
 Petition of PPL Electric |
 Utilities Corporation | Docket No.:
 for Approval of its Second | P-2024-3049223
 Distributed Energy |
 Resources Management Plan |
 |
 Call-In Telephonic |
Evidentiary Hearing

Pages 263 - 498

Judge's Chambers
 Commonwealth Keystone
 Building - Plaza Level
 400 North Street
 Harrisburg, PA

February 12, 2025
 Commencing at 10:07 a.m.

INDEX TO EXHIBITS

Docket No. P-2024-3049223

Hearing Date: February 12, 2025

<u>NUMBER</u>		<u>FOR IDENTIFICATION</u>	<u>IN EVIDENCE</u>
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JSP Hearing Exhibit:

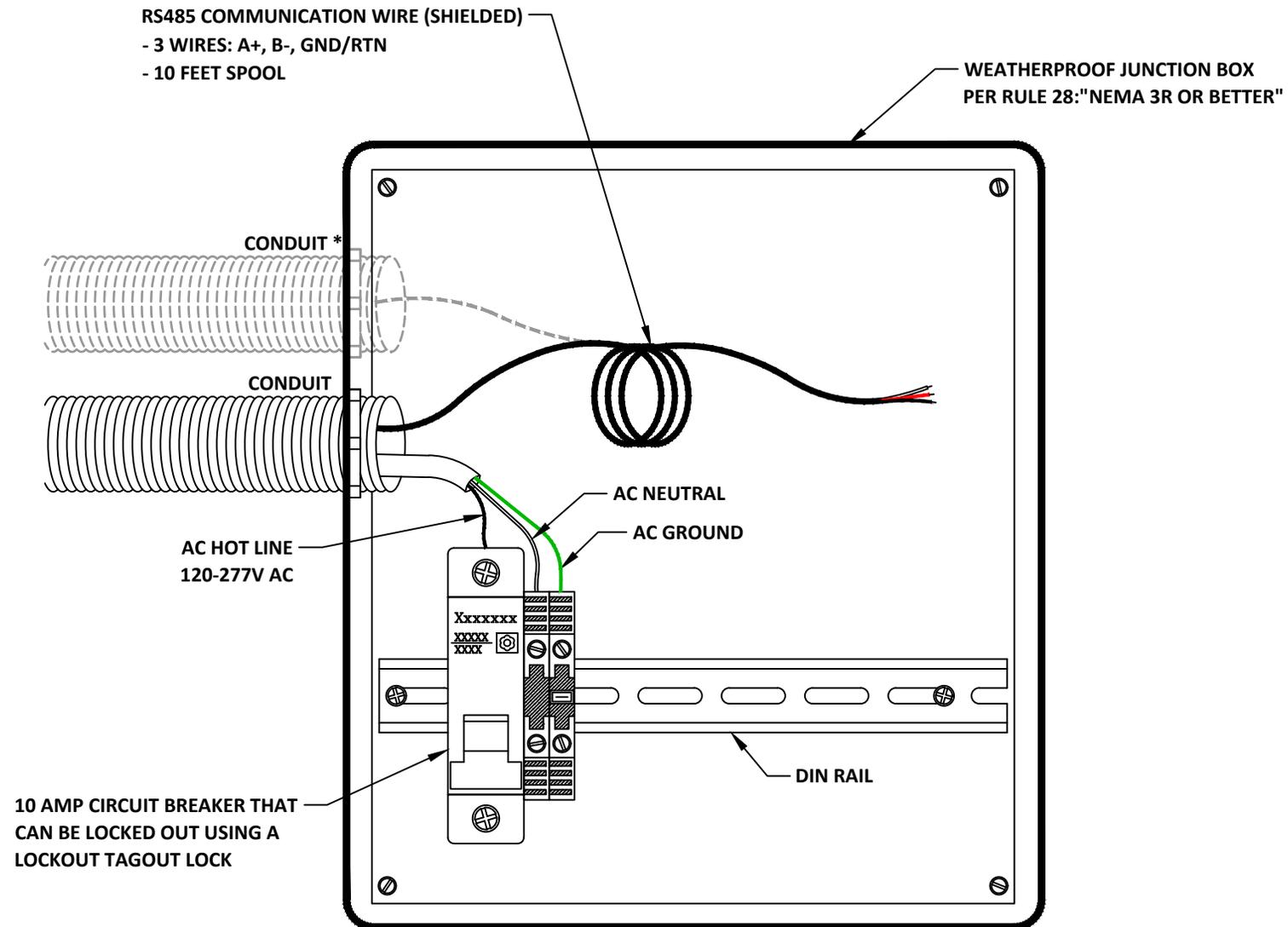
1	(PDF)	303	304
2	(Attachments 1	384	385
	Through 4)		

PPL Exhibit:

3 (Discovery Response) 462

463

FOR MODBUS-OVER-RS485 JUNCTION BOXES



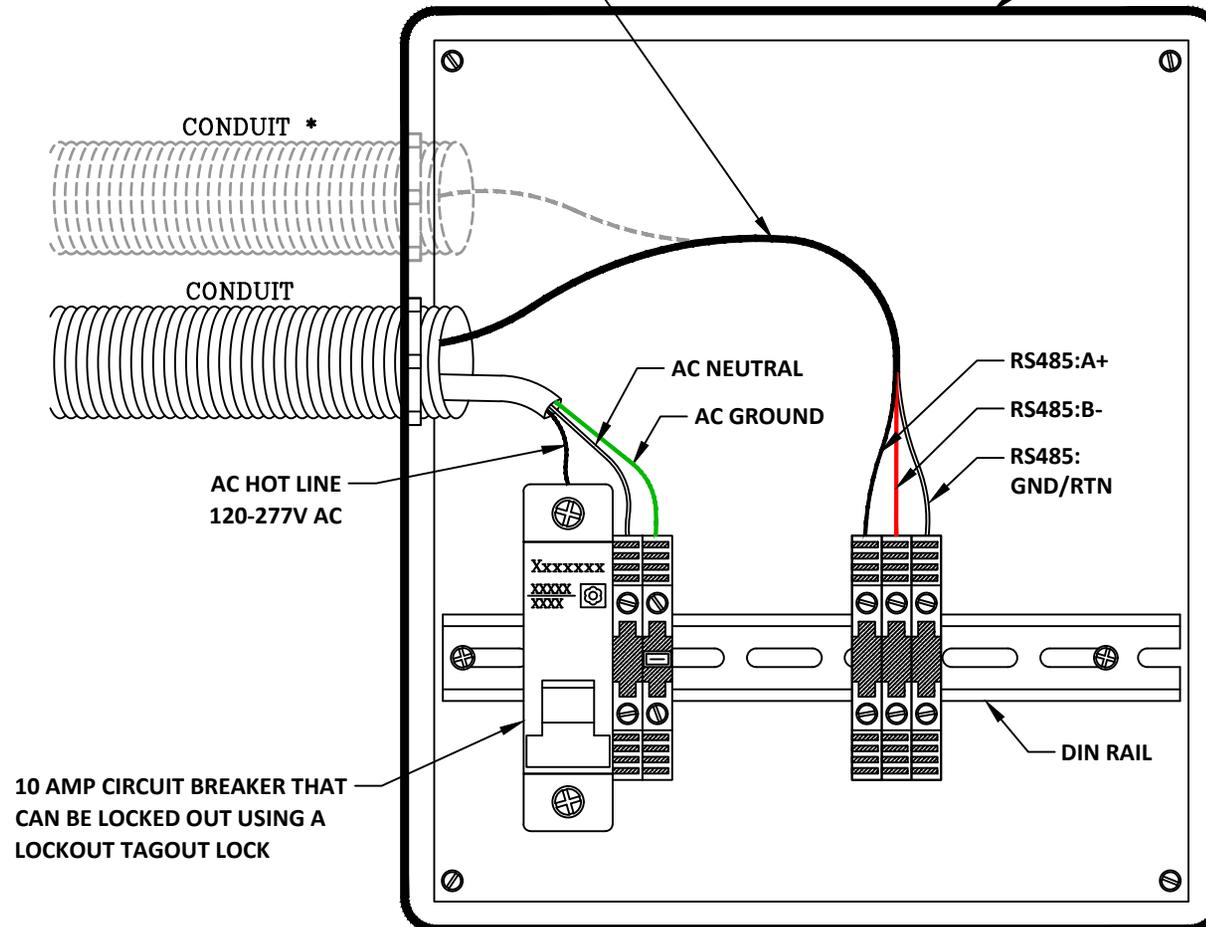
*** NOTE, PER THE NEC:**
IF LINE-TO-GROUND VOLTAGE IS 150V OR LESS, THE POWER CABLE AND COMMUNICATION CABLE CAN BE RUN IN THE SAME CONDUIT. OTHERWISE, THE POWER CABLE AND COMMUNICATION CABLE MUST BE RUN IN SEPARATE CONDUITS.

FOR MODBUS-OVER-RS485 JUNCTION BOXES

RS485 COMMUNICATION WIRE (SHIELDED)

- 3 WIRES: A+, B-, GND/RTN
- TERMINATED INTO PASS-THROUGH TERMINAL BLOCKS

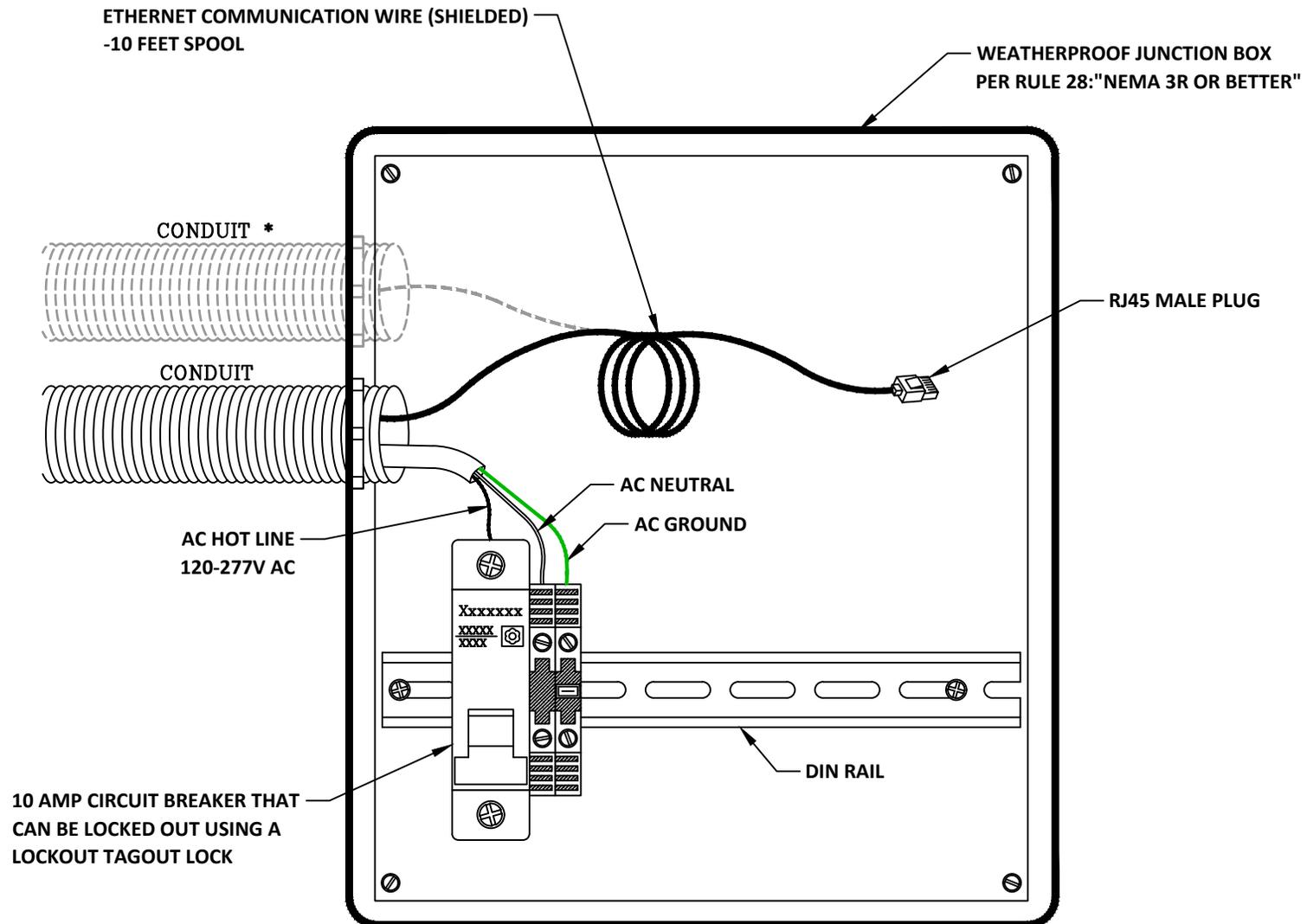
WEATHERPROOF JUNCTION BOX
PER RULE 28: "NEMA 3R OR BETTER"



* NOTE, PER THE NEC:

IF LINE-TO-GROUND VOLTAGE IS 150V OR LESS, THE POWER CABLE AND COMMUNICATION CABLE CAN BE RUN IN THE SAME CONDUIT. OTHERWISE, THE POWER CABLE AND COMMUNICATION CABLE MUST BE RUN IN SEPARATE CONDUITS.

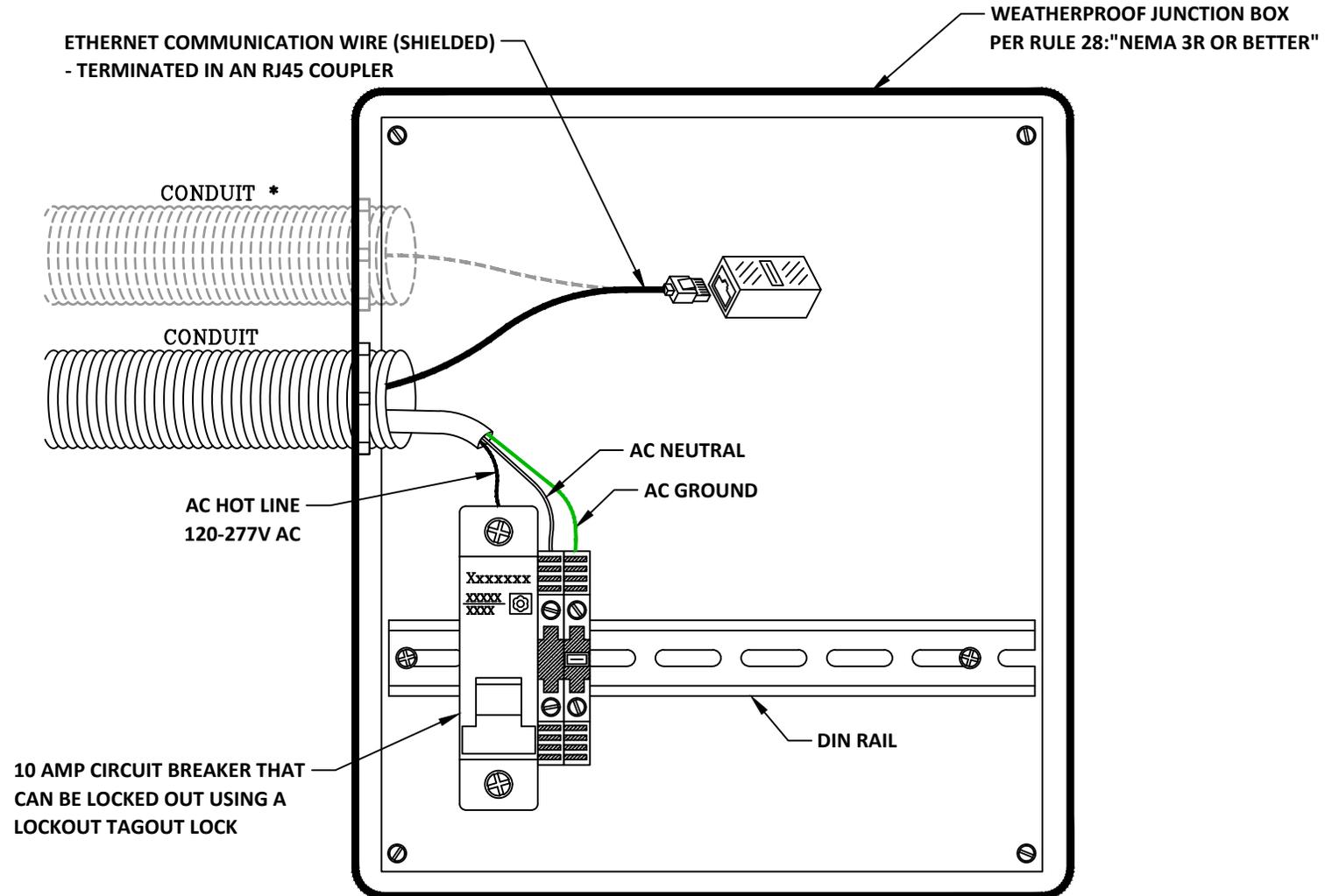
FOR MODBUS-OVER-ETHERNET OR IEEE 2030.5 JUNCTION BOXES



* NOTE, PER THE NEC:

IF LINE-TO-GROUND VOLTAGE IS 150V OR LESS, THE POWER CABLE AND COMMUNICATION CABLE CAN BE RUN IN THE SAME CONDUIT. OTHERWISE, THE POWER CABLE AND COMMUNICATION CABLE MUST BE RUN IN SEPARATE CONDUITS.

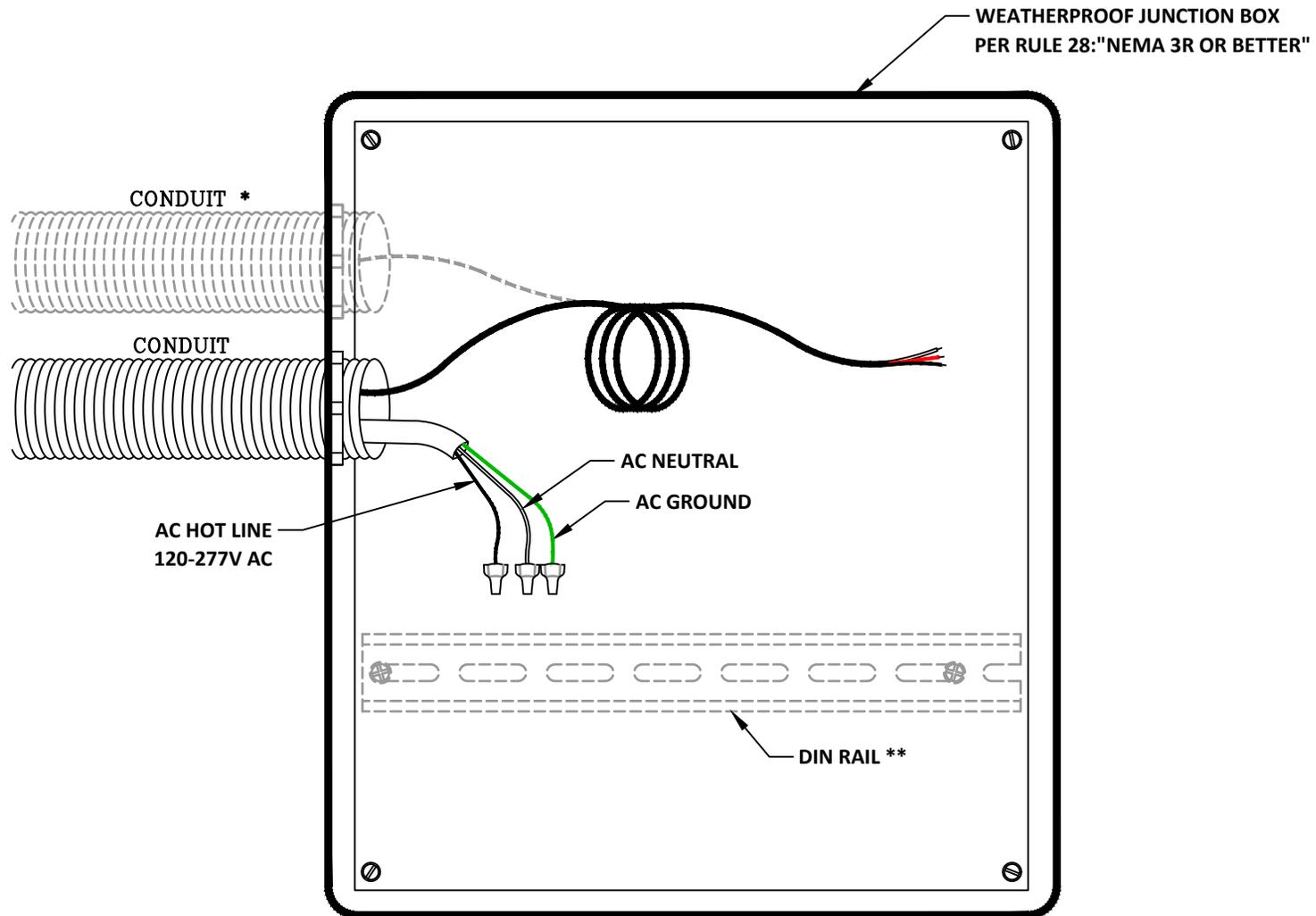
FOR MODBUS-OVER-ETHERNET OR IEEE 2030.5 JUNCTION BOXES



*** NOTE, PER THE NEC:**

IF LINE-TO-GROUND VOLTAGE IS 150V OR LESS, THE POWER CABLE AND COMMUNICATION CABLE CAN BE RUN IN THE SAME CONDUIT. OTHERWISE, THE POWER CABLE AND COMMUNICATION CABLE MUST BE RUN IN SEPARATE CONDUITS.

IF AC SOURCE CAN BE DE-ENERGIZED VIA THE GENERATOR ISOLATION DEVICE (THE AC DISCONNECT)



*** NOTE, PER THE NEC:**

IF LINE-TO-GROUND VOLTAGE IS 150V OR LESS, THE POWER CABLE AND COMMUNICATION CABLE CAN BE RUN IN THE SAME CONDUIT. OTHERWISE, THE POWER CABLE AND COMMUNICATION CABLE MUST BE RUN IN SEPARATE CONDUITS.

**** IF AC SOURCE CAN BE DE-ENERGIZED VIA THE GENERATOR ISOLATION DEVICE (THE AC DISCONNECT), INSTALLING DIN RAIL AND POWER TERMINAL BLOCKS IS NOT NECESSARY. SAFELY TERMINATE EACH OF THE THREE AC POWER WIRES (L, N, AND G) (E.G., USING WIRE NUTS OR WAGO LEVER NUTS).**



If you have technical queries concerning our products,
please contact our support through SolarEdge service portal:
<http://www.solaredge.com/groups/support/services>

North America	(Toll free) 1877 360 529 2
Australia	(Toll free) 1800 46 55 67
Germany	089 454 597 30
France	(Toll free) 0800 917 410
Italy	(Toll free) 800 784 824
Japan	(Toll free) 81 03 6262 1223
United Kingdom	(Toll free) 0800 028 1183
Belgium	(Toll free) 0800 730 41
Israel	073 240 311 8
Rest of world	972 (0) 73 240 311 8
Fax	972 (0) 73 240 311 7
Email to:	support@solaredge.com

www.solaredge.com



MAN-01-00365 -1.0

Control & Communication Gateway

with GSM Modem Support

Version 1.0

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Disclaimers

Important Notice

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Patent marking notice: see <http://www.solaredge.com/patent>

The general terms and conditions of delivery of SolarEdge shall apply.

The content of these documents is continually reviewed and amended, where necessary. However, discrepancies cannot be excluded. No guarantee is made for the completeness of these documents.

The images contained in this document are for illustrative purposes only and may vary depending on product models.

Emission Compliance

This equipment has been tested and found to comply with the limits applied by the local regulations. 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, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

Support and Contact Information

If you have technical problems concerning SolarEdge products, please contact us:

Country	Phone	E-Mail
Australia (+61)	1800 465 567	support@solaredge.net.au
APAC (Asia Pacific)(+972)	073 240 3118	support-asia@solaredge.com
China (+86)	21 6212 5536	support_china@solaredge.com
DACH & Rest of Europe (+49)	089 454 59730	support@solaredge.de
France and Belgium (+33)	0800 917410	support@solaredge.fr
Italy (+39)	0422 053700	support@solaredge.it
Japan (+81)	03 6262 1223	support@solaredge.jp
Netherlands (+31)	0800 0221 089	support@solaredge.nl
New Zealand (+64)	0800 144 875	support@solaredge.net.au
US & Canada (+1)	510 498 3200	ussupport@solaredge.com
United Kingdom (+44)	0800 028 1183	support-uk@solaredge.com
Greece (+30)	0800 125574	support@solaredge.com
Middle East & Africa (+972)	073 240 3118	
South Africa (+27)	0800 982 659	
Turkey (+90)	216 706 1929	
Worldwide (+972)	073 240 3118	

Before contact, make sure to have the following information at hand:

- Model and serial number of the product in question.
- The error indicated on the inverter screen or on the SolarEdge monitoring platform, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The software version as appears in the ID status screen.

HANDLING AND SAFETY INSTRUCTIONS

During installation, testing and inspection, adherence to all the handling and safety instructions is mandatory. **Failure to do so may result in injury or loss of life and damage to the equipment.**

Safety Information

The following safety symbols are used in this document. Familiarize yourself with the symbols and their meaning before installing or operating the system.



WARNING!

Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **injury or loss of life**. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.



CAUTION!

Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **damage or destruction of the product**. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.



NOTE

Denotes additional information about the current subject.



IMPORTANT SAFETY FEATURE

Denotes information about safety issues.

Disposal requirements under the Waste Electrical and Electronic Equipment (WEEE) regulations:



NOTE

Discard this product according to local regulations or send it back to SolarEdge.

About This Guide

This user guide is intended for Photovoltaic (PV) system owners, installers, technicians, maintainers and integrators who use the SolarEdge power harvesting system.

This guide describes the process of installing and configuring the SolarEdge Control and Communication gateway (also referred to as SolarEdge gateway).

This guide assumes that the SolarEdge power harvesting system is already installed and commissioned. For additional information about how to install and commission the SolarEdge power harvesting system, refer to the relevant inverter or safety and monitoring system (SMI) installation guide.

The guide includes the following chapters:

- *Introducing the SolarEdge Control and Communication Gateway (CCG)* on page 7, describes the SolarEdge control and communication gateway.
- *Chapter 2: Installing the Control and Communication Gateway* on page 10, describes how to install the SolarEdge gateway.
- *Chapter 3: LCD – Status Screens and Setup Options* on page 30 describes how to configure the SolarEdge gateway and how to identify its status.
- *Chapter 4: Connecting the SolarEdge CCG to the SolarEdge Installation* on page 13, describes how to connect the control and communication gateway to inverters or Safety and Monitoring Interface (SMI) using the RS485 bus connection.
- *Chapter 5: Connecting Environmental Sensors (Optional)* on page 20, describes how to connect and configure external environmental sensors to the SolarEdge gateway.
- *Chapter 6: Setting Up Monitoring through the CCG (Optional)* on page 39, describes how to set up communication through the SolarEdge gateway to the SolarEdge monitoring platform.
- *Appendix A: "Mounting the ZigBee Card in the CCG"* on page 45
- *Appendix B: "Inserting the GSM Modem in the CCG"* on page 46
- *Appendix C: Errors and Troubleshooting* on page 50, describes the error messages that appear on the LCD panel when an error occurs, and how to troubleshoot them.
- *Appendix D: Technical Specifications* on page 53, provides the electrical and mechanical specifications of the SolarEdge gateway device.

For further information, datasheets and the most up-to-date certifications for various products in different countries, please visit the SolarEdge website: www.solaredge.com.

Chapter 3: Introducing the SolarEdge Control and Communication Gateway (CCG)

Overview

The SolarEdge control and communication gateway (CCG) expands the SolarEdge monitoring and control capabilities. It can be connected to SolarEdge and non-SolarEdge devices and can transfer the monitoring data to the SolarEdge monitoring server and optionally, to a non-SolarEdge logger.

The control and communication gateway can connect to the following devices¹:

- SolarEdge devices, such as inverters and safety and monitoring interfaces (SMIs)
- Environmental sensors
- Revenue grade meters
- Power reduction control devices



NOTE

Sensors, meters, loggers, and power reduction control devices are sold separately.

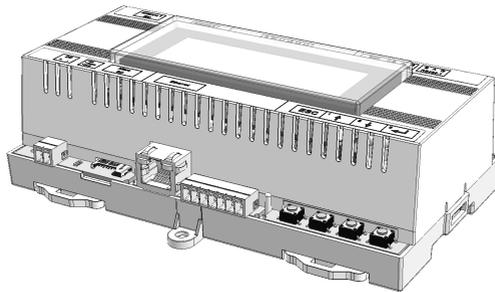


Figure 1: The SolarEdge Control and Communication gateway

¹For a list of supported environmental sensors, revenue meters, and third party inverters, refer to <http://www.solaredge.com/articles/se-supported-devices>

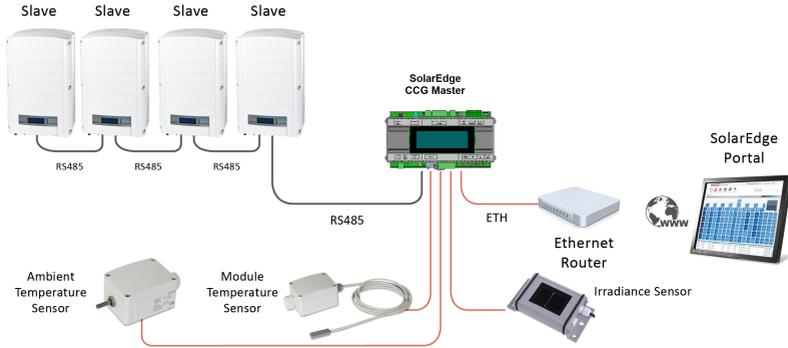


Figure 2: Example of sensor connection to the SolarEdge CCG

Control and Communication Gateway Interfaces

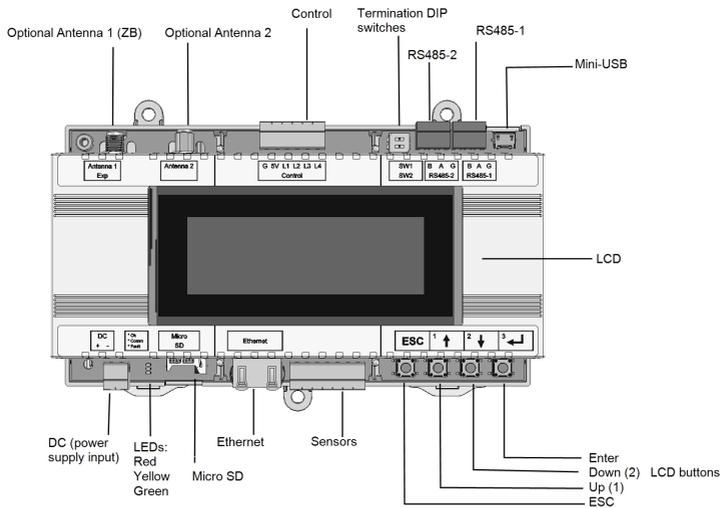


Figure 3: Control and Communication gateway interfaces

LCD and LCD-Menu Buttons

The LCD screen displays status information of the system and various menus for configuration options. The LCD panel and buttons are used during the following processes:

- **Operational mode:** The LCD panel allows checking for proper system operation. Refer to *Status Screens - Operational Mode* on page 30 for a description of this option..
- **Setup mode:** Upon installation, an installer may perform basic configuration as described in *Configuration Menu Options* on page 34.
- **Error messages:** In the event of a problem, an error message may be displayed on the LCD panel. For more information, refer to *Errors and Troubleshooting* on page 50.

Use the four user buttons to control the LCD panel menus:

- **Esc:** Moves the cursor (>) to the beginning of the currently displayed parameter; goes to the previous menu, and cancels a value change with a long press (until **Aborted** is displayed).
- **Up** and **Down:** Moves the cursor from one menu option to another, moves among the characters of a displayed parameter, and toggles between possible characters when setting a value.
- **Enter (3):** Selects a menu option and accepts a value change with a long press (until **Applied** is displayed).

Use the three rightmost buttons for entering **123** when entering the Setup mode password **12312312**.

Communication Connectors

- **Antenna1:** used for optional wireless ZB (ZigBee) or Wi-Fi antenna connection.
- **Antenna2:** Currently not installed
- **RS485-1** and **RS485-2:** used for connecting external devices to the gateway (refer to *Connecting the SolarEdge CCG to the SolarEdge Installation* on page 13)
- **Mini-USB:** Enables PC/laptop connection for using the SolarEdge configuration tool.
- **Ethernet:** Enables connecting the SolarEdge gateway to the SolarEdge monitoring platform through an Ethernet switch/router (refer to *Creating an Ethernet (LAN) Connection* on page 40). The Ethernet switch/router should be connected to the Internet.

LEDs

The CCG has three LED indicators, as follows:

- **OK (Green):** Indicates whether or not the SolarEdge CCG is powered.
- **Comm (Communication, Yellow):** Blinks when monitoring information is received from another SolarEdge device in the installation.
- **Fault (Red):** Indicates that there is an error. For more information, contact SolarEdge support.

All LEDs are ON while the CCG is being configured and during power up.

Other Interfaces

- **DC:** used for the power supply input as described in *Connecting the SolarEdge Gateway to AC* on page 12.
- **Sensors:** enables connecting to external environmental sensors (refer to *Connecting Environmental Sensors (Optional)* on page 20).
- **Control:** used for connection to an external power reducer device
- **SW1/SW2:** RS485-1/2 termination
- **Micro SD:** used for field software upgrade

Chapter 3: Installing the Control and Communication Gateway

Safety

**CAUTION!**

For North America only: The product's communication with external devices must not use wires that span more than one building, as per the UL 60950-2 standard.

Transport and Storage

Transport the SolarEdge gateway in its original packaging, without exposing it to unnecessary shocks. If the original package is no longer available, use a similar box, which can be closed fully.

Store the SolarEdge gateway in a dry place where ambient temperatures are -40°C (-40°F) to +60°C (140°F).

Package Contents

- Control and communication gateway
- 100-240VAC to 12VDC (50 Hz/60 Hz) power supply with an interchangeable AC plug (US, EU, AU)
- Accessory kit including:
 - Three 3-pin terminal blocks
 - One 7-pin terminal block
 - One 6-pin terminal block

Installation Equipment

Standard tools can be used during the installation of the SolarEdge gateway. The following is a recommendation of the equipment needed for installation:

- DIN rails
- Drill and 4mm diameter bits
- Three twisted wires or four-wire twisted pair cable
- For installing the communication options: CAT5/6 Ethernet cable

Installation Guidelines

The following requirements apply when locating and mounting the SolarEdge gateway:

- The gateway is suitable for mounting indoors only. For outdoor installation, use an external outdoor enclosure (not provided by SolarEdge)
- The gateway must always remain in an ambient temperature of -20°C (-4°F) to +60°C (140°F).
- The gateway power supply requires a socket outlet with a grid voltage of 100 V - 240 V (50/60Hz).
- Protect the gateway from dust, wet conditions, corrosive substances and vapors.
- Cable specifications:

Connection Type	Cable Type	Maximum Length
RS485 communication bus (per RS485 port)	Three twisted wires or 4-wire twisted pair cable (two twisted pairs). Recommended wire size: 20 AWG / 0.52 mm ²	1,000m (3,330 ft)
Ethernet	CAT5/6	100m (325 ft).
Sensor/control interface	Recommended wire size: 20 AWG / 0.52 mm ²	50m (165 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 recommend to use external surge protection devices. For details refer to: http://www.solaredge.com/files/pdfs/lightning_surge_protection.pdf. If grounded metal conduit are used for routing the communication wires, there is no need for a lightning protection device.



Installation Workflow

The following provides an overview of the workflow for installing and setting up the control and communication gateway:

- [Step 1 - Mounting the CCG](#), page 12
- [Step 2 - Connecting the CCG to the SolarEdge installation](#), page 13
- [Step 3 - Connecting environmental sensors \(optional\)](#), page 20
- [Step 4 - Configuring the CCG and inverters/SMI](#), page 16
- [Step 5 - Using the control and communication gateway to connect the installation to the monitoring server \(optional\)](#), page 39

Mounting and Connecting the SolarEdge Gateway

The SolarEdge gateway can be installed on a wall or on a DIN rail.

► To mount the SolarEdge gateway on a wall:

1. Determine the mounting location. Leave clearance from all sides of the gateway for cover opening, cable connection and routing.
2. Position the device on the wall, mark points through the mounting tabs and drill holes using a 4mm diameter drill bit.
3. Mount the unit using screw anchors and screws (use 3.5mm diameter screws, 20mm minimum length, not provided by SolarEdge).

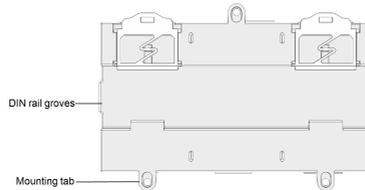


Figure 4: Gateway mounting tabs

► To mount the SolarEdge gateway on a DIN rail:

1. Press the gateway upwards and snap it into the upper and lower edges of the DIN rail.

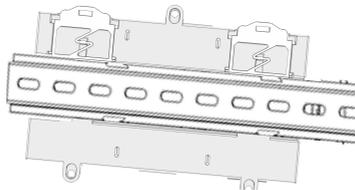


Figure 5: Gateway mounted on a DIN rail

Connecting the SolarEdge Gateway to AC

For connecting to power, use the supplied power supply:

1. Connect the power supply cable connector to the connector labeled **DC** on SolarEdge gateway (see *Figure 3*).
2. Connect the power supply to the AC mains. The LEDs are lit momentarily to indicate power connection (see *Figure 3*).



CAUTION!

If you use a non-SolarEdge power supply, check that it has 12Vdc/1A output ratings, and that it is certified to UL/CSA/IEC60950-1 2ed standards. Limited Power Source output, NEC class 2. Verify the power supply polarity as marked on the gateway.

Chapter 4: Connecting the SolarEdge CCG to the SolarEdge Installation

Overview

The SolarEdge control and communication CCG connects to the PV system installation using the RS485 communication option. The RS485 option enables creating a chain (bus) of up to 31 slave SolarEdge devices, connected to one master, which can be another SolarEdge device or the SolarEdge CCG.

The following is an example of a master CCG connected to a chain of slave inverters.

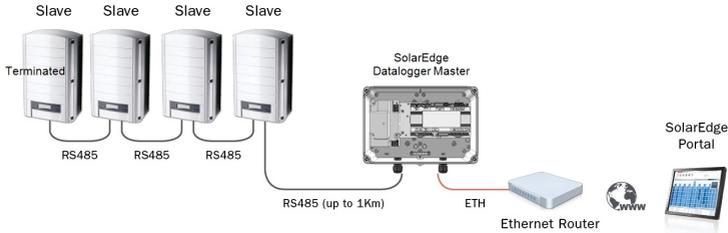


Figure 6: Example of RS485 connection

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

Creating an RS485 Bus Connection

The RS485 bus uses a three-wire cable connecting the RS485-1/2 terminal blocks on the SolarEdge CCG to the RS485 input of the inverters/SMI.

► To connect the RS485 communication bus between inverters/SMIs and SolarEdge CCG:

1. Use one of the supplied 3-pin terminal blocks: Loosen the screws and insert the wire ends into the A, B and G pins. For connections longer than 10m use twisted pair wires for A and B wires.

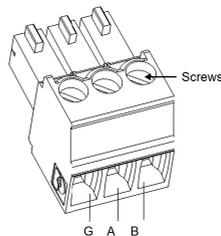


Figure 7: 3-pin terminal block

2. Choose either RS485-1 or RS485-2 for connection. Connect the 3-pin terminal block to the designated port on the CCG.



NOTE

RS485-1 is configured as SolarEdge device by default, therefore RS485-1 is recommended as the RS485 bus connection point.

3. If the CCG is at the end of the RS485 chain, terminate the CCG by switching a termination DIP switch to ON. The switches in the SolarEdge CCG are marked **SW1** for the RS485-1 port termination and **SW2** for the RS485-2 port termination, as shown below:

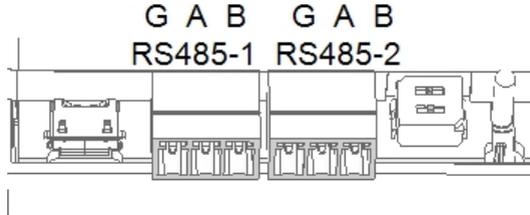


Figure 8: RS485 connectors and termination switches

4. Open the inverter/SMI cover as described in their manual.
5. Remove the seal from one of the openings in communication gland #2 of the inverter and insert the cable through the opening.
6. Pull out the 9-pin RS485 terminal block connector, as shown below:

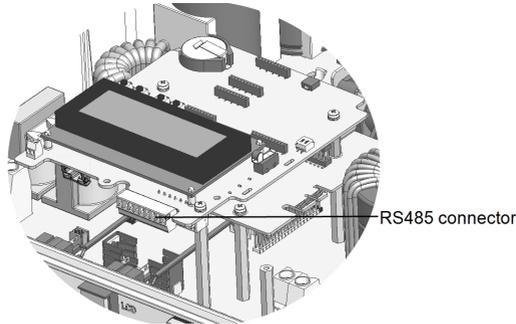


Figure 9: The RS485 terminal block in the inverter/SMI

7. Loosen the screws of pins B, A and G on the left of the RS-485 terminal block.
 - For inverter: RS485-1 pins (left-most)
 - For SMI: RS485-1 (recommended, as this is the default configuration), or RS485-2

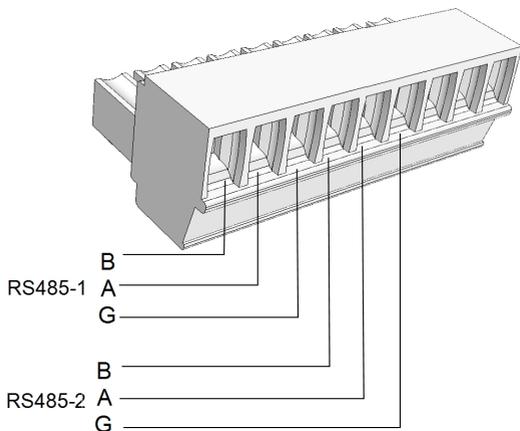


Figure 10: RS485 terminal block

8. Insert the wire ends into the G, A and B pins shown above. You can use any color wire for each of the A, B 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.
9. Connect all B, A and G pins in all inverters/SMI. The following figure illustrates this connection schema (the illustration applies to both inverters and SMI):

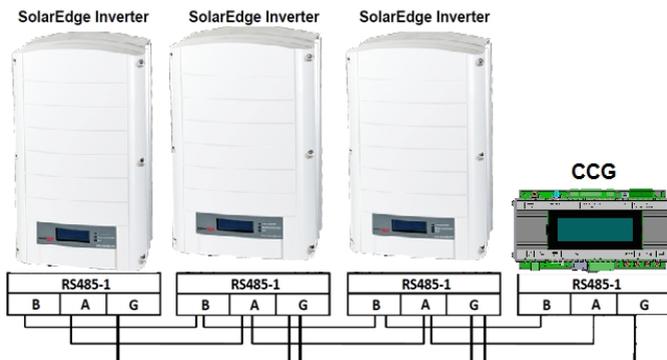


Figure 11: Connecting SolarEdge devices (inverters or SMI) in a chain

NOTE

Do not cross-connect B, A and G wires.
 For inverters - Do not insert wires into RS485-2 pins.
 For SMI - Make sure you are using the same RS485 port (1/2) in all devices.

10. Tighten the terminal block screws.
11. Push the RS485 terminal block firmly all the way into the communication board.

12. Terminate the inverters/SMIs at the two ends of the chain by switching a termination DIP-switch inside the inverter/SMI to ON (move the switch to the top). The switch is located on the communication board and is marked **SW7**.

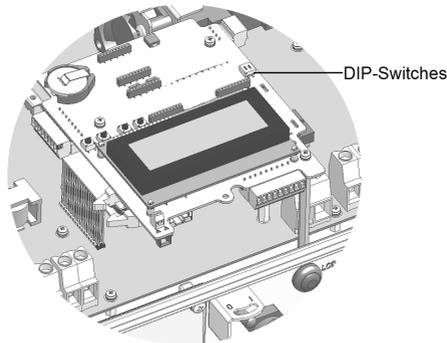


Figure 12: RS485 termination switch



NOTE

Only the first and last SolarEdge devices in the chain should be terminated. The other devices in the chain should have the termination switch OFF.

► **To configure the RS485 communication bus with SolarEdge inverters/SMI:**

By default, all SolarEdge devices are pre-configured as slaves on the RS485-1 port. Slaves can be further configured using the **RS485-X Conf** option in the Communication menu.

One device must be set as the master on the RS485 bus. Any SolarEdge device may be the master (CCG, inverter, or SMI). If you connect the installation to the SolarEdge monitoring platform, the device used to connect to the server must be the master.

The following describes how to configure the master device.

1. Press the **Enter** button until the following message is displayed:

```

Please enter
Password
*****
    
```

2. Use the three-right most LCD buttons to type in the following password: **12312312**

The following menu is displayed:

```

Language <Eng>
Communication
Power Control
Display
Maintenance
Information
    
```

3. Short-press the arrow buttons to scroll to the Communication menu. Press the Enter button to select it.

4. Select **Server** → **RS485-X** Conf (X=1 or 2 depending on the specific physical port connection) to communicate with different external devices (SolarEdge inverters, revenue meters, non-SolarEdge loggers or non-SolarEdge inverters).
5. To configure the master, select the following in the LCD menu:
 - **Communication** → **RS485-1 Conf** → **Device Type** → **SolarEdge**
 - **RS485-1 Conf** → **Protocol** → **Master**
 - **RS485-1 Conf** → **Slave Detect**The system starts automatic detection of the SolarEdge slave inverters connected to the master CCG. The CCG should report the correct number of slaves. If not, verify the connections and terminations. Verify that only one master is configured on the bus.
6. Close the inverter/SMI cover and start power production.
7. Verify the connection of the Master to the SolarEdge monitoring platform, as described below.

Verifying the Connection

1. After connection, a message similar to the following appears in the main status screen (see also *Initial Status* on page 30):

```
RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
```

2. Verify that **S_OK** appears, to indicate that the connection to the SolarEdge monitoring platform is successful. If **S_OK** is not displayed, refer to Troubleshooting Communication, below.

Troubleshooting the RS485 Communication

1. If **No Communication** is displayed on the SolarEdge CCG, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the master and that slaves were detected, as described above.
2. If the message **Master Not Found** appears, check the connections to the master device and fix if required.

3. If after slave detection the number of slaves displayed in the master under **RS485-X Conf** → **Slave Detect** is smaller than the actual number of slaves, use the slave list to identify missing slaves and troubleshoot connectivity problems:
 - a. Select **RS485-X Conf** → **Slave List**. A list showing the serial numbers of the detected slaves is displayed.
 - b. To view the details of a detected slave device, select its serial number entry.

```
ID: 5000FE01-4F
Last Communication
17/02/2015
14:24:01
```

- **ID:** Serial number
- **Last Communication:** date and time (dd:mm:yy 24h) of last communication with the master. If this device is detected for the first time after the master wakeup, **N/A** appears for this information.

RS485 Configuration Options

In all configurations, use the following RS485 port configuration menus:

RS485-X

```
Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Slave List <#>
```

Device Type:

```
SolarEdge <M>
Non-SE Logger <S>
Multi Devices <M>
None
```

Protocol:

```
Slave
Master
```

Device ID:

```
Please Select
Device ID
1
```

- **Device Type** is used to select the specific port configuration. The following devices are supported:
 - **SolarEdge** (default for RS485-1): Used when connecting to SolarEdge devices, such as: inverters, SMIs or CCGs. By default, all SolarEdge devices are pre-configured as slaves on the RS485-1 port.
 - **Revenue Meter:** Used when connecting to an external revenue grade meter, in order to read the meter data and send it to the monitoring platform. For a list of supported meters, refer to <http://www.solaredge.com/articles/se-supported-devices>.

- **Non-SE Logger:** Used when connecting to an external non-SolarEdge logger. The logger can read SolarEdge inverters data for Non-SolarEdge monitoring purposes.
- **None:** No device (default for RS485-2)
- **Protocol:**
 - When selecting a SolarEdge device, the following protocols appear under the Protocol option:
 - Slave (default)
 - Master
 - When selecting Device Type <Inv. Reader>, the Device Type <field> changes to Device Type <INV>
 - When selecting Device type <Non-SE Logger>, the Device Type <field> changes to Device Type <LGR> and the following protocol appears under the Protocol option: SunSpec (default)
 - When selecting Device type <Revenue Meter>, the Device Type <field> changes to Device Type <MTR>

**NOTE**

For other supported protocols, refer to <http://www.solaredge.com/articles/se-supported-devices>

- **Device ID:** The device ID is used to set the SolarEdge CCG device ID (MODBUS ID) when connecting to an external master device (for example, a non SolarEdge logger), or to set the ID of the external device (for example, revenue meter).
- **Slave Detect:** Is used to initiate automatic detection of the slave devices connected to this master device. The number next to the option is the number of devices that have been detected.

Chapter 5: Connecting Environmental Sensors (Optional)

Overview

The SolarEdge CCG supports up to three analog sensors. If you connect more sensors than supported by a single CCG, use an additional CCG:

- Two sensors with voltage output (V1, V2), each supports different voltage ranges
- One sensor with current output (I)

The following environmental sensor types are supported:

Sensor Type	Configurable Range	Unit
Temperature	-99.0 to +99.0	°C
	-146.20 to 210.20	°F
Irradiance	0 to 9999	W/m2
Wind velocity	0 to 99	m/s
Wind direction	0 to 359	degrees
Pyranometer	-200 to 2000	W/m ²

You can view the sensor data in the Status window (see *Sensors Status* on page 33), and in the SolarEdge monitoring platform.

This chapter describes how to connect sensors to the SolarEdge CCG and how to configure them.

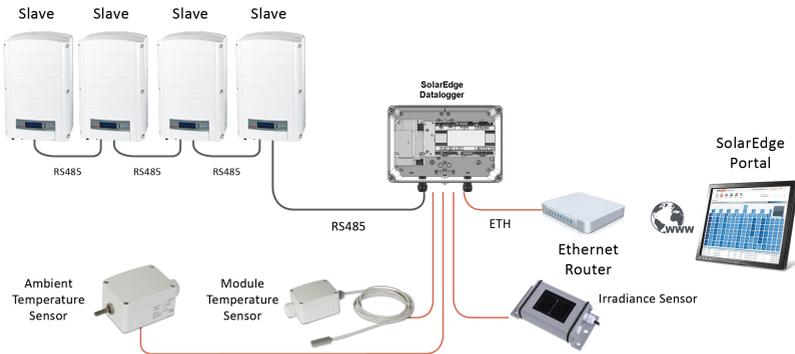


Figure 13: Example of sensor connection to the SolarEdge CCG

Connecting Sensors to the SolarEdge CCG

For connection of the irradiance and temperature sensors available from SolarEdge refer to *Sensor Connection Example* on page 27.

Sensors are directly connected to the SolarEdge CCG via the sensor interface connector. Use the supplied 7-pin terminal block. *Figure 14* shows the location of the sensors connector on the CCG.

Sensor Connector Pin #	Pin Name	Description
1	V1	Voltage sensor input number 1
2	GND	Ground (common for V1, V2 and ground)
3	V2	Voltage sensor input number 2
4	I-	Current sensor input – negative
5	I+	Current sensor input – positive
6	GND	Ground (common for V1, V2 and ground)
7	12V	12VDC output voltage supply to the sensors. (limited to 800mA)

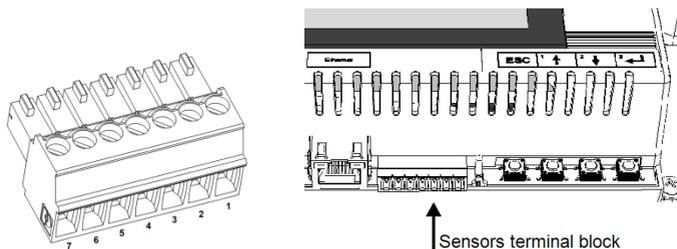


Figure 14: Sensor Interface Inputs

► **To connect a voltage sensor:**

Use a 3-wire cable for this connection. Recommended wire size is 0.52mm²/ 20 AWG with maximum length of 50m/164 ft.

1. Connect a voltage source sensor to either V1 or V2, depending on its operating voltage range. Voltage sensor inputs support the following user selectable ranges:
 - V1: 0–2 Vdc or 0–30 mVdc.
 - V2: 0–10 Vdc or 0–2 Vdc .

2. Depending on the sensor range, connect the sensor between V1 (pin1) and GND (pin 2), or between V2 (pin 3) and GND (pin 2).

The GND (pin 2) serves as a common ground for both V1 and V2.

The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

For an example of sensor connection, refer to *Sensor Connection Example* on page 27

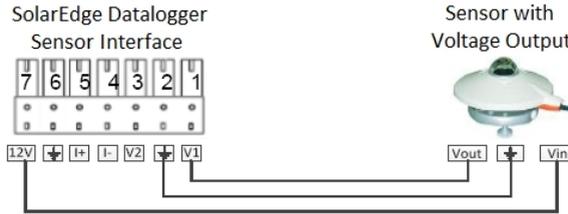


Figure 15: Voltage sensor connection



CAUTION!

Excessive voltage on the sensor input can damage the SolarEdge CCG. Refer to input ranges specified in the *Technical Specifications* on page 53.

▶ To connect a current sensor:

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm²/20 AWG with maximum length of 50m/164 ft.

Connect a current source sensor to either I+ or I-, depending on its operating range:

- For positive current:
 - I+ (pin 5) - connect to the current output (Iout) of the sensor.
 - I- (pin 4) - connect to ground.
 - GND (pin 6) - connect to the ground connection terminal of the sensor.
 - The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

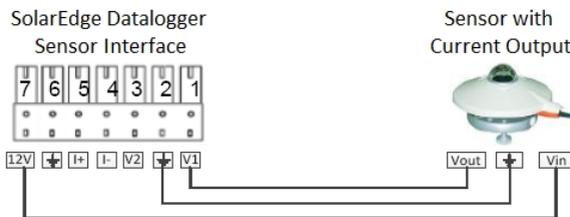


Figure 16: Current sensor (4-20mA) positive connection

- For Negative current:
 - I- (pin 4) - connect to the current output (Iout) of the sensor.
 - I+ (pin 5) - connect to ground.
 - GND (pin 6) - connect to the ground connection terminal of the sensor.
 - The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

**CAUTION!**

Excessive current on the sensor input can damage the SolarEdge CCG. Refer to input ranges specified in the *Technical Specifications* on page 53.

Configuring Environmental Sensors

Menus

The SolarEdge CCG sensor interface is disabled by default. The following shows a hierarchical tree of the Sensors menu options:

Sensors

```
V1 Sensor<Dis>
V2 Sensor<Dis>
I Sensor<Dis>
```

Set V1/V2/I Sensor (example for V1 sensor)

```
Sensor <En>
Range <0-2V>
Type <--->
Two Points
```

Range

```
0 - 2 V
0 - 30 mV
```

Sensor Type

```
Temp. Ambient
Temp. Module
Wind Speed
Wind Direction
Irradiance Global
Irradiance Direct
Irradiance Diff.
Irradiance POA
```

Two Points setting

```
P0 <0.0, 0.0>
P1 <1.000, 1.000>
```

Set Point

```
Set Point
(V, degC)
0.0, 0.0
```

- Sensors:
 - **V1 Sensor** and **V2 sensor**- sensors with voltage output, enabled or disabled
 - **I Sensor**—a sensor with current output, enabled or disabled
- Range:

- **V1** – select a range between 0–2 Vdc or 0–30 mVdc.
- **V2** – select a range between 0–10 Vdc or 0–2 Vdc. I – select a range between 0–20 mA
- **Sensor Type:** One of the following sensors:

Sensor Type	Description	Unit
Temp. Ambient	Ambient temperature sensor measurement	°C, °F
Temp. Module	Module temperature sensor measurement	
Wind Speed	Wind speed sensor measurement	m/s
Wind Direction	Wind direction sensor measurement	degrees
Irradiance Global	Global horizontal irradiance	W/m2
Irradiance Direct	Direct irradiance	
Irradiance Diff.	Diffused irradiance	
Irradiance POA	Plane of Array (POA) irradiance	



NOTE

The temperature units are configured in °C by default and can be changed to °F under the **Temperature** submenu located under the **Display** menu.

- **Two Points setting:** P0 and P1 represent points on the sensor graph to be configured in the CCG. The values refer to the measurement signal and the measurement range from the sensor datasheet. Refer to the example below.
- **Set point:** Enables entering two measurement signal values (voltage, current or temperature).

Configuring the Sensors in the SolarEdge CCG

▶ **To enable the sensors in the SolarEdge CCG:**

1. Press the Enter button until the following message is displayed:

```

Please enter
Password
*****
    
```

The CCG is now in Setup mode and all its LEDs are lit.

2. Use the three-right most LCD buttons to type in the following password: 12312312. The following menu is displayed:

```

Language <Eng>
Communication
Power Control
Display
Maintenance
Information
    
```

3. Under the main menu, select **Sensors**.

4. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>
Range <0-2V>
Type <--->
Two Points
```

► To configure sensors in the SolarEdge CCG:



NOTE

When using sensors provided by SolarEdge, enabling the sensors as described above automatically sets their configuration (available from SolarEdge CCG CPU version 2.07xx). If the CPU version is lower, configure the sensors as described below.

Configure the working range of the sensor that covers the sensor specification. Refer to the table on page 20.

1. Select **Range** under the specific configured sensor and then select the applicable range:
 - V1—select a range between 0–2 Vdc or 0–30 mVdc.
 - V2—select a range between 0–10 Vdc or 0–2 Vdc.
 - I—select a range between 0–20 mA.

A screen similar to the following is displayed, depending on the selected sensor:

```
0-2V
0-30mV
```

2. Select the **Type** of the connected sensor from the following:

```
Temp. Ambient
Temp. Module
Wind Speed
Wind Direction
Irradiance Global
Irradiance Direct
Irradiance Diff.
Irradiance POA
```

3. Select Two Points to configure two points on the sensor graph using the measurement signal and measurement range data from the sensor datasheet.

```
P0 <0.0, 0.0>
P1 <1.000, 1.000>
```

4. Set the point values as follows:
 - Use the **Up** and **Down** buttons to adjust the value.
 - Press the **Enter** button to move to a character.
 - Long press the **Enter** button (until **Applied** message appears)—apply the value
 - Long press the **Esc** button (until **Aborted** message appears)—erase all characters

```
Set Point
(V, DegC)
10, 70
```

5. If required, repeat steps 1 through 4 above to configure additional sensors.

- Check that the Sensors status screen on the LCD displays a screen similar to below, and verify that the sensor's readings are within the range that appears in its datasheet. Refer to *Sensors Status* on page 33.

```
Sensors
1 : XXX.XXX Deg C
V2 : XXX.XXX W/m2
I : Disabled
```

Example of Sensor Graph Configuration

The following is an example of setting a temperature sensor with the following specifications:

- Measurement signal: 0..10V
- Measurement range: -10...+70°C

The following graph shows the min. and max. values, and the focused (linear) area.

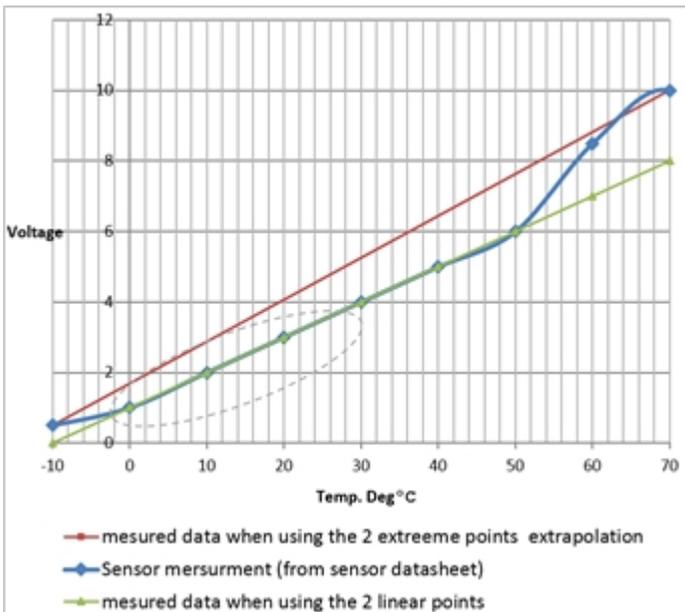


Figure 17: Example of sensor graph

If you want to include the full range of the sensor, the points for setting are the minimum and maximum values from the sensor datasheet:

```
P 0 < 0 , - 1 0 >
P 1 < 1 0 , 7 0 >
```

However, if you want to include a partial range, set any value for the two points, as long as the points are within the SolarEdge CCG selected range. The SolarEdge CCG then extrapolates the sensor linear graph based on these two points.

```
P 0 < 1 , 0 >
P 1 < 5 , 5 0 >
```

Sensor Connection Example

This section describes how to connect three of the sensors available from SolarEdge to the CCG. For their full specifications refer to http://www.solaredge.com/files/pdfs/products/inverters/se_sensor_datasheet.pdf (for other recommended sensors and suppliers refer to http://www.solaredge.com/articles/se-supported-devices#environmental_sensors).

- Ambient temperature sensor - a voltage output sensor, measuring the ambient temperature. Electrical output: 0..10V.
- Module temperature sensor - a current output sensor, measuring the module surface temperature. Electrical output: 4..20 mA.
- Solar irradiance sensor - a voltage output sensor, measuring the solar irradiance. Electrical output: 0-1.4 VDC.

An external 24VDC/1A power supply is required for connecting the temperature sensors. A single PSU can be used for both sensors.

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm² / 20 AWG with maximum length of 50m/164 ft.

The following diagram illustrates the connections of the above devices to the SolarEdge CCG:

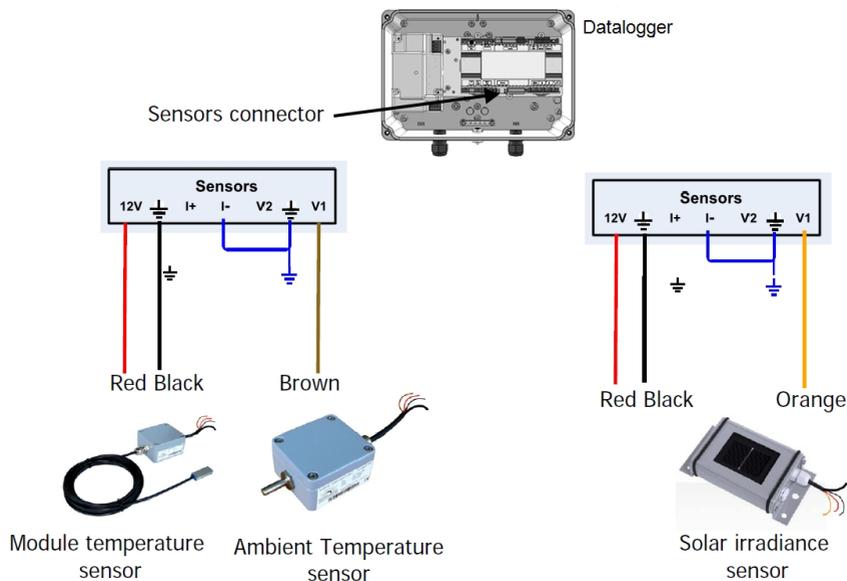


Figure 18: Sensors connection diagram

▶ **To connect an ambient or module temperature sensor to the power supply and to the CCG:**

The same power supply can be used for both sensors.

1. Use a flat screwdriver to open the sensor cover screws and remove the cover.
2. Insert the cable through the supplied gland and rubber seal, and into the sensor opening..
3. Connect I- to ground.
4. Connect the power supply to an AC source using the , N, L connection points at the bottom of the power supply.

▶ **To connect a solar irradiance sensor to the SolarEdge CCG:**

1. Connect the thin wires to the CCG sensors connector as follows (see *Figure 19*):
 - Orange - to V1
 - Black - to Ground
 - Red - to 12V
 - Leave the thicker black wire (Shield) unconnected.

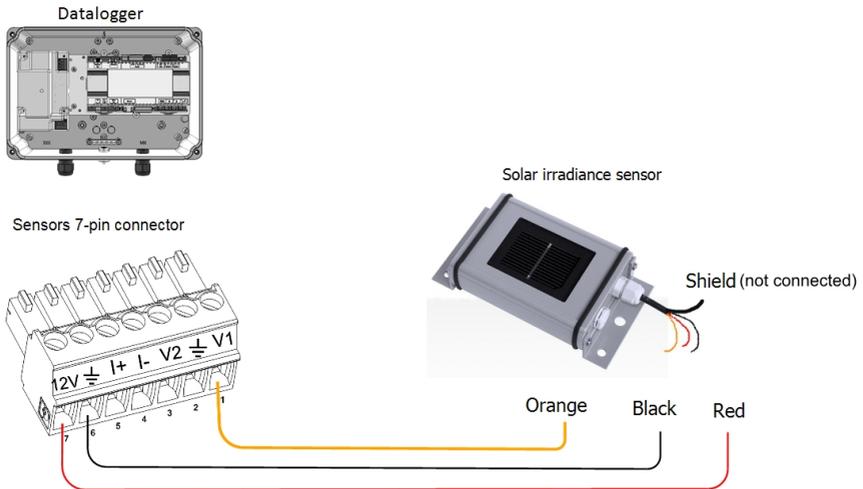


Figure 19: Solar irradiance sensor connection



NOTE

When configuring this sensor in the CCG, the type should be **Irradiance Direct**

▶ **To enable the sensors in the SolarEdge CCG:**

1. Enter Setup mode, as described in *LCD and LCD-Menu Buttons* on page 8.
2. Under the main menu, select **Sensors**.

3. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>  
Range <0 - 2 V>  
Type <- - - >  
Two Points
```

If the CPU version of the SolarEdge CCG is 2.07xx and higher, the sensors are automatically configured. If the CPU version is lower, configure the sensors as described in: *To configure sensors in the SolarEdge CCG*: on page 25

Chapter 6: LCD – Status Screens and Setup Options

This chapter describes the LCD display of the SolarEdge CCG. The LCD screen displays status information of the CCG and various menus for configuration.

Status Screens - Operational Mode

During normal operation pressing the **Enter** button turns on the LCD backlight. The backlight is active for 30 seconds by default. This duration is configurable, as described in *Display* on page 37.

Additional presses display the following screens one after the other.

Initial Status

```
RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
```

- **RRCR:** If enabled, indicates the active power set by the power control interface, in percent of peak power.
- **Sensors:** Enable/disable status of Sensors' input reading
- **Server:** Server communication method
- **Total # of Slaves:** Indicates the total number of slave devices communicating with the SolarEdge CCG

ID Status

This screen displays the ID of the CCG and the software version.

```
ID: ##### ##
DSP1: 1.0210
CPU: 0003.19xx
Country: ESP
```

Server Communication Status

```
Server: LAN <S_OK>
Status: <OK>
xxxxxxx
<ERROR MESSAGE>
```

NOTE



If the connection method is CDMA (Cellular) or GSM, the server screen is replaced with the Cellular or GSM status screens (see *Status Screens - Operational Mode* on page 30 and *GSM Status* on page 32).

- **Server:** The method of connection to the SolarEdge monitoring platform.
- **S_OK:** The connection to the SolarEdge monitoring platform is successful (should appear only if the inverter is connected to the server).

- **Status:** Displays OK if the CCG established successful connection and communication with the specified server port/device (LAN, RS485, Wi-Fi or ZigBee card).
- **xxxxxxx:** Eight-bit Ethernet communication connection status: A string of 1s and 0s is displayed. 1 indicates OK, 0 indicates an error. For a list of possible errors and how to troubleshoot them, refer to on page 50.
- **Error message,** according to failure. Refer to <http://www.solaredge.com/sites/default/files/se-inverter-installation-guide-error-codes.pdf>.



IP Status

This screen describes the Ethernet configuration: IP, Mask, TCP Gateway and MAC address (Media Access Control) of the CCG.

```
IP 192.168.2.119
MSK 255.255.255.0
GW 192.168.2.1
MAC 0-27-02-00-39-36
```

ZigBee Status

This screen describes the ZigBee configuration:

```
PAN : XXXXX
CH : XX / XXXX RSSI : < L >
MID : XXXX XX
ZigBee Ready
```

- **RSSI:** The receive signal strength indication of the closest ZigBee in the system. L = low, M = medium, H = high and (-) = no signal.
- **PAN ID:** The ZigBee transceiver PAN ID
- **Ch.:** The ZigBee transceiver channel
- **ID:** The ZigBee transceiver ID
- **MID:** The Master ID of the coordinator (master) ZigBee card. This field is shown only in devices with router (slave) ZigBee cards, and after a successful ZigBee association. If a ZigBee card is not connected, a **No ZigBee** message is displayed instead of the **MID** field.
- **ZigBee Ready:** This field is shown only in devices with ZigBee router transceivers (slaves), in a multi-point (MP) protocol configuration. If a ZigBee transceiver is not physically connected, a **No ZigBee** message is displayed.

Wi-Fi Status

This screen describes the Wi-Fi configuration:

```
IP : 192.168.2.119
GW : 192.168.2.1
SSID : xxxxxxxx
RSSI : < L / M / H / - >
```

- **IP:** The DHCP provided address
- **GW:** The gateway IP address
- **SSID:** Service Set Identifier - the name of a wireless local area network (WLAN). All wireless devices on a WLAN must employ the same SSID in order to communicate with each other.

- **RSSI:** The receive signal strength indication of the closest Wi-Fi in the SolarEdge system. L = low, M = medium, H = high and - = no signal.

GSM Status

If a GSM modem is connected, this screen replaces the Server status screen:

```
Server: Cell    <S_OK>
Status:         <OK>
MNO:  <xxxxxxx> Sig: 5
<Error message>
```

- **Server:** The method of communication to the SolarEdge monitoring platform. Should display **Cell**.
- **Status:** Displays OK if the inverter established a successful physical connection to the modem.
- **S_OK:** The last communication to the SolarEdge monitoring platform was successful (appears if the inverter is connected to the platform). If S_OK is not displayed, refer to *Status Screens - Operational Mode* on page 30.
- **MNO:** The mobile network operator name
- **Sig:** The signal strength, received from the modem. A value between 0-5, (0 = no signal; 5=excellent signal).
- **Error message:** per communication connection status failure

Communication Ports Status

This screen presents the communication port (RS485-1/2 or ZigBee), and the devices connected to them, with details about the number, type, and protocol.

```
          Dev Prot  ##
RS485-1 <SE><S  > <-->
RS485-2 <SE><S  > <-->
ZigBee  <SE><MPS><-->
```

- **##:** The total number of slaves detected on the specific port
- **Dev:** The type of device that was configured to a specific port (based on the port's functionality), as follows:
 - **SE:** SolarEdge device (default)
 - **LGR:** Non-SolarEdge logger
 - **MLT:** Multiple devices, such as meters and batteries
 - **HA:** Home automation devices (for load management)

- **PROT:** The protocol type to which the port is set:
 - For a SolarEdge device:

RS485 protocol	ZigBee protocol
S: SolarEdge slave	
M: SolarEdge master	
	P2P: ZigBee point-to-point
	MPM: ZigBee multipoint master (for the SolarEdge ZigBee home gateway or for load management by the inverter)
	MPS: ZigBee multipoint slave (for a ZigBee router card)

- For electricity meters, refer to the *application note - Connecting an Electricity Meter to SolarEdge Devices* at <http://www.solaredge.com/files/pdfs/solaredge-meter-installation-guide.pdf>.
- **SS:** SunSpec - for a non-SolarEdge logger (monitoring and control)



Smart Energy Management Status

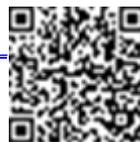
This screen is displayed only when Smart Energy Management is enabled. The screen shows energy details of the site:

```

Site Limit:      7.0 kW
Site Prod:       10.0 kW
Site Export:     4.0 kW
Self-consume:   6.0 kW
    
```

- **Site Limit:** The limit that was defined for the site
- **Site Prod:** The power produced by the site
- **Site Export:** The power that is fed into the grid
- **Self-consume:** The PV power consumed by the site

For more information, refer to the *Export Limitation Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/products/feed-in_limitation_application_note.pdf.



Sensors Status

This screen displays the status of up to three different sensors connected to the gateway.

```

Sensors
1: XXX.XXX DegC
V2: XXX.XXX W/m2
I : Disabled
    
```

- **V1:** Displays the real time reading of the sensor connected to V1 sensor input
- **V2:** Displays the real time reading of the sensor connected to V2 sensor input
- **I:** Displays the real time reading of the sensor connected to I sensor input

The reading is displayed according to the relevant sensor that was configured on the specific sensor input:

- Temperature sensor - the degrees reading in Celsius or Fahrenheit
- Irradiance reading - in W/m2

- Wind speed, in m/s
- Wind direction, in Deg

Configuration Menu Options

This section describes basic CCG configuration options.

► To enter Setup mode:

1. Verify that the SolarEdge CCG is connected to a power outlet.
2. Press the Enter button until the following message is displayed:

```

Please enter
Password
*****
  
```

The CCG is now in Setup mode and all its LEDs are lit. The CCG automatically exits Setup mode if no buttons are pressed for more than 2 minutes.

3. Use the three-right-most LCD buttons to type in the following password: **12312312**. The following message is displayed:

```

Language <Eng>
Communication
Power Control
Display
Maintenance
Information
  
```

Language

1. Select the **Language** option to set the language in which the LCD should display.
2. Confirm your language selection in the confirmation screen: Toggle to **YES** and press **Enter**.

Communication

1. Select the **Communication** option to define and configure:
 - The communication option used by the CCG to communicate with the SolarEdge monitoring platform
 - The communication option used to communicate between multiple SolarEdge devices or other external non-SolarEdge devices, such as electricity meters or loggers.



NOTE

The Server menu shows only the communication options installed in the CCG.

The following shows a hierarchical tree of the menu options in the **Communication** menu.

For detailed information about all the configuration options, refer to the *Communication Options Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/solaredge-communication_options_application_note_v2_250_and_above.pdf.



Communication1:

```
Server<LAN>
LAN Conf
RS485-1 Conf<S>
RS485-2 Conf<S>
ZigBee Conf<S>
Wi-Fi Conf<N/A>
Cellular Conf
Slave Detect
```

Server:

```
LAN
RS485
Zigbee
Wi-Fi
Cellular
None
```

LAN Conf:

```
IP Config
Set DHCP <en>
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP<Dis>
```

RS485-X Conf:

```
Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Slave List <#>
```

ZigBee Conf. (enabled only if the ZigBee internal card is connected):

```
Device Type<SE>
Protocol<MPS>
Device ID<1>
PAN ID
Scan Channel
Load ZB Defaults
```

¹If ZigBee is connected, the Wi-Fi Conf menu is not displayed. If ZigBee is not connected, ZigBee Conf and Wi-Fi Conf are both displayed with <N/A> and their menus are not accessible.

Wi-Fi Conf (enabled only if the internal card is connected):

```
Scan Networks
Set key
Load Defaults
```

GSM Conf:

```
Device Type<SE>
Protocol<GSM>
Set APN
Set Modem Type
Set User Name
Set Password
```

GPIO Conf:

```
Device Type <RRCR>
```

Power Control

For detailed information about active and reactive power control options refer to the *Power Control Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/application_note_power_control_configuration.pdf.



```
RRCR Conf.
Load Defaults
```

Sensors

Select **Sensors** to set the following options:

```
V1 Sensor<Dis>
V2 Sensor<Dis>
I Sensor<Dis>
```

The SolarEdge CCG sensor interface supports up to three analog sensors:

- **V1, V2:** Voltage sensors
- **I:** Current sensors

For detailed information about all the configuration options for sensors, refer to *Connecting Environmental Sensors (Optional)* on page 20.

Display

Select **Display** to set the following:

LCD On Time <30>

- **Temperature:** Select Celsius or Fahrenheit units.
- **LCD On Time <30>:** The number of seconds that the LCD backlight is ON after pressing the LCD light button. Set a value within the range of 10-120 seconds.
- **TLM On Time <15>:** The number of minutes that the LCD backlight is ON while viewing the Telemetry window. Set a value within the range of 1-120 minutes.

Maintenance

Select **Maintenance** to set the following options:

Date and Time
Factory Reset
SW Upgrade SD-Card

- **Date and Time:** Set the internal real-time clock. If connected to the SolarEdge monitoring platform, the date and time are set automatically and only time zone should be set.
- **Reset Counters:** Resets the accumulated energy counters that are sent to the SolarEdge monitoring platform
- **Factory Reset:** Performs a general reset to the default device settings.
- **FW Upgrade:** Perform a software upgrade by using an SD card. Refer to [upgrading an inverter using micro sd card.pdf](#).
- **Diagnostics:** Displays the Isolation Status and optimizers status screens. Refer to www.solaredge.com/files/pdfs/application_note_isolation_fault_troubleshooting.pdf.
- **Standby Mode:** Enables/disables Standby Mode - for remote commissioning.
- **Grid Protection:** Available in specific countries. Enables viewing and setting grid protection values.
- **Board Replacement:** Backs up the system parameters; Used during board replacement according to the instructions supplied with replacement kits.



Information

Select **Information** to display the following options:

```
Versions
Error Log
Warning log
Hardware IDs
```

- **Versions:** Displays firmware versions:
 - **ID:** The ID.
 - **DSP 1:** The DSP digital control board firmware version
 - **CPU:** The communication board firmware version



NOTE

Please have these numbers ready when you contact SolarEdge Support.

- **Error Log:** Displays the last five errors.
- **Warning Log:** Displays the last five warnings.
- **Hardware IDs:** Displays the following HW serial numbers (if exist, and connected to the inverter):
 - **ID:** the inverter's ID
 - **RGM1** (Revenue Grade Meter): Modbus meter (with lower Modbus ID)
 - **RGM2:** A second external Modbus meter (with the higher Modbus ID)
 - **ZB:** Zigbee MAC address
 - **Cell:** MEID (CDMA) or IMEI (GSM)
 - **WiFi:** Wi-Fi MAC address

Chapter 7: Setting Up Monitoring through the CCG (Optional)

Communication Dataflow

The SolarEdge site information can be accessed remotely using the SolarEdge monitoring platform, as described in the *SolarEdge Monitoring Platform User Guide*. In order to transfer monitoring data from a SolarEdge site to the SolarEdge monitoring platform, a communication connection must be set up. Communication setup is not required for power harvesting and is needed only when using the monitoring platform.

This chapter describes how to set up this connection when the CCG is the connection point to the monitoring platform.

The connection point can be any SolarEdge device. If it is the CCG, it should be the master on an RS485 bus. Otherwise, it should be a slave.

Communication Options

The following types of communication can be used to transfer the monitored information from the inverter to the SolarEdge monitoring platform through the SolarEdge CCG:

Ethernet

Ethernet is used for a LAN connection. For connection instructions refer to *Creating an Ethernet (LAN) Connection* on page 40.

RS485

RS485 is used for the connection of multiple SolarEdge devices on the same bus in a master-slave configuration. RS485 can also be used as an interface to external devices, such as meters and third party data loggers.

- RS485-1: Enables the connection of multiple devices (inverters/SMIs/CCG) through the same bus, such that connecting only one device to the Internet is sufficient to provide communication services for all the devices on the bus.
- RS485-2: Enables connection of non-SolarEdge devices, such as inverters and revenue metering devices.
- RS485-E: The RS485 Expansion Kit provides an additional RS485 port for the CCG for enhanced communications. The kit contains a module, which is installed on the communication board, and has a 3-pin RS485 terminal block. This Kit is provided with an installation guide, which should be reviewed prior to connection see, https://www.solaredge.com/sites/default/files/RS485_expansion_kit_installation_guide.pdf



For connection instructions refer to *Creating an RS485 Bus Connection* on page 13.

ZigBee

Two types of ZigBee products are available:

- Wireless Communication ZigBee Kit - this option enables wireless connection of one or several devices to a ZigBee gateway, for wireless communication to the SolarEdge monitoring server.

This kit is provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-zigbee-home-gateway-installation-guide.pdf>.

To mount the ZigBee card in the CCG, see "Mounting the ZigBee Card in the CCG" on page 45

- Device Control ZigBee card - this option enables wireless connection of one or several devices to Device Control product, which automatically divert PV energy to home appliances (home automation).

This option is provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-device-control-zigbee-module-installation-guide.pdf>

To mount the ZigBee card in the CCG, see "Mounting the ZigBee Card in the CCG" on page 45



Wi-Fi

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

The Wi-Fi kit can be purchased separately and assembled during system installation. The Wi-Fi kit is provided with a user manual, which should be reviewed prior to connection. Refer to http://www.solaredge.com/sites/default/files/se_wifi_communication_solution_installation_guide.pdf



GSM

This wireless communication option (purchased separately) enables using a GSM connection to connect one or several devices to the SolarEdge monitoring platform.

The GSM cellular modem is provided with a user manual, which should be reviewed prior to connection. Refer to http://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf



Only communication products offered by SolarEdge are supported.

Always connect the communication options when the inverter is OFF.

Creating an Ethernet (LAN) Connection

Overview

This communication option enables using an Ethernet connection to connect the SolarEdge CCG to the monitoring platform through a LAN. The SolarEdge CCG has an RJ45 connector for Ethernet communication.

You can connect more than one SolarEdge CCG to the same switch/router or to different switches/routers, as required. Each CCG sends its monitored data independently to the SolarEdge monitoring platform.

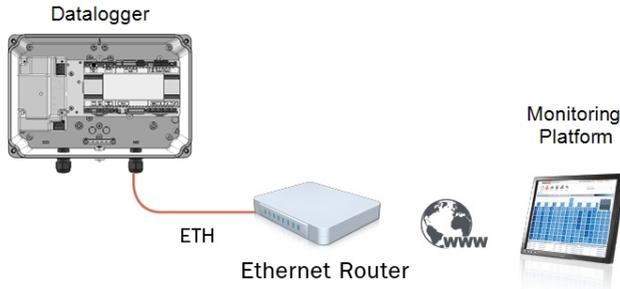


Figure 20: Example of Ethernet connection

Ethernet Communication Configuration Options

The following is a description of the options to configure the Ethernet (LAN) port settings.

Communication:

```
Server<LAN>
LAN Conf
RS485-1 Conf<S>
RS485-2 Conf<S>
ZigBee Conf<S>
Wi-Fi Conf<N/A>
Cellular Conf
Slave Detect
```

LAN Conf:

```
IP Config
Set DHCP <en>
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP<Dis>
```

- **IP Config:** Displays the current IP configuration of the CCG, as shown below. If DHCP is used, this screen reflects the parameters retrieved from the DHCP server. If manual settings are used, the screen shows the last manually input configurations.

```
IP 0.0.0.0
MSK 255.255.255.0
GW 192.168.0.1
DNS 0.0.0.0
```

- Set DHCP <En>: If the LAN connection between the CCG and the SolarEdge Monitoring Platform has a DHCP server, enable this option by setting it to Enable (default). If this option is enabled, then the DHCP server automatically configures the IP, Subnet Mask, default gateway and DNS. If not, set them manually.
- **Set IP:** Enables setting the IP of the default gateway according to the LAN settings:
 - Use the **Up** and **Down** buttons to adjust the value of each IP address octet.
 - Press the **Enter** button to move to the next IP address octet.
 - Long press the **Enter** button (until **Applied** message appears) – apply the value
 - Long press the **Esc** button (until **Aborted** message appears) – erase all characters

```
Setup IP
192.168.2.7
```

- **Set Mask:** Set the subnet mask of the SolarEdge CCG according to the LAN settings.
- **Set Gateway:** Set the default gateway address of the SolarEdge CCG according to the LAN settings.
- **Set DNS:** Set the DNS of the SolarEdge CCG according to the LAN settings.
- **Set Server Addr:** Set the IP address of the SolarEdge monitoring platform. This option is predefined in the SolarEdge CCG to specify the SolarEdge monitoring platform IP address and does not normally need configuration.
- **Set Server Port:** Set the port through which to connect to the SolarEdge monitoring platform. This option is predefined in the CCG to specify the SolarEdge monitoring platform IP port and normally does not need configuration.

NOTE



If your LAN has a firewall, you must verify that the address and port configured in the **Set Server Addr** and the **Set Server Port** fields are not blocked. You may need to configure it to enable the connection to the following address:

Destination Address: prod.solaredge.com

Port: 22222

Connecting and Configuring LAN

► To connect the Ethernet cable to the router/switch:

1. Use a pre-crimped cable or use a crimper to prepare an RJ45 communication connector on both ends of a standard CAT5/6 cable: Insert the eight wires into the RJ45 connector.

CAT5/6 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.

RJ45 Pin #	Wire Color		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-
7	White/Brown	White/Brown	Reserved
8	Brown	Brown	Reserved

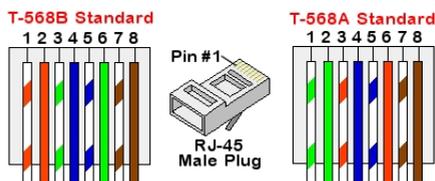


Figure 21: Standard cable wiring

2. Connect one end of the Ethernet cable to the RJ45 plug at the router or Ethernet gateway that is connected to the Internet.
3. Connect the other end to the SolarEdge CCG Ethernet connector.
4. Verify that the yellow communication LED turns ON.

► To configure Ethernet communication to the SolarEdge monitoring platform:

Define the device connected to the monitoring platform as the master device.

The server communication method is configured by default to **LAN with DHCP enabled**.

If a different setting is required, follow the steps below:

1. Enter Setup mode, as described in: *To enter Setup mode:* on page 34.
2. Set the CCG as the master of the RS485 bus and perform slave detection as described in “*configure the RS485 communication bus with SolarEdge inverters/SMI:* on page 16

3. To configure the LAN to Static IP select the following in the LCD menus on the CCG:
 - Communication → Server → LAN
 - LAN Conf → Set DHCP → <Dis>
4. Set the IP, subnet mask, gateway DNS, server address, and server port as necessary using the LCD User buttons. Refer to the *Ethernet Communication Configuration Options* on page 41.
5. Verify that the status field in the Server Communication Status window displays S_OK:

```
S e r v e r : L A N      < S _ O K >
S t a t u s :           < O K >
      x x x x x x x x
< E R R O R   M E S S A G E >
```

6. Exit the Setup mode.

Appendix A: Mounting the ZigBee Card in the CCG

1. Unscrew the nut and washer on the ZigBee card.
2. Connect the ZigBee card in a CCG board as shown below, and ensure that:
 - the antenna connector at the end of the ZigBee card goes through the bracket.
 - all pins are correctly positioned in the CCG socket and no pins are left out of their socket.
 - the card is firmly in place.

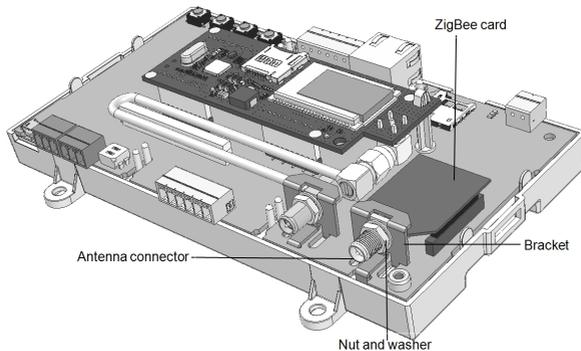


Figure 22: ZigBee card in a CCG board

3. Connect the antenna.
4. Close the CCG enclosure.

Appendix B: Inserting the GSM Modem in the CCG

Prerequisites

Purchase the GSM kit for the CCG that includes:

- GSM modem
- Cable
- Plastic spacer

▶ **To turn off the inverter, disconnect the AC and insert a SIM card:**

1. Turn the inverter Safety Switch (if applicable) to OFF.
2. Turn the inverter ON/OFF switch to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel. Wait 5 minutes for the capacitors to discharge.
4. If there is no SIM card installed in the modem, insert one into the slot on the GSM modem.

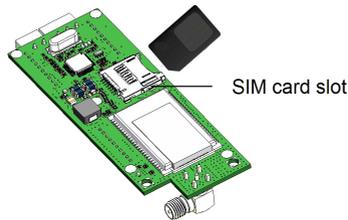


Figure 23: Inserting the SIM card into the GSM modem

▶ **To install the GSM modem in the CCG:**

1. Insert the top of the plastic spacer through the opening in the GSM modem, see *Figure 25*.
2. Connect one end of the cable to the GSM modem, see *Figure 24*
3. Remove the nut and the washer from the other end of the cable and insert the cable through the bracket on the CCG board, see *Figure 24*

- Return and tighten the nut and washer, see *Figure 24*

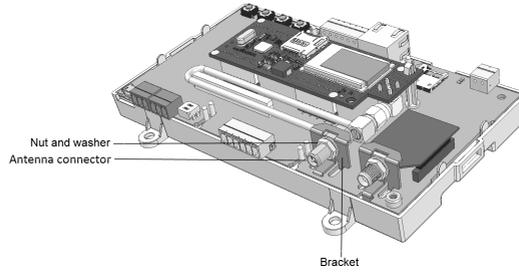


Figure 24: GSM modem on a CCG board with cables and a plastic spacer

Place the GSM modem on the CCG board and ensure that:

- the three row of pins are correctly positioned in the CCG's sockets and no pins are left out of their socket, see *Figure 25* and .
- the GSM modem is firmly in place on the CCG board, see *Figure 24*.

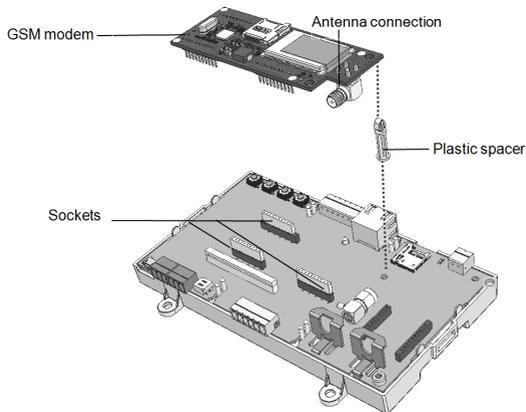
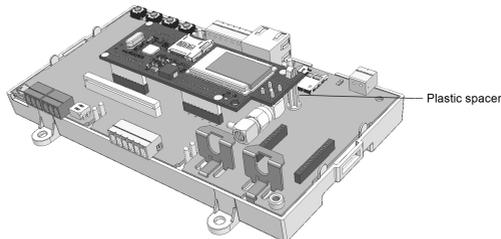


Figure 25: Installing a GSM modem on a CCG board



- GSM modem on CCG board.
- Connect the antenna.
- Turn on the AC

- 8. Check that all the GSM modem LEDs are lit. If not, refer to *Errors and Troubleshooting* on page 50.

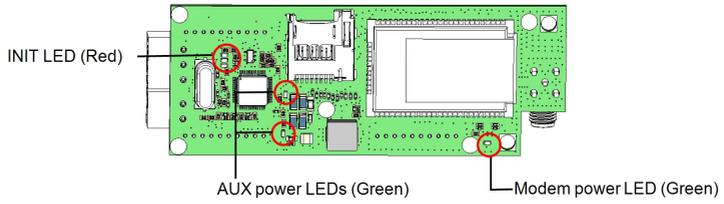


Figure 26: GSM modem LEDs

Appendix C: Errors and Troubleshooting

This appendix describes general system problems, and how to troubleshoot them. For further assistance, contact SolarEdge Support.

For information on the error and warning messages that appear on the LCD panel when an error occurs, refer to <http://www.solaredge.com/sites/default/files/se-inverter-installation-guide-error-codes.pdf>.

Troubleshooting Communication

Troubleshooting Ethernet Communication

When using Ethernet communication, use the **Server Communication Status** window to identify the location of the error:

```

Server : LAN    <S_OK>
Status :       <OK>
          xxxxxxxx
<ERROR MESSAGE>
  
```

xxxxxxx is a string of 1s and 0s showing an eight-bit communication connection status. 1 indicates OK and 0 indicates an error.

Bit Location	Error Message	Cause and Troubleshooting
1st	LAN Disconnected	Physical connection fault. Check the cable pin-out assignment and cable connection. Refer to <i>Creating an Ethernet (LAN) Connection</i> on page 40
2nd	DHCP Failed, or Invalid DHCP Config	IP settings issue. Check the router and inverter configuration. Consult your network IT.
3rd	Gateway Ping Failed	Ping to router failed. Check the physical connection to the switch/router. Check that the link LED at the router /switch is lit (indicating phy-link). If OK - contact your network IT, otherwise replace the cable or change it from cross to straight connection.

Bit Location	Error Message	Cause and Troubleshooting
4th	G Server Ping Failed	Ping to google.com failed. Connect a laptop and check for internet connection. If internet access is unavailable, contact your IT admin or your internet provider. For Wi-Fi networks, ensure that username and password are as defined in the internet provider AP/router.
5th	Server x Ping Failed	Ping or connection to SolarEdge server failed. Check the SolarEdge server address, under LAN Conf submenu: Address: prod.solaredge.com Port: 22222
6th		Check with your network administrator whether a firewall or another device is blocking transmission.
7th		
8th	Tcp Connect. Failed	

- If **No Communication** is displayed on the SolarEdge CCG, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the master and that slaves were detected, as described above.
- If the message **Master Not Found** appears, check the connections to the master device and fix if required.
- If after slave detection the number of slaves displayed in the master under **RS485-X Conf → Slave Detect** is smaller than the actual number of slaves, use the slave list to identify missing slaves and troubleshoot connectivity problems:
 - Select **RS485-X Conf → Slave List**. A list showing the serial numbers of the detected slaves is displayed.
 - To view the details of a detected slave device, select its serial number entry.

```

ID: 5000FE01-4F
Last Communication
17/02/2015
14:24:01
```

- ID:** Serial number
- Last Communication:** date and time (dd:mm:yy 24h) of last communication with the master. If this device is detected for the first time after the master wakeup, **N/A** appears for this information.

Additional Troubleshooting

- Check that the modem or hub/router is functioning properly.
- Check that the connection to the internal connector on the communication board is properly done.
- Check that the selected communication option is properly configured.

4. Use a method independent of the SolarEdge device to check whether the network and modem are operating properly. For example, connect a laptop to the Ethernet router and connect to the Internet.
5. Check whether a firewall or another type of network filter is blocking communication.

Appendix D: Technical Specifications

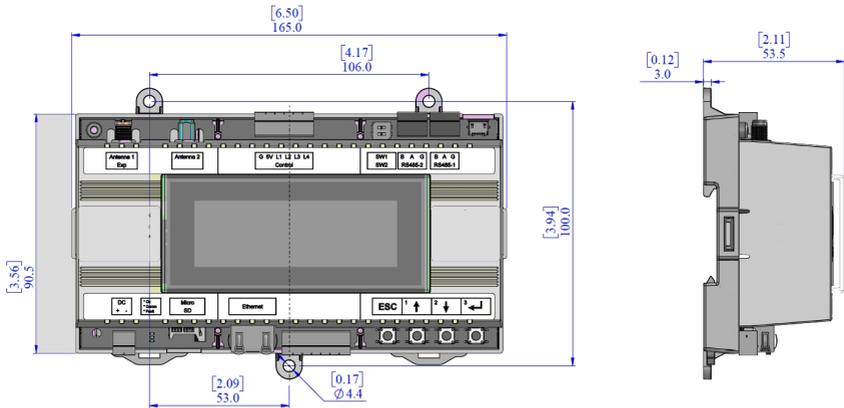
Power	Description	Units	
Power Supply – wall mount	Included, 100–240 VAC, EU/UK/US/AU interchangeable 2-pin plug		
Supply Voltage	9-14	Vdc	
Connector Type	terminal block		
Power Consumption	<2	W (typ.)	
Analog Sensor Input			
Number of Inputs	3		
	Range	Accuracy	Resolution
Input 1	0–30 mV or 0–2V	+/-1% f.s	10-bit
Input 2	0–2V or 0–10V		
Input 3	-20 mA – 20 mA		
Communication Interfaces	Type	Max. Length	
Ethernet Interface	10/100-BaseT	100/328	m/ft.
Wireless Connections	Wi-Fi ¹ or ZigBee cards ¹		
GSM Modem Interface	2G/3G GSM ¹		
Power Reduction Interface	4 control pins, 5V, GND	50/165	m/ft.
485 Interface	Two separate ports may be used for local connection	1000/3330	m/ft.
Supported RS485 Devices			
SolarEdge Devices	Yes		
Revenue Meters ²	Yes		
Export Inverter Data	Yes		
Export Data to Non-SolarEdge Logger	Yes		
Environmental			
Operating Temperatures	-20 to 60 / -4 to 140	°C / °F	

¹Sold separately. See individual product specifications for supported locations

²For a list of recommended sensors, refer to <http://www.solaredge.com/articles/se-supported-devices>

Protection Rating	IP20 Indoor		
Mechanical			
Mounting Type	DIN rail/ Wall mount		
Dimensions (L x W x H)	165 X 90.5 X 53.5 / 6.5 X 3.56 X 2.11	mm / inches	
Weight	< 0.5 / 1.1	kg / lbs	
Standard Compliance			
Safety	UL60950-1, IEC-60950-1		
EMC	FCC Part 15 class B, IEC61000-6-2, IEC61000-6-3		

Mechanical specifications:





If you have technical queries concerning our products,
please contact our support through SolarEdge service portal:
<http://www.solaredge.com/groups/support/services>

North America	(Toll free) 1877 360 529 2
Australia	(Toll free) 1800 46 55 67
Germany	089 454 597 30
France	(Toll free) 0800 917 410
Italy	(Toll free) 800 784 824
Japan	(Toll free) 81 03 6262 1223
United Kingdom	(Toll free) 0800 028 1183
Belgium	(Toll free) 0800 730 41
Israel	073 240 311 8
Rest of world	972 (0) 73 240 311 8
Fax	972 (0) 73 240 311 7
Email to:	support@solaredge.com

www.solaredge.com



MAN-01-00365-1.1

Commercial Gateway

with Cellular Support

Version 1.1

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Disclaimers

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The images contained in this document are for illustrative purposes only and may vary depending on product models.

Emission Compliance

This equipment has been tested and found to comply with the limits applied by the local regulations. 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, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

Support and Contact Information

If you have technical problems concerning SolarEdge products, please contact us:

Country	Phone	E-Mail
Australia (+61)	1800 465 567	support@solaredge.net.au
APAC (Asia Pacific)(+972)	073 240 3118	support-asia@solaredge.com
Benelux	NL (+31): 0800-7105 BE (+32): 0800-76633	support@solaredge.nl support@solaredge.be
China (+86)	21 6212 5536	support_china@solaredge.com
DACH & Rest of Europe (+49)	089 454 59730	support@solaredge.de
France (+33)	0800 917410	support@solaredge.fr
Italy (+39)	0422 053700	support@solaredge.it
Japan (+81)	03 6262 1223	support@solaredge.jp
New Zealand (+64)	0800 144 875	support@solaredge.net.au
US & Canada (+1)	510 498 3200	ussupport@solaredge.com
United Kingdom (+44)	0800 028 1183	support-uk@solaredge.com
Greece (+49)	89 454 59730	support@solaredge.com
Israel (+972)	073 240 3122	
Middle East & Africa (+972)	073 240 3118	
South Africa (+27)	0800 982 659	
Turkey (+90)	216 706 1929	
Worldwide (+972)	073 240 3118	

Before contact, make sure to have the following information at hand:

- Model and serial number of the product in question.
- The error indicated on the LCD screen or on the SolarEdge monitoring platform or by the LED, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The software version as appears in the ID status screen.

Revision History

Version 1.1 (June 2018)

- The Commercial Gateway now supports CDMA as well as GSM cellular connectivity , therefore its name was hanged to Commercial Gateway with Cellular with Support
- Changed name CCG to Commercial Gateway
- Removed indications that Commercial Gateway can be connected to non- SolarEdge inverters

Version 1.0 - initial release (June 2017)

HANDLING AND SAFETY INSTRUCTIONS

During installation, testing and inspection, adherence to all the handling and safety instructions is mandatory. **Failure to do so may result in injury or loss of life and damage to the equipment.**

Safety Symbols Information

The following safety symbols are used in this document. Familiarize yourself with the symbols and their meaning before installing or operating the system.

WARNING!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **injury or loss of life**. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.

CAUTION!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **damage or destruction of the product**. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

NOTE



Denotes additional information about the current subject.

IMPORTANT SAFETY FEATURE



Denotes information about safety issues.

Disposal requirements under the Waste Electrical and Electronic Equipment (WEEE) regulations:



NOTE

Discard this product according to local regulations or send it back to SolarEdge.

About This Guide

This user guide is intended for Photovoltaic (PV) system owners, installers, technicians, maintainers and integrators who use the SolarEdge power harvesting system.

This guide describes the process of installing and configuring the SolarEdge Control and Communication gateway (also referred to as SolarEdge gateway).

This guide assumes that the SolarEdge power harvesting system is already installed and commissioned. For additional information about how to install and commission the SolarEdge power harvesting system, refer to the relevant inverter or safety and monitoring system (SMI) installation guide.

The guide includes the following chapters:

- *Introducing the Commercial Gateway* on page 8, describes the SolarEdge control and communication gateway.
- Chapter 2: *Installing the Commercial Gateway* on page 18, describes how to install the SolarEdge gateway.
- Chapter 3: *LCD – Status Screens and Setup Options* on page 31 describes how to configure the SolarEdge gateway and how to identify its status.
- Chapter 4: *Connecting the Commercial Gateway to the Installation* on page 11, describes how to connect the control and communication gateway to inverters or Safety and Monitoring Interface (SMI) using the RS485 bus connection.
- Chapter 5: *Connecting Environmental Sensors (Optional)* on page 21, describes how to connect and configure external environmental sensors to the SolarEdge gateway.
- Chapter 6: *Setting Up Monitoring through the Commercial Gateway (Optional)* on page 40, describes how to set up communication through the SolarEdge gateway to the SolarEdge monitoring platform.
- Appendix A: "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46
- Appendix B: "Inserting the GSM Modem in the Commercial Gateway" on page 47
- Appendix C: *Errors and Troubleshooting* on page 49, describes the error messages that appear on the LCD panel when an error occurs, and how to troubleshoot them.
- Appendix D: *Technical Specifications* on page 51, provides the electrical and mechanical specifications of the SolarEdge gateway device.

For further information, datasheets and the most up-to-date certifications for various products in different countries, please visit the SolarEdge website: www.solaredge.com.

Chapter 1: Introducing the Commercial Gateway

Overview

The Commercial gateway expands SolarEdge monitoring and control capabilities. It can be connected to SolarEdge and non-SolarEdge devices (excluding inverters) and can transfer the monitoring data to the SolarEdge monitoring server and optionally, to a non-SolarEdge logger.

The Commercial Gateway can connect to the following devices¹:

- SolarEdge devices, such as inverters and safety and monitoring interfaces (SMIs)
- Environmental sensors
- Revenue grade meters
- Power reduction control devices



NOTE

Sensors, meters, loggers, and power reduction control devices are sold separately.

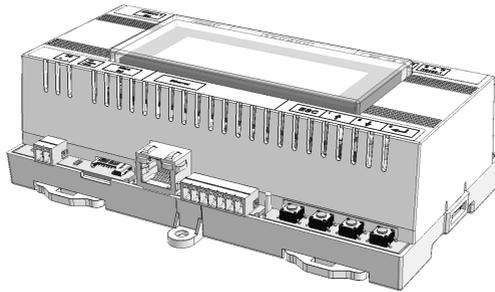


Figure 1: The Commercial Gateway

¹For a list of supported environmental sensors, revenue meters, and third party inverters, refer to <http://www.solaredge.com/articles/se-supported-devices>

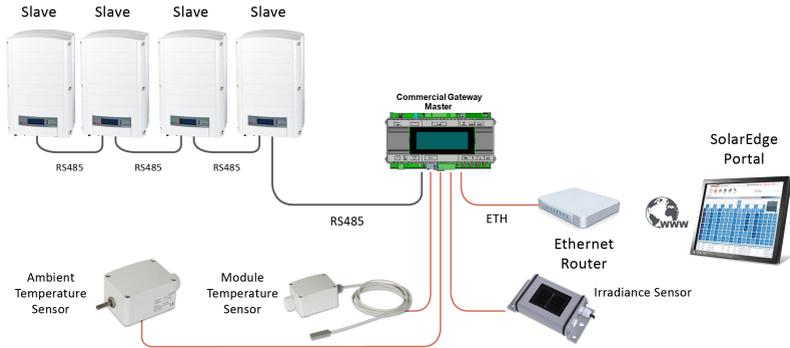


Figure 2: Example of sensor connection to the Commercial Gateway

Commercial Gateway Interfaces

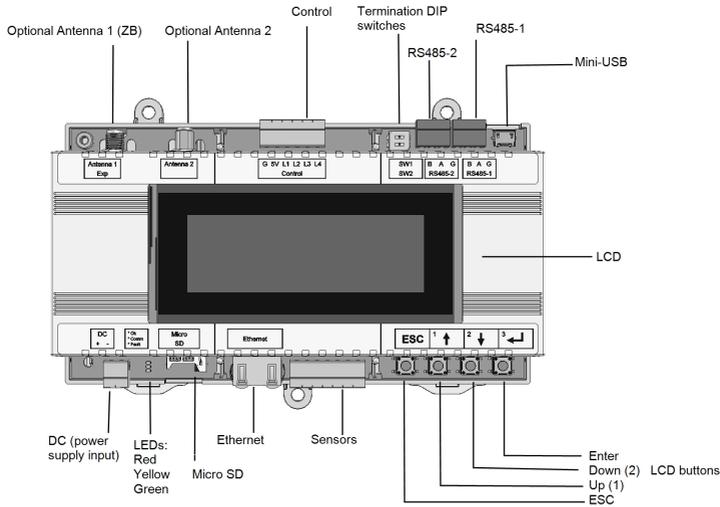


Figure 3: Commercial Gateway interfaces

LCD and LCD-Menu Buttons

The LCD screen displays status information of the system and various menus for configuration options. The LCD panel and buttons are used during the following processes:

- **Operational mode:** The LCD panel allows checking for proper system operation. Refer to *Status Screens - Operational Mode* on page 31 for a description of this option.
- **Setup mode:** Upon installation, an installer may perform basic configuration as described in *Configuration Menu Options* on page 35.
- **Error messages:** In the event of a problem, an error message may be displayed on the LCD panel. For more information, refer to *Errors and Troubleshooting* on page 49.

Use the four user buttons to control the LCD panel menus:

- **Esc:** Moves the cursor (>) to the beginning of the currently displayed parameter; goes to the previous menu, and cancels a value change with a long press (until **Aborted** is displayed).
- **Up (1)** and **Down (2):** Moves the cursor from one menu option to another, moves among the characters of a displayed parameter, and toggles between possible characters when setting a value.
- **Enter (3):** Selects a menu option and accepts a value change with a long press (until **Applied** is displayed).

Use the three rightmost buttons for entering the digits **123** when entering the Setup mode password **12312312**.

Communication Connectors

- **Antenna1:** used for optional wireless ZB (ZigBee) or Wi-Fi antenna connection.
- **Antenna2:** Currently not installed
- **RS485-1** and **RS485-2:** used for connecting external devices to the gateway (refer to *Connecting the Commercial Gateway to the Installation* on page 11)
- **Mini-USB:** Enables PC/laptop connection for using the SolarEdge configuration tool.
- **Ethernet:** Enables connecting the SolarEdge gateway to the SolarEdge monitoring platform through an Ethernet switch/router (refer to *Creating an Ethernet (LAN) Connection* on page 42). The Ethernet switch/router should be connected to the Internet.

LEDs

The Commercial gateway has three LED indicators, as follows:

- **OK (Green):** Indicates whether or not the Commercial gateway is powered.
- **Comm (Communication, Yellow):** Blinks when monitoring information is received from another SolarEdge device in the installation.
- **Fault (Red):** Indicates that there is an error. For more information, contact SolarEdge support.

All LEDs are ON while the Commercial gateway is being configured and during power up.

Other Interfaces

- **DC:** used for the power supply input as described in *Connecting the Commercial Gateway to AC* on page 20.
- **Sensors:** enables connecting to external environmental sensors (refer to *Connecting Environmental Sensors (Optional)* on page 21).
- **Control:** used for connection to an external power reducer device
- **SW1/SW2:** RS485-1/2 termination
- **Micro SD:** used for field software upgrade

Chapter 2: Connecting the Commercial Gateway to the Installation

Overview

The Commercial Gateway connects to the PV system installation using the RS485 communication option. The RS485 option enables creating a chain (bus) of up to 31 slave SolarEdge devices, connected to one master, which can be another SolarEdge device or the Commercial Gateway.

The following is an example of a master Commercial Gateway connected to a chain of slave inverters.

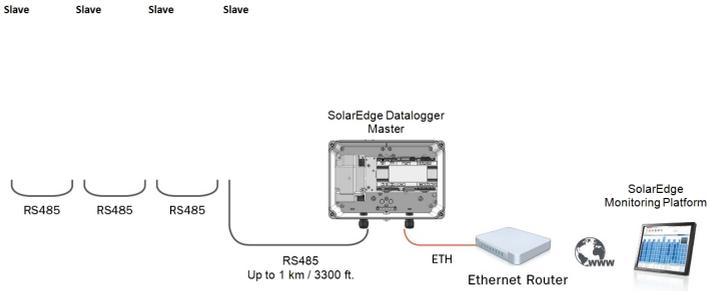


Figure 4: Example of RS485 connection

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

Creating an RS485 Bus Connection

The RS485 bus uses a three-wire cable connecting the RS485-1/2 terminal blocks on the Commercial Gateway to the RS485 input of the inverters/SMI.

▶ To connect the RS485 communication bus between inverters/SMIs and the Commercial Gateway:

1. Use one of the supplied 3-pin terminal blocks: Loosen the screws and insert the wire ends into the A, B and G pins. For connections longer than 10m use twisted pair wires for A and B wires.

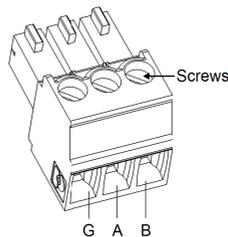


Figure 5: 3-pin terminal block

- Choose either RS485-1 or RS485-2 for connection. Connect the 3-pin terminal block to the designated port on the Commercial Gateway.



NOTE

RS485-1 is configured as SolarEdge device by default, therefore RS485-1 is recommended as the RS485 bus connection point.

- If the Commercial Gateway is at the end of the RS485 chain, terminate the Commercial Gateway by switching a termination DIP switch to ON. The switches in the SolarEdge Commercial Gateway are marked **SW1** for the RS485-1 port termination and **SW2** for the RS485-2 port termination, as shown below:



Figure 6: RS485 connectors and termination switches

- Open the inverter/SMI cover as described in their manual.
- Remove the seal from one of the openings in communication gland #2 of the inverter and insert the cable through the opening.
- Pull out the 9-pin RS485 terminal block connector, as shown below:

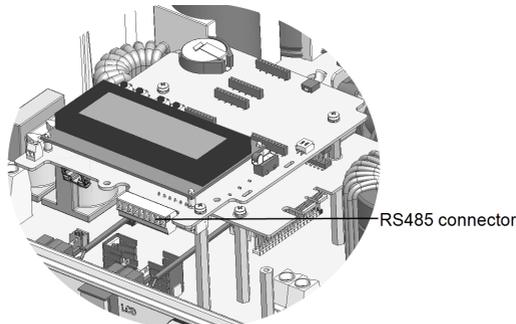


Figure 7: The RS485 terminal block in the inverter/SMI

7. Loosen the screws of pins B, A and G on the left of the RS-485 terminal block.
 - For inverter: RS485-1 pins (left-most)
 - For SMI: RS485-1 (recommended, as this is the default configuration), or RS485-2

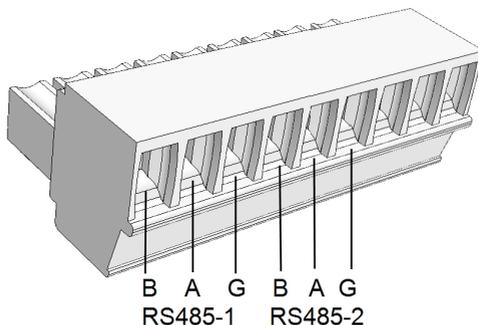


Figure 8: RS485 terminal block

8. Insert the wire ends into the G, A and B pins shown above. You can use any color wire for each of the A, B 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.
9. Connect all B, A and G pins in all inverters/SMI. The following figure illustrates this connection schema (the illustration applies to both inverters and SMI):

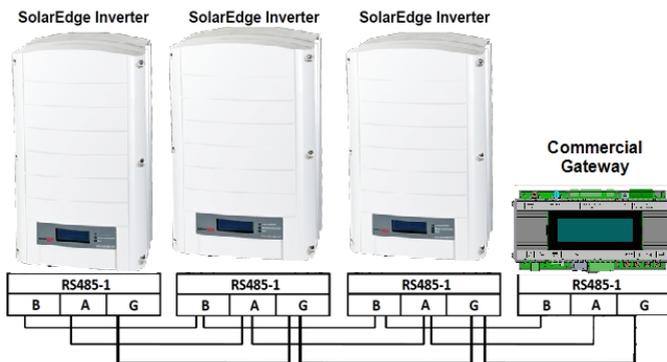


Figure 9: Connecting SolarEdge devices (inverters or SMI) in a chain

NOTE

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

For inverters - Do not insert wires into RS485-2 pins.

For SMI - Make sure you are using the same RS485 port (1/2) in all devices.

10. Tighten the terminal block screws.
11. Push the RS485 terminal block firmly all the way into the communication board.

12. Terminate the inverters/SMIs at the two ends of the chain by switching a termination DIP-switch inside the inverter/SMI to ON (move the switch to the top). The switch is located on the communication board and is marked **SW7**.

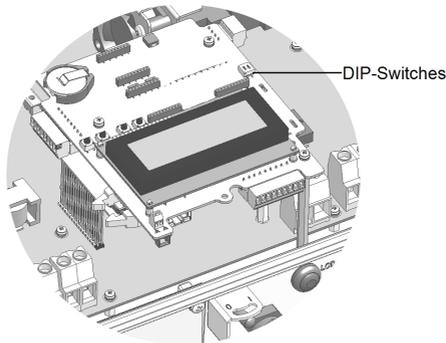


Figure 10: RS485 termination switch



NOTE
Only the first and last SolarEdge devices in the chain should be terminated. The other devices in the chain should have the termination switch OFF.

► **To configure the RS485 communication bus with SolarEdge inverters/SMI:**

By default, all SolarEdge devices are pre-configured as slaves on the RS485-1 port. Slaves can be further configured using the **RS485-X Conf** option in the Communication menu.

One device must be set as the master on the RS485 bus. Any SolarEdge device may be the master (Commercial Gateway, inverter, or SMI). If you connect the installation to the SolarEdge monitoring platform, the device used to connect to the server must be the master.

The following describes how to configure the master device.

1. Press the **Enter** button until the following message is displayed:

```
Please enter
Password
*****
```

2. Use the three-right most LCD buttons to type in the following password: **12312312**

The following menu is displayed:

```
Language <Eng>
Communication
Power Control
Display
Maintenance
Information
```

3. Short-press the arrow buttons to scroll to the Communication menu. Press the Enter button to select it.

4. Select **Server** → **RS485-X Conf** (X=1 or 2 depending on the specific physical port connection) to communicate with different external devices (SolarEdge inverters, revenue meters or non-SolarEdge loggers).
5. To configure the master, select the following in the LCD menu:
 - **Communication** → **RS485-1 Conf** → **Device Type** → **SolarEdge**
 - **RS485-1 Conf** → **Protocol** → **Master**
 - **RS485-1 Conf** → **Slave Detect**The system starts automatic detection of the SolarEdge slave inverters connected to the master Commercial Gateway. The Commercial Gateway should report the correct number of slaves. If not, verify the connections and terminations. Verify that only one master is configured on the bus.
6. Close the inverter/SMI cover and start power production.
7. Verify the connection of the Master to the SolarEdge monitoring platform, as described below.

Verifying the Connection

1. After connection, a message similar to the following appears in the main status screen (see also *Initial Status* on page 31):

```
RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
```

2. Verify that **S_OK** appears, to indicate that the connection to the SolarEdge monitoring platform is successful. If **S_OK** is not displayed, refer to Troubleshooting Communication, below.

Troubleshooting the RS485 Communication

1. If **No Communication** is displayed on the SolarEdge Commercial Gateway, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the master and that slaves were detected, as described above.
2. If the message **Master Not Found** appears, check the connections to the master device and fix if required.
3. If after slave detection the number of slaves displayed in the master under **RS485-X Conf** → **Slave Detect** is smaller than the actual number of slaves, use one of the following methods to identify missing slaves and troubleshoot connectivity problems:
 - Use the **Long slave Detect** to retry connecting to slaves
 - Analyze the **Slave List** to check for missing slaves, and check their connection

Refer to https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf



RS485 Configuration Options

In all configurations, use the following RS485 port configuration menus:

RS485-X

```
Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Cluster SLV Detect
Long Slave Detect <#>
Slave List <#>
Multi-Inv. Set
```

Device Type:

```
SolarEdge <M>
Non-SE Logger <S>
Revenue Meter <M>
Multi Devices <M>
None
```

Protocol:

```
Slave
Master
```

Device ID:

```
Please Select
Device ID
1
```

- **Device Type** is used to select the specific port configuration. The following devices are supported:
 - **SolarEdge** (default for RS485-1): Used when connecting to SolarEdge devices, such as: inverters, SMIs or Commercial Gateways. By default, all SolarEdge devices are pre-configured as slaves on the RS485-1 port.
 - **Revenue Meter**: Used when connecting to an external revenue grade meter, in order to read the meter data and send it to the monitoring platform. For a list of supported meters, refer to <http://www.solaredge.com/se-supported-devices>.
 - **Non-SE Logger**: Used when connecting to an external non-SolarEdge logger. The logger can read SolarEdge inverters data for Non-SolarEdge monitoring purposes.
 - **None**: No device (default for RS485-2)
- **Protocol**:
 - When selecting a SolarEdge device, the following protocols appear under the Protocol option:
 - Slave (default)
 - Master
 - When selecting Device Type <Inv. Reader>, the Device Type <field> changes to Device Type <INV>
 - When selecting Device type <Non-SE Logger>, the Device Type <field> changes to Device Type <LGR> and the following protocol appears under the Protocol option: SunSpec (default)

- When selecting Device type <Revenue Meter>, the Device Type <field> changes to Device Type <MTR>

**NOTE**

For other supported protocols, refer to <http://www.solaredge.com/se-supported-devices>

- **Device ID:** The device ID is used to set the Commercial Gateway device ID (MODBUS ID) when connecting to an external master device (for example, a non-SolarEdge logger), or to set the ID of the external device (for example, revenue meter).
- **Slave Detect:** Is used to initiate automatic detection of the slave devices connected to this master device. The number next to the option is the number of devices that have been detected.

Chapter 3: Installing the Commercial Gateway

Safety

**CAUTION!**

For North America only: The product's communication with external devices must not use wires that span more than one building, as per the UL 60950-2 standard.

Transport and Storage

Transport the SolarEdge gateway in its original packaging, without exposing it to unnecessary shocks. If the original package is no longer available, use a similar box, which can be closed fully.

Store the SolarEdge gateway in a dry place where ambient temperatures are -40°C (-40°F) to +60°C (140°F).

Package Contents

- Commercial Gateway
- 100-240VAC to 12VDC (50 Hz/60 Hz) power supply with an interchangeable AC plug (US, EU, AU)
- Accessory kit including:
 - Three 3-pin terminal blocks
 - One 7-pin terminal block
 - One 6-pin terminal block

Installation Equipment

Standard tools can be used during the installation of the Commercial Gateway . The following is a recommendation of the equipment needed for installation:

- DIN rails
- Drill and 4mm diameter bits
- Three twisted wires or four-wire twisted pair cable
- For installing the communication options: CAT5/6 Ethernet cable

Installation Guidelines

The following requirements apply when locating and mounting the SolarEdge gateway:

- The gateway is suitable for mounting indoors only. For outdoor installation, use an external outdoor enclosure (not provided by SolarEdge)
- The gateway must always remain in an ambient temperature of -20°C (-4°F) to +60°C (140°F).
- The gateway power supply requires a socket outlet with a grid voltage of 100 V - 240 V (50/60Hz).
- Protect the gateway from dust, wet conditions, corrosive substances and vapors.
- Cable specifications:

Connection Type	Cable Type	Maximum Length
RS485 communication bus (per RS485 port)	Three twisted wires or 4-wire twisted pair cable (two twisted pairs). Recommended wire size: 20 AWG / 0.52 mm2	1,000m (3,330 ft)
Ethernet	CAT5/6	100m (325 ft).
Sensor/control interface	Recommended wire size: 20 AWG / 0.52 mm2	50m (165 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 recommend to use external surge protection devices. For details refer to: http://www.solaredge.com/files/pdfs/lightning_surge_protection.pdf. If grounded metal conduit are used for routing the communication wires, there is no need for a lightning protection device.



Installation Workflow

The following provides an overview of the workflow for installing and setting up the Commercial gateway:

- [Step 1 - Mounting the Commercial Gateway](#), page 20
- [Step 2 - Connecting the Commercial Gateway to the SolarEdge installation](#), page 11
- [Step 3 - Connecting environmental sensors \(optional\)](#), page 22
- [Step 4 - Configuring the Commercial Gateway and inverters/SMI](#), page 14
- [Step 5 - Using the control and communication gateway to connect the installation to the monitoring server \(optional\)](#), page 40

Mounting and Connecting the Commercial Gateway

The gateway can be installed on a wall or on a DIN rail.

► To mount the Commercial Gateway on a wall:

1. Determine the mounting location. Leave clearance from all sides of the gateway for cover opening, cable connection and routing.
2. Position the device on the wall, mark points through the mounting tabs and drill holes using a 4mm diameter drill bit.
3. Mount the unit using screw anchors and screws (use 3.5mm diameter screws, 20mm minimum length, not provided by SolarEdge).

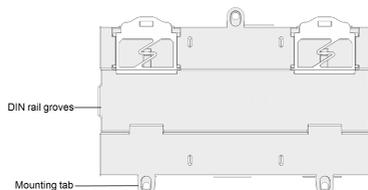


Figure 11: Commercial Gateway mounting tabs

► To mount the Commercial Gateway on a DIN rail:

1. Press the gateway upwards and snap it into the upper and lower edges of the DIN rail.

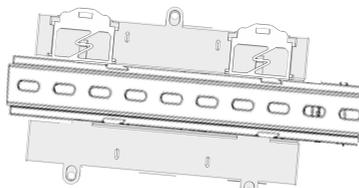


Figure 12: Commercial Gateway mounted on a DIN rail

Connecting the Commercial Gateway to AC

For connecting to power, use the supplied power supply:

1. Connect the power supply cable connector to the connector labeled **DC** on the Commercial Gateway (see Figure 3).
2. Connect the power supply to the AC mains. The LEDs are lit momentarily to indicate power connection (see Figure 3).



CAUTION!

If you use a non-SolarEdge power supply, check that it has 12Vdc/1A output ratings, and that it is certified to UL/CSA/IEC60950-1 2ed standards. Limited Power Source output, NEC class 2. Verify the power supply polarity as marked on the gateway.

Chapter 4: Connecting Environmental Sensors (Optional)

Overview

The Commercial Gateway supports up to three analog sensors. If you connect more sensors than supported by a single Commercial Gateway, use an additional Commercial Gateway:

- Two sensors with voltage output (V1, V2), each supports different voltage ranges
- One sensor with current output (I)

The following environmental sensor types are supported:

Sensor Type	Configurable Range	Unit
Temperature	-99.0 to +99.0	°C
	-146.20 to 210.20	°F
Irradiance	0 to 9999	W/m ²
Wind velocity	0 to 99	m/s
Wind direction	0 to 359	degrees
Pyranometer	-200 to 2000	W/m ²

You can view the sensor data in the Status window (see *Sensors Status* on page 35), and in the monitoring platform.

This chapter describes how to connect sensors to the Commercial Gateway and how to configure them.

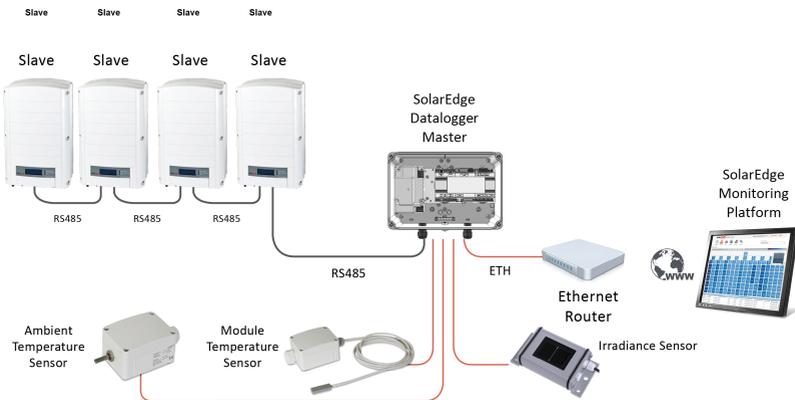


Figure 13: Example of sensor connection to the SolarEdge Commercial Gateway

Connecting Sensors to the Commercial Gateway

For connection of the irradiance and temperature sensors available from SolarEdge refer to *Sensor Connection Example* on page 28.

Sensors are directly connected to the Commercial Gateway via the sensor interface connector. Use the supplied 7-pin terminal block. *Figure 14* shows the location of the sensors connector on the Commercial Gateway.

Sensor Connector Pin #	Pin Name	Description
1	V1	Voltage sensor input number 1
2	GND	Ground (common for V1, V2 and ground)
3	V2	Voltage sensor input number 2
4	I-	Current sensor input – negative
5	I+	Current sensor input – positive
6	GND	Ground (common for V1, V2 and ground)
7	12V	12VDC output voltage supply to the sensors. (limited to 800mA)

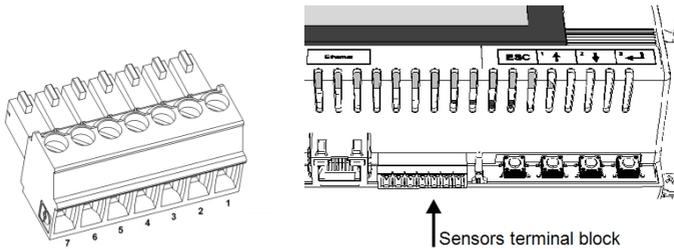


Figure 14: Sensor Interface Inputs

▶ To connect a voltage sensor:

Use a 3-wire cable for this connection. Recommended wire size is 0.52mm²/ 20 AWG with maximum length of 50m/164 ft.

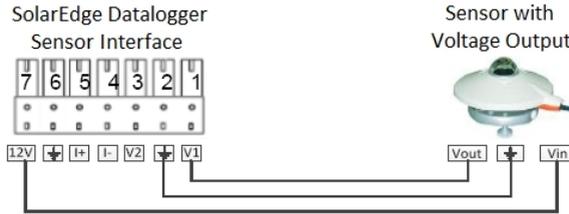
1. Connect a voltage source sensor to either V1 or V2, depending on its operating voltage range. Voltage sensor inputs support the following user selectable ranges:
 - V1: 0–2 Vdc or 0–30 mVdc.
 - V2: 0–10 Vdc or 0–2 Vdc .

- Depending on the sensor range, connect the sensor between V1 (pin1) and GND (pin 2), or between V2 (pin 3) and GND (pin 2).

The GND (pin 2) serves as a common ground for both V1 and V2.

The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

For an example of sensor connection, refer to *Sensor Connection Example* on page 28



CAUTION!

Excessive voltage on the sensor input can damage the SolarEdge Commercial Gateway. Refer to input ranges specified in the *Technical Specifications* on page 51.

Une tension excessive à l'entrée du capteur peut endommager le Data Logger de SolarEdge. Referrez vous aux plages d'entrée spécifiées dans la fiche technique .

► To connect a current sensor:

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm²/20 AWG with maximum length of 50m/164 ft.

Connect a current source sensor to either I+ or I-, depending on its operating range:

- For positive current:
 - I+ (pin 5) - connect to the current output (Iout) of the sensor.
 - I- (pin 4) - connect to ground.
 - GND (pin 6) - connect to the ground connection terminal of the sensor.
 - The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

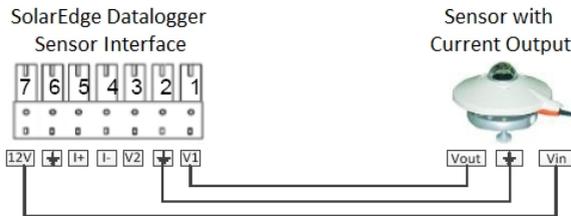


Figure 15: Current sensor (4-20mA) positive connection

- For Negative current:
 - I- (pin 4) - connect to the current output (Iout) of the sensor.
 - I+ (pin 5) - connect to ground.
 - GND (pin 6) - connect to the ground connection terminal of the sensor.
 - The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

**CAUTION!**

Excessive current on the sensor input can damage the SolarEdge Commercial Gateway. Refer to input ranges specified in the *Technical Specifications* on page 51.

Un courant excessif à l'entrée du capteur peut endommager le Data Logger de SolarEdge. Referrez vous aux plages d'entrée spécifiées dans la fiche technique.

Configuring Environmental Sensors

Menus

The SolarEdge Commercial Gateway sensor interface is disabled by default. The following shows a hierarchical tree of the Sensors menu options:

Sensors

```
V1 Sensor<Dis>
V2 Sensor<Dis>
I Sensor<Dis>
```

Set V1/V2/I Sensor (example for V1 sensor)

```
Sensor <En>
Range <0-2V>
Type <--->
Two Points
```

Range

```
0 - 2 V
0 - 30 mV
```

Sensor Type

```
Temp. Ambient
Temp. Module
Wind Speed
Wind Direction
Irradiance Global
Irradiance Direct
Irradiance Diff.
Irradiance POA
```

Two Points setting

```
P0 <0.0, 0.0>
P1 <1.000, 1.000>
```

Set Point

```
Set Point
(V, degC)
0.0, 0.0
```

- Sensors:
 - **V1 Sensor** and **V2 sensor**- sensors with voltage output, enabled or disabled
 - **I Sensor** – a sensor with current output, enabled or disabled

- Range:
 - **V1** – select a range between 0–2 Vdc or 0–30 mVdc.
 - **V2** – select a range between 0–10 Vdc or 0–2 Vdc. I – select a range between 0–20 mA
- **Sensor Type:** One of the following sensors:

Sensor Type	Description	Unit
Temp. Ambient	Ambient temperature sensor measurement	°C, °F
Temp. Module	Module temperature sensor measurement	
Wind Speed	Wind speed sensor measurement	m/s
Wind Direction	Wind direction sensor measurement	degrees
Irradiance Global	Global horizontal irradiance	
Irradiance Direct	Direct irradiance	W/m2
Irradiance Diff.	Diffused irradiance	
Irradiance POA	Plane of Array (POA) irradiance	



NOTE

The temperature units are configured in °C by default and can be changed to °F under the **Temperature** submenu located under the **Display** menu.

- **Two Points setting:** P0 and P1 represent points on the sensor graph to be configured in the Commercial Gateway. The values refer to the measurement signal and the measurement range from the sensor datasheet. Refer to the example below.
- **Set point:** Enables entering two measurement signal values (voltage, current or temperature).

Configuring the Sensors in the Commercial Gateway

► **To enable the sensors in the Commercial Gateway:**

1. Press the Enter button until the following message is displayed:

```

Please enter
Password
*****
    
```

The Commercial Gateway is now in Setup mode and all its LEDs are lit.

2. Use the three-right most LCD buttons to type in the following password: 12312312. The following menu is displayed:

```

Language <Eng>
Communication
Power Control
Display
Maintenance
Information
    
```

3. Under the main menu, select **Sensors**.

4. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>
Range <0-2V>
Type <--->
Two Points
```

► To configure sensors in the Commercial Gateway:



NOTE

When using sensors provided by SolarEdge, enabling the sensors as described above automatically sets their configuration (available from SolarEdge Commercial Gateway CPU version 2.07xx). If the CPU version is lower, configure the sensors as described below.

Configure the working range of the sensor that covers the sensor specification. Refer to the table on page 21.

1. Select **Range** under the specific configured sensor and then select the applicable range:
 - V1—select a range between 0–2 Vdc or 0–30 mVdc.
 - V2—select a range between 0–10 Vdc or 0–2 Vdc.
 - I—select a range between 0–20 mA.

A screen similar to the following is displayed, depending on the selected sensor:

```
0-2V
0-30mV
```

2. Select the **Type** of the connected sensor from the following:

```
Temp. Ambient
Temp. Module
Wind Speed
Wind Direction
Irradiance Global
Irradiance Direct
Irradiance Diff.
Irradiance POA
```

3. Select Two Points to configure two points on the sensor graph using the measurement signal and measurement range data from the sensor datasheet.

```
P0 <0.0, 0.0>
P1 <1.000, 1.000>
```

4. Set the point values as follows:
 - Use the **Up** and **Down** buttons to adjust the value.
 - Press the **Enter** button to move to a character.
 - Long press the **Enter** button (until **Applied** message appears)—apply the value
 - Long press the **Esc** button (until **Aborted** message appears)—erase all characters

```
Set Point
(V, DegC)
10, 70
```

5. If required, repeat steps 1 through 4 above to configure additional sensors.

- Check that the Sensors status screen on the LCD displays a screen similar to below, and verify that the sensor's readings are within the range that appears in its datasheet. Refer to *Sensors Status* on page 35.

```
Sensors
1 : XXX.XXX DegC
V2 : XXX.XXX W/m2
I : Disabled
```

Example of Sensor Graph Configuration

The following is an example of setting a temperature sensor with the following specifications:

- Measurement signal: 0..10V
- Measurement range: -10...+70°C

The following graph shows the min. and max. values, and the focused (linear) area.

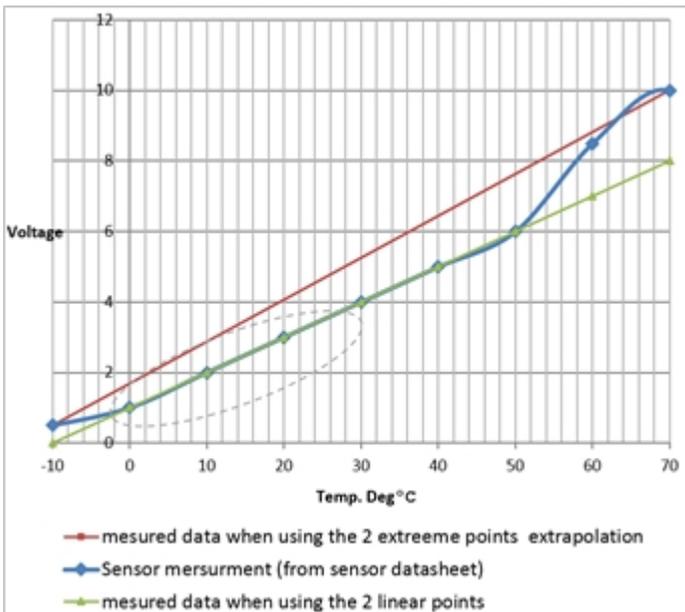


Figure 16: Example of sensor graph

If you want to include the full range of the sensor, the points for setting are the minimum and maximum values from the sensor datasheet:

```
P 0 < 0 , - 10 >
P 1 < 10 , 70 >
```

However, if you want to include a partial range, set any value for the two points, as long as the points are within the SolarEdge Commercial Gateway selected range. The SolarEdge Commercial Gateway then extrapolates the sensor linear graph based on these two points.

```
P 0 < 1 , 0 >
P 1 < 5 , 50 >
```

Sensor Connection Example

This section describes how to connect three of the sensors available from SolarEdge to the Commercial Gateway. For their full specifications refer to

http://www.solaredge.com/files/pdfs/products/inverters/se_sensor_datasheet.pdf (for other recommended sensors and suppliers refer to http://www.solaredge.com/articles/se-supported-devices#environmental_sensors).

- Ambient temperature sensor - a voltage output sensor, measuring the ambient temperature. Electrical output: 0..10V.
- Module temperature sensor - a current output sensor, measuring the module surface temperature. Electrical output: 4..20 mA.
- Solar irradiance sensor - a voltage output sensor, measuring the solar irradiance. Electrical output: 0-1.4 VDC.

An external 24VDC/1A power supply is required for connecting the temperature sensors. A single PSU can be used for both sensors.

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm² / 20 AWG with maximum length of 50m/164 ft.

The following diagram illustrates the connections of the above devices to the SolarEdge Commercial Gateway:

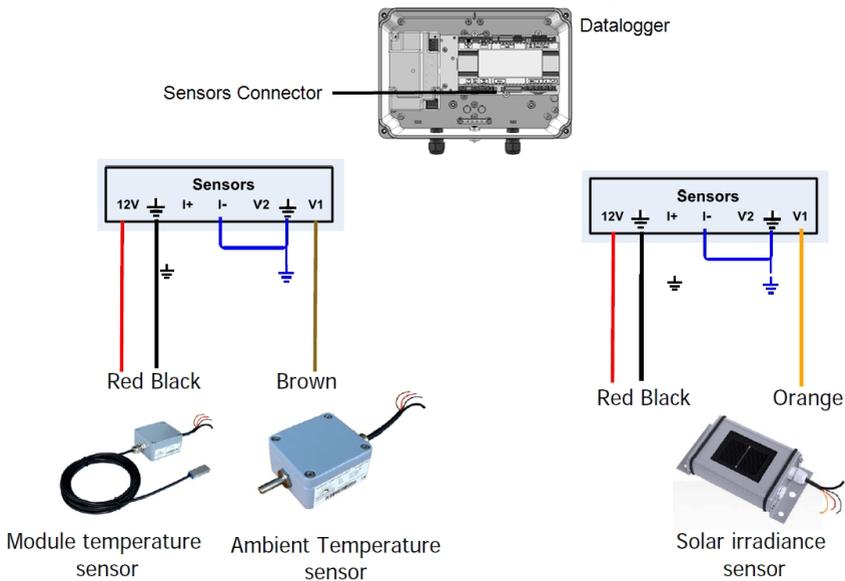


Figure 17: Sensors connection diagram

▶ **To connect an ambient or module temperature sensor to the power supply and to the Commercial Gateway:**

The same power supply can be used for both sensors.

1. Use a flat screwdriver to open the sensor cover screws and remove the cover.
2. Insert the cable through the supplied gland and rubber seal, and into the sensor opening..
3. Connect I- to ground.
4. Connect the power supply to an AC source using the , N, L connection points at the bottom of the power supply.

▶ **To connect a solar irradiance sensor to the Commercial Gateway:**

1. Connect the thin wires to the Commercial Gateway sensors connector as follows (see *Figure 18*):
 - Orange - to V1
 - Black - to Ground
 - Red - to 12V
 - Leave the thicker black wire (Shield) unconnected.

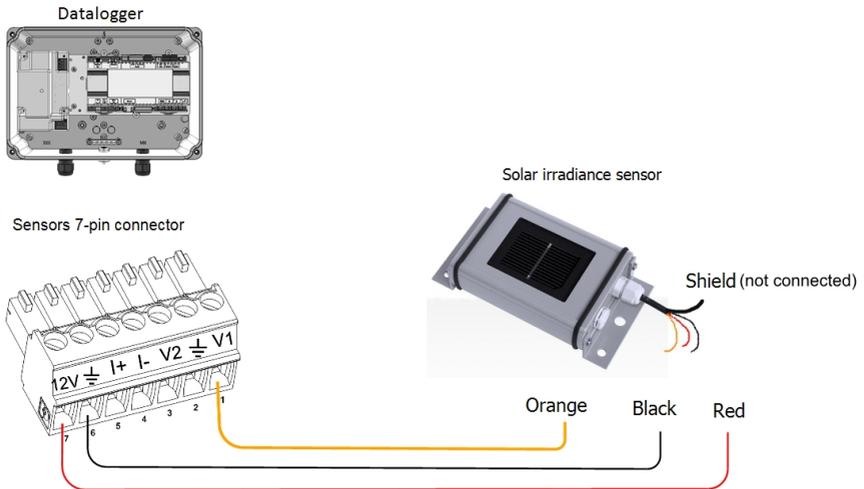


Figure 18: Solar irradiance sensor connection



NOTE

When configuring this sensor in the Commercial Gateway, the type should be **Irradiance Direct**

▶ **To enable the sensors in the Commercial Gateway:**

1. Enter Setup mode, as described in sensors configuration above.
2. Under the main menu, select **Sensors**.

3. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>  
Range <0 - 2 V>  
Type <- - ->  
Two Points
```

If the CPU version of the SolarEdge Commercial Gateway is 2.07xx and higher, the sensors are automatically configured. If the CPU version is lower, configure the sensors as described in: *To configure sensors in the Commercial Gateway*: on page 26

Chapter 5: LCD – Status Screens and Setup Options

This chapter describes the LCD display of the SolarEdge Commercial Gateway. The LCD screen displays status information of the Commercial Gateway and various menus for configuration.

Status Screens - Operational Mode

During normal operation pressing the **Enter** button turns on the LCD backlight. The backlight is active for 30 seconds by default. This duration is configurable, as described in *Display* on page 38.

Additional presses display the following screens one after the other.

Initial Status

```
RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
```

- **RRCR:** If enabled, indicates the active power set by the power control interface, in percent of peak power.
- **Sensors:** Enable/disable status of Sensors' input reading
- **Server:** Server communication method
- **Total # of Slaves:** Indicates the total number of slave devices communicating with the SolarEdge Commercial Gateway

Energy Meter Status

If a meter is connected to the inverter, the following status screen, showing the power and energy readings, is displayed in addition to the above screen.

If the meter is set to Export +Import, there are two status screens, with the first line displaying: "Export Meter" or "Import Meter". The following is an example of an export meter status:

```
Export Meter
Status: <OK/ Error # >
Power [W]: xxxxx.x
Energy [Wh]: XXXXX.X
```

- **Status:** Displays OK if the meter is communicating with the communication board.
- **<Error message>:** If there is a meter error, it is displayed in this line.
- **Power (W):** Depending on the meter type connected to the inverter, this line displays the exported or imported power in Watts.
- **Energy (Wh):** The total energy read by the meter, in Watt/hour. The value displayed in this line depends on the meter type connected to the inverter and its location:
 - If a bidirectional meter is connected at the consumption point, this value is the consumed energy.
 - If the meter is installed at the production connection point, this value is the energy produced by the site.
 - If the meter is installed at the grid connection point, this value is the energy exported to the grid.

If the inverter is connected to the SolarEdge server, this value will also be displayed in the monitoring platform.



NOTE

This data is accumulated according to an internal real-time clock.

ID Status

This screen displays the ID of the Commercial Gateway and the software version.

```
ID: ##### ##
DSP1: 1.0210
CPU: 0003.19xx
Country: ESP
```

Server Communication Status

```
Server: LAN <S_OK>
Status: <OK>
xxxxxxx
<ERROR MESSAGE>
```



NOTE

If the connection method is CDMA (referred to as "Cellular" in the status screens) or GSM, the server screen is replaced with the Cellular or GSM status screens (see *Status Screens - Operational Mode* on page 31 and *GSM Status* on page 33).

- **Server:** The method of connection to the SolarEdge monitoring platform.
- **S_OK:** The connection to the SolarEdge monitoring platform is successful (should appear only if the inverter is connected to the server).
- **Status:** Displays OK if the Commercial Gateway established successful connection and communication with the specified server port/device (LAN, RS485, Wi-Fi or ZigBee Plug-in).
- **xxxxxxx:** Eight-bit Ethernet communication connection status: A string of 1s and 0s is displayed. 1 indicates OK, 0 indicates an error. For a list of possible errors and how to troubleshoot them, refer to on page 49.
- **Error message,** according to failure. Refer to <http://www.solaredge.com/sites/default/files/se-inverter-installation-guide-error-codes.pdf>.



IP Status

This screen describes the Ethernet configuration: IP, Mask, TCP Gateway and MAC address (Media Access Control) of the Commercial Gateway.

```
IP 192.168.2.119
MSK 255.255.255.0
GW 192.168.2.1
MAC 0-27-02-00-39-36
```

ZigBee Status

This screen describes the ZigBee configuration:

```
PAN : XXXXX
CH : XX / XXXX  RSSI : <L>
MID : XXXX  XX
ZigBee Ready
```

- **RSSI:** The receive signal strength indication of the closest ZigBee in the system. L = low, M = medium, H = high and (-) = no signal.
- **PAN ID:** The ZigBee transceiver PAN ID (Personal Area Network Identification), the ID uniquely represents a device in a Zigbee network.
- **Ch.:** The ZigBee transceiver channel
- **ID:** The ZigBee transceiver ID
- **MID:** The Master ID of the coordinator (master) ZigBee Plug-in. This field is shown only in devices with router (slave) ZigBee cards, and after a successful ZigBee association. If a ZigBee Plug-in is not connected, a **No ZigBee** message is displayed instead of the **MID** field.
- **ZigBee Ready:** This field is shown only in devices with ZigBee router transceivers (slaves), in a multi-point (MP) protocol configuration. If a ZigBee transceiver is not physically connected, a **No ZigBee** message is displayed.

Wi-Fi Status

This screen describes the Wi-Fi configuration:

```
IP : 192.168.2.119
GW : 192.168.2.1
SSID : xxxxxxxx
RSSI : <L/M/H/->
```

- **IP:** The DHCP provided address
- **GW:** The gateway IP address
- **SSID:** Service Set Identifier - the name of a wireless local area network (WLAN). All wireless devices on a WLAN must employ the same SSID in order to communicate with each other.
- **RSSI:** The receive signal strength indication of the closest Wi-Fi in the SolarEdge system. L = low, M = medium, H = high and - = no signal.

GSM Status

If a GSM Plug-in is connected, this screen replaces the Server status screen:

```
Server: Cell <S_OK>
Status: <OK>
MNO: <xxxxxxx> Sig: 5
<Error message>
```

- **Server:** The method of communication to the SolarEdge monitoring platform. Should display **Cell**.
- **Status:** Displays OK if the inverter established a successful physical connection to the modem.
- **S_OK:** The last communication to the SolarEdge monitoring platform was successful (appears if the inverter is connected to the platform). If S_OK is not displayed, refer to *Status Screens - Operational Mode* on page 31.
- **MNO:** The mobile network operator name
- **Sig:** The signal strength, received from the modem. A value between 0-5, (0 = no signal; 5 = excellent signal)
- **Error message:** per communication connection status failure

Communication Ports Status

This screen presents the communication port (RS485-1/2 or ZigBee), and the devices connected to them, with details about the number, type, and protocol.

```

      Dev Prot  ##
RS485-1<SE><S > <-->
RS485-2<SE><S > <-->
ZigBee <SE><MPS><-->
    
```

- **##:** The total number of slaves detected on the specific port
- **Dev:** The type of device that was configured to a specific port (based on the port’s functionality), as follows:
 - **SE:** SolarEdge device (default)
 - **LGR:** Non-SolarEdge logger
 - **MLT:** Multiple devices, such as meters and batteries
 - **HA:** Home automation devices (for Smart Energy)
- **PROT:** The protocol type to which the port is set:
 - For a SolarEdge device:

RS485 protocol	ZigBee protocol
S: SolarEdge slave	
M: SolarEdge master	
	P2P: ZigBee point-to-point
	MPM: ZigBee multipoint master (for the SolarEdge ZigBee home gateway or for load management by the inverter)
	MPS: ZigBee multipoint slave (for a ZigBee router card)

- For electricity meters, refer to the *application note - Connecting an Electricity Meter to SolarEdge Devices* at <http://www.solaredge.com/files/pdfs/solaredge-meter-installation-guide.pdf>.
- **SS:** SunSpec - for a non-SolarEdge logger (monitoring and control)



Smart Energy Management Status

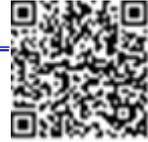
This screen is displayed only when Smart Energy Management is enabled. The screen shows energy details of the site:

```

Site Limit:      7.0 kW
Site Prod:       10.0 kW
Site Export:     4.0 kW
Self-consume:    6.0 kW
    
```

- **Site Limit:** The limit that was defined for the site
- **Site Prod:** The power produced by the site
- **Site Export:** The power that is fed into the grid
- **Self-consume:** The PV power consumed by the site

For more information, refer to the *Export Limitation Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/products/feed-in_limitation_application_note.pdf.



Sensors Status

This screen displays the status of up to three different sensors connected to the Commercial Gateway.

```
Sensors
1 : XXX.XXX DegC
V2 : XXX.XXX W/m2
I  : Disabled
```

- **V1:** Displays the real time reading of the sensor connected to V1 sensor input
- **V2:** Displays the real time reading of the sensor connected to V2 sensor input
- **I:** Displays the real time reading of the sensor connected to I sensor input

The reading is displayed according to the relevant sensor that was configured on the specific sensor input:

- Temperature sensor - the degrees reading in Celsius or Fahrenheit
- Irradiance reading - in W/m²
- Wind speed, in m/s
- Wind direction, in Deg

Configuration Menu Options

This section describes basic Commercial Gateway configuration options.

▶ To enter Setup mode:

1. Verify that the SolarEdge Commercial Gateway is connected to a power outlet.
2. Press the Enter button until the following message is displayed:

```
Please enter
Password
*****
```

The Commercial Gateway is now in Setup mode and all its LEDs are lit. The Commercial Gateway automatically exits Setup mode if no buttons are pressed for more than 2 minutes.

3. Use the three-right-most LCD buttons to type in the following password: **12312312**. The following message is displayed:

```
Language <Eng>
Communication
Power Control
Display
Maintenance
Information
```

Language

1. Select the **Language** option to set the language in which the LCD should display.
2. Confirm your language selection in the confirmation screen: Toggle to **YES** and press **Enter**.

Communication

1. Select the **Communication** option to define and configure:
 - The communication option used by the Commercial Gateway to communicate with the SolarEdge monitoring platform
 - The communication option used to communicate between multiple SolarEdge devices or other external non-SolarEdge devices, such as electricity meters or loggers.



NOTE

The Server menu shows only the communication options installed in the Commercial Gateway.

The following shows a hierarchical tree of the menu options in the **Communication** menu.

For detailed information about all the configuration options, refer to the *Communication Options Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/solaredge-communication_options_application_note_v2_250_and_above.pdf.



Communication^{1,2}:

```

Server <LAN >
LAN Conf
RS485-1 Conf <S >
RS485-2 Conf <S >
ZigBee Conf <S >
Wi-Fi Conf <N/A >
Cellular Conf
Slave Detect
    
```

Server:

```

LAN
RS485
Zigbee
Wi-Fi
Cellular
None
    
```

LAN Conf:

```

IP Config
Set DHCP <en >
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP <Dis >
    
```

¹If ZigBee is connected, the Wi-Fi Conf menu is not displayed. If ZigBee is not connected, ZigBee Conf and Wi-Fi Conf are both displayed with <N/A> and their menus are not accessible.

²When using the SolarEdge GSM products, RS232 Conf menu is unavailable.

RS485-X Conf:

```

Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Cluster SLV Detect
Long Slave Detect <#>
Slave List <#>
Multi-Inv. Set

```

ZigBee Conf. (enabled only if the ZigBee internal card is connected):

```

Device Type<SE>
Protocol<MPS>
Device ID<1>
PAN ID
Scan Channel
Load ZB Defaults

```

Wi-Fi Conf (enabled only if the internal card is connected):

```

Scan Networks
Set key
Load Defaults

```

RS232 Conf1:

```

Device Type<SE>
Protocol<GSM>
Set APN
Set Modem Type
Set User Name
Set Password

```

GPIO Conf:

```

Device Type <RRCR>

```

Power Control

```

RRCR Conf.
Load Defaults

```

Power control options are detailed in the *Power Control Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/application_note_power_control_configuration.pdf.



¹When using the SolarEdge GSM products this menu is unavailable.

Sensors

Select **Sensors** to set the following options:

```
V1 Sensor<Dis>
V2 Sensor<Dis>
I Sensor<Dis>
```

The SolarEdge Commercial Gateway sensor interface supports up to three analog sensors:

- **V1, V2:** Voltage sensors
- **I:** Current sensors

For detailed information about all the configuration options for sensors, refer to *Connecting Environmental Sensors (Optional)* on page 21.

Display

Select **Display** to set the following:

```
LCD On Time <30>
```

- **Temperature:** Select Celsius or Fahrenheit units.
- **LCD On Time <30>:** The number of seconds that the LCD backlight is ON after pressing the LCD light button. Set a value within the range of 10-120 seconds.
- **TLM On Time <15>:** The number of minutes that the LCD backlight is ON while viewing the Telemetry window. Set a value within the range of 1-120 minutes.

Maintenance

Select **Maintenance** to set the following options:

```
Date and Time
Factory Reset
FW Upgrade
```

- **Date and Time:** Set the internal real-time clock. If connected to the SolarEdge monitoring platform, the date and time are set automatically and only time zone should be set.
- **Factory Reset:** Performs a general reset to the default device settings.
- **FW Upgrade:** Perform a software upgrade by using an SD card. Refer to [upgrading_an_inverter_using_micro_sd_card.pdf](#).



Information

Select **Information** to display the following options:

```
Versions
Error Log
Warning log
Hardware IDs
```

- **Versions:** Displays firmware versions:
 - **ID:** The ID.
 - **DSP 1:** The DSP digital control board firmware version
 - **CPU:** The communication board firmware version

**NOTE**

Please have these numbers ready when you contact SolarEdge Support.

- **Error Log:** Displays the last five errors.
- **Warning Log:** Displays the last five warnings.
- **Hardware IDs:** Displays the following HW serial numbers (if exist, and connected to the inverter):
 - **ID:** the inverter's ID
 - **RGM1** (Revenue Grade Meter): Energy Meter with Modbus Connection
 - **RGM2:** A second external Energy Meter with Modbus Connection
 - **ZB:** ZigBee MAC address
 - **Cell:** MEID (CDMA) or IMEI (GSM)
 - **WiFi:** Wi-Fi MAC address

Chapter 6: Setting Up Monitoring through the Commercial Gateway (Optional)

Communication Dataflow

The SolarEdge site information can be accessed remotely using the SolarEdge monitoring platform. In order to transfer monitoring data from a SolarEdge site to the SolarEdge monitoring platform, a communications connection must be established. Communications are not required for power harvesting - they are required only when using the monitoring platform.

Any SolarEdge device can serve as the connection point. This chapter describes how to set up this connection with the Commercial Gateway serving as the connection point to the monitoring platform. The Commercial Gateway should be the master on an RS485 bus.

Communication Options

The following types of communication can be used to transfer the monitored information from the inverter to the monitoring platform through the Commercial Gateway.

Only communication products offered by SolarEdge are supported.

Always connect the communication options when the relevant devices are powered down - Commercial Gateway, inverter, etc.

Ethernet

Ethernet is used for a LAN connection. For connection instructions refer to *Creating an Ethernet (LAN) Connection* on page 42.

RS485

RS485 is used for the connection of multiple SolarEdge devices on the same bus in a master-slave configuration. RS485 can also be used as an interface to external devices, such as meters and third party data loggers.

- RS485-1: Enables the connection of multiple devices (inverters/Commercial Gateway) over the same bus, such that connecting only one device to the Internet is sufficient to provide communication services for all the devices on the bus.
- RS485-2: Enables connection of non-SolarEdge devices.
- RS485 Plug-in: The RS485 Plug-in provides an additional RS485 port for the Commercial Gateway for enhanced communications. The kit contains a module, which is installed on the communication board, and has a 3-pin RS485 terminal block. This kit is provided with an installation guide, which should be reviewed prior to connection see, https://www.solaredge.com/sites/default/files/RS485_expansion_kit_installation_guide.pdf



For connection instructions refer to *Creating an RS485 Bus Connection* on page 11.

ZigBee

This option enables wireless connection to one or several Smart Energy products, which automatically divert PV energy to home appliances.

This option enables wireless connection, and requires a ZigBee Plug-in and an external antenna. ZigBee connection is used for:

- **Monitoring** - connection of one or several devices to a SolarEdge ZigBee Gateway, for wireless communication to the SolarEdge monitoring platform.

The ZigBee Gateway is provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-zigbee-home-gateway-installation-guide.pdf>.

To mount the ZigBee Plug-in in the Commercial Gateway, see "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46

- **Smart Energy Management** - wireless connection to one or several Smart Energy products, which automatically divert PV energy to home appliances.

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#.

The ZigBee Plug-in for Smart Energy is are provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-device-control-zigbee-module-installation-guide.pdf>

To mount the ZigBee Plug-in in the Commercial Gateway, see "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46.



Wi-Fi

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

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

The Wi-Fi option requires a Wi-Fi Plug-in and an external antenna, available from SolarEdge in a kit, which can be purchased separately and assembled during system installation. The Wi-Fi Plug-in kit is provided with a user manual, which should be reviewed prior to connection. Refer to http://www.solaredge.com/sites/default/files/se_wifi_communication_solution_installation_guide.pdf



Cellular

This wireless communication option (purchased separately) enables using a cellular connection to connect one or several devices (depending on the data plan used) to the monitoring platform.

The GSM Plug-in is provided with a user manual, which should be reviewed prior to connection. Refer to https://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf



Creating an Ethernet (LAN) Connection

Overview

This communication option enables using an Ethernet connection to connect the SolarEdge Commercial Gateway to the monitoring platform through a LAN. The SolarEdge Commercial Gateway has an RJ45 connector for Ethernet communication.

You can connect more than one SolarEdge Commercial Gateway to the same switch/router or to different switches/routers, as required. Each Commercial Gateway sends its monitored data independently to the SolarEdge monitoring platform.

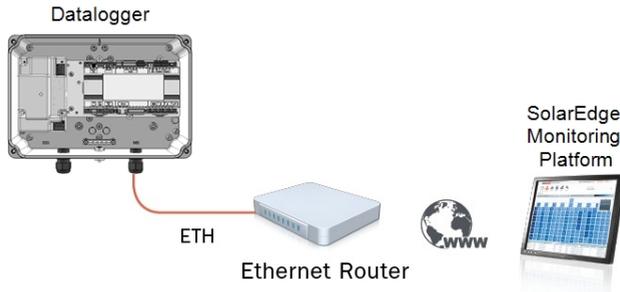


Figure 19: Example of Ethernet connection

Ethernet Communication Configuration Options

The following is a description of the options to configure the Ethernet (LAN) port settings. Communication:

```
Server <LAN >
LAN Conf
RS485-1 Conf <S >
RS485-2 Conf <S >
ZigBee Conf <S >
Wi-Fi Conf <N/A >
Cellular Conf
Slave Detect
```

LAN Conf:

```
IP Config
Set DHCP <en >
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP <Dis >
```

- **IP Config:** Displays the current IP configuration of the Commercial Gateway, as shown below. If DHCP is used, this screen reflects the parameters retrieved from the DHCP server. If manual settings are used, the screen shows the last manually input configurations.

```
IP 0.0.0.0
MSK 255.255.255.0
GW 192.168.0.1
DNS 0.0.0.0
```

- **Set DHCP <En>:** If the LAN connection between the Commercial Gateway and the SolarEdge Monitoring Platform has a DHCP server, enable this option by setting it to Enable (default). If this option is enabled, then the DHCP server automatically configures the IP, Subnet Mask, default gateway and DNS. If not, set them manually.
- **Set IP:** Enables setting the IP of the default gateway according to the LAN settings:
 - Use the **Up** and **Down** buttons to adjust the value of each IP address octet.
 - Press the **Enter** button to move to the next IP address octet.
 - Long press the **Enter** button (until **Applied** message appears) – apply the value
 - Long press the **Esc** button (until **Aborted** message appears) – erase all characters

```
Setup IP
192.168.2.7
```

- **Set Mask:** Set the subnet mask of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set Gateway:** Set the default gateway address of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set DNS:** Set the DNS of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set Server Addr:** Set the IP address of the SolarEdge monitoring platform. This option is predefined in the SolarEdge Commercial Gateway to specify the SolarEdge monitoring platform IP address and does not normally need configuration.
- **Set Server Port:** Set the port through which to connect to the SolarEdge monitoring platform. This option is predefined in the Commercial Gateway to specify the SolarEdge monitoring platform IP port and normally does not need configuration.

NOTE

If your LAN has a firewall, you must verify that the address and port configured in the **Set Server Addr** and the **Set Server Port** fields are not blocked. You may need to configure it to enable the connection to the following address:

Destination Address: prod.solaredge.com

Port: 22222



Connecting and Configuring LAN

► **To connect the Ethernet cable to the router/switch:**

1. Use a pre-terminated cable or use a crimper to prepare an RJ45 communication connector on both ends of a standard CAT5/6 cable: Insert the eight wires into the RJ45 connector.

CAT5/6 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.

RJ45 Pin #	Wire Color		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-
7	White/Brown	White/Brown	Reserved
8	Brown	Brown	Reserved

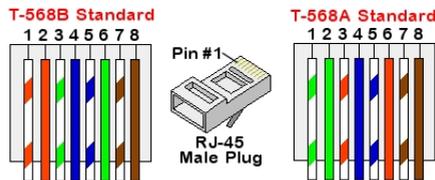


Figure 20: Standard cable wiring

2. Connect one end of the Ethernet cable to the RJ45 plug at the router or Ethernet gateway that is connected to the Internet.
3. Thread the other end through a gland and connect to the Commercial Gateway Ethernet connector.
4. Verify that the yellow communication LED turns ON.

► **To configure Ethernet communication to the SolarEdge monitoring platform:**

Define the device connected to the monitoring platform as the master device.

The server communication method is configured by default to **LAN with DHCP enabled**.

If a different setting is required, follow the steps below:

1. Enter Setup mode, as described in: *To enter Setup mode:* on page 35.
2. Set the Commercial Gateway as the master of the RS485 bus and perform slave detection as described in “. *Creating an RS485 Bus Connection* on page 11

3. To configure the LAN to Static IP select the following in the LCD menus on the Commercial Gateway:
 - Communication → Server → LAN
 - LAN Conf → Set DHCP → <Dis>
4. Set the IP, subnet mask, gateway DNS, server address, and server port as necessary using the LCD User buttons. Refer to the *Ethernet Communication Configuration Options* on page 42.
5. Verify that the status field in the Server Communication Status window displays S_OK:

```
S e r v e r : L A N      < S _ O K >
S t a t u s :           < O K >
      x x x x x x x x
< E R R O R   M E S S A G E >
```

6. Exit the Setup mode.

Appendix A: Mounting the ZigBee Plug-in in the Commercial Gateway



NOTE

The ZigBee Plug-in should be purchased separately.

1. Turn the inverter Safety Switch (if applicable) to OFF.
2. Turn the inverter ON/OFF switch to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel. Wait 5 minutes for the capacitors to discharge.
4. Open the Commercial Gateway cover.
5. Unscrew the nut and washer on the ZigBee Plug-in.
6. Connect the ZigBee Plug-in in a Commercial Gateway board as shown below, and ensure that:
 - the antenna connector at the end of the ZigBee Plug-in goes through the bracket.
 - all pins are correctly positioned in the Commercial Gateway socket and no pins are left out of their socket.
 - the card is firmly in place.

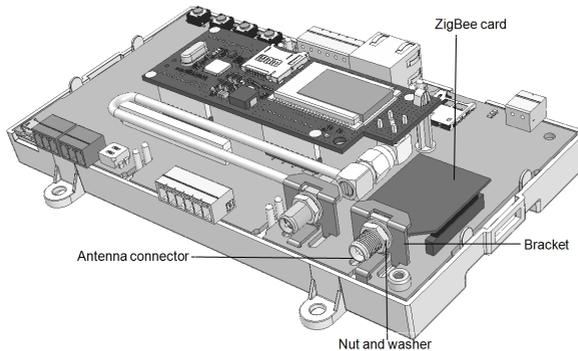


Figure 21: ZigBee Plug-in on a Commercial Gateway board

3. Screw in the nut and washer on the ZigBee Plug-in
4. Connect the antenna.
5. Replace the Commercial Gateway cover.

Appendix B: Inserting the GSM Modem in the Commercial Gateway



NOTE

The GSM modem should be purchased separately.

▶ To turn off the inverter, disconnect the AC and insert a SIM card:

1. Turn the inverter Safety Switch (if applicable) to OFF.
2. Turn the inverter ON/OFF switch to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel. Wait 5 minutes for the capacitors to discharge.
4. Open the Commercial Gateway cover.
5. If there is no SIM card installed in the modem, insert one into the slot on the GSM modem.

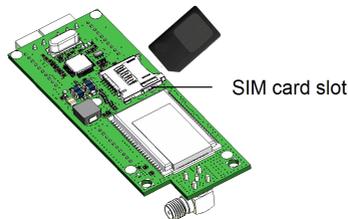


Figure 22: Inserting the SIM card into the GSM modem

▶ To install the GSM modem in the Commercial Gateway:

1. Insert the top of the plastic spacer through the opening in the GSM modem, as shown in *Figure 23*.

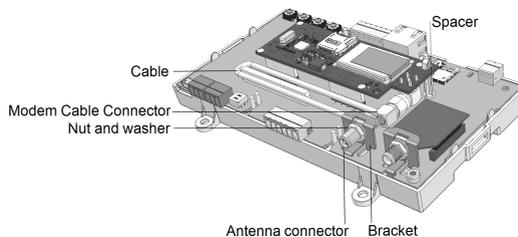


Figure 23: GSM modem on a Commercial Gateway board

2. Connect one end of the cable to the GSM modem connector.
3. Remove the nut and the washer from the other end of the cable and insert the cable through the bracket on the Commercial Gateway board.
4. Re-attach and tighten the nut and washer.

5. Place the GSM modem on the Commercial Gateway board and ensure that:
 - the three rows of pins are correctly positioned in the Commercial Gateway sockets and no pins are left out of their socket.
 - the GSM modem is firmly in place on the Commercial Gateway board.
6. Connect the antenna to the antenna connector.
7. Replace the Commercial Gateway cover.
8. Power on AC.
9. Check that all the GSM modem LEDs are lit. If not, refer to *Errors and Troubleshooting* on page 49.

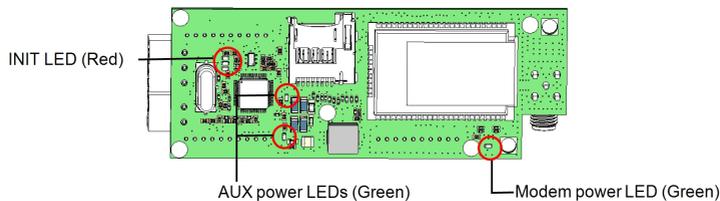


Figure 24: GSM modem LEDs

Appendix C: Errors and Troubleshooting

This appendix describes general system problems, and how to troubleshoot them. For further assistance, contact SolarEdge Support.



Troubleshooting Communication

Troubleshooting Ethernet Communication

When using Ethernet communication, use the **Server Communication Status** window to identify the location of the error:

```
Server : LAN    <S_OK>
Status :       <OK>
          xxxxxxxx
<ERROR MESSAGE>
```

xxxxxxx is a string of 1s and 0s showing an eight-bit communication connection status. 1 indicates OK and 0 indicates an error.

Bit Location	Error Message	Cause and Troubleshooting
1st	LAN Disconnected	Physical connection fault. Check the cable pin-out assignment and cable connection. Refer to <i>Creating an Ethernet (LAN) Connection</i> on page 42
2nd	DHCP Failed, or Invalid DHCP Config	IP settings issue. Check the router and inverter configuration. Consult your network IT.
3rd	Gateway Ping Failed	Ping to router failed. Check the physical connection to the switch/router. Check that the link LED at the router /switch is lit (indicating phy-link). If OK - contact your network IT, otherwise replace the cable or change it from cross to straight connection.
4th	G Server Ping Failed	Ping to google.com failed. Connect a laptop and check for internet connection. If internet access is unavailable, contact your IT admin or your internet provider. For Wi-Fi networks, ensure that username and password are as defined in the internet provider AP/router.
5th	Server x Ping Failed	Ping or connection to SolarEdge server failed. Check the SolarEdge server address, under LAN Conf submenu:
6th		Address: prod.solaredge.com
7th		Port: 22222 Check with your network administrator whether a firewall or another device is blocking transmission.
8th	Tcp Connect. Failed	

1. If **No Communication** is displayed on the SolarEdge Commercial Gateway, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the master and that slaves were detected, as described above.
2. If the message **Master Not Found** appears, check the connections to the master device and fix if required.
3. If after slave detection the number of slaves displayed in the master under **RS485-X Conf → Slave Detect** is smaller than the actual number of slaves, use one of the following methods to identify missing slaves and troubleshoot connectivity problems:
 - Use the **Long slave Detect** to retry connecting to slaves
 - Analyze the **Slave List** to check for missing slaves, and check their connection

Refer to https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf



Additional Troubleshooting

1. Check that the modem or hub/router is functioning properly.
2. Check that the connection to the internal connector on the communication board is properly done.
3. Check that the selected communication option is properly configured.
4. Use a method independent of the SolarEdge device to check whether the network and modem are operating properly. For example, connect a laptop to the Ethernet router and connect to the Internet.
5. Check whether a firewall or another type of network filter is blocking communication.

Commercial Gateway

with Cellular Support

Version 1.2

If you have technical queries concerning our products,
please contact our support through SolarEdge service portal:
<http://www.solaredge.com/groups/support/services>

North America	(Toll free) 1877 360 529 2
Australia	(Toll free) 1800 46 55 67
Germany	089 454 597 30
France	(Toll free) 0800 917 410
Italy	(Toll free) 800 784 824
Japan	(Toll free) 81 03 6262 1223
United Kingdom	(Toll free) 0800 028 1183
Belgium	(Toll free) 0800 730 41
Israel	073 240 311 8
Rest of world	972 (0) 73 240 311 8
Fax	972 (0) 73 240 311 7
Email to:	support@solaredge.com

www.solaredge.com



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Disclaimers

Important Notice

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Patent marking notice: see <http://www.solaredge.com/patent>

The general terms and conditions of delivery of SolarEdge shall apply.

The content of these documents is continually reviewed and amended, where necessary. However, discrepancies cannot be excluded. No guarantee is made for the completeness of these documents.

The images contained in this document are for illustrative purposes only and may vary depending on product models.

Emission Compliance

This equipment has been tested and found to comply with the limits applied by the local regulations. 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, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

Support and Contact Information

If you have technical problems concerning SolarEdge products, please contact us:

Country	Phone	E-Mail
Australia (+61)	1800 465 567	support@solaredge.net.au
APAC (Asia Pacific)(+972)	073 240 3118	support-asia@solaredge.com
Benelux	NL (+31): 0800-7105 BE (+32): 0800-76633	support@solaredge.nl support@solaredge.be
China (+86)	21 6212 5536	support_china@solaredge.com
DACH & Rest of Europe (+49)	089 454 59730	support@solaredge.de
France (+33)	0800 917410	support@solaredge.fr
Italy (+39)	0422 053700	support@solaredge.it
Japan (+81)	03 6262 1223	support@solaredge.jp
New Zealand (+64)	0800 144 875	support@solaredge.net.au
US & Canada (+1)	510 498 3200	ussupport@solaredge.com
United Kingdom (+44)	0800 028 1183	support-uk@solaredge.com
Greece (+49)	89 454 59730	support@solaredge.com
Israel (+972)	073 240 3122	
Middle East & Africa (+972)	073 240 3118	
South Africa (+27)	0800 982 659	
Turkey (+90)	216 706 1929	
Worldwide (+972)	073 240 3118	

Before contact, make sure to have the following information at hand:

- Model and serial number of the product in question.
- The error indicated on the LCD screen or on the SolarEdge monitoring platform or by the LED, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The software version as appears in the ID status screen.

Revision History

Version 1.2 (March 2020)

- Change in Figure 20: Solar irradiance sensor connection. Change to port 443 in Ethernet Communication Configuration Options.

Version 1.1 - (June 2018)

- The Commercial Gateway now supports CDMA as well as GSM cellular connectivity , therefore its name was hanged to Commercial Gateway with Cellular with Support
- Changed name CCG to Commercial Gateway
- Removed indications that Commercial Gateway can be connected to non- SolarEdge inverters

Version 1.0 - initial release (June 2017)

HANDLING AND SAFETY INSTRUCTIONS

During installation, testing and inspection, adherence to all the handling and safety instructions is mandatory. **Failure to do so may result in injury or loss of life and damage to the equipment.**

Safety Symbols Information

The following safety symbols are used in this document. Familiarize yourself with the symbols and their meaning before installing or operating the system.

WARNING!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **injury or loss of life**. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.

CAUTION!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **damage or destruction of the product**. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

NOTE



Denotes additional information about the current subject.

IMPORTANT SAFETY FEATURE



Denotes information about safety issues.

Disposal requirements under the Waste Electrical and Electronic Equipment (WEEE) regulations:

NOTE



Discard this product according to local regulations or send it back to SolarEdge.

About This Guide

This user guide is intended for Photovoltaic (PV) system owners, installers, technicians, maintainers and integrators who use the SolarEdge power harvesting system.

This guide describes the process of installing and configuring the SolarEdge Control and Communication gateway (also referred to as SolarEdge gateway).

This guide assumes that the SolarEdge power harvesting system is already installed and commissioned. For additional information about how to install and commission the SolarEdge power harvesting system, refer to the relevant inverter or safety and monitoring system (SMI) installation guide.

The guide includes the following chapters:

- *Introducing the Commercial Gateway* on page 8, describes the SolarEdge control and communication gateway.
- Chapter 2: *Installing the Commercial Gateway* on page 18, describes how to install the SolarEdge gateway.
- Chapter 3: *LCD – Status Screens and Setup Options* on page 31 describes how to configure the SolarEdge gateway and how to identify its status.
- Chapter 4: *Connecting the Commercial Gateway to the Installation* on page 11, describes how to connect the control and communication gateway to inverters or Safety and Monitoring Interface (SMI) using the RS485 bus connection.
- Chapter 5: *Connecting Environmental Sensors (Optional)* on page 21, describes how to connect and configure external environmental sensors to the SolarEdge gateway.
- Chapter 6: *Setting Up Monitoring through the Commercial Gateway (Optional)* on page 40, describes how to set up communication through the SolarEdge gateway to the SolarEdge monitoring platform.
- Appendix A: "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46
- Appendix B: "Inserting the GSM Modem in the Commercial Gateway" on page 47
- Appendix C: *Errors and Troubleshooting* on page 49, describes the error messages that appear on the LCD panel when an error occurs, and how to troubleshoot them.
- Appendix D: *Technical Specifications* on page 51, provides the electrical and mechanical specifications of the SolarEdge gateway device.

For further information, datasheets and the most up-to-date certifications for various products in different countries, please visit the SolarEdge website: www.solaredge.com.

Chapter 1: Introducing the Commercial Gateway

Overview

The Commercial gateway expands SolarEdge monitoring and control capabilities. It can be connected to SolarEdge and non-SolarEdge devices (excluding inverters) and can transfer the monitoring data to the SolarEdge monitoring server and optionally, to a non-SolarEdge logger.

The Commercial Gateway can connect to the following devices¹:

- SolarEdge devices, such as inverters and safety and monitoring interfaces (SMIs)
- Environmental sensors
- Revenue grade meters
- Power reduction control devices



NOTE

Sensors, meters, loggers, and power reduction control devices are sold separately.

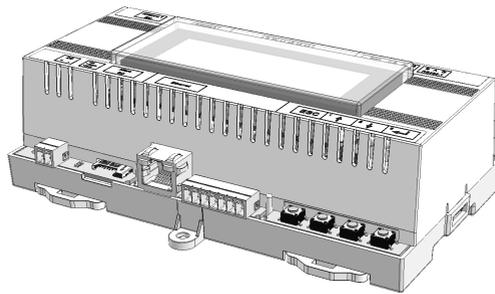


Figure 1: The Commercial Gateway

¹For a list of supported environmental sensors, revenue meters, and third party inverters, refer to <http://www.solaredge.com/articles/se-supported-devices>

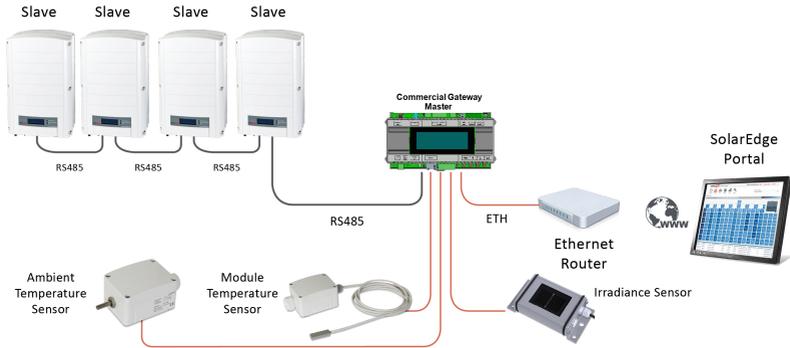


Figure 2: Example of sensor connection to the Commercial Gateway

Commercial Gateway Interfaces

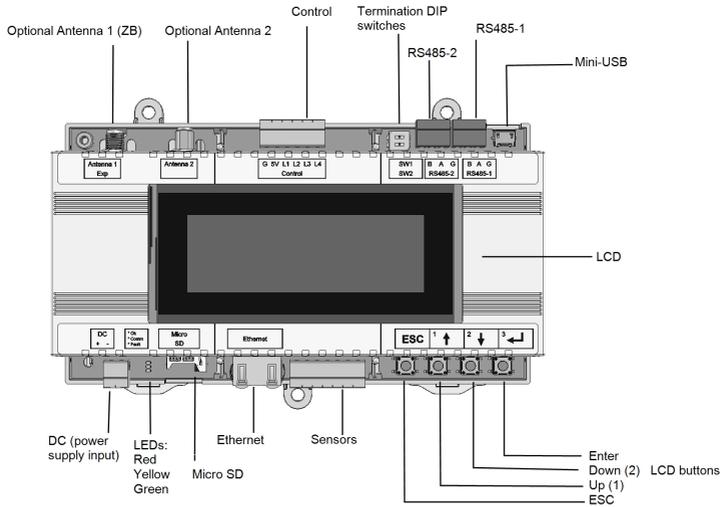


Figure 3: Commercial Gateway interfaces

LCD and LCD-Menu Buttons

The LCD screen displays status information of the system and various menus for configuration options. The LCD panel and buttons are used during the following processes:

- **Operational mode:** The LCD panel allows checking for proper system operation. Refer to *Status Screens - Operational Mode* on page 31 for a description of this option.
- **Setup mode:** Upon installation, an installer may perform basic configuration as described in *Configuration Menu Options* on page 35.
- **Error messages:** In the event of a problem, an error message may be displayed on the LCD panel. For more information, refer to *Errors and Troubleshooting* on page 49.

Use the four user buttons to control the LCD panel menus:

- **Esc:** Moves the cursor (>) to the beginning of the currently displayed parameter; goes to the previous menu, and cancels a value change with a long press (until **Aborted** is displayed).
- **Up (1)** and **Down (2):** Moves the cursor from one menu option to another, moves among the characters of a displayed parameter, and toggles between possible characters when setting a value.
- **Enter (3):** Selects a menu option and accepts a value change with a long press (until **Applied** is displayed).

Use the three rightmost buttons for entering the digits **123** when entering the Setup mode password **12312312**.

Communication Connectors

- **Antenna1:** used for optional wireless ZB (ZigBee) or Wi-Fi antenna connection.
- **Antenna2:** Currently not installed
- **RS485-1** and **RS485-2:** used for connecting external devices to the gateway (refer to *Connecting the Commercial Gateway to the Installation* on page 11)
- **Mini-USB:** Enables PC/laptop connection for using the SolarEdge configuration tool.
- **Ethernet:** Enables connecting the SolarEdge gateway to the SolarEdge monitoring platform through an Ethernet switch/router (refer to *Creating an Ethernet (LAN) Connection* on page 42). The Ethernet switch/router should be connected to the Internet.

LEDs

The Commercial gateway has three LED indicators, as follows:

- **OK (Green):** Indicates whether or not the Commercial gateway is powered.
- **Comm (Communication, Yellow):** Blinks when monitoring information is received from another SolarEdge device in the installation.
- **Fault (Red):** Indicates that there is an error. For more information, contact SolarEdge support.

All LEDs are ON while the Commercial gateway is being configured and during power up.

Other Interfaces

- **DC:** used for the power supply input as described in *Connecting the Commercial Gateway to AC* on page 20.
- **Sensors:** enables connecting to external environmental sensors (refer to *Connecting Environmental Sensors (Optional)* on page 21).
- **Control:** used for connection to an external power reducer device
- **SW1/SW2:** RS485-1/2 termination
- **Micro SD:** used for field software upgrade

Chapter 2: Connecting the Commercial Gateway to the Installation

Overview

The Commercial Gateway connects to the PV system installation using the RS485 communication option. The RS485 option enables creating a chain (bus) of up to 31 slave SolarEdge devices, connected to one master, which can be another SolarEdge device or the Commercial Gateway.

The following is an example of a master Commercial Gateway connected to a chain of slave inverters.

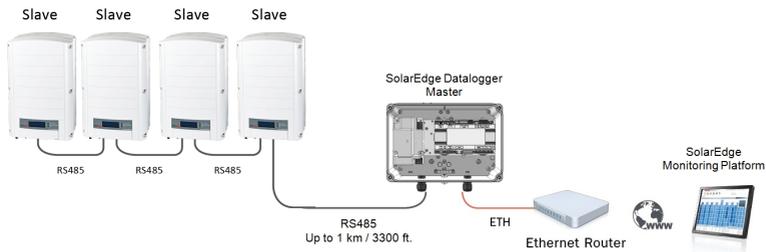


Figure 4: Example of RS485 connection

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

Creating an RS485 Bus Connection

The RS485 bus uses a three-wire cable connecting the RS485-1/2 terminal blocks on the Commercial Gateway to the RS485 input of the inverters/SMI.

▶ To connect the RS485 communication bus between inverters/SMIs and the Commercial Gateway:

1. Use one of the supplied 3-pin terminal blocks: Loosen the screws and insert the wire ends into the A, B and G pins. For connections longer than 10m use twisted pair wires for A and B wires.

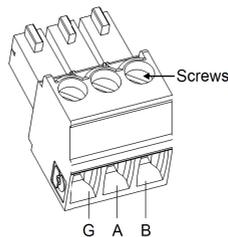


Figure 5: 3-pin terminal block

- Choose either RS485-1 or RS485-2 for connection. Connect the 3-pin terminal block to the designated port on the Commercial Gateway.



NOTE

RS485-1 is configured as SolarEdge device by default, therefore RS485-1 is recommended as the RS485 bus connection point.

- If the Commercial Gateway is at the end of the RS485 chain, terminate the Commercial Gateway by switching a termination DIP switch to ON. The switches in the SolarEdge Commercial Gateway are marked **SW1** for the RS485-1 port termination and **SW2** for the RS485-2 port termination, as shown below:

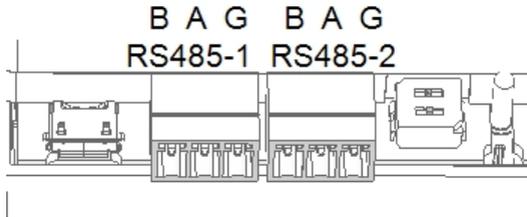


Figure 6: RS485 connectors and termination switches

- Open the inverter/SMI cover as described in their manual.
- Remove the seal from one of the openings in communication gland #2 of the inverter and insert the cable through the opening.
- Pull out the 9-pin RS485 terminal block connector, as shown below:

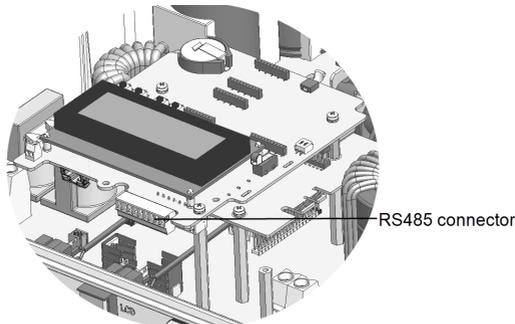


Figure 7: The RS485 terminal block in the inverter/SMI

7. Loosen the screws of pins B, A and G on the left of the RS-485 terminal block.
 - For inverter: RS485-1 pins (left-most)
 - For SMI: RS485-1 (recommended, as this is the default configuration), or RS485-2

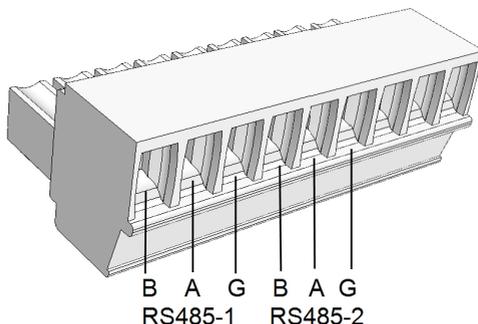


Figure 8: RS485 terminal block

8. Insert the wire ends into the G, A and B pins shown above. You can use any color wire for each of the A, B 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.
9. Connect all B, A and G pins in all inverters/SMI. The following figure illustrates this connection schema (the illustration applies to both inverters and SMI):

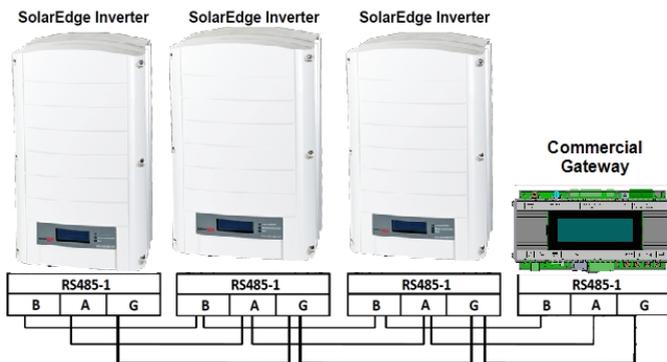


Figure 9: Connecting SolarEdge devices (inverters or SMI) in a chain

NOTE

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

For inverters - Do not insert wires into RS485-2 pins.

For SMI - Make sure you are using the same RS485 port (1/2) in all devices.

10. Tighten the terminal block screws.
11. Push the RS485 terminal block firmly all the way into the communication board.

12. Terminate the inverters/SMIs at the two ends of the chain by switching a termination DIP-switch inside the inverter/SMI to ON (move the switch to the top). The switch is located on the communication board and is marked **SW7**.

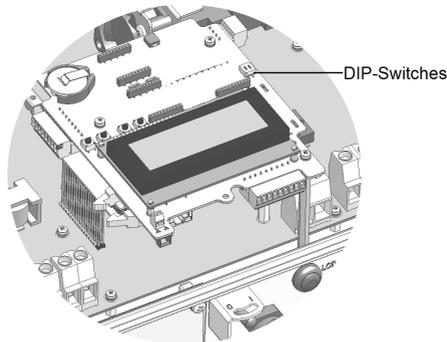


Figure 10: RS485 termination switch



NOTE

Only the first and last SolarEdge devices in the chain should be terminated. The other devices in the chain should have the termination switch OFF.

► To configure the RS485 communication bus with SolarEdge inverters/SMI:

By default, all SolarEdge devices are pre-configured as slaves on the RS485-1 port. Slaves can be further configured using the **RS485-X Conf** option in the Communication menu.

One device must be set as the master on the RS485 bus. Any SolarEdge device may be the master (Commercial Gateway, inverter, or SMI). If you connect the installation to the SolarEdge monitoring platform, the device used to connect to the server must be the master.

The following describes how to configure the master device.

1. Press the **Enter** button until the following message is displayed:

```
Please enter
Password
*****
```

2. Use the three-right most LCD buttons to type in the following password: **12312312**

The following menu is displayed:

```
Language <Eng>
Communication
Power Control
Display
Maintenance
Information
```

3. Short-press the arrow buttons to scroll to the Communication menu. Press the Enter button to select it.

4. Select **Server** → **RS485-X Conf** (X=1 or 2 depending on the specific physical port connection) to communicate with different external devices (SolarEdge inverters, revenue meters or non-SolarEdge loggers).
5. To configure the master, select the following in the LCD menu:
 - **Communication** → **RS485-1 Conf** → **Device Type** → **SolarEdge**
 - **RS485-1 Conf** → **Protocol** → **Master**
 - **RS485-1 Conf** → **Slave Detect**The system starts automatic detection of the SolarEdge slave inverters connected to the master Commercial Gateway. The Commercial Gateway should report the correct number of slaves. If not, verify the connections and terminations. Verify that only one master is configured on the bus.
6. Close the inverter/SMI cover and start power production.
7. Verify the connection of the Master to the SolarEdge monitoring platform, as described below.

Verifying the Connection

1. After connection, a message similar to the following appears in the main status screen (see also *Initial Status* on page 31):

```
RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
```

2. Verify that **S_OK** appears, to indicate that the connection to the SolarEdge monitoring platform is successful. If **S_OK** is not displayed, refer to Troubleshooting Communication, below.

Troubleshooting the RS485 Communication

1. If **No Communication** is displayed on the SolarEdge Commercial Gateway, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the master and that slaves were detected, as described above.
2. If the message **Master Not Found** appears, check the connections to the master device and fix if required.
3. If after slave detection the number of slaves displayed in the master under **RS485-X Conf** → **Slave Detect** is smaller than the actual number of slaves, use one of the following methods to identify missing slaves and troubleshoot connectivity problems:
 - Use the **Long slave Detect** to retry connecting to slaves
 - Analyze the **Slave List** to check for missing slaves, and check their connection

Refer to https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf



RS485 Configuration Options

In all configurations, use the following RS485 port configuration menus:

RS485-X

```
Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Cluster SLV Detect
Long Slave Detect <#>
Slave List <#>
Multi-Inv. Set
```

Device Type:

```
SolarEdge <M>
Non-SE Logger <S>
Revenue Meter <M>
Multi Devices <M>
None
```

Protocol:

```
Slave
Master
```

Device ID:

```
Please Select
Device ID
1
```

- **Device Type** is used to select the specific port configuration. The following devices are supported:
 - **SolarEdge** (default for RS485-1): Used when connecting to SolarEdge devices, such as: inverters, SMIs or Commercial Gateways. By default, all SolarEdge devices are pre-configured as slaves on the RS485-1 port.
 - **Revenue Meter**: Used when connecting to an external revenue grade meter, in order to read the meter data and send it to the monitoring platform. For a list of supported meters, refer to <http://www.solaredge.com/se-supported-devices>.
 - **Non-SE Logger**: Used when connecting to an external non-SolarEdge logger. The logger can read SolarEdge inverters data for Non-SolarEdge monitoring purposes.
 - **None**: No device (default for RS485-2)
- **Protocol**:
 - When selecting a SolarEdge device, the following protocols appear under the Protocol option:
 - Slave (default)
 - Master
 - When selecting Device Type <Inv. Reader>, the Device Type <field> changes to Device Type <INV>
 - When selecting Device type <Non-SE Logger>, the Device Type <field> changes to Device Type <LGR> and the following protocol appears under the Protocol option: SunSpec (default)

- When selecting Device type <Revenue Meter>, the Device Type <field> changes to Device Type <MTR>

**NOTE**

For other supported protocols, refer to <http://www.solaredge.com/se-supported-devices>

- **Device ID:** The device ID is used to set the Commercial Gateway device ID (MODBUS ID) when connecting to an external master device (for example, a non-SolarEdge logger), or to set the ID of the external device (for example, revenue meter).
- **Slave Detect:** Is used to initiate automatic detection of the slave devices connected to this master device. The number next to the option is the number of devices that have been detected.

Chapter 3: Installing the Commercial Gateway

Safety

**CAUTION!**

For North America only: The product's communication with external devices must not use wires that span more than one building, as per the UL 60950-2 standard.

Transport and Storage

Transport the SolarEdge gateway in its original packaging, without exposing it to unnecessary shocks. If the original package is no longer available, use a similar box, which can be closed fully.

Store the SolarEdge gateway in a dry place where ambient temperatures are -40°C (-40°F) to +60°C (140°F).

Package Contents

- Commercial Gateway
- 100-240VAC to 12VDC (50 Hz/60 Hz) power supply with an interchangeable AC plug (US, EU, AU)
- Accessory kit including:
 - Three 3-pin terminal blocks
 - One 7-pin terminal block
 - One 6-pin terminal block

Installation Equipment

Standard tools can be used during the installation of the Commercial Gateway . The following is a recommendation of the equipment needed for installation:

- DIN rails
- Drill and 4mm diameter bits
- Three twisted wires or four-wire twisted pair cable
- For installing the communication options: CAT5/6 Ethernet cable

Installation Guidelines

The following requirements apply when locating and mounting the SolarEdge gateway:

- The gateway is suitable for mounting indoors only. For outdoor installation, use an external outdoor enclosure (not provided by SolarEdge)
- The gateway must always remain in an ambient temperature of -20°C (-4°F) to +60°C (140°F).
- The gateway power supply requires a socket outlet with a grid voltage of 100 V - 240 V (50/60Hz).
- Protect the gateway from dust, wet conditions, corrosive substances and vapors.
- Cable specifications:

Connection Type	Cable Type	Maximum Length
RS485 communication bus (per RS485 port)	Three twisted wires or 4-wire twisted pair cable (two twisted pairs). Recommended wire size: 20 AWG / 0.52 mm2	1,000m (3,330 ft)
Ethernet	CAT5/6	100m (325 ft).
Sensor/control interface	Recommended wire size: 20 AWG / 0.52 mm2	50m (165 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 recommend to use external surge protection devices. For details refer to: http://www.solaredge.com/files/pdfs/lightning_surge_protection.pdf. If grounded metal conduit are used for routing the communication wires, there is no need for a lightning protection device.



Installation Workflow

The following provides an overview of the workflow for installing and setting up the Commercial gateway:

- [Step 1 - Mounting the Commercial Gateway](#), page 20
- [Step 2 - Connecting the Commercial Gateway to the SolarEdge installation](#), page 11
- [Step 3 - Connecting environmental sensors \(optional\)](#), page 22
- [Step 4 - Configuring the Commercial Gateway and inverters/SMI](#), page 14
- [Step 5 - Using the control and communication gateway to connect the installation to the monitoring server \(optional\)](#), page 40

Mounting and Connecting the Commercial Gateway

The gateway can be installed on a wall or on a DIN rail.

► To mount the Commercial Gateway on a wall:

1. Determine the mounting location. Leave clearance from all sides of the gateway for cover opening, cable connection and routing.
2. Position the device on the wall, mark points through the mounting tabs and drill holes using a 4mm diameter drill bit.
3. Mount the unit using screw anchors and screws (use 3.5mm diameter screws, 20mm minimum length, not provided by SolarEdge).

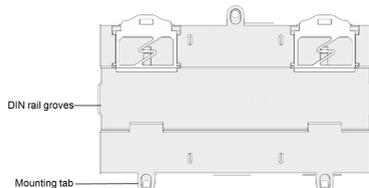


Figure 11: Commercial Gateway mounting tabs

► To mount the Commercial Gateway on a DIN rail:

1. Press the gateway upwards and snap it into the upper and lower edges of the DIN rail.

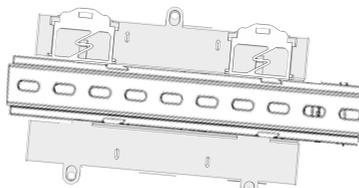


Figure 12: Commercial Gateway mounted on a DIN rail

Connecting the Commercial Gateway to AC

For connecting to power, use the supplied power supply:

1. Connect the power supply cable connector to the connector labeled **DC** on the Commercial Gateway (see Figure 3).
2. Connect the power supply to the AC mains. The LEDs are lit momentarily to indicate power connection (see Figure 3).



CAUTION!

If you use a non-SolarEdge power supply, check that it has 12Vdc/1A output ratings, and that it is certified to UL/CSA/IEC60950-1 2ed standards. Limited Power Source output, NEC class 2. Verify the power supply polarity as marked on the gateway.

Chapter 4: Connecting Environmental Sensors (Optional)

Overview

The Commercial Gateway supports up to three analog sensors. If you connect more sensors than supported by a single Commercial Gateway, use an additional Commercial Gateway:

- Two sensors with voltage output (V1, V2), each supports different voltage ranges
- One sensor with current output (I)

The following environmental sensor types are supported:

Sensor Type	Configurable Range	Unit
Temperature	-99.0 to +99.0	°C
	-146.20 to 210.20	°F
Irradiance	0 to 9999	W/m ²
Wind velocity	0 to 99	m/s
Wind direction	0 to 359	degrees
Pyranometer	-200 to 2000	W/m ²

You can view the sensor data in the Status window (see *Sensors Status* on page 35), and in the monitoring platform.

This chapter describes how to connect sensors to the Commercial Gateway and how to configure them.

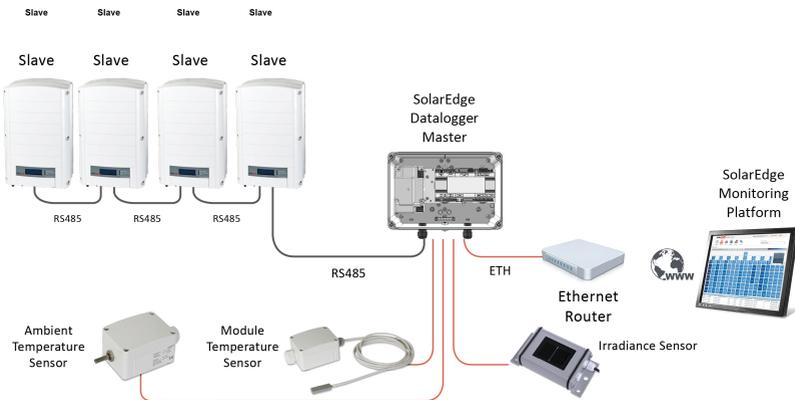


Figure 13: Example of sensor connection to the SolarEdge Commercial Gateway

Connecting Sensors to the Commercial Gateway

For connection of the irradiance and temperature sensors available from SolarEdge refer to *Sensor Connection Example* on page 28.

Sensors are directly connected to the Commercial Gateway via the sensor interface connector. Use the supplied 7-pin terminal block. *Figure 14* shows the location of the sensors connector on the Commercial Gateway.

Sensor Connector Pin #	Pin Name	Description
1	V1	Voltage sensor input number 1
2	GND	Ground (common for V1, V2 and ground)
3	V2	Voltage sensor input number 2
4	I-	Current sensor input – negative
5	I+	Current sensor input – positive
6	GND	Ground (common for V1, V2 and ground)
7	12V	12VDC output voltage supply to the sensors. (limited to 800mA)

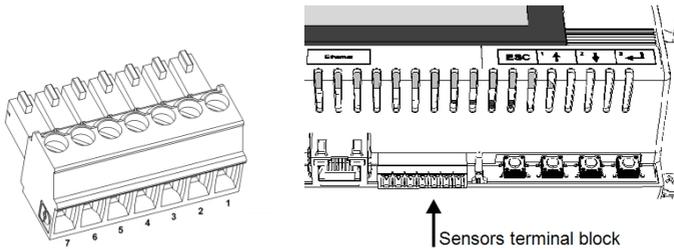


Figure 14: Sensor Interface Inputs

▶ To connect a voltage sensor:

Use a 3-wire cable for this connection. Recommended wire size is 0.52mm²/ 20 AWG with maximum length of 50m/164 ft.

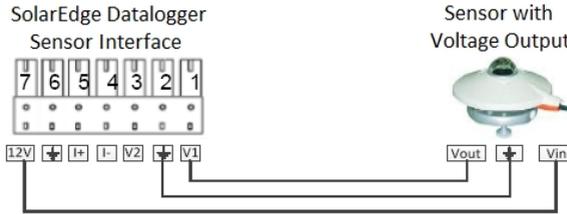
1. Connect a voltage source sensor to either V1 or V2, depending on its operating voltage range. Voltage sensor inputs support the following user selectable ranges:
 - V1: 0–2 Vdc or 0–30 mVdc.
 - V2: 0–10 Vdc or 0–2 Vdc .

2. Depending on the sensor range, connect the sensor between V1 (pin1) and GND (pin 2), or between V2 (pin 3) and GND (pin 2).

The GND (pin 2) serves as a common ground for both V1 and V2.

The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

For an example of sensor connection, refer to *Sensor Connection Example* on page 28



CAUTION!

Excessive voltage on the sensor input can damage the SolarEdge Commercial Gateway. Refer to input ranges specified in the *Technical Specifications* on page 51.

Une tension excessive à l'entrée du senseur peut endommager le Data Logger de SolarEdge. Referrez vous aux plages d'entrée spécifiées dans la fiche technique .

► To connect a current sensor:

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm²/20 AWG with maximum length of 50m/164 ft.

Connect a current source sensor to either I+ or I-, depending on its operating range:

- For positive current:
 - I+ (pin 5) - connect to the current output (Iout) of the sensor.
 - I- (pin 4) - connect to ground.
 - GND (pin 6) - connect to the ground connection terminal of the sensor.
 - The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

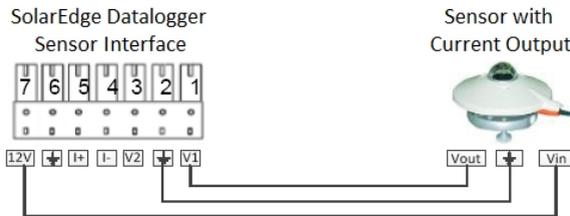


Figure 15: Current sensor (4-20mA) positive connection

- For Negative current:
 - I- (pin 4) - connect to the current output (Iout) of the sensor.
 - I+ (pin 5) - connect to ground.
 - GND (pin 6) - connect to the ground connection terminal of the sensor.
 - The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

**CAUTION!**

Excessive current on the sensor input can damage the SolarEdge Commercial Gateway. Refer to input ranges specified in the *Technical Specifications* on page 51.

Un courant excessif à l'entrée du capteur peut endommager le Data Logger de SolarEdge. Referrez vous aux plages d'entrée spécifiées dans la fiche technique .

Configuring Environmental Sensors

Menus

The SolarEdge Commercial Gateway sensor interface is disabled by default. The following shows a hierarchical tree of the Sensors menu options:

Sensors

```
V1 Sensor<Dis>
V2 Sensor<Dis>
I Sensor<Dis>
```

Set V1/V2/I Sensor (example for V1 sensor)

```
Sensor <En>
Range <0-2V>
Type <--->
Two Points
```

Range

```
0 - 2 V
0 - 30 mV
```

Sensor Type

```
Temp. Ambient
Temp. Module
Wind Speed
Wind Direction
Irradiance Global
Irradiance Direct
Irradiance Diff.
Irradiance POA
```

Two Points setting

```
P0 <0.0, 0.0>
P1 <1.000, 1.000>
```

Set Point

```
Set Point
(V, degC)
0.0, 0.0
```

- Sensors:
 - **V1 Sensor** and **V2 sensor**- sensors with voltage output, enabled or disabled
 - **I Sensor** – a sensor with current output, enabled or disabled

- Range:
 - **V1** – select a range between 0–2 Vdc or 0–30 mVdc.
 - **V2** – select a range between 0–10 Vdc or 0–2 Vdc. I – select a range between 0–20 mA
- **Sensor Type:** One of the following sensors:

Sensor Type	Description	Unit
Temp. Ambient	Ambient temperature sensor measurement	°C, °F
Temp. Module	Module temperature sensor measurement	
Wind Speed	Wind speed sensor measurement	m/s
Wind Direction	Wind direction sensor measurement	degrees
Irradiance Global	Global horizontal irradiance	
Irradiance Direct	Direct irradiance	W/m2
Irradiance Diff.	Diffused irradiance	
Irradiance POA	Plane of Array (POA) irradiance	



NOTE

The temperature units are configured in °C by default and can be changed to °F under the **Temperature** submenu located under the **Display** menu.

- **Two Points setting:** P0 and P1 represent points on the sensor graph to be configured in the Commercial Gateway. The values refer to the measurement signal and the measurement range from the sensor datasheet. Refer to the example below.
- **Set point:** Enables entering two measurement signal values (voltage, current or temperature).

Configuring the Sensors in the Commercial Gateway

► **To enable the sensors in the Commercial Gateway:**

1. Press the Enter button until the following message is displayed:

```

Please enter
Password
*****
```

The Commercial Gateway is now in Setup mode and all its LEDs are lit.

2. Use the three-right most LCD buttons to type in the following password: 12312312. The following menu is displayed:

```

Language <Eng>
Communication
Power Control
Display
Maintenance
Information
```

3. Under the main menu, select **Sensors**.

4. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>
Range <0-2V>
Type <--->
Two Points
```

► To configure sensors in the Commercial Gateway:



NOTE

When using sensors provided by SolarEdge, enabling the sensors as described above automatically sets their configuration (available from SolarEdge Commercial Gateway CPU version 2.07xx). If the CPU version is lower, configure the sensors as described below.

Configure the working range of the sensor that covers the sensor specification. Refer to the table on page 21.

1. Select **Range** under the specific configured sensor and then select the applicable range:
 - V1—select a range between 0–2 Vdc or 0–30 mVdc.
 - V2—select a range between 0–10 Vdc or 0–2 Vdc.
 - I—select a range between 0–20 mA.

A screen similar to the following is displayed, depending on the selected sensor:

```
0-2V
0-30mV
```

2. Select the **Type** of the connected sensor from the following:

```
Temp. Ambient
Temp. Module
Wind Speed
Wind Direction
Irradiance Global
Irradiance Direct
Irradiance Diff.
Irradiance POA
```

3. Select Two Points to configure two points on the sensor graph using the measurement signal and measurement range data from the sensor datasheet.

```
P0 <0.0, 0.0>
P1 <1.000, 1.000>
```

4. Set the point values as follows:
 - Use the **Up** and **Down** buttons to adjust the value.
 - Press the **Enter** button to move to a character.
 - Long press the **Enter** button (until **Applied** message appears)—apply the value
 - Long press the **Esc** button (until **Aborted** message appears)—erase all characters

```
Set Point
(V, DegC)
10, 70
```

5. If required, repeat steps 1 through 4 above to configure additional sensors.

- Check that the Sensors status screen on the LCD displays a screen similar to below, and verify that the sensor's readings are within the range that appears in its datasheet. Refer to *Sensors Status* on page 35.

```
Sensors
1 : XXX.XXX Deg C
V2 : XXX.XXX W/m2
I : Disabled
```

Example of Sensor Graph Configuration

The following is an example of setting a temperature sensor with the following specifications:

- Measurement signal: 0..10V
- Measurement range: -10...+70°C

The following graph shows the min. and max. values, and the focused (linear) area.

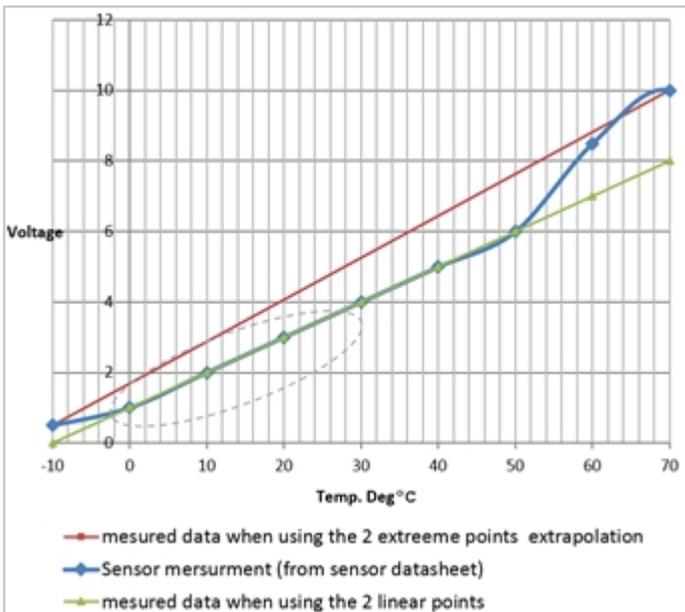


Figure 16: Example of sensor graph

If you want to include the full range of the sensor, the points for setting are the minimum and maximum values from the sensor datasheet:

```
P 0 < 0 , - 10 >
P 1 < 10 , 70 >
```

However, if you want to include a partial range, set any value for the two points, as long as the points are within the SolarEdge Commercial Gateway selected range. The SolarEdge Commercial Gateway then extrapolates the sensor linear graph based on these two points.

```
P 0 < 1 , 0 >
P 1 < 5 , 50 >
```

Sensor Connection Example

This section describes how to connect three of the sensors available from SolarEdge to the Commercial Gateway. For their full specifications refer to

http://www.solaredge.com/files/pdfs/products/inverters/se_sensor_datasheet.pdf (for other recommended sensors and suppliers refer to http://www.solaredge.com/articles/se-supported-devices#environmental_sensors).

- Ambient temperature sensor - a voltage output sensor, measuring the ambient temperature. Electrical output: 0..10V.
- Module temperature sensor - a current output sensor, measuring the module surface temperature. Electrical output: 4..20 mA.
- Solar irradiance sensor - a voltage output sensor, measuring the solar irradiance. Electrical output: 0-1.4 VDC.

An external 24VDC/1A power supply is required for connecting the temperature sensors. A single PSU can be used for both sensors.

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm² / 20 AWG with maximum length of 50m/164 ft.

The following diagram illustrates the connections of the above devices to the SolarEdge Commercial Gateway:

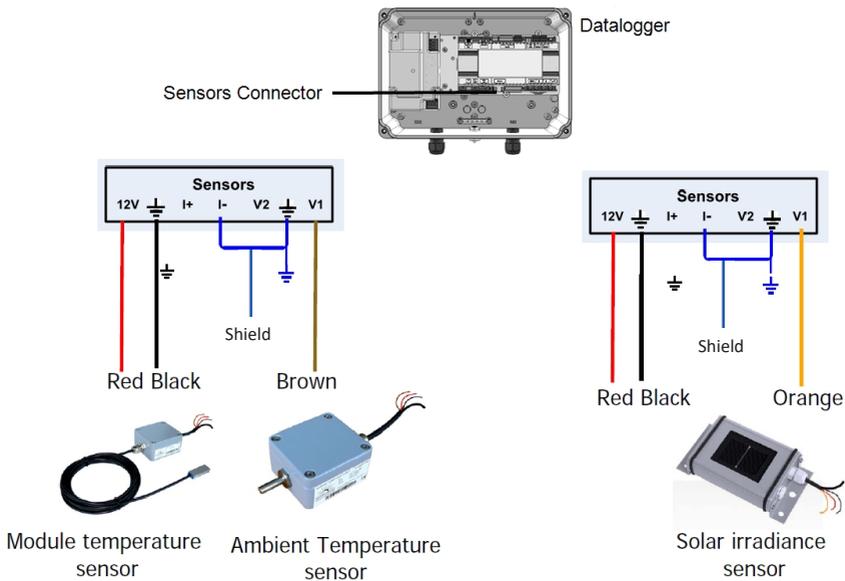


Figure 17: Sensors connection diagram

▶ **To connect an ambient or module temperature sensor to the power supply and to the Commercial Gateway:**

The same power supply can be used for both sensors.

1. Use a flat screwdriver to open the sensor cover screws and remove the cover.
2. Insert the cable through the supplied gland and rubber seal, and into the sensor opening..
3. Connect I- to ground.
4. Connect the power supply to an AC source using the , N, L connection points at the bottom of the power supply.

▶ **To connect a solar irradiance sensor to the Commercial Gateway:**

1. Connect the thin wires to the Commercial Gateway sensors connector as follows (see *Figure 18*):
 - Orange - to V1
 - Black - to Ground
 - Red - to 12V
 - Shield - to Ground

Sensors Terminal Connector

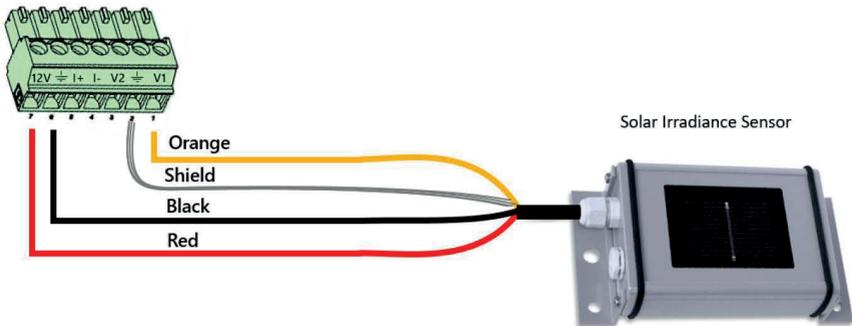


Figure 18: Solar irradiance sensor connection



NOTE

When configuring this sensor in the Commercial Gateway, the type should be **Irradiance Direct**

▶ **To enable the sensors in the Commercial Gateway:**

1. Enter Setup mode, as described in sensors configuration above.
2. Under the main menu, select **Sensors**.

3. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>  
Range <0 - 2V>  
Type <--->  
Two Points
```

If the CPU version of the SolarEdge Commercial Gateway is 2.07xx and higher, the sensors are automatically configured. If the CPU version is lower, configure the sensors as described in: *To configure sensors in the Commercial Gateway*: on page 26

Chapter 5: LCD – Status Screens and Setup Options

This chapter describes the LCD display of the SolarEdge Commercial Gateway. The LCD screen displays status information of the Commercial Gateway and various menus for configuration.

Status Screens - Operational Mode

During normal operation pressing the **Enter** button turns on the LCD backlight. The backlight is active for 30 seconds by default. This duration is configurable, as described in *Display* on page 38.

Additional presses display the following screens one after the other.

Initial Status

```
RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
```

- **RRCR:** If enabled, indicates the active power set by the power control interface, in percent of peak power.
- **Sensors:** Enable/disable status of Sensors' input reading
- **Server:** Server communication method
- **Total # of Slaves:** Indicates the total number of slave devices communicating with the SolarEdge Commercial Gateway

Energy Meter Status

If a meter is connected to the inverter, the following status screen, showing the power and energy readings, is displayed in addition to the above screen.

If the meter is set to Export +Import, there are two status screens, with the first line displaying: "Export Meter" or "Import Meter". The following is an example of an export meter status:

```
Export Meter
Status: <OK/Error#>
Power [W]: xxxxx.x
Energy [Wh]: XXXXX.X
```

- **Status:** Displays OK if the meter is communicating with the communication board.
- **<Error message>:** If there is a meter error, it is displayed in this line.
- **Power (W):** Depending on the meter type connected to the inverter, this line displays the exported or imported power in Watts.
- **Energy (Wh):** The total energy read by the meter, in Watt/hour. The value displayed in this line depends on the meter type connected to the inverter and its location:
 - If a bidirectional meter is connected at the consumption point, this value is the consumed energy.
 - If the meter is installed at the production connection point, this value is the energy produced by the site.
 - If the meter is installed at the grid connection point, this value is the energy exported to the grid.

If the inverter is connected to the SolarEdge server, this value will also be displayed in the monitoring platform.



NOTE

This data is accumulated according to an internal real-time clock.

ID Status

This screen displays the ID of the Commercial Gateway and the software version.

```
ID: ##### ##
DSP1: 1.0210
CPU: 0003.19xx
Country: ESP
```

Server Communication Status

```
Server: LAN <S_OK>
Status: <OK>
xxxxxxx
<ERROR MESSAGE>
```



NOTE

If the connection method is CDMA (referred to as "Cellular" in the status screens) or GSM, the server screen is replaced with the Cellular or GSM status screens (see *Status Screens - Operational Mode* on page 31 and *GSM Status* on page 33).

- **Server:** The method of connection to the SolarEdge monitoring platform.
- **S_OK:** The connection to the SolarEdge monitoring platform is successful (should appear only if the inverter is connected to the server).
- **Status:** Displays OK if the Commercial Gateway established successful connection and communication with the specified server port/device (LAN, RS485, Wi-Fi or ZigBee Plug-in).
- **xxxxxxx:** Eight-bit Ethernet communication connection status: A string of 1s and 0s is displayed. 1 indicates OK, 0 indicates an error. For a list of possible errors and how to troubleshoot them, refer to on page 49.
- **Error message,** according to failure. Refer to <http://www.solaredge.com/sites/default/files/se-inverter-installation-guide-error-codes.pdf>.



IP Status

This screen describes the Ethernet configuration: IP, Mask, TCP Gateway and MAC address (Media Access Control) of the Commercial Gateway.

```
IP 192.168.2.119
MSK 255.255.255.0
GW 192.168.2.1
MAC 0-27-02-00-39-36
```

ZigBee Status

This screen describes the ZigBee configuration:

```
PAN : XXXXX
CH : XX / XXXX  RSSI : <L>
MID : XXXX  XX
ZigBee Ready
```

- **RSSI:** The receive signal strength indication of the closest ZigBee in the system. L = low, M = medium, H = high and (-) = no signal.
- **PAN ID:** The ZigBee transceiver PAN ID (Personal Area Network Identification), the ID uniquely represents a device in a ZigBee network.
- **Ch.:** The ZigBee transceiver channel
- **ID:** The ZigBee transceiver ID
- **MID:** The Master ID of the coordinator (master) ZigBee Plug-in. This field is shown only in devices with router (slave) ZigBee cards, and after a successful ZigBee association. If a ZigBee Plug-in is not connected, a **No ZigBee** message is displayed instead of the **MID** field.
- **ZigBee Ready:** This field is shown only in devices with ZigBee router transceivers (slaves), in a multi-point (MP) protocol configuration. If a ZigBee transceiver is not physically connected, a **No ZigBee** message is displayed.

Wi-Fi Status

This screen describes the Wi-Fi configuration:

```
IP : 192.168.2.119
GW : 192.168.2.1
SSID : xxxxxxxx
RSSI : <L/M/H/->
```

- **IP:** The DHCP provided address
- **GW:** The gateway IP address
- **SSID:** Service Set Identifier - the name of a wireless local area network (WLAN). All wireless devices on a WLAN must employ the same SSID in order to communicate with each other.
- **RSSI:** The receive signal strength indication of the closest Wi-Fi in the SolarEdge system. L = low, M = medium, H = high and - = no signal.

GSM Status

If a GSM Plug-in is connected, this screen replaces the Server status screen:

```
Server: Cell <S_OK>
Status: <OK>
MNO: <xxxxxxx> Sig: 5
<Error message>
```

- **Server:** The method of communication to the SolarEdge monitoring platform. Should display **Cell**.
- **Status:** Displays OK if the inverter established a successful physical connection to the modem.
- **S_OK:** The last communication to the SolarEdge monitoring platform was successful (appears if the inverter is connected to the platform). If S_OK is not displayed, refer to *Status Screens - Operational Mode* on page 31.
- **MNO:** The mobile network operator name
- **Sig:** The signal strength, received from the modem. A value between 0-5, (0 = no signal; 5 = excellent signal)
- **Error message:** per communication connection status failure

Communication Ports Status

This screen presents the communication port (RS485-1/2 or ZigBee), and the devices connected to them, with details about the number, type, and protocol.

```

      Dev Prot  ##
RS485-1<SE><S> <-->
RS485-2<SE><S> <-->
ZigBee <SE><MPS><-->
    
```

- **##:** The total number of slaves detected on the specific port
- **Dev:** The type of device that was configured to a specific port (based on the port’s functionality), as follows:
 - **SE:** SolarEdge device (default)
 - **LGR:** Non-SolarEdge logger
 - **MLT:** Multiple devices, such as meters and batteries
 - **HA:** Home automation devices (for Smart Energy)
- **PROT:** The protocol type to which the port is set:
 - For a SolarEdge device:

RS485 protocol	ZigBee protocol
S: SolarEdge slave	
M: SolarEdge master	
	P2P: ZigBee point-to-point
	MPM: ZigBee multipoint master (for the SolarEdge ZigBee home gateway or for load management by the inverter)
	MPS: ZigBee multipoint slave (for a ZigBee router card)

- For electricity meters, refer to the *application note - Connecting an Electricity Meter to SolarEdge Devices* at <http://www.solaredge.com/files/pdfs/solaredge-meter-installation-guide.pdf>.
- **SS:** SunSpec - for a non-SolarEdge logger (monitoring and control)



Smart Energy Management Status

This screen is displayed only when Smart Energy Management is enabled. The screen shows energy details of the site:

```

Site Limit:      7.0 kW
Site Prod:       10.0 kW
Site Export:     4.0 kW
Self-consume:   6.0 kW
    
```

- **Site Limit:** The limit that was defined for the site
- **Site Prod:** The power produced by the site
- **Site Export:** The power that is fed into the grid
- **Self-consume:** The PV power consumed by the site

For more information, refer to the *Export Limitation Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/products/feed-in_limitation_application_note.pdf.



Sensors Status

This screen displays the status of up to three different sensors connected to the Commercial Gateway.

```
Sensors
1 : XXX.XXX DegC
V2 : XXX.XXX W/m2
I  : Disabled
```

- **V1:** Displays the real time reading of the sensor connected to V1 sensor input
- **V2:** Displays the real time reading of the sensor connected to V2 sensor input
- **I:** Displays the real time reading of the sensor connected to I sensor input

The reading is displayed according to the relevant sensor that was configured on the specific sensor input:

- Temperature sensor - the degrees reading in Celsius or Fahrenheit
- Irradiance reading - in W/m2
- Wind speed, in m/s
- Wind direction, in Deg

Configuration Menu Options

This section describes basic Commercial Gateway configuration options.

▶ To enter Setup mode:

1. Verify that the SolarEdge Commercial Gateway is connected to a power outlet.
2. Press the Enter button until the following message is displayed:

```
Please enter
Password
*****
```

The Commercial Gateway is now in Setup mode and all its LEDs are lit. The Commercial Gateway automatically exits Setup mode if no buttons are pressed for more than 2 minutes.

3. Use the three-right-most LCD buttons to type in the following password: **12312312**. The following message is displayed:

```
Language <Eng>
Communication
Power Control
Display
Maintenance
Information
```

Language

1. Select the **Language** option to set the language in which the LCD should display.
2. Confirm your language selection in the confirmation screen: Toggle to **YES** and press **Enter**.

Communication

1. Select the **Communication** option to define and configure:
 - The communication option used by the Commercial Gateway to communicate with the SolarEdge monitoring platform
 - The communication option used to communicate between multiple SolarEdge devices or other external non-SolarEdge devices, such as electricity meters or loggers.



NOTE

The Server menu shows only the communication options installed in the Commercial Gateway.

The following shows a hierarchical tree of the menu options in the **Communication** menu.

For detailed information about all the configuration options, refer to the *Communication Options Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/solaredge-communication_options_application_note_v2_250_and_above.pdf.



Communication^{1,2}:

```

Server <LAN >
LAN Conf
RS485-1 Conf <S >
RS485-2 Conf <S >
ZigBee Conf <S >
Wi-Fi Conf <N/A >
Cellular Conf
Slave Detect
    
```

Server:

```

LAN
RS485
Zigbee
Wi-Fi
Cellular
None
    
```

LAN Conf:

```

IP Config
Set DHCP <en >
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP <Dis >
    
```

¹If ZigBee is connected, the Wi-Fi Conf menu is not displayed. If ZigBee is not connected, ZigBee Conf and Wi-Fi Conf are both displayed with <N/A> and their menus are not accessible.

²When using the SolarEdge GSM products, RS232 Conf menu is unavailable.

RS485-X Conf:

```

Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Cluster SLV Detect
Long Slave Detect <#>
Slave List <#>
Multi-Inv. Set

```

ZigBee Conf. (enabled only if the ZigBee internal card is connected):

```

Device Type<SE>
Protocol<MPS>
Device ID<1>
PAN ID
Scan Channel
Load ZB Defaults

```

Wi-Fi Conf (enabled only if the internal card is connected):

```

Scan Networks
Set key
Load Defaults

```

RS232 Conf1:

```

Device Type<SE>
Protocol<GSM>
Set APN
Set Modem Type
Set User Name
Set Password

```

GPIO Conf:

```

Device Type <RRCR>

```

Power Control

```

RRCR Conf.
Load Defaults

```

Power control options are detailed in the *Power Control Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/application_note_power_control_configuration.pdf.



¹When using the SolarEdge GSM products this menu is unavailable.

Sensors

Select **Sensors** to set the following options:

```
V 1  S e n s o r < D i s >
V 2  S e n s o r < D i s >
I    S e n s o r < D i s >
```

The SolarEdge Commercial Gateway sensor interface supports up to three analog sensors:

- **V1, V2:** Voltage sensors
- **I:** Current sensors

For detailed information about all the configuration options for sensors, refer to *Connecting Environmental Sensors (Optional)* on page 21.

Display

Select **Display** to set the following:

```
L C D   O n   T i m e   < 3 0 >
```

- **Temperature:** Select Celsius or Fahrenheit units.
- **LCD On Time <30>:** The number of seconds that the LCD backlight is ON after pressing the LCD light button. Set a value within the range of 10-120 seconds.
- **TLM On Time <15>:** The number of minutes that the LCD backlight is ON while viewing the Telemetry window. Set a value within the range of 1-120 minutes.

Maintenance

Select **Maintenance** to set the following options:

```
D a t e   a n d   T i m e
F a c t o r y   R e s e t
F W   U p g r a d e
```

- **Date and Time:** Set the internal real-time clock. If connected to the SolarEdge monitoring platform, the date and time are set automatically and only time zone should be set.
- **Factory Reset:** Performs a general reset to the default device settings.
- **FW Upgrade:** Perform a software upgrade by using an SD card. Refer to [upgrading_an_inverter_using_micro_sd_card.pdf](#).



Information

Select **Information** to display the following options:

```
V e r s i o n s
E r r o r   L o g
W a r n i n g   l o g
H a r d w a r e   I D s
```

- **Versions:** Displays firmware versions:
 - **ID:** The ID.
 - **DSP 1:** The DSP digital control board firmware version
 - **CPU:** The communication board firmware version

**NOTE**

Please have these numbers ready when you contact SolarEdge Support.

- **Error Log:** Displays the last five errors.
- **Warning Log:** Displays the last five warnings.
- **Hardware IDs:** Displays the following HW serial numbers (if exist, and connected to the inverter):
 - **ID:** the inverter's ID
 - **RGM1** (Revenue Grade Meter): Energy Meter with Modbus Connection
 - **RGM2:** A second external Energy Meter with Modbus Connection
 - **ZB:** ZigBee MAC address
 - **Cell:** MEID (CDMA) or IMEI (GSM)
 - **WiFi:** Wi-Fi MAC address

Chapter 6: Setting Up Monitoring through the Commercial Gateway (Optional)

Communication Dataflow

The SolarEdge site information can be accessed remotely using the SolarEdge monitoring platform. In order to transfer monitoring data from a SolarEdge site to the SolarEdge monitoring platform, a communications connection must be established. Communications are not required for power harvesting - they are required only when using the monitoring platform.

Any SolarEdge device can serve as the connection point. This chapter describes how to set up this connection with the Commercial Gateway serving as the connection point to the monitoring platform. The Commercial Gateway should be the master on an RS485 bus.

Communication Options

The following types of communication can be used to transfer the monitored information from the inverter to the monitoring platform through the Commercial Gateway.

Only communication products offered by SolarEdge are supported.

Always connect the communication options when the relevant devices are powered down - Commercial Gateway, inverter, etc.

Ethernet

Ethernet is used for a LAN connection. For connection instructions refer to *Creating an Ethernet (LAN) Connection* on page 42.

RS485

RS485 is used for the connection of multiple SolarEdge devices on the same bus in a master-slave configuration. RS485 can also be used as an interface to external devices, such as meters and third party data loggers.

- RS485-1: Enables the connection of multiple devices (inverters/Commercial Gateway) over the same bus, such that connecting only one device to the Internet is sufficient to provide communication services for all the devices on the bus.
- RS485-2: Enables connection of non-SolarEdge devices.
- RS485 Plug-in: The RS485 Plug-in provides an additional RS485 port for the Commercial Gateway for enhanced communications. The kit contains a module, which is installed on the communication board, and has a 3-pin RS485 terminal block. This kit is provided with an installation guide, which should be reviewed prior to connection see, https://www.solaredge.com/sites/default/files/RS485_expansion_kit_installation_guide.pdf



For connection instructions refer to *Creating an RS485 Bus Connection* on page 11.

ZigBee

This option enables wireless connection to one or several Smart Energy products, which automatically divert PV energy to home appliances.

This option enables wireless connection, and requires a ZigBee Plug-in and an external antenna. ZigBee connection is used for:

- *Monitoring* - connection of one or several devices to a SolarEdge ZigBee Gateway, for wireless communication to the SolarEdge monitoring platform.

The ZigBee Gateway is provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-zigbee-home-gateway-installation-guide.pdf>.

To mount the ZigBee Plug-in in the Commercial Gateway, see "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46

- *Smart Energy Management* - wireless connection to one or several Smart Energy products, which automatically divert PV energy to home appliances.

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#.

The ZigBee Plug-in for Smart Energy is are provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-device-control-zigbee-module-installation-guide.pdf>

To mount the ZigBee Plug-in in the Commercial Gateway, see "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46.



Wi-Fi

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

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

The Wi-Fi option requires a Wi-Fi Plug-in and an external antenna, available from SolarEdge in a kit, which can be purchased separately and assembled during system installation. The Wi-Fi Plug-in kit is provided with a user manual, which should be reviewed prior to connection. Refer to http://www.solaredge.com/sites/default/files/se_wifi_communication_solution_installation_guide.pdf



Cellular

This wireless communication option (purchased separately) enables using a cellular connection to connect one or several devices (depending on the data plan used) to the monitoring platform.

The GSM Plug-in is provided with a user manual, which should be reviewed prior to connection. Refer to https://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf



Creating an Ethernet (LAN) Connection

Overview

This communication option enables using an Ethernet connection to connect the SolarEdge Commercial Gateway to the monitoring platform through a LAN. The SolarEdge Commercial Gateway has an RJ45 connector for Ethernet communication.

You can connect more than one SolarEdge Commercial Gateway to the same switch/router or to different switches/routers, as required. Each Commercial Gateway sends its monitored data independently to the SolarEdge monitoring platform.

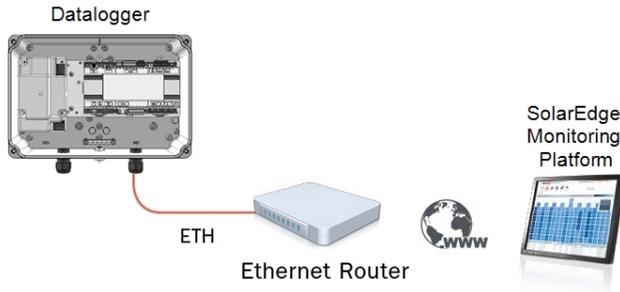


Figure 19: Example of Ethernet connection

Ethernet Communication Configuration Options

The following is a description of the options to configure the Ethernet (LAN) port settings. Communication:

```
Server <LAN >
LAN Conf
RS485-1 Conf <S >
RS485-2 Conf <S >
ZigBee Conf <S >
Wi-Fi Conf <N/A >
Cellular Conf
Slave Detect
```

LAN Conf:

```
IP Config
Set DHCP <en >
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP <Dis >
```

- **IP Config:** Displays the current IP configuration of the Commercial Gateway, as shown below. If DHCP is used, this screen reflects the parameters retrieved from the DHCP server. If manual settings are used, the screen shows the last manually input configurations.

```
IP 0.0.0.0
MSK 255.255.255.0
GW 192.168.0.1
DNS 0.0.0.0
```

- **Set DHCP <En>:** If the LAN connection between the Commercial Gateway and the SolarEdge Monitoring Platform has a DHCP server, enable this option by setting it to Enable (default). If this option is enabled, then the DHCP server automatically configures the IP, Subnet Mask, default gateway and DNS. If not, set them manually.
- **Set IP:** Enables setting the IP of the default gateway according to the LAN settings:
 - Use the **Up** and **Down** buttons to adjust the value of each IP address octet.
 - Press the **Enter** button to move to the next IP address octet.
 - Long press the **Enter** button (until **Applied** message appears) – apply the value
 - Long press the **Esc** button (until **Aborted** message appears) – erase all characters

```
Setup IP
192.168.2.7
```

- **Set Mask:** Set the subnet mask of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set Gateway:** Set the default gateway address of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set DNS:** Set the DNS of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set Server Addr:** Set the IP address of the SolarEdge monitoring platform. This option is predefined in the SolarEdge Commercial Gateway to specify the SolarEdge monitoring platform IP address and does not normally need configuration.
- **Set Server Port:** Set the port through which to connect to the SolarEdge monitoring platform. This option is predefined in the Commercial Gateway to specify the SolarEdge monitoring platform IP port and normally does not need configuration.

NOTE

If your LAN has a firewall, you must verify that the address and port configured in the **Set Server Addr** and the **Set Server Port** fields are not blocked. You may need to configure it to enable the connection to the following address:

Destination Address: prod.solaredge.com

Port: 443



Connecting and Configuring LAN

► **To connect the Ethernet cable to the router/switch:**

1. Use a pre-terminated cable or use a crimper to prepare an RJ45 communication connector on both ends of a standard CAT5/6 cable: Insert the eight wires into the RJ45 connector.

CAT5/6 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.

RJ45 Pin #	Wire Color		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-
7	White/Brown	White/Brown	Reserved
8	Brown	Brown	Reserved

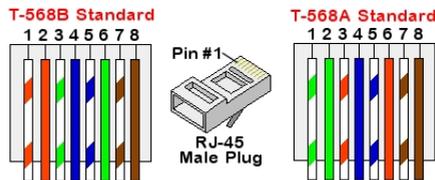


Figure 20: Standard cable wiring

2. Connect one end of the Ethernet cable to the RJ45 plug at the router or Ethernet gateway that is connected to the Internet.
3. Thread the other end through a gland and connect to the Commercial Gateway Ethernet connector.
4. Verify that the yellow communication LED turns ON.

► **To configure Ethernet communication to the SolarEdge monitoring platform:**

Define the device connected to the monitoring platform as the master device.

The server communication method is configured by default to **LAN with DHCP enabled**.

If a different setting is required, follow the steps below:

1. Enter Setup mode, as described in: *To enter Setup mode:* on page 35.
2. Set the Commercial Gateway as the master of the RS485 bus and perform slave detection as described in “. *Creating an RS485 Bus Connection* on page 11

3. To configure the LAN to Static IP select the following in the LCD menus on the Commercial Gateway:
 - Communication → Server → LAN
 - LAN Conf → Set DHCP → <Dis>
4. Set the IP, subnet mask, gateway DNS, server address, and server port as necessary using the LCD User buttons. Refer to the *Ethernet Communication Configuration Options* on page 42.
5. Verify that the status field in the Server Communication Status window displays S_OK:

```
S e r v e r : L A N      < S _ O K >
S t a t u s :           < O K >
      x x x x x x x x
< E R R O R   M E S S A G E >
```

6. Exit the Setup mode.

Appendix A: Mounting the ZigBee Plug-in in the Commercial Gateway



NOTE

The ZigBee Plug-in should be purchased separately.

1. Turn the inverter Safety Switch (if applicable) to OFF.
2. Turn the inverter ON/OFF switch to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel. Wait 5 minutes for the capacitors to discharge.
4. Open the Commercial Gateway cover.
5. Unscrew the nut and washer on the ZigBee Plug-in.
6. Connect the ZigBee Plug-in in a Commercial Gateway board as shown below, and ensure that:
 - the antenna connector at the end of the ZigBee Plug-in goes through the bracket.
 - all pins are correctly positioned in the Commercial Gateway socket and no pins are left out of their socket.
 - the card is firmly in place.

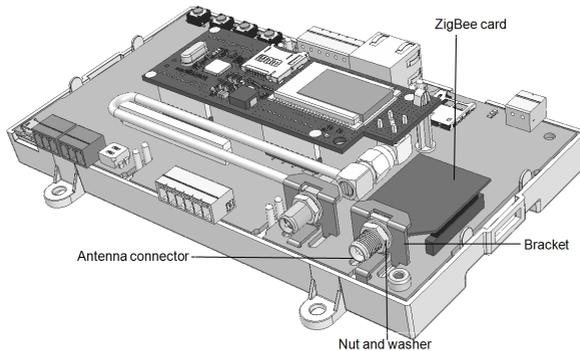


Figure 21: ZigBee Plug-in on a Commercial Gateway board

3. Screw in the nut and washer on the ZigBee Plug-in
4. Connect the antenna.
5. Replace the Commercial Gateway cover.

Appendix B: Inserting the GSM Modem in the Commercial Gateway



NOTE

The GSM modem should be purchased separately.

▶ To turn off the inverter, disconnect the AC and insert a SIM card:

1. Turn the inverter Safety Switch (if applicable) to OFF.
2. Turn the inverter ON/OFF switch to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel. Wait 5 minutes for the capacitors to discharge.
4. Open the Commercial Gateway cover.
5. If there is no SIM card installed in the modem, insert one into the slot on the GSM modem.

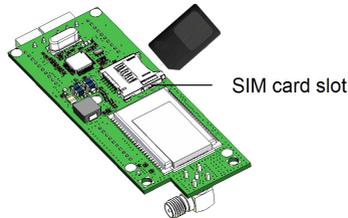


Figure 22: Inserting the SIM card into the GSM modem

▶ To install the GSM modem in the Commercial Gateway:

1. Insert the top of the plastic spacer through the opening in the GSM modem, as shown in *Figure 23*.

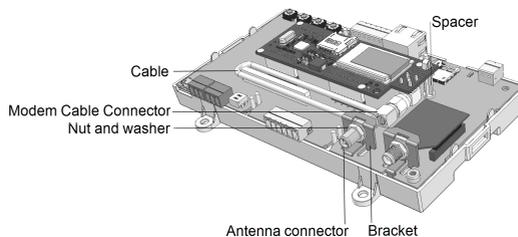


Figure 23: GSM modem on a Commercial Gateway board

2. Connect one end of the cable to the GSM modem connector.
3. Remove the nut and the washer from the other end of the cable and insert the cable through the bracket on the Commercial Gateway board.
4. Re-attach and tighten the nut and washer.

5. Place the GSM modem on the Commercial Gateway board and ensure that:
 - the three rows of pins are correctly positioned in the Commercial Gateway sockets and no pins are left out of their socket.
 - the GSM modem is firmly in place on the Commercial Gateway board.
6. Connect the antenna to the antenna connector.
7. Replace the Commercial Gateway cover.
8. Power on AC.
9. Check that all the GSM modem LEDs are lit. If not, refer to *Errors and Troubleshooting* on page 49.

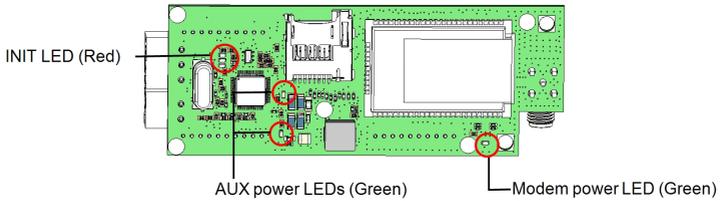


Figure 24: GSM modem LEDs

Appendix C: Errors and Troubleshooting

This appendix describes general system problems, and how to troubleshoot them. For further assistance, contact SolarEdge Support.



Troubleshooting Communication

Troubleshooting Ethernet Communication

When using Ethernet communication, use the **Server Communication Status** window to identify the location of the error:

```
Server : LAN    <S_OK>
Status :      <OK>
          xxxxxxxx
<ERROR MESSAGE>
```

xxxxxxx is a string of 1s and 0s showing an eight-bit communication connection status. 1 indicates OK and 0 indicates an error.

Bit Location	Error Message	Cause and Troubleshooting
1st	LAN Disconnected	Physical connection fault. Check the cable pin-out assignment and cable connection. Refer to <i>Creating an Ethernet (LAN) Connection</i> on page 42
2nd	DHCP Failed, or Invalid DHCP Config	IP settings issue. Check the router and inverter configuration. Consult your network IT.
3rd	Gateway Ping Failed	Ping to router failed. Check the physical connection to the switch/router. Check that the link LED at the router /switch is lit (indicating phy-link). If OK - contact your network IT, otherwise replace the cable or change it from cross to straight connection.
4th	G Server Ping Failed	Ping to google.com failed. Connect a laptop and check for internet connection. If internet access is unavailable, contact your IT admin or your internet provider. For Wi-Fi networks, ensure that username and password are as defined in the internet provider AP/router.
5th	Server x Ping Failed	Ping or connection to SolarEdge server failed. Check the SolarEdge server address, under LAN Conf submenu:
6th		Address: prod.solaredge.com
7th		Port: 22222 Check with your network administrator whether a firewall or another device is blocking transmission.
8th	Tcp Connect. Failed	

1. If **No Communication** is displayed on the SolarEdge Commercial Gateway, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the master and that slaves were detected, as described above.
2. If the message **Master Not Found** appears, check the connections to the master device and fix if required.
3. If after slave detection the number of slaves displayed in the master under **RS485-X Conf → Slave Detect** is smaller than the actual number of slaves, use one of the following methods to identify missing slaves and troubleshoot connectivity problems:
 - Use the **Long slave Detect** to retry connecting to slaves
 - Analyze the **Slave List** to check for missing slaves, and check their connection

Refer to https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf



Additional Troubleshooting

1. Check that the modem or hub/router is functioning properly.
2. Check that the connection to the internal connector on the communication board is properly done.
3. Check that the selected communication option is properly configured.
4. Use a method independent of the SolarEdge device to check whether the network and modem are operating properly. For example, connect a laptop to the Ethernet router and connect to the Internet.
5. Check whether a firewall or another type of network filter is blocking communication.



Commercial Gateway

with Cellular Support

Version 1.3

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Disclaimers

Important Notice

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The general terms and conditions of delivery of SolarEdge shall apply.

The content of these documents is continually reviewed and amended, where necessary. However, discrepancies cannot be excluded. No guarantee is made for the completeness of these documents.

The images contained in this document are for illustrative purposes only and may vary depending on product models.

Emission Compliance

This equipment has been tested and found to comply with the limits applied by the local regulations.

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, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

Support and Contact Information

If you have technical problems concerning SolarEdge products, please contact us:

Country	Phone	E-Mail
Australia (+61)	1800 465 567	support@solaredge.net.au
APAC (Asia Pacific)(+972)	073 240 3118	support-asia@solaredge.com
Benelux	NL (+31): 0800-7105	support@solaredge.nl
	BE (+32): 0800-76633	support@solaredge.be
China (+86)	21 6212 5536	support_china@solaredge.com
DACH & Rest of Europe (+49)	089 454 59730	support@solaredge.de
France (+33)	0800 917410	support@solaredge.fr
Italy (+39)	0422 053700	support@solaredge.it
Japan (+81)	03 6262 1223	support@solaredge.jp
New Zealand (+64)	0800 144 875	support@solaredge.net.au
US & Canada (+1)	510 498 3200	ussupport@solaredge.com
United Kingdom (+44)	0800 028 1183	support-uk@solaredge.com
Greece (+49)	89 454 59730	support@solaredge.com
Israel (+972)	073 240 3122	
Middle East & Africa (+972)	073 240 3118	
South Africa (+27)	0800 982 659	
Turkey (+90)	216 706 1929	
Worldwide (+972)	073 240 3118	

Before contact, make sure to have the following information at hand:

- Model and serial number of the product in question.
- The error indicated on the LCD screen or on the SolarEdge monitoring platform or by the LED, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The software version as appears in the ID status screen.

Revision History

Version 1.3 (June 2024)

- Added note to install the Commercial Gateway as a follower on the inverter in the UK under UK-PSTI.

Version 1.2 (March 2020)

- Change in Figure 20: Solar irradiance sensor connection. Change to port 443 in Ethernet Communication Configuration Options.

Version 1.1 - (June 2018)

- The Commercial Gateway now supports CDMA as well as GSM cellular connectivity , therefore its name was hanged to Commercial Gateway with Cellular with Support
- Changed name CCG to Commercial Gateway
- Removed indications that Commercial Gateway can be connected to non- SolarEdge inverters

Version 1.0 - initial release (June 2017)

HANDLING AND SAFETY INSTRUCTIONS

During installation, testing and inspection, adherence to all the handling and safety instructions is mandatory. **Failure to do so may result in injury or loss of life and damage to the equipment.**

Safety Symbols Information

The following safety symbols are used in this document. Familiarize yourself with the symbols and their meaning before installing or operating the system.

WARNING!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **injury or loss of life**. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.

CAUTION!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **damage or destruction of the product**. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

NOTE



Denotes additional information about the current subject.

IMPORTANT SAFETY FEATURE



Denotes information about safety issues.

Disposal requirements under the Waste Electrical and Electronic Equipment (WEEE) regulations:



NOTE

Discard this product according to local regulations or send it back to SolarEdge.

About This Guide

This user guide is intended for Photovoltaic (PV) system owners, installers, technicians, maintainers and integrators who use the SolarEdge power harvesting system.

This guide describes the process of installing and configuring the SolarEdge Control and Communication gateway (also referred to as SolarEdge gateway).

This guide assumes that the SolarEdge power harvesting system is already installed and commissioned. For additional information about how to install and commission the SolarEdge power harvesting system, refer to the relevant inverter or safety and monitoring system (SMI) installation guide.

The guide includes the following chapters:

- *Introducing the Commercial Gateway* on page 8, describes the SolarEdge control and communication gateway.
- Chapter 2: *Installing the Commercial Gateway* on page 18, describes how to install the SolarEdge gateway.
- Chapter 3: *LCD – Status Screens and Setup Options* on page 31 describes how to configure the SolarEdge gateway and how to identify its status.
- Chapter 4: *Connecting the Commercial Gateway to the Installation* on page 11, describes how to connect the control and communication gateway to inverters or Safety and Monitoring Interface (SMI) using the RS485 bus connection.
- Chapter 5: *Connecting Environmental Sensors (Optional)* on page 21, describes how to connect and configure external environmental sensors to the SolarEdge gateway.
- Chapter 6: *Setting Up Monitoring through the Commercial Gateway (Optional)* on page 40, describes how to set up communication through the SolarEdge gateway to the SolarEdge monitoring platform.
- Appendix A: "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46
- Appendix B: "Inserting the GSM Modem in the Commercial Gateway" on page 47
- Appendix C: *Errors and Troubleshooting* on page 49, describes the error messages that appear on the LCD panel when an error occurs, and how to troubleshoot them.
- Appendix D: *Technical Specifications* on page 51, provides the electrical and mechanical specifications of the SolarEdge gateway device.

For further information, datasheets and the most up-to-date certifications for various products in different countries, please visit the SolarEdge website: www.solaredge.com.

Chapter 1: Introducing the Commercial Gateway

Overview

The Commercial gateway expands SolarEdge monitoring and control capabilities. It can be connected to SolarEdge and non-SolarEdge devices (excluding inverters) and can transfer the monitoring data to the SolarEdge monitoring server and optionally, to a non-SolarEdge logger.

The Commercial Gateway can connect to the following devices¹:

- SolarEdge devices, such as inverters and safety and monitoring interfaces (SMIs)
- Environmental sensors
- Revenue grade meters
- Power reduction control devices



NOTE

Sensors, meters, loggers, and power reduction control devices are sold separately.

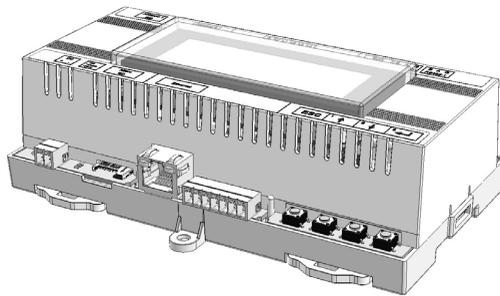


Figure 1: The Commercial Gateway

¹For a list of supported environmental sensors, revenue meters, and third party inverters, refer to <http://www.solaredge.com/articles/se-supported-devices>

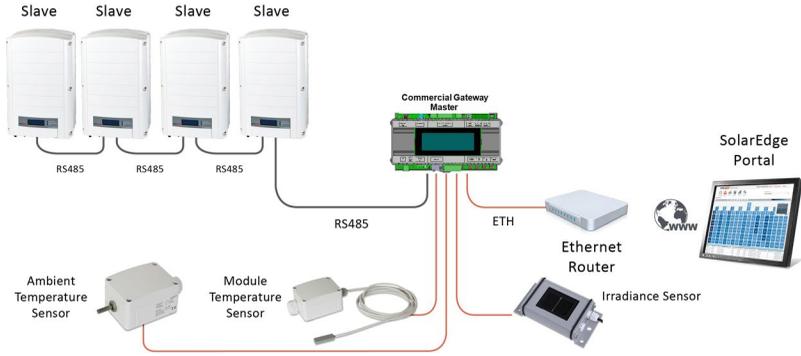


Figure 2: Example of sensor connection to the Commercial Gateway

Commercial Gateway Interfaces

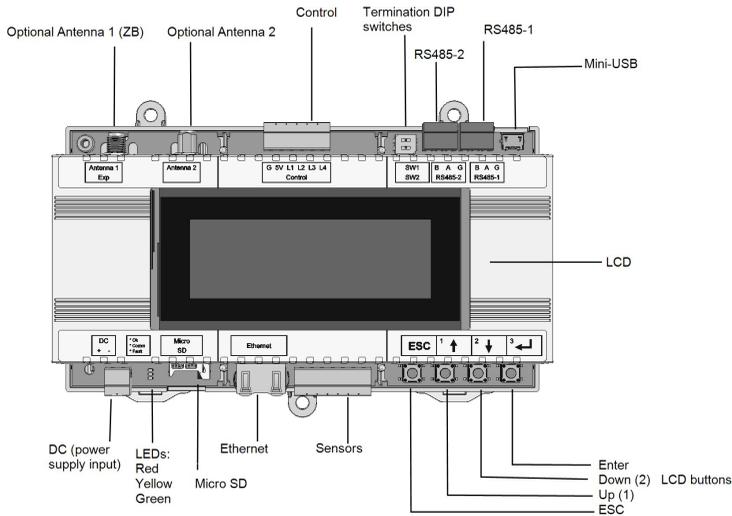


Figure 3: Commercial Gateway interfaces

LCD and LCD-Menu Buttons

The LCD screen displays status information of the system and various menus for configuration options. The LCD panel and buttons are used during the following processes:

- **Operational mode:** The LCD panel allows checking for proper system operation. Refer to *Status Screens - Operational Mode* on page 31 for a description of this option.
- **Setup mode:** Upon installation, an installer may perform basic configuration as described in *Configuration Menu Options* on page 35.
- **Error messages:** In the event of a problem, an error message may be displayed on the LCD panel. For more information, refer to *Errors and Troubleshooting* on page 49.

Use the four user buttons to control the LCD panel menus:

- **Esc:** Moves the cursor (>) to the beginning of the currently displayed parameter; goes to the previous menu, and cancels a value change with a long press (until **Aborted** is displayed).
- **Up (1)** and **Down (2):** Moves the cursor from one menu option to another, moves among the characters of a displayed parameter, and toggles between possible characters when setting a value.
- **Enter (3):** Selects a menu option and accepts a value change with a long press (until **Applied** is displayed).

Use the three rightmost buttons for entering the digits **123** when entering the Setup mode password **12312312**.

Communication Connectors

- **Antenna1:** used for optional wireless ZB (ZigBee) or Wi-Fi antenna connection.
- **Antenna2:** Currently not installed
- **RS485-1** and **RS485-2:** used for connecting external devices to the gateway (refer to *Connecting the Commercial Gateway to the Installation* on page 11)
- **Mini-USB:** Enables PC/laptop connection for using the SolarEdge configuration tool.
- **Ethernet:** Enables connecting the SolarEdge gateway to the SolarEdge monitoring platform through an Ethernet switch/router (refer to *Creating an Ethernet (LAN) Connection* on page 42). The Ethernet switch/router should be connected to the Internet.

LEDs

The Commercial gateway has three LED indicators, as follows:

- **OK (Green):** Indicates whether or not the Commercial gateway is powered.
- **Comm (Communication, Yellow):** Blinks when monitoring information is received from another SolarEdge device in the installation.
- **Fault (Red):** Indicates that there is an error. For more information, contact SolarEdge support.

All LEDs are ON while the Commercial gateway is being configured and during power up.

Other Interfaces

- **DC:** used for the power supply input as described in *Connecting the Commercial Gateway to AC* on page 20.
- **Sensors:** enables connecting to external environmental sensors (refer to *Connecting Environmental Sensors (Optional)* on page 21).
- **Control:** used for connection to an external power reducer device
- **SW1/SW2:** RS485-1/2 termination
- **Micro SD:** used for field software upgrade

Chapter 2: Connecting the Commercial Gateway to the Installation

Overview

The Commercial Gateway connects to the PV system installation using the RS485 communication option. The RS485 option enables creating a chain (bus) of up to 31 follower SolarEdge devices, connected to one leader, which can be another SolarEdge device or the Commercial Gateway.

The following is an example of a leader Commercial Gateway connected to a chain of follower inverters.

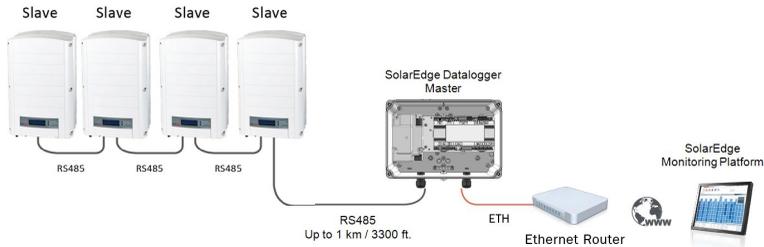


Figure 4: Example of RS485 connection

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

Creating an RS485 Bus Connection

The RS485 bus uses a three-wire cable connecting the RS485-1/2 terminal blocks on the Commercial Gateway to the RS485 input of the inverters/SMI.

▶ To connect the RS485 communication bus between inverters/SMIs and the Commercial Gateway:

1. Use one of the supplied 3-pin terminal blocks: Loosen the screws and insert the wire ends into the A, B and G pins. For connections longer than 10m use twisted pair wires for A and B wires.

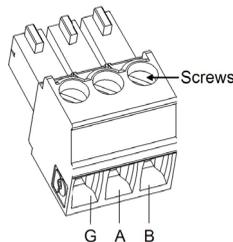


Figure 5: 3-pin terminal block

- Choose either RS485-1 or RS485-2 for connection. Connect the 3-pin terminal block to the designated port on the Commercial Gateway.



NOTE

RS485-1 is configured as SolarEdge device by default, therefore RS485-1 is recommended as the RS485 bus connection point.

- If the Commercial Gateway is at the end of the RS485 chain, terminate the Commercial Gateway by switching a termination DIP switch to ON. The switches in the SolarEdge Commercial Gateway are marked **SW1** for the RS485-1 port termination and **SW2** for the RS485-2 port termination, as shown below:



Figure 6: RS485 connectors and termination switches

- Open the inverter/SMI cover as described in their manual.
- Remove the seal from one of the openings in communication gland #2 of the inverter and insert the cable through the opening.
- Pull out the 9-pin RS485 terminal block connector, as shown below:

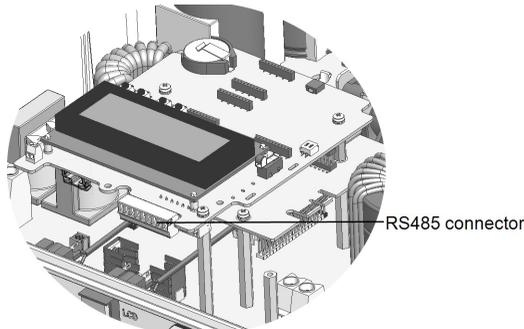


Figure 7: The RS485 terminal block in the inverter/SMI

7. Loosen the screws of pins B, A and G on the left of the RS-485 terminal block.
 - For inverter: RS485-1 pins (left-most)
 - For SMI: RS485-1 (recommended, as this is the default configuration), or RS485-2

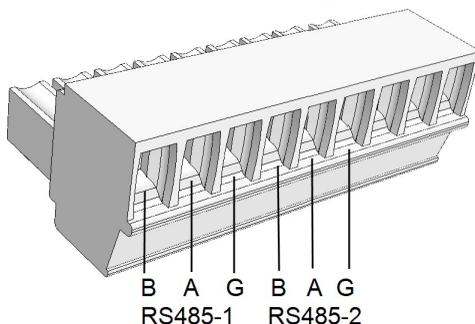


Figure 8: RS485 terminal block

8. Insert the wire ends into the G, A and B pins shown above. You can use any color wire for each of the A, B 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.
9. Connect all B, A and G pins in all inverters/SMI. The following figure illustrates this connection schema (the illustration applies to both inverters and SMI):

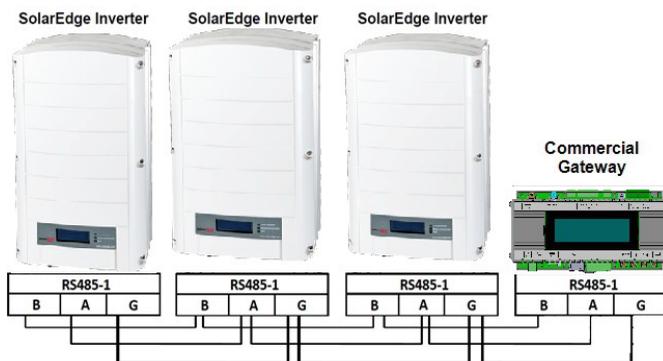


Figure 9: Connecting SolarEdge devices (inverters or SMI) in a chain

NOTE

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

For inverters - Do not insert wires into RS485-2 pins.

For SMI - Make sure you are using the same RS485 port (1/2) in all devices.

10. Tighten the terminal block screws.
11. Push the RS485 terminal block firmly all the way into the communication board.

12. Terminate the inverters/SMIs at the two ends of the chain by switching a termination DIP-switch inside the inverter/SMI to ON (move the switch to the top). The switch is located on the communication board and is marked **SW7**.

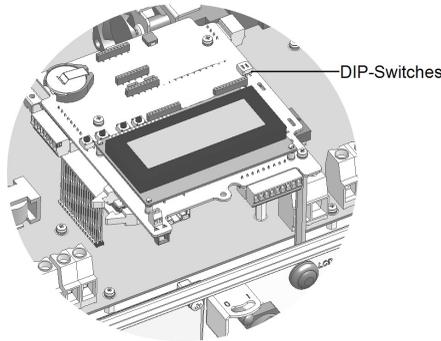


Figure 10: RS485 termination switch



NOTE
Only the first and last SolarEdge devices in the chain should be terminated. The other devices in the chain should have the termination switch OFF.

► **To configure the RS485 communication bus with SolarEdge inverters/SMI:**

By default, all SolarEdge devices are pre-configured as followers on the RS485-1 port. Followers can be further configured using the **RS485-X Conf** option in the Communication menu.

One device must be set as the leader on the RS485 bus. Any SolarEdge device may be the leader (Commercial Gateway, inverter, or SMI). If you connect the installation to the SolarEdge monitoring platform, the device used to connect to the server must be the leader.

The following describes how to configure the leader device.

1. Press the **Enter** button until the following message is displayed:

```
Please enter
Password
*****
```

2. Use the three-right most LCD buttons to type in the following password: **12312312**

The following menu is displayed:

```
Language <Eng>
Communication
Power Control
Display
Maintenance
Information
```

3. Short-press the arrow buttons to scroll to the Communication menu. Press the Enter button to select it.

4. Select **Server** → **RS485-X Conf** (X=1 or 2 depending on the specific physical port connection) to communicate with different external devices (SolarEdge inverters, revenue meters or non-SolarEdge loggers).
5. To configure the leader, select the following in the LCD menus:
 - **Communication** → **RS485-1 Conf** → **Device Type** → **SolarEdge**
 - **RS485-1 Conf** → **Protocol** → **Leader**
 - **RS485-1 Conf** → **Follower Detect**

The system starts automatic detection of the SolarEdge follower inverters connected to the leader Commercial Gateway. The Commercial Gateway should report the correct number of followers. If not, verify the connections and terminations. Verify that only one leader is configured on the bus.
6. Close the inverter/SMI cover and start power production.
7. Verify the connection of the Leader to the SolarEdge monitoring platform, as described below.

Verifying the Connection

1. After connection, a message similar to the following appears in the main status screen (see also *Initial Status* on page 31):

```

RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
  
```

2. Verify that **S_OK** appears, to indicate that the connection to the SolarEdge monitoring platform is successful. If **S_OK** is not displayed, refer to Troubleshooting Communication, below.

Troubleshooting the RS485 Communication

1. If **No Communication** is displayed on the SolarEdge Commercial Gateway, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the leader and that followers were detected, as described above.
2. If the message **Leader Not Found** appears, check the connections to the leader device and fix if required.
3. If after follower detection the number of followers displayed in the leader under **RS485-X Conf** → **Follower Detect** is smaller than the actual number of followers, use one of the following methods to identify missing followers and troubleshoot connectivity problems:
 - Use the **Long follower Detect** to retry connecting to followers
 - Analyze the **Follower List** to check for missing followers, and check their connection

Refer to https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf



RS485 Configuration Options

In all configurations, use the following RS485 port configuration menus:

RS485-X

```

Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Cluster SLV Detect
Long Slave Detect <#>
Slave List <#>
Multi-Inv. Set
  
```

Device Type:

```

SolarEdge <M>
Non-SE Logger <S>
Revenue Meter <M>
Multi Devices <M>
None
  
```

Protocol:

```

Slave
Master
  
```

Device ID:

```

Please Select
Device ID
1
  
```

- **Device Type** is used to select the specific port configuration. The following devices are supported:
 - **SolarEdge** (default for RS485-1): Used when connecting to SolarEdge devices, such as: inverters, SMIs or Commercial Gateways. By default, all SolarEdge devices are pre-configured as followers on the RS485-1 port.
 - **Revenue Meter**: Used when connecting to an external revenue grade meter, in order to read the meter data and send it to the monitoring platform. For a list of supported meters, refer to <http://www.solaredge.com/se-supported-devices>.
 - **Non-SE Logger**: Used when connecting to an external non-SolarEdge logger. The logger can read SolarEdge inverters data for Non-SolarEdge monitoring purposes.
 - **None**: No device (default for RS485-2)
- **Protocol**:
 - When selecting a SolarEdge device, the following protocols appear under the Protocol option:
 - Follower (default)
 - Leader
 - When selecting Device Type <Inv. Reader>, the Device Type <field> changes to Device Type <INV>
 - When selecting Device type <Non-SE Logger>, the Device Type <field> changes to Device Type <LGR> and the following protocol appears under the Protocol option: SunSpec (default)

- When selecting Device type <Revenue Meter>, the Device Type <field> changes to Device Type <MTR>

**NOTE**

For other supported protocols, refer to <http://www.solaredge.com/se-supported-devices>

- **Device ID:** The device ID is used to set the Commercial Gateway device ID (MODBUS ID) when connecting to an external leader device (for example, a non-SolarEdge logger), or to set the ID of the external device (for example, revenue meter).
- **Follower Detect:** Is used to initiate automatic detection of the follower devices connected to this leader device. The number next to the option is the number of devices that have been detected.

Chapter 3: Installing the Commercial Gateway

Important Information

**NOTE**

To be compliant with UK-PSTI, install the Commercial Gateway as a follower on the inverter. Do not connect the Commercial Gateway directly to the network.

Safety

**CAUTION!**

For North America only: The product's communication with external devices must not use wires that span more than one building, as per the UL 60950-2 standard.

Transport and Storage

Transport the SolarEdge gateway in its original packaging, without exposing it to unnecessary shocks. If the original package is no longer available, use a similar box, which can be closed fully.

Store the SolarEdge gateway in a dry place where ambient temperatures are -40°C (-40°F) to +60°C (140°F).

Package Contents

- Commercial Gateway
- 100-240VAC to 12VDC (50 Hz/60 Hz) power supply with an interchangeable AC plug (US, EU, AU)
- Accessory kit including:
 - o Three 3-pin terminal blocks
 - o One 7-pin terminal block
 - o One 6-pin terminal block

Installation Equipment

Standard tools can be used during the installation of the Commercial Gateway. The following is a recommendation of the equipment needed for installation:

- DIN rails
- Drill and 4mm diameter bits
- Three twisted wires or four-wire twisted pair cable
- For installing the communication options: CAT5/6 Ethernet cable

Installation Guidelines

The following requirements apply when locating and mounting the SolarEdge gateway:

- The gateway is suitable for mounting indoors only. For outdoor installation, use an external outdoor enclosure (not provided by SolarEdge)
- The gateway must always remain in an ambient temperature of -20°C (-4°F) to +60°C (140°F).
- The gateway power supply requires a socket outlet with a grid voltage of 100 V - 240 V (50/60Hz).
- Protect the gateway from dust, wet conditions, corrosive substances and vapors.
- Cable specifications:

Connection Type	Cable Type	Maximum Length
RS485 communication bus (per RS485 port)	Three twisted wires or 4-wire twisted pair cable (two twisted pairs). Recommended wire size: 20 AWG / 0.52 mm ²	1,000m (3,330 ft)
Ethernet	CAT5/6	100m (325 ft).
Sensor/control interface	Recommended wire size: 20 AWG / 0.52 mm ²	50m (165 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 recommend to use external surge protection devices. For details refer to: http://www.solaredge.com/files/pdfs/lightning_surge_protection.pdf. If grounded metal conduit are used for routing the communication wires, there is no need for a lightning protection device.



Installation Workflow

The following provides an overview of the workflow for installing and setting up the Commercial gateway:

- [Step 1 - Mounting the Commercial Gateway](#) page 20
- [Step 2 - Connecting the Commercial Gateway to the SolarEdge installation](#), page 11
- [Step 3 - Connecting environmental sensors \(optional\)](#), page 22
- [Step 4 - Configuring the Commercial Gateway and inverters/SMI](#), page 14
- [Step 5 - Using the control and communication gateway to connect the installation to the monitoring server \(optional\)](#), page 40

Mounting and Connecting the Commercial Gateway

The gateway can be installed on a wall or on a DIN rail.

► To mount the Commercial Gateway on a wall:

1. Determine the mounting location. Leave clearance from all sides of the gateway for cover opening, cable connection and routing.
2. Position the device on the wall, mark points through the mounting tabs and drill holes using a 4mm diameter drill bit.
3. Mount the unit using screw anchors and screws (use 3.5mm diameter screws, 20mm minimum length, not provided by SolarEdge).

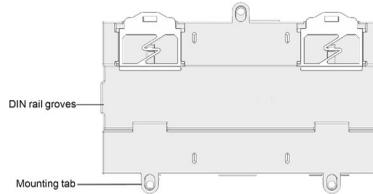


Figure 11: Commercial Gateway mounting tabs

► To mount the Commercial Gateway on a DIN rail:

1. Press the gateway upwards and snap it into the upper and lower edges of the DIN rail.

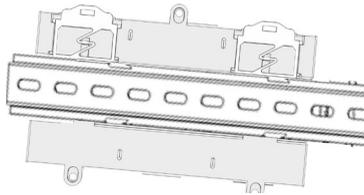


Figure 12: Commercial Gateway mounted on a DIN rail

Connecting the Commercial Gateway to AC

For connecting to power, use the supplied power supply:

1. Connect the power supply cable connector to the connector labeled **DC** on the Commercial Gateway (see *Figure 3*).
2. Connect the power supply to the AC mains. The LEDs are lit momentarily to indicate power connection (see *Figure 3*).



CAUTION!

If you use a non-SolarEdge power supply, check that it has 12Vdc/1A output ratings, and that it is certified to UL/CSA/IEC60950-1 2ed standards. Limited Power Source output, NEC class 2. Verify the power supply polarity as marked on the gateway.

Chapter 4: Connecting Environmental Sensors (Optional)

Overview

The Commercial Gateway supports up to three analog sensors. If you connect more sensors than supported by a single Commercial Gateway, use an additional Commercial Gateway:

- Two sensors with voltage output (V1, V2), each supports different voltage ranges
- One sensor with current output (I)

The following environmental sensor types are supported:

Sensor Type	Configurable Range	Unit
Temperature	-99.0 to +99.0	°C
	-146.20 to 210.20	°F
Irradiance	0 to 9999	W/m ²
Wind velocity	0 to 99	m/s
Wind direction	0 to 359	degrees
Pyranometer	-200 to 2000	W/m ²

You can view the sensor data in the Status window (see *Sensors Status* on page 35), and in the monitoring platform.

This chapter describes how to connect sensors to the Commercial Gateway and how to configure them.

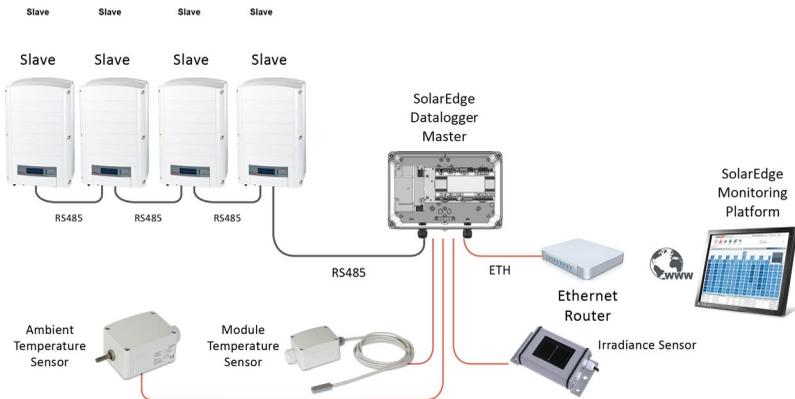


Figure 13: Example of sensor connection to the SolarEdge Commercial Gateway

Connecting Sensors to the Commercial Gateway

For connection of the irradiance and temperature sensors available from SolarEdge refer to *Sensor Connection Example* on page 28.

Sensors are directly connected to the Commercial Gateway via the sensor interface connector. Use the supplied 7-pin terminal block. *Figure 14* shows the location of the sensors connector on the Commercial Gateway.

Sensor Connector Pin #	Pin Name	Description
1	V1	Voltage sensor input number 1
2	GND	Ground (common for V1, V2 and ground)
3	V2	Voltage sensor input number 2
4	I-	Current sensor input – negative
5	I+	Current sensor input – positive
6	GND	Ground (common for V1, V2 and ground)
7	12V	12VDC output voltage supply to the sensors. (limited to 800mA)

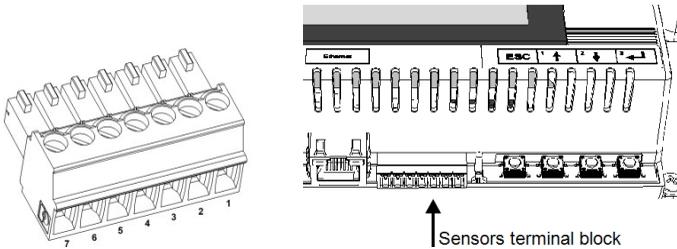


Figure 14: Sensor Interface Inputs

▶ To connect a voltage sensor:

Use a 3-wire cable for this connection. Recommended wire size is 0.52mm²/ 20 AWG with maximum length of 50m/164 ft.

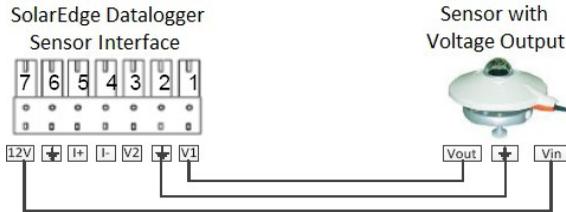
1. Connect a voltage source sensor to either V1 or V2, depending on its operating voltage range. Voltage sensor inputs support the following user selectable ranges:
 - V1: 0–2 Vdc or 0–30 mVdc.
 - V2: 0–10 Vdc or 0–2 Vdc .

2. Depending on the sensor range, connect the sensor between V1 (pin1) and GND (pin 2), or between V2 (pin 3) and GND (pin 2).

The GND (pin 2) serves as a common ground for both V1 and V2.

The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

For an example of sensor connection, refer to *Sensor Connection Example* on page 28



CAUTION!

Excessive voltage on the sensor input can damage the SolarEdge Commercial Gateway. Refer to input ranges specified in the *Technical Specifications* on page 51.

Une tension excessive à l'entrée du senseur peut endommager le Data Logger de SolarEdge. Referrez vous aux plages d'entrée spécifiées dans la fiche technique.

► To connect a current sensor:

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm²/20 AWG with maximum length of 50m/164 ft.

Connect a current source sensor to either I+ or I-, depending on its operating range:

- For positive current:
 - o I+ (pin 5) - connect to the current output (Iout) of the sensor.
 - o I- (pin 4) - connect to ground.
 - o GND (pin 6) - connect to the ground connection terminal of the sensor.
 - o The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

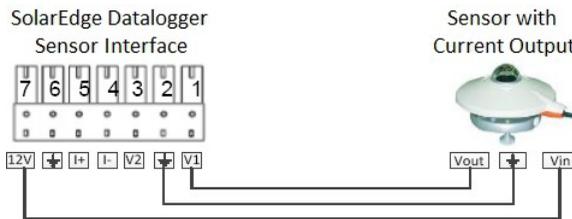


Figure 15: Current sensor (4-20mA) positive connection

- For Negative current:
 - o I- (pin 4) - connect to the current output (Iout) of the sensor.
 - o I+ (pin 5) - connect to ground.
 - o GND (pin 6) - connect to the ground connection terminal of the sensor.
 - o The 12V (pin7) can be used as the supply voltage to the sensor. Optionally, an external power supply can be connected to the sensors if a different input voltage to the sensor is required.

**CAUTION!**

Excessive current on the sensor input can damage the SolarEdge Commercial Gateway. Refer to input ranges specified in the *Technical Specifications* on page 51.

Un courant excessif à l'entrée du senseur peut endommager le Data Logger de SolarEdge. Referrez vous aux plages d'entrée spécifiées dans la fiche technique.

Configuring Environmental Sensors

Menus

The SolarEdge Commercial Gateway sensor interface is disabled by default. The following shows a hierarchical tree of the Sensors menu options:

Sensors

```
V 1 S e n s o r < D i s >
V 2 S e n s o r < D i s >
I   S e n s o r < D i s >
```

Set V1/V2/I Sensor (example for V1 sensor)

```
S e n s o r   < E n >
R a n g e   < 0 - 2 V >
T y p e   < - - - >
T w o   P o i n t s
```

Range

```
0   -   2   V
0   -   3 0 m V
```

Sensor Type

```
T e m p .   A m b i e n t
T e m p .   M o d u l e
W i n d   S p e e d
W i n d   D i r e c t i o n
I r r a d i a n c e   G l o b a l
I r r a d i a n c e   D i r e c t
I r r a d i a n c e   D i f f .
I r r a d i a n c e   P O A
```

Two Points setting

```
P 0   < 0 . 0 , 0 . 0 >
P 1   < 1 . 0 0 0 , 1 . 0 0 0 >
```

Set Point

```
S e t   P o i n t
( V ,   d e g C )
0 . 0 , 0 . 0
```

- Sensors:
 - o **V1 Sensor** and **V2 sensor**- sensors with voltage output, enabled or disabled
 - o **I Sensor** – a sensor with current output, enabled or disabled

- Range:
 - o **V1** –select a range between 0–2 Vdc or 0–30 mVdc.
 - o **V2** –select a range between 0–10 Vdc or 0–2 Vdc.I –select a range between 0–20 mA
- **Sensor Type:** One of the following sensors:

Sensor Type	Description	Unit
Temp. Ambient	Ambient temperature sensor measurement	°C, °F
Temp. Module	Module temperature sensor measurement	
Wind Speed	Wind speed sensor measurement	m/s
Wind Direction	Wind direction sensor measurement	degrees
Irradiance Global	Global horizontal irradiance	W/m2
Irradiance Direct	Direct irradiance	
Irradiance Diff.	Diffused irradiance	
Irradiance POA	Plane of Array (POA) irradiance	



NOTE
 The temperature units are configured in °C by default and can be changed to °F under the **Temperature** submenu located under the **Display** menu.

- **Two Points setting:** P0 and P1 represent points on the sensor graph to be configured in the Commercial Gateway. The values refer to the measurement signal and the measurement range from the sensor datasheet. Refer to the example below.
- **Set point:** Enables entering two measurement signal values (voltage, current or temperature).

Configuring the Sensors in the Commercial Gateway

► To enable the sensors in the Commercial Gateway:

1. Press the Enter button until the following message is displayed:

```

Please enter
Password
*****
    
```

The Commercial Gateway is now in Setup mode and all its LEDs are lit.

2. Use the three-right most LCD buttons to type in the following password: 12312312. The following menu is displayed:

```

Language <Eng>
Communication
Power Control
Display
Maintenance
Information
    
```

3. Under the main menu, select **Sensors**.

4. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>
Range <0-2V>
Type <--->
Two Points
```

► To configure sensors in the Commercial Gateway:



NOTE

When using sensors provided by SolarEdge, enabling the sensors as described above automatically sets their configuration (available from SolarEdge Commercial Gateway CPU version 2.07xx). If the CPU version is lower, configure the sensors as described below.

Configure the working range of the sensor that covers the sensor specification. Refer to the table on page 21.

1. Select **Range** under the specific configured sensor and then select the applicable range:
 - V1—select a range between 0–2 Vdc or 0–30 mVdc.
 - V2—select a range between 0–10 Vdc or 0–2 Vdc.
 - I—select a range between 0–20 mA.

A screen similar to the following is displayed, depending on the selected sensor:

```
0-2V
0-30mV
```

2. Select the **Type** of the connected sensor from the following:

```
Temp. Ambient
Temp. Module
Wind Speed
Wind Direction
Irradiance Global
Irradiance Direct
Irradiance Diff.
Irradiance POA
```

3. Select Two Points to configure two points on the sensor graph using the measurement signal and measurement range data from the sensor datasheet.

```
P0 <0.0, 0.0>
P1 <1.000, 1.000>
```

4. Set the point values as follows:
 - Use the **Up** and **Down** buttons to adjust the value.
 - Press the **Enter** button to move to a character.
 - Long press the **Enter** button (until **Applied** message appears) – apply the value
 - Long press the **Esc** button (until **Aborted** message appears) – erase all characters

```
Set Point
(V, DegC)
10, 70
```

5. If required, repeat steps 1 through 4 above to configure additional sensors.

- Check that the Sensors status screen on the LCD displays a screen similar to below, and verify that the sensor's readings are within the range that appears in its datasheet. Refer to *Sensors Status* on page 35.

```
Sensors
1 : XXX . XXX Deg C
V2 : XXX . XXX W / m2
I : Disabled
```

Example of Sensor Graph Configuration

The following is an example of setting a temperature sensor with the following specifications:

- Measurement signal: 0..10V
- Measurement range: -10...+70°C

The following graph shows the min. and max. values, and the focused (linear) area.

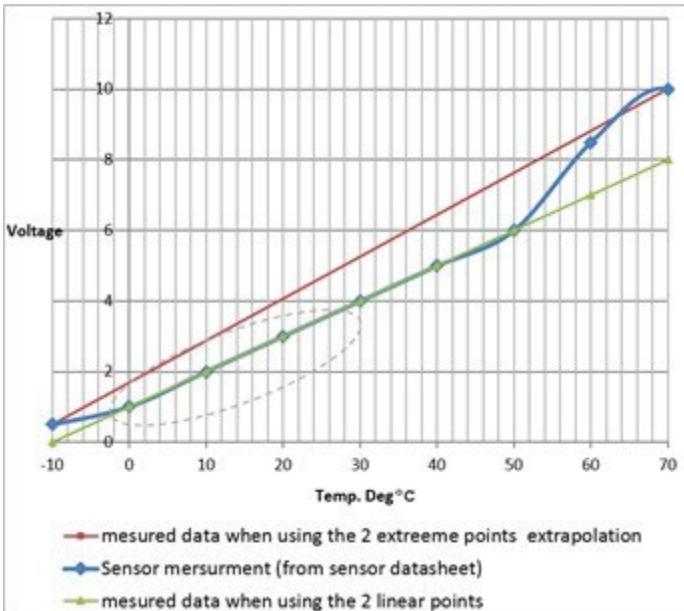


Figure 16: Example of sensor graph

If you want to include the full range of the sensor, the points for setting are the minimum and maximum values from the sensor datasheet:

```
P0 < 0 , - 1 0 >
P1 < 1 0 , 7 0 >
```

However, if you want to include a partial range, set any value for the two points, as long as the points are within the SolarEdge Commercial Gateway selected range. The SolarEdge Commercial Gateway then extrapolates the sensor linear graph based on these two points.

```
P0 < 1 , 0 >
P1 < 5 , 5 0 >
```

Sensor Connection Example

This section describes how to connect three of the sensors available from SolarEdge to the Commercial Gateway. For their full specifications refer to

http://www.solaredge.com/files/pdfs/products/inverters/se_sensor_datasheet.pdf (for other recommended sensors and suppliers refer to http://www.solaredge.com/articles/se-supported-devices#environmental_sensors).

- Ambient temperature sensor - a voltage output sensor, measuring the ambient temperature. Electrical output: 0..10V.
- Module temperature sensor - a current output sensor, measuring the module surface temperature. Electrical output: 4..20 mA.
- Solar irradiance sensor - a voltage output sensor, measuring the solar irradiance. Electrical output: 0-1.4 VDC.

An external 24VDC/1A power supply is required for connecting the temperature sensors. A single PSU can be used for both sensors.

Use a 3-wire cable for this connection. Recommended wire size is 0.52 mm² / 20 AWG with maximum length of 50m/164 ft.

The following diagram illustrates the connections of the above devices to the SolarEdge Commercial Gateway:

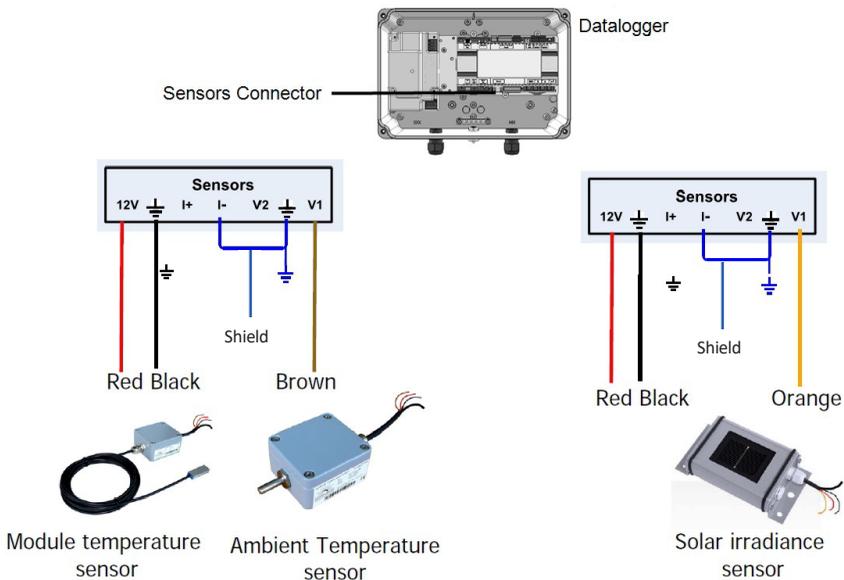


Figure 17: Sensors connection diagram

▶ **To connect an ambient or module temperature sensor to the power supply and to the Commercial Gateway:**

The same power supply can be used for both sensors.

1. Use a flat screwdriver to open the sensor cover screws and remove the cover.
2. Insert the cable through the supplied gland and rubber seal, and into the sensor opening..
3. Connect I- to ground.
4. Connect the power supply to an AC source using the , N, L connection points at the bottom of the power supply.

▶ **To connect a solar irradiance sensor to the Commercial Gateway:**

1. Connect the thin wires to the Commercial Gateway sensors connector as follows (see *Figure 18*):
 - Orange - to V1
 - Black - to Ground
 - Red - to 12V
 - Shield - to Ground

Sensors Terminal Connector

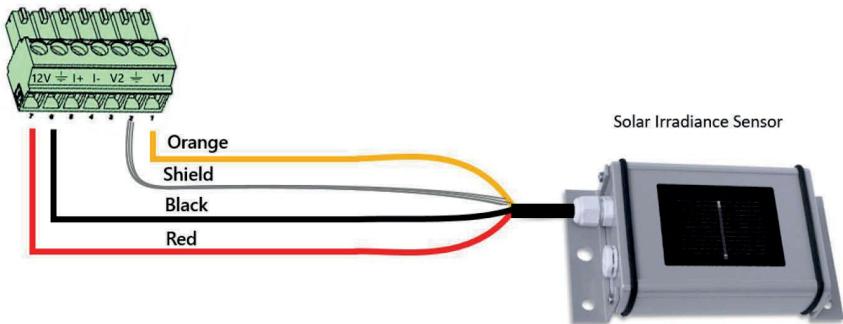


Figure 18: Solar irradiance sensor connection



NOTE

When configuring this sensor in the Commercial Gateway, the type should be **Irradiance Direct**

▶ **To enable the sensors in the Commercial Gateway:**

1. Enter Setup mode, as described in sensors configuration above.
2. Under the main menu, select **Sensors**.

3. Select the preferred sensor submenu (**V1**, **V2** or **I**), and select **Enable**.

```
Sensor <En>  
Range <0-2V>  
Type <- - - >  
Two Points
```

If the CPU version of the SolarEdge Commercial Gateway is 2.07xx and higher, the sensors are automatically configured. If the CPU version is lower, configure the sensors as described in: *To configure sensors in the Commercial Gateway*: on page 26

Chapter 5: LCD – Status Screens and Setup Options

This chapter describes the LCD display of the SolarEdge Commercial Gateway. The LCD screen displays status information of the Commercial Gateway and various menus for configuration.

Status Screens - Operational Mode

During normal operation pressing the **Enter** button turns on the LCD backlight. The backlight is active for 30 seconds by default. This duration is configurable, as described in *Display* on page 38.

Additional presses display the following screens one after the other.

Initial Status

```
RRCR: Disabled
Sensors: Disabled
Server: LAN <S_OK>
Total # of Slaves: --
```

- **RRCR**: If enabled, indicates the active power set by the power control interface, in percent of peak power.
- **Sensors**: Enable/disable status of Sensors' input reading
- **Server**: Server communication method
- **Total # of Followers**: Indicates the total number of follower devices communicating with the SolarEdge Commercial Gateway

Energy Meter Status

If a meter is connected to the inverter, the following status screen, showing the power and energy readings, is displayed in addition to the above screen.

If the meter is set to Export +Import, there are two status screens, with the first line displaying: "Export Meter" or "Import Meter". The following is an example of an export meter status:

```
Export Meter
Status: <OK/Error#>
Power [ W ] : xxxxx.x
Energy [ Wh ] : XXXXX.X
```

- **Status**: Displays OK if the meter is communicating with the communication board.
- **<Error message>**: If there is a meter error, it is displayed in this line.
- **Power (W)**: Depending on the meter type connected to the inverter, this line displays the exported or imported power in Watts.
- **Energy (Wh)**: The total energy read by the meter, in Watt/hour. The value displayed in this line depends on the meter type connected to the inverter and its location:
 - o If a bidirectional meter is connected at the consumption point, this value is the consumed energy.
 - o If the meter is installed at the production connection point, this value is the energy produced by the site.
 - o If the meter is installed at the grid connection point, this value is the energy exported to the grid.

If the inverter is connected to the SolarEdge server, this value will also be displayed in the monitoring platform.



NOTE

This data is accumulated according to an internal real-time clock.

ID Status

This screen displays the ID of the Commercial Gateway and the software version.

```
ID: ##### ##
DSP1: 1.0210
CPU: 0003.19xx
Country: ESP
```

Server Communication Status

```
Server: LAN<S_OK>
Status: <OK>
xxxxxxx
<ERROR MESSAGE>
```



NOTE

If the connection method is CDMA (referred to as "Cellular" in the status screens) or GSM, the server screen is replaced with the Cellular or GSM status screens (see *Status Screens - Operational Mode* on page 31 and *GSM Status* on page 33).

- **Server:** The method of connection to the SolarEdge monitoring platform.
- **S_OK:** The connection to the SolarEdge monitoring platform is successful (should appear only if the inverter is connected to the server).
- **Status:** Displays OK if the Commercial Gateway established successful connection and communication with the specified server port/device (LAN, RS485, Wi-Fi or ZigBee Plug-in).
- **xxxxxxx:** Eight-bit Ethernet communication connection status: A string of 1s and 0s is displayed. 1 indicates OK, 0 indicates an error. For a list of possible errors and how to troubleshoot them, refer to on page 49.
- **Error message,** according to failure. Refer to <http://www.solaredge.com/sites/default/files/se-inverter-installation-guide-error-codes.pdf>.



IP Status

This screen describes the Ethernet configuration: IP, Mask, TCP Gateway and MAC address (Media Access Control) of the Commercial Gateway.

```
IP 192.168.2.119
MSK 255.255.255.0
GW 192.168.2.1
MAC 0-27-02-00-39-36
```

ZigBee Status

This screen describes the ZigBee configuration:

```
PAN : XXXXX
CH : XX / XXXX RSSI : <L>
MID : XXXX XX
ZigBee Ready
```

- **RSSI:** The receive signal strength indication of the closest ZigBee in the system. L = low, M = medium, H = high and (-) = no signal.
- **PAN ID:** The ZigBee transceiver PAN ID (Personal Area Network Identification), the ID uniquely represents a device in a Zigbee network.
- **Ch.:** The ZigBee transceiver channel
- **ID:** The ZigBee transceiver ID
- **MID:** The Leader ID of the coordinator (leader) ZigBee Plug-in. This field is shown only in devices with router (follower) ZigBee cards, and after a successful ZigBee association. If a ZigBee Plug-in is not connected, a **No ZigBee** message is displayed instead of the **MID** field.
- **ZigBee Ready:** This field is shown only in devices with ZigBee router transceivers (followers), in a multi- point (MP) protocol configuration. If a ZigBee transceiver is not physically connected, a **No ZigBee** message is displayed.

Wi-Fi Status

This screen describes the Wi-Fi configuration:

```
IP : 192.168.2.119
GW : 192.168.2.1
SSID : xxxxxxxx
RSSI : <L/M/H/->
```

- **IP:** The DHCP provided address
- **GW:** The gateway IP address
- **SSID:** Service Set Identifier - the name of a wireless local area network (WLAN). All wireless devices on a WLAN must employ the same SSID in order to communicate with each other.
- **RSSI:** The receive signal strength indication of the closest Wi-Fi in the SolarEdge system. L = low, M = medium, H = high and - = no signal.

GSM Status

If a GSM Plug-in is connected, this screen replaces the Server status screen:

```
Server : Cell <S_OK>
Status : <OK>
MNO : <xxxxxxx> Sig : 5
<Error message>
```

- **Server:** The method of communication to the SolarEdge monitoring platform. Should display **Cell**.
- **Status:** Displays OK if the inverter established a successful physical connection to the modem.
- **S_OK:** The last communication to the SolarEdge monitoring platform was successful (appears if the inverter is connected to the platform). If S_OK is not displayed, refer to *Status Screens - Operational Mode* on page 31.
- **MNO:** The mobile network operator name
- **Sig:** The signal strength, received from the modem. A value between 0-5, (0 = no signal; 5 = excellent signal)
- **Error message:** per communication connection status failure

Communication Ports Status

This screen presents the communication port (RS485-1/2 or ZigBee), and the devices connected to them, with details about the number, type, and protocol.

```

      D e v P r o t   # #
R S 4 8 5 - 1 < S E > < S > < - - >
R S 4 8 5 - 2 < S E > < S > < - - >
Z i g B e e   < S E > < M P S > < - - >
    
```

- **##:** The total number of followers detected on the specific port
- **Dev:** The type of device that was configured to a specific port (based on the port’s functionality), as follows:
 - o **SE:** SolarEdge device (default)
 - o **LGR:** Non-SolarEdge logger
 - o **MLT:** Multiple devices, such as meters and batteries
 - o **HA:** Home automation devices (for Smart Energy)
- **PROT:** The protocol type to which the port is set:
 - o For a SolarEdge device:

RS485 protocol	ZigBee protocol
S: SolarEdge follower	
M: SolarEdge leader	
	P2P: ZigBee point-to-point
	MPM: ZigBee multipoint leader (for the SolarEdge ZigBee home gateway or for load management by the inverter)
	MPS: ZigBee multipoint follower (for a ZigBee router card)

- o For electricity meters, refer to the *application note - Connecting an Electricity Meter to SolarEdge Devices* at <http://www.solaredge.com/files/pdfs/solaredge-meter-installation-guide.pdf>.
- o **SS:** SunSpec - for a non-SolarEdge logger (monitoring and control)



Smart Energy Management Status

This screen is displayed only when Smart Energy Management is enabled. The screen shows energy details of the site:

```

S i t e   L i m i t :      7 . 0 k W
S i t e   P r o d :      1 0 . 0 k W
S i t e   E x p o r t :   4 . 0 k W
S e l f - c o n s u m e : 6 . 0 k W
    
```

- **Site Limit:** The limit that was defined for the site
- **Site Prod:** The power produced by the site
- **Site Export:** The power that is fed into the grid
- **Self-consume:** The PV power consumed by the site

For more information, refer to the *Export Limitation Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/products/feed-in_limitation_application_note.pdf.



Sensors Status

This screen displays the status of up to three different sensors connected to the Commercial Gateway.

```
Sensors
1 : XXX . XXX  Deg C
V2 : XXX . XXX  W / m2
I  : Disabled
```

- **V1:** Displays the real time reading of the sensor connected to V1 sensor input
- **V2:** Displays the real time reading of the sensor connected to V2 sensor input
- **I:** Displays the real time reading of the sensor connected to I sensor input

The reading is displayed according to the relevant sensor that was configured on the specific sensor input:

- Temperature sensor - the degrees reading in Celsius or Fahrenheit
- Irradiance reading - in W/m2
- Wind speed, in m/s
- Wind direction, in Deg

Configuration Menu Options

This section describes basic Commercial Gateway configuration options.

▶ To enter Setup mode:

1. Verify that the SolarEdge Commercial Gateway is connected to a power outlet.
2. Press the Enter button until the following message is displayed:

```
Please enter
Password
*****
```

The Commercial Gateway is now in Setup mode and all its LEDs are lit. The Commercial Gateway automatically exits Setup mode if no buttons are pressed for more than 2 minutes.

3. Use the three-right-most LCD buttons to type in the following password: **12312312**. The following message is displayed:

```
Language <Eng>
Communication
Power Control
Display
Maintenance
Information
```

Language

1. Select the **Language** option to set the language in which the LCD should display.
2. Confirm your language selection in the confirmation screen: Toggle to **YES** and press **Enter**.

Communication

1. Select the **Communication** option to define and configure:
 - The communication option used by the Commercial Gateway to communicate with the SolarEdge monitoring platform
 - The communication option used to communicate between multiple SolarEdge devices or other external non-SolarEdge devices, such as electricity meters or loggers.



NOTE

The Server menu shows only the communication options installed in the Commercial Gateway.

The following shows a hierarchical tree of the menu options in the **Communication** menu.

For detailed information about all the configuration options, refer to the *Communication Options Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/solaredge-communication_options_application_note_v2_250_and_above.pdf.



Communication^{1,2}:

```
Server <LAN >
LAN Conf
RS485-1 Conf <S >
RS485-2 Conf <S >
ZigBee Conf <S >
Wi-Fi Conf <N/A >
Cellular Conf
Slave Detect
```

Server:

```
LAN
RS485
Zigbee
Wi-Fi
Cellular
None
```

LAN Conf:

```
IP Config
Set DHCP <en >
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP <Dis >
```

¹If ZigBee is connected, the Wi-Fi Conf menu is not displayed. If ZigBee is not connected, ZigBee Conf and Wi-Fi Conf are both displayed with <N/A> and their menus are not accessible.

²When using the SolarEdge GSM products, RS232 Conf menu is unavailable.

RS485-X Conf:

```

Device Type <SE>
Protocol <M>
Device ID <1>
Slave Detect <#>
Cluster SLV Detect
Long Slave Detect <#>
Slave List <#>
Multi-Inv. Set

```

ZigBee Conf. (enabled only if the ZigBee internal card is connected):

```

Device Type<SE>
Protocol<MPS>
Device ID<1>
PAN ID
Scan Channel
Load ZB Defaults

```

Wi-Fi Conf (enabled only if the internal card is connected):

```

Scan Networks
Set key
Load Defaults

```

RS232 Conf1:

```

Device Type<SE>
Protocol<GSM>
Set APN
Set Modem Type
Set User Name
Set Password

```

GPIO Conf:

```

Device Type <RRCR>

```

Power Control

```

RRCR Conf.
Load Defaults

```

Power control options are detailed in the *Power Control Application Note*, available on the SolarEdge website at http://www.solaredge.com/files/pdfs/application_note_power_control_configuration.pdf.



¹When using the SolarEdge GSM products this menu is unavailable.

Sensors

Select **Sensors** to set the following options:

```
V 1 S e n s o r < D i s >
V 2 S e n s o r < D i s >
I   S e n s o r < D i s >
```

The SolarEdge Commercial Gateway sensor interface supports up to three analog sensors:

- **V1, V2:** Voltage sensors
- **I:** Current sensors

For detailed information about all the configuration options for sensors, refer to *Connecting Environmental Sensors (Optional)* on page 21.

Display

Select **Display** to set the following:

```
L C D   O n   T i m e   < 3 0 >
```

- **Temperature:** Select Celsius or Fahrenheit units.
- **LCD On Time <30>:** The number of seconds that the LCD backlight is ON after pressing the LCD light button. Set a value within the range of 10-120 seconds.
- **TLM On Time <15>:** The number of minutes that the LCD backlight is ON while viewing the Telemetry window. Set a value within the range of 1-120 minutes.

Maintenance

Select **Maintenance** to set the following options:

```
D a t e   a n d   T i m e
F a c t o r y   R e s e t
F W   U p g r a d e
```

- **Date and Time:** Set the internal real-time clock. If connected to the SolarEdge monitoring platform, the date and time are set automatically and only time zone should be set.
- **Factory Reset:** Performs a general reset to the default device settings.
- **FW Upgrade:** Perform a software upgrade by using an SD card. Refer to [upgrading an inverter using micro sd card.pdf](#).



Information

Select **Information** to display the following options:

```
V e r s i o n s
E r r o r   L o g
W a r n i n g   l o g
H a r d w a r e   I D s
```

- **Versions:** Displays firmware versions:
 - o **ID:** The ID.
 - o **DSP 1:** The DSP digital control board firmware version
 - o **CPU:** The communication board firmware version

**NOTE**

Please have these numbers ready when you contact SolarEdge Support.

- **Error Log:** Displays the last five errors.
- **Warning Log:** Displays the last five warnings.
- **Hardware IDs:** Displays the following HW serial numbers (if exist, and connected to the inverter):
 - **ID:** the inverter's ID
 - **RGM1** (Revenue Grade Meter): Energy Meter with Modbus Connection
 - **RGM2:** A second external Energy Meter with Modbus Connection
 - **ZB:** ZigBee MAC address
 - **Cell:** MEID (CDMA) or IMEI (GSM)
 - **WiFi:** Wi-Fi MAC address

Chapter 6: Setting Up Monitoring through the Commercial Gateway (Optional)

Communication Dataflow

The SolarEdge site information can be accessed remotely using the SolarEdge monitoring platform. In order to transfer monitoring data from a SolarEdge site to the SolarEdge monitoring platform, a communications connection must be established. Communications are not required for power harvesting - they are required only when using the monitoring platform.

Any SolarEdge device can serve as the connection point. This chapter describes how to set up this connection with the Commercial Gateway serving as the connection point to the monitoring platform. The Commercial Gateway should be the leader on an RS485 bus.

Communication Options

The following types of communication can be used to transfer the monitored information from the inverter to the monitoring platform through the Commercial Gateway.

Only communication products offered by SolarEdge are supported.

Always connect the communication options when the relevant devices are powered down - Commercial Gateway, inverter, etc.

Ethernet

Ethernet is used for a LAN connection. For connection instructions refer to *Creating an Ethernet (LAN) Connection* on page 42.

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.

- RS485-1: Enables the connection of multiple devices (inverters/Commercial Gateway) over the same bus, such that connecting only one device to the Internet is sufficient to provide communication services for all the devices on the bus.
- RS485-2: Enables connection of non-SolarEdge devices.
- RS485 Plug-in: The RS485 Plug-in provides an additional RS485 port for the Commercial Gateway for enhanced communications. The kit contains a module, which is installed on the communication board, and has a 3-pin RS485 terminal block. This kit is provided with an installation guide, which should be reviewed prior to connection see, https://www.solaredge.com/sites/default/files/RS485_expansion_kit_installation_guide.pdf



For connection instructions refer to *Creating an RS485 Bus Connection* on page 11.

ZigBee

This option enables wireless connection to one or several Smart Energy products, which automatically divert PV energy to home appliances.

This option enables wireless connection, and requires a ZigBee Plug-in and an external antenna. ZigBee connection is used for:

- *Monitoring* - connection of one or several devices to a SolarEdge ZigBee Gateway, for wireless communication to the SolarEdge monitoring platform.

The ZigBee Gateway is provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-zigbee-home-gateway-installation-guide.pdf>.

To mount the ZigBee Plug-in in the Commercial Gateway, see "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46

- *Smart Energy Management* - wireless connection to one or several Smart Energy products, which automatically divert PV energy to home appliances.

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#/.](https://www.solaredge.com/products/device-control#/)

The ZigBee Plug-in for Smart Energy is are provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-device-control-zigbee-module-installation-guide.pdf>

To mount the ZigBee Plug-in in the Commercial Gateway, see "Mounting the ZigBee Plug-in in the Commercial Gateway" on page 46.



Wi-Fi

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

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

The Wi-Fi option requires a Wi-Fi Plug-in and an external antenna, available from SolarEdge in a kit, which can be purchased separately and assembled during system installation. The Wi-Fi Plug-in kit is provided with a user manual, which should be reviewed prior to connection. Refer to http://www.solaredge.com/sites/default/files/se_wifi_communication_solution_installation_guide.pdf



Cellular

This wireless communication option (purchased separately) enables using a cellular connection to connect one or several devices (depending on the data plan used) to the monitoring platform.

The GSM Plug-in is provided with a user manual, which should be reviewed prior to connection. Refer to https://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf



Creating an Ethernet (LAN) Connection

Overview

This communication option enables using an Ethernet connection to connect the SolarEdge Commercial Gateway to the monitoring platform through a LAN. The SolarEdge Commercial Gateway has an RJ45 connector for Ethernet communication.

You can connect more than one SolarEdge Commercial Gateway to the same switch/router or to different switches/routers, as required. Each Commercial Gateway sends its monitored data independently to the SolarEdge monitoring platform.

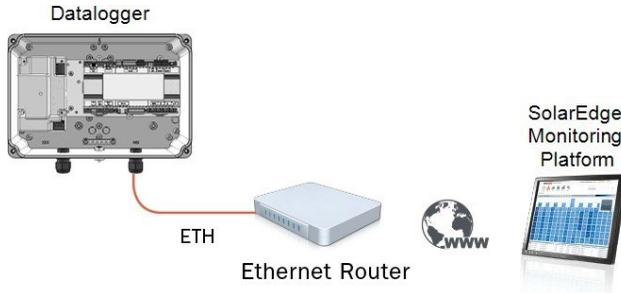


Figure 19: Example of Ethernet connection

Ethernet Communication Configuration Options

The following is a description of the options to configure the Ethernet (LAN) port settings.

Communication:

```
Server<LAN>
LAN Conf
RS485-1 Conf<S>
RS485-2 Conf<S>
ZigBee Conf<S>
Wi-Fi Conf<N/A>
Cellular Conf
Slave Detect
```

LAN Conf:

```
IP Config
Set DHCP <en>
Set IP
Set Mask
Set Gateway
Set DNS
Set Server Addr
Set Server Port
Modbus TCP<Dis>
```

- **IP Config:** Displays the current IP configuration of the Commercial Gateway, as shown below. If DHCP is used, this screen reflects the parameters retrieved from the DHCP server. If manual settings are used, the screen shows the last manually input configurations.

```
IP 0.0.0.0
MSK 255.255.255.0
GW 192.168.0.1
DNS 0.0.0.0
```

- **Set DHCP <En>:** If the LAN connection between the Commercial Gateway and the SolarEdge Monitoring Platform has a DHCP server, enable this option by setting it to Enable (default). If this option is enabled, then the DHCP server automatically configures the IP, Subnet Mask, default gateway and DNS. If not, set them manually.
- **Set IP:** Enables setting the IP of the default gateway according to the LAN settings:
 - o Use the **Up** and **Down** buttons to adjust the value of each IP address octet.
 - o Press the **Enter** button to move to the next IP address octet.
 - o Long press the **Enter** button (until **Applied** message appears) – apply the value
 - o Long press the **Esc** button (until **Aborted** message appears) – erase all characters

```
Setup IP
192.168.2.7
```

- **Set Mask:** Set the subnet mask of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set Gateway:** Set the default gateway address of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set DNS:** Set the DNS of the SolarEdge Commercial Gateway according to the LAN settings.
- **Set Server Addr:** Set the IP address of the SolarEdge monitoring platform. This option is predefined in the SolarEdge Commercial Gateway to specify the SolarEdge monitoring platform IP address and does not normally need configuration.
- **Set Server Port:** Set the port through which to connect to the SolarEdge monitoring platform. This option is predefined in the Commercial Gateway to specify the SolarEdge monitoring platform IP port and normally does not need configuration.

NOTE

If your LAN has a firewall, you must verify that the address and port configured in the **Set Server Addr** and the **Set Server Port** fields are not blocked. You may need to configure it to enable the connection to the following address:

Destination Address: prod.solaredge.com

Port: 443



Connecting and Configuring LAN

► **To connect the Ethernet cable to the router/switch:**

1. Use a pre-crimped cable or use a crimper to prepare an RJ45 communication connector on both ends of a standard CAT5/6 cable: Insert the eight wires into the RJ45 connector.

CAT5/6 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.

RJ45 Pin #	Wire Color		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-
7	White/Brown	White/Brown	Reserved
8	Brown	Brown	Reserved

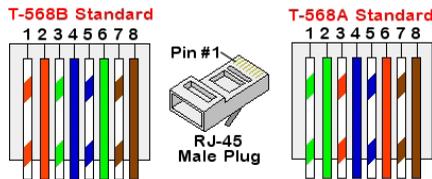


Figure 20: Standard cable wiring

2. Connect one end of the Ethernet cable to the RJ45 plug at the router or Ethernet gateway that is connected to the Internet.
3. Thread the other end through a gland and connect to the Commercial Gateway Ethernet connector.
4. Verify that the yellow communication LED turns ON.

► **To configure Ethernet communication to the SolarEdge monitoring platform:**

Define the device connected to the monitoring platform as the leader device.

The server communication method is configured by default to **LAN with DHCP enabled**.

If a different setting is required, follow the steps below:

1. Enter Setup mode, as described in: *To enter Setup mode:* on page 35.
2. Set the Commercial Gateway as the leader of the RS485 bus and perform follower detection as described in ". *Creating an RS485 Bus Connection* on page 11

3. To configure the LAN to Static IP select the following in the LCD menus on the Commercial Gateway:
 - Communication → Server → LAN
 - LAN Conf → Set DHCP → <Dis>
4. Set the IP, subnet mask, gateway DNS, server address, and server port as necessary using the LCD User buttons. Refer to the *Ethernet Communication Configuration Options* on page 42.
5. Verify the that the status field in the Server Communication Status window displays S_OK:

```
S e r v e r : L A N < S _ O K >  
S t a t u s :           < O K >  
      x x x x x x x x  
< E R R O R   M E S S A G E >
```

6. Exit the Setup mode.

Appendix A: Mounting the ZigBee Plug-in in the Commercial Gateway



NOTE

The ZigBee Plug-in should be purchased separately.

1. Turn the inverter Safety Switch (if applicable) to OFF.
2. Turn the inverter ON/OFF switch to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel. Wait 5 minutes for the capacitors to discharge.
4. Open the Commercial Gateway cover.
5. Unscrew the nut and washer on the ZigBee Plug-in.
6. Connect the ZigBee Plug-in in a Commercial Gateway board as shown below, and ensure that:
 - the antenna connector at the end of the ZigBee Plug-in goes through the bracket.
 - all pins are correctly positioned in the Commercial Gateway socket and no pins are left out of their socket.
 - the card is firmly in place.

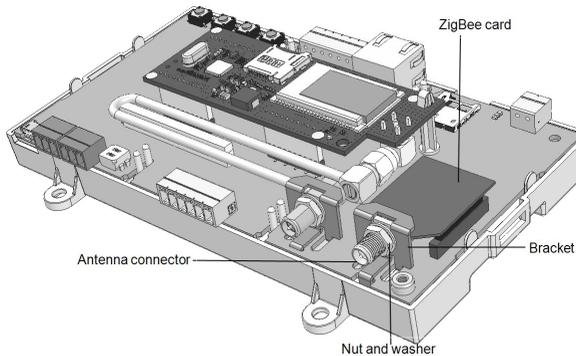


Figure 21: ZigBee Plug-in on a Commercial Gateway board

3. Screw in the nut and washer on the ZigBee Plug-in
4. Connect the antenna.
5. Replace the Commercial Gateway cover.

Appendix B: Inserting the GSM Modem in the Commercial Gateway



NOTE

The GSM modem should be purchased separately.

▶ To turn off the inverter, disconnect the AC and insert a SIM card:

1. Turn the inverter Safety Switch (if applicable) to OFF.
2. Turn the inverter ON/OFF switch to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel. Wait 5 minutes for the capacitors to discharge.
4. Open the Commercial Gateway cover.
5. If there is no SIM card installed in the modem, insert one into the slot on the GSM modem.

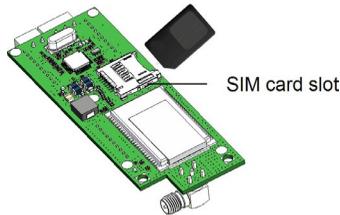


Figure 22: Inserting the SIM card into the GSM modem

▶ To install the GSM modem in the Commercial Gateway:

1. Insert the top of the plastic spacer through the opening in the GSM modem, as shown in *Figure 23*.

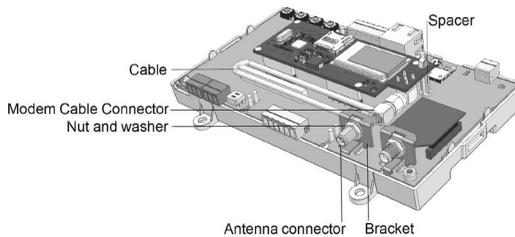


Figure 23: GSM modem on a Commercial Gateway board

2. Connect one end of the cable to the GSM modem connector.
3. Remove the nut and the washer from the other end of the cable and insert the cable through the bracket on the Commercial Gateway board.
4. Re-attach and tighten the nut and washer.

5. Place the GSM modem on the Commercial Gateway board and ensure that:
 - the three rows of pins are correctly positioned in the Commercial Gateway sockets and no pins are left out of their socket.
 - the GSM modem is firmly in place on the Commercial Gateway board.
6. Connect the antenna to the antenna connector.
7. Replace the Commercial Gateway cover.
8. Power on AC.
9. Check that all the GSM modem LEDs are lit. If not, refer to *Errors and Troubleshooting* on page 49.

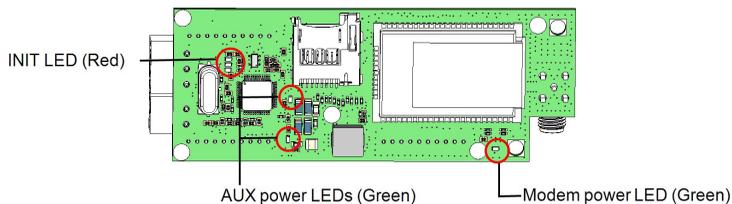


Figure 24: GSM modem LEDs

Appendix C: Errors and Troubleshooting

This appendix describes general system problems, and how to troubleshoot them. For further assistance, contact SolarEdge Support.



Troubleshooting Communication

Troubleshooting Ethernet Communication

When using Ethernet communication, use the **Server Communication Status** window to identify the location of the error:

```

Server : LAN<S_OK>
Status :      <OK>
      xxxxxxxx
<ERROR MESSAGE>
  
```

xxxxxxx is a string of 1s and 0s showing an eight-bit communication connection status. 1 indicates OK and 0 indicates an error.

Bit Location	Error Message	Cause and Troubleshooting
1st	LAN Disconnected	Physical connection fault. Check the cable pin-out assignment and cable connection. Refer to <i>Creating an Ethernet (LAN) Connection</i> on page 42
2nd	DHCP Failed, or Invalid DHCP Config	IP settings issue. Check the router and inverter configuration. Consult your network IT.
3rd	Gateway Ping Failed	Ping to router failed. Check the physical connection to the switch/router. Check that the link LED at the router /switch is lit (indicating phy-link). If OK - contact your network IT, otherwise replace the cable or change it from cross to straight connection.
4th	G Server Ping Failed	Ping to google.com failed. Connect a laptop and check for internet connection. If internet access is unavailable, contact your IT admin or your internet provider. For Wi-Fi networks, ensure that username and password are as defined in the internet provider AP/router.
5th	Server x Ping Failed	Ping or connection to SolarEdge server failed. Check the SolarEdge server address, under LAN Conf submenu: Address: prod.solaredge.com Port: 22222 Check with your network administrator whether a firewall or another device is blocking transmission.
6th		
7th		
8th		

1. If **No Communication** is displayed on the SolarEdge Commercial Gateway, perform the following:
 - Verify that the RS485 cable is connected to all inverters. Check the connections between the first inverter in the chain and the other inverters.
 - Verify that one of the devices is defined as the leader and that followers were detected, as described above.
2. If the message **Leader Not Found** appears, check the connections to the leader device and fix if required.
3. If after follower detection the number of followers displayed in the leader under **RS485-X Conf** → **Follower Detect** is smaller than the actual number of followers, use one of the following methods to identify missing followers and troubleshoot connectivity problems:
 - Use the **Long follower Detect** to retry connecting to followers
 - Analyze the **Follower List** to check for missing followers, and check their connection

Refer to https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf



Additional Troubleshooting

1. Check that the modem or hub/router is functioning properly.
2. Check that the connection to the internal connector on the communication board is properly done.
3. Check that the selected communication option is properly configured.
4. Use a method independent of the SolarEdge device to check whether the network and modem are operating properly. For example, connect a laptop to the Ethernet router and connect to the Internet.
5. Check whether a firewall or another type of network filter is blocking communication.

Technical Specifications

Power	Description	Units	
Power Supply – wall mount	Included, 100–240 VAC, EU/UK/US/AU interchangeable 2-pin plug		
Supply Voltage	9-14	Vdc	
Connector Type	terminal block		
Power Consumption	<2	W (typ.)	
Analog Sensor Input			
Number of Inputs	3		
Range		Accuracy	Resolution
Input 1	0–30 mV or 0–2V	+/-1% f.s	10-bit
Input 2	0–2V or 0–10V		
Input 3	-20 mA – 20 mA		
Communication Interfaces	Type	Max. Length	
Ethernet Interface	10/100-BaseT	100/328	m/ft.
Wireless Connections	Wi-Fi ¹ or ZigBee cards ¹		
GSM Modem Interface	2G/3G GSM ¹		
Power Reduction Interface	4 control pins, 5V, GND	50/165	m/ft.
485 Interface	Two separate ports may be used for local connection	1000/3330	m/ft.

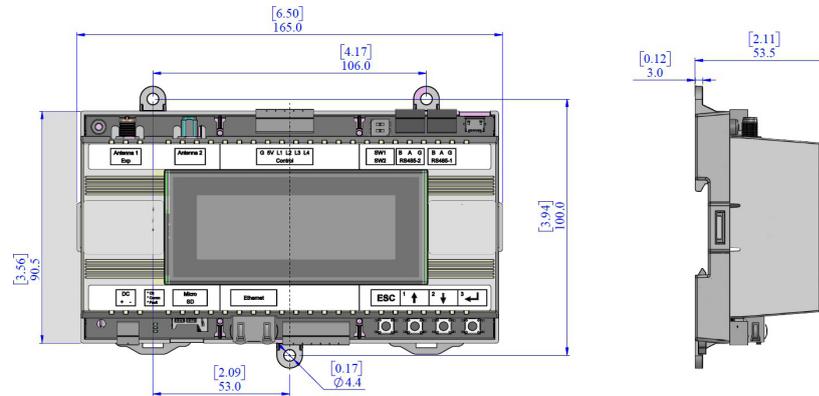
¹Sold separately. See individual product specifications for supported locations



Supported RS485 Devices			
SolarEdge Devices	Yes		
Revenue Meters ¹	Yes		
Export Inverter Data	Yes		
Export Data to Non-SolarEdge Logger	Yes		
Environmental			
Operating Temperatures	-20 to 60 / -4 to 140	°C / °F	
Protection Rating	IP20 Indoor		
Mechanical			
Mounting Type	DIN rail/ Wall mount		
Dimensions (L x W x H)	165 X 90.5 X 53.5 / 6.5 X 3.56 X 2.11	mm / inches	
Weight	< 0.5 / 1.1	kg / lbs	
Standard Compliance			
Safety	UL60950-1, IEC-60950-1		
EMC	FCC Part 15 class B, IEC61000-6-2, IEC61000-6-3		

¹For a list of recommended sensors, refer to <http://www.solaredge.com/articles/se-supported-devices>

Mechanical Specifications



If you have technical queries concerning our products,
please contact our support through SolarEdge service portal:
<http://www.solaredge.com/groups/support/services>

North America	(Toll free) 1877 360 529 2
Australia	(Toll free) 1800 46 55 67
Germany	089 454 597 30
France	(Toll free) 0800 917 410
Italy	(Toll free) 800 784 824
Japan	(Toll free) 81 03 6262 1223
United Kingdom	(Toll free) 0800 028 1183
Belgium	(Toll free) 0800 730 41
Israel	073 240 311 8
Rest of world	972 (0) 73 240 311 8
Fax	972 (0) 73 240 311 7
Email to:	support@solaredge.com

www.solaredge.com

solaredge



MAN-01-00365-1.2

PPL ELECTRIC EXHIBIT 3

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities Corporation :
for Approval of its Second Distributed : Docket No. P-2024-3049223
Energy Resources Management Plan :

**RESPONSES OF JOINT SOLAR PARTIES TO
INTERROGATORIES AND REQUESTS FOR
PRODUCTION OF DOCUMENTS PROPOUNDED BY
PPL ELECTRIC UTILITIES CORPORATION ON
THE JOINT SOLAR PARTIES – SET XXI**

**INTERROGATORIES AND REQUESTS FOR
PRODUCTION OF DOCUMENTS ON
THE JOINT SOLAR PARTIES – SET XXI**

WITNESS: ALEX DINH

PPL to JSP-XXI-1

Re: JSP St. No. 7-SR, pp. 6-7.

- (a) Please provide copies of all versions of the manual for SolarEdge’s “Commercial Gateway with Cellular Support” that were effective since 2015.
- (b) Please state whether any of those versions of the manual indicate or reference the connection of the Commercial Gateway to the AC terminals in the inverters.

ANSWER to PPL to JSP-XXI-1

- (a) Please see attached.
- (b) They do not.

PPL to JSP-XXI-2

Re: JSP St. No. 11-SR, pp. 6-7.

- (a) Please provide the date that the referenced “waiver” process was instituted by SolarEdge.
- (b) Please provide the date(s) that Mr. Dinh received “in-house training from SolarEdge” on the referenced waiver process.
- (c) Please produce all Documents relied upon in answering subparts (a) and (b), *supra*.

ANSWER to PPL to JSP-XXI-2

WITNESS: ALEX DINH

- (a) The JSPs are not presently in possession of a document stating when the waiver process was instituted, but Solaredge employee will testify that the process has been in place since his arrival to Solaredge in 2016.
- (b) To the best of his recollection, employees receive in-house training when they are on-boarded.
- (c) See JSP-JB-9SR (Solaredge waiver form).

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities Corporation for	:	
Approval of its	:	Docket No. P-2024-3049223
Second Distributed Energy	:	
Resources Management Plan	:	

VERIFICATION

I, ALEX DINH, hereby state that the facts set forth in the Joint Solar Parties' Responses to PPL's Discovery Set XXI are true and correct (or are true and correct to the best of my knowledge, information and belief), and that I expect to be able to prove the same at a hearing held in this matter.

I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).



Alex Dinh

DATED: February 10, 2025