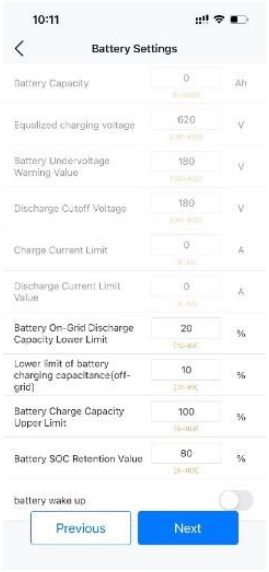
Set **Parallel mode** to your required mode.

Configuration	Paralleling mode
Multiple inverters + batteries (paralleling)	Storage on-grid parallel
One inverter + batteries One solar inverter (AC coupling)	PV on-grid parallel
Multiple inverters + batteries Solar inverter(s) (paralleling + AC coupling)	Storage on-grid parallel+ PV on-grid parallel

If a paralleling mode has been selected, configure the related parameters based on the actual conditions:

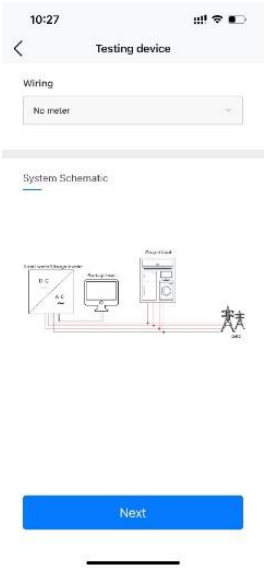
- **Total number of parallel devices**
- **Parallel ID**
- **Multi-machine connection method**

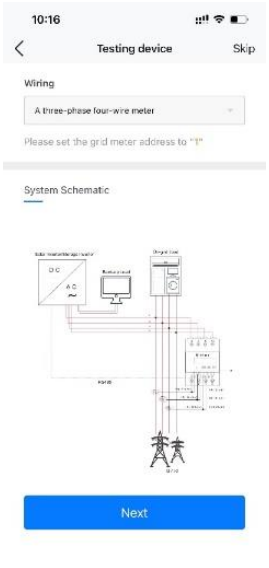


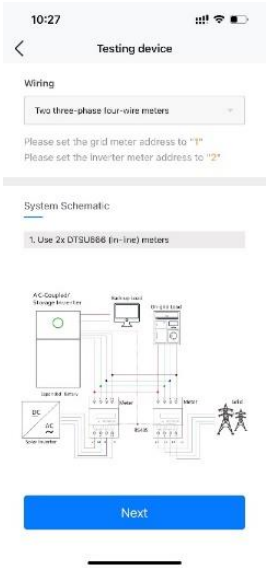


Battery brand and settings

Select your battery brand and then set the battery parameters per your needs.



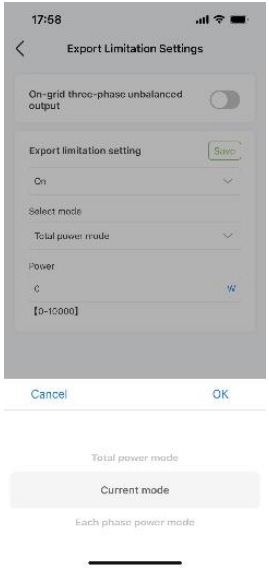




Meter and system schematic

Set Wiring based on the actual system configurations.

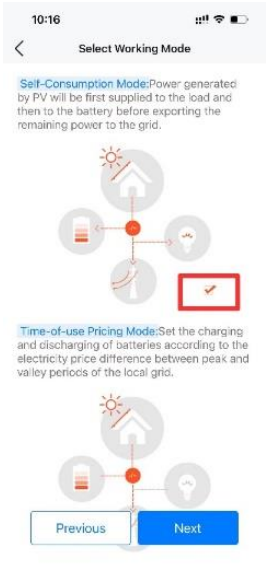
The left figures illustrate three examples of the system schematic settings.

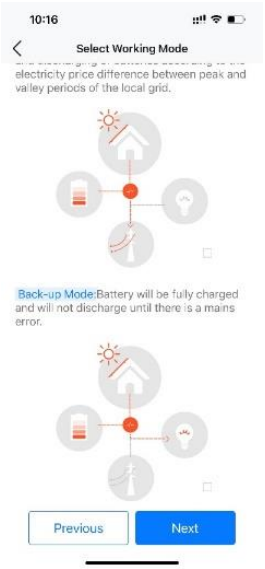


Export limit settings

Set the values per your needs.

- **Total power mode**: If this option is selected and the power value is set (for example, 1000 W), the maximum power exported from the whole system to the grid is 1000 W.
- **Current mode**: If this option is selected and the current value is set (for example, 20 A), the maximum current of each phase is 20 A.
- **Each phase power mode**: If this option is selected and the power value is set (for example, 1000 W), the maximum power exported from each phase to the grid is 1000 W.

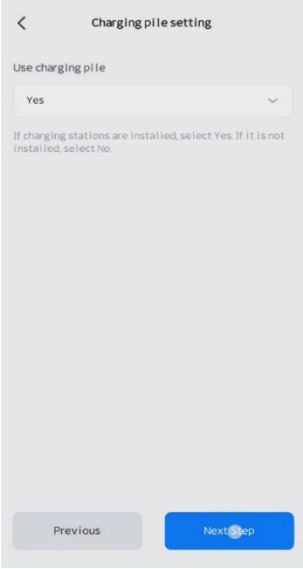




Working mode

Here takes **Self-Consumption Mode** as an example.

- **Self-Consumption Mode**: The generated PV energy is provided to the devices in order: loads > batteries > grid
- **Time-of-use Pricing Mode**
  - In the battery charging or discharging period, the batteries can only be in charging or discharging status. In other period, the battery will work in the self-consumption mode.
  - The battery charging and discharging periods are adjustable.
- **Back-up Mode**
  - After initialization, you can change the default SOC value.
  - When the battery SOC is lower than the configured SOC value, the batteries can only be in charging status without discharging.
  - When the battery SOC reaches the configured SOC value, the batteries will stop charging.
  - When the battery SOC is higher than the configured SOC value, the batteries will work in self-consumption mode.

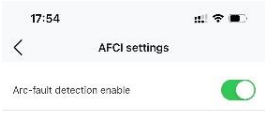


Charging pile setting

This page is displayed only if a charging pile has been installed with the inverter.

If a charging pile has been connected, select **Yes**.

Then, tap **Next**.



AFCI function

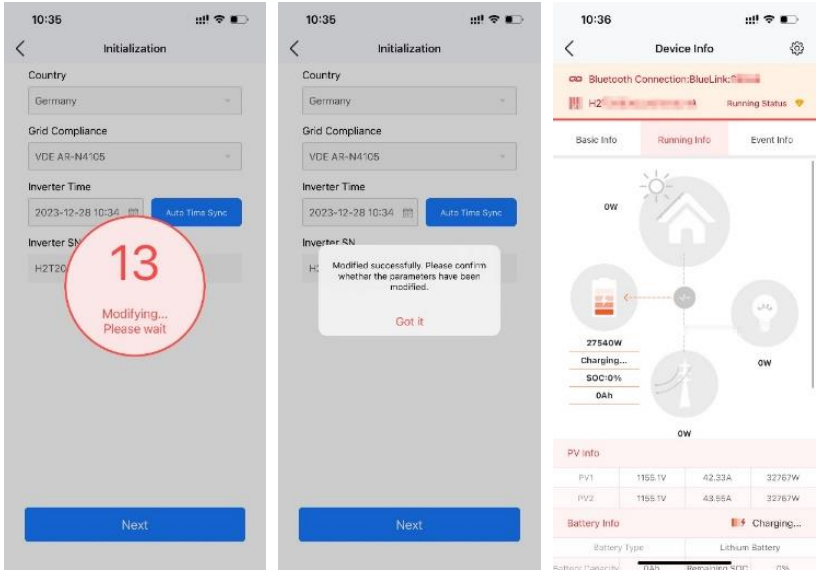
This page is displayed only if your inverter provides the AFCI function.

You can choose whether to enable this function and tap **Next**.

Country and grid compliance

- **Country:** Set it to your desired country.
- **Grid Compliance:** It is set automatically after you selected the country.
- **Auto Time Sync**: Tap it to synchronize the time. Otherwise, the inverter will be displayed as offline.

Tap **Next**.



Wait for the initialization settings to take effect. Then, view the configured device information.

5.4. Configure the communication module

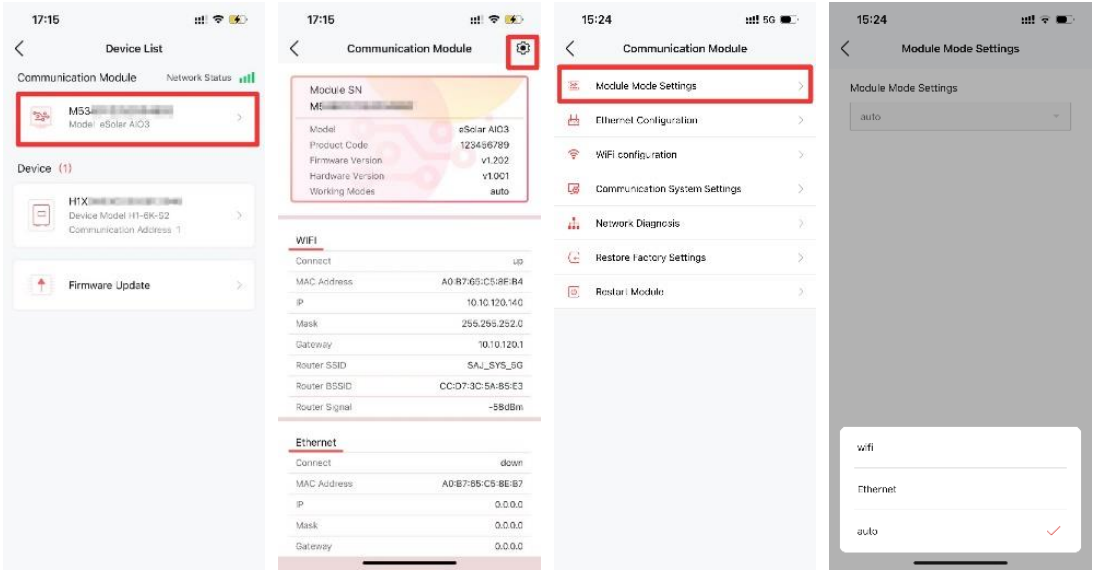
About this task

If you want to remotely monitor the energy storage system and view the device statistics (for example, when you are away from home), connect the communication module installed on the inverter to your home network.

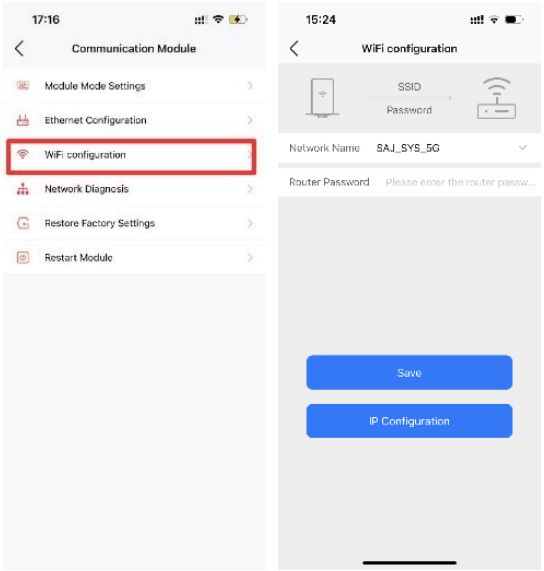
Procedure

1. On the Device List page, select your communication module according to its SN.
2. Tap the settings icon on the upper right corner.
3. If you want to change the default network connection mode **auto**, tap **Module Mode Settings** and select the required option.

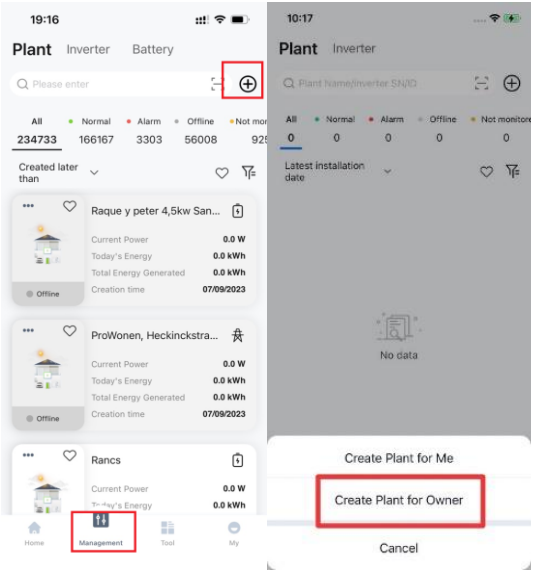
In the **auto** mode, the communication module will use Wi-Fi or Ethernet connection mode based on the actual networking condition.



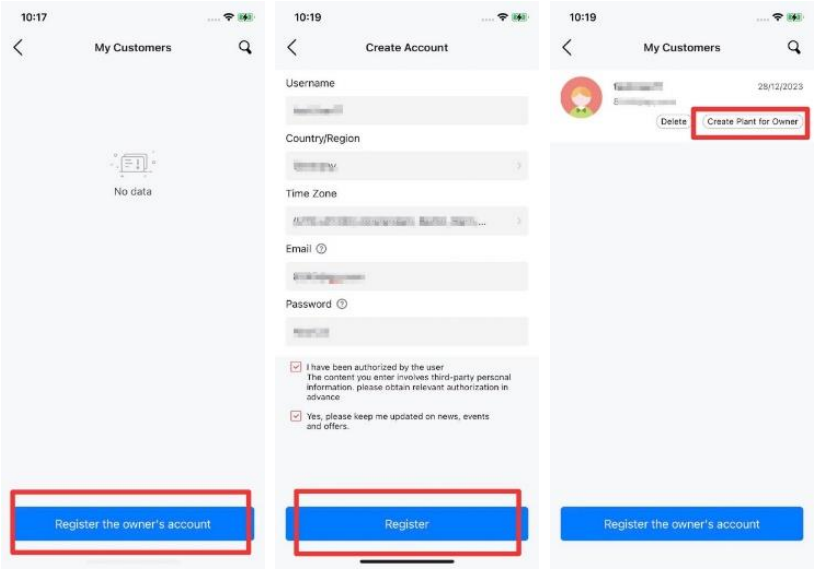
If **auto** or **wifi** is selected, tap **WiFi Configuration**, and input the name and password of your home network.



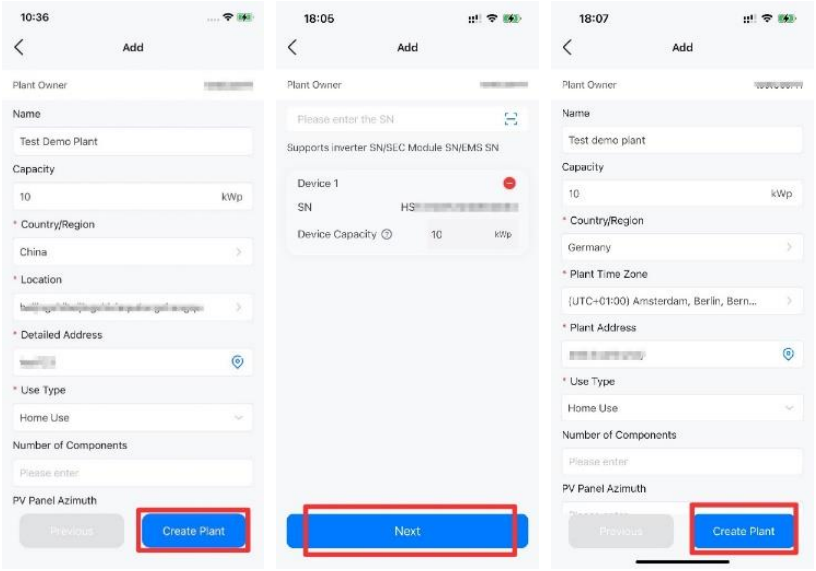
5.5. Create a Plant



1. On the **Management** page, tap the ⊕ icon on the top right corner. Select **Create Plant for Owner**.



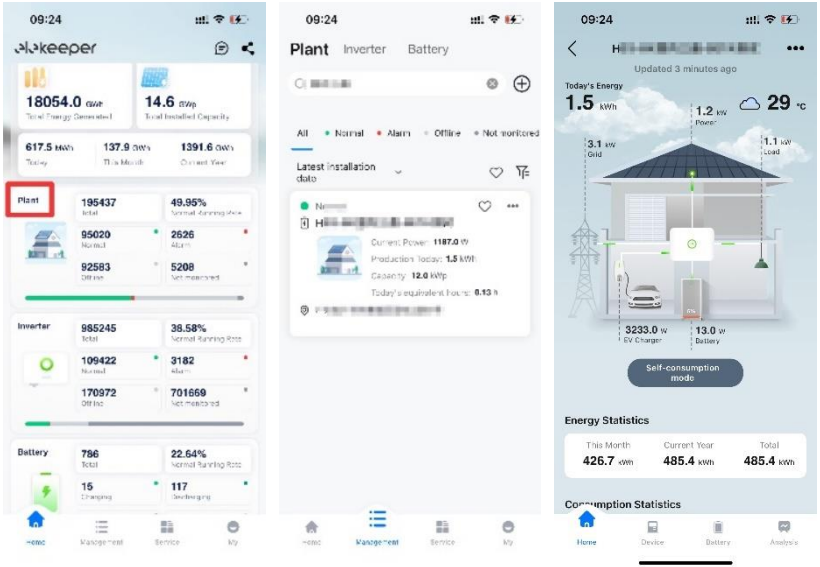
2. Apply for an account for the end user.
   a. Tap Register the owner's account.
   b. Input the username, country or region, time zone, E-mail, password. Tap **Register**.
   c. Tap **Create Plant for Owner**.



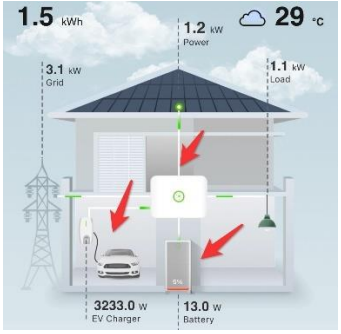
3. Configure the plant details based on your actual conditions.
   a. Configure the plant owner details. Tap **Create plant**.
   b. Add the required devices for this plant: Scan the SN of each device and tap **Next**. The devices include inverters, batteries, and/or an EV charger.
   c. Verify that the plant information that you just set is correct, tap **Create Plant**.

5.6. View the plant details

1. On the home page, tap **Plant**.
2. Search for the required plant and then tap the plant.
3. On the main page of the plant, view the following plant information:
   - Data update time: In this example, the data has been updated three minutes ago.
   - Working mode
   - **Energy Statistics**, **Consumption Statistics**, and **Environmental Benefits**.



4. To view the detailed information of the devices in this plant, tap the device icon on the image.

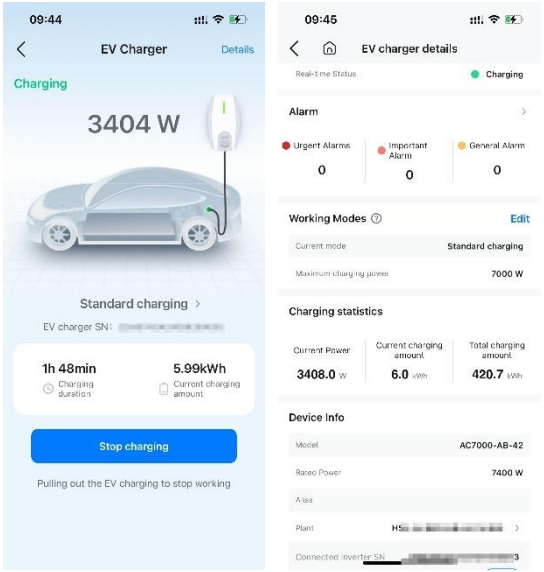


Note: The EV charger is optional, depending on your system configuration.

The following takes the EV charger as an example.

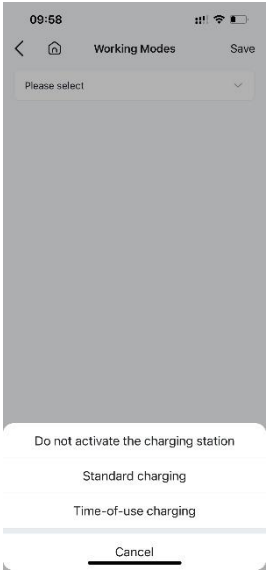
a. On the main page of the EV charger, view the charging mode, charging duration, and charging amount.

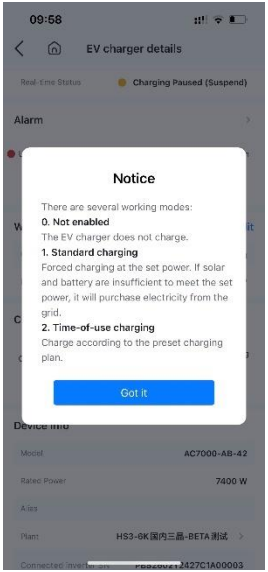
b. Tap **Details** on the upper right corner of the page. On this page, view the generated alarms, working mode, charging statistics, device information, and phase information.



c. (Optional) To change the working mode, tap **Edit** adjacent to **Working modes** and select the required option.

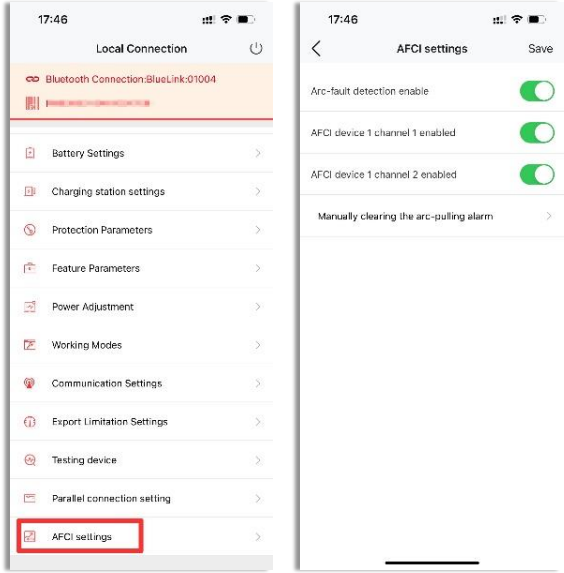
To learn about the differences of each working mode, tap the question mark adjacent to **Working Modes**.





5.7. Enable the AFCI (optional)

If you want to enable or disable the AFCI function, on the **Local Connection** page, tap **AFCI settings**. On the **AFCI settings** page, choose to enable or disable the detailed settings.

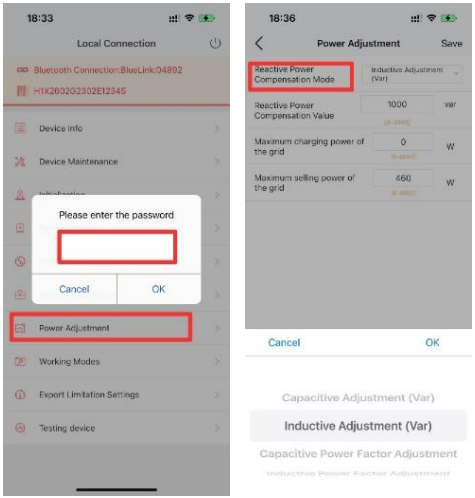


5.8. View the fixed power factor mode and fixed reactive power mode

Once **Country** and **Grid Compliance** are selected during initialization, the parameters relating to the reactive power control settings are set automatically. In typical household scenarios, no need to change these default parameter values. If you really need to change them, before any modifications, contact SAJ for consultation and ensure that you have necessary electric knowledge and are fully aware of the impact of such modifications.

To view the settings, perform as follows:

1. Check the manufacturing date of the inverter according to the SN, such as an SN “1 502 0 G 11 01 CN 00000”, in which “11 01” indicates that the manufacturing date is the first week in 2011.
2. Depending on your inverter manufacturing date, view the parameter values as follows:

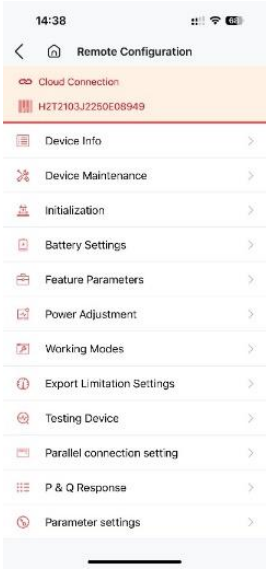


- For the equipment manufactured before August 2023:

  Tap **Power Adjustment** and enter the password. (Contact SAJ for the password.)

  In **Reactive Power Compensation Mode**:

  - Fixed power factor mode: **Capacitive Power Factor Adjustment** or **Inductive Power Factor Adjustment**. The power factor range is from 0.8 leading to 0.8 lagging.
  - Fixed reactive power mode: **Inductive Adjustment (Var)** or **Capacitive Adjustment (Var)**. The power ranges from -60% Pn to 60% Pn.



- For the equipment manufactured after August 2023:

  Tap **Parameter settings**.

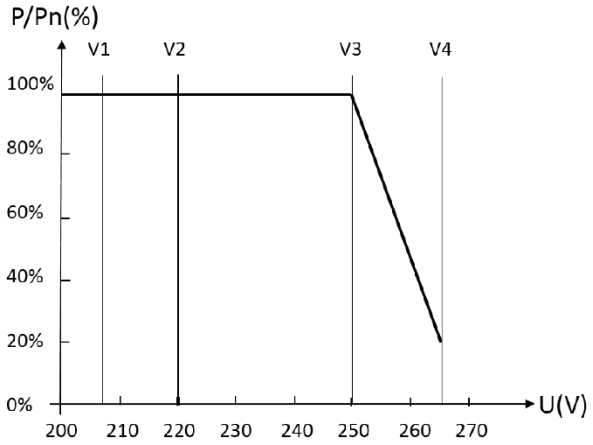
5.9. Configurations for Australia and New Zealand

5.9.1. View the V-Watt and Volt-Var modes

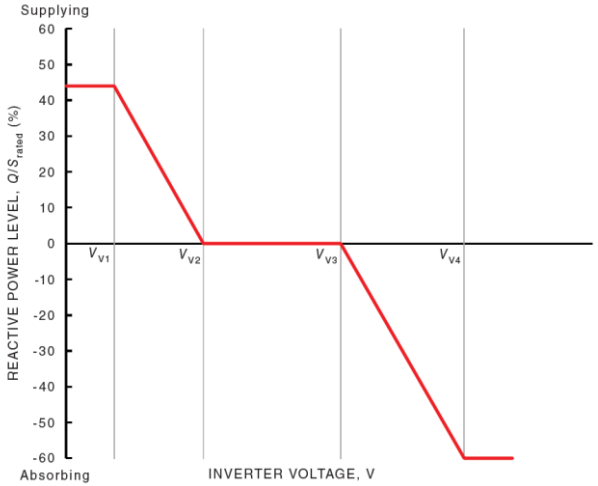
About this task

This inverter complies with AS/NZS 4777.2: 2020 for power quality response modes. It meets DNSPs' grid connection rules and requirements for the volt-watt and volt-var settings in different regions.

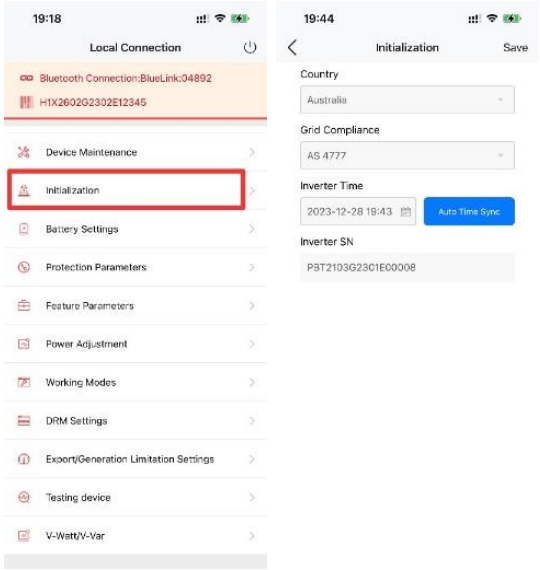
Curve for a Volt-Watt response mode (AS4777 Series)



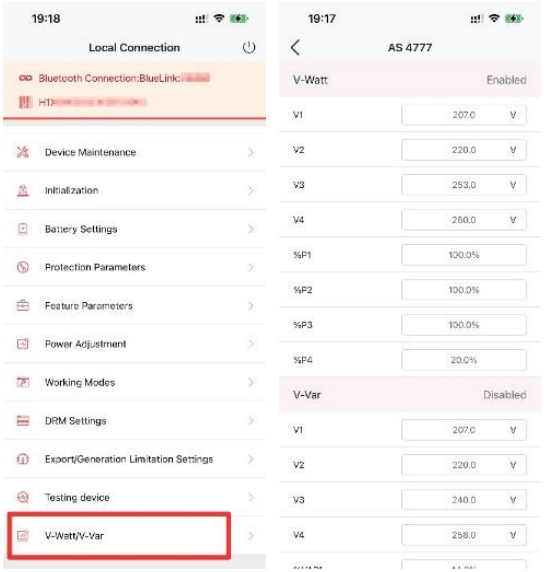
Curve for a Volt-Var control mode (AS4777 Series)



1. Tap **Initialization** and check whether the grid compliance is set properly. Change the settings if needed.



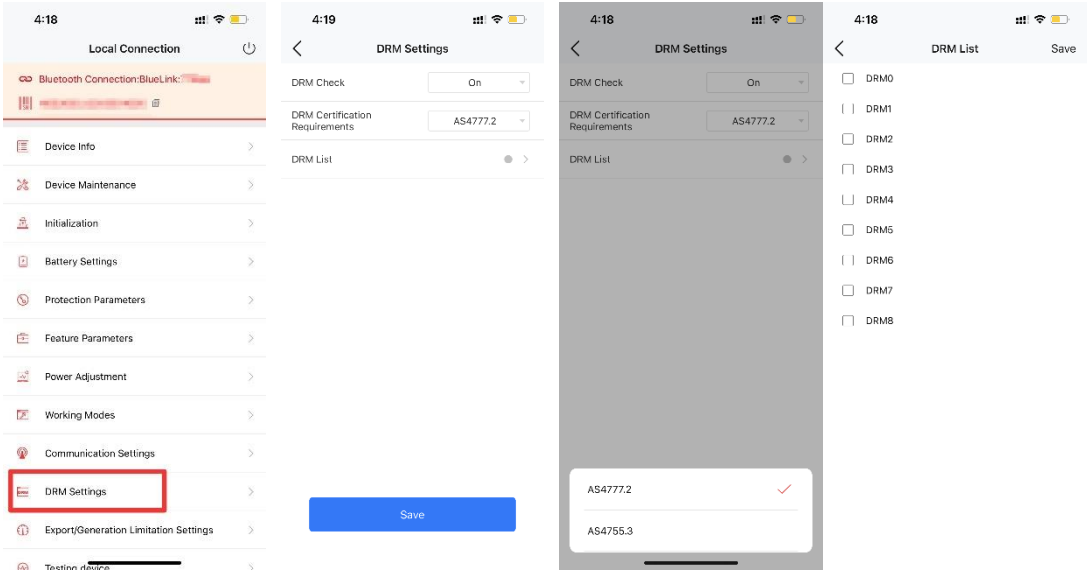
2. Tap **V-Watt/V-Var** to enter the settings page.



5.9.2. Configure the DRM settings

If you have set **Country** to **Australia** in the initialization process, according to local regulations, you can set the demand response mode (DRM) as follows:

On the **Local Connection** page, tap **DRM Settings**. Set the required parameters.



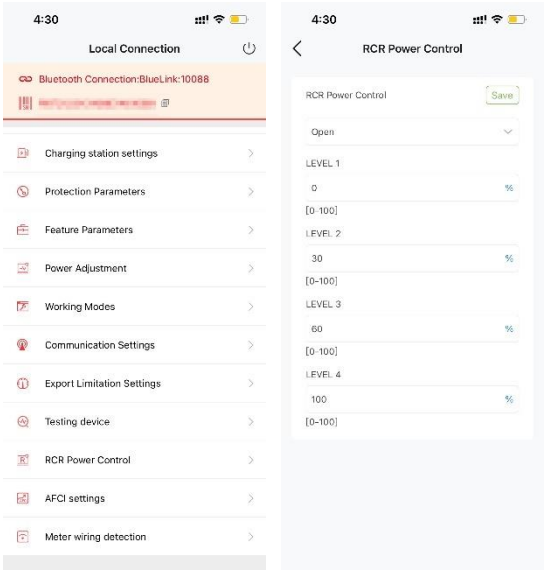
5.10.Configurations for Germany and Austria

5.10.1. Set the RCR power control function

About this task

If you have set **Country** to **Germany** or **Austria** in the initialization process, and the total power of the plant exceeds 25 kW, you can set the ripple control receiver (RCR) power control function. However, before the RCR settings, you need to disable the export limit function first.

On the **Local Connection** page, tap **RCR Power Control**. Set the required parameters.



5.11.Configurations for the United Kingdom

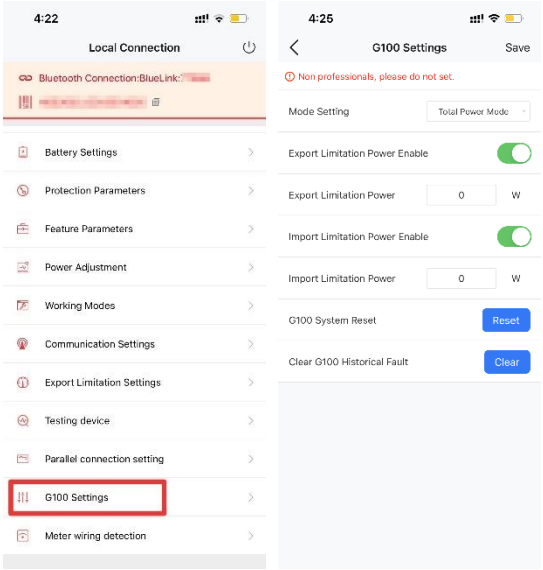
5.11.1. Configure the G100 settings

About this task

If you have set **Country** to **UK** in the initialization process, according to local regulations, you can set the G100 function as follows:

On the **Local Connection** page, tap **G100 Settings**. Enter the password if required. Set the required parameters.

Note: If a message is displayed, prompting you to upgrade the firmware, you need to upgrade the inverter firmware before the G100 settings.



5.12.Configurations for Italy

5.12.1. Run the self-test

About this task

Italian Standard CEI0-21 requires a self-test function for all inverters connected to the utility grid. The self-test ensures that the inverter can be disconnected from the grid when required.

During the self-test, the inverter will check the reaction time for over-frequency, under-frequency, over-voltage, and under-voltage. If the self-test failed, the inverter stops providing the electricity to the grid.

Before you start

- Ensure that the communication module (Wi-Fi/Bluetooth/Ethernet) of the inverter is connected to the network. Refer to section 5.4 "Configure the communication module".
- Ensure that **Country** is set to **Italy** and **Grid Compliance** is selected properly. To check the settings, tap **Initialization** on the **Local Connection** page.

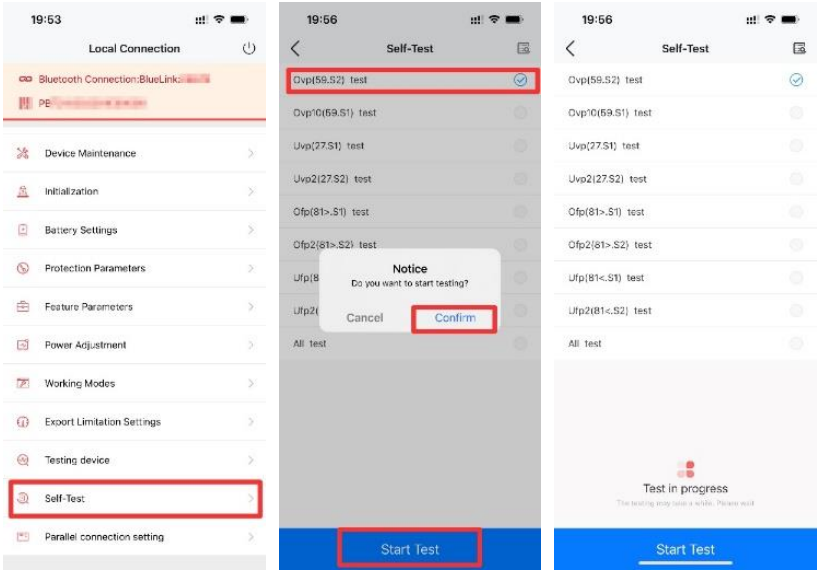
Procedure

1. On the **Local Connection** page, tap **Self-Test**. Set the self-test parameters if needed.
2. Select the required test and tap **Start**.

   One test will take around 5 minutes. If you have selected **All test**, all tests will take around 40 minutes.

3. (Optional) After the self-test is completed, save the test report.

   If the self-test failed, contact SAJ or your installer.



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GUANGZHOU SANJING ELECTRIC CO.,LTD

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