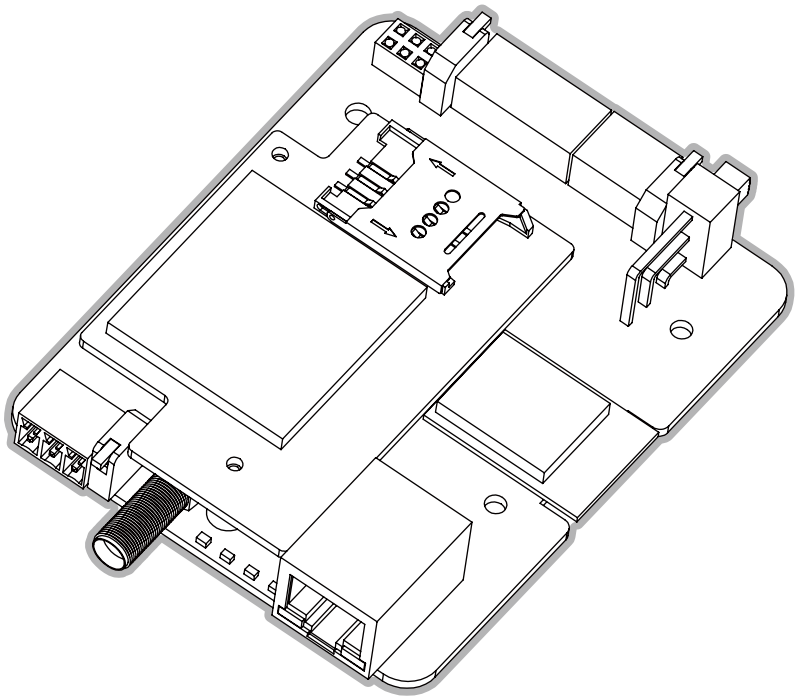


EHX2 (NO RSD) Gateway Quick Guide
For CPS 3 Phase Inverter

03/26/2024

Revision 6

Table of Contents

1 Safety Precautions

NOTICE

Before performing operations, read through this manual and follow all the precautions to prevent accidents. The safety precautions provided in this document do not cover all the safety precautions. CPS shall not be liable for any consequence caused by the violation of the safety operation regulations and design, production, and usage standards.

Declaration

CPS shall not be liable for any consequence caused by any of the following events.

- Transportation
- The storage conditions do not meet the requirements specified in this document.
- Violate the operation instructions and safety precautions in this document for installation, cable connecting, and maintenance.
- Operation in extreme environments which are not covered in this document.
- Unauthorized modifications to the product or software code.
- Installation or use in environments which are not specified in related international standards.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Personal Requirements

- Only qualified electrical technicians are allowed to install and operate the FlexOM Gateway.
- Operation personnel should receive professional training.
- Operation personnel should read through this document and follow all the precautions.
- Operation personnel should be familiar with the safety specifications about the electrical system.
- Operation personnel should understand the composition and working principles of the grid-tied PV power system and local regulations.

Installation

- Ensure that the FlexOM Gateway is not connected to a power supply and is not powered on before starting installation.
- Ensure that the FlexOM Gateway is installed in a well ventilated environment.
- Do not perform any operation on other components inside the chassis except connecting AC power cables and communications cables.
- Ensure that all electrical connections comply with local electrical standards.

DANGER

High voltages may cause electric shocks and serious injuries during FlexOM Gateway operating.
Do not touch components such as AC cables, circuit breakers and connectors during FlexOM Gateway is energized.

- Maintain the FlexOM Gateway with sufficient knowledge of this document and proper tools and testing equipment.
- Before performing maintenance tasks, power off the FlexOM Gateway and perform lockout/tagout (LOTO) of the source circuit.
- For personal safety, wear personal protective equipment (PPE), including insulaed gloves and protective shoes.

2 Warranty Policy

- The warranty policy of this product is specified in the contract; otherwise, the standard warranty is 2 years.
- For warranty terms, please refer to the CPS accessories warranty policy in place at time of purchase.

3 Gateway specifications

3.1 Datasheet

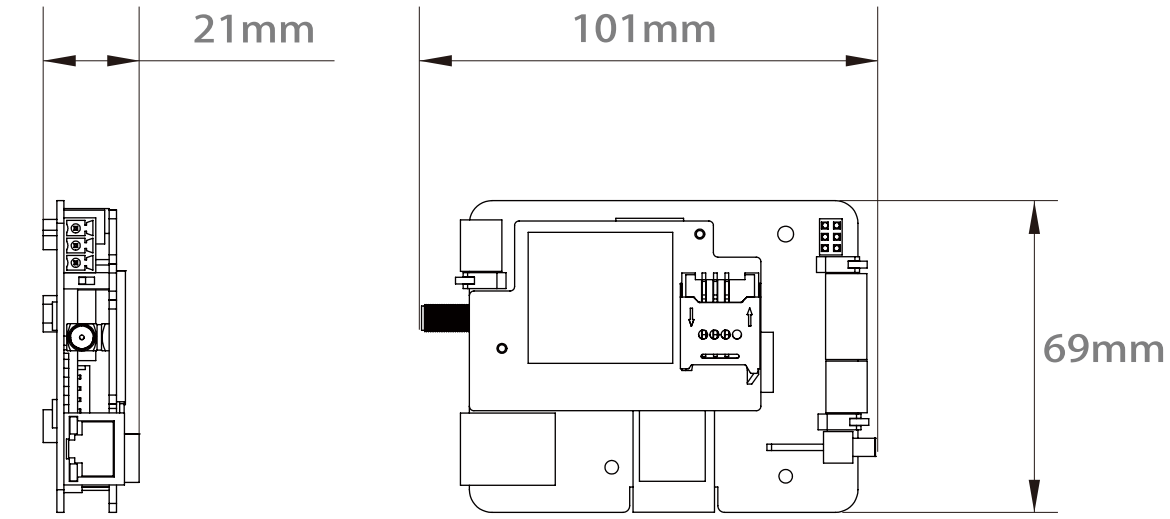
Daisy Chain Interface	
No. of Ports	1 (5-pole Terminal Block or 6 Pin Connector)
Protocol	Modbus RTU
Modbus RTU Mode	Master
Terminator for RS485	120 ohms
Isolation	5 kV
CAN Interface	
No. of Ports	1 (3-pole Terminal Block)
Signals	CAN_L, CAN_H, CAN Signal GND
Terminator	120 ohms (configurable)
Isolation	3 kV (built-in)
AUX Interface	
No. of Ports	1 (3-pole Terminal Block)
Protocol	Modbus RTU
Modbus RTU Mode	Slave (RS485 pass-thru)
Terminator for RS485	120 ohms
Isolation	5 kV
Bluetooth Interface	
Standard	BLE 4.2
Antenna	Built-in

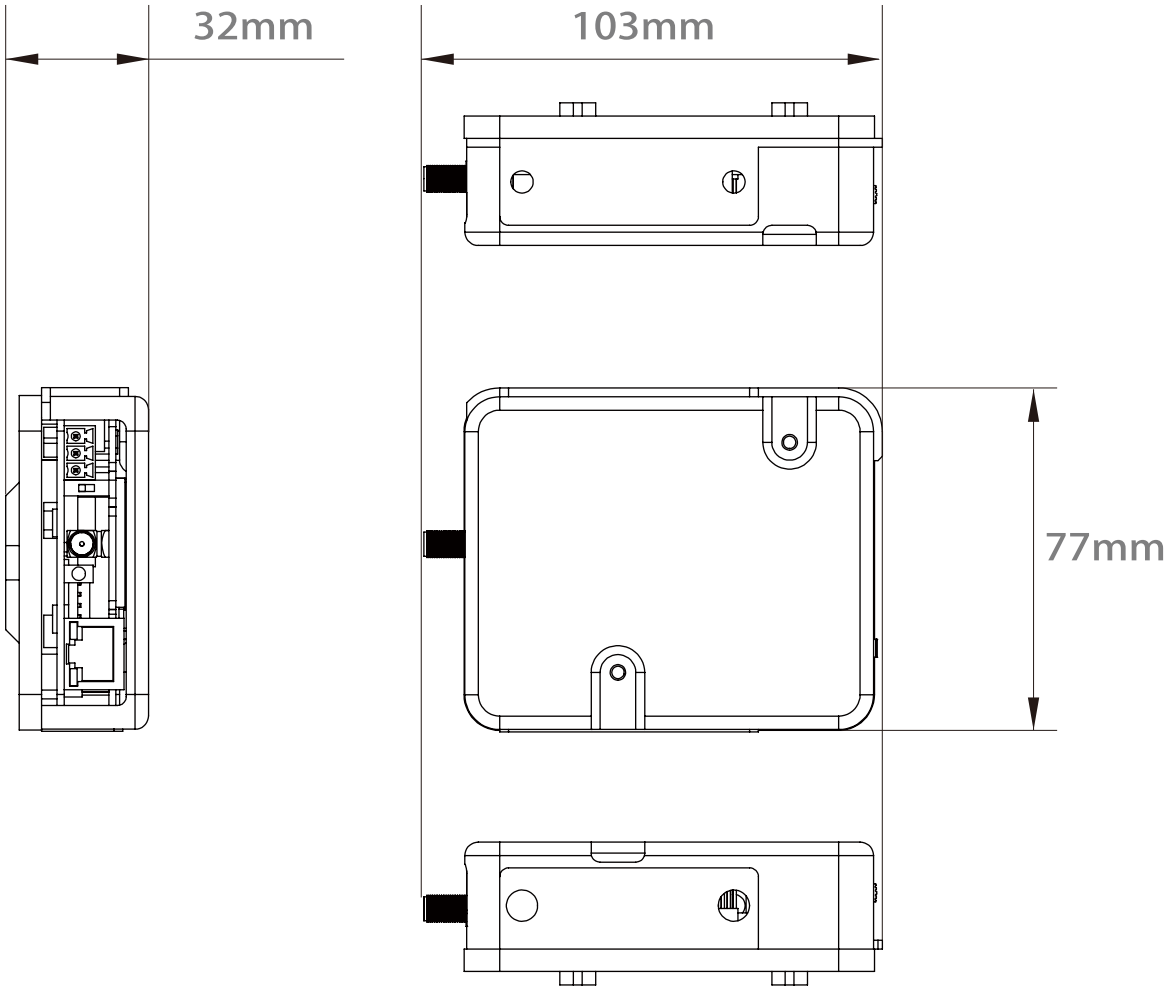
Ethernet Interface	
10/100BaseTX Ports	1 (RJ45 connector)
Protocol for Cloud Applications	MQTT
SCADA controllers on the same LAN subnet	Modbus TCP
Modbus TCP	
Mode	Server (Slave)
Max. No. of Client Connections	2
WLAN Interface	
WLAN Standards	802.11 b/g/n
Frequency Band	2.4 GHz
Wireless Security	WEP, WPA/WPA2
Antenna	Built-in
Cellular Interface	
Cellular Standards	LTE-FDD/LTE-TDD
No. of SIM Slot	1
Cellular Antenna Connectors	1 SMA female
Power Parameters	
Input Voltage	8 to 24 Vdc
Power Consumption	2.5 W, Max. 5 W
Power Connector	Terminal Block

Environment limits	
Operating Temperature	-30℃ to 85℃, Natural convection
Storage Temperature	-40 to 85°C
Ambient Relative Humidity	5 to 85% (non-condensing)
Physical Characteristics	
Housing	Plastic, DIN rail mounting
IP Rating	IP20
Dimensions	101 mm / 69 mm / 21 mm
Dimensions (with housing)	103 mm / 77 mm / 32 mm
Weight	150g / 200g (with housing and clip)
Compliance	
RoHS	IEC 62321, (EU) 2015/863
CE - EMC	EN 55032 / 55035, EN 61000-3-2/-3-3
CE - RED	EN 301 908 / 300 328, EN 301 489-1/-17/-52, EN 62368-1
CE - LVD	EN 62368-1
FCC	SDoC Part 15B, ID Part 15C
Production Metering	ANSI C12.20 accuracy class 0.5, working with EPM kit
Consumption Metering	Accuracy class 2.5, working with EPM kit

3 Gateway specifications

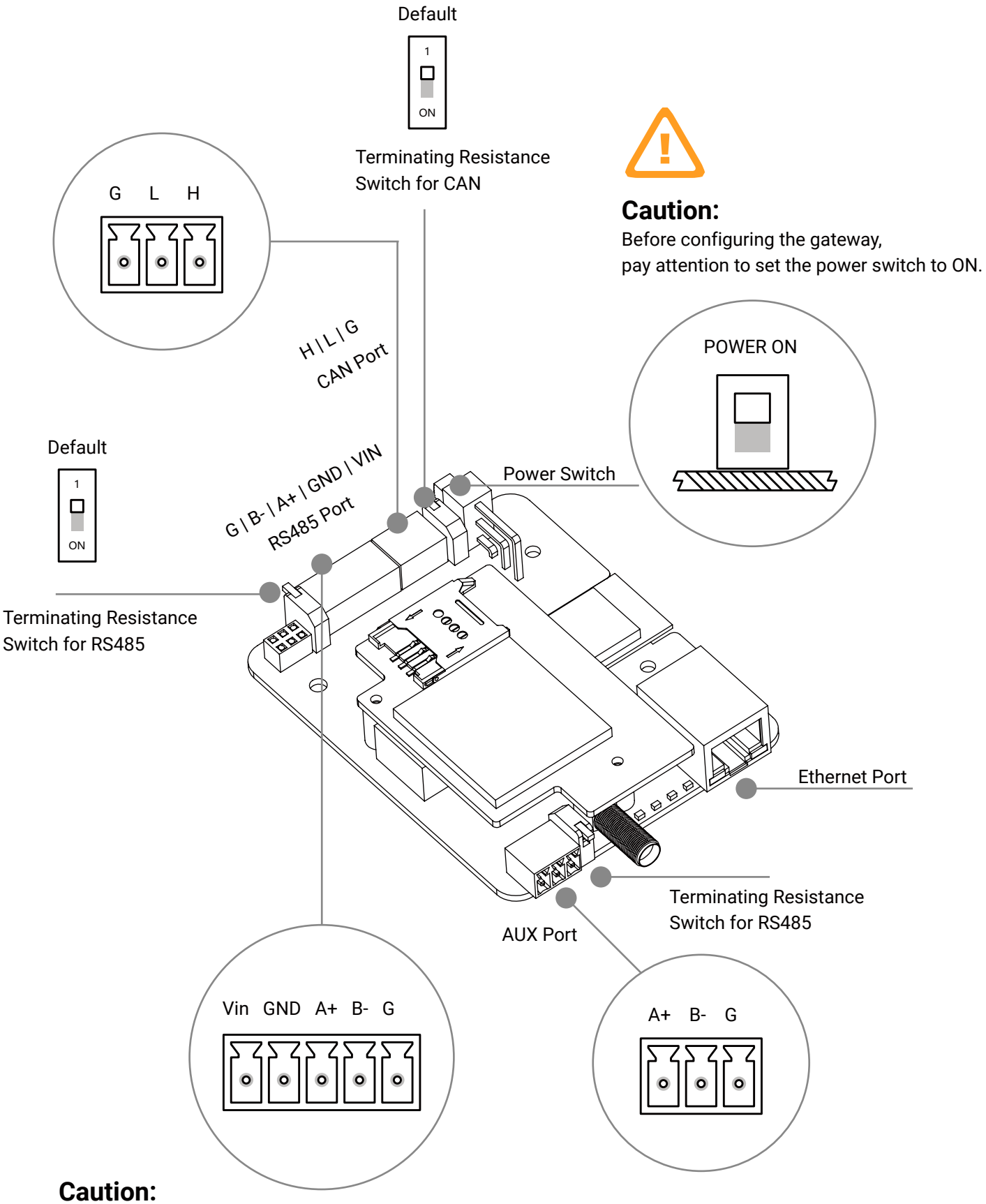
3.2 Dimensions





3 Gateway specifications

3.3 Interfaces and indicatiors

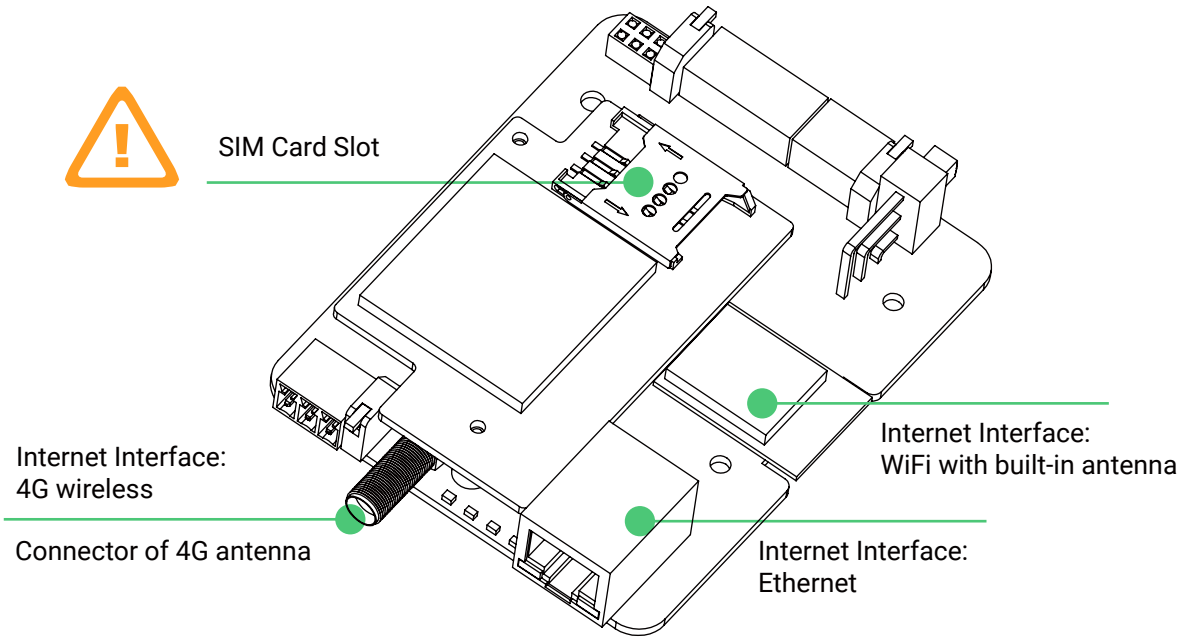


Caution:

Before configuring the gateway,
pay attention to set the power switch to ON.

Caution:

If the length of the cable connecting to RS485 port or AUX port of
the gateway is over 1000 meters, the Switch button must be set to ON.



Caution:

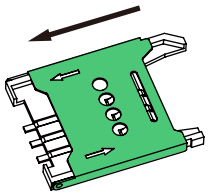
FlexOM SIM can only be used in FlexOM Gateway.

By default, FlexOM Gateway support customers' unrestricted use of the existing and future remote O&M functions of CPS Portal.

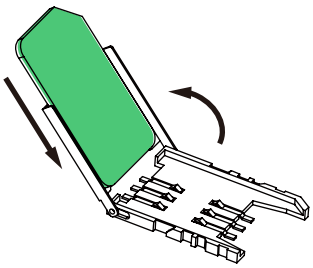
DATA PLAN CONSUMPTION STATISTICS ARE NOT PROVIDED.

At the same time, FlexOM Gateway does not guarantee the 3rd party SIM card.

FlexOM Gateway hardware warranty is valid by default within the validity period of our data plan.

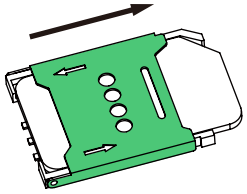


1) Push in the direction shown to unlock the flap



2) Open the flap

Then, insert the SIM card into the flap along the slot in the flap. Fold the flap and SIM card into place on the SIM card holder



3) Push in the direction shown to lock the flap

Internet interface : 4G (Optional)

The FlexOM SIM card can operate in multiple carrier environments in all regions of the world, for example, North America supports AT&T + T-mobile + Verizon at the same time.
After the gateway is powered on and works normally, it will select and connect to the provider network with the strongest or most stable signal.

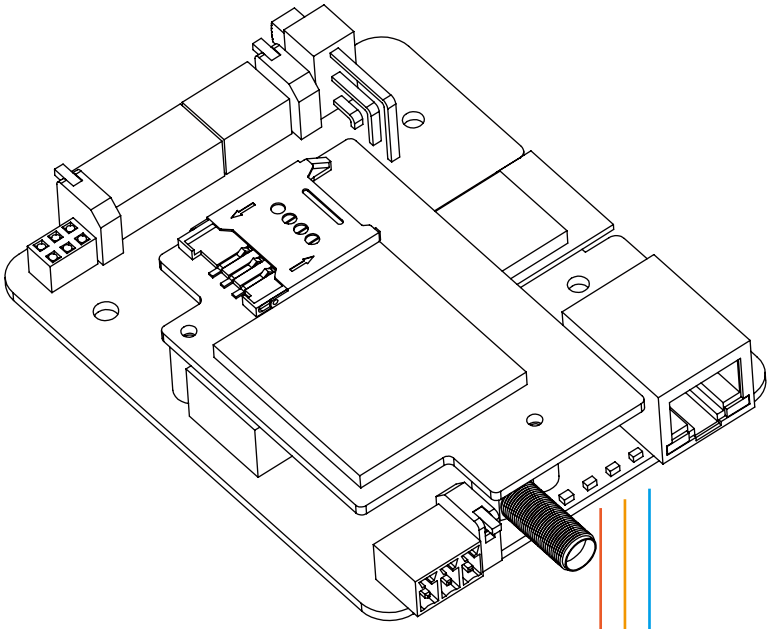
If you need to purchase FlexOM SIM, please contact CPS sales staff for detailed information.

Internet interface : WIFI / Ethernet

Firewall Issue : WIFI / Ethernet

If the gateway is connected to the Internet using WiFi/ Ethernet instead of 4G.
Open the LAN firewall ports before commissiong !

The following ports must be opened both ways (incoming and outgoing communications):
TCP 1883 with destination IP 18.134.238.207



Cellular Error

Indicates whether the cellular is faulty

Light Off		No cellular module or no error
Light On		Error

RS485 Device

Indicates whether the RS485 device is connected to the gateway and whether there is a RW command to the daisy chain being executed

Light Off		Found Nothing
Light On		Some Devices Found

IP ACK

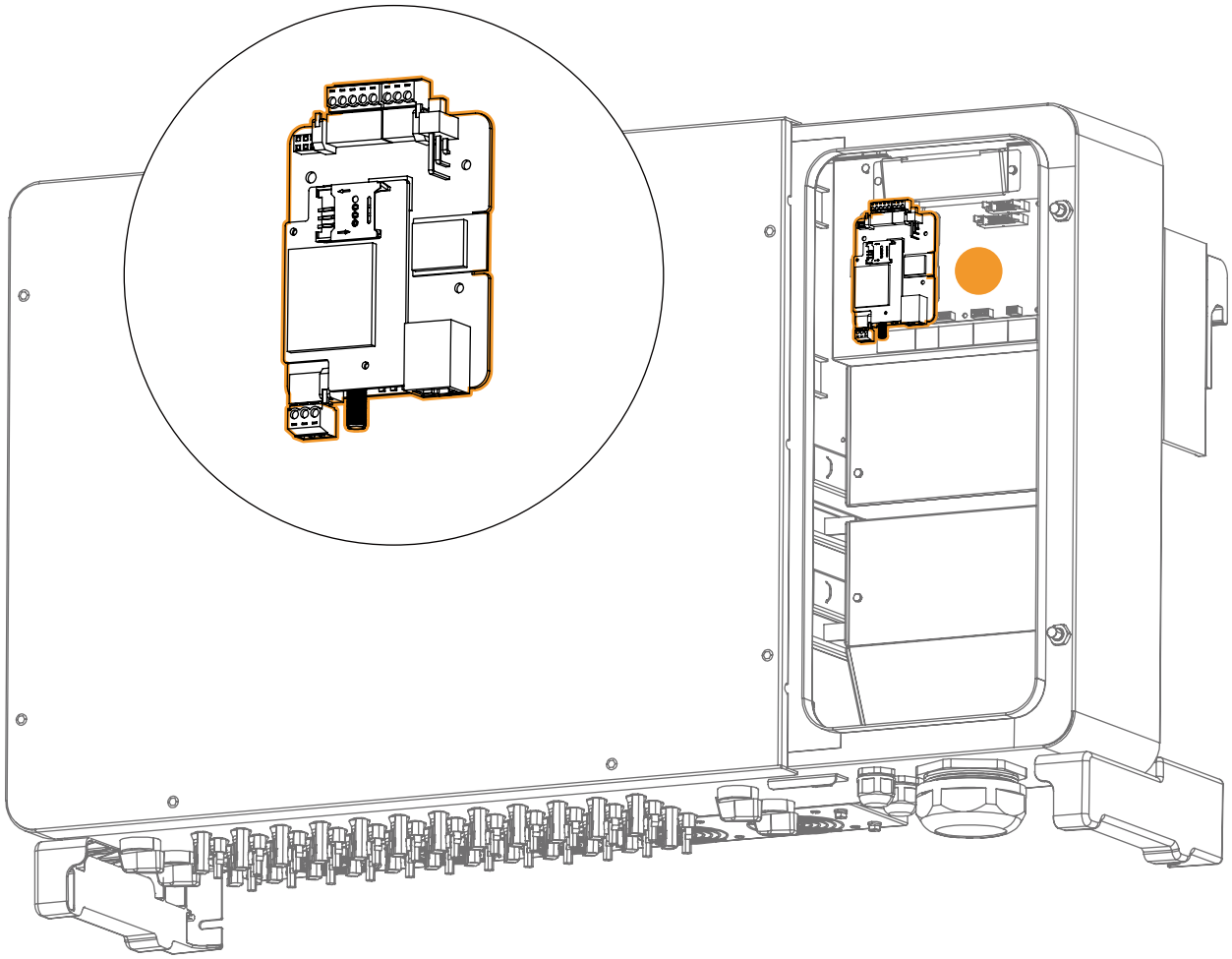
Indicates whether the gateway is connected to the CPS portal or target server via the Internet

Light Off		Unable to connect to LAN router or 4G base station
Blink		Connected to a LAN router or 4G base station, but not yet connected to the target server
Light On		Connected to the target server

3 Gateway specifications

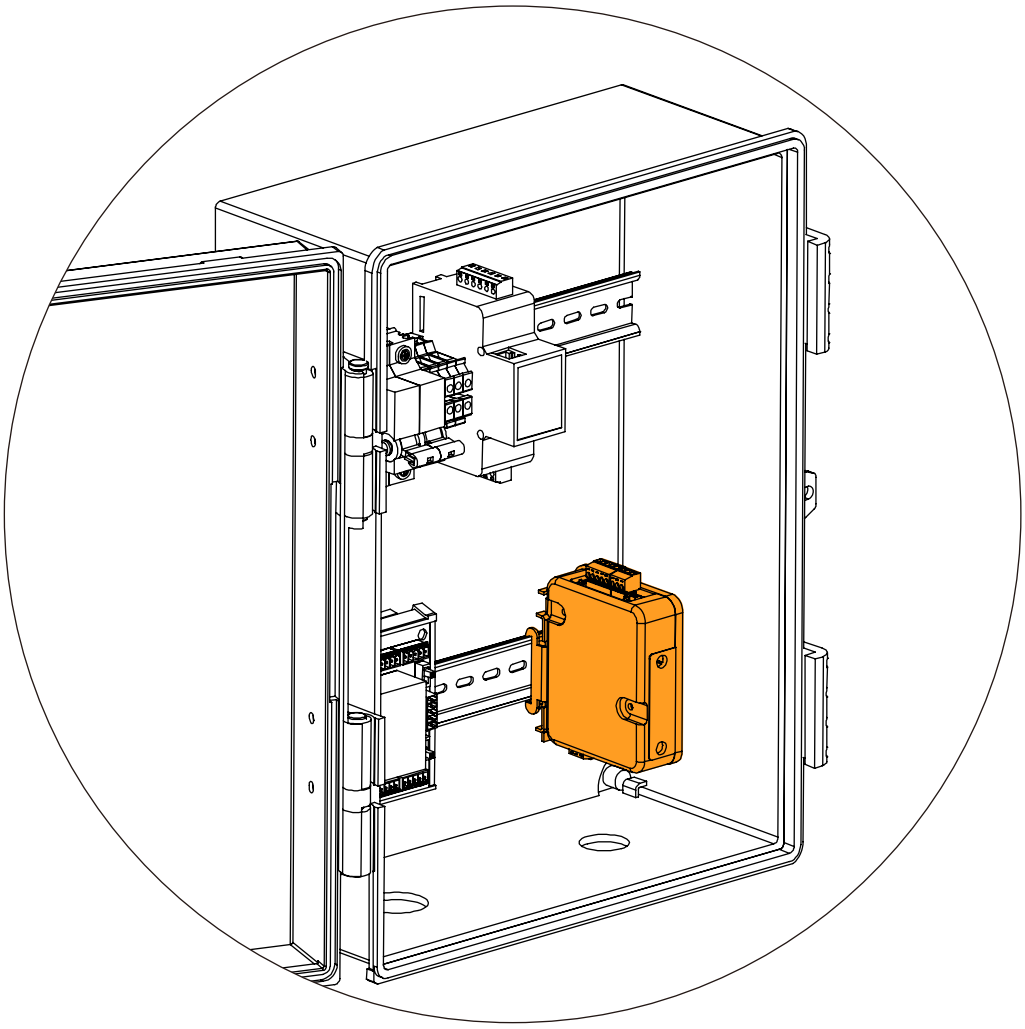
3.4 Housing and mounting

Option A: Gateway installed in inverter wire-box



The FlexOM Gateway is installed in the CPS inverter wire-box .

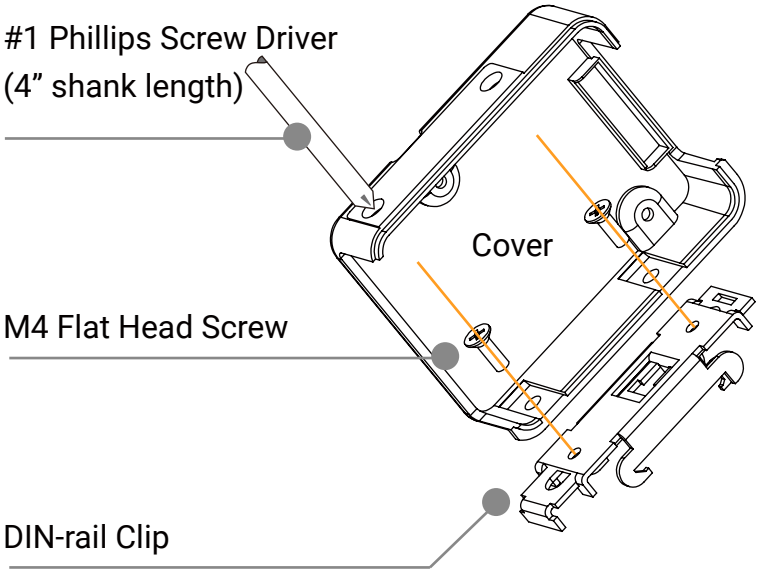
Option B: Gateway installed in DAS box



Plastic housing included in the gateway accessory, able to be mounted on the DIN rail of the DAS Box.

Gateway installed in DAS box

DIN Rail Mounting



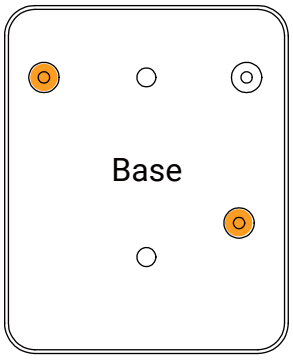
1 Side Mounting

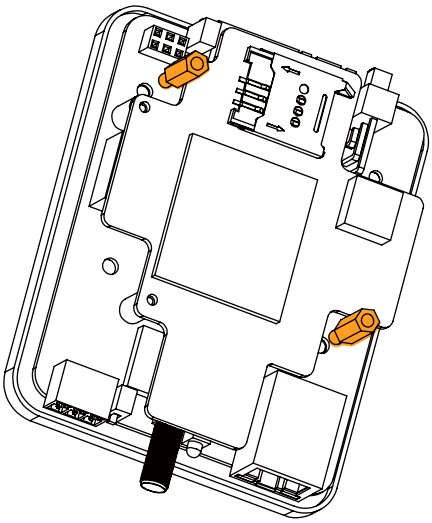
As shown in the figure, use a screw-driver to insert and secure the DIN rail clip and the upper cover of the housing together with M4 flat head screws.

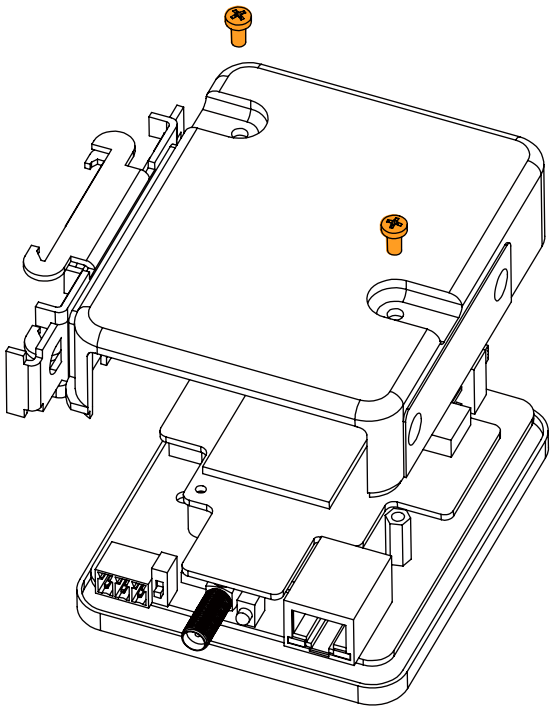
2 Side Mounting

Install the FlexOM Gateway onto the base of the housing and tighten it at the positions shown in the figure with the standoffs provided in the accessories kit.

Torque to 7 in-lbs using 3/16” socket hex driver.





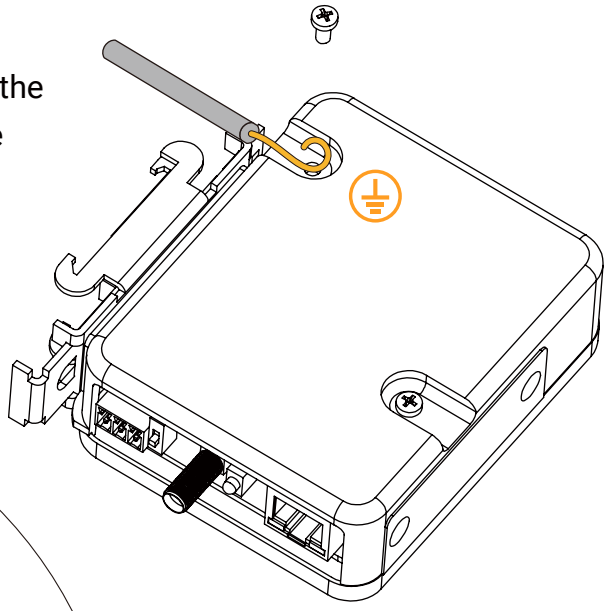


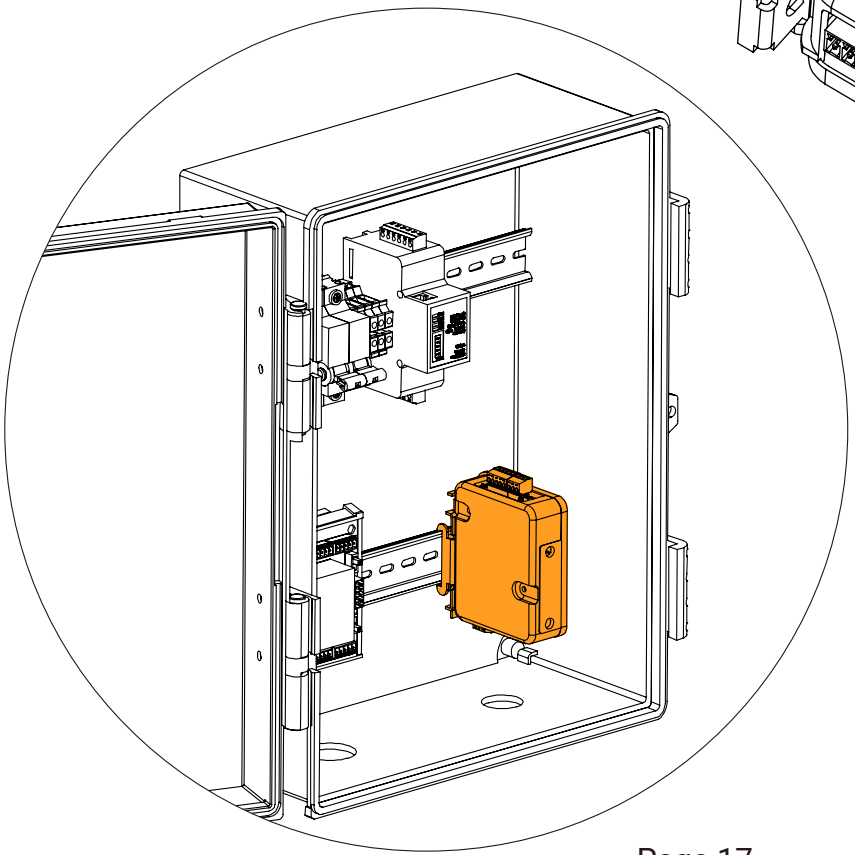
3 Side Mounting

Align and close the upper and lower housings according to the positions of the screw holes, and use a #1 Phillips screwdriver to fasten the two parts together with M3 screws.

4 Side Mounting

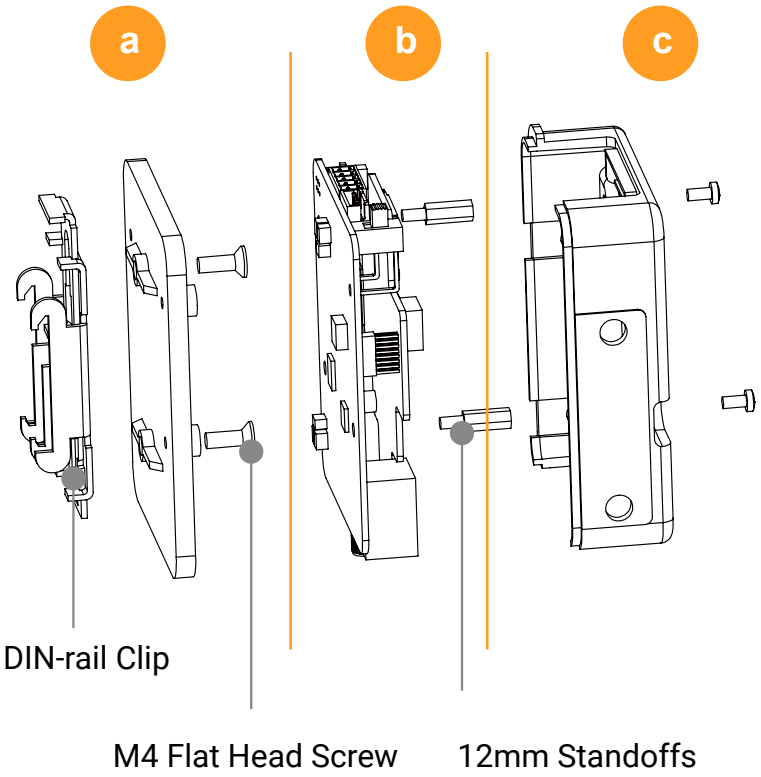
To ground the FlexOM Gateway once installed in the DIN rail enclosure, clamp the ground wire into the screw at the position shown in the figure.





5 Side Mounting

Mount the housing within the DAS box using the DIN rail clip.



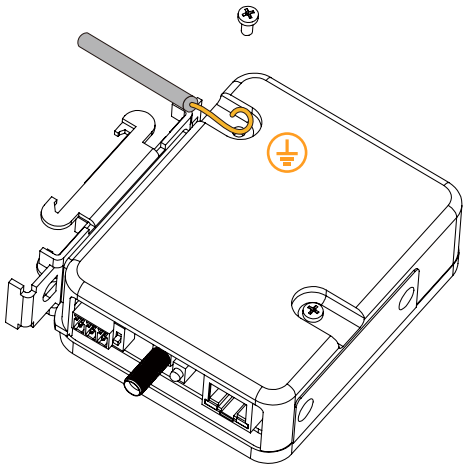
1 Flat Mounting

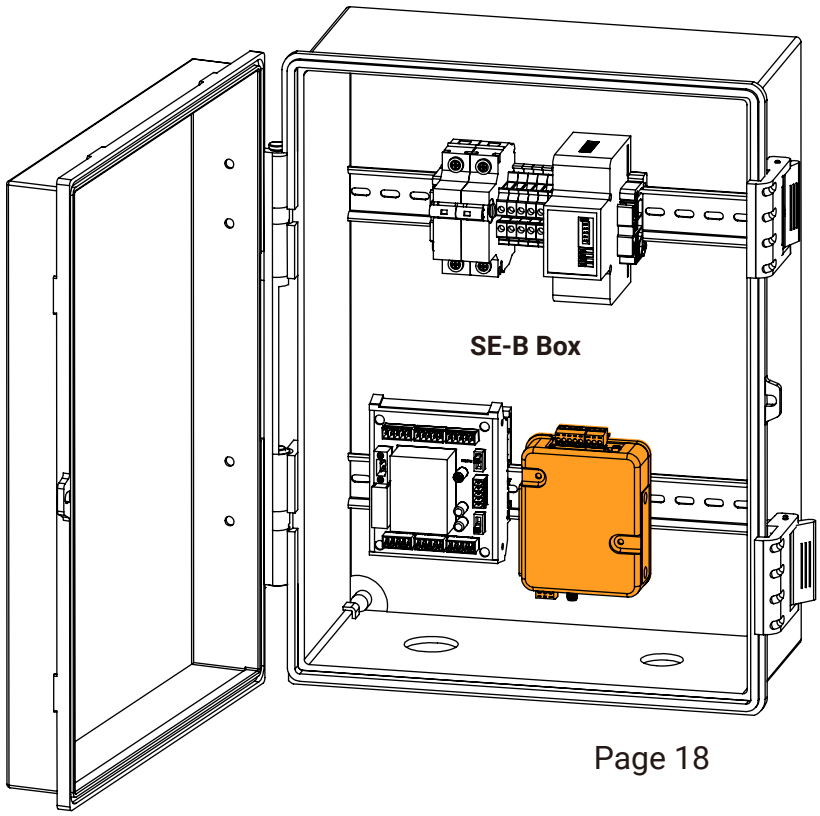
Put the parts in position in the order of a, b, c, and tighten the corresponding screws and standoffs.

Torque to 7 in-lbs using 3/16” socket hex driver.

2 Flat Mounting

To ground the FlexOM Gateway once installed in the DIN rail enclosure, clamp the ground wire into the screw at the position shown in the figure.



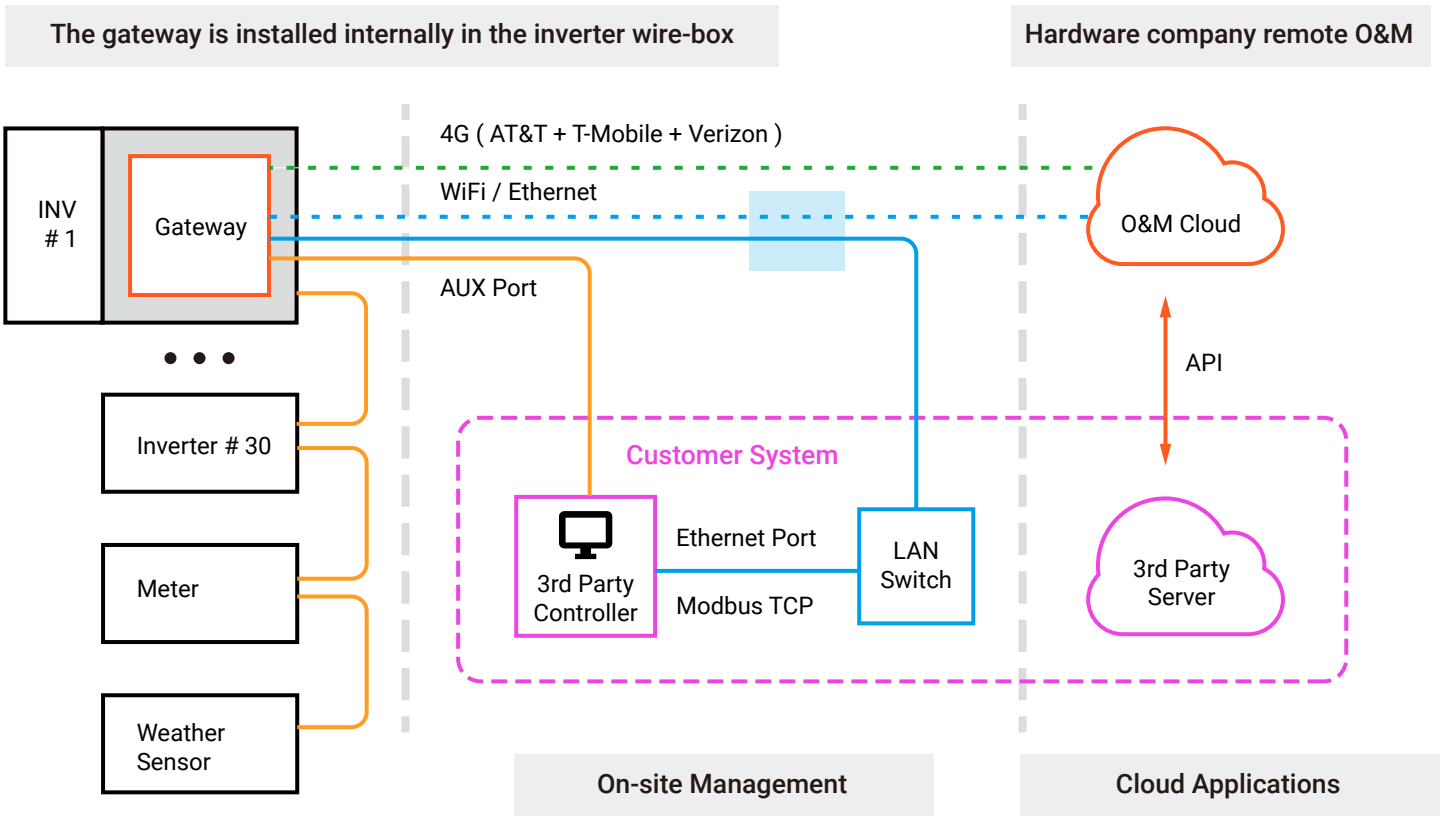


3 Flat Mounting

Mount the housing within the DAS box using the DIN rail clip.

4 System design for FlexOM gateway

4.1 Gateway default : Flex Mode (NO RSD)

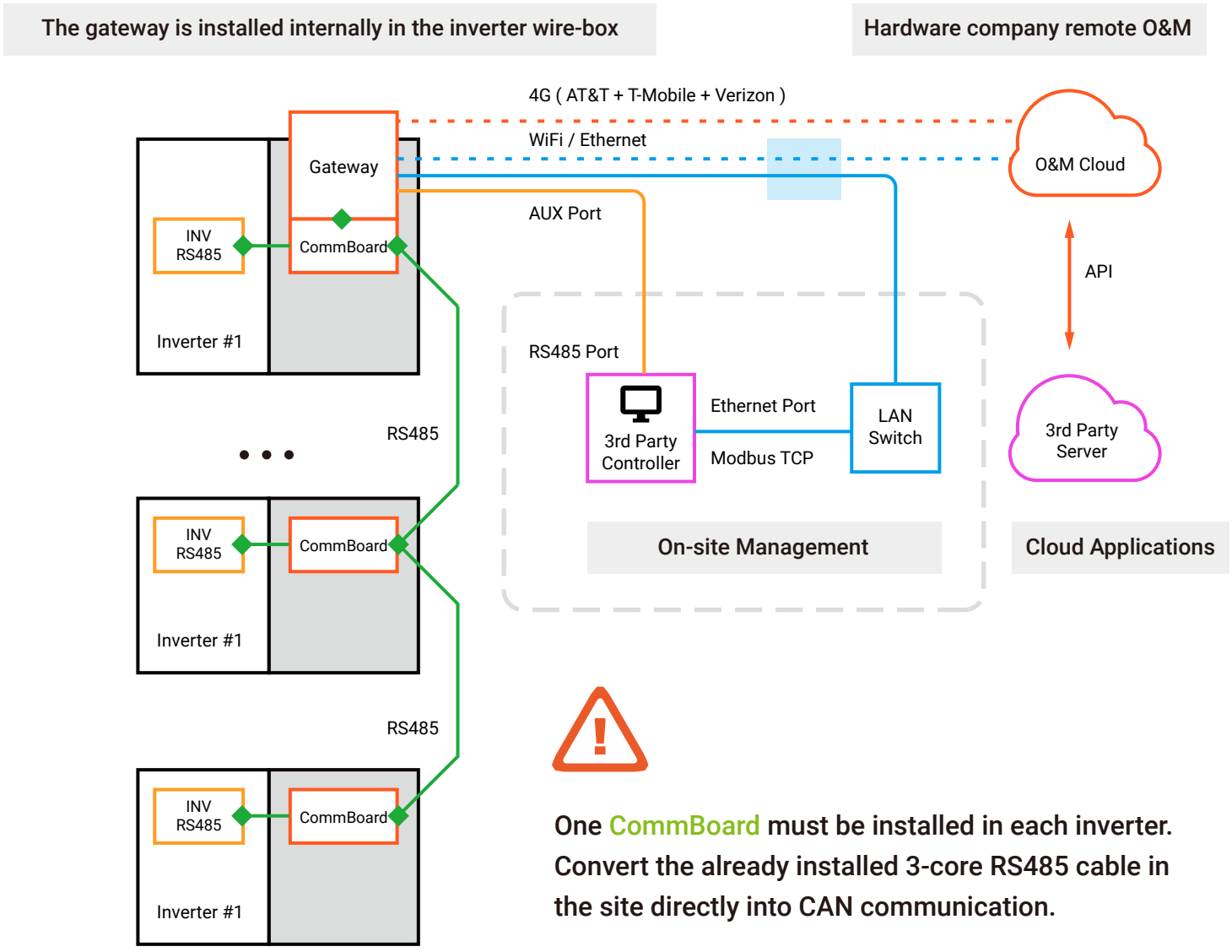


On a daisy chain cable, users can connect different kinds of hardware or different versions of the same model. The gateway can be configured with different data communication protocols depending on the Modbus ID.

The gateway can be connected to up to 32 inverters (or different hardware).

4 System design for FlexOM gateway

4.2 Super Mode (NO RSD)



Auto-commissioning :

After the entire Inverter daisy chain has been replaced with FCB , the FlexOM Gateway automatically discovers all the hardware, eliminating the need for the user to configure Modbus IDs for the inverters one by one.

In scenarios without MLPE connection, the gateway can be connected to up to 32 inverters (or different hardware).

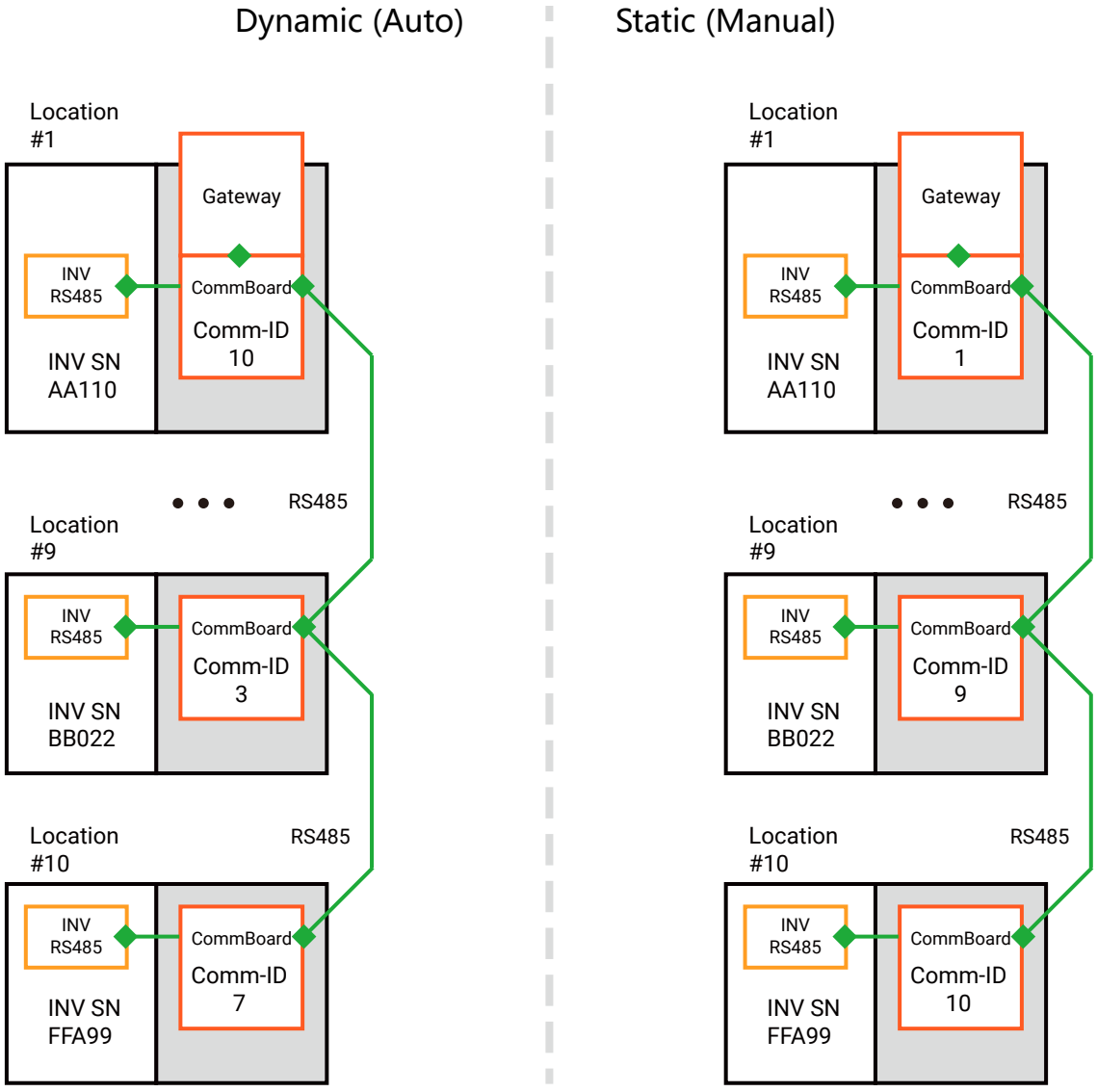
In Super Mode, the installer can automatically commission the entire daisy chain of inverters. As a result, the Modbus ID of all inverters is kept at the default #1.
At the same time, the gateway automatically assigns a Comm-ID to each CommBoard based on the number of inverters connected to the gateway (which can be changed manually).

The format of Comm-ID is the same as Modbus ID 1~254, also use 1~254 integer.

When the third party controller needs to read/write the inverter daisy chain, just send read/write commands to the target Comm-ID (inverter) according to the Comm-ID and follow the standard Modbus RTU commands.

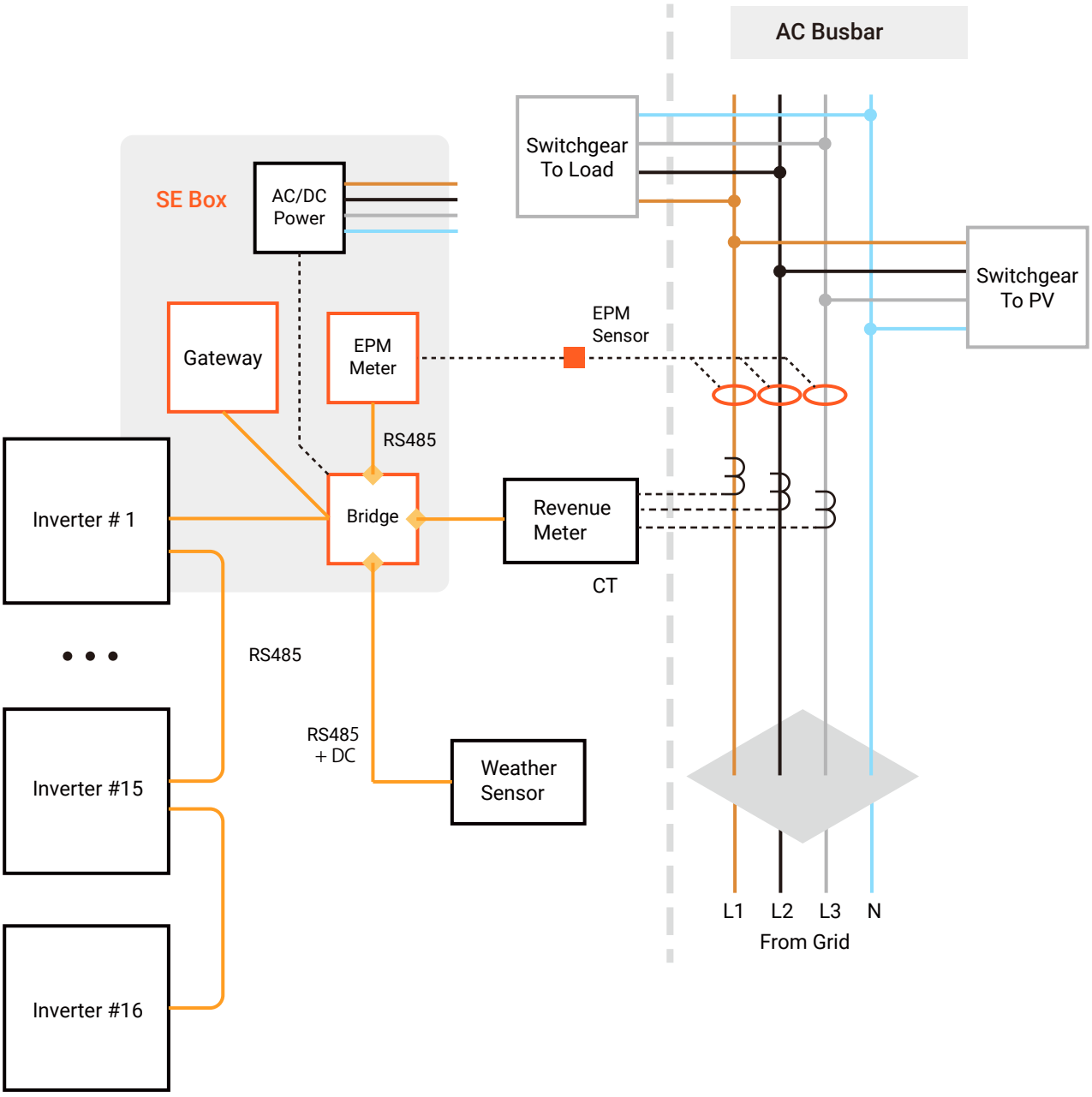
The Comm-IDs are read/written sequentially and then the entire inverter daisy chain is polled. This will complete the polling of the entire Daisy Chain.

The relationship between the Comm-ID and the inverter SN is created automatically by the gateway and can be viewed via the APP/WEB. You can also manually reassign Comm-IDs one by one according to the physical installation order via APP.



4 System design for FlexOM gateway

4.3 Zero-export and load-monitoring (Requires EPM kit)



- Convenient and safety hardware that accommodates C&I sites of all sizes.
- Set everything up with one click and diagnose incorrect wiring.
- More than "zero exports" and adjusting generation with intelligence.

The FlexOM gateway works in conjunction with the EPM kit to provide real-time "Zero Export" dynamic control of multiple inverters in C&I sites in response to load variations.

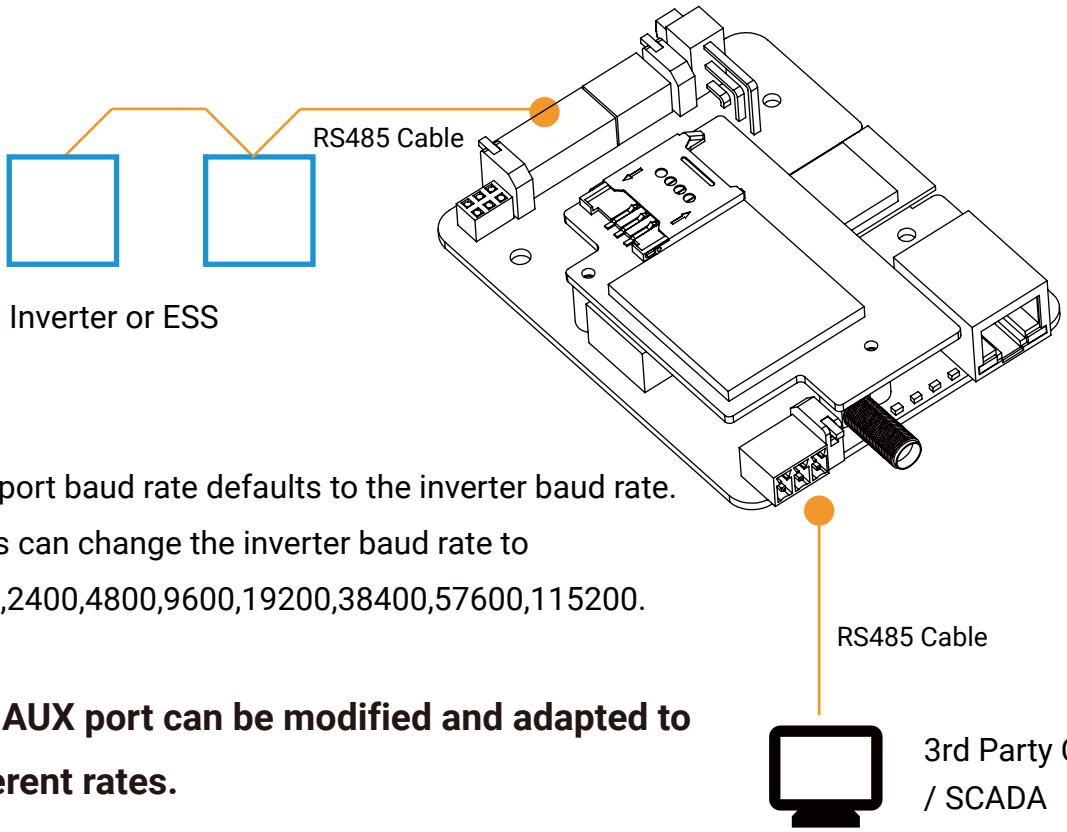
“Zero Export” is completely dependent on the reliability and timeliness of communication between the gateway and the devices in the daisy chain, and EPM performance is based on the premise of reliable communication.

4 System design for X2 gateway

4.4 AUX Mode (Multi-party management)

Option A : RS485 Pass-thru

The RS485 interface of the third-party controller is connected to the AUX interface of the gateway, which is equivalent to a direct transmission connection with a daisy chain.



AUX port baud rate defaults to the inverter baud rate.
Users can change the inverter baud rate to 1200,2400,4800,9600,19200,38400,57600,115200.

The AUX port can be modified and adapted to different rates.

Key parameters for third-party controllers/SCADA:

Interval between polls: 300 milliseconds or more

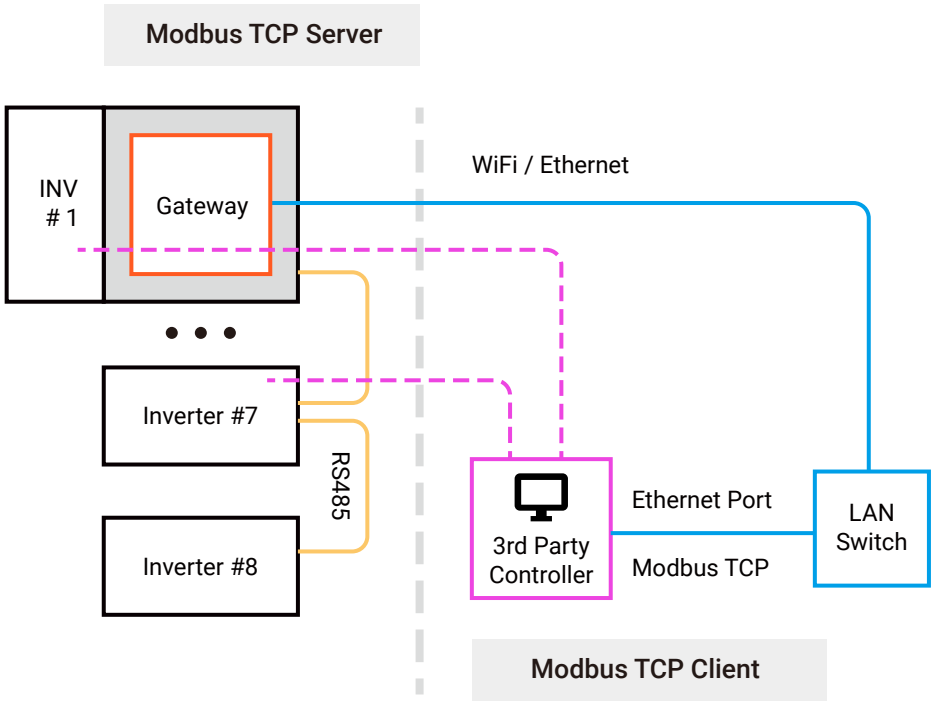
3rd Party Portal

Response timeout :
200ms minimum for read commands, recommended to be more than 500ms;
400ms minimum for write commands, recommended to be more than 700ms;
2.5s for connection via AC-PLC;

4 System design for X2 gateway

4.4 AUX Mode (Multi-party management)

Option B : Modbus TCP Pass-thru



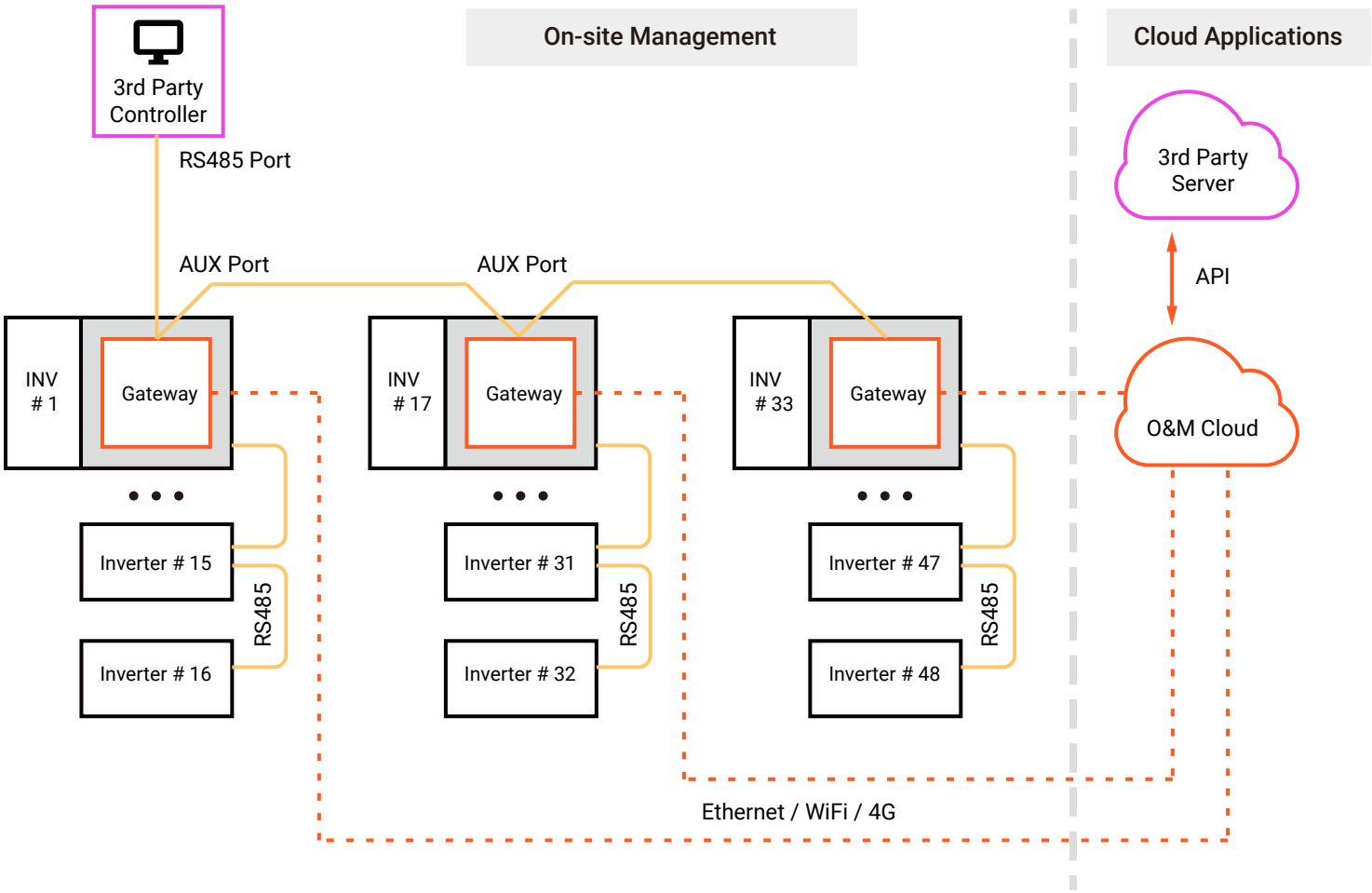
The gateway connects to the Daisy Chain and is created as a Modbus TCP server object for each device with a different Modbus ID.

A third party SCADA acts as a Modbus TCP client and connects to the target Modbus ID device via a TCP channel.

The gateway can be connected to up to 8 Modbus TCP clients.

4 System design for X2 gateway

4.5 Hyper Star-link (Expansion wiring via AUX)



No setup is required to connect the different inverters to the daisy chain as shown in the diagram.

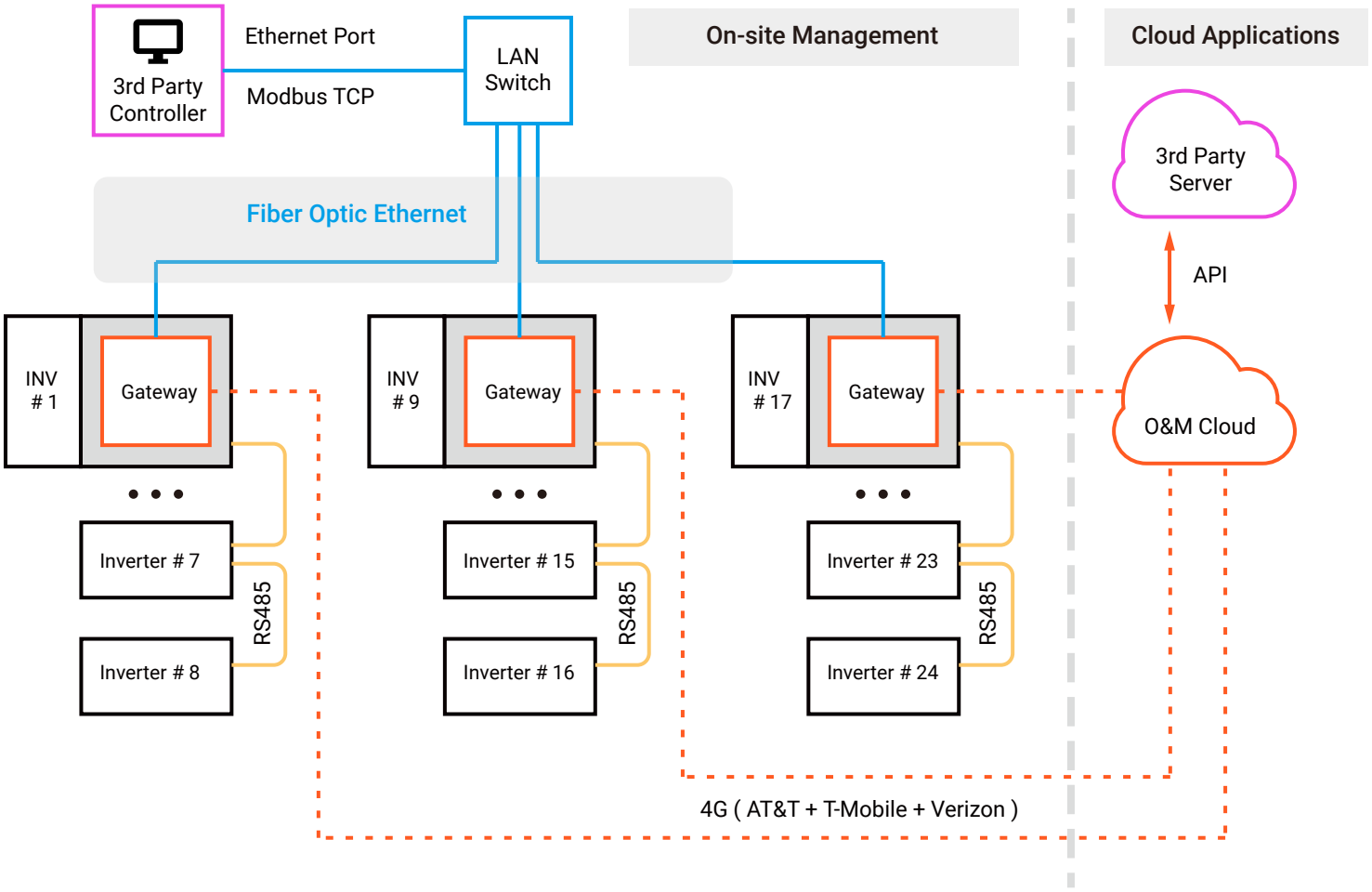
It is possible to connect groups of different inverters that are physically far away from each other, and at the same time, the read/write cycle of the SCADA controller for all the inverters will not be out of control due to the large number of inverters, but can be controlled close to one polling cycle.

Note that you need to set non-repeating Modbus IDs for all inverters connected under different gateways.

For more details on the solution, please contact the FAE or after-sales personnel .

4 System design for X2 gateway

4.5 Hyper Star-link (Expansion wiring via Ethernet)



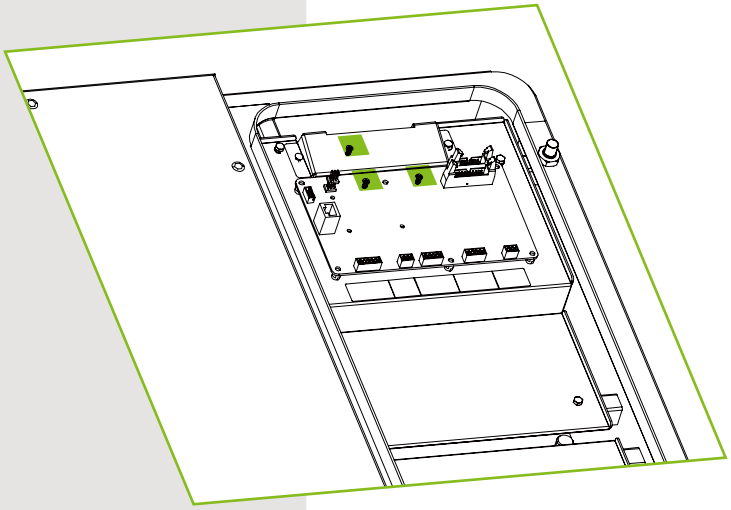
For AUX connection scenario, each gateway can connect up to 32 inverters,
it is recommended to evaluate the maximum acceptable polling time for a full polling from the 3rd party controller point of view.

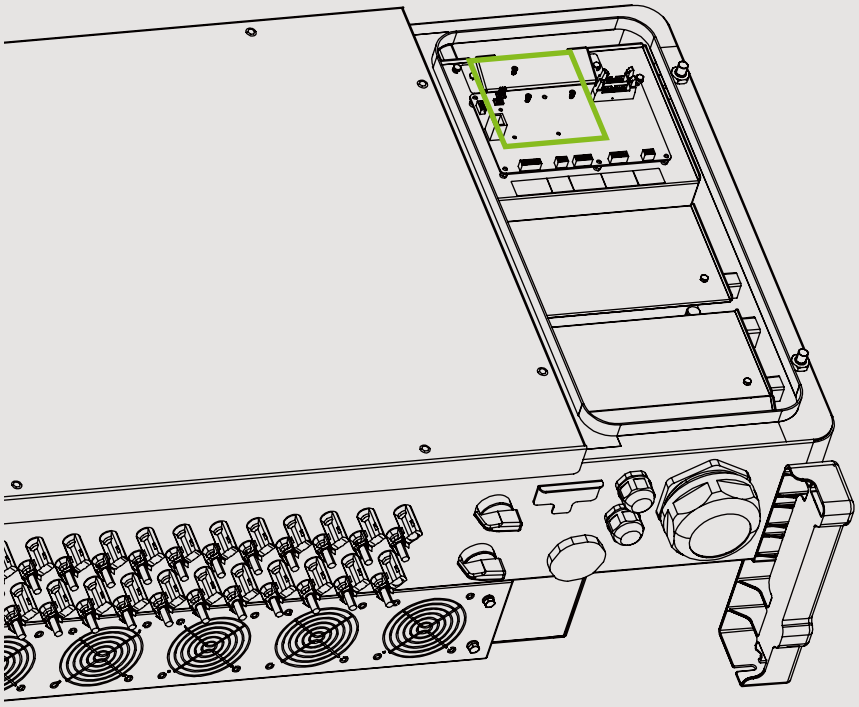
For Ethernet connection scenarios, each gateway supports a maximum of 8 Modbus TCP Clients, it is recommended that 8 inverters are connected to each gateway if a Modbus TCP Client connection is created for each inverter.

If the 3rd party controller is able to poll multiple inverters with a single Modbus TCP Client, the gateway can connect more inverters.

5 Hardware installation

5.1 Flex Mode (NO RSD)



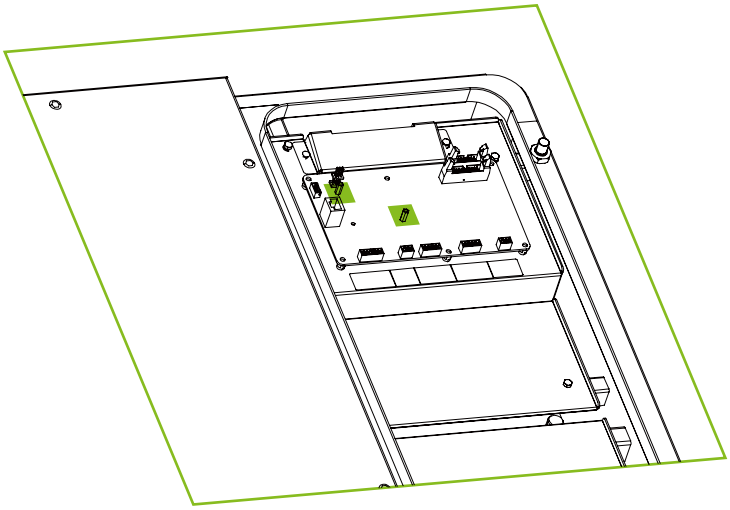


Remove the screws that attach the inverter communication board in the wire-box using a #1 Phillips bit.

1

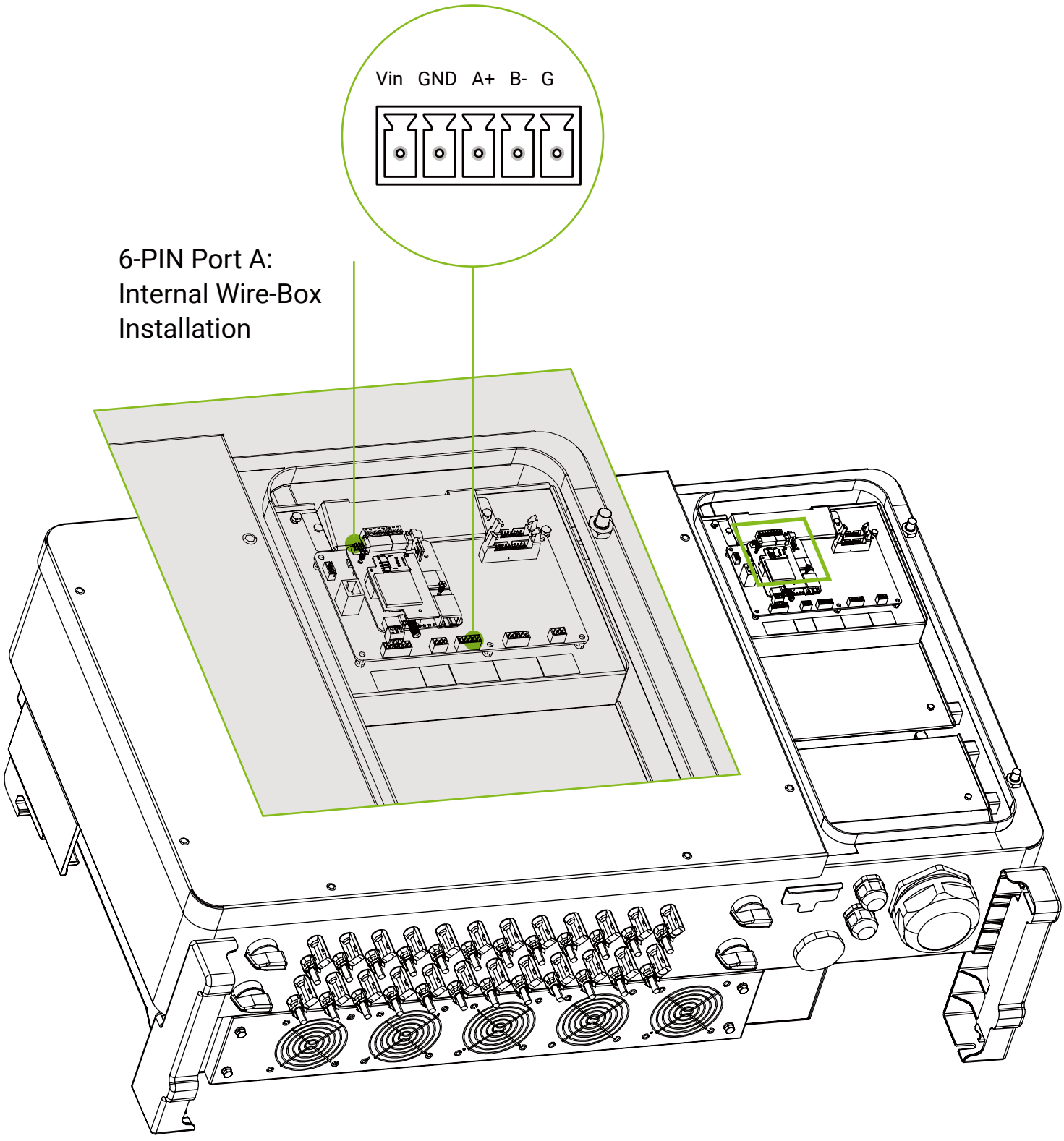
Replace the screws with the standoffs included in the accessories kit.

Repeat this process for each of the (3) screws and stand-offs while keeping the commu-nication board in place.



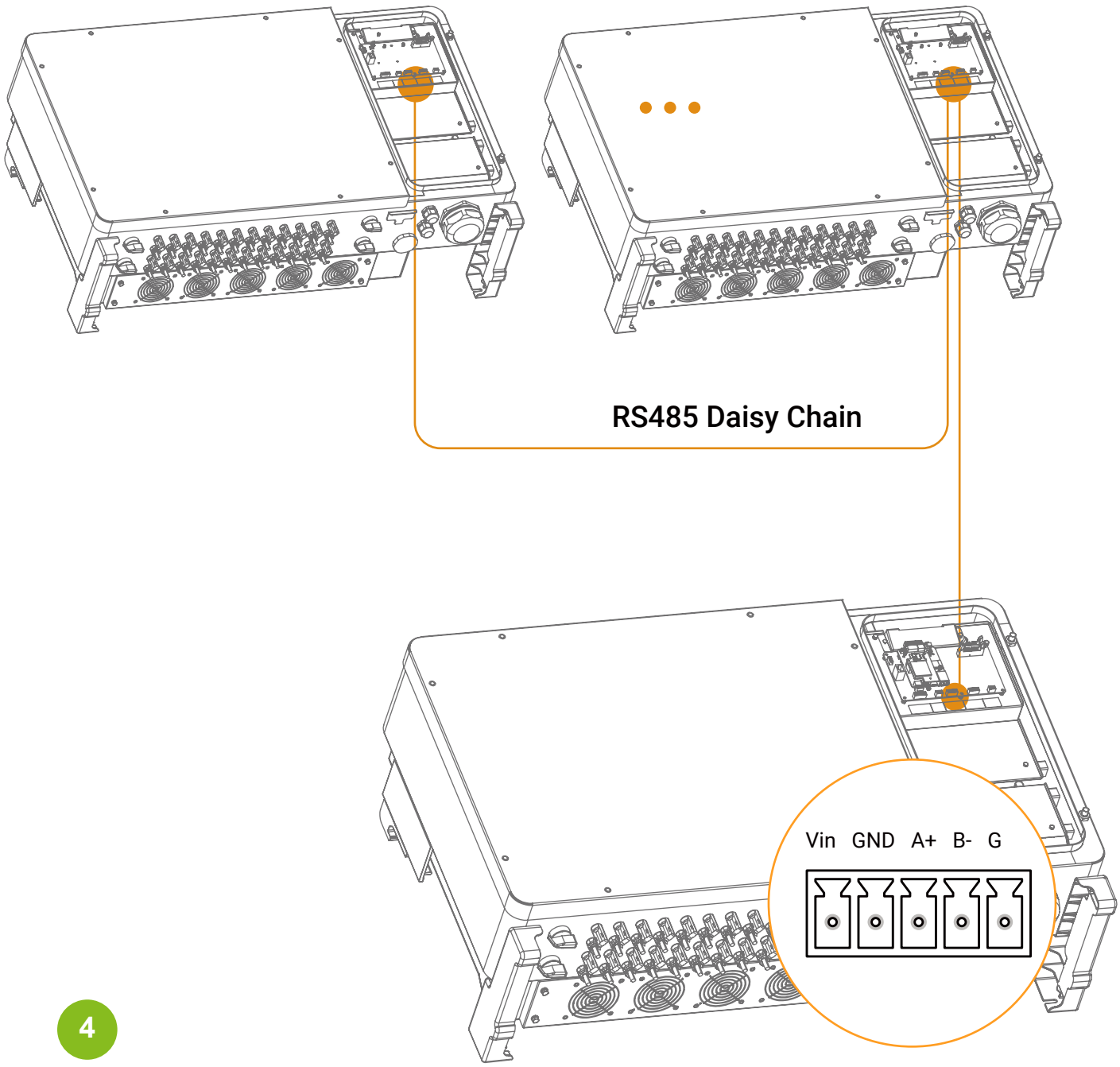
2

Torque standoffs to 7 in-lbs using a 3/16” socket hex driver.



3 After all standoffs have been inserted, install the FlexOM Gateway by carefully aligning the 6-PIN Port A with the 6-PIN header in the upper right-hand corner of the communication board.

Install the (3) screws removed in step 1 into the standoffs to secure the FlexOM Gateway in place and torque to 7 in-lbs using a #1 Phillips bit.



RS485 Inverter Daisy Chain (connected to inverter communication board)

4

Connect the RS485 inverter daisy chain to the inverter communication board using pins A+, B-, and G in the Connector provided in the inverter accessories kit when mounting inside the inverter wire-box.

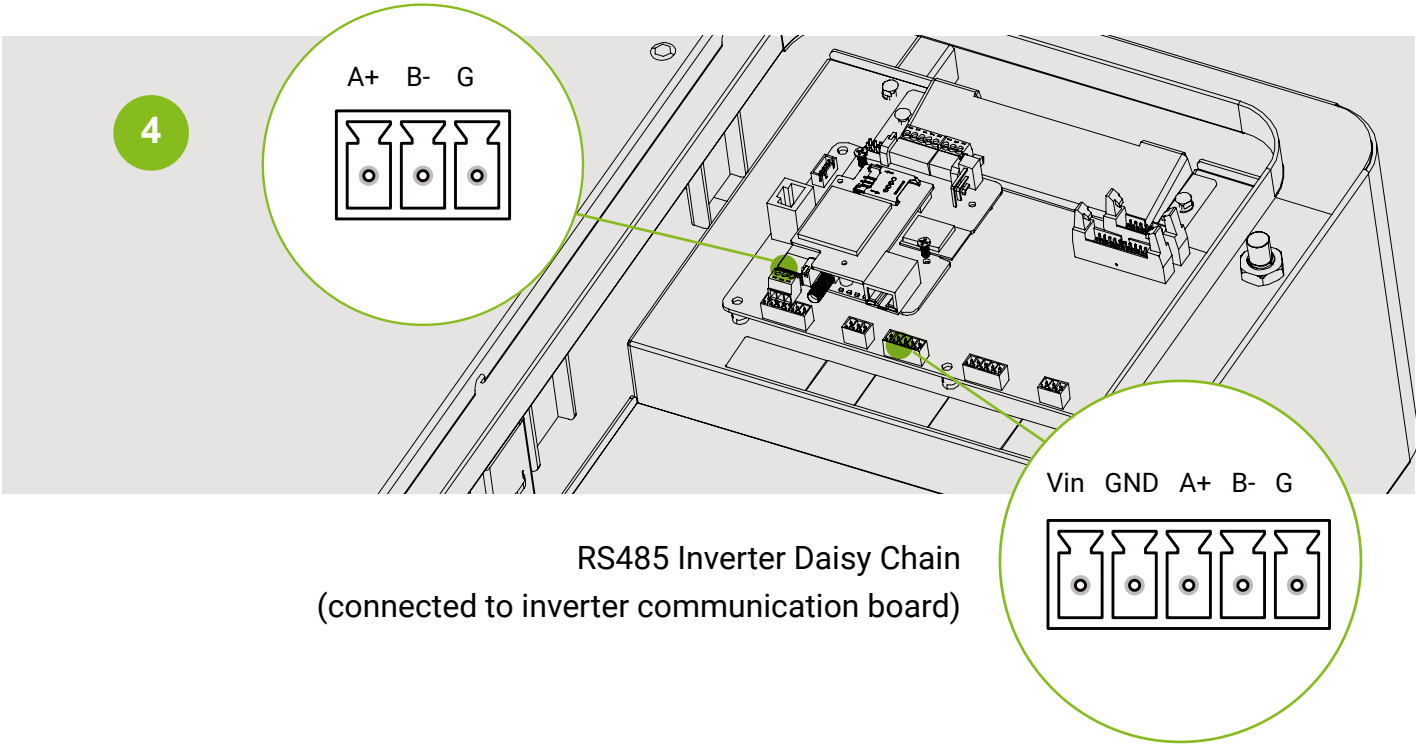
Check the inverter User Manual for RS485 installation instructions.

FlexOM Gateway uses a two-wire Modbus RS485 multipoint serial line system. Shielded, twisted pair, 22 AWG, stranded cable such as Belden 3106A is recommended for the daisy chain.

Once pins A+, B-, and G in the Connector are connected, then insert the Connector into the terminal block in the port on the bottom of the inverter communication board (behind the FlexOM Gateway as shown below).

If applicable, connect the 3rd Party Datalogger to the AUX port in the bottom eft-hand corner of the FlexOM Gateway V2 using the 3-PIN Connector provided in the accessories kit.

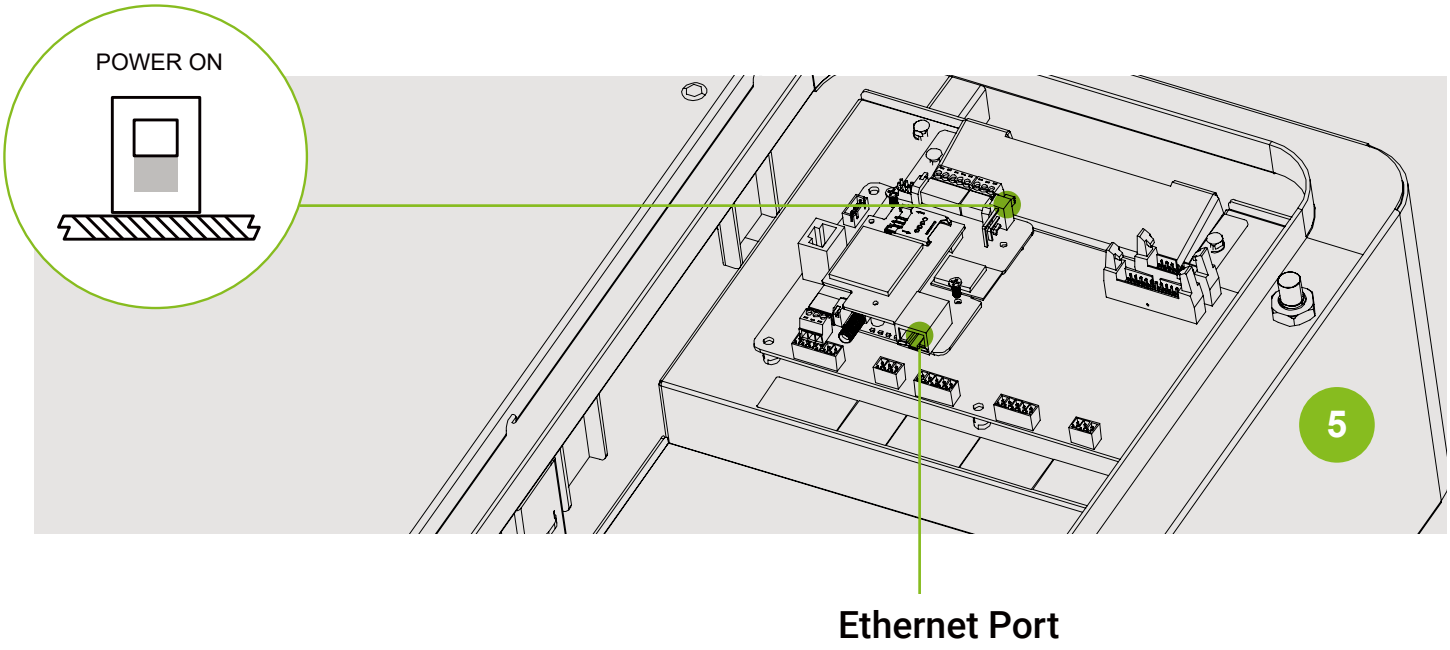
RS485 3rd Party Data Logger
(connected to FlexOM Gateway V2 card)



RS485 Inverter Daisy Chain
(connected to inverter communication board)

Use the Connector supplied in the inverter accessories kit to connect to the RS485 daisy chain via the inverter communication board. This may be a 5-PIN, 6-PIN, or 8-PIN Connector depending on the inverter model.

Ensure the Gateway Power Switch is set to ON and an LED indicator is ON before closing the inverter wire-box enclosure.



NOTE: If connecting to the Internet via Ethernet, follow step 5 below. If connecting via 4G, skip to steps about antenna installation.

To connect to the Internet via Ethernet, insert the RJ45 LAN cable into the Ethernet port of the FlexOM Gateway.

The LAN connection must be able to access the Internet without port filtering behind the firewall .

The following ports must be opened both ways
(for incoming and outgoing communications):

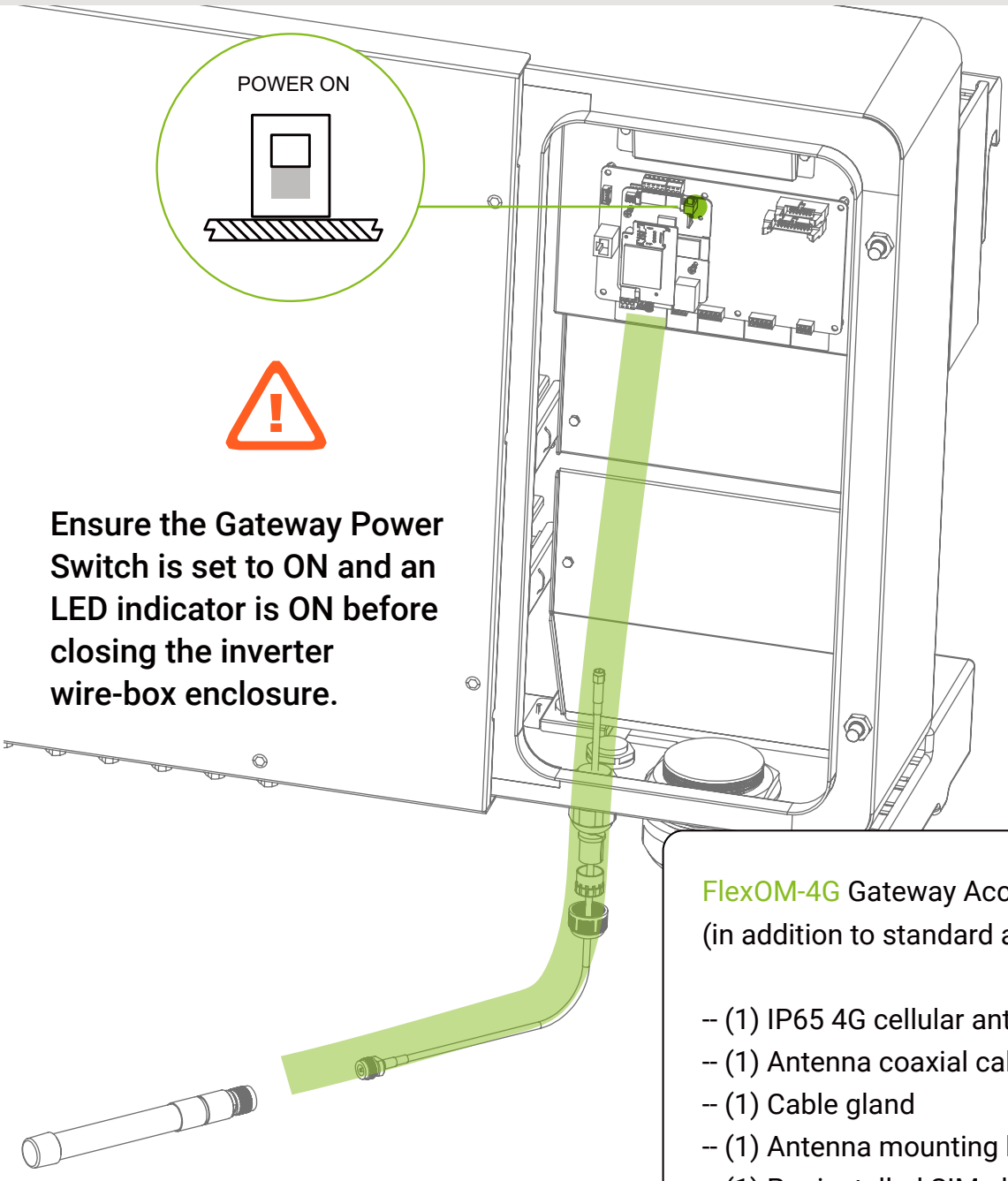
TCP 1884 with destination IP 18.134.238.207

4G Cellular Antenna Installation
(FlexOM-4G only)

Pass the SMA end of the coaxial antenna cable through the disassembled cable gland parts in sequence, then tighten the cable glands again.

Screw one end of the antenna cable into the cable connector of the gateway (applicable to FlexOM-4G model only).

Mount the 4G antenna as high as possible on a metallic structure.



Ensure the Gateway Power Switch is set to ON and an LED indicator is ON before closing the inverter wire-box enclosure.

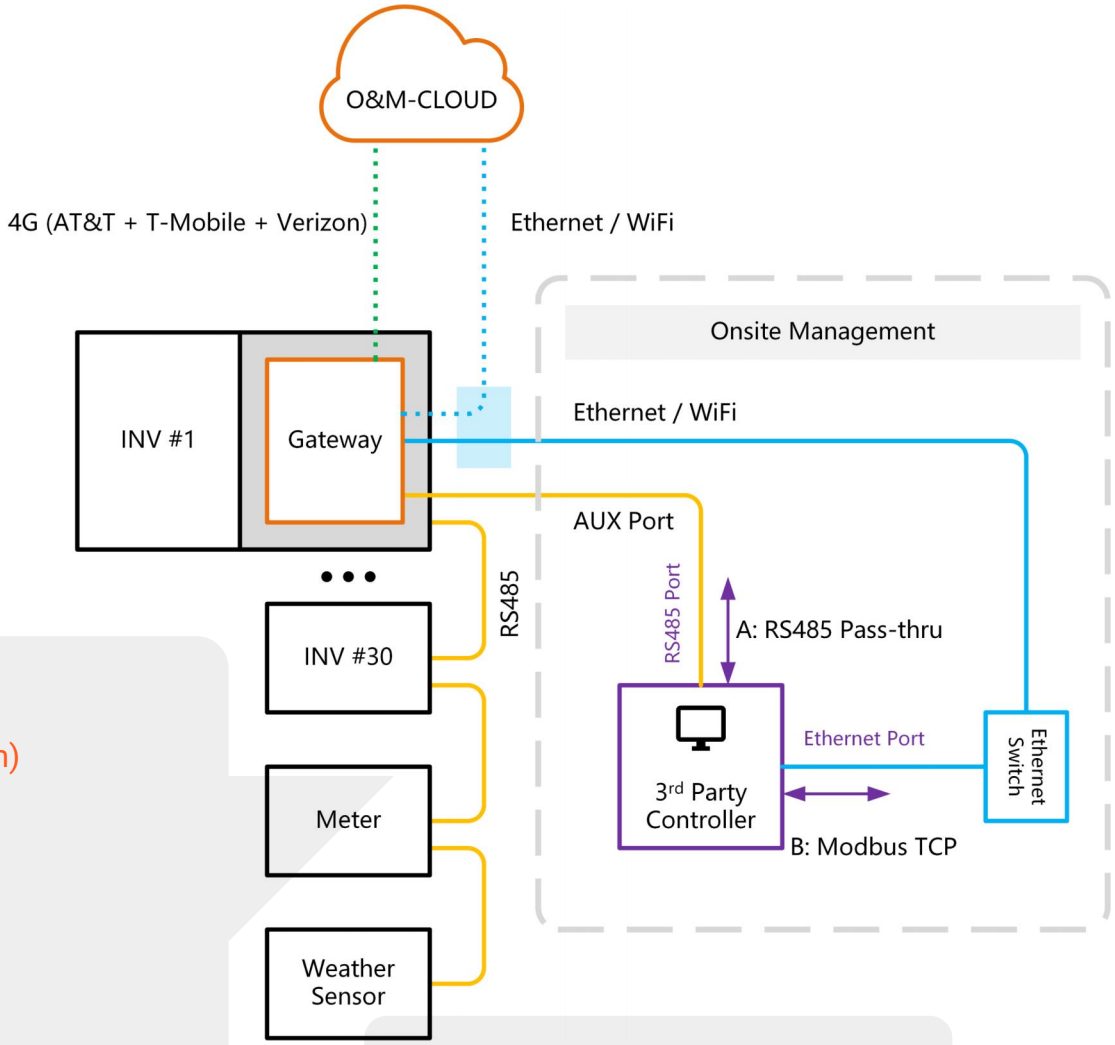
FlexOM-4G Gateway Accessory Kit includes (in addition to standard accessories):

-- (1) IP65 4G cellular antenna
-- (1) Antenna coaxial cable (3m)
-- (1) Cable gland
-- (1) Antenna mounting bracket
-- (1) Pre-installed SIM chip

Check that the "Modbus Mode" of the gateway is correctly set to Flex via the APP.

Any gateway that is factory default, or has worked in Super mode, can be set to Flex Mode at any time.

The gateway can be connected to different types of other hardware such as revenue meters and weather stations via RS485 cable.



- ABB (M4M)
- Accuenergy (Acuvim)
- Acrel
- Chint
- Elkor
- Inepro Metering
- Janitza Electronics (UMG)
- Schneider Electric (PowerLogic)
- Veris
- WattNode
- WEG (MMW)
- Weidmüller (Energy Meter)
- Zhuhai Pilot (PMAC and SPM)

- IMT (Ingenieurbüro) Products
- JinZhou SunShine Products
- KippZonen Products
- Lufft Products
- RainWise Products

5 Hardware installation

5.2 Zero-export with Flex Mode (Requires EPM kit)

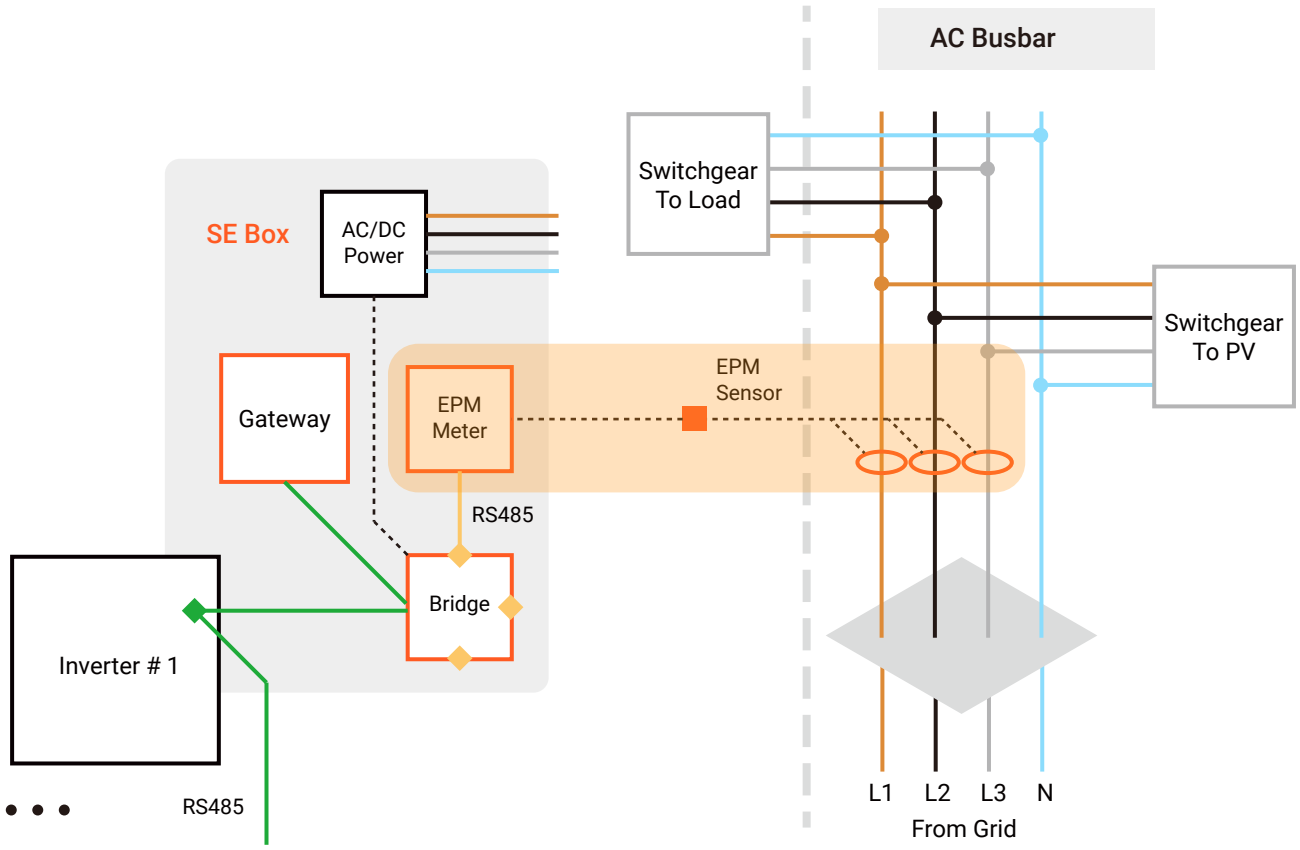
The FlexOM gateway works in conjunction with the EPM kit to provide real-time "Zero Export" dynamic control of multiple inverters in C&I sites in response to load variations.

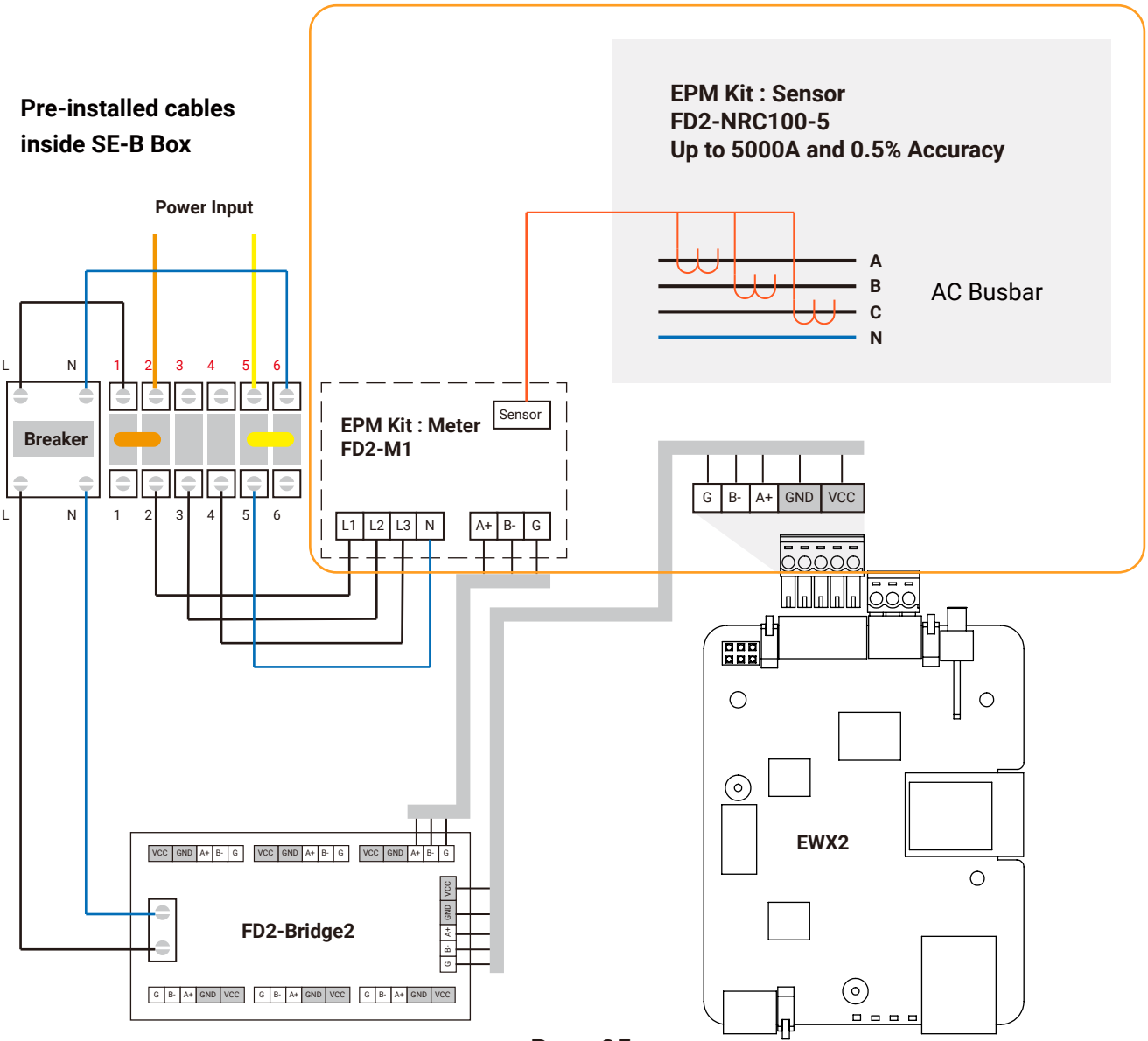
“Zero Export” is completely dependent on the reliability and timeliness of communication between the gateway and the devices in the daisy chain, and EPM performance is based on the premise of reliable communication.

Minimum time interval for the entire daisy chain to perform a single derating	Maximum time for the inverter to execute a write command	
	< 100 ms	~ 200 ms
2 Seconds	5	2
5 Seconds	16	8

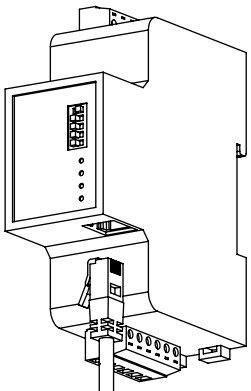
Maximum number of inverters that can be connected

FA1-C does not support EPM, other FlexOM gateway models support EPM scenarios.
Please contact sales for more information.


AC Busbar
Switchgear
To Load
SE Box
AC/DC
Power
Switchgear
To PV
Gateway
EPM
Meter
EPM
Sensor
RS485
Bridge
Inverter # 1
RS485
L1
L2
L3
N
From Grid


Pre-installed cables
inside SE-B Box
Power Input
EPM Kit : Sensor
FD2-NRC100-5
Up to 5000A and 0.5% Accuracy
A
B
C
N
AC Busbar
L
N
1
2
3
4
5
6
Breaker
EPM Kit : Meter
FD2-M1
Sensor
L1
L2
L3
N
A+
B-
G
G
B-
A+
GND
VCC
EWX2
FD2-Bridge2

EPM Meter
FD2-M1

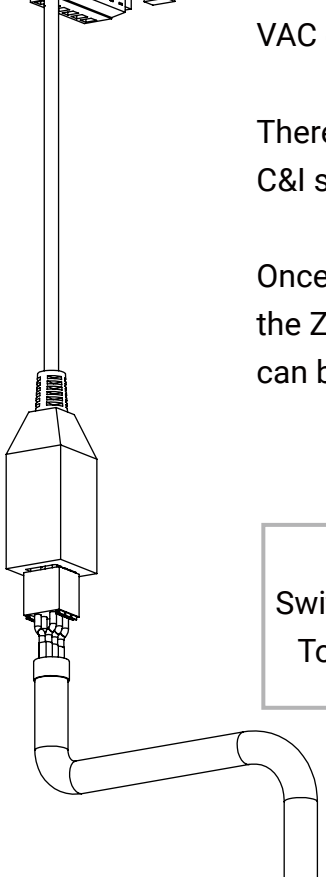


The EPM sensor is capable of measuring currents up to 5000 A.

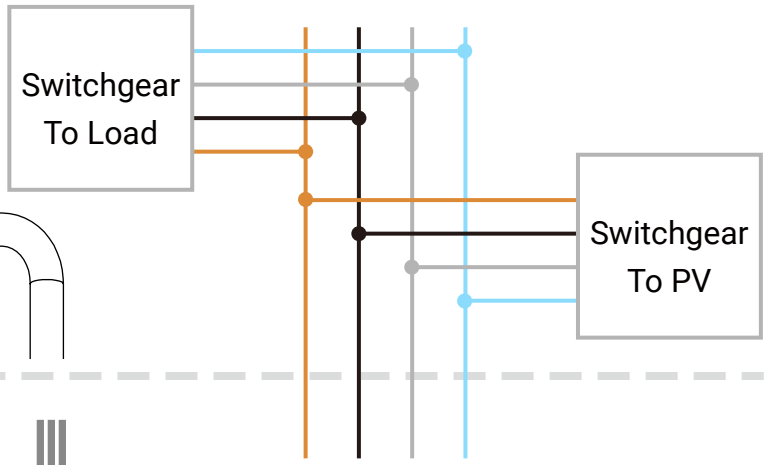
The EPM meter supports 480 VAC by default (800 VAC optional).

Therefore, it can be directly applied to all kinds of C&I sites.

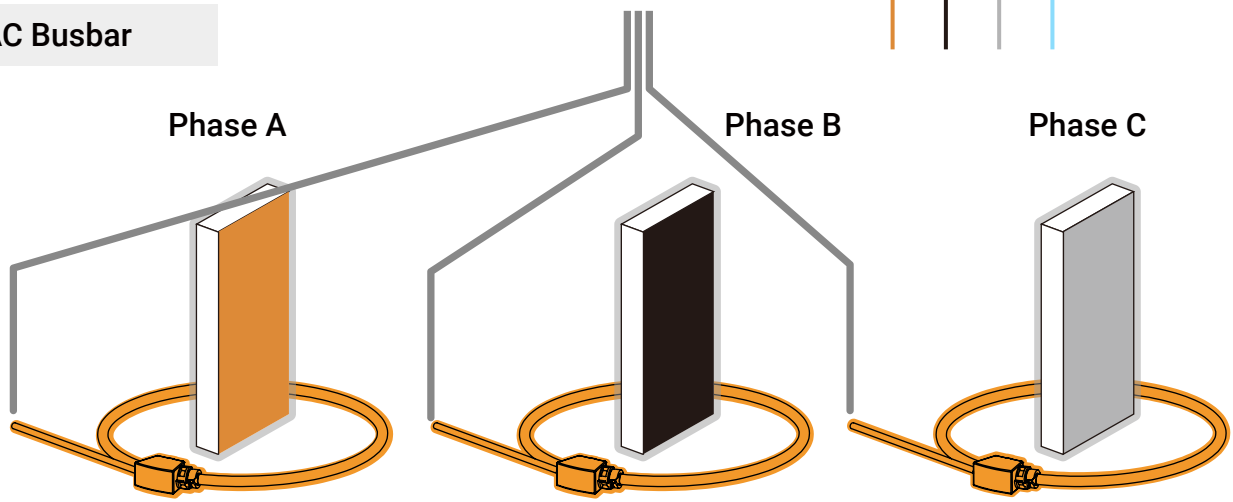
Once the EPM kit is connected to the X2 gateway, the Zero-export and Load-monitoring functions can be activated via App/Web.



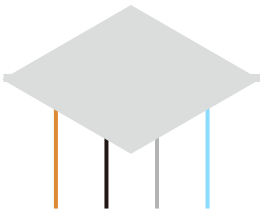
5 Meters Cable



AC Busbar



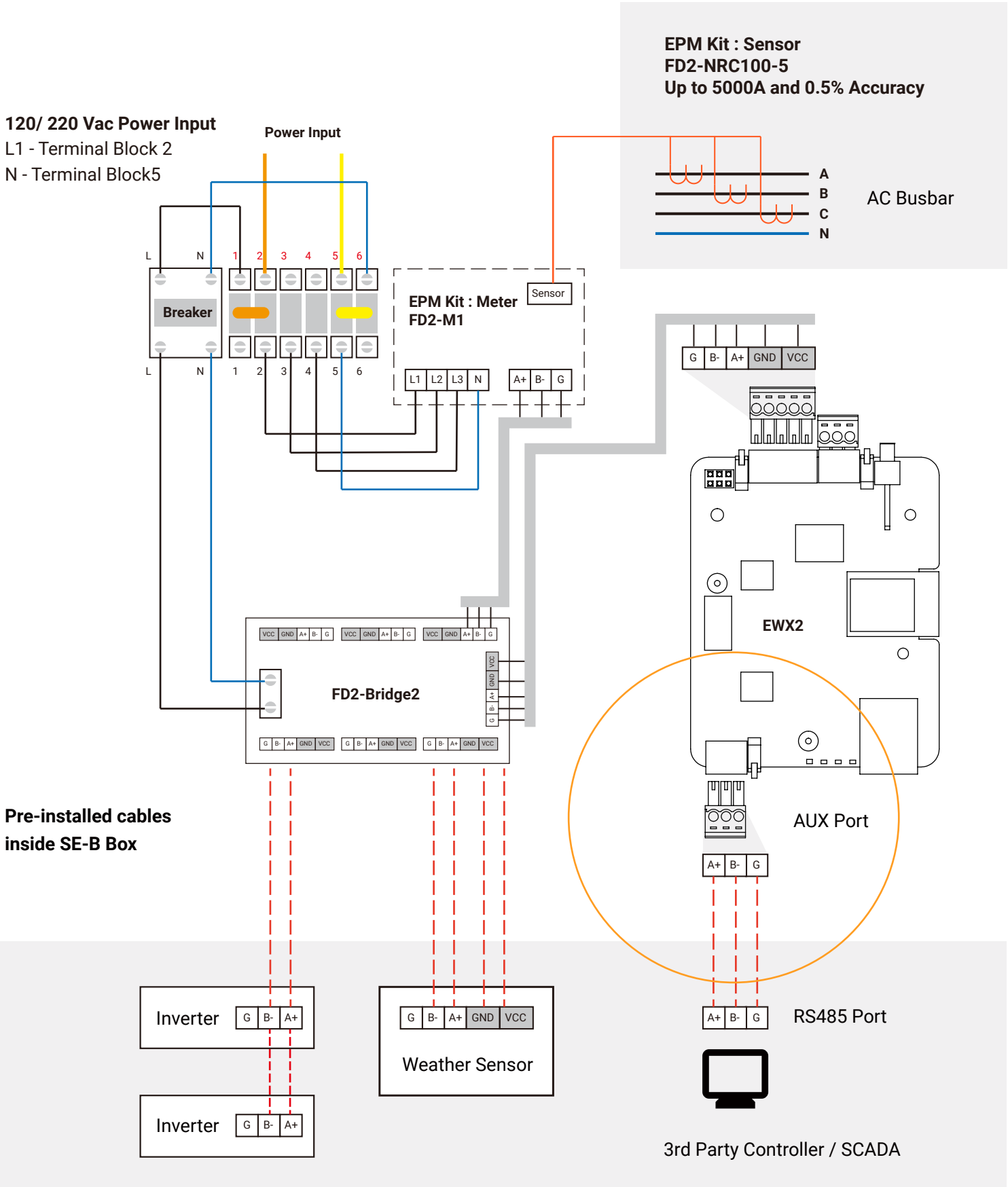
EPM Sensor : FD2-NRC100-5



From Grid (L1 / L2 / L3 / N)

5 Hardware installation

5.3 AUX Mode (Multi-party management)



6 Non-registered User (Installer)

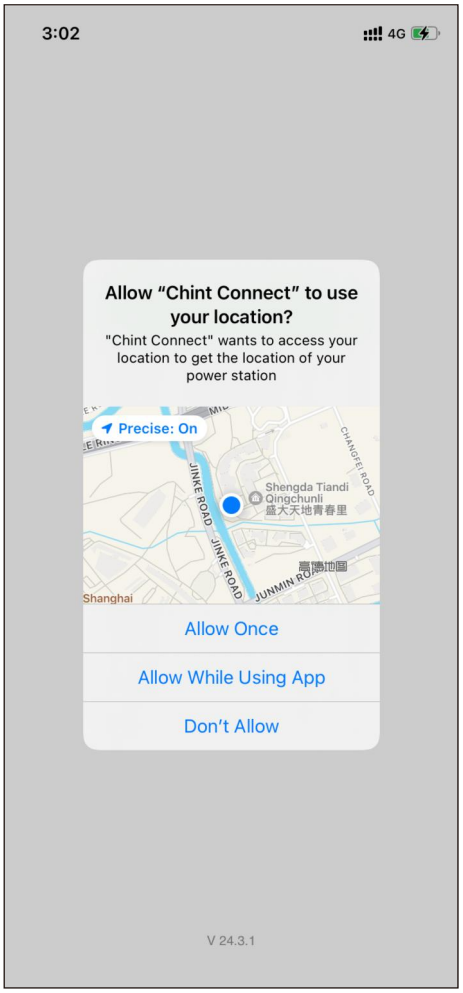
6.1 APP connect to gateway

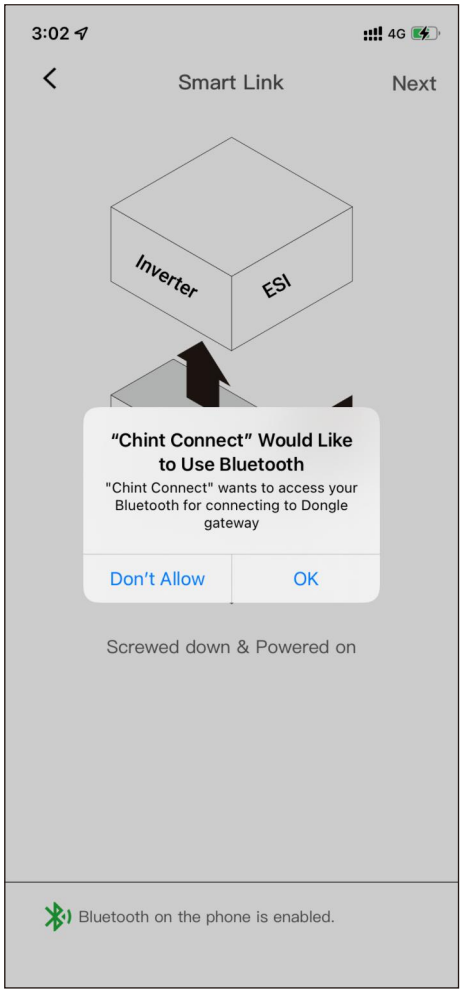
Scan the QR-code to complete APP download and installation by using the mobile phones that can access the Internet. Or search for “Chint Connect ” in Apple Store and Google Play.

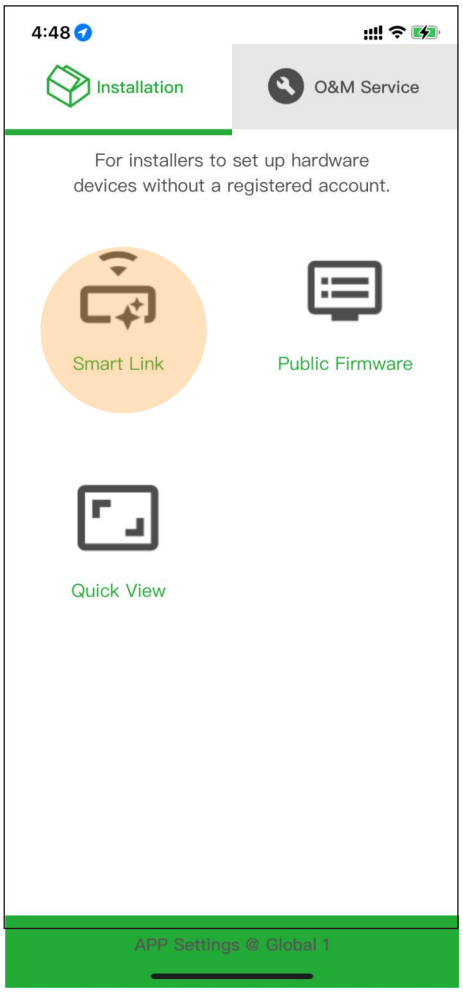
The Android/iPhone user interface may look slightly different but the setup procedure will be the same as shown.

global-2.chintpowersystems.com

“Portfolio Owner” manages the site remotely through a web console and can log in from the URL global-2.chintpowersystems.com





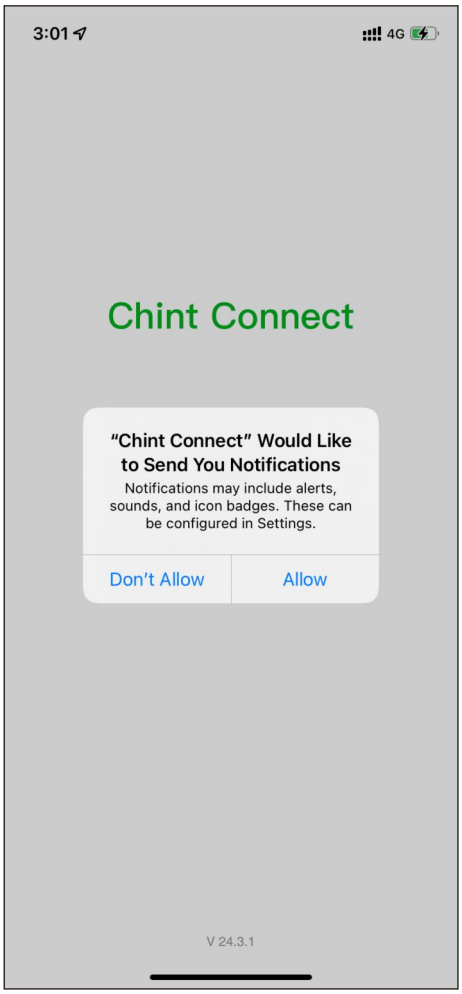


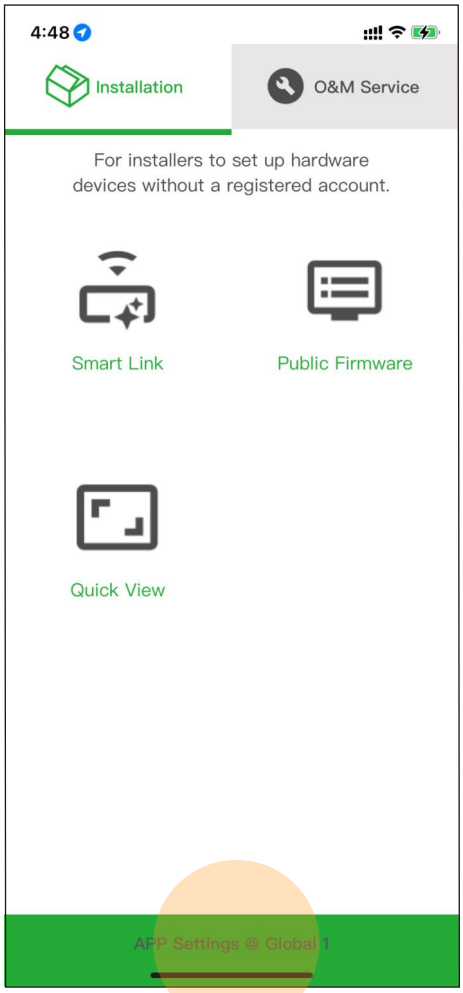
Launch the APP,

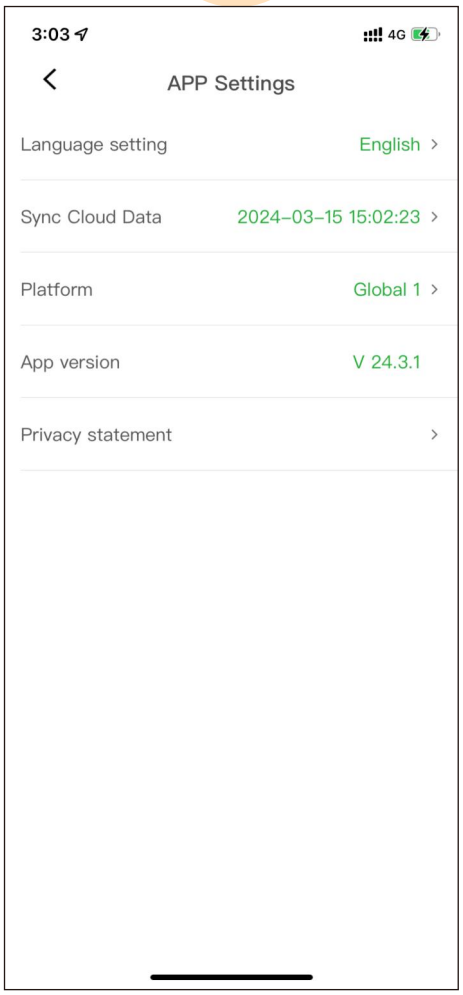
note that you must allow the APP to obtain the two mobile phone permissions of location and Bluetooth, otherwise the APP will not work properly.

By clicking "Smart link",

the APP will automatically detect the connected hardware scene and provide different interactive interfaces after connecting to the gateway.







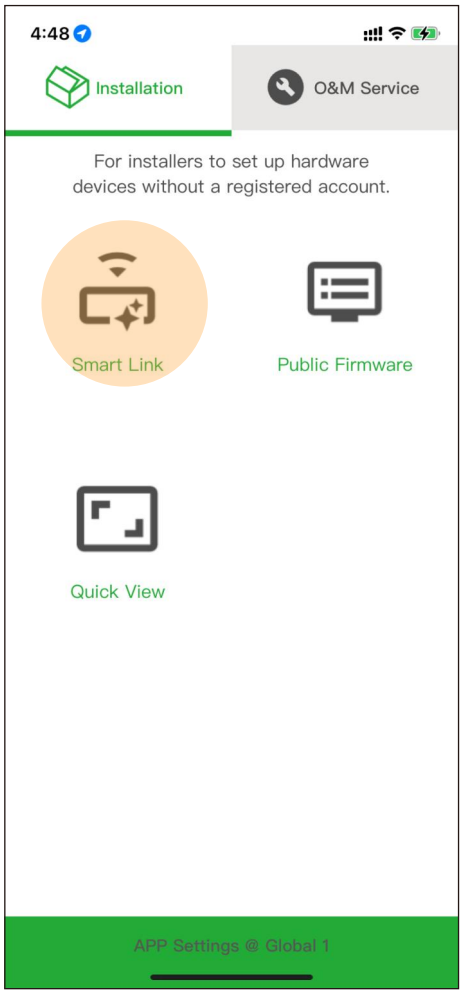
When launching an app, it is recommended to allow the app to send notifications.

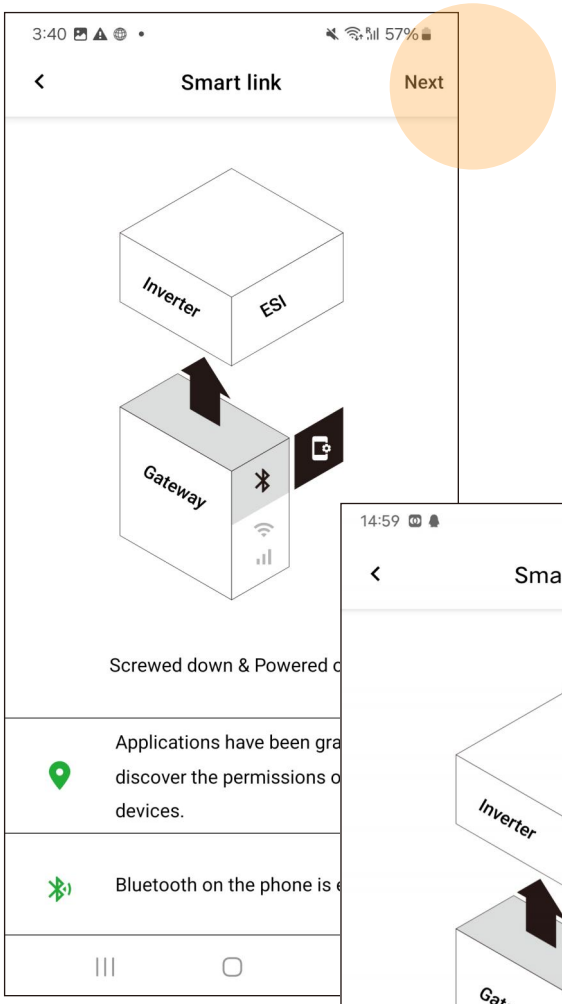
Otherwise users cannot receive subscribed real-time hardware alertsconnecting to the gateway.

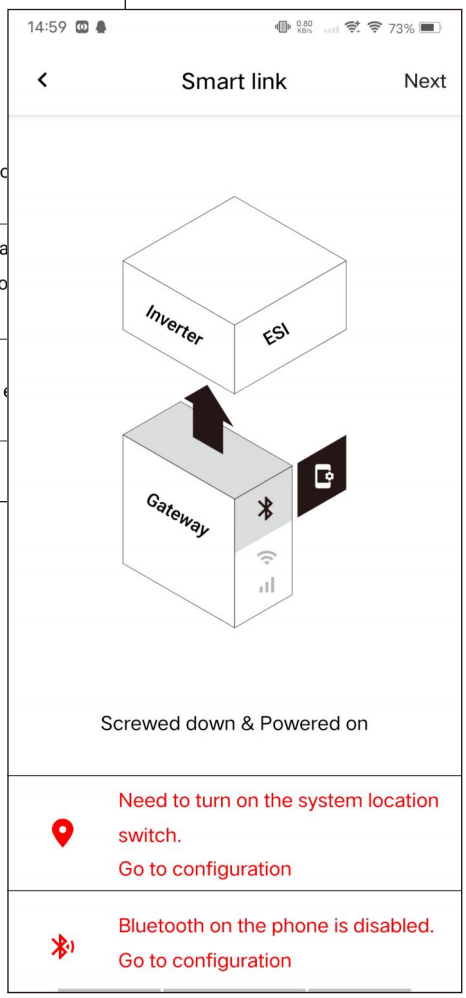
In the APP settings interface, users can change the language, synchronise scene data and switch servers at any time.

Make sure your phone can connect to the Internet when you run the app for the first time.

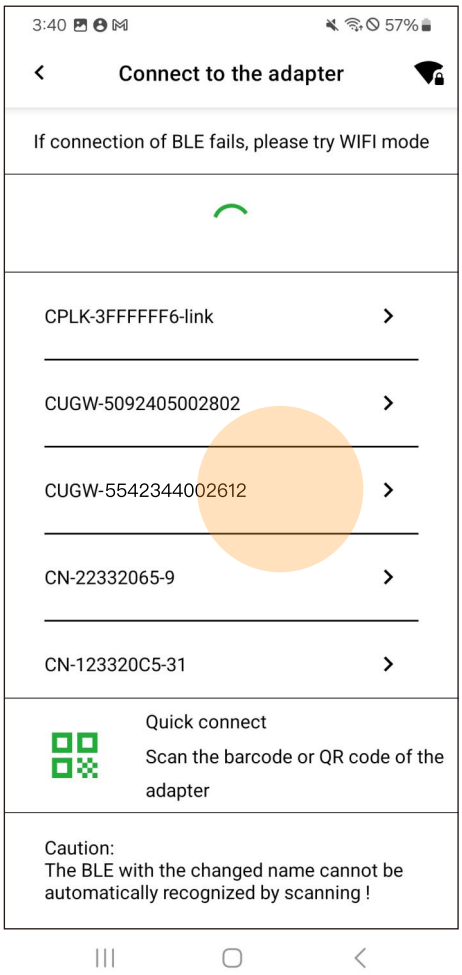
The APP needs to sync some important data from the cloud.

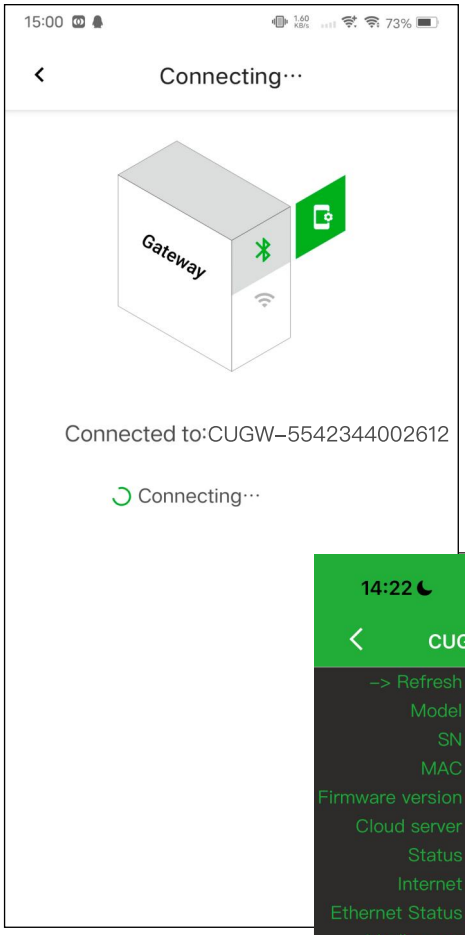


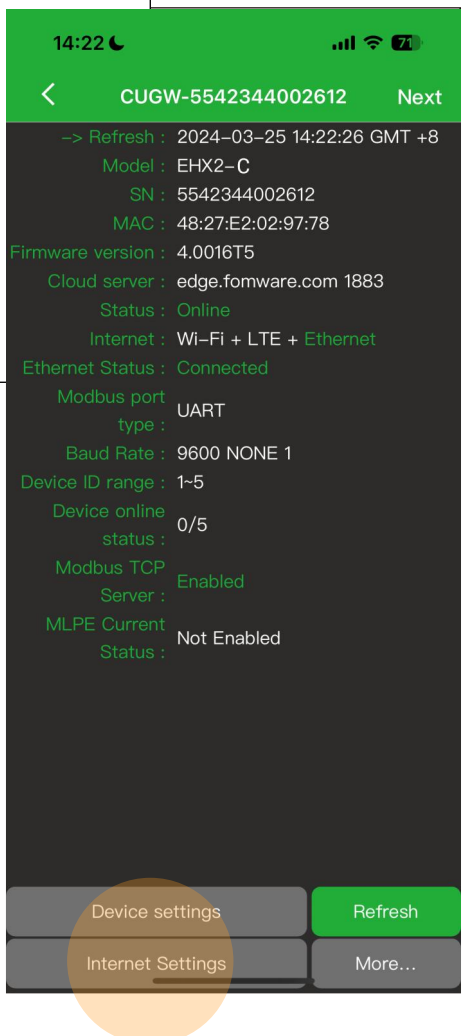




When the APP prompts for location and Bluetooth permission issues, please tap the warning area to enter the phone settings interface.







The gateway SN is included in the BLE signal name, and the APP will list the scanned signals.

Select the SN consistent with the target gateway label and click to enter.

Click on the gateway SN, when the APP connects to the gateway, if there is a problem, it will indicate a specific error.

Bluetooth troubleshooting

“ Connection failure ”

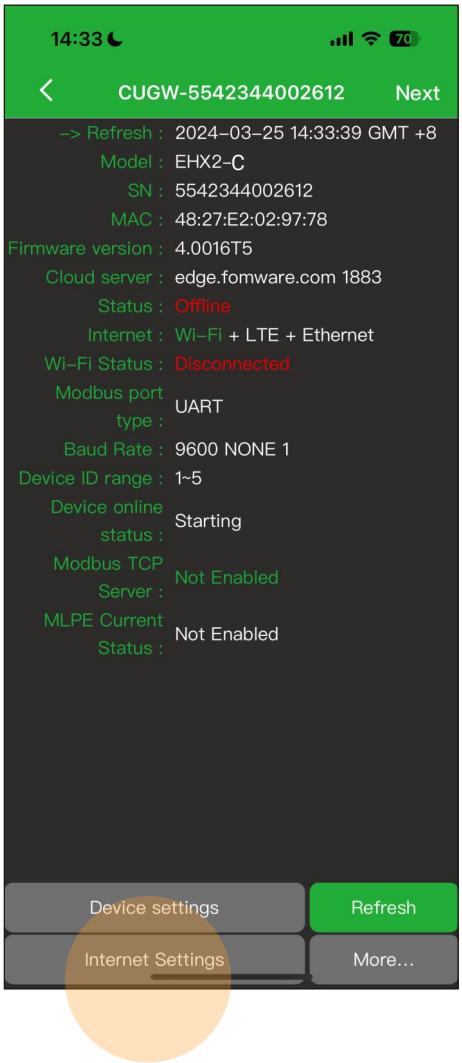
- Phone is too far away from the gateway.
- Another phone has been connected to the gateway and is communicating normally.
- Android 14 (or other versions) may have issues communicating with the gateway and will need to upgrade the gateway to the latest version.

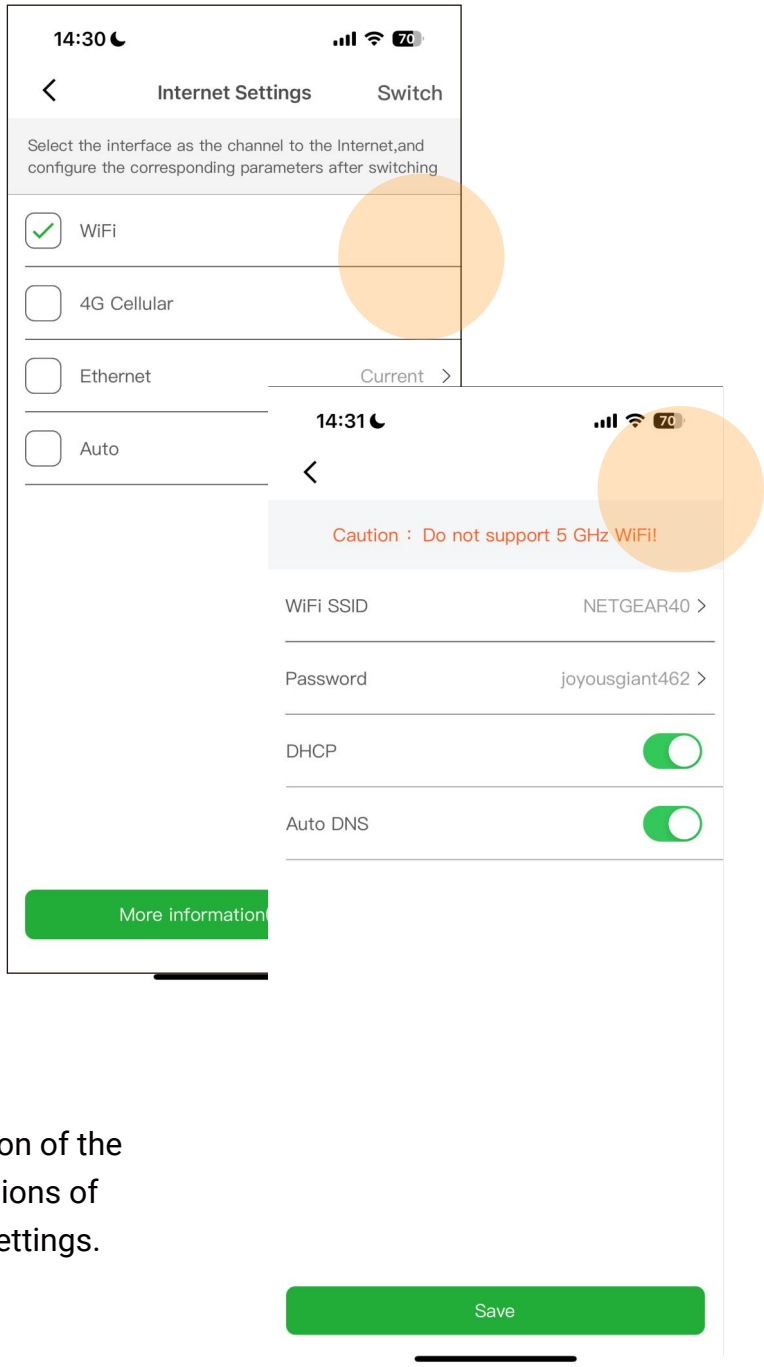
“The gateway must be upgraded with firmware to work properly, please wait for about 5 minutes”

- Unknown communication error, try to solve it by updating the firmware.

6 Non-registered User (Installer)

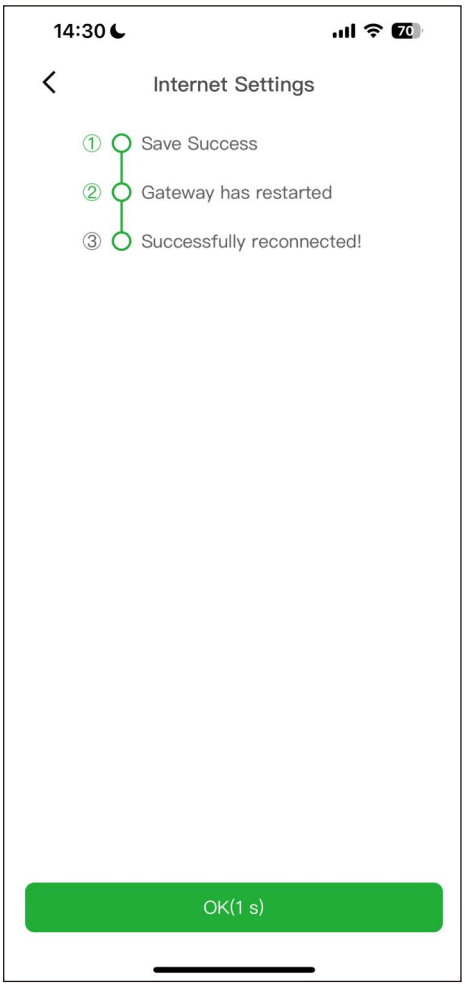
6.2 Setting up the gateway to connect to the WiFi router





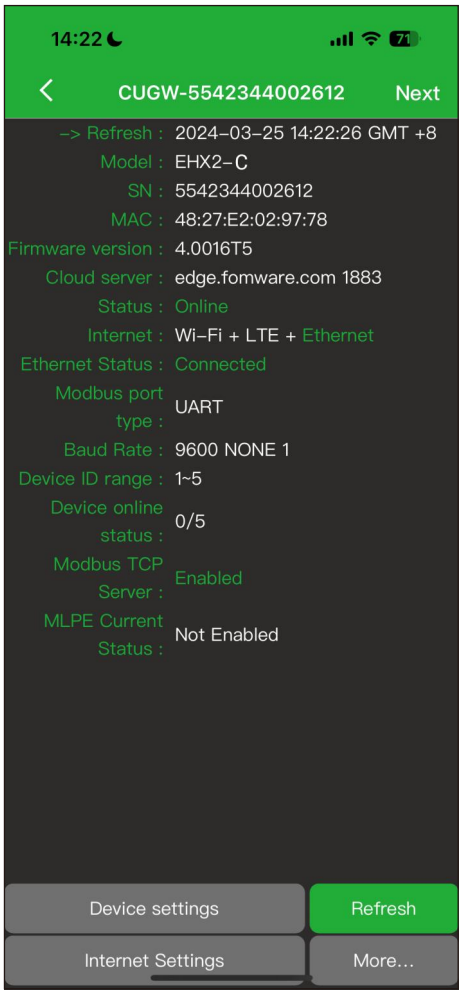
Click on "Internet Settings" , the WiFi version of the gateway only has WiFi settings, other versions of the gateway will list both Ethernet or 4G settings.

Caution : The gateway does not support 5Ghz WIFI gateways, as well as WIFI users who need to open a browser and redirect to an account-verified router.



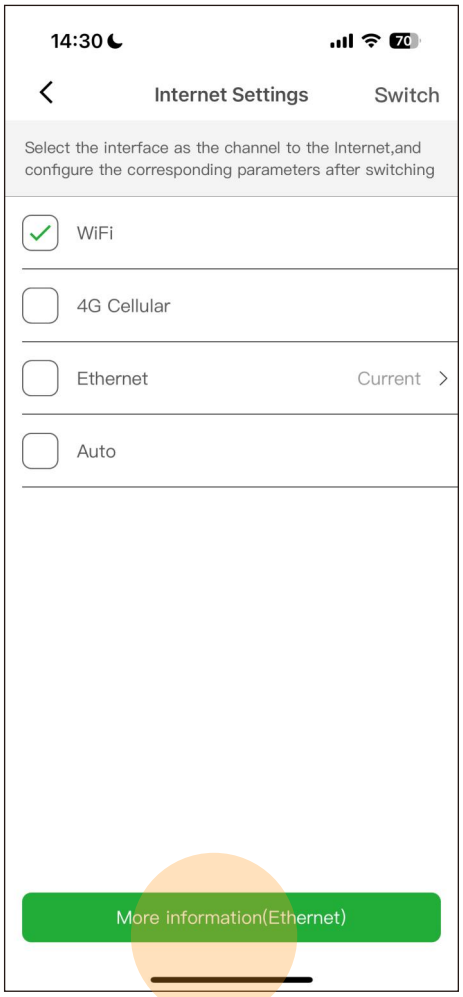
After entering the SSID and password of the WiFi, save the settings and the gateway will automatically connect to the WiFi router.

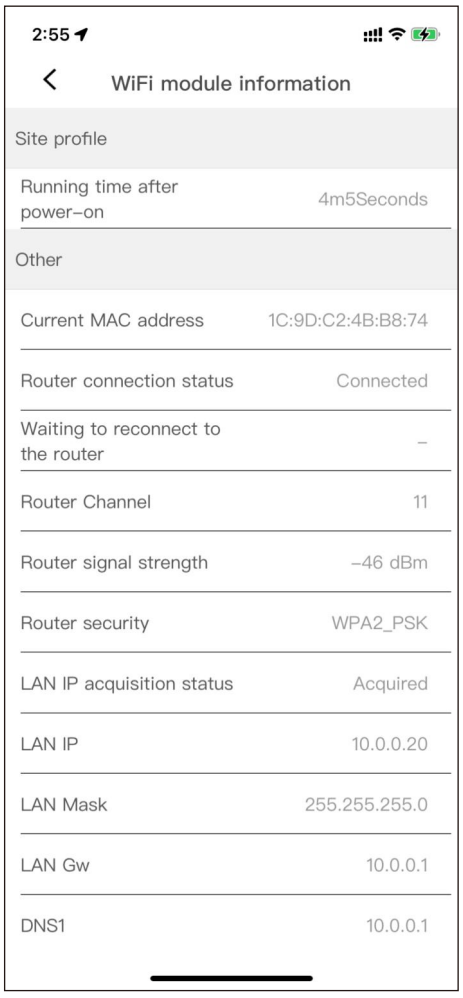
If the gateway reports an error, there is a high probability that the character input is wrong.



Caution :

If the user cannot judge the network status of the WLAN router, the user can configure the WiFi hotspot of the mobile phone to the gateway for reference.





The gateway may not be able to access the Internet even if it is connected to a WiFi router, in this case, the gateway is also not working properly.

Usually there is a firewall in the LAN to which the WiFi router is connected, and you need to add a TCP access policy for the gateway.

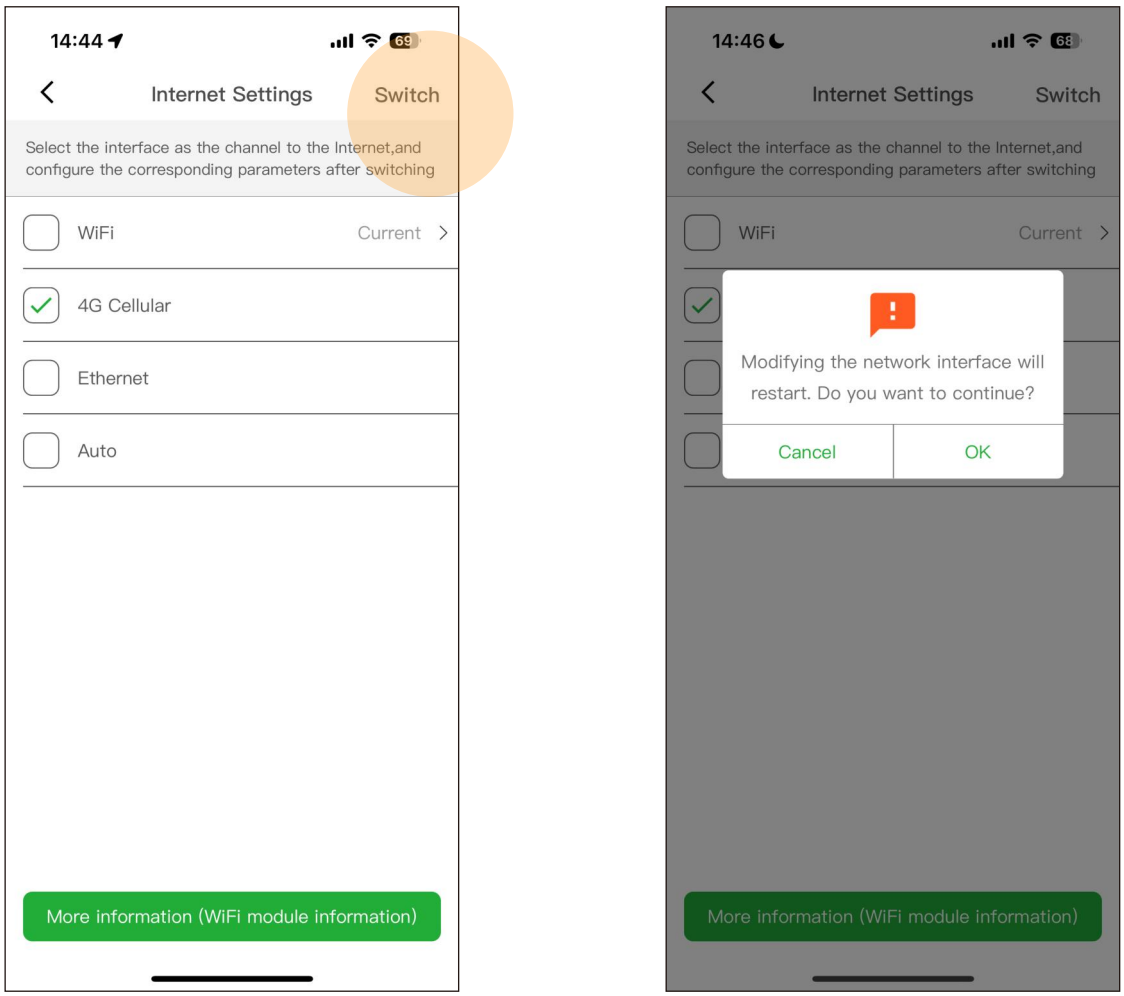
Click "More Information" to check whether the gateway is connected to the WiFi router properly.

It can help to diagnose if the firewall must be found and to increase the policy.

Open the LAN firewall ports before commissiong !

The following ports must be opened both ways (incoming and outgoing communications):
TCP 1883 with destination IP 18.134.238.207

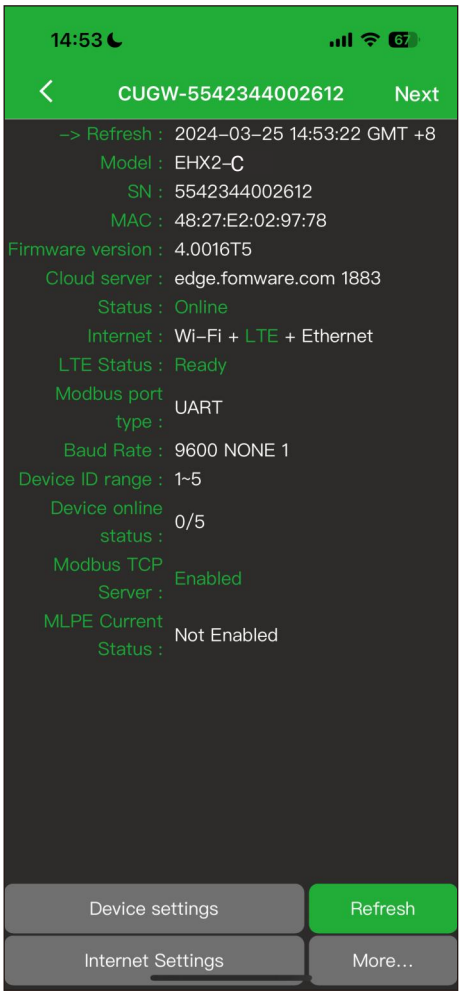
6 Non-registered User (Installer)
6.3 Gateway connects to the Internet via 4G



Different versions of the gateway have different options for connecting to the Internet. Users can select 4G and click "Switch" to change the connection options.

Changing the connection will cause the gateway to reboot and it will take about 1~5 minutes for the 4G to connect to the Internet properly.

The gateway connects to the Internet via 4G and can still connect to the Modbus TCP client via WIFI at the same time.



Cellular troubleshooting

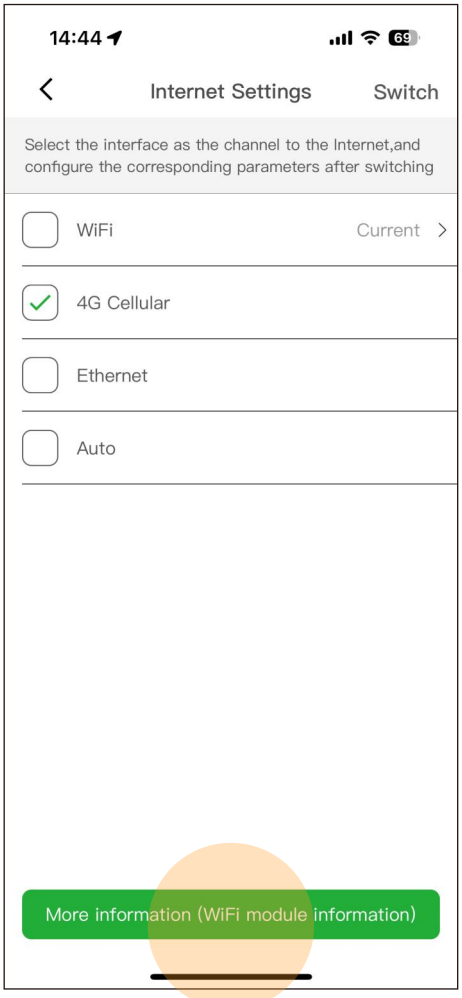
“ Not Ready ”

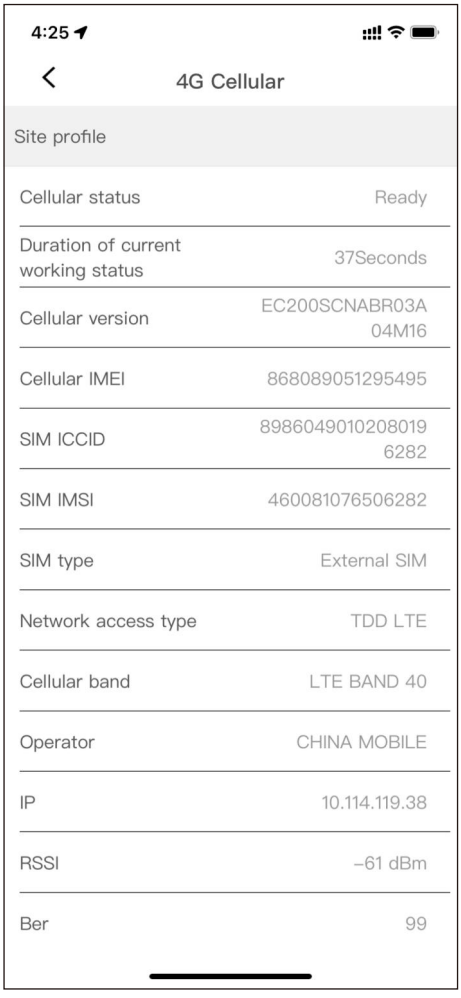
- The 4G modem is searching/registering for a cellular network, if it fails it will reboot and try again.

  Check “More Information” for networking details.
-

“ Ready ”

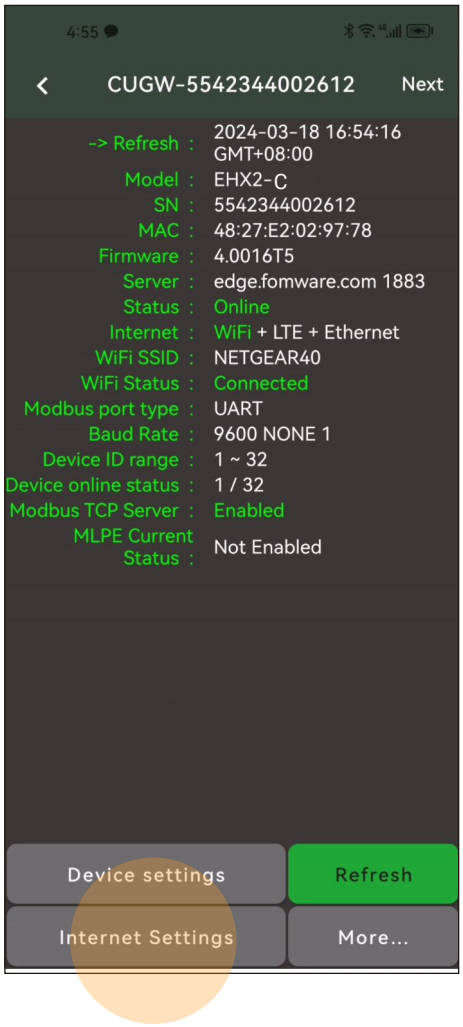
- Everything went well.

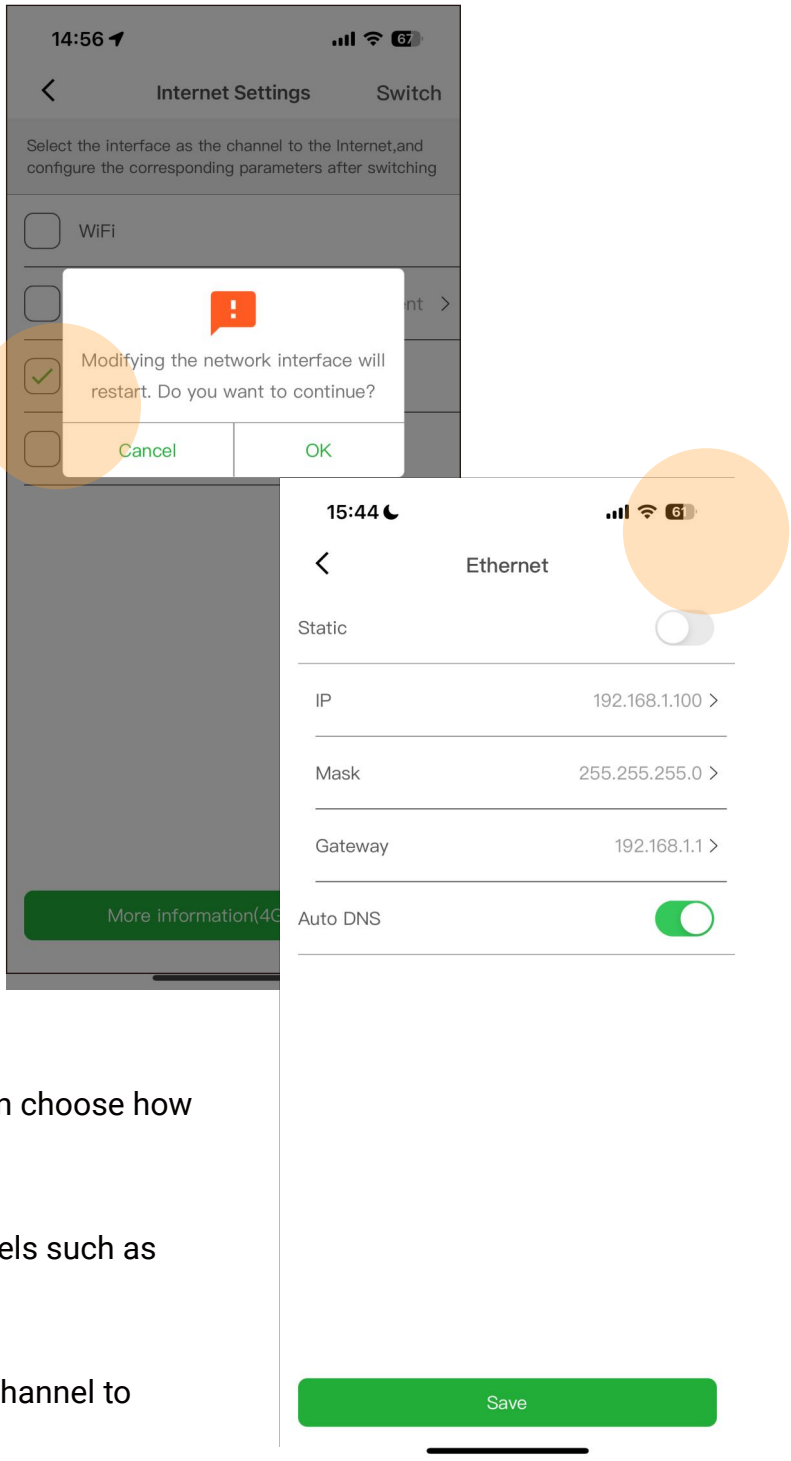




6 Non-registered User (Installer)

6.4 Gateway connects to the LAN router via Ethernet





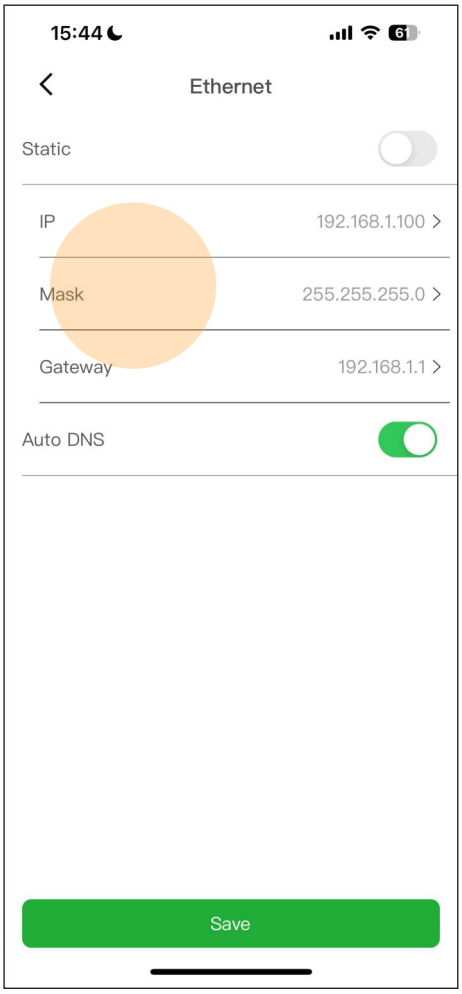
By clicking on "Internet settings", you can choose how to connect to the Internet.

Different gateways have different channels such as Ethernet + WiFi + 4G.

The gateway automatically selects the channel to connect to the Internet in "Auto" mode.

As shown in the figure, click "Save" after finishing the Ethernet parameter setting.

Then click "Switch" to make the channel selection effective.



Typical Modbus TCP applications, it is recommended to go through Ethernet and a static IP address and related parameters must be configured.

It must be ensured that the gateway is on a LAN subnet with the third party SCADA.

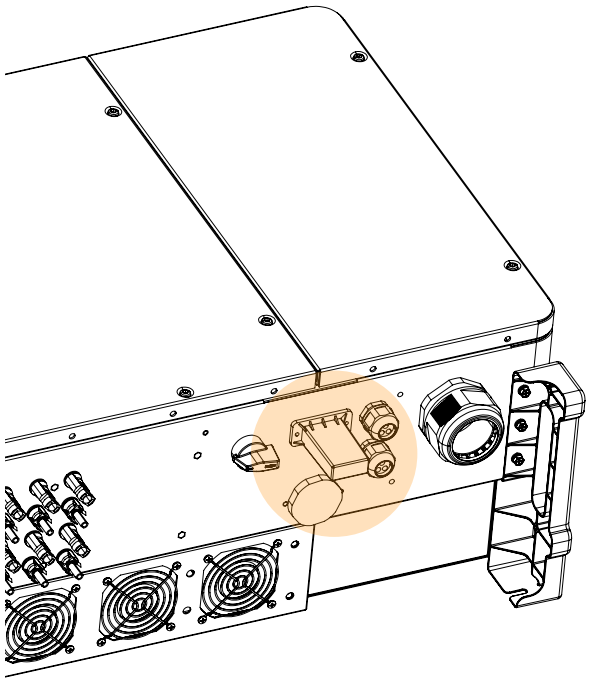
Open the LAN firewall ports before commissiong !

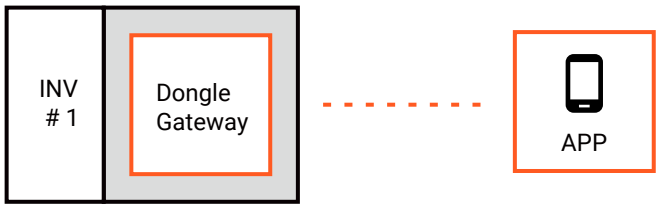
The following ports must be opened both ways (incoming and outgoing communications):
TCP 1883 with destination IP 18.134.238.207

6 Non-registered User (Installer)
6.5 Setting the Modbus ID from the inverter panel

Please consult the inverter manual to set the Modbus ID of the inverter correctly via the inverter LCB panel.

If the inverter does not have LCD panel, it is likely to use Dongle Gateway to provide Bluetooth connection, and the Modbus ID setting can be completed after APP connects to the inverter.





The App will show the initialisation interface of the inverter.

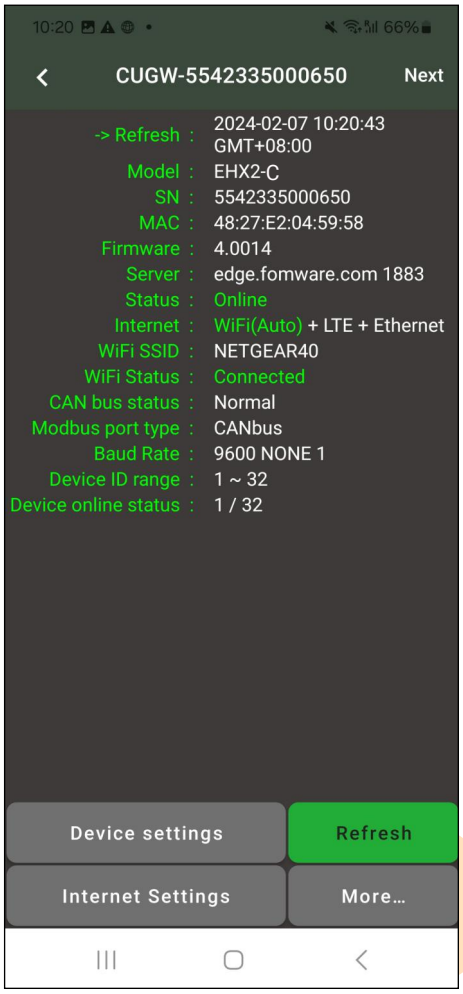
Inverters without Grid code are considered as uninitialised inverters.

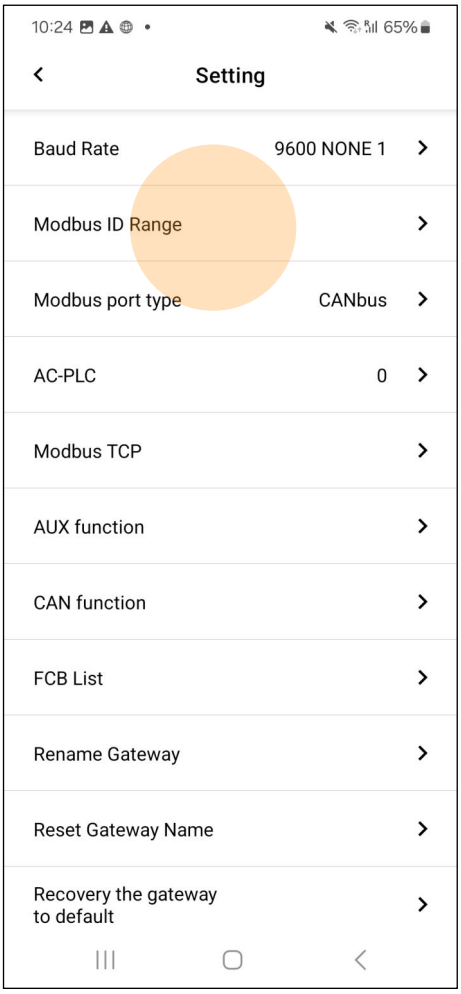
The initialisation screen varies slightly from inverter to inverter, but all will ask for settings:

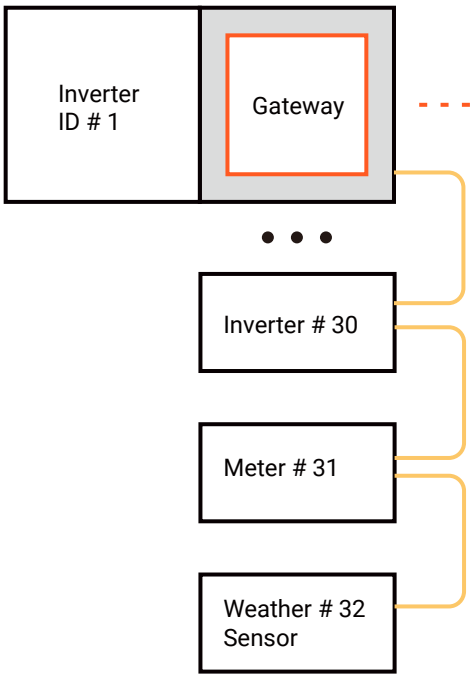
- Grid Code
- PV Line Type
- Neutral Line
- Inverter Clock
- RS485 Port

6 Non-registered User (Installer)

6.6 Scanning the daisy chain

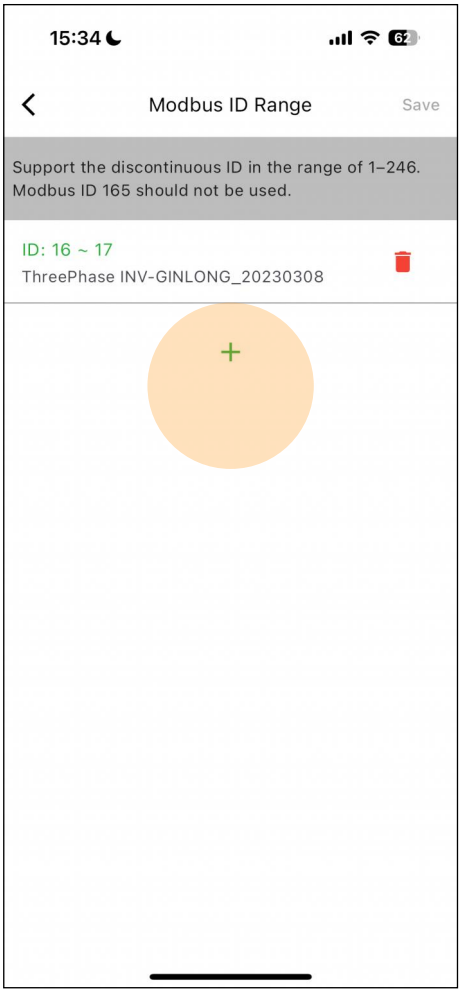


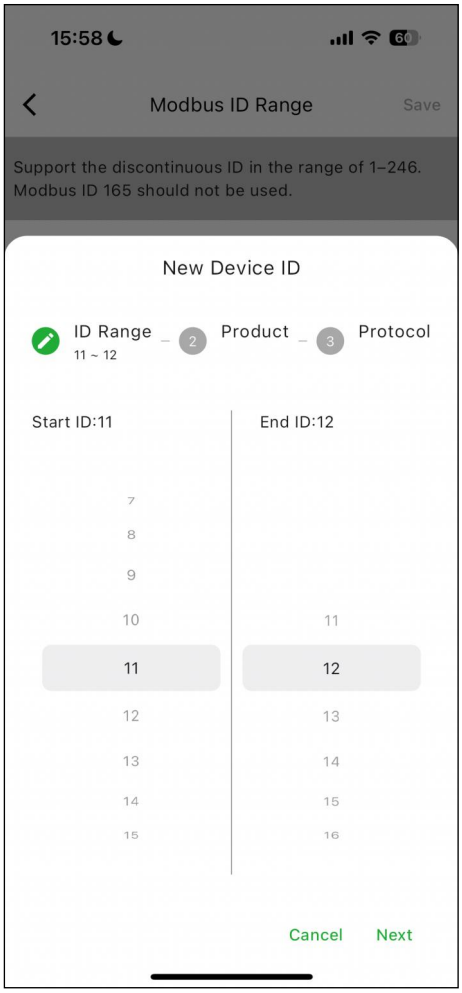




Set the gateway to scan the daisy chain:

Modbus ID Range 1~30 == Inverter Model A
Modbus ID Range 31 == Meter
Modbus ID Range 32~35 == Weather Sensor

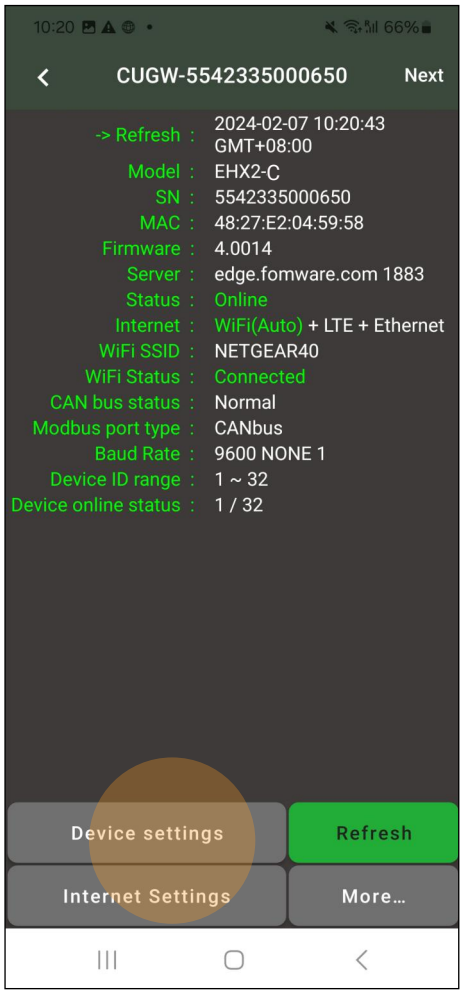


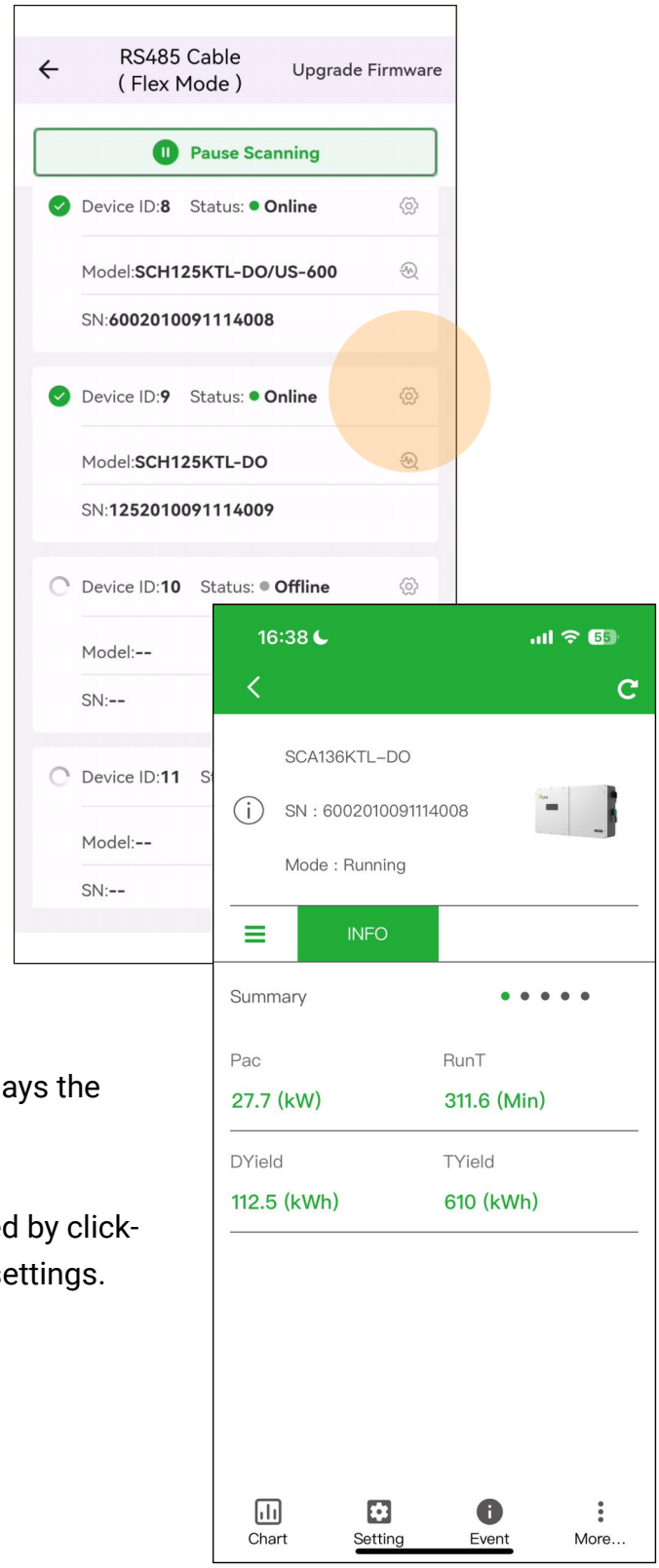


The gateway is able to automatically discover connected hardware based on protocols or models with different Modbus ID segments.

The gateway is in "Flex Mode" and each hardware on the Daisy chain must be correctly set with a unique Modbus ID.

The gateway is in "Super Mode", where the inverters on the Daisy Chain do not need to be set up in any way, and the gateway is able to auto-discover and remotely modify the registers.

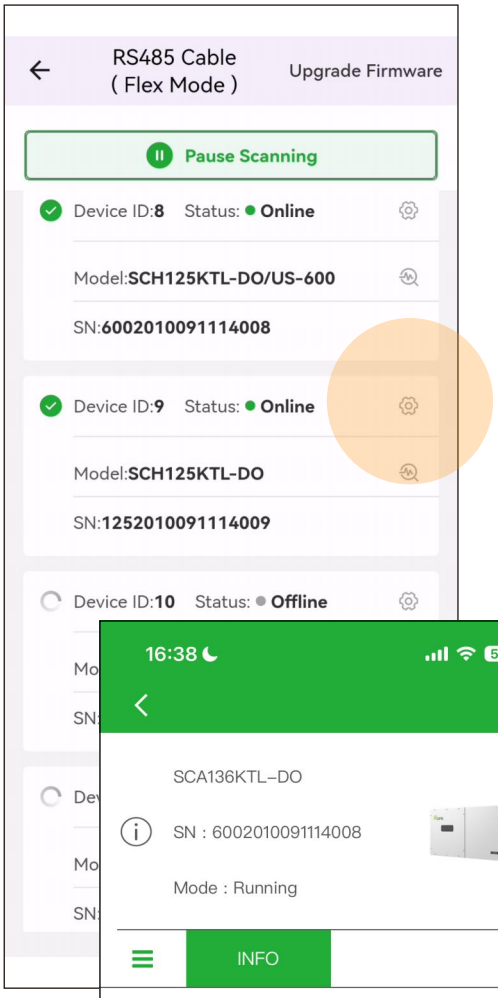




Click on "Device Settings" and the APP displays the scanning status of the daisy chain.

The listed hardware objects can be accessed by clicking on them to perform read/write register settings.

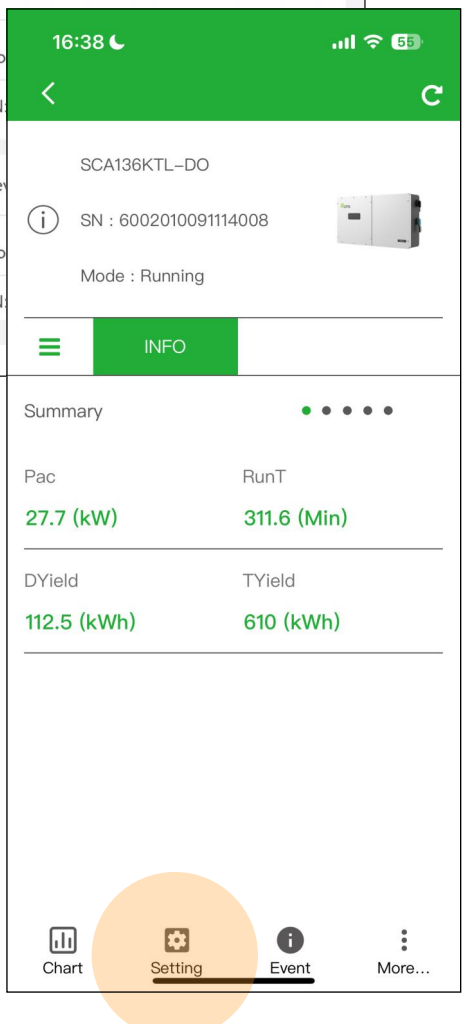
6 Non-registered User (Installer)
6.7 Setting inverter parameters



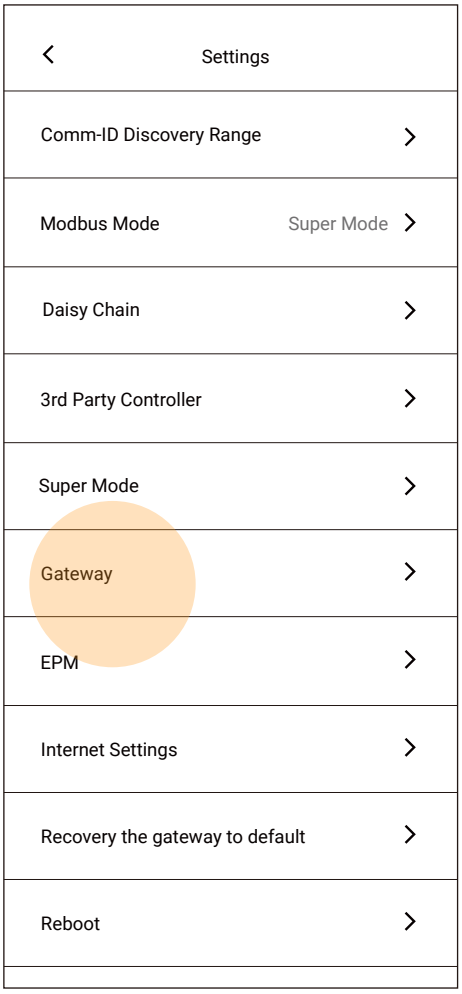
Click "Device Settings" to view the devices in daisy chain.

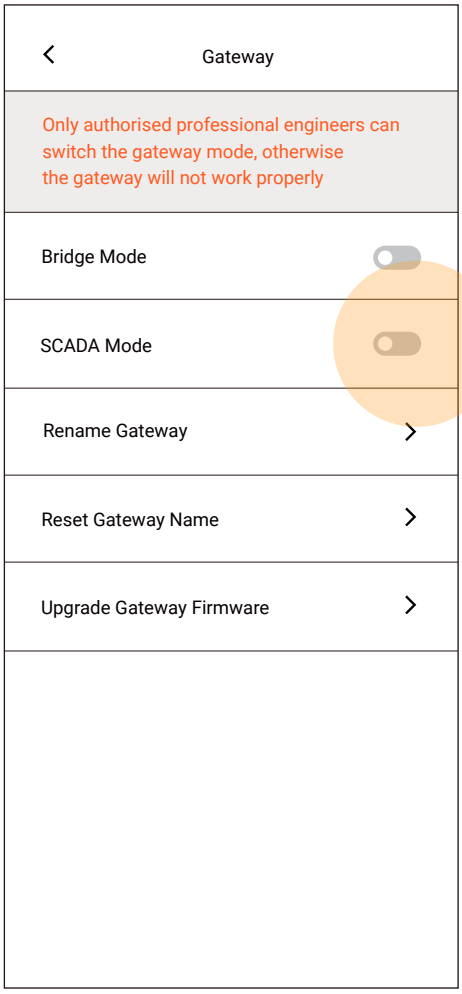
Users can scan the daisy chain to discover normal/ab-normal connected devices.

Perform read/write operations or firmware upgrades on devices



6 Non-registered User (Installer)
6.8 Enable “SCADA Mode”

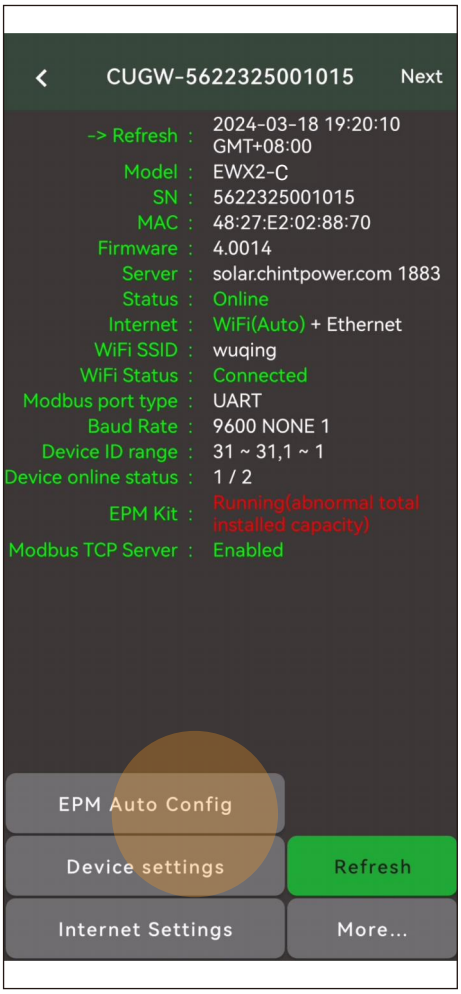


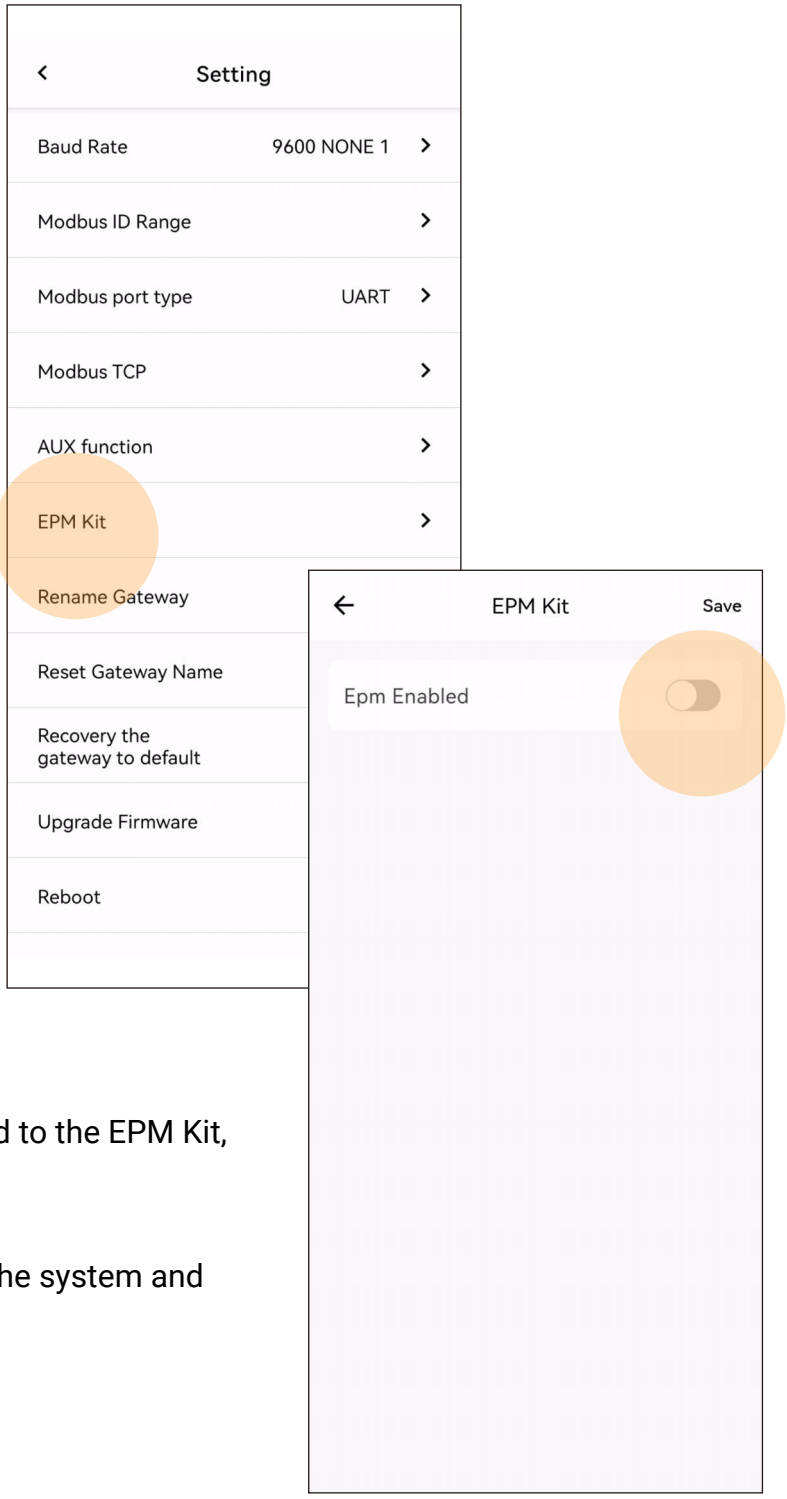


When the system is deployed in AUX Mode, setting the gateway to SCADA Mode suspends almost all of the gateway's own functions, leaving the Daisy Chain entirely in the hands of SCADA read/write access.

Not all gateway models support this mode.

6 Non-registered User (Installer)
6.9 Enable “EPM Mode”

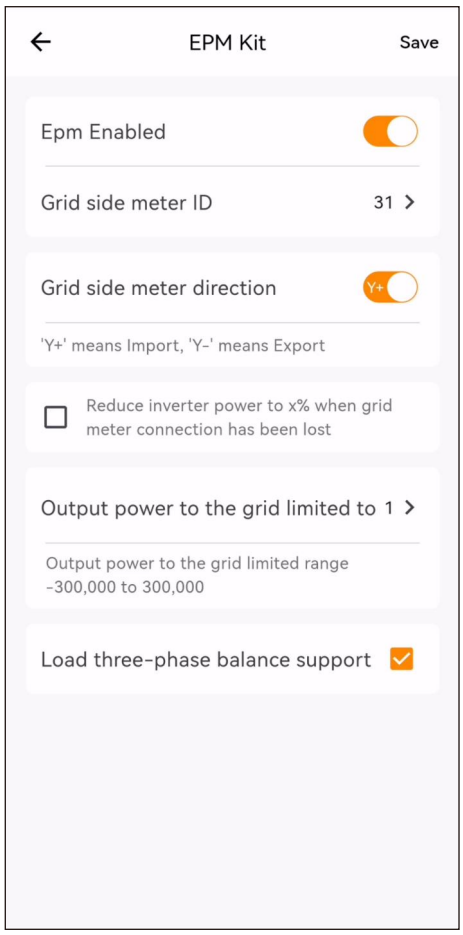


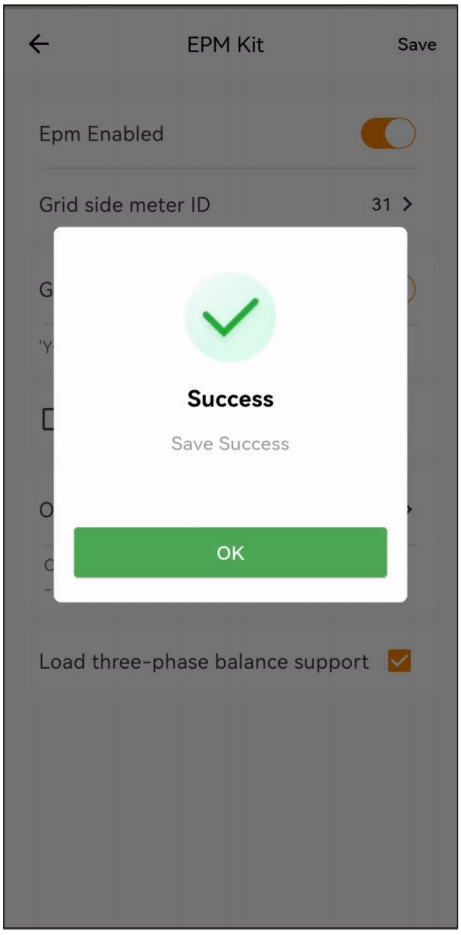


Once the gateway is properly connected to the EPM Kit, click "EPM Auto Config".

The gateway will automatically detect the system and give the operation status:

1) Abnormal, cannot start
2) Running
3) Running, meter not connected
4) Running, meter abnormal
5) Running, kWp detection abnormal
6) Running, Daisy Chain occupied



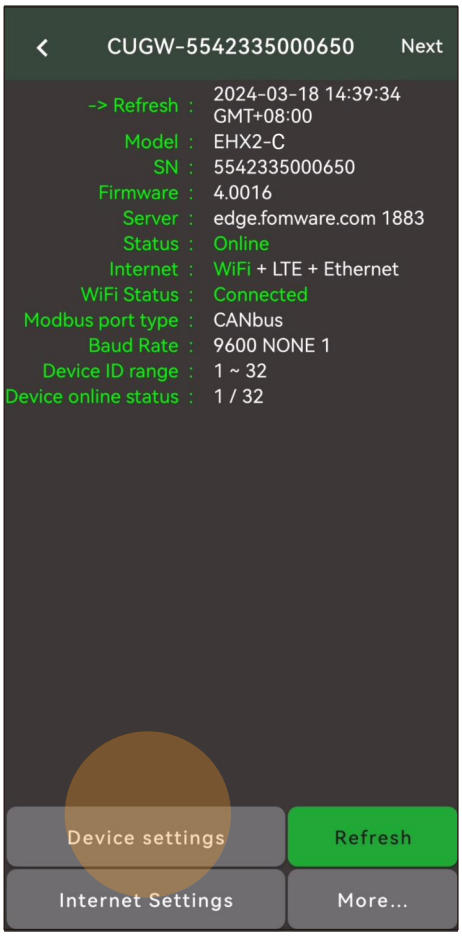


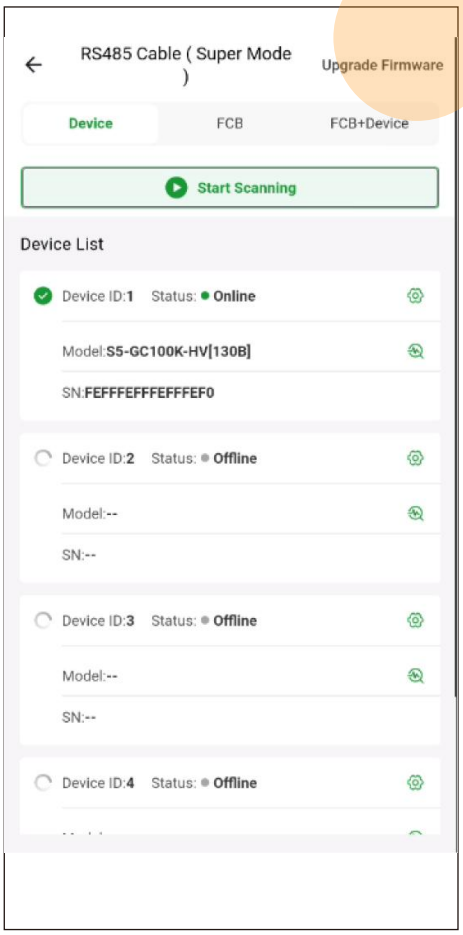
The policy adjustment required for Zero-export scenarios can be set via the APP.

When you find a problem with the Zero-export operation at your site, it is very likely that you have selected the wrong AC Busbar location for the Grid Edge, or there is a problem with the inverter version.

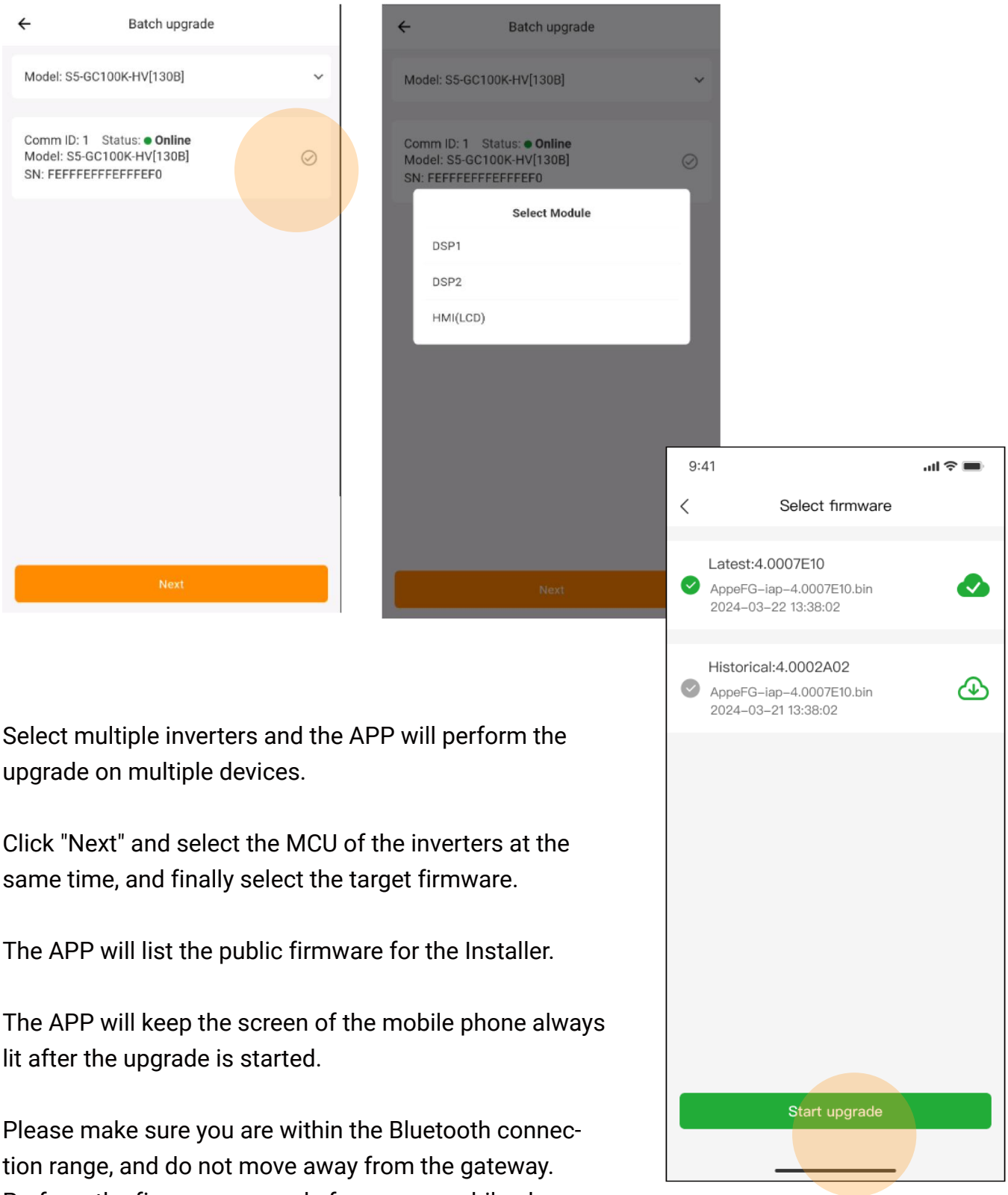
Please contact the after-sales service.

6 Non-registered User (Installer)
6.10 Upgrade inverter firmware





Click "Device Settings", APP will display the scanning result of inverter daisy chain, for the correctly listed inverter model and operation status, user can directly execute the firmware upgrade.



Select multiple inverters and the APP will perform the upgrade on multiple devices.

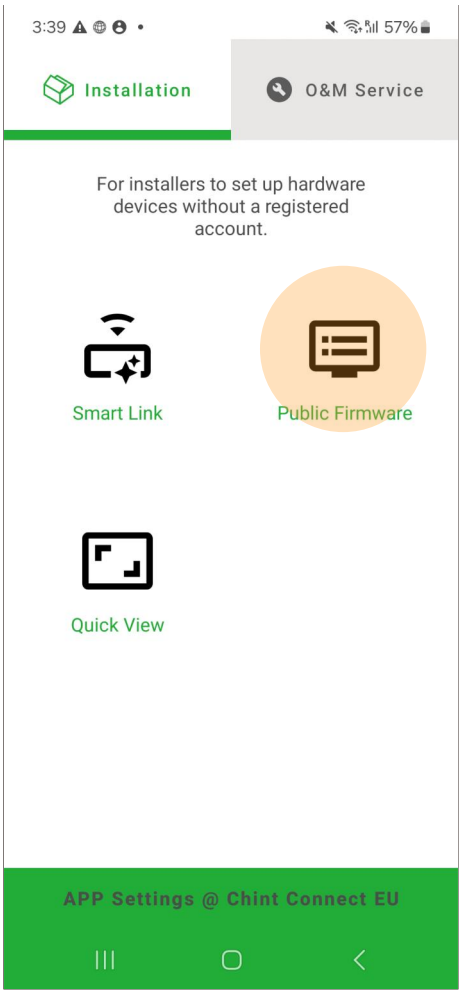
Click "Next" and select the MCU of the inverters at the same time, and finally select the target firmware.

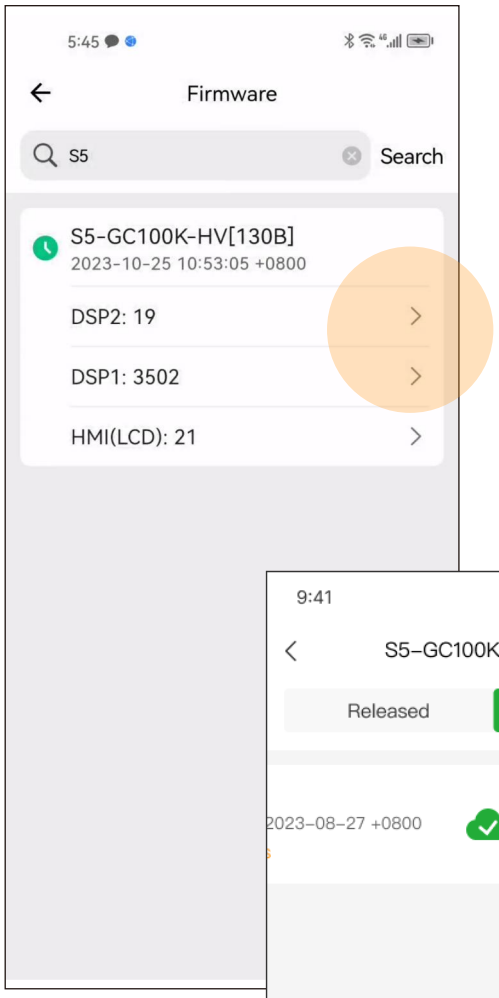
The APP will list the public firmware for the Installer.

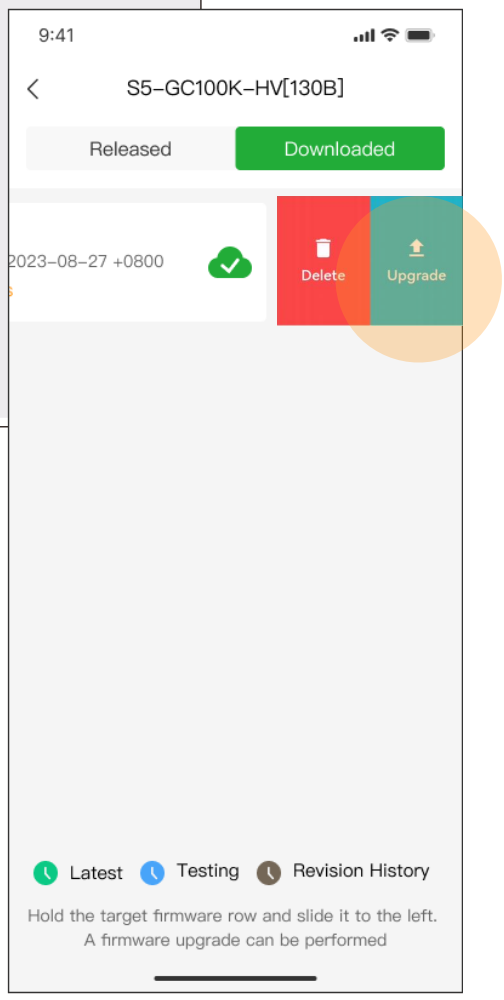
The APP will keep the screen of the mobile phone always lit after the upgrade is started.

Please make sure you are within the Bluetooth connection range, and do not move away from the gateway. Perform the firmware upgrade from your mobile phone, phone calls during the process will interrupt the upgrade process.

Firmware upgrade interruptions do not cause the inverter to fail, restarting the firmware upgrade is sufficient.





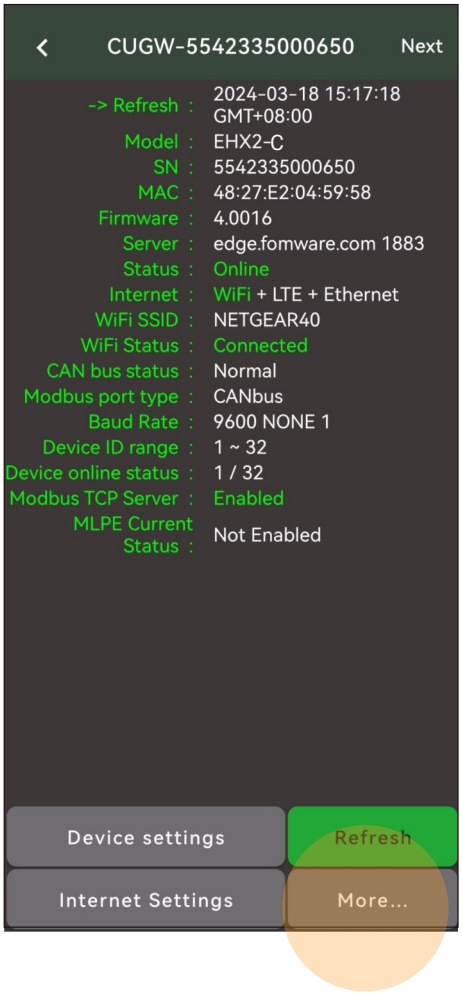


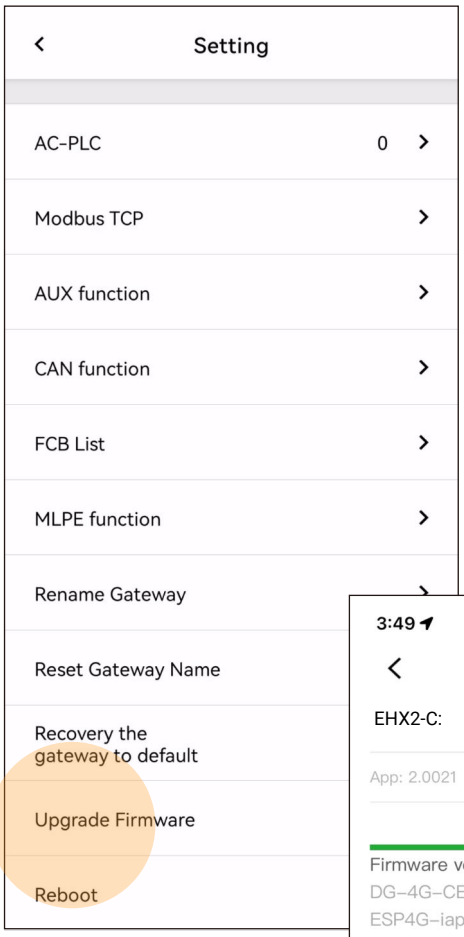
Installers can simply use the latest or most stable public version of the firmware.

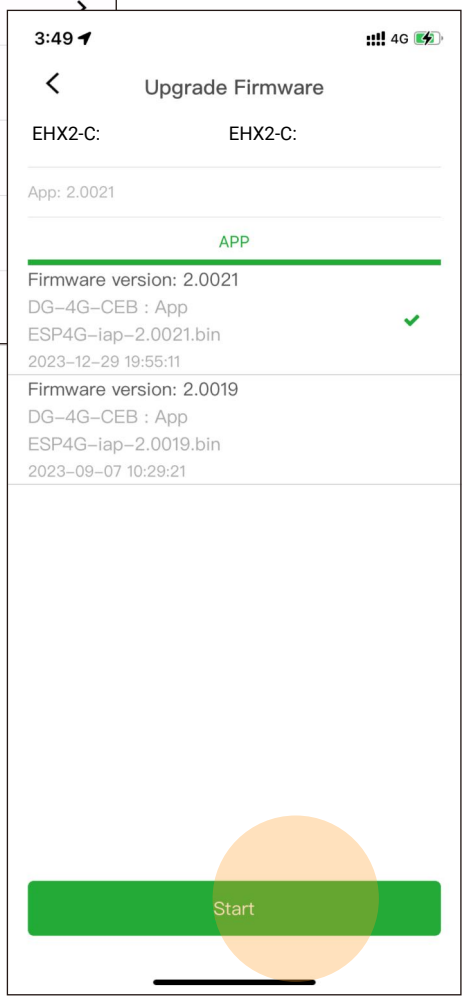
Click on the desired model to get a list of firmware and then click to download.

If there is no required model, it means APP has not released the public version firmware at present, please contact the after-sales service.

6 Non-registered User (Installer)
6.11 Upgrade gateway firmware







Click “More” and then click "Upgrade Firmware".

Select the gateway firmware to be upgraded, and the APP will list the public firmware for the Installer.

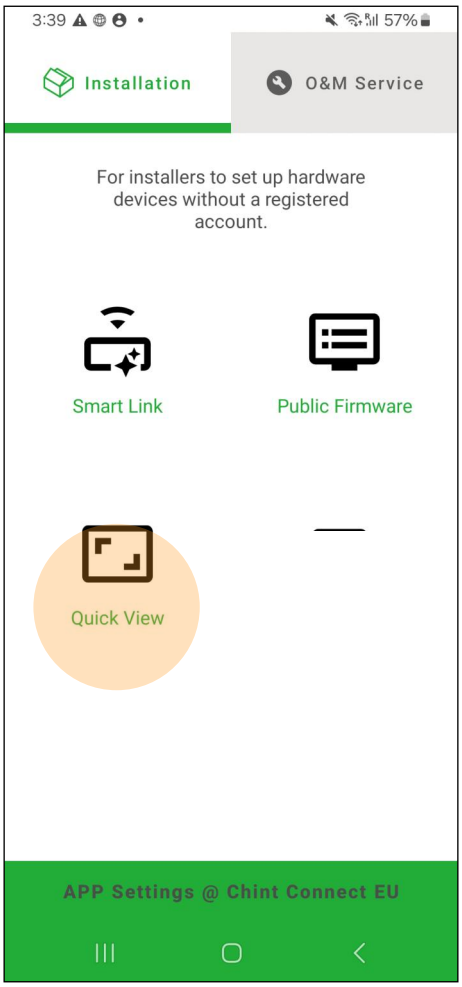
The APP will keep the screen of the mobile phone always lit after the upgrade is started.

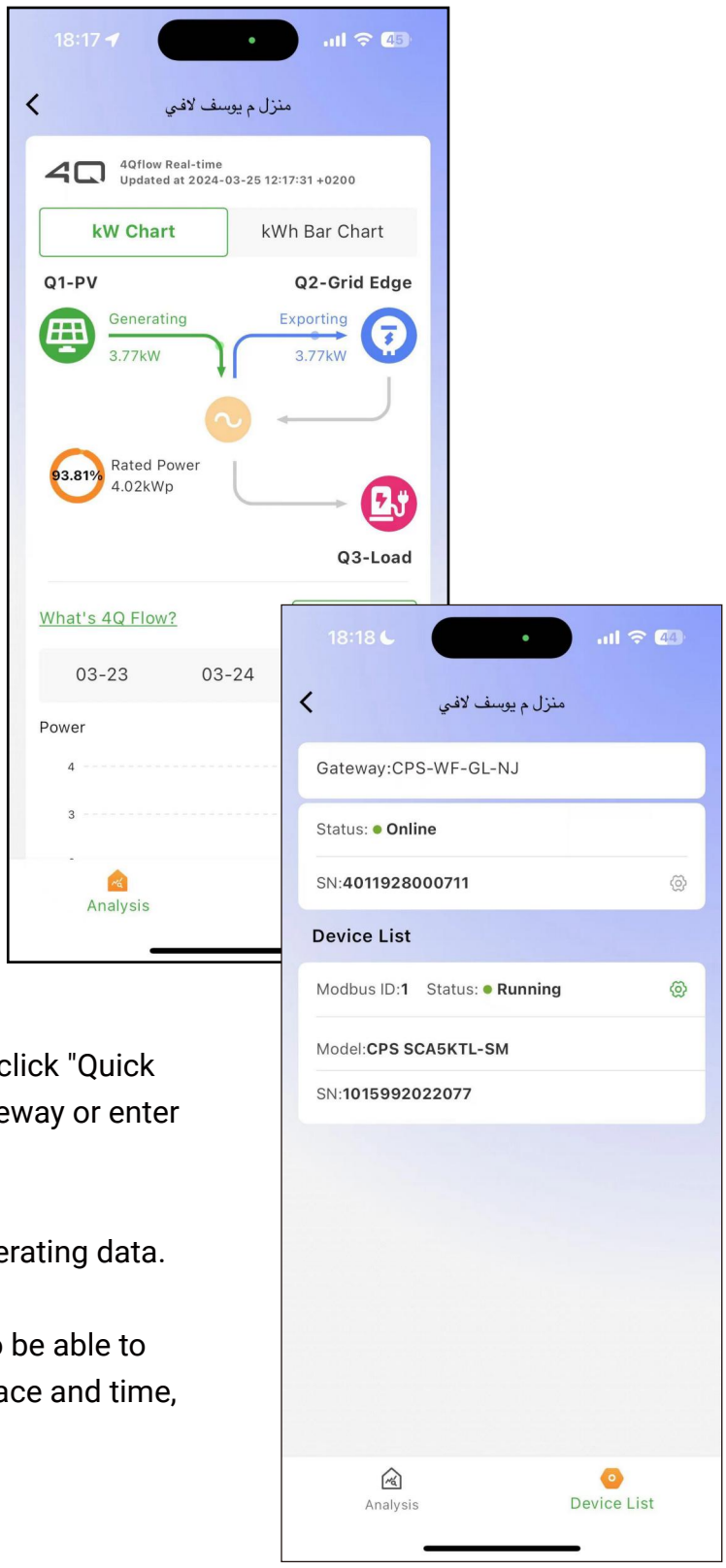
Please make sure you are within the Bluetooth connection range, and do not move away from the gateway. Perform the firmware upgrade from your mobile phone, phone calls during the process will interrupt the upgrade process.

Firmware upgrade interruptions do not cause the gateway to fail, restarting the firmware upgrade is sufficient.

6 Non-registered User (Installer)

6.12 Quickly check hardware running status

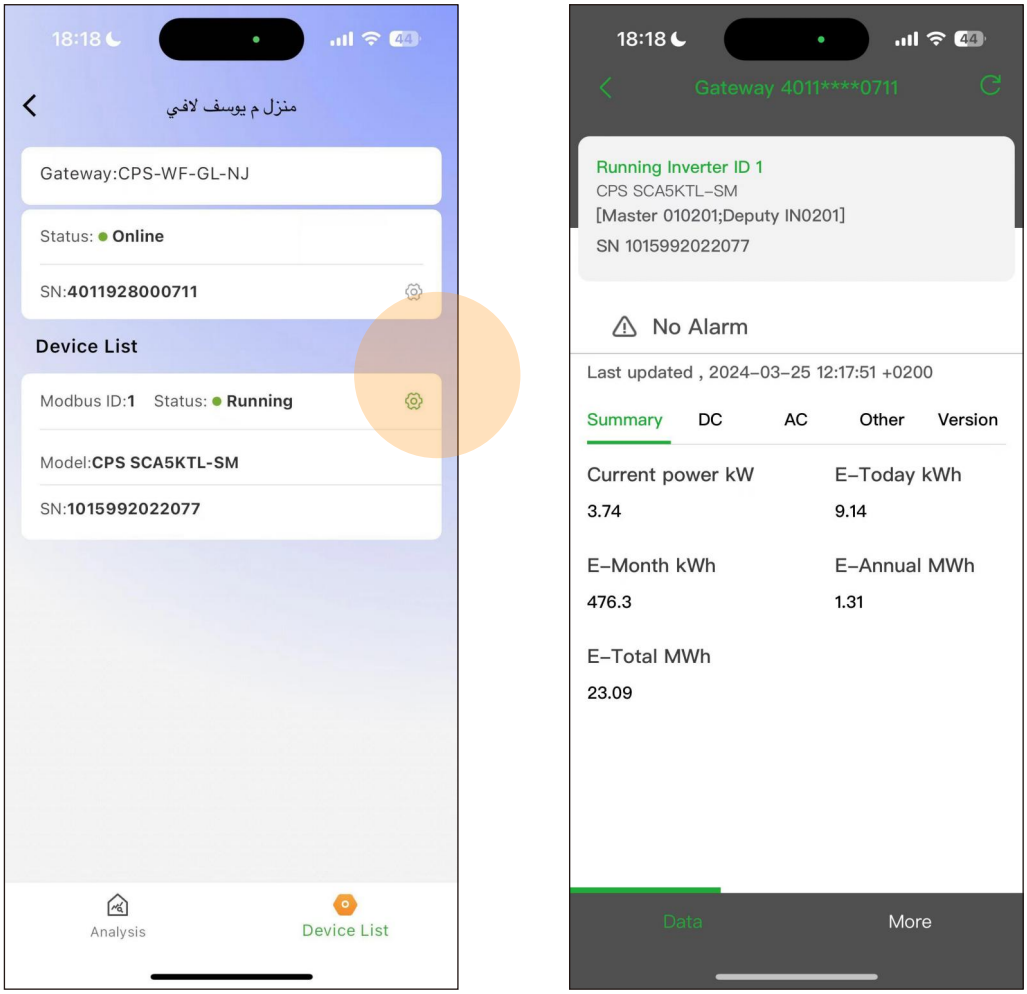




Without any account, the installer can click "Quick View" and scan the barcode of the gateway or enter the gateway SN.

The app will display the hardware's operating data.

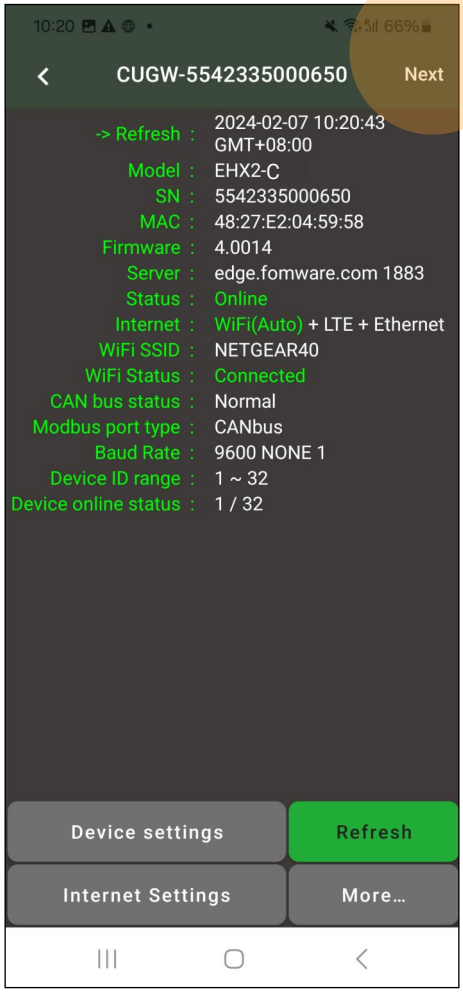
This is a very simple way for anyone to be able to check the operation of a site, at any place and time, knowing the gateway SN.

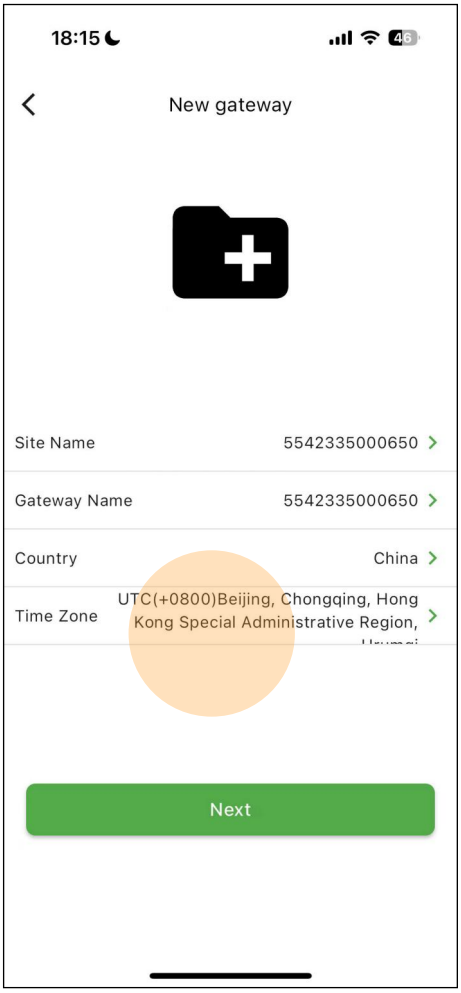


The interface displayed will be different for different gateways and inverters.

Users can only view the underlying data and cannot make any changes to the hardware.

6 Non-registered User (Installer)
6.13 Setting the site time zone



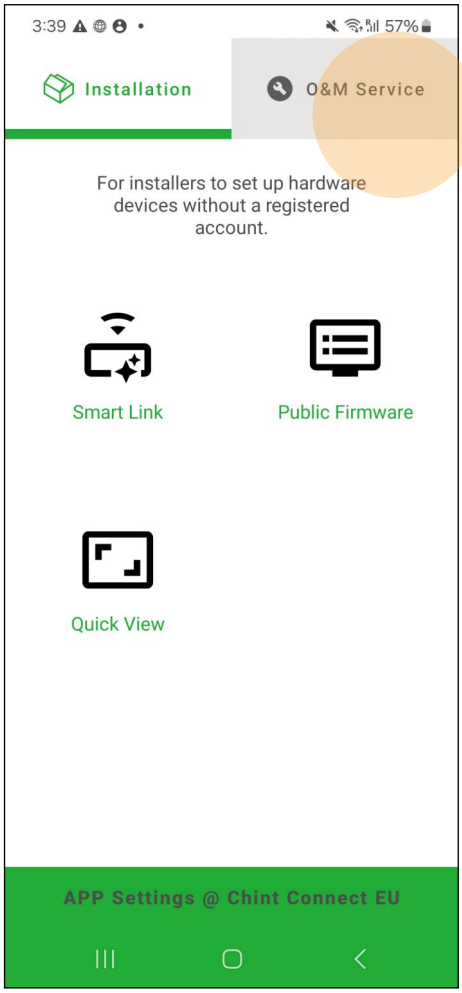


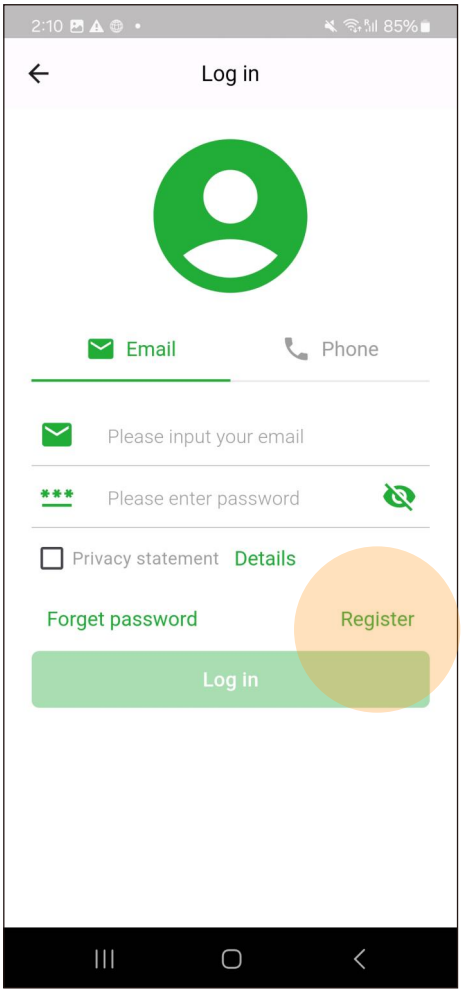
After confirming that the gateway is properly connected to the Internet, click "Next" to set the correct time zone.

Time zone is an important factor in the accuracy of site data.

7 Portfolio Owner (End User)

7.1 Self-registered “End User” account through the APP



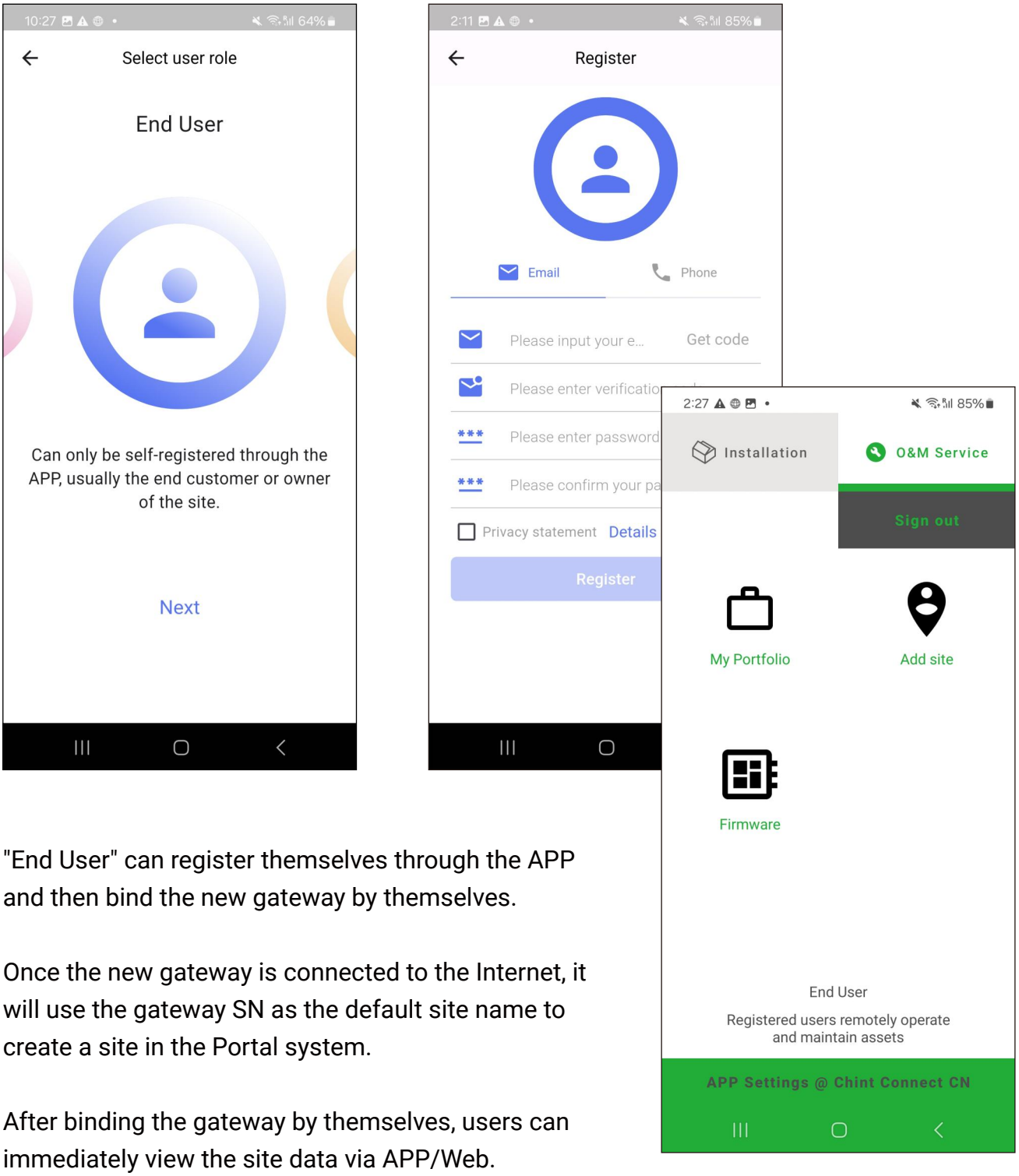


Click "O&M Service", APP prompts you to log in, click "Register" to self-register a new "End User" account.

Users can register for an account via email or cell phone number.

The system will send a verification code to verify the authenticity of the email or cell phone number to ensure that the user can receive product alerts and other notifications.

If a user registers an account with a cell phone number, the system automatically generates an account in the form of an email address "phone@superkwh.site" (with an initialized password of 123456) for the user to log in to the Web console.

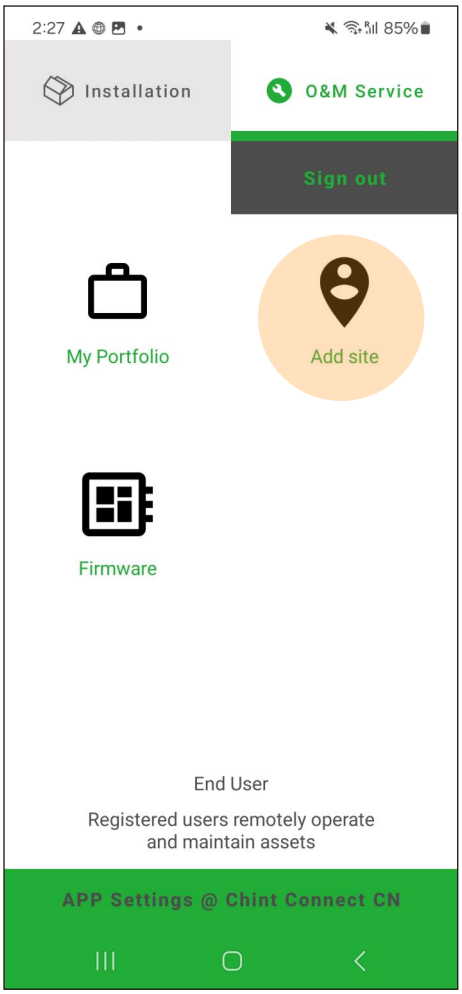


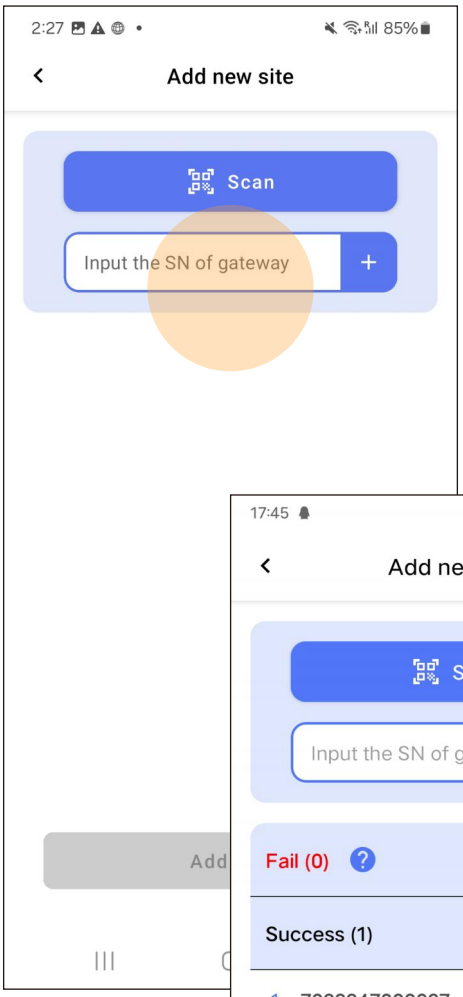
"End User" can register themselves through the APP and then bind the new gateway by themselves.

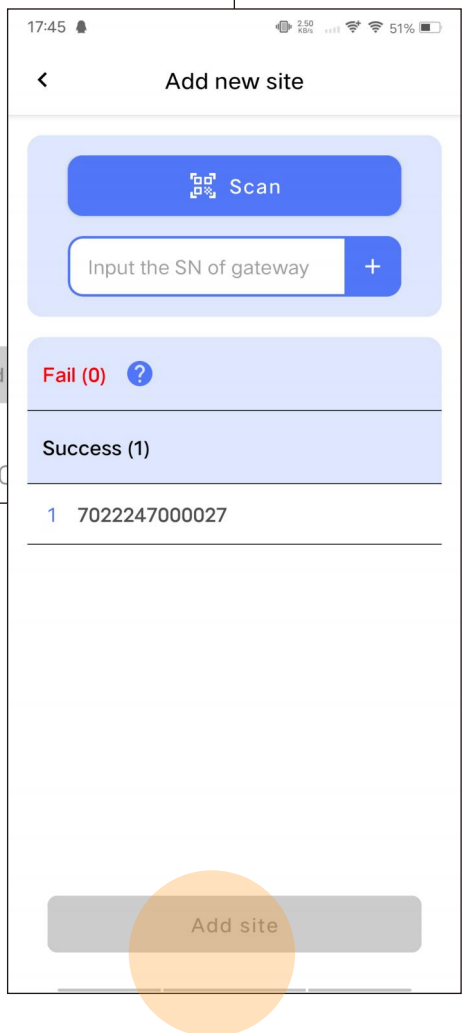
Once the new gateway is connected to the Internet, it will use the gateway SN as the default site name to create a site in the Portal system.

After binding the gateway by themselves, users can immediately view the site data via APP/Web.

7 Portfolio Owner (End User)
7.2 Bind site to account



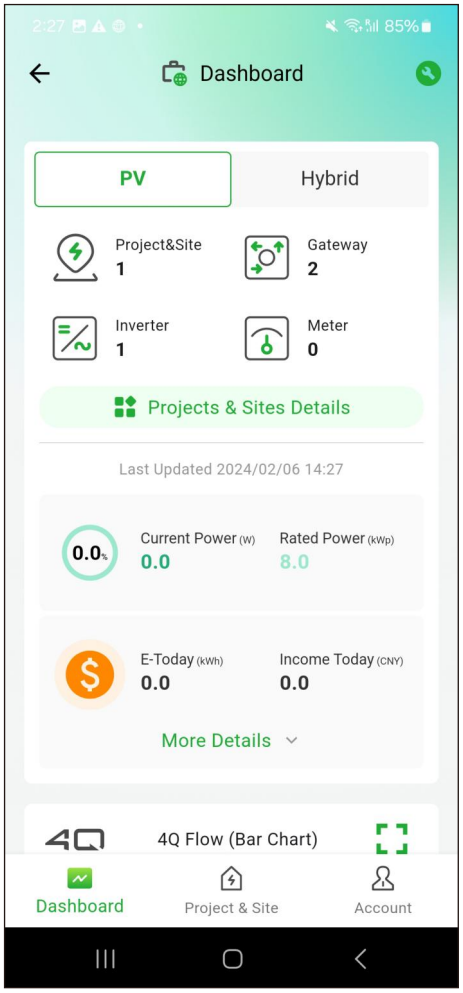


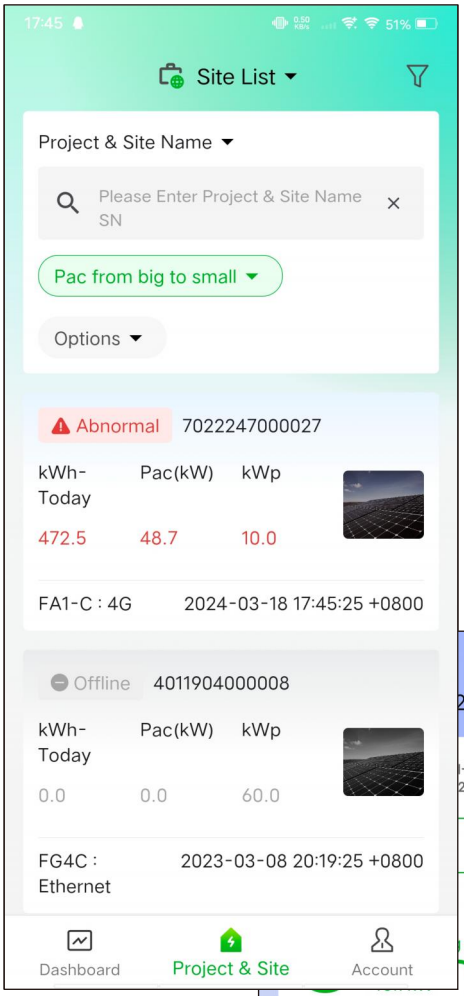


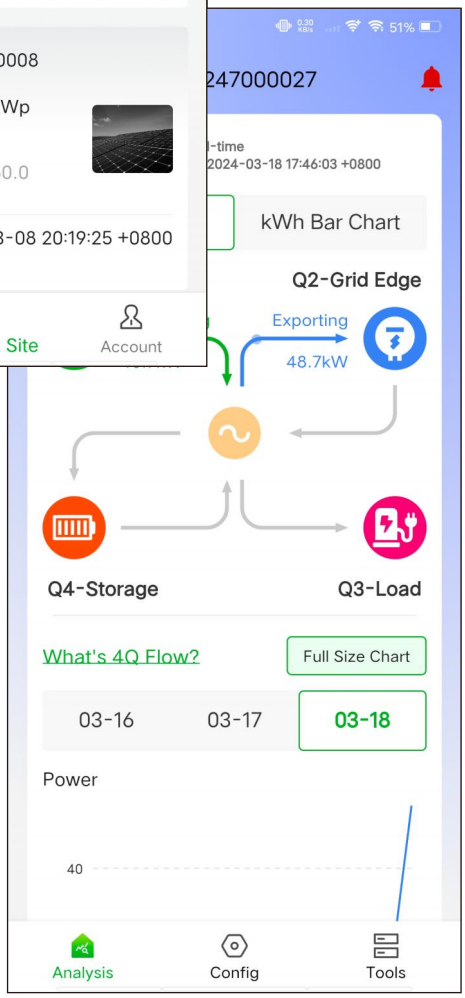
After logging in "End User", click "Add Site", and then output the gateway SN.

APP will prompt successful binding, or prompt that the current gateway has been bound by other users and other exceptions.

7 Portfolio Owner (End User)
7.3 Remote checking of hardware running status





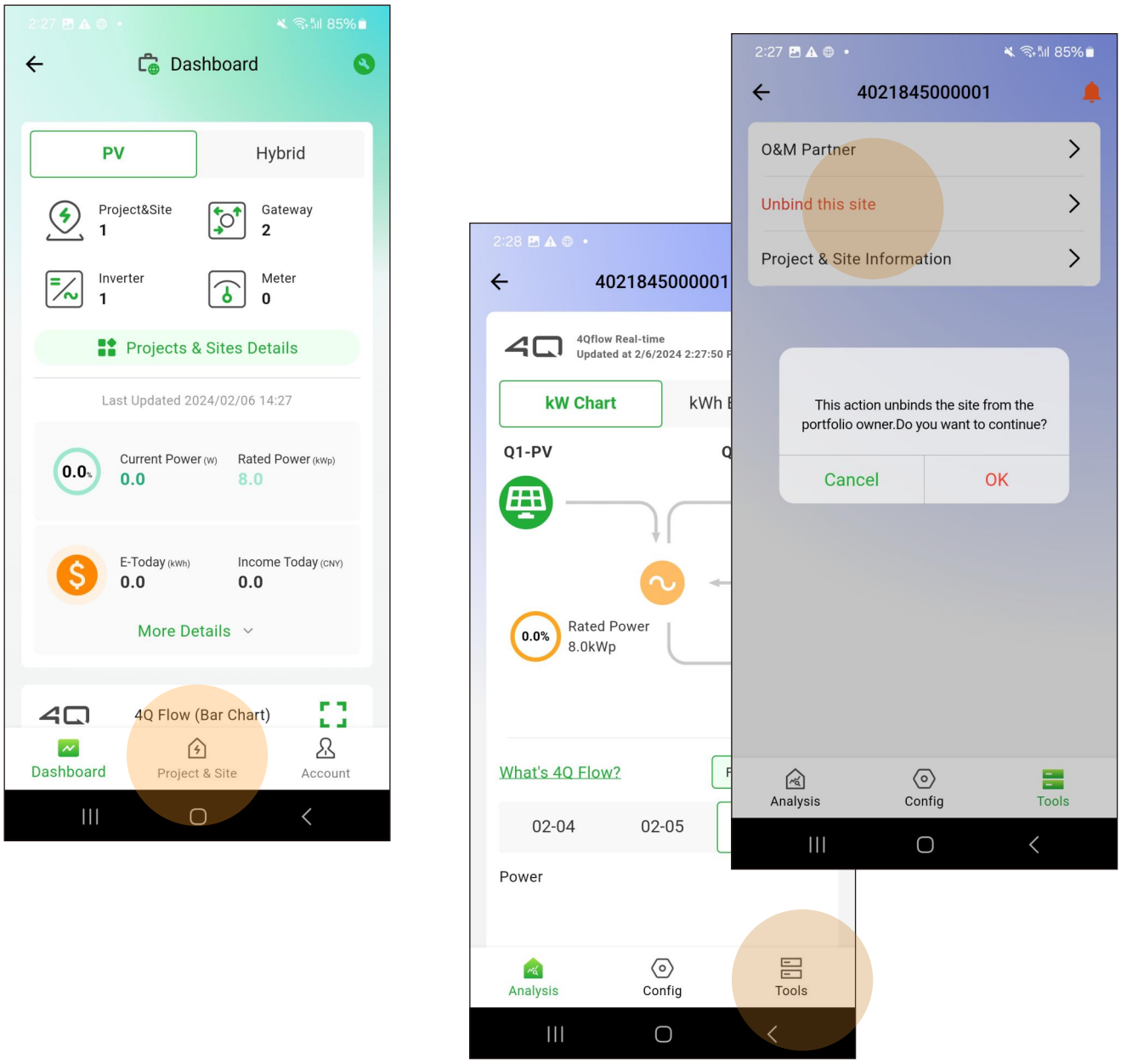


After logging in via the APP/Web, Portfolio Owner is able to view data for all sites in the account, as well as remotely modify hardware settings.

Different roles will be given different permissions, so the Portal system administrator will adjust the account permissions according to the contract.

Please check the product sales contract for details.

7 Portfolio Owner (End User)
7.4 Unbind site from account

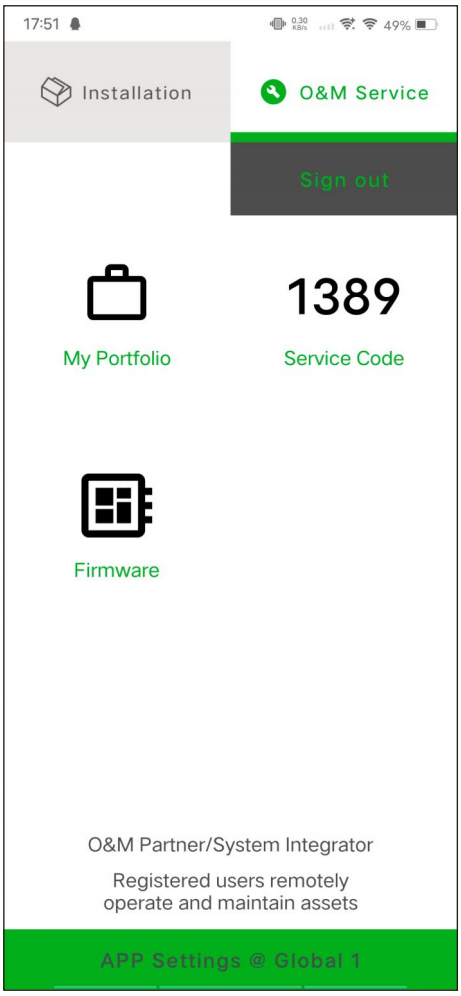


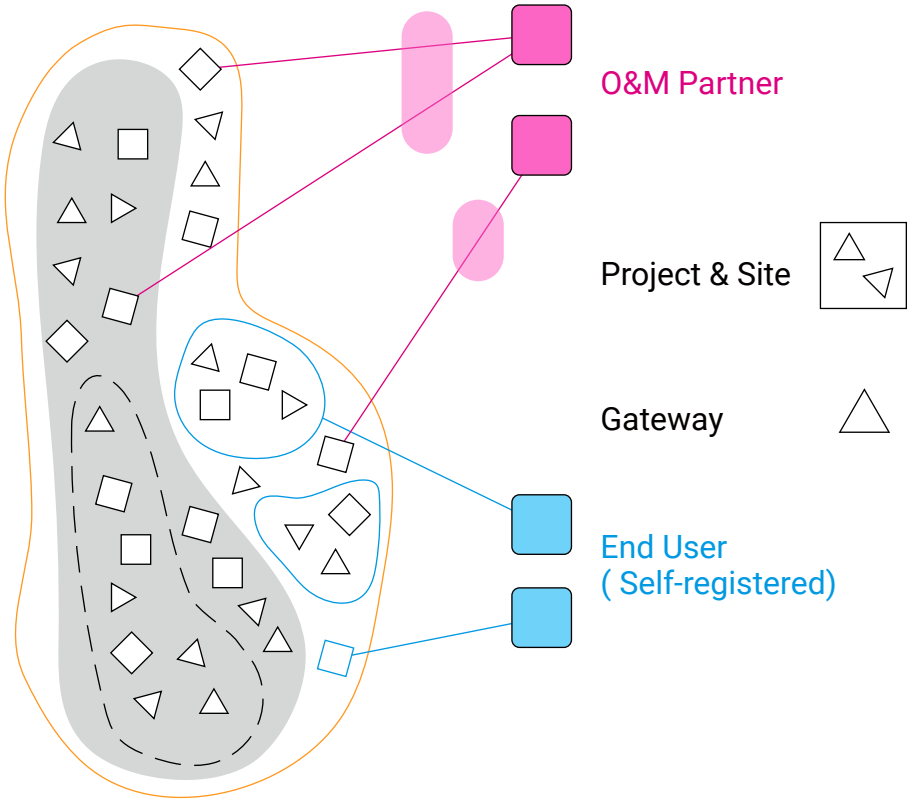
Users can enter a site from the site list, click on "Tools" and then select "Unbind this site".

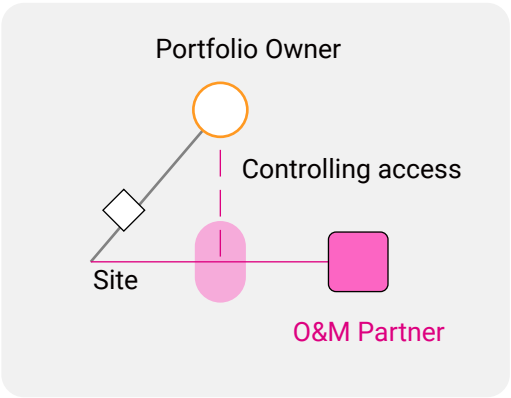
The site is unbound from the current account and the site and data are not deleted.

The Portal administrator is still able to manage the site, so in case of misuse, you can contact after-sales service.

7 Portfolio Owner (End User)
7.5 Authorize an O&M partner to control the site







The Portal Admin can send an "Invite-to-register" self-registration URL to the target user.

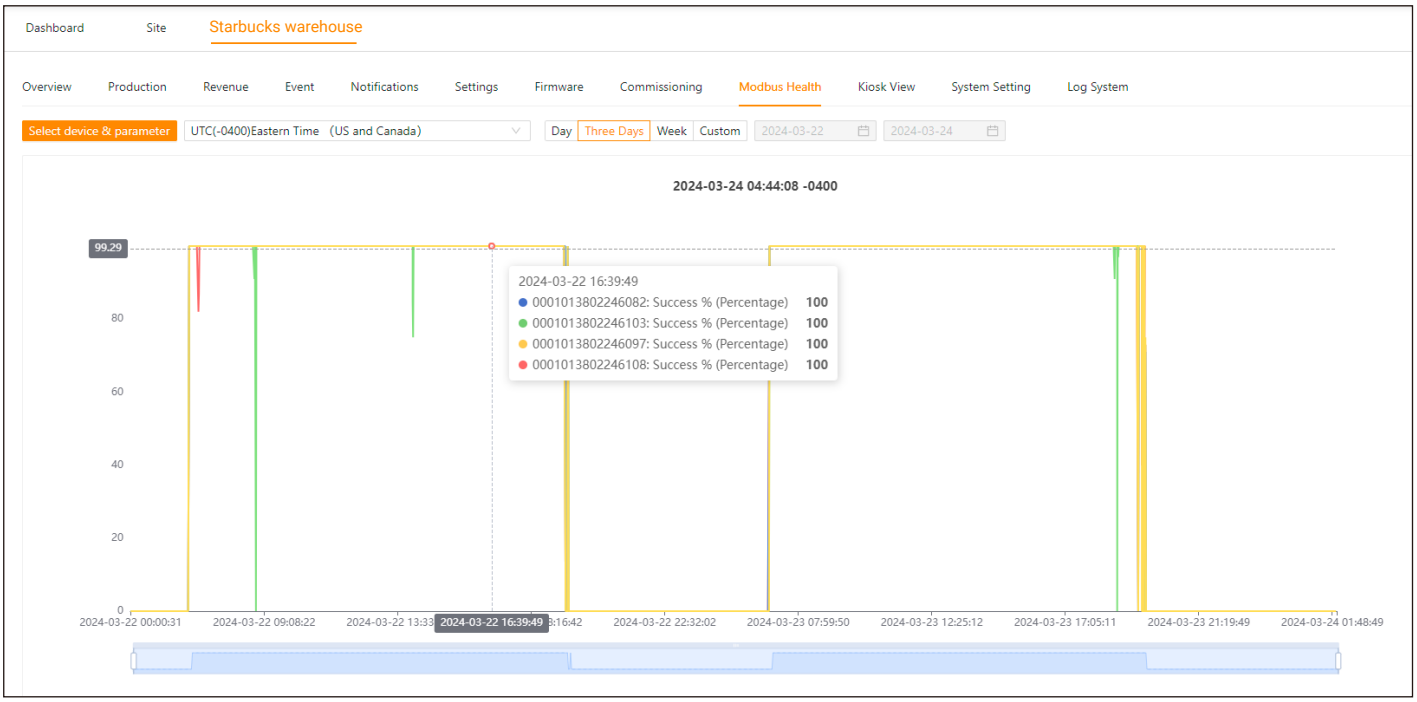
O&M Partner will receive a 4-digit "Service Code" after completing the account registration.

Both the "Service Code" and the O&M Partner account name can be used as elements of the Portfolio Owner's authorisation.

O&M Partner is a service or integrator account role with a cross-organizational perspective.

“Portfolio Owner” can turn on or off O&M Partner's access to sites in his account.

7 Portfolio Owner (End User)
7.6 Diagnose wiring communications at the site

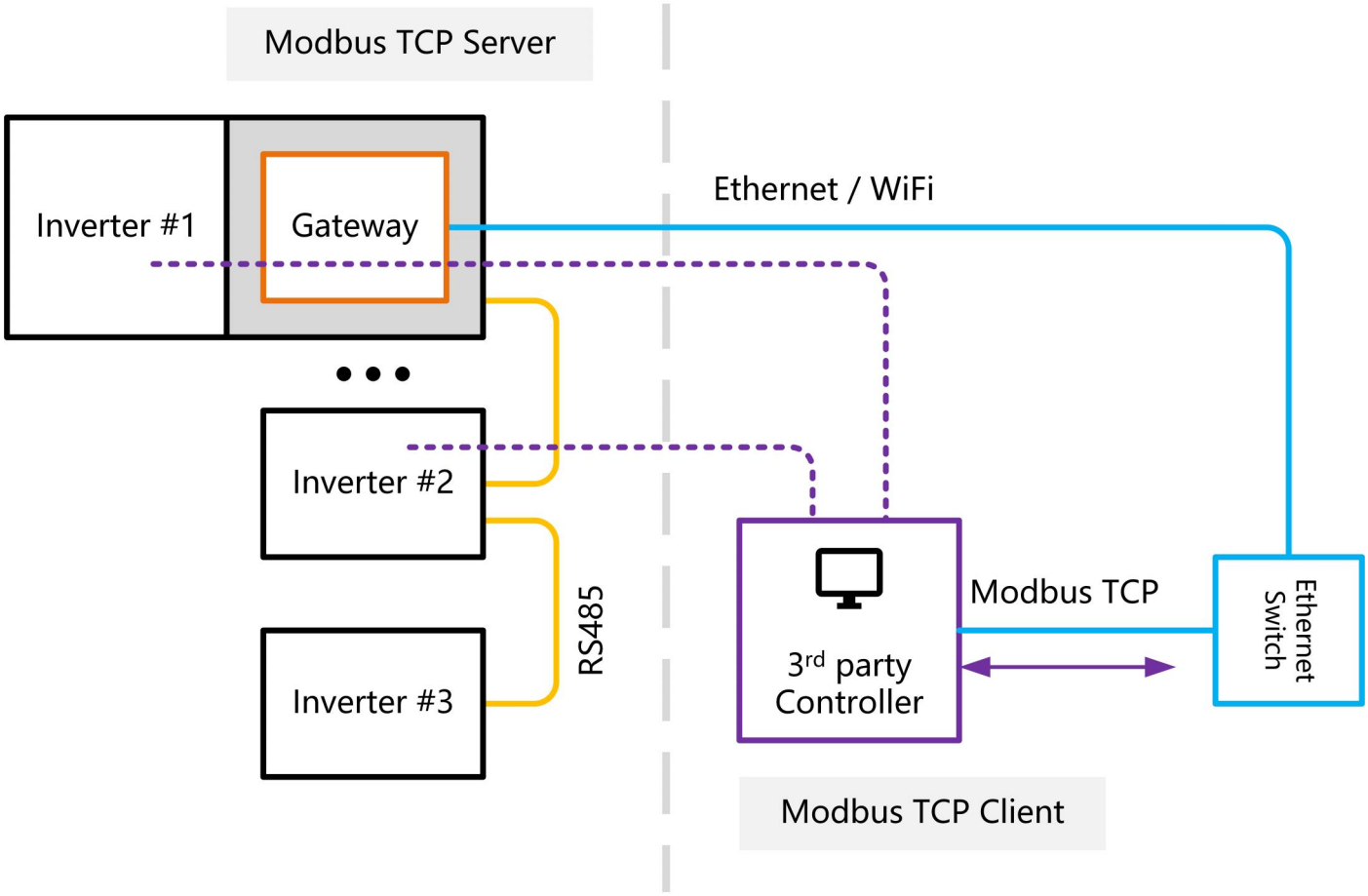


80% of the problems with the first completed installation are wiring problems.
The gateway provides a detailed diagnosis of Daisy Chain's communications.

Each Modbus device should have a consistent communication success rate of 95% or more, otherwise there is a high probability of wiring problems or interference with the RS485 cable.
RS485 reversals and double masters are also very common.

For further support, please feel free to contact the after-sales service.

8 Appendix
8.1 Example of Modbus TCP application

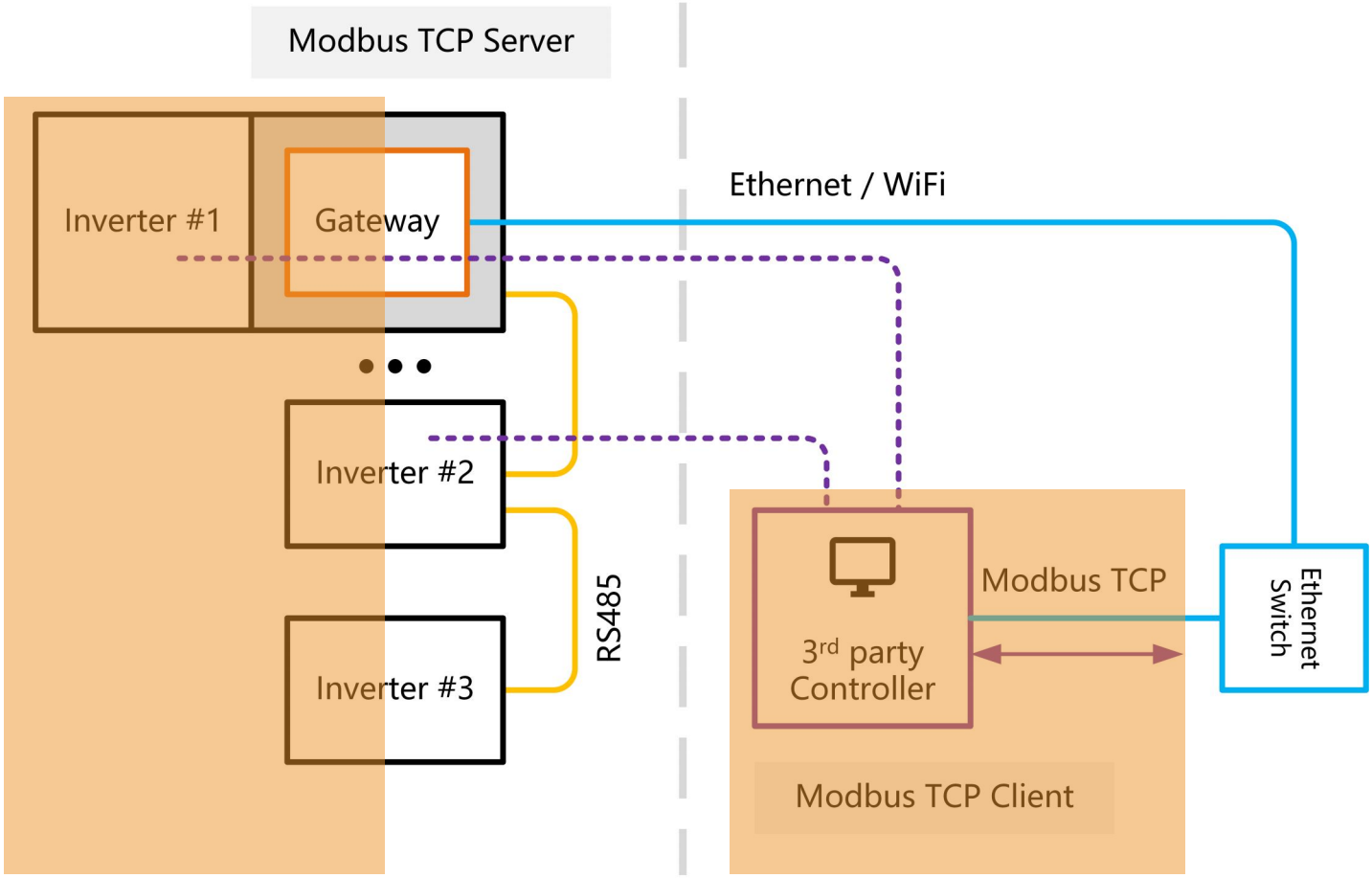


The gateway connects to the Daisy Chain and is created as a Modbus TCP server object for each device with a different Modbus ID.

A third party SCADA acts as a Modbus TCP client and connects to the target Modbus ID device via a TCP channel.

SCADA typically creates a long connection TCP channel for each Modbus ID; we recommend that SCADA reads and writes to the Modbus ID devices one at a time over a short connection TCP channel.

The advantage of this model is that only one TCP channel (Modbus TCP client) is needed to read and write multiple devices one by one.



Simulator : Modbus Slave

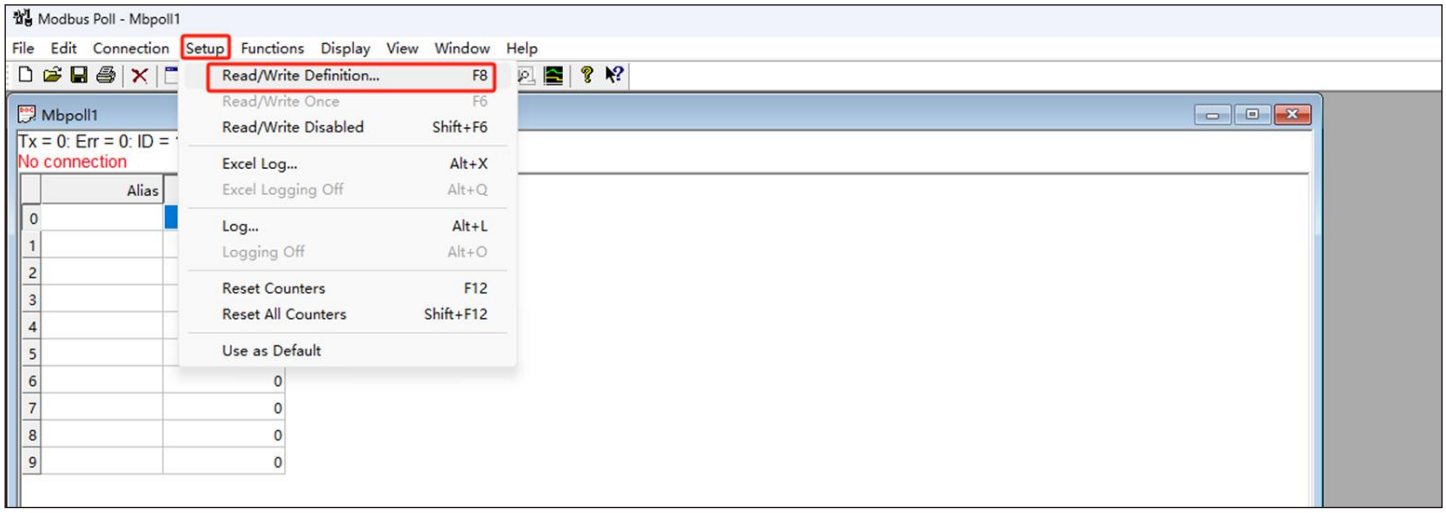
Simulator : Modbus Poll

Assuming that the user has connected two inverters using Modbus IDs 1 and 2, it is also possible to simulate the same inverters using the Modbus slave software.

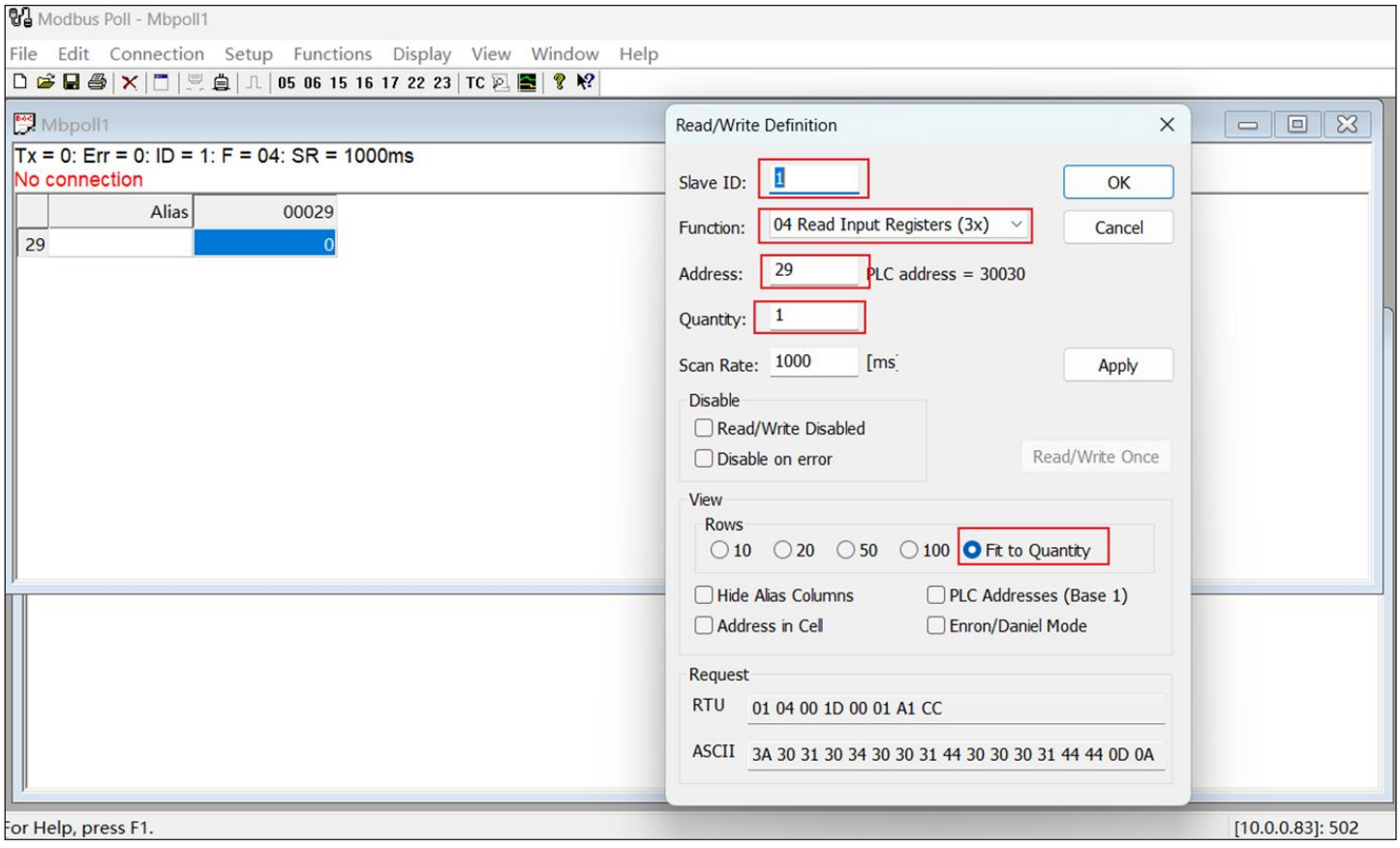
Create the register objects correctly, for example:

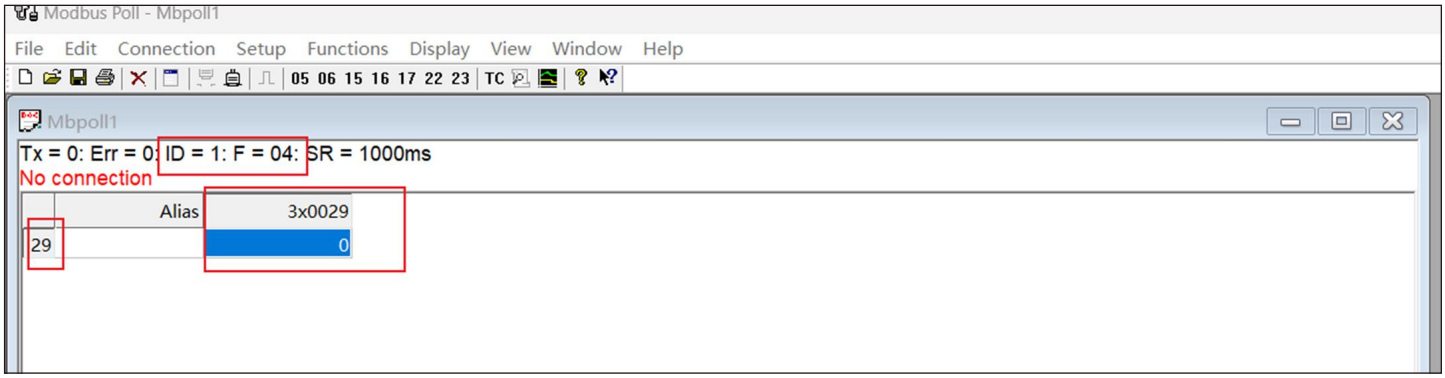
Register Name: Pac (AC active power)
Address: 0x001D (29)
R/W: RO
Type: uint16
Function Code: 0x04

Create a read/write interface for Modbus ID 1 in the Modbus Poll software.



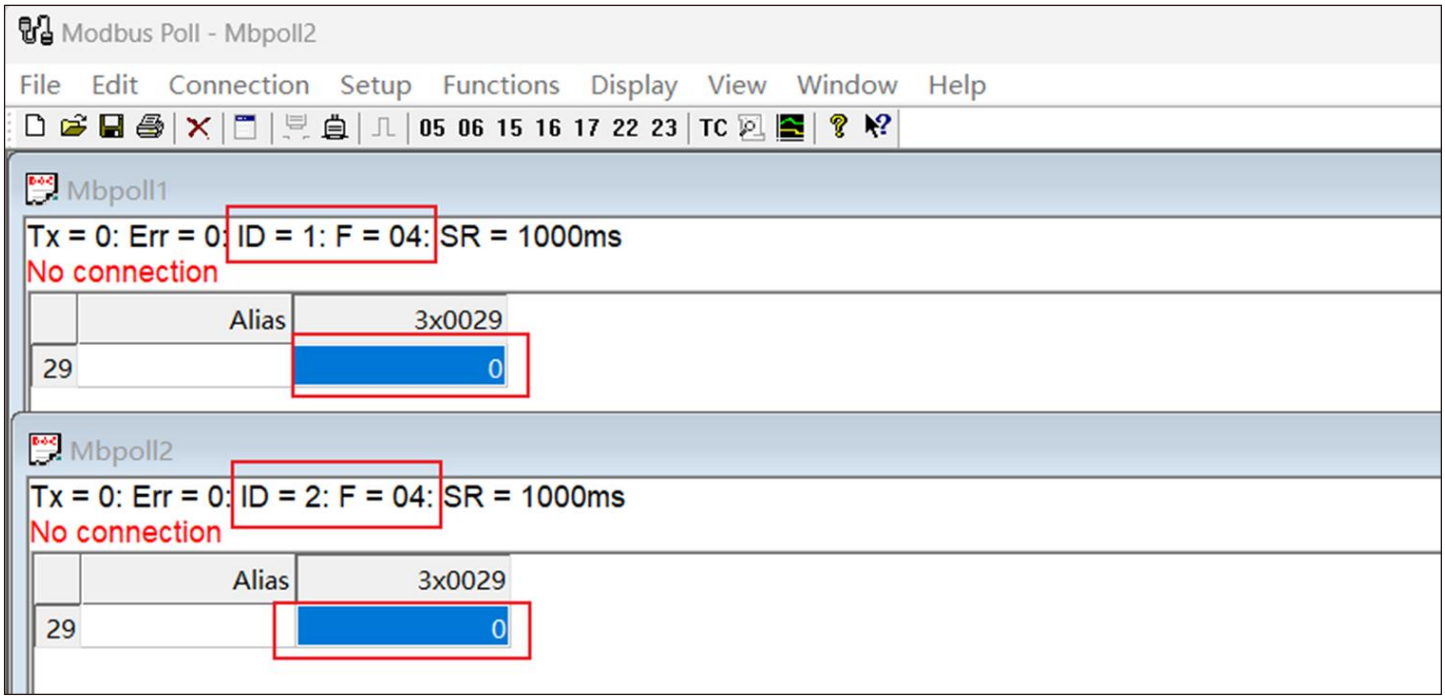
Take care to correctly define the register objects that need to be read and written to. The current illustration defines the Pac registers for the CPS inverter.

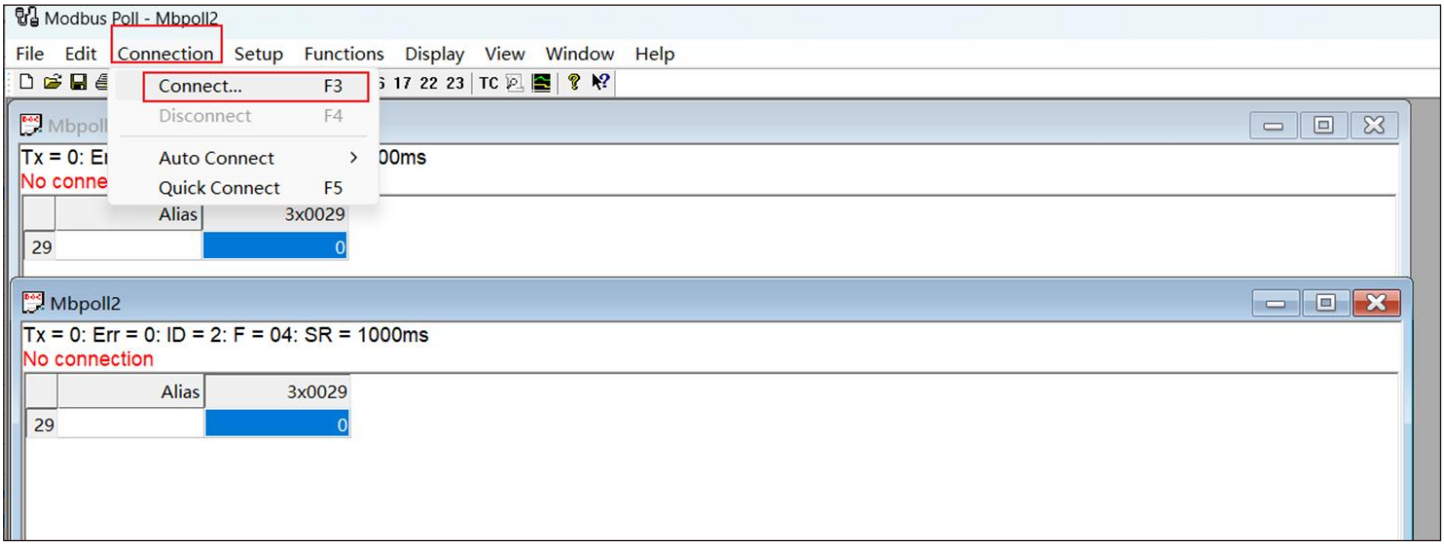




Follow the same procedure to create a read/write interface for Modbus ID 2.

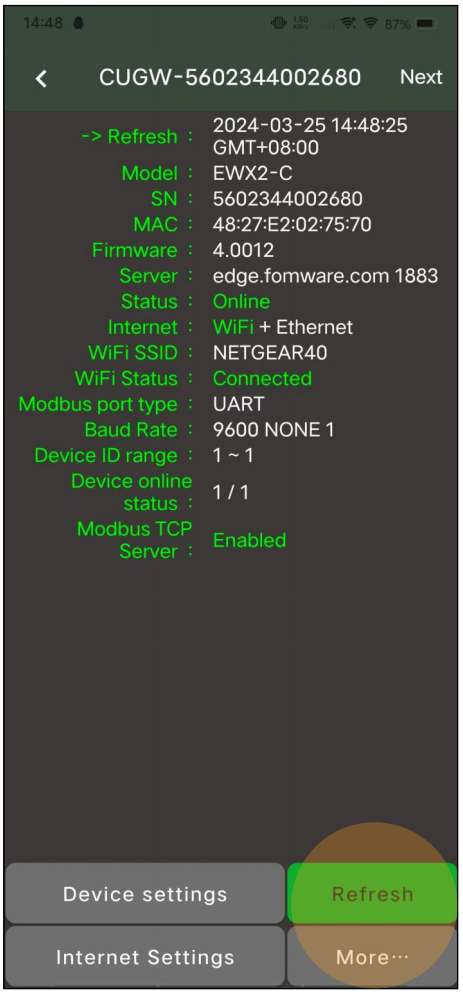
As shown in the figure, the Modbus Poll is ready to perform read and write operations to both Modbus IDs.

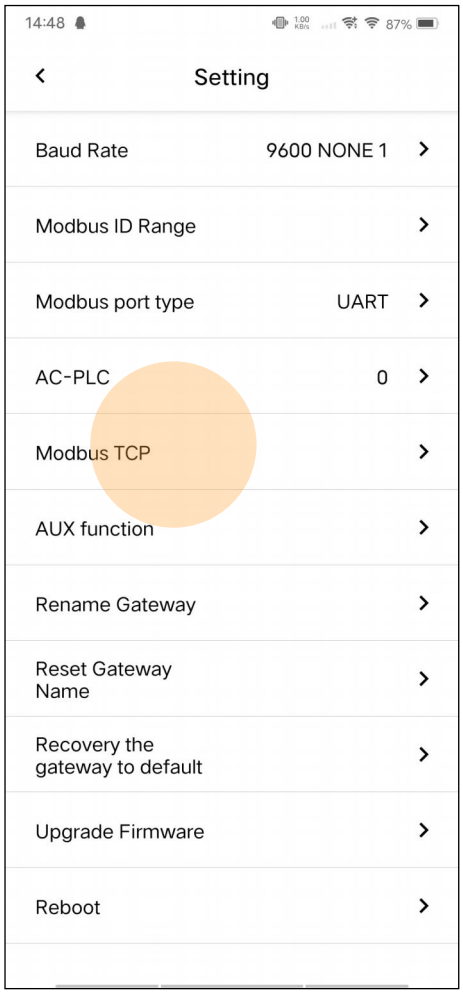


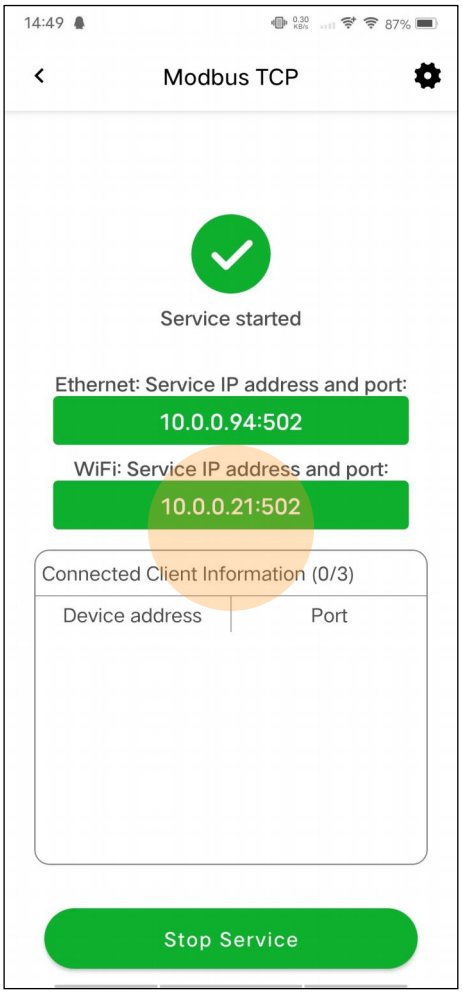


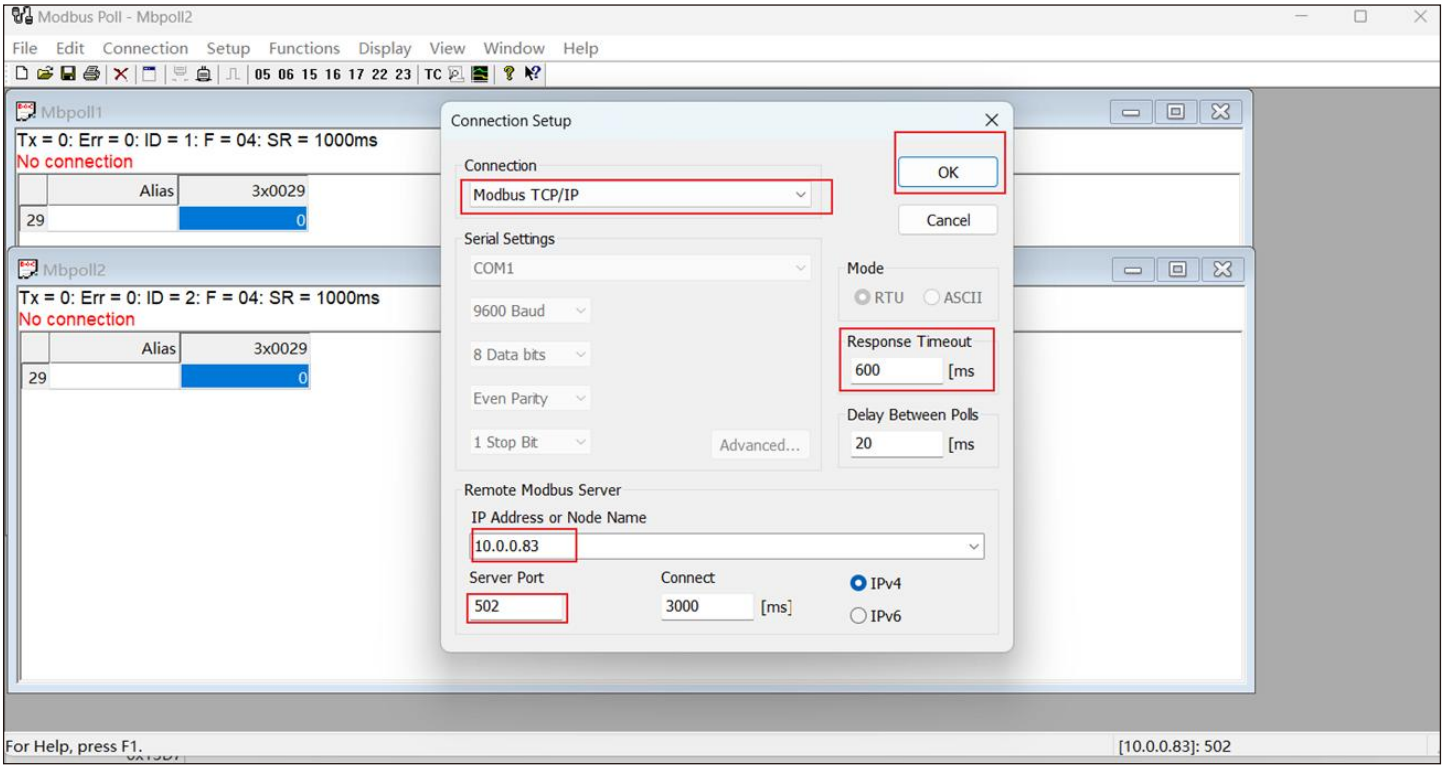
Initiate a Modbus Poll to connect to the Modbus TCP Server (gateway).

You need to know the Modbus TCP Server parameters of the target gateway, and view the operation of WiFi or Ethernet after it has been set to a static IP address via the APP.









The third party SCADA or Modbus Poll successfully connects to the gateway and the Modbus TCP Client connection can also be viewed on the APP.

8 Appendix
8.2 EPM kit specifications

EPM Kit : FD2-M1 Meter

Specification	
Wiring Type	3P4W / 3CT, 3P3W / 3CT, 1P3W, 1P2W
Sensor Type	Rogowski Coil
Voltage Range	0~480 VAC
Max. Voltage	528 VAC
Accuracy	
Current	0.1% +Current Sensor Accuracy
Voltage	±0.2% (60V~600V AC)
Frequency	±0.01% (45~65Hz)
Power Factor	±0.005
Active and Apparent Power	IEC62053-22 Grade:0.5S
Reactive Power	IEC62053-21 Grade:1S
Active Energy	IEC62053-22 Grade:0.5S
Reactive Eergy	IEC62053-21 Grade:1S
Physical Characteristics	
Housing	Plastic, DIN rail mounting
Dimensions	93 mm / 80 mm / 36 mm
Weight	122g

EPM Kit : FD2-NRC100-5 Sensor

Specification	
Rated Current	5000A
Sensitivity @50Hz	Calibrated 100mV/kA, 85mV/kA
	Uncalibrated 108mV/kA, 90mV/kA
Temperature Drift	Calibrated ＜100ppm/℃
	Uncalibrated ＜50ppm/℃
Accuracy	0.5%（Vertical Centering）
Internal Resistance	50～250 Ω
Coil Cross-sectional Thickness	8mm
Signal Length	5 meters

Service Hotline: 855-584-7168

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