

Quick Guide for **ENC-G5**

09/22/2022

Revision 1

Table of Contents

Product Features

Product Specifications

-- -- Datasheet

-- -- Dimensions and Interfaces

-- -- LED Indicators

-- -- Typical System Design and Diagrams

Hardware Installation

-- -- Internal In Wire-box of The Inverter

-- -- Mounting (External in a DAS Box)

-- -- Grounding the Unit

-- -- Wiring

Using the APP

-- -- Check the Internet Connection

-- -- Modbus Device Settings

-- -- Modbus TCP

-- -- Reset / Restart

Product Features

- The IoT cloud-based gateway integrates various hardware and system scenarios.
- Multi-model device topology using one RS485 daisy chain.
- RS485 pass-thru (3rd party controller always acts as master in daisy chain)
- Automatically diagnose RS485 wiring problems.
- Modbus TCP pass-thru (The 3rd party controller can R/W the RS485 daisy chain at any time through Modbus TCP)
- Built-in 4G modem (SIM card included when purchasing the connectivity package, which includes the ENC-G5 gateway card, a SIM card, and access to the YConnect Pro Portal)
- Easy mass deployment and configuration via APP using built-in Bluetooth Low Energy (BLE).
- Plastic DIN rail enclosure (included) supports side and flat DIN-rail mounting.

Product Specifications

● Datasheet

RS485 Interface

No. of Ports	1 (B: 5-Pole Terminal Block or A: 6-Pin Connector)
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Protocol	Modbus RTU
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Modbus RTU Mode	Master
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Terminator for RS485	120 ohms
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Isolation	2.5 kV
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AUX Interface

No. of Ports	1 (3-pole Terminal Block)
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Protocol	Modbus RTU
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Modbus RTU Mode	Slave (RS485 Pass-thru)
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Terminator for RS485	120 ohms
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Isolation	2.5 kV
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Ethernet Interface

10/100BaseTX Ports (RJ45 connector)	1
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Connect to the Cloud Applications	MQTT
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Forward Raw Data to 3rd Party	HTTPS / MQTT (Unidirectional)
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SCADA controllers on the same LAN subnet	Modbus TCP
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Modbus TCP

Mode	Server (Slave)
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Max. No. of Client Connections	2
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Cellular Interface

Cellular Standards	LTE-FDD/LTE-TDD, WCDMA
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No. of SIM Slot	1
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Cellular Antenna Connectors	1 SMA female
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Bluetooth Interface

Standard	BLE 4.2
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Antenna	Built-in
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Power Parameters

Input Voltage	9 to 24 Vdc
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Power Consumption	2.5 W, Max. 5 W
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Power Connector	Terminal Block
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Environmental Limits

Operating Temperature	-30 °C to 85 °C (-22 to 185°F), Natural convection
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Storage Temperature	-40 to 85°C (-40 to 185°F)
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Ambient Relative Humidity	5 to 85% (non-condensing)
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Physical Characteristics

Housing	Plastic
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IP Rating	IP 20
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Dimensions	70 mm / 100 mm / 28 mm (2.76 in x 3.94 in x 1.10 in)
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Weight	73g (0.16 lb)
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Standards and Certifications (DoC)

CE-EMC	EN 55032
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	EN 55035
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	EN 61000-3-2
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	EN 61000-3-3
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CE-RED	EN 301 908
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	EN 300 328
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	EN 301 489-1 / -17 / -52
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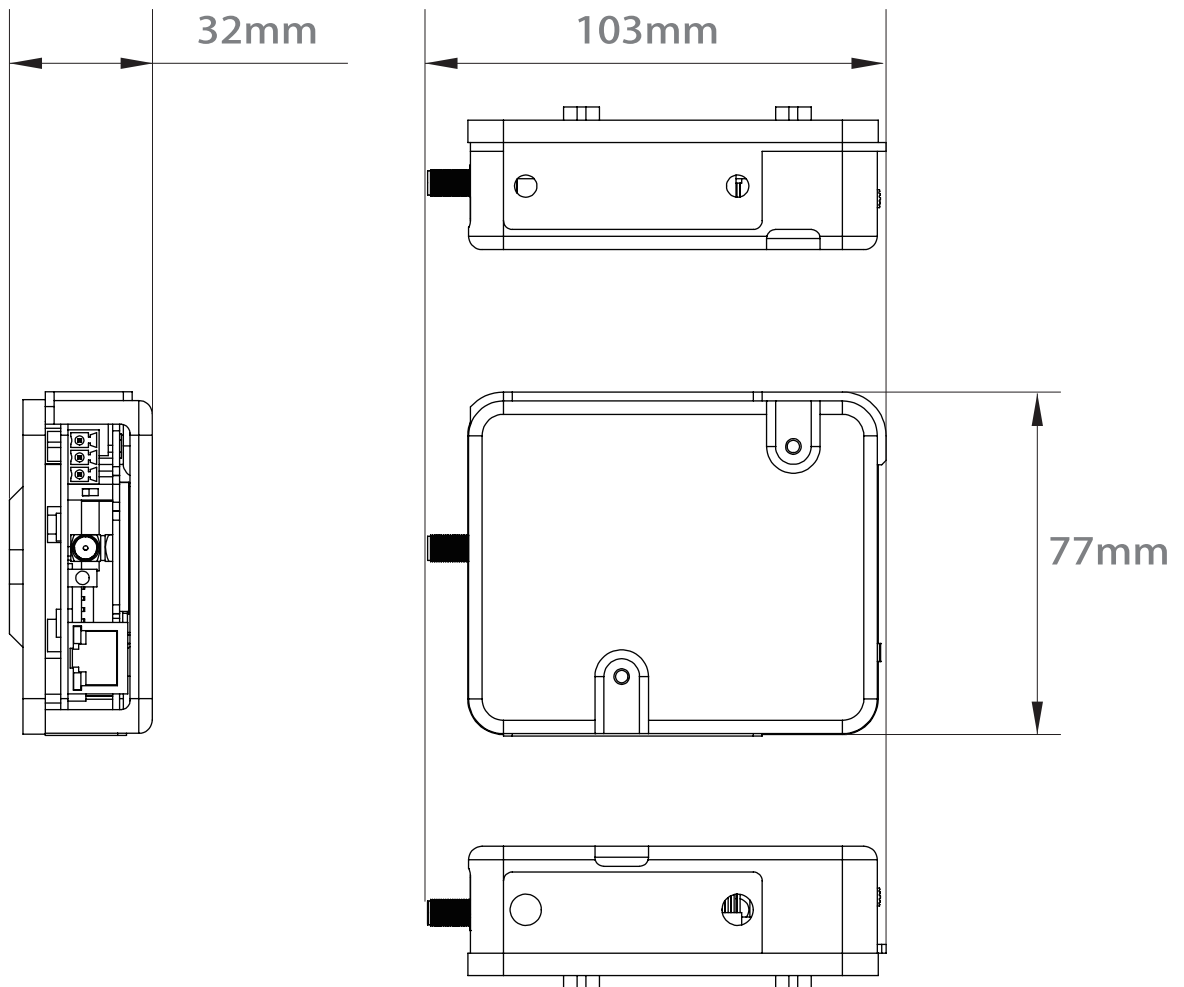
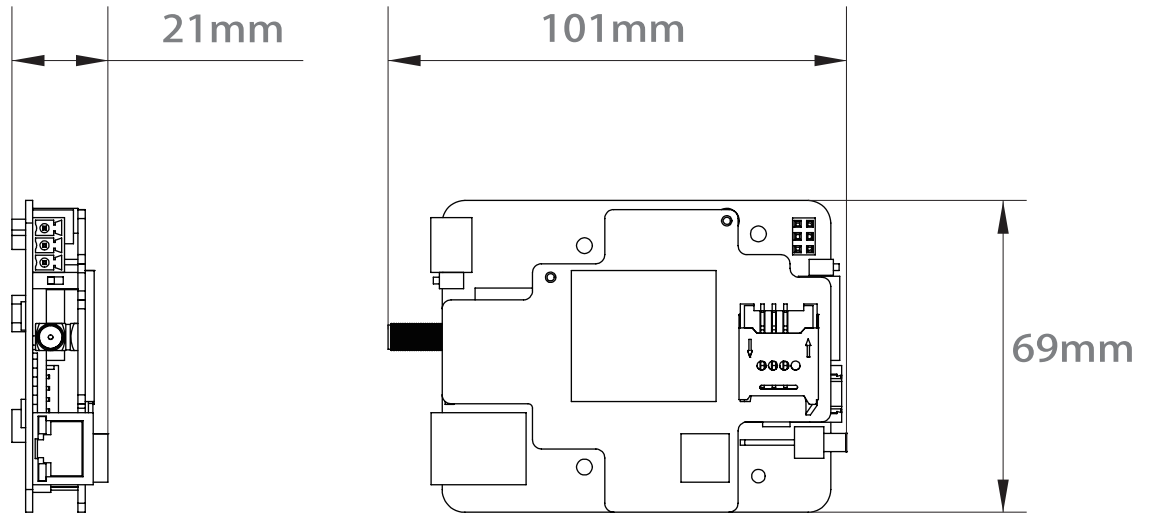
	EN 62368-1
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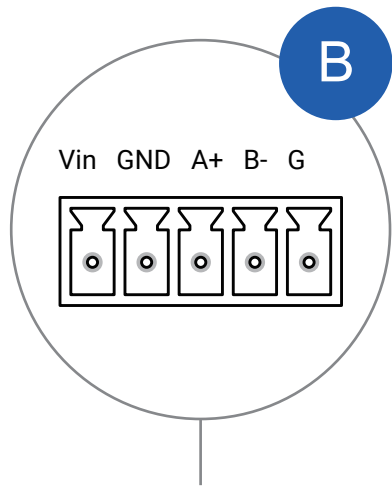
CE-LVD	EN 62368-1
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FCC SDoC	Part 15B
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FCC ID	Part 15C
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● Dimensions and Interfaces





B External installation option
RS485 Port B



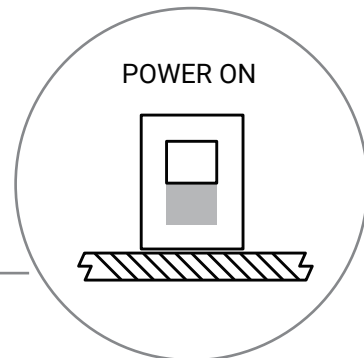
Caution:
Before configuring the gateway, pay attention to set the power switch to ON.

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.

Default



Terminating Resistance Switch

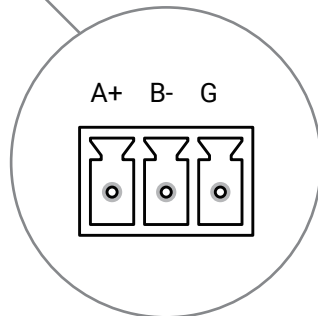
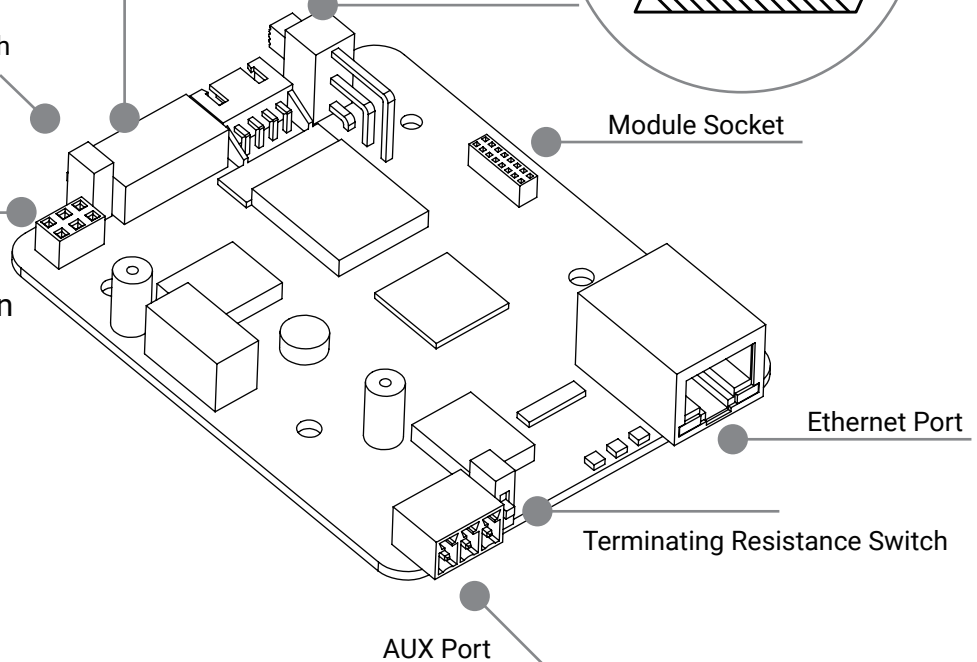


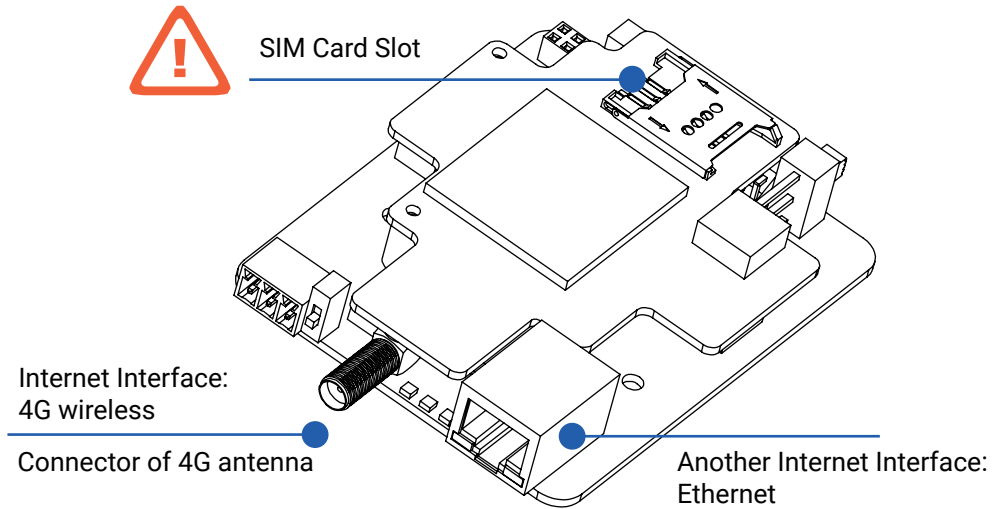
Power Switch

Module Socket



A Internal installation option
RS485 Port A





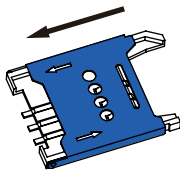
The [ENC-G5 gateway](#) comprises two boards, the Main Board and the Daughter Board. The Daughter Board includes a SIM card slot for easy 4G Internet connectivity with the use of the [optional](#) SIM card products. The [ENC-G5 gateway](#) supports the use of the optional [Yaskawa Solectria Solar YConnect Pro Portal](#).

The [ENC-PORT-C532 Connectivity Package](#) product allows for 4G connectivity of up to 32 inverters for 5 years. The [ENC-PORT-C510 Connectivity Package](#) product allows for 4G connectivity of up to 10 inverters for 5 years. Both of these products come with the capability of accessing the [Yaskawa Solectria Solar YConnect Pro Portal](#) for 5 years.

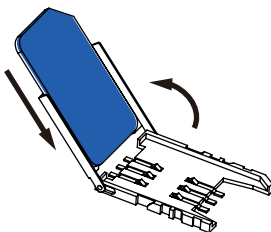
Note :

The [ENC gateway](#) is not compatible with third-party sourced SIM card. The Yaskawa Solectria Solar technical support team will not be able to assist in the implementation of third-party SIM cards with this gateway.

[ENC gateway](#) hardware warranty is valid by default within the validity period of our data plan.

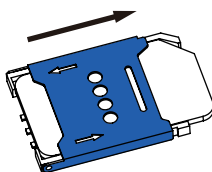


1) Push in the direction shown to unlock the flap



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

ENC SIM card provided in the ENC-PORT-C5XX Connectivity Packages supports AT&T + T-mobile networks.

After the gateway is powered on and working, it will select and connect to the provider network with the strongest or most stable signal.

If you are interested in a Yaskawa Solectria Solar Connectivity Package, please contact the YASKAWA Solectria Solar US sales team for detailed information.

Internet interface : Ethernet

If the gateway is connected to the Internet using Ethernet instead of 4G.

Open the LAN firewall ports before commissioning !

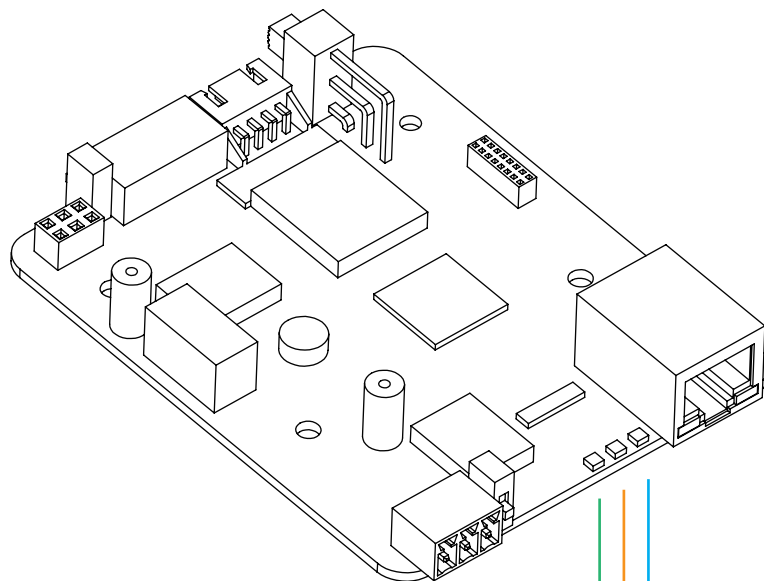
The following ports must be opened both ways (incoming and outgoing communications):

TCP 1884 with destination IP 47.254.52.209

TCP 443 with destination solrenview.com (IP 209.160.64.80)






● LED Indicators





● APP Connect

Indicates whether the APP is connected to the gateway and whether the device is being configured

- Light Off  BLE Hardware Error
- Blink  No Active Connection
- Light On  Phone Connected




● 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

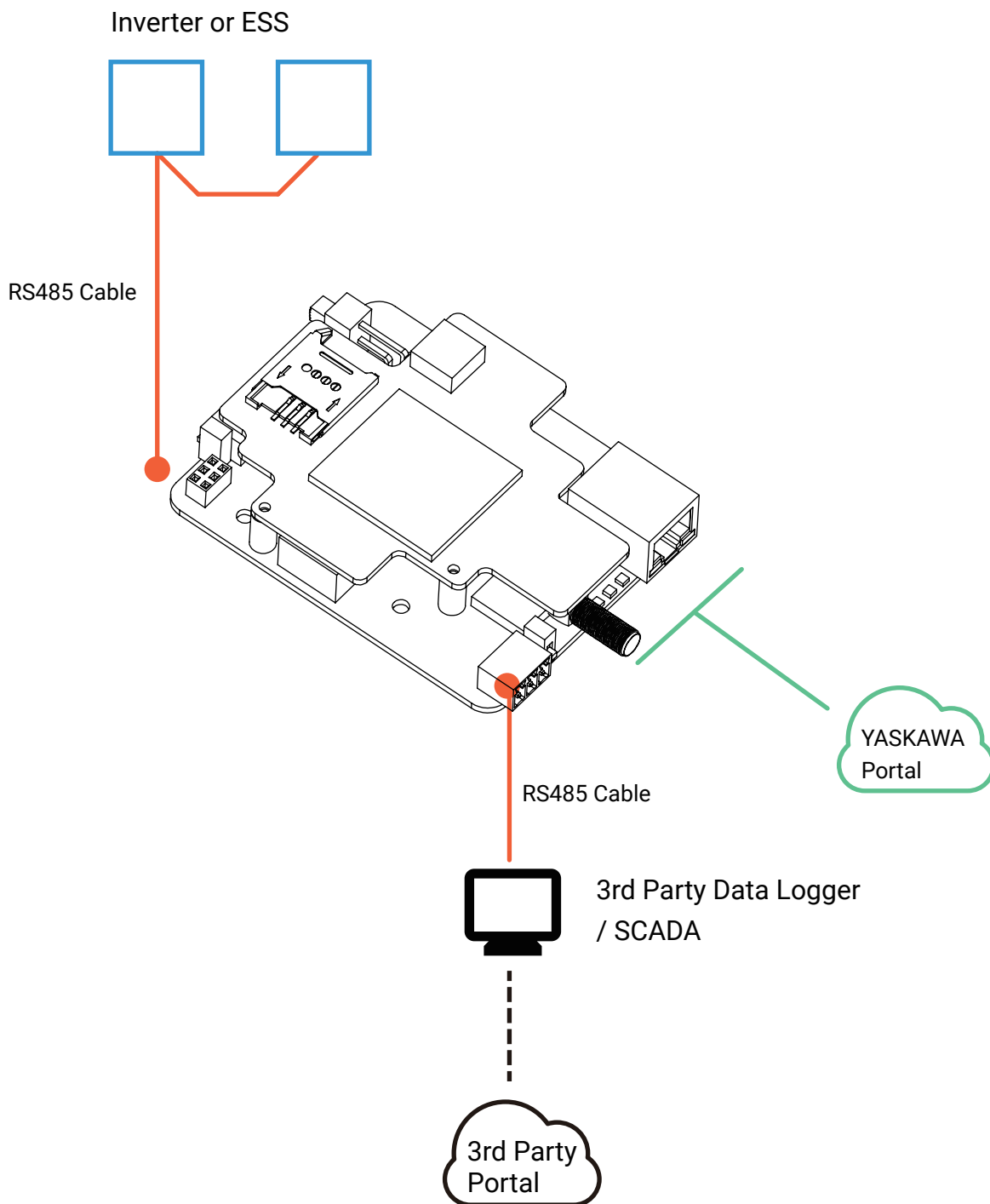
Indicates whether the gateway is connected to the [YASKAWA Solectria portal](#) or target server via the Internet

- 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

- Typical System Design and Diagrams

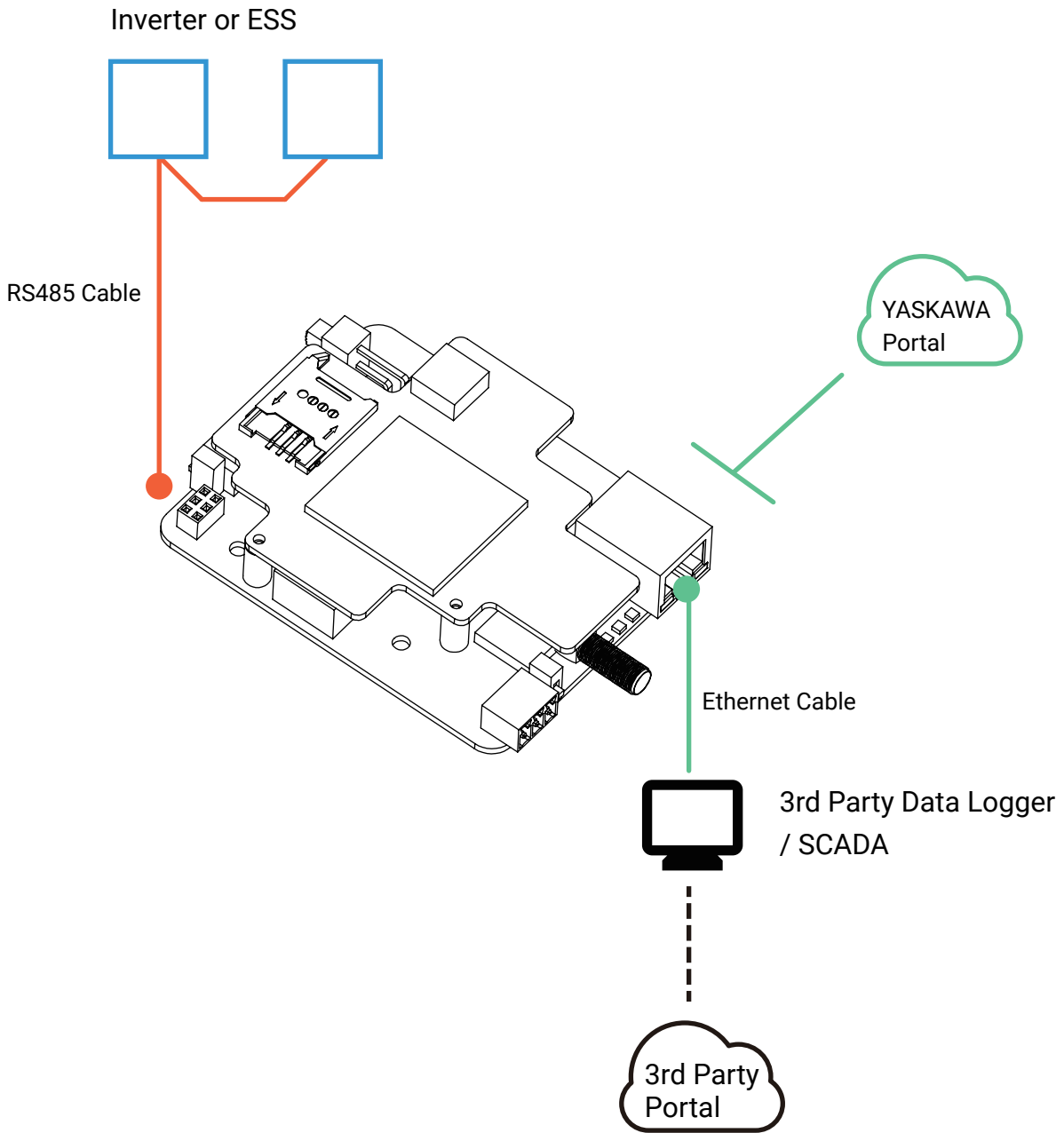
System Diagram for RS485 Pass-through

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.



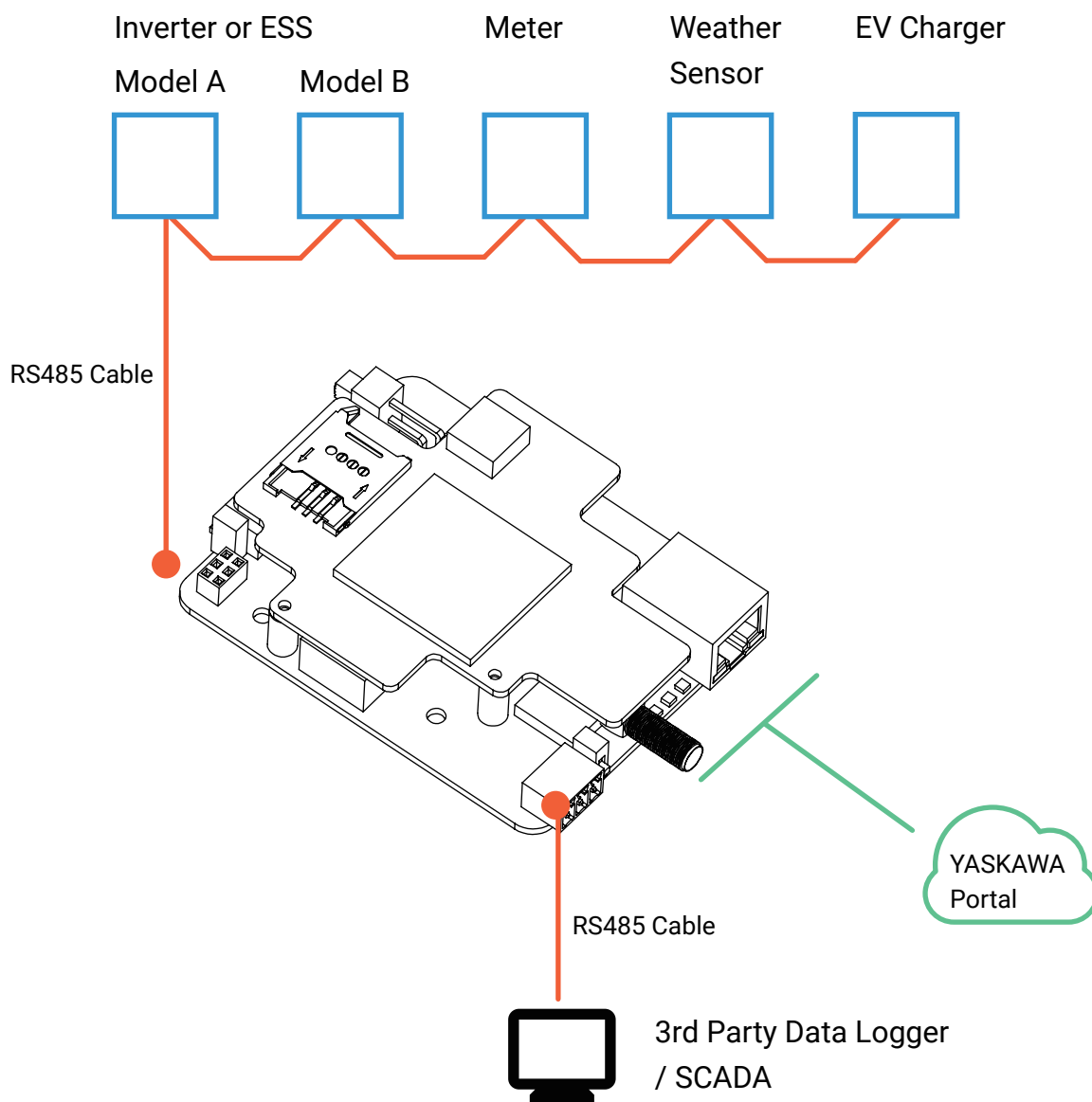
System Diagram for Modbus/TCP Pass-through

The gateway can be used as a Modbus/TCP server, connect to a third-party SCADA system, and forward various commands to the daisy chain.



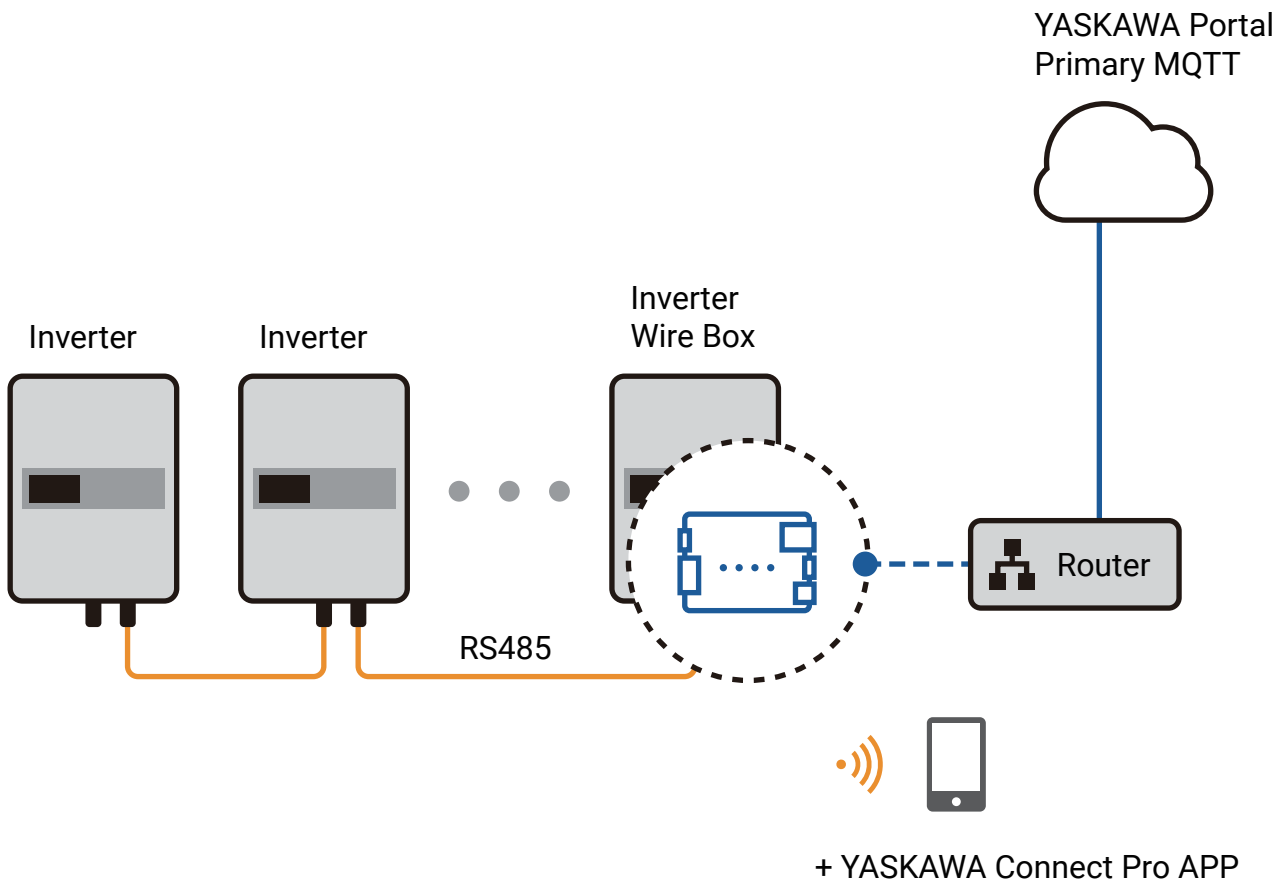
System Diagram for Connecting Multi-model Devices Using One RS485

The gateway allows users to connect different brands and models of hardware in the same daisy chain via RS485. The connected hardware needs to be pre-compatible with the [YASKAWA Solectria Solar YConnect Pro Portal](#).



Hardware Installation

- Internal in Wire-box of The Inverter



When the inverters are monitored via the gateway, a unique RS-485 address for each inverter can be set up through the LCD interface.

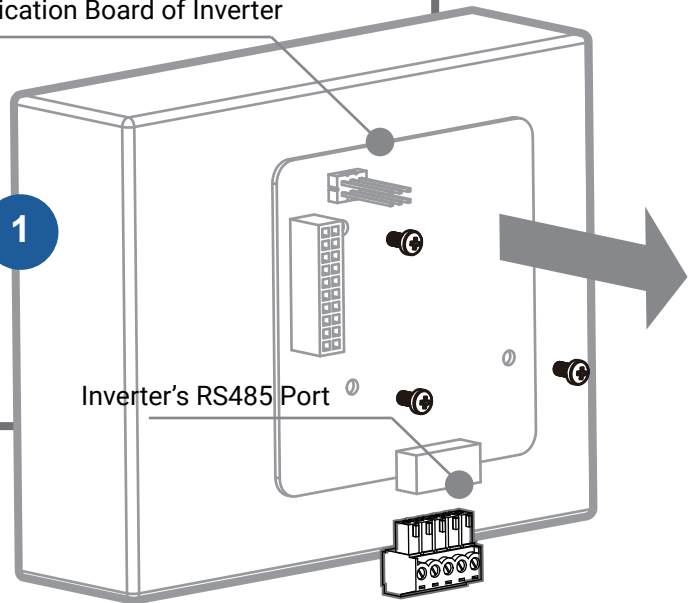
Up to 32 inverters can be connected in the daisy chain network.

Inverter Wire-Box

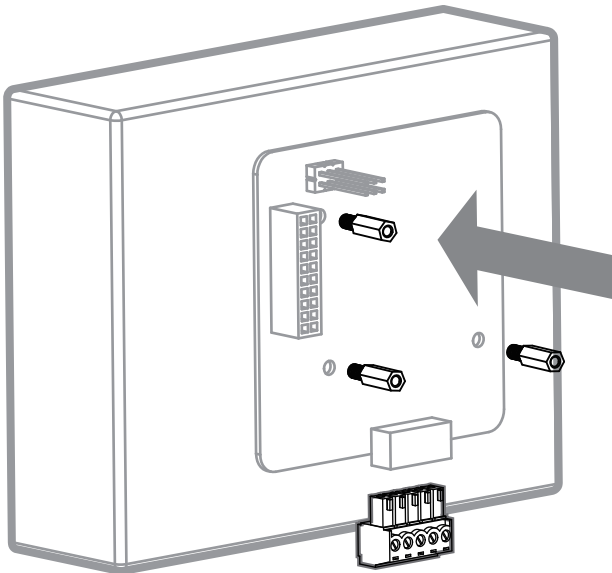
The Communication Board of Inverter

Remove the (3) screws that attach the inverter communication board in the Wire-Box using a #2 Phillips bit.

1



Inverter's RS485 Port



2

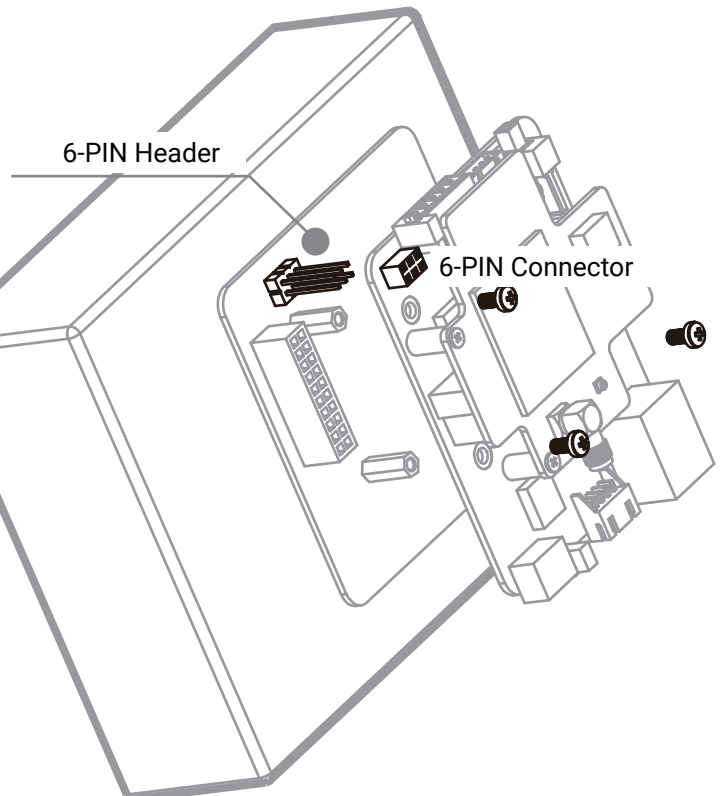
Replace the screws with the (3) standoffs included in the gateway kit.

Install the gateway by carefully aligning the 6-PIN connector in the upper left-hand corner of the communication board.

Install the (3) screws into the standoffs to secure the gateway in place. Install the 3 screws and torque to 7 in-lbs using a #2 Phillips bit.

3

6-PIN Header



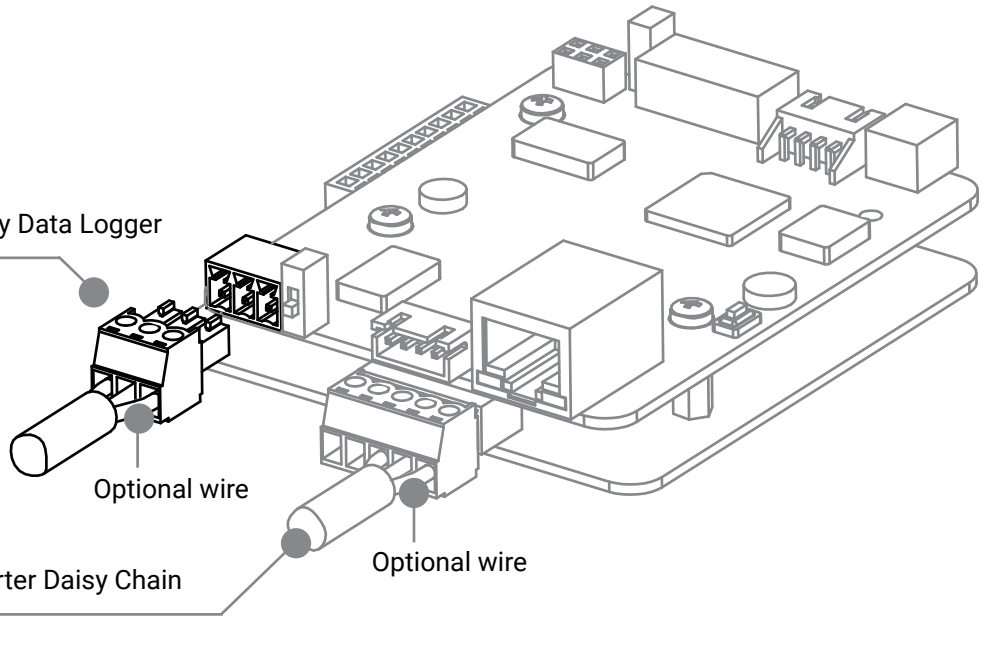
6-PIN Connector

Connect the 3rd party Datalogger to the AUX port in the bottom left-hand corner of the gateway using the 3-Pin Connector provided in the gateway kit.



4

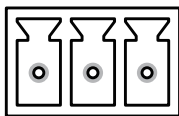
RS485 of 3rd Party Data Logger
A+ / B- / G



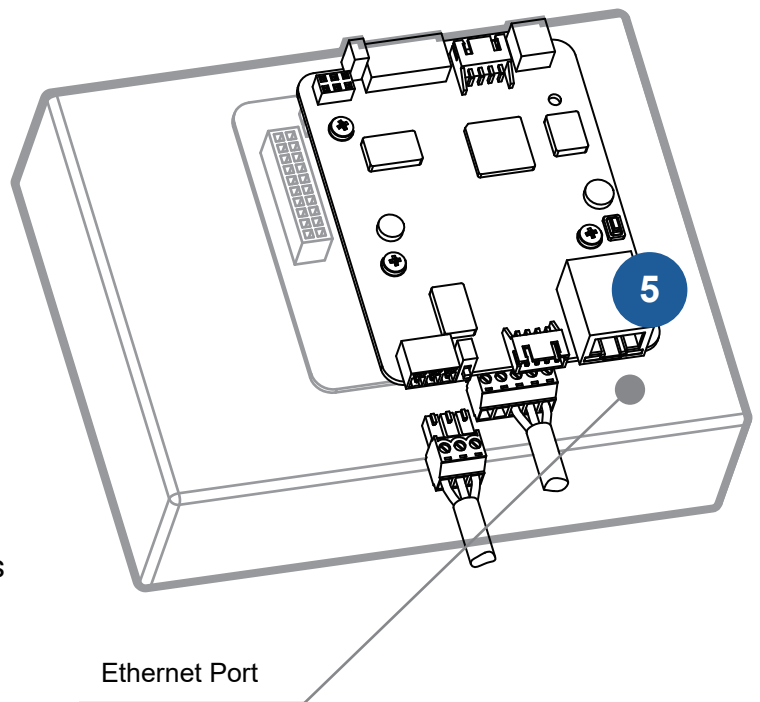
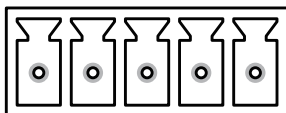
Connect the RS485 inverter daisy chain to the inverter communication board using the 5-Pin Connector provided in the gateway kit.

NOTE: The 5-Pin Connector is installed on the port on the bottom of the inverter communication board (behind the gateway) .

A+ B- G



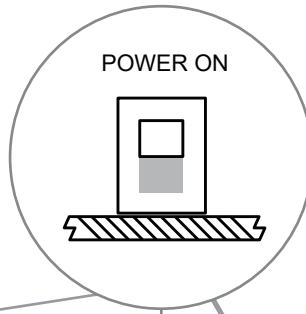
Vin GND A+ B- G



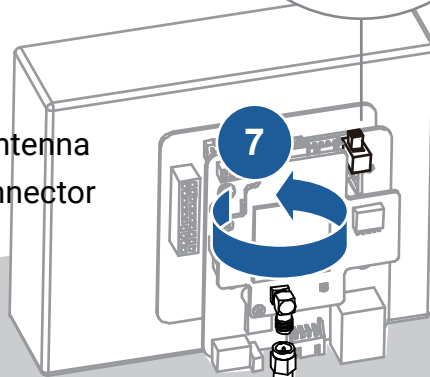
The RJ45 LAN cable is inserted into the Ethernet port of the gateway. The LAN cable must be able to access the Internet without port filtering behind the firewall.



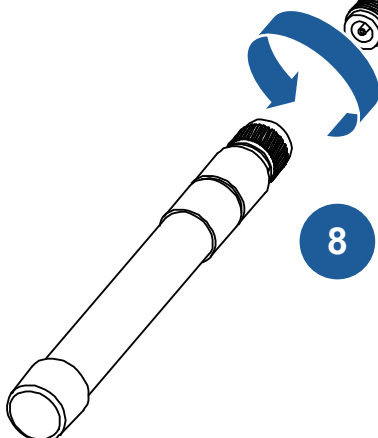
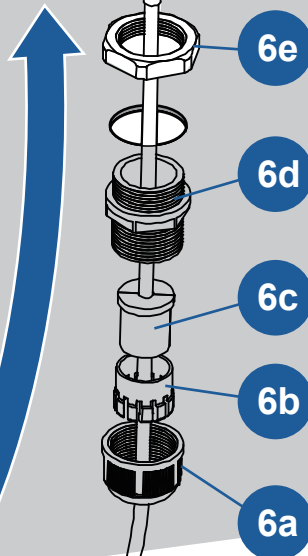
Before closing the cover of inverter wire-box, check again that the gateway's power switch is set to on.



Screw one end of the antenna cable into the cable connector of the gateway.

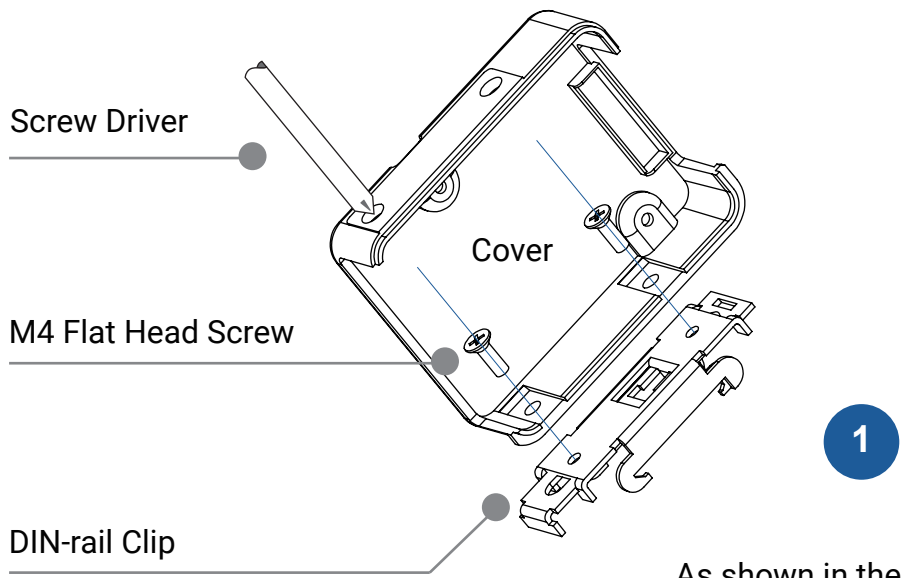


Pass the cable through the disassembled cable gland parts in sequence, then tighten the cable glands again.

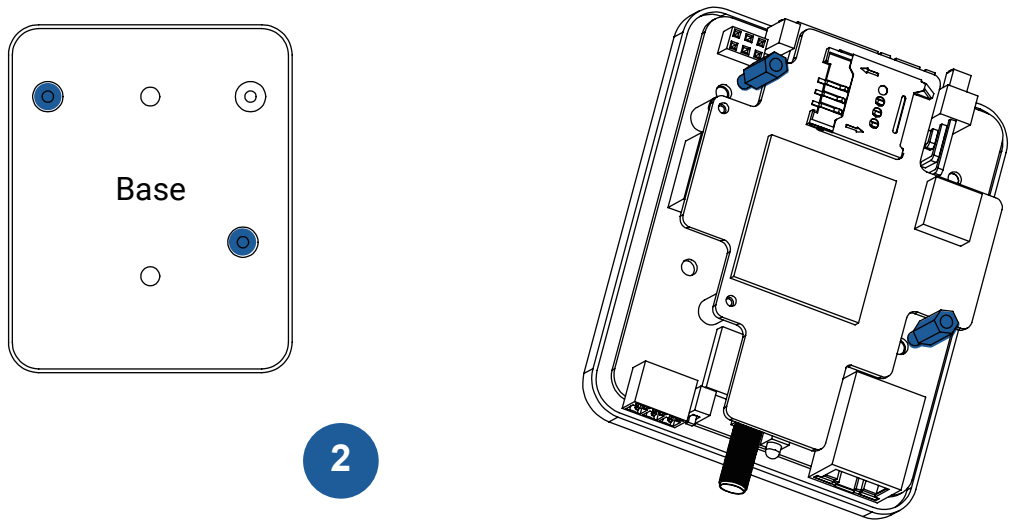


8 Screw the other end of the antenna cable into the antenna.

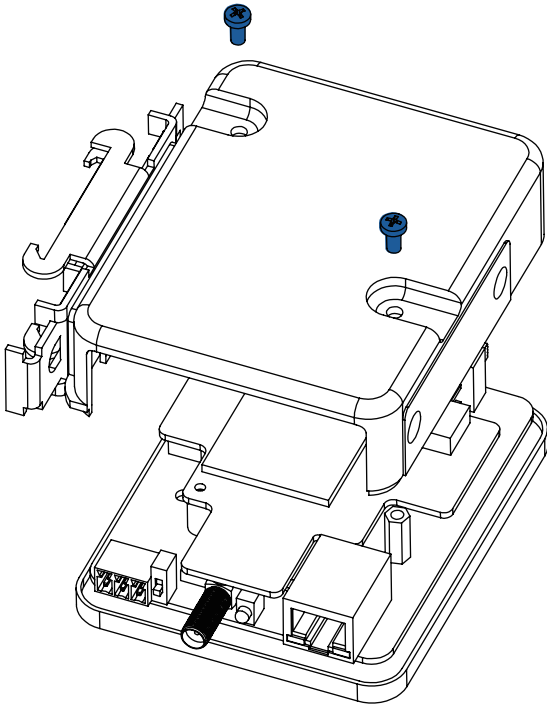
- Side Mounting (External in a DAS Box)



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



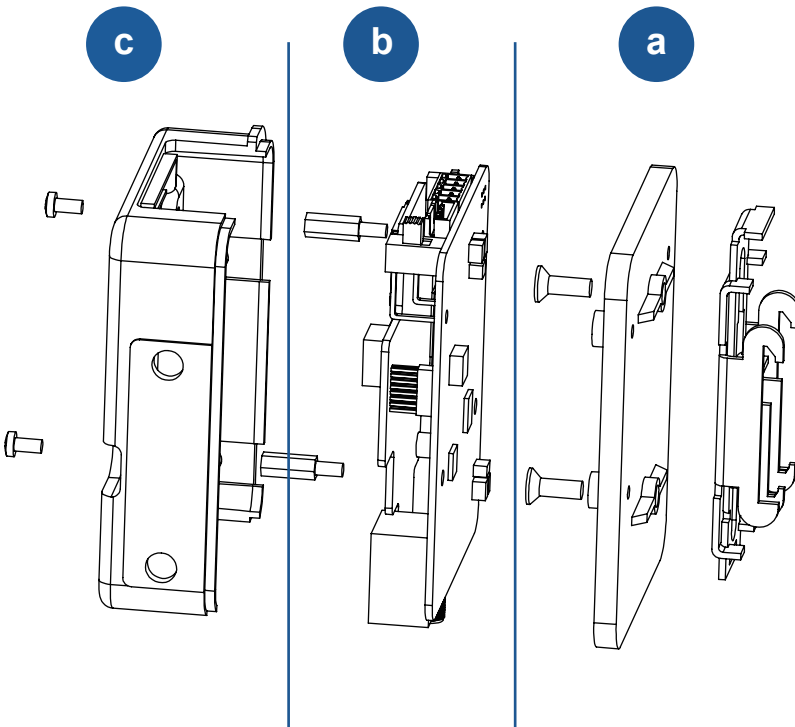
Put the [ENC gateway](#) on the base of the housing and tighten it at the position shown in the figure with standoffs.



3

Align and close the upper and lower housings according to the positions of the screw holes, and fasten the two parts together with M3 screws.

- Flat Mounting (External in a DAS Box)

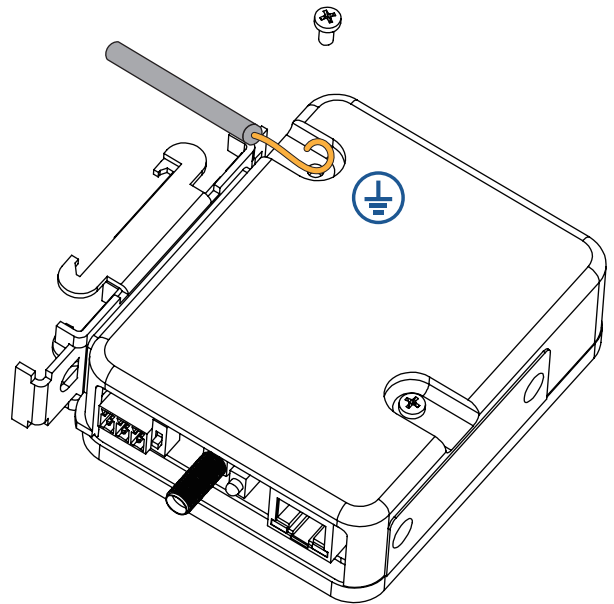


Put the parts in position in the order of a, b, c, and tighten the corresponding screws.

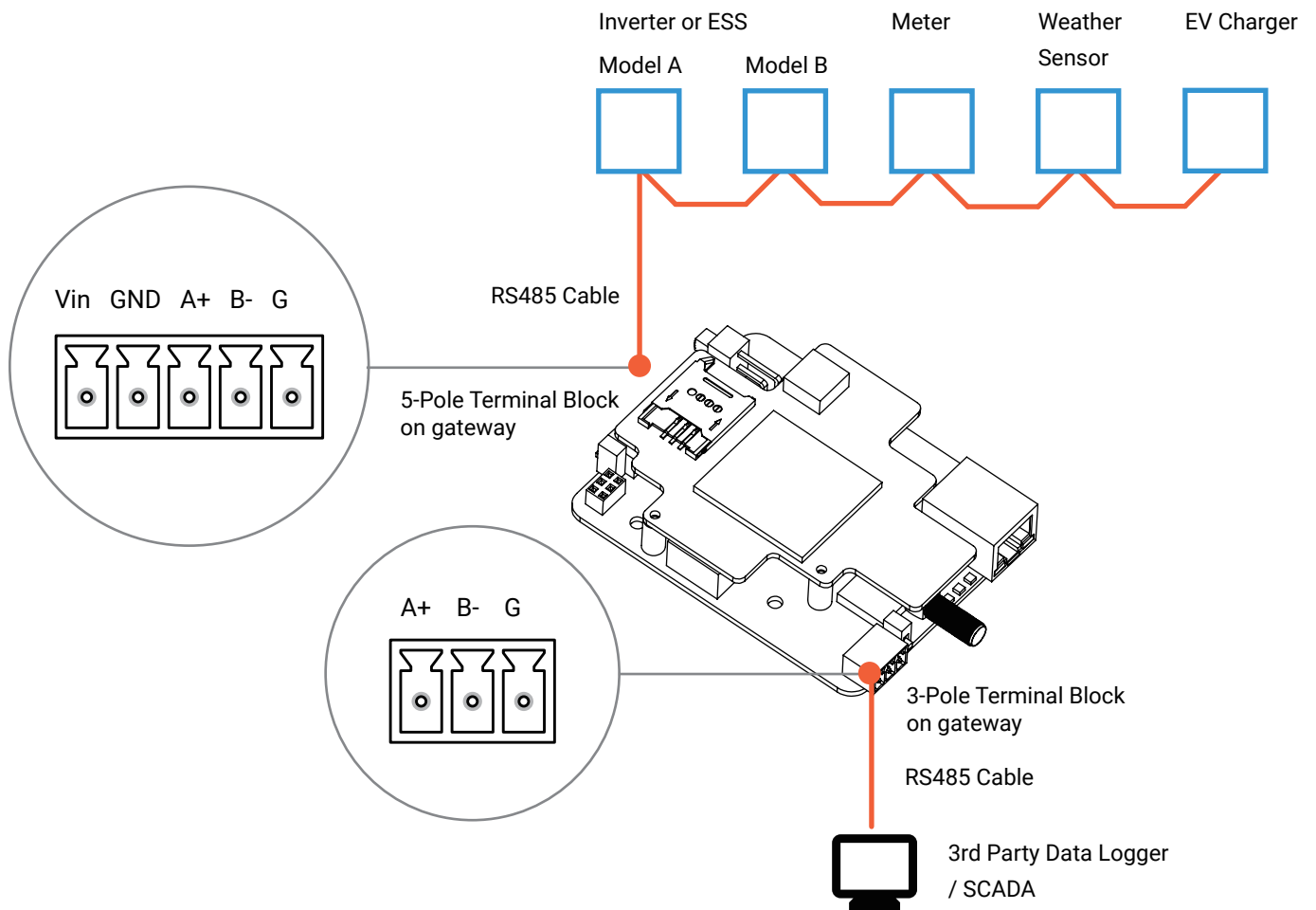
● Grounding the Unit



Clamp the ground wire into the screw at the position shown in the figure, and the gateway is grounded.



● Wiring



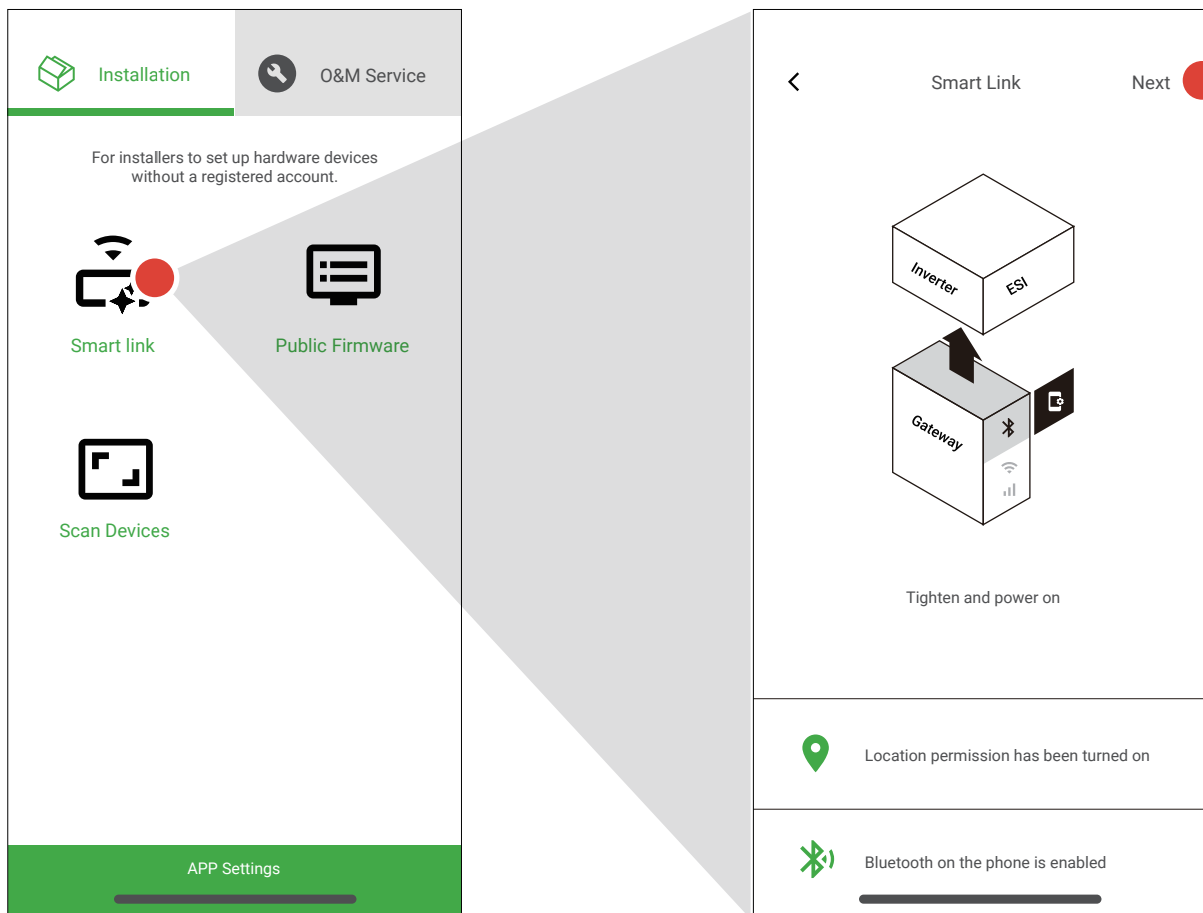
Scan the QR-code to complete APP download and installation by using the mobile phones that can access the Internet.

Or search for “YASKAWA Connect Pro” in Apple Store and Google Play.



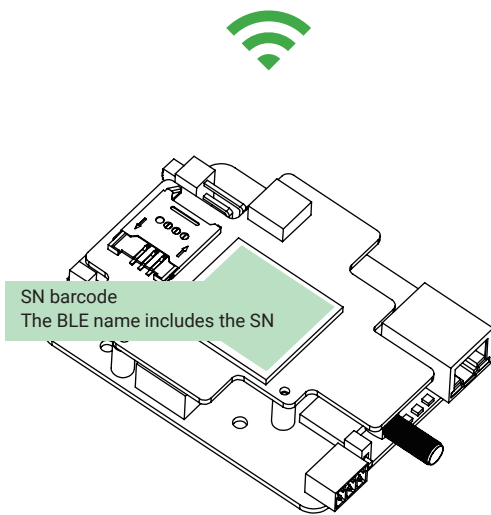
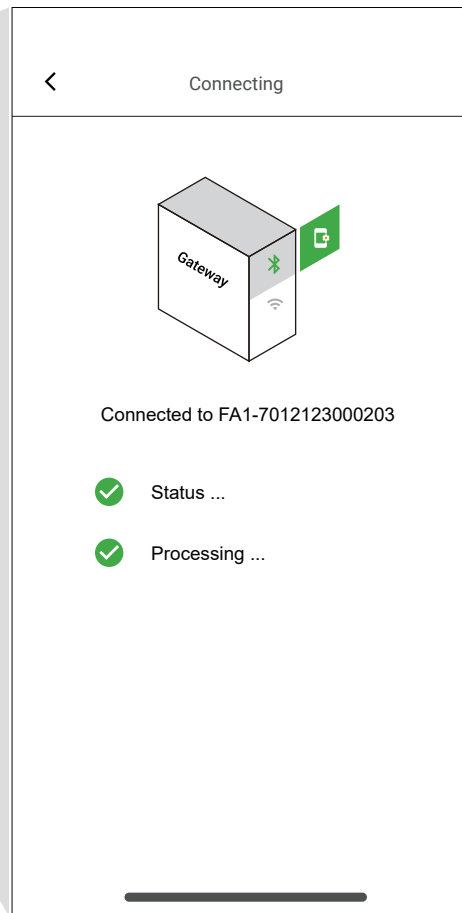
Using the APP

- Check the Internet Connection



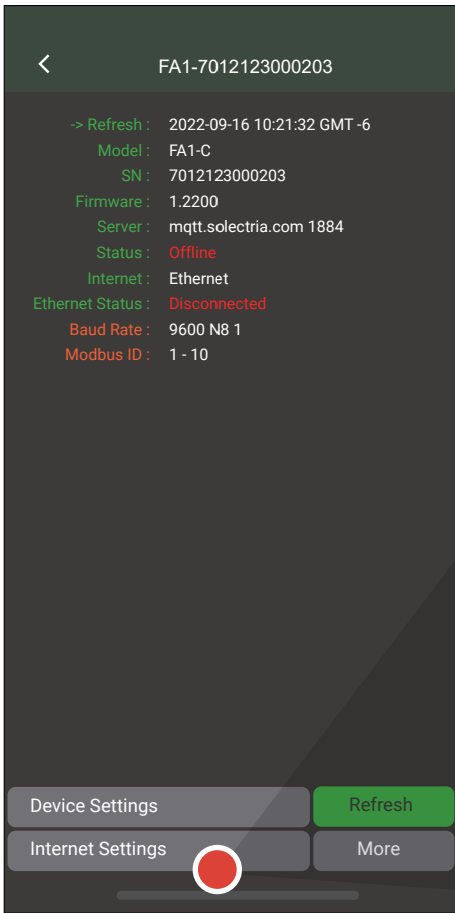
Make sure your phone can connect to the Internet when you run the app for the first time. The APP needs to sync some important data from the cloud.

Click "smart link" and the app will prompt you to obtain some phone permissions. There is no abnormal prompt, click "next" to enter.



While connecting and configuring the gateway interface, the app will inform users if there are any networking issues to address.

The gateway serial number (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.



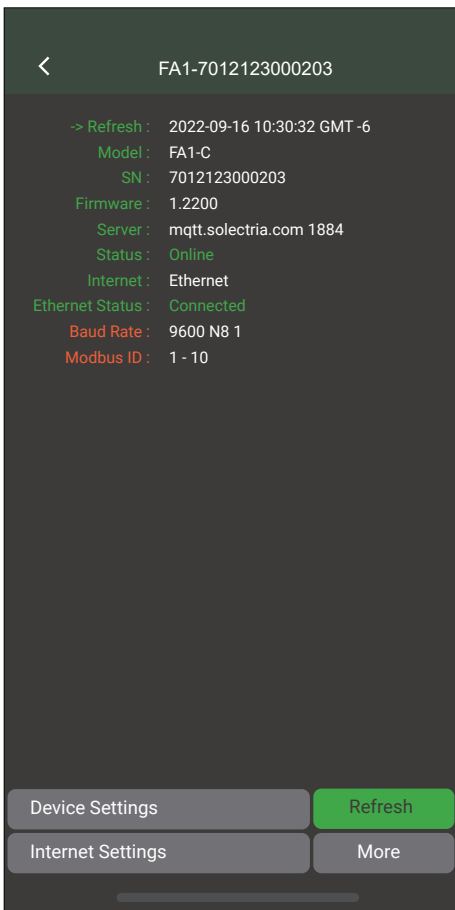
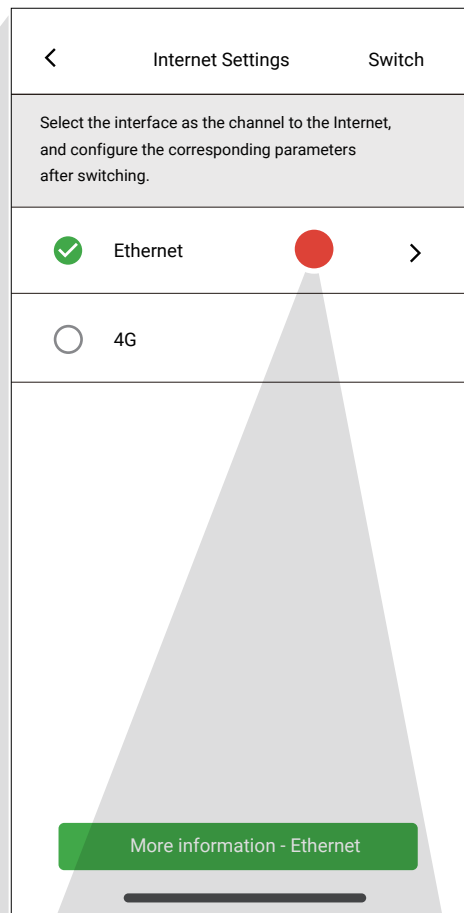
Ensuring that the gateway can connect to the Internet is the most important step.

The gateway connects to the Internet through 4G by default.

if connection to the Internet via Ethernet is desired, select "Ethernet" and press "Switch".

Enter the correct Ethernet IP information.

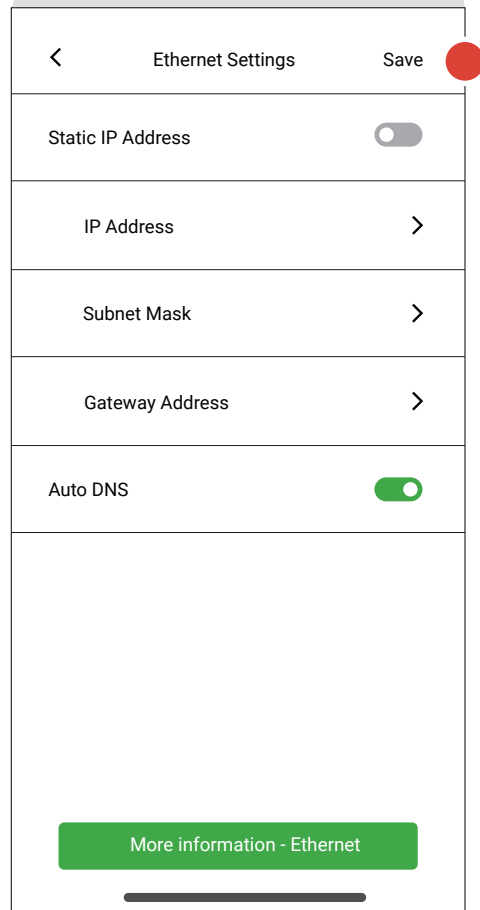
Click "Refresh" to check for updated configuration.



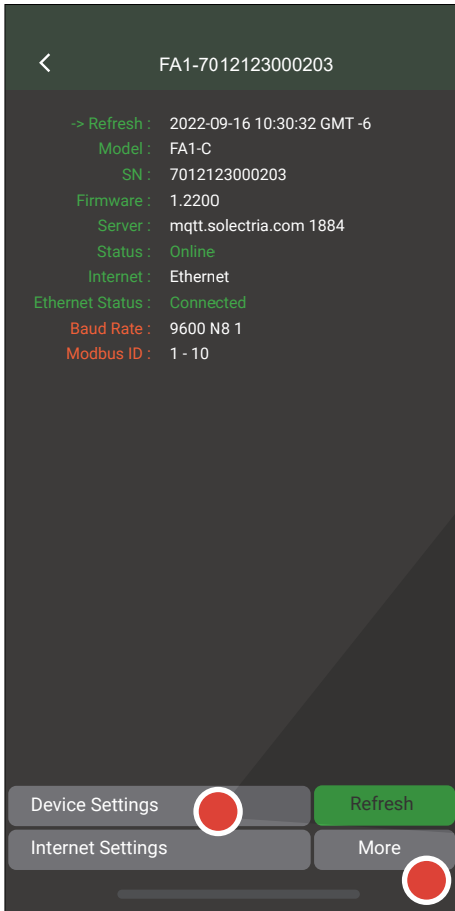
if the "Status" is "Online", the gateway is connected to the target server.

When the gateway status becomes "Online", the gateway will automatically create related objects on the portal, and the administrator can remotely set the required parameters.

In this case, it is assumed that the SIM card is inserted into the gateway.



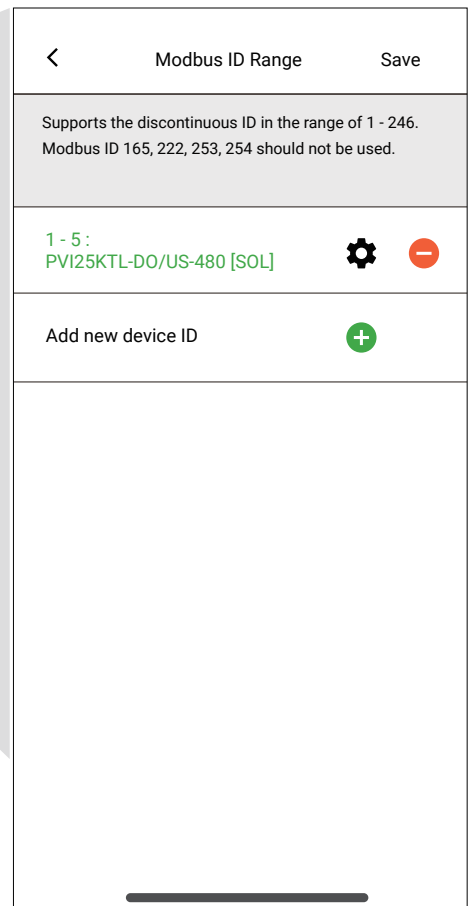
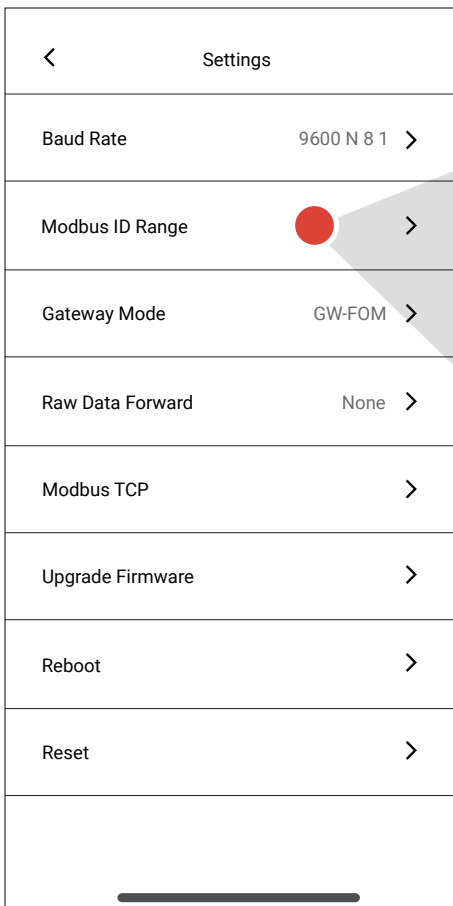
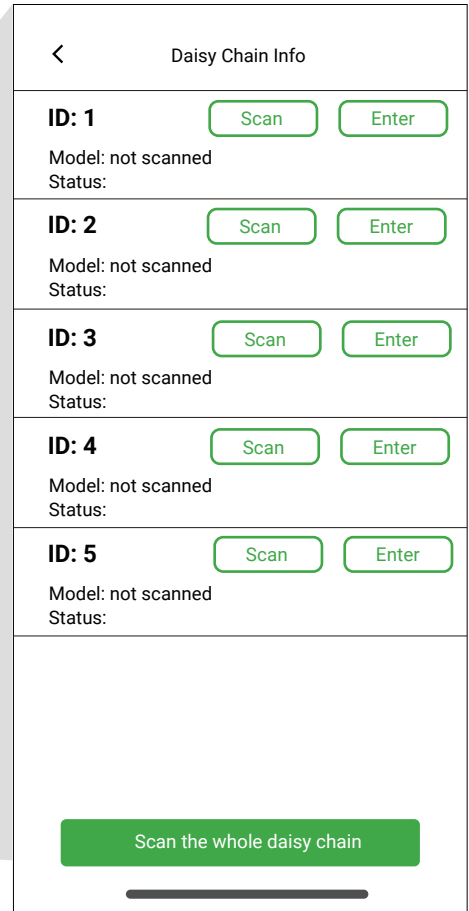
● Modbus Device Settings



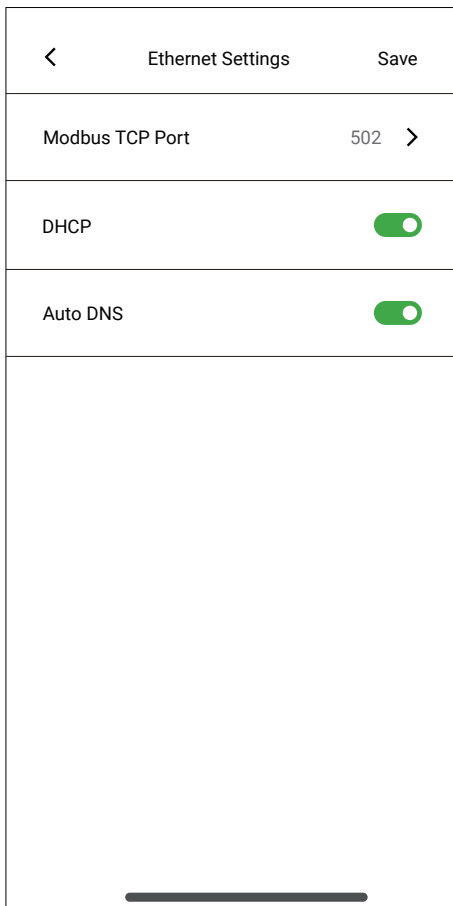
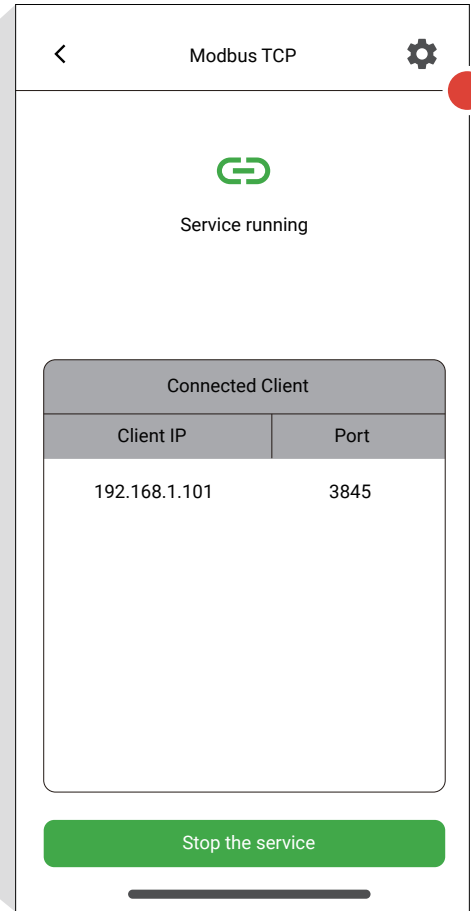
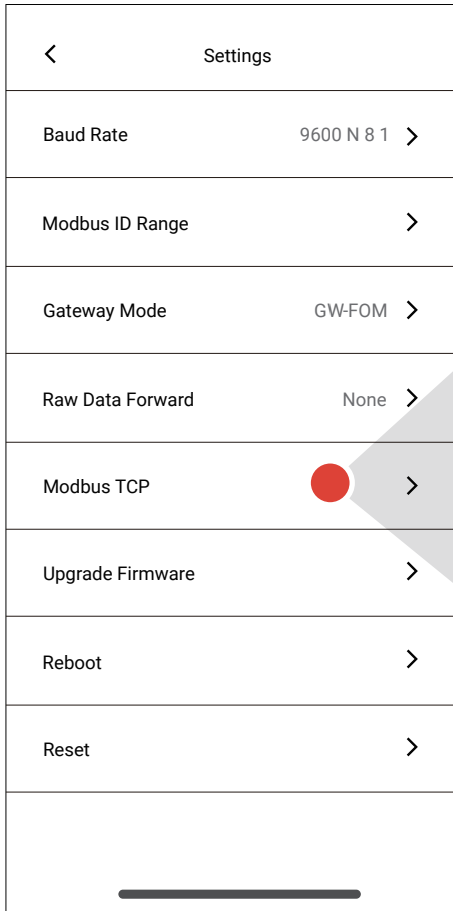
The gateway is configured with a default modbus ID range. Click on "Device settings". The gateway will scan the daisy chain and list the device list with the default IDs.

The user can either rescan the target IDs individually in the list, or scan the daisy chain in full.

By clicking "More", the user can edit the modbus ID range.



● Modbus TCP




Usually the modbus tcp client is in the same subnet as the gateway and can automatically connect to the gateway.

If an exception occurs, first check whether the two are in the same subnet, or whether the Ethernet cable is properly plugged in.

[ENC-G5 gateway](#) supports 1 Modbus TCP client.

User can change Modbus TCP settings.

● Reset / Restart

Settings	
Baud Rate	9600 N 8 1 >
Modbus ID Range	>
Gateway Mode	GW-FOM >
Raw Data Forward	None >
Modbus TCP	>
Upgrade Firmware	>
Reboot	>
Reset	 >

Click "Reset", the gateway will clear all the current setting parameters and restore the factory settings.

Click "Reboot", the gateway will automatically power off and restart without changing the current setting parameters.



Monitoring Support

Phone: (978) 683 9700, Option 5

Hours: 8:30 AM to 5:30 PM (EST) Mon-Fri

Email: monitoring@solectria.com