

solaredge SE-SGM-R12-US-S1 Communication Board For Inverters with SetApp User Guide

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Configuration Guide Communication Board for Inverters with NetApp Configuration Version 1.4

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Chapter 1: Activating, Commissioning, and Configuring the System

After the solar system is installed, it is important to activate and commission the solar system. Activation and commission of the system are performed using the inverter SetApp mobile application. During the activation and commissioning, the inverter discovers and communicates with all connected components in the solar system, such as optimizers, peripheral communication devices, and other linked inverters. When commissioning is performed, the user is required to set the grid parameters and backup Voltage information (if used). Before starting the activation and commissioning, verify that all the communication hardware is properly connected. For communication options, refer to Setting Up Communication with the Monitoring Platform on page 6. Before arriving at the site, download the SolarEdge SetApp application to your mobile device from Apple App Store or Google Play. Before activation and commissioning, download the NetApp application from:



<https://itunes.apple.com/il/app/inverter-setapp/id1381441516>



<https://play.google.com/store/apps/details?id=com.solaredge.apps.activator>

For downloading SetApp, Internet connection, one-time registration, and logging are required. No registration is required for using the NetApp. Step 1: Activating the Installation During system activation, a Wi-Fi connection is created between the mobile device and the inverter, and the system firmware is upgraded. Before activation Download, register (first time only), and login to SetApp on your mobile device. Verify that the application is updated with the latest version.

- If applicable, turn on all devices (battery, Energy Meter) connected to the inverter, so that the devices may be auto-detected.

—> **To activate the inverter:**

1. Turn on the AC circuit breaker on the main distribution panel.
2. Open SetApp and follow the on-screen instructions (scan the inverter barcode; move the ON/OFF/P switch to

P position for 2 seconds and release). NetApp creates a Wi-Fi connection, upgrades the inverter firmware, and activates the inverter.

3. When the activation is complete, do one of the following:

- Select Connect to Another Device to continue activating additional inverters.
- Select Start Commissioning for pairing and other system configurations.

Step 2: Commissioning and Configuring the Installation

This section describes how to use the NetApp menus for commissioning and configuring the inverter settings. Menus may vary in your application depending on your system type.

—> **To access the Commissioning screen:**

Do one of the following:

- During first-time installation: Upon activation completion, in the NetApp, tap Start Commissioning. If the inverter has already been activated and commissioned:
- If not already ON – turn ON AC to the inverter by turning ON the circuit breaker on the main distribution panel.
- Open SetApp and follow the on-screen instructions (scan the inverter QR code, move the ON/OFF/P switch to P position for 2 seconds, and release). The mobile device creates a Wi-Fi connection with the inverter and displays the main Commissioning screen.

Setting Country, Grid, and Language

The inverter must be configured to the proper settings in order to ensure that it complies with the country grid code and functions. Unless these settings are selected, the inverter will not start production.

1. From the Commissioning screen, select Country & Grid.
2. From the Country & Grid drop-down list, select the required option and tap Set Country & Grid.
3. If relevant, from the Language drop-down list, select your language and tap Set Language.
4. To save the information to a read-only file, tap the PDF icon (iOS) or the JPEG icon (Android) at the bottom of the screen.

Pairing

1. From the Commissioning menu, select Pairing.
2. Tap Start Pairing.
3. When Pairing Complete is displayed, the system startup process begins: Since the inverter is ON, the Power Optimizers start producing power and the inverter starts converting AC.



WARNING!

When you turn ON the inverter ON/OFF/P switch, the DC cables carry a high Voltage and the Power Optimizers no longer output a safe output. When the inverter starts converting power after the initial connection to the AC, the inverter enters Wake up mode until its working voltage is reached. This mode is indicated by the flickering green inverter LED. When working voltage is reached, the inverter enters Production mode and produces power. The steadily lit green inverter LED indicates this mode.

4. Tap OK to return to the Commissioning menu.

Communication

Communication settings can be configured only after communication connections are complete. Refer to Setting Up Communication with the Monitoring Platform on page 6. Select Monitoring Communication to configure communication with the monitoring platform.

a Select Site Communication to configure communication between multiple SolarEdge devices or external non-SolarEdge devices, such as batteries or loggers.

Power Control Power control options are detailed in the Power Control Application Note, available on the SolarEdge website at:

https://www.solaredge.com/sites/default/files/application_note_power_control_configuration.pdf.



The Grid Control option may be disabled. Enabling it opens additional options in the menu. The Energy Manager option is used for setting power export limitations, as described in the Export Limitation Application Note, available on the SolarEdge website at: https://www.solaredge.com/sites/default/files/feed-in_limitation_application_note.pdf.

Step 3: Verifying Proper Activation and Commissioning

1. Select Information and verify that the correct firmware versions are installed on each inverter.
2. Select Status and verify that the inverter is operating and producing power.
3. Verify that additional configurations were properly set by viewing the relevant Status screens.
4. Verify that the green inverter LED is steadily lit. Your SolarEdge power harvesting system is now operational.

Communication Status Indications

This screen displays the status of connection option(s): LAN, RS485, Wi-Fi, or cellular Plug-in. For each communication option, one of the following statuses is displayed:

- Connected: The inverter established a successful connection and communication with the specified server port
- NC: Not Connected
- OK: The connection to the monitoring platform is successful (should appear only if the is connected to the server)
- N/A: Not Applicable
- x of y: Number of devices connected out of all devices Temporarily displayed (with a clock  sign):
- Initializing communication
- Connecting to network
- Connecting to SolarEdge servers an Error message (with the  sign)

Chapter 2: Setting Up Communication with the Monitoring Platform

The inverter sends the following information to the monitoring platform:

- Power Optimizer information received via the DC power lines (the PV output circuit)
- Inverter information
- Information of any other connected devices This chapter describes how to set up communication between:
- The inverter and the monitoring platform through the Internet (wired/ wireless)
- Multiple inverters for a leader-follower configuration Communication setup is not required for power harvesting, however, it is needed for using the monitoring platform.



CAUTION! When connecting the communication cables, make sure that the ON/OFF/P A switch at the bottom of the inverter is turned OFF, and the AC is turned OFF. When configuring the communication parameters, make sure that the ON/OFF/P switch (and the switch of the Connection Unit if applicable) is OFF, and the AC is turned ON.

Communication Options

The following types of communication can be used to transfer the monitored information from the inverter to the monitoring platform. Only communication products offered by SolarEdge are supported.

Ethernet

Ethernet is used for a LAN connection.

RS485

RS485 is used for the connection of multiple SolarEdge devices on the same bus in a leader-follower configuration. RS485 can also be used as an interface to external devices, such as meters and third-party data loggers. For connection, instructions refer to Creating RS485 Bus Connection on page 11.

Wi-Fi

This communication option enables using a Wi-Fi connection for connecting to the monitoring platform.

The Wi-Fi access point is built into the inverter. An antenna is required and available from SolarEdge for connection to the monitoring platform.

Wireless Gateway, Wireless Repeater(s)

The Wireless Gateway collects inverter data using a dedicated Wi-Fi connection and connects to the monitoring platform with the help of a home router. Wireless Repeater(s) extend the Wi-Fi signal range between the Wireless Gateway and inverter. Wireless Gateway and Wireless Repeaters can be purchased separately from SolarEdge. For more information, refer to



<https://www.solaredge.com/sites/default/files/se-wireless-gateway-wireless-repeater-installation-guide.pdf>

Cellular

This wireless communication option enables using a cellular connection to connect one or several devices (depending on the data plan used) to the monitoring platform. The Cellular Plug-in is provided with a user manual, which should be reviewed prior to connection. Refer to



<https://www.solaredge.com/sites/default/files/se-cellular-plug-in-for-inverters-with-setapp-installation-guide.pdf>

ZigBee

This option enables wireless connection to one or several Smart Energy products, which automatically divert PV energy to home appliances. The Smart Energy ZigBee connections require a ZigBee plug-in and an external antenna, available from SolarEdge. The ZigBee Plug-in for Smart Energy is provided with an installation guide, which should be reviewed prior to connection. Refer to



<https://www.solaredge.com/sites/default/files/se-zigbee-plug-in-for-setapp-installation-guide.pdf>

The Smart Energy products are provided with an installation guide, which should be reviewed prior to connection. Refer to



<https://www.solaredge.com/products/device-control/>.

Creating an Ethernet (LAN) Connection

This communication option enables using an Ethernet connection to connect the inverter to the monitoring platform through a LAN.

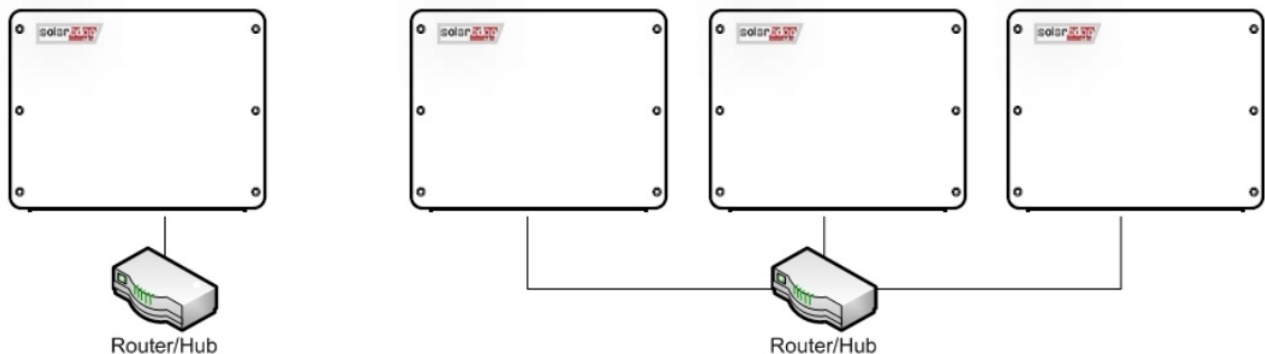


Figure 1: Example of Ethernet connection

Ethernet cable specifications:

- Cable type — a shielded CAT6 Ethernet cable

- Maximum distance between the inverter and the router — 100 m/ 330 ft.



NOTE

If using a cable longer than 10 m / 33 ft in areas where there is a risk of induced voltage surges by lightning, it is recommended to use external surge protection devices. For details refer to:



<http://www.solaredge.com/files/pdfs/lightning-surge-protection.pdf>.

-> To connect the Ethernet cable:

1. Remove the inverter cover as described above.
2. Open Communication Gland 1.



CAUTION! The gland includes a rubber waterproof fitting, which should be used to ensure proper sealing.

3. Remove the plastic seal from one of the large openings.
4. Remove the rubber fitting from the gland and insert the CAT6 cable through the gland and through the grand opening in the inverter.
5. Push the cable into the cut opening of the rubber fitting.

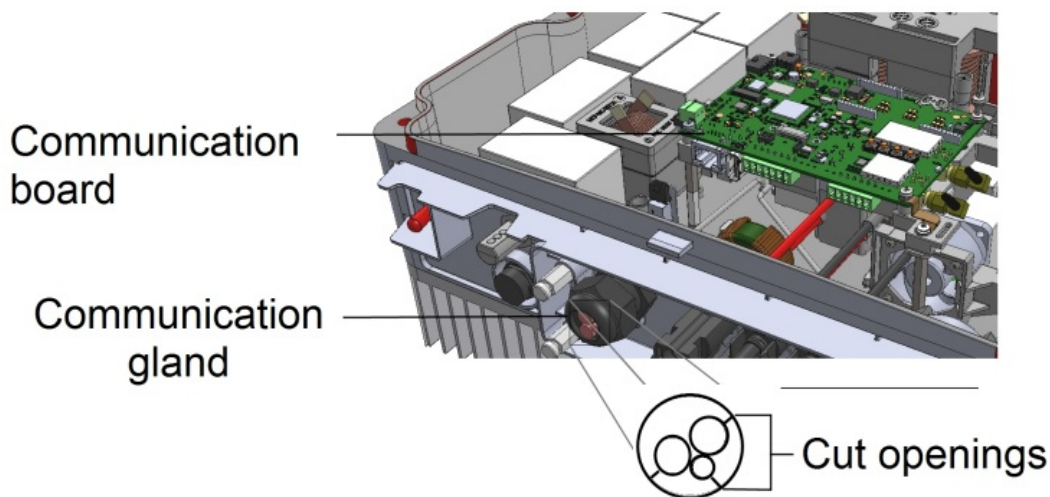


Figure 2: Communication gland and rubber fitting

CAT6 standard cables have eight wires (four twisted pairs), as shown in the diagram below. Wire colors may differ from one cable to another. You can use either wiring standard, as long as both sides of the cable have the same pin-out and color-coding.

R145 Pin #	Wire Color ⁽¹⁾		10Base-T Signal 100Base-TX Signal
	T568B	T568A	
1	White/Orange	White/Green	Transmit+
2	Orange	Green	Transmit-
3	White/Green	White/Orange	Receive+
4	Blue	Blue	Reserved
5	White/Blue	White/Blue	Reserved
6	Green	Orange	Received-
1 7	White/Brown	White/Brown	Reserved
8	Brown	Brown	Reserved

(¹)The inverter connection does not support RX/TX polarity change. Supporting crossover Ethernet cables depends on the switch capabilities.

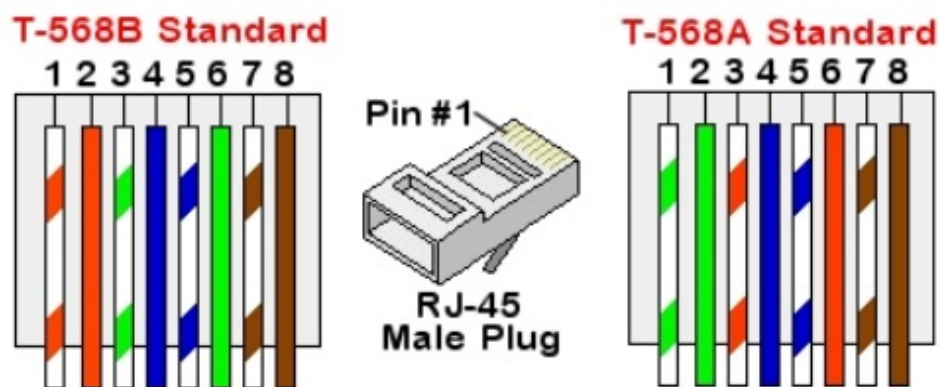


Figure 3: Standard cable wiring

6. Use a pre-terminated cable to connect via Communication Gland 1 to the RJ45 plug on the inverter's communication board or, if using a spool of cable, connect as follows:
 - a. Insert the cable through the gland.
 - b. Remove the cable's external insulation using a crimping tool or cable cutter and expose eight wires.
 - c. Insert the eight wires into an RJ45 connector (see Figure 3).
 - d. Use a crimping tool to crimp the connector.
 - e. Connect the Ethernet connector to the RJ45 port on the communication board (see Figure 2).

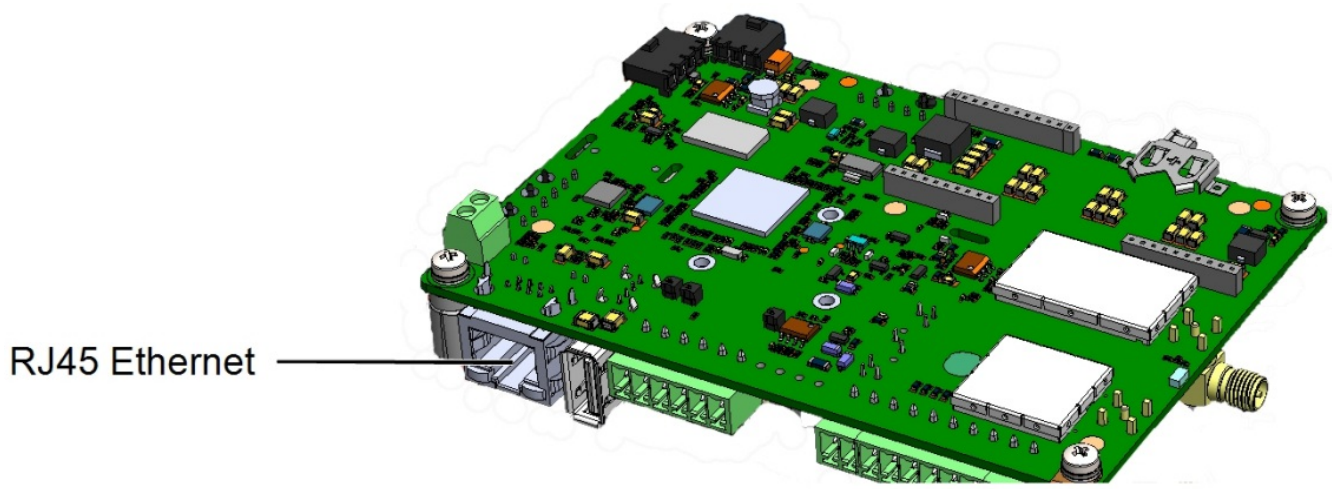


Figure 4: The RJ45 Ethernet connection

7. For the switch/router side, use a pre-crimped cable or use a crimper to prepare an RJ45 communication connector: Insert the eight wires into the RJ45 connector in the same order as above (see Figure 3).
8. Connect the cable RJ45 connector to the RJ45 port of the Ethernet switch or router. You can connect more than one inverter to the same switch/router or to different switches/routers, as needed. Each inverter sends its monitored data independently to the SolarEdge monitoring platform.
9. The inverter is configured by default to LAN. If reconfiguration is required:
 - a. Make sure the ON/OFF/P switch is OFF.
 - b. Turn ON the AC to the inverter by turning ON the circuit breaker on the main distribution panel.
 - c. Configure the connection as described in Communication on page 4.

NOTE

If your network has a firewall, you may need to configure it to enable the connection to the following address:

Destination Address: prodssl.solaredge.com TCP Port: 443 (for incoming and outgoing data)

10. Verify the connection, as described in Verifying the Connection on page 14.

Creating RS485 Bus Connection

The RS485 option enables creating a bus of connected inverters, consisting of up to 31 follower inverters and 1 leader inverter. Using this option, inverters are connected to each other in a bus (chain), via their RS485 connectors. The first and last inverters in the chain must be terminated as described on page 13.

RS485 wiring specifications:

- Cable type: CAT6 and higher with shielding protection of the twisted pairs of wires and an outer foil or braided shielding
- Wire cross-section area: 0.2- 1mm²
- Maximum nodes: 32
- Maximum distance between first and last devices: 1000m.



NOTE If using a cable longer than 10 m/33 ft in areas where there is a risk of induced voltage surges by lightning, it is recommended to use external surge protection devices. For details refer to:



https://www.solaredge.com/sites/default/files/lightning_surge_protection.pdf.



If grounded metal conduits are used for routing the communication wires, a lightning protection device is not required. If not using surge protection, connect the grounding wire to the first inverter in the RS485 chain; make sure the grounding wire is not in contact with other wires. For inverters with a Connection Unit, connect the grounding wire to the grounding bus bar in the Connection Unit.

The following sections describe how to physically connect the RS485 bus and how to configure the bus.

To connect the RS485 communication bus:

1. Remove the inverter cover, as described above.
2. Open Communication Gland and insert the cable through one of the openings.
3. Remove the connector, as shown below.

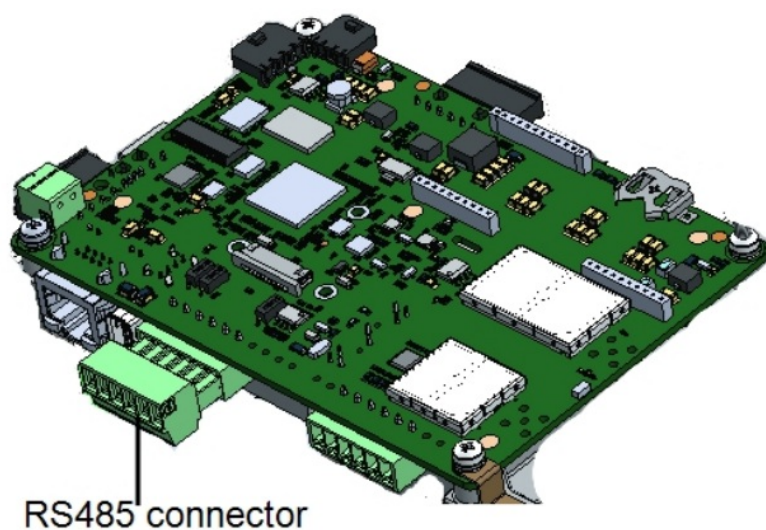


Figure 5: RS485 connector on the communication board

4. Loosen the screws of pins A(+), B(-), and G on the left of the RS485 connector (RS485-1).

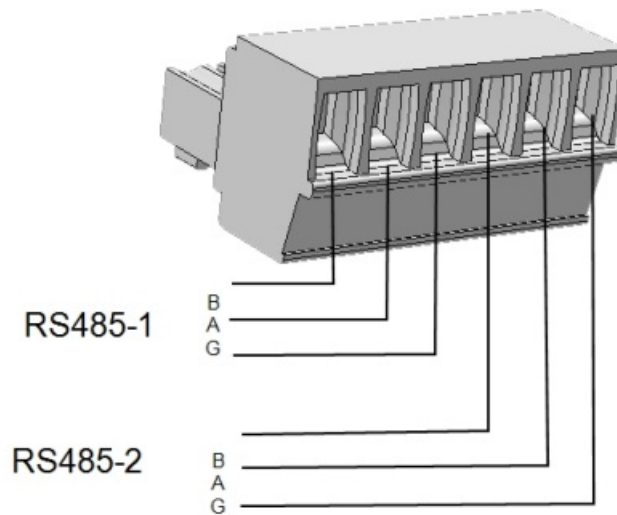
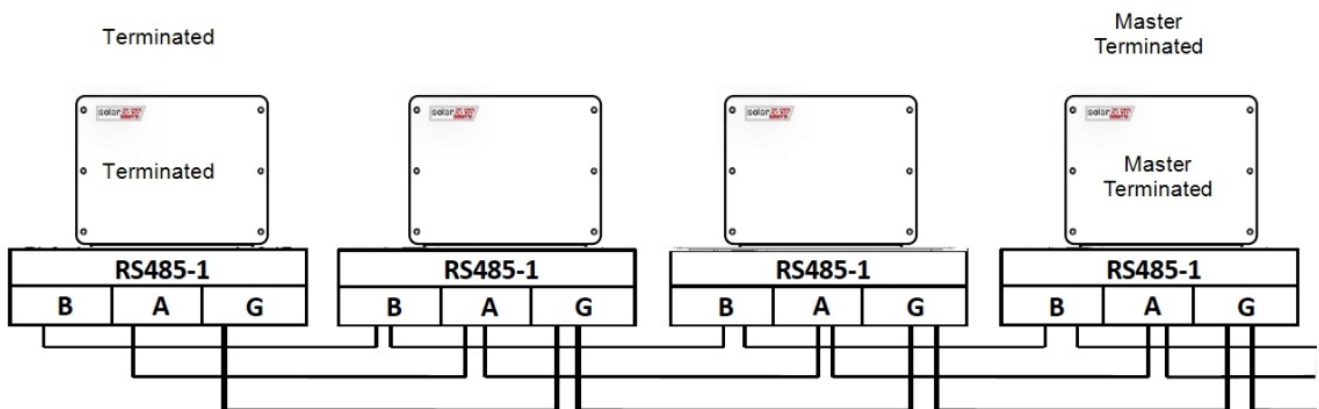


Figure 6: RS485 connector

5. Insert the wire ends into the B, A, and G openings on the connector. You can use any color wire for each of the B, A, and G connections as long as:
 The same color wire is used for all A pins the same color for all B pins and the same color for all G pins
 The wire for G is not from the same twisted pair as A or B.
6. For creating an RS485 bus, connect all B, A and G pins in all inverters.



NOTE Do not cross-connect B, A and G wires.

7. Tighten the connector screws.
8. Check that the wires are fully inserted and cannot be pulled out easily.
9. Connect the RS485 connector to the RS485 port on the communication board.
10. Terminate the first and last SolarEdge inverter in the chain. The inverter can be terminated by switching on (up) the left DIP switch on the communication board.

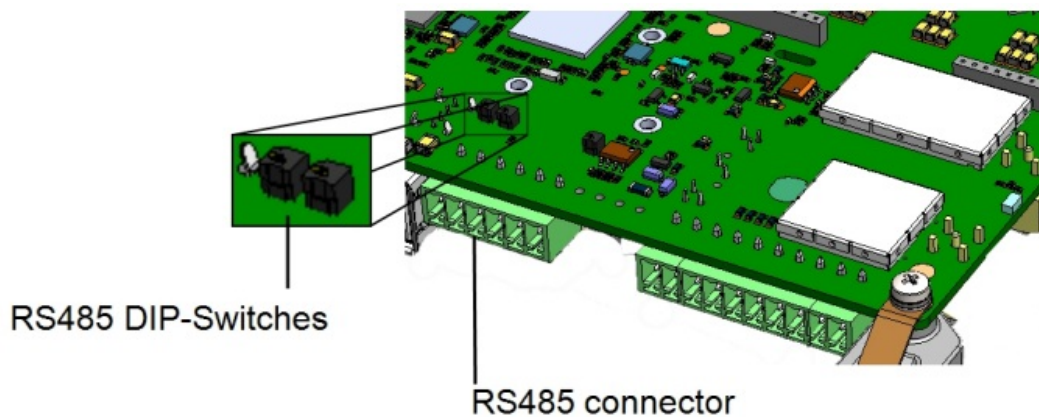


Figure 7: RS485 termination switch



NOTE Only the first and last SolarEdge inverter in the chain must be terminated. In the other inverters in the chain, the DIP switch must be in the off (down) position.

11. If no surge protection is used, connect the grounding wire to the first inverter in the RS485 chain; make sure the grounding wire is not in contact with other wires. For inverters with a Connection Unit, connect the grounding wire to the grounding busbar in the Connection Unit.

RS485 Bus Configuration

To connect to the monitoring platform:

1. Designate a single inverter as the connection point between the RS485 bus and the monitoring platform. This inverter will serve as the leader inverter.
2. Connect the leader to the monitoring platform using Ethernet (refer to Creating an Ethernet (LAN) Connection above).

To configure the RS485 bus:

All inverters are configured by default as followers. To configure the leader:

1. Make sure the inverter's ON/OFF/P switch is off.
2. Make sure that the AC circuit breaker on the main distribution panel is on.
3. Access NetApp, as described in Communication on page 4.
4. From the Commissioning screen, select Site Communication > RS485- > Protocol > SolarEdge > SolarEdge Leader.
5. Return to the RS485- screen and select Follower Detect.

The system starts automatic detection of the follower inverters connected to the leader inverter. The inverter should report the correct number of followers. If it does not, verify the connections and terminations in all inverters in the chain.

6. To check the follower IDs and last communication time, select RS485- > Follower List.
7. Verify the connection of the leader to the monitoring platform, as described below.

Verifying the Connection

After connecting and configuring a communication option, perform the following steps to check that the connection to the monitoring platform has been successfully established.

1. Commission the inverter as described in “Activating, Commissioning and Configuring the System” on pages 1.
2. Access SetApp and select Status from the Configuring screen.
3. In the Summary section, under Server Comm., make sure S_OK is displayed together with the selected communication option.
4. Scroll down to the Communication section and check that the communication options are as required.

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



CAUTION! Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FOR MOBILE DEVICE USAGE (>20cm/low power)

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 20cm between the radiator & your body.

FOR COUNTRY-CODE SELECTION USAGE (WLAN DEVICES)



NOTE The country code selection is for non-US models only and is not available to all US models. Per FCC regulation, all WiFi products marketed in the US must be fixed to Communication Board for Inverters with NetApp Configuration

Federal Communication Commission Interference Statement

US operation channels only.

This device is intended only for OEM integrators under the following conditions:

- The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- The transmitter module may not be co-located with any other transmitter or antenna.
- Module approval valid only when the module is installed in the tested host or compatible series of hosts which have similar RF exposure characteristics with equal or larger antenna separation distance.



IMPORTANT NOTE

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

FOR MOBILE DEVICE USAGE (>20cm/low power) This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: 2AGPT-PLNX2". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End-User

The OEM integrator has to be aware not to provide information to the end-user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end-user manual shall include all required regulatory information/warning as shown in this manual.

Installation Personnel

This product is designed for specific applications and needs to be installed by qualified personnel who have RF and related rule knowledge. The general user shall not attempt to install or change the setting.

List of Applicable FCC Rules

This module has been tested for compliance with FCC Part **15C**.

Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance with this portion of rule requirements if applicable. As long as all conditions above are met, further transmitter tests will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Industry Canada statement

This device complies with ISED's license-exempt RSS. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FOR MOBILE DEVICE USAGE (>20cm/low power)

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. This device is intended only for OEM integrators under the following conditions: (For module device use)

1. The antenna must be installed such that 20 cm is maintained between the antenna and users.
2. The transmitter module may not be co-located with any other transmitter or antenna.
3. Module approval is valid only when the module is installed in the tested host or compatible series of hosts which have similar RF exposure characteristics with equal or larger antenna separation distance. As long as the 3 conditions above are met, further transmitter tests will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.



IMPORTANT NOTE

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with

another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

End Product Labeling FOR MOBILE DEVICE USAGE (>20cm/low power)

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains IC: 20916PLNX2”.

Manual Information

To the End User, The OEM integrator has to be aware not to provide information to the end-user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module. The end-user manual shall include all required regulatory information/warning as shown in this manual.

DETACHABLE ANTENNA USAGE

This radio transmitter (IC: 20916-PLNX2/ Model: 2AGPT-PLNX2) has been approved by ISED to operate with the antenna type listed below with maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Approved antenna(s) list

Type	Gain	Impedance	Brand	Manufacturer
Chip antenna	0.5dBi	50 Ohm	AUX	AUX
Dipole	5dBi	50 Ohm	SolarEdge	SolarEdge

Communication Board for Inverters with NetApp Configuration

Documents / Resources

	solaredge SE-SGM-R12-US-S1 Communication Board For Inverters with SetApp [pdf] User Guide PLNX2, 2AGPT-PLNX2, 2AGPTPLNX2, SE-SGM-R12-US-S1 Communication Board For Inverters with SetApp, Communication Board For Inverters with SetApp
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