solar**edge**

Installation Guide

Data Logger

For North America

Version 1.2

Disclaimers

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FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, 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:

USA and Canada: 1 510 498 3200

Worldwide: +972 073 2403118

Fax: +1 (530) 273-2769

Email: ussupport@solaredge.com.

Support Center: https://www.solaredge.com/us/service/support

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 LCD screen or on the monitoring platform or by the LEDs, 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.

Version History

Data Logger:

- Version 1.0 (Oct. 2017) - Initial release
- Version 1.1 (Nov. 2017) - Technical specification update
- Version 1.2 (May 2019) - editorial modifications

Contents

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.
	AVERTISSEMENT!
	Dénote un risque: il attire l'attention sur une opération qui, si elle n'est pas faite ou suivi correctement, pourrait causer des blessures ou un danger de mort. Ne pas dépasser une telle note avant que les conditions requises soient totallement comprises et accomplies.
	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.
	ATTENTION!
	Dénote un risque: il attire l'attention sur une opération qui, si elle n'est pas faite ou suivi correctement, pourrait causer un dommage ou destruction de l'équipement. Ne pas dépasser une telle note avant que les conditions requises soient totallement comprises et accomplies.
	NOTE
	Denotes additional information about the current subject.
	IMPORTANT SAFETY FEATURE
	Denotes information about safety issues.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

⚠ WARNING!

Opening the Data Logger and repairing or testing under power must be performed only by qualified service personnel familiar with this device.

AVERTISSEMENT!

L'unité ne doit être Data Logger que par un technicien qualifié dans le cadre de l'installation et de la maintenance.

⚠ WARNING!

The device should **not** be serviced when powered up. Make sure to power down the equipment before performing service activities.

AVERTISSEMENT!

La maintenance de cet équipement ne doit pas être faite quand il est en marche. Assurez-vous de l'éteindre avant toute maintenance.

⚠ CAUTION!

Communications cabling between the Data Logger and external devices must not use wires that span more than one building, as per the UL 60950-2 standard.

ATTENTION!

Le câblage de la communication entre le Compteur d'énergie et les appareils ne doivent pas utiliser des câbles qui peuvent s'étendre d'un bâtiment à un autre, d'après le standard UL 600950-2.

Chapter 1: Introducing the Data Logger

Overview

The Data Logger is an enclosed Control and Communication Gateway that can be connected to SolarEdge and non-SolarEdge devices, and can transfer the monitoring data to the monitoring platform and optionally, to a non-SolarEdge logger.

The Data Logger can connect to the following devices[1]:

- SolarEdge devices, such as inverters
- Environmental sensors
- Revenue grade meters
- Power control devices
- Loggers

> **NOTE**
>
> Sensors and meters are available from SolarEdge and are sold separately.
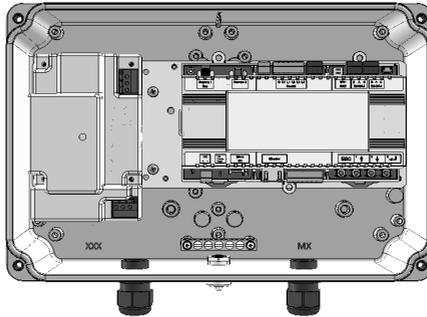
Figure 1: The Data Logger

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[1]For a list of supported meters and environmental sensors, refer to https://www.solaredge.com/se-supported-devices
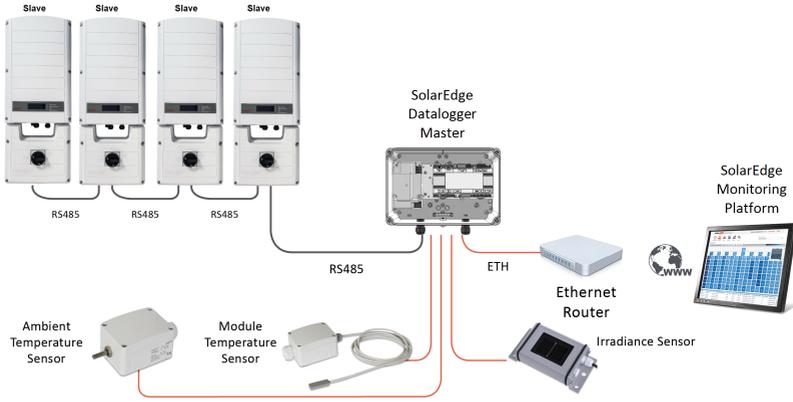
Figure 2: Example of sensor connection to the SolarEdge Data Logger

Data Logger Interfaces

The Data Logger external and internal interfaces are described in this section.

External Interfaces

- **Communications glands**: used to thread communications cables into the Data Logger enclosure

- **Drill guide for AC**: used to feed the Data Logger power supply as described in *Connecting the SolarEdge Data Logger to AC* on page 16. The AC power cable is threaded through the designated drill guide, as shown in *Figure 3*.

- **Additional drill guides**: provide additional cabling entry points in the Data Logger enclosure as required
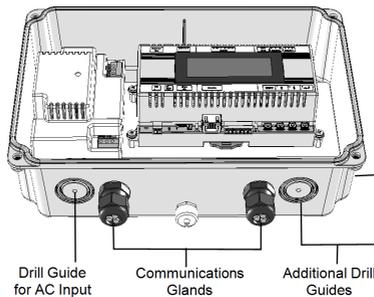
Figure 3: Data Logger external interfaces

Internal Interfaces
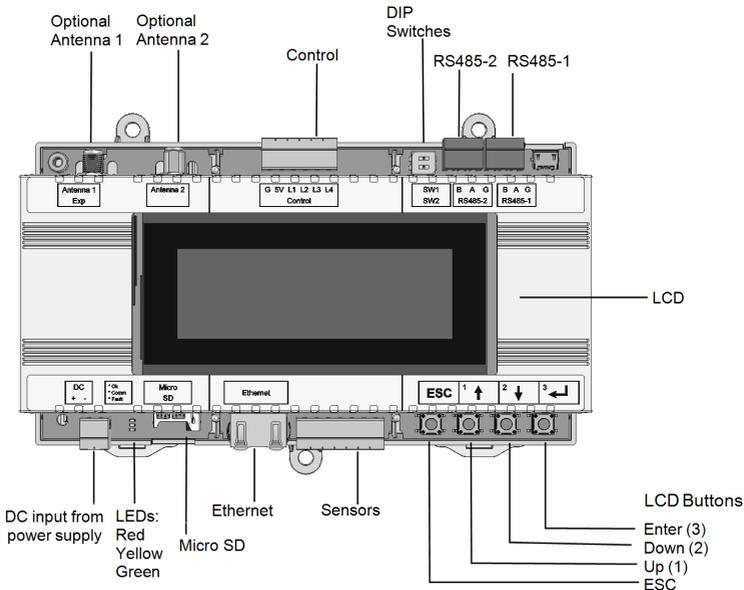
Figure 4: Data Logger internal interfaces

LCD and LCD 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 38 for a description of this option.

- **Setup mode**: Upon installation, an installer may perform basic configurationas described in *Configuration Menu Options* on page 43.

- **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 60.

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 ZigBee antenna connection.

🔺 **Antenna2**: used for optional GSM antenna connection.

🔺 **RS485-1** and **RS485-2**: used for connecting external devices to the Data Logger (refer to *Connecting the Data Logger to the Installation* on page 18) and inverters.

🔺 **Ethernet**: Enables connecting the Data Logger to the SolarEdge monitoring platform through an Ethernet switch/router (refer to *Creating an Ethernet (LAN) Connection* on page 50). The Ethernet switch/router should be connected to the Internet.

LEDs

The Data Logger has three LED indicators, as follows:

🔺 **OK (Green)**: Indicates whether or not the SolarEdge Data Logger 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 Data Logger is being configured and during power up.

Other Interfaces

🔺 **DC**: DC output from the power supply. AC power is converted by the power supply to DC for the internal components

🔺 **Sensors**: enables connecting to external environmental sensors (refer to *Connecting Environmental Sensors (Optional)* on page 26).

🔺 **Control**: used for connection to an external power reducer device

🔺 **DIP Switches SW1/SW2**: used to configure RS485-1/2 termination

🔺 **Micro SD**: used for field software upgrade

Chapter 2: Installing the Data Logger

Transport and Storage

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

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

Package Contents

- Data Logger
- 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 Data Logger. The following is a recommendation of the equipment needed for installation:

- Drill and 5/32 inch diameter bits
- Three-wire twisted cable or four-wire twisted pair cable
- For optional Ethernet communications: CAT5/6 cable

Installation Guidelines

- The Data Logger is considered "permanently connected equipment" and requires a disconnect means (circuit breaker, switch, or disconnect) and overcurrent protection (fuse or circuit breaker).
- The Data Logger draws 10-30 mA, therefore the rating of any switches, disconnects, fuses, and/ or circuit breakers is determined by the wire gauge, the mains voltage, and the current interrupting rating required.
- The switch, disconnect, or circuit breaker must be located near the meter and be easily operated .
- Use circuit breakers or fuses rated for 20A or less.

- Use grouped circuit breakers when monitoring more than one line.
- The circuit breakers or fuses must protect the mains terminals labeled L1, L2, and L3. In the rare cases where neutral has overcurrent protection, the overcurrent protection device must interrupt both neutral and the ungrounded conductors simultaneously.
- The circuit protection / disconnect system must meet all national and local electrical codes.
- The Data Logger power supply requires a grid voltage of 208-277 Vac (50/60Hz).
- Protect the Data Logger from dust, wet conditions, corrosive substances and vapors.

Cable specifications:

Connection Type	Cable Type	Maximum Length
AC Wiring	Stranded wire, 600 V, type THHN, MTW, or THWN. Wire cross-section area: 22-16 AWG / 0.33-1.31 mm²	N/A
RS485 communication bus (per RS485 port)	Three twisted wire cable or 4-wire twisted pair cable (two twisted pairs). Wire cross-section area: 24-18 AWG / 0.2- 1 mm² (a CAT5 cable may be used) Recommended: 20 AWG / 0.52 mm²	1,000 m / 3,330 ft
Ethernet	CAT5/6	100 m / 325 ft
Sensor/ control interface	Recommended wire size: 20 AWG / 0.52 mm²	50 m /165 ft

Communication Glands

Two PG13.5 (M20x1.5) communication glands are used for connection of the various communication options. Each gland has three 2.0-5.0 mm diameter openings.

Opening Conduit Drill Guides

This step may be performed before or after mounting the Data Logger.

→ To open conduit drill guides:

1. Loosen the 4 Allen screws of the Data Logger enclosure and remove the cover.
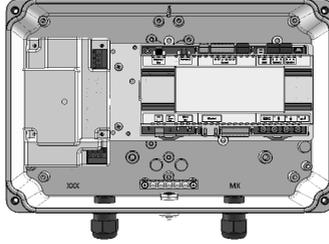
Figure 5: Data Logger front view without cover

2. Open the required conduit drill guides according to the conduits used in the installation: The drill guides are located at the bottom, back and sides of the enclosure, each with two sizes: ¾'' and 1''. Open the required drill guides, taking care not to interfere with any of the internal components. A Unibit drill may be used.

⚠️ **CAUTION!**

Use only drill guides located at the bottom, back and sides of the enclosure. Opening the top drill guides may damage the protection rating of the enclosure, and will void the product warranty. Unused conduit openings and glands should be sealed with appropriate seals.

ATTENTION!

Utilisez uniquement les guides de perçage situes en dessous, derrière et sur les côtes de l'enceinte. L'ouverture des guides de perçage supérieurs pourrait endommager le niveau d'étanchéité de l'enceinte, et annuler la garantie produit. Les orifices ou presses étoupes non utilises doivent être scellés avec des bouchons appropriés.
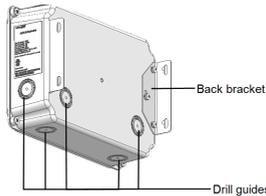
Figure 6: Data Logger - rear view, with back bracket and drill guides

Safety

⚠	**WARNING!**
	The equipment should **not** be serviced when powered up. Make sure to power down the equipment before performing service activities.
	AVERTISSEMENT!
	La maintenance de cet équipement ne doit pas être faite quand il est en marche. Assurez-vous de l'éteindre avant toute maintenance.
⚠	**CAUTION!**
	Communications cabling between the Data Logger and external devices must not use wires that span more than one building, as per the UL 60950-2 standard.
	ATTENTION!
	Le câblage de la communication entre le Data Logger et les appareils ne doivent pas utiliser des câbles qui peuvent s'étendre d'un bâtiment à un autre, d'après le standard UL 600950-2.

Installation Workflow

The following provides an overview of the workflow for installing and setting up the Data Logger:

- Step 1: "Mounting the Data Logger" below
- Step 2: "Connecting the SolarEdge Data Logger to AC" on the next page
- Step 3: "Connecting the Data Logger to the Installation" on page 18
- Step 4: "Connecting Environmental Sensors (Optional)" on page 26
- Step 5: "LCD – Status Screens and Setup Options" on page 38
- Step 6: "Setting Up Monitoring through the Data Logger (Optional)" on page 48

Mounting the Data Logger

Mount the Data Logger on a wall or pole using the supplied bracket.

The Data Logger is should be mounted vertically, with the glands facing downward.

→ To mount the Data Logger:

1. Install the bracket with the semi-circles facing downward, as shown below. Verify that the bracket is firmly attached to the mounting surface.
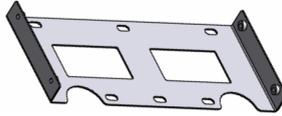
Figure 7: Mounting bracket

2. Open one or more conduit drill guides as required by the installation. See "Opening Conduit Drill Guides" on page 14.

3. Mount the Data Logger: Attach the Data Logger enclosure's back brackets to the mounted bracket using the four supplied screws. Tighten the screws with a torque of 9 N*m / 6.6 lb*ft.

Connecting the SolarEdge Data Logger to AC

NOTE

- The conduits, hubs and fittings must be suited for field wiring systems.
- The hubs and other fittings must comply with UL514B.
- Use only copper conductors rated for a minimum of 75°C.
- Use the conduit and wiring appropriate for the installation location per the NEC. Outdoor installations must use components that are rated NEMA 3R or higher.
- For more wiring information refer to the *SolarEdge Recommended AC Wiring Application Note*,
  available on the SolarEdge website at
  https://www.solaredge.com/sites/default/files/application-note-recommended-wiring.pdf

→ To connect the Data Logger to AC

1. Disconnect the AC to the Data Logger by turning OFF the circuit breakers on the distribution panel.

2. Strip off 5/16" (8mm) of the AC cable insulation and expose the L (red), N (blue) and G (green) wires.

3. Thread the AC cable into the Data Logger via the open AC wiring drill guide.
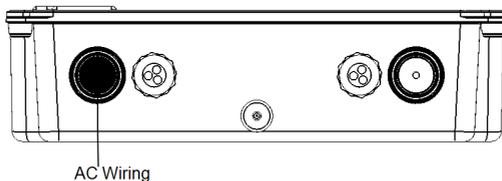
Figure 8: AC wiring drill guide on interface panel

4. Attach the L, N, and G wires to the 3-pin terminal block provided in the accessory kit, as shown in the below figure.
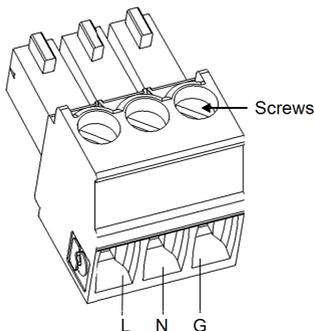
Figure 9: Three-Pin AC Terminal Block

5. Insert the terminal block into its socket in the Data Logger, as shown in the below figure.
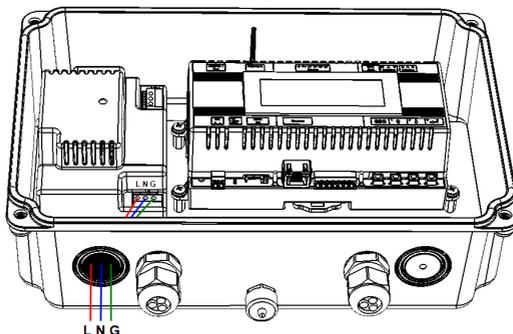
Figure 10: AC Wiring Scheme

Chapter 3: Connecting the Data Logger to the Installation

Overview

The Data Logger 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 Data Logger.

The following is an example of a master Data Logger connected to a chain of slave inverters.
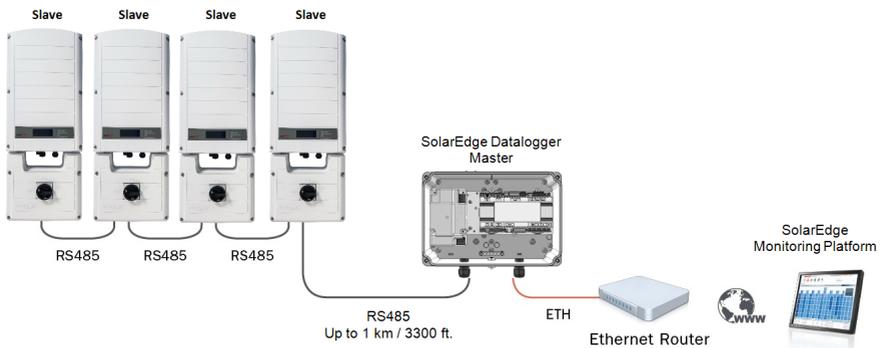
Figure 11: Example of RS485 connection

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 Data Logger to the RS485 input of the inverters.

→ To connect the RS485 communication bus between inverters and the Data Logger:

1. Thread the RS485 cable through one of the Data Logger's communication glands.

2. 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 10 meters, use twisted-pair A and B wires.
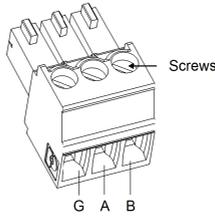
Figure 12: 3-pin terminal block

3. Connect the 3-pin terminal block to the designated RS485-1 port on the Data Logger.

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

Figure 13: Data Logger RS485 connectors and termination switches

5. Open the inverter cover as described in its manual.

6. Remove the seal from one of the openings in communication gland #2 of the inverter and insert the cable through the opening.

7. Pull out the 9-pin RS485 terminal block connector, as shown below:
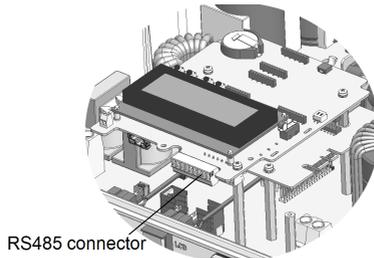
Figure 14: The RS485 terminal block in the inverter

8. Loosen the screws of pins B, A and G on the left of the RS-485 terminal block.

☛ For inverter: Use the RS485-1 pins (left-most)
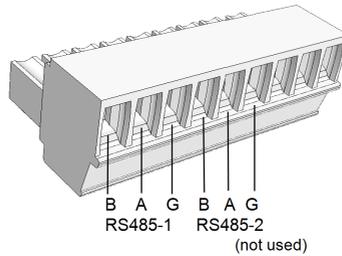
Figure 15: RS485 terminal block

9. Insert the wire ends into the B, A and G pins shown above.

   You can use any color wire for each of the B, A and G connections, as long as:

- The same color wire is used for all A pins the same color for all B pins and the same color for all G pins
- The wire for G is not from the same twisted pair as A or B.

10. Connect all B, A and G pins in all inverters. The following figure illustrates this connection schema:
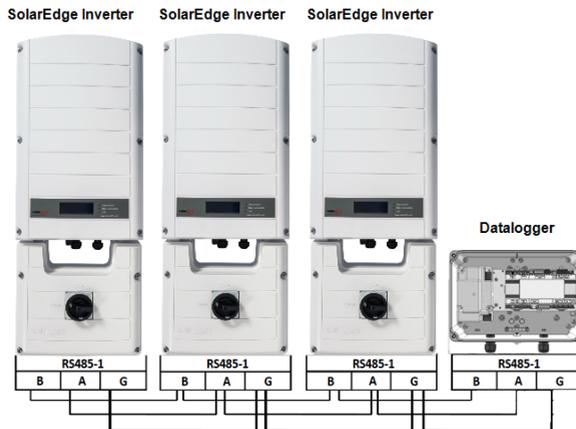
Figure 16: Connecting SolarEdge devices in a chain

> **NOTE**
>
> Do not cross-connect B, A and G wires.
>
> For inverters - Do not insert wires into RS485-2 pins.

11. Tighten the terminal block screws.

12. Push the RS485 terminal block firmly all the way into the communication board.

13. Terminate inverters installed at the ends of the chain by setting the DIP switch block marked **SW7** on the communication board. Set the switch to ON (up) as shown in the figure below.

Move up the
left switch
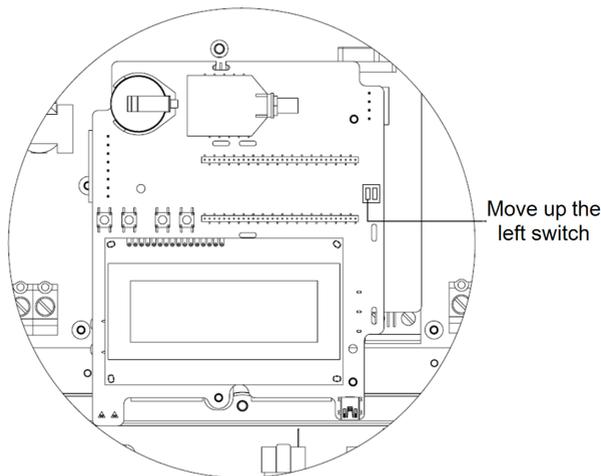
Figure 17: RS485 termination switch

→ To configure the RS485 communication bus with SolarEdge inverters:

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

One device must be configured as the master on the RS485 bus. Any SolarEdge device may be the master (for example, inverter, Data Logger). If you connect the installation to the 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:

```
P l e a s e   e n t e r
  P a s s w o r d
* * * * * * * *
```

2. Use the three-right most LCD buttons to enter the password: **12312312**

   The following menu is displayed:

```
L a n g u a g e   < E n g >
C o m m u n i c a t i o n
P o w e r   C o n t r o l
D i s p l a y
M a i n t e n a n c e
I n f o r m a t i o n
```

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** (where 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 menus:

▬ **Communication ➔RS485-X Conf ➔Device Type➔SolarEdge**

▬ **Communication ➔RS485-X Conf ➔Protocol➔Master**

▬ **Communication ➔RS485-X Conf ➔Slave Detect**

   The system starts automatic detection of the SolarEdge slave inverters connected to the master Data Logger. The Data Logger 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 cover and start power production.

7. Verify the connection of the Master to the 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 38):

```
R R C R : D i s a b l e d
S e n s o r s : D i s a b l e d
S e r v e r : L A N   < S _ O K >
T o t a l   #   o f   S l a v e s : - -
```

2. Verify that **S_OK** appears, to indicate that the connection to the 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 Data Logger, 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.us/sites/default/files/troubleshooting_undetected_RS485_devices.pdf

RS485 Configuration Options

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

RS485-X

```
D e v i c e   T y p e   < S E >
P r o t o c o l   < M >
D e v i c e   I D   < 1 >
S l a v e   D e t e c t   < # >
L o n g   S L V   D e t e c t   < # >
S l a v e   L i s t   < # >
M u l t i - I n v .   S e t
```

Device Type:

```
S o l a r E d g e   < M >
N o n - S E   L o g g e r   < S >
M u l t i   D e v i c e s   < M >
N o n e
```

Protocol:

```
S l a v e
M a s t e r
```

Device ID:

```
P l e a s e   S e l e c t
D e v i c e   I D
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 or Data Loggers. 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 Data Logger 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.

Connecting an RGM (Optional)

The Data Logger optionally supports connectivity with a Revenue Generation Meter (RGM) via the RS485-2 port on the Data Logger.
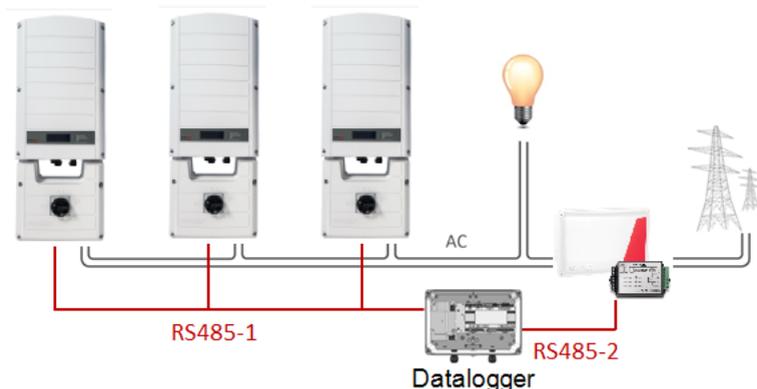
Figure 18: Connecting an RGM to the Data Logger

For a complete guide to the installation and connection of the RGM, see the SolarEdge Electricity Meter Installation Guide at
https://www.solaredge.com/sites/default/files/solaredge-meter-installation-guide-na.pdf.

Chapter 4: Connecting Environmental Sensors (Optional)

Overview

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

- 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/m²

You can view the sensor data in the Status window (see *Sensors Status* on page 43), and in the monitoring platform.

This chapter describes how to connect sensors to the Data Logger and how to configure them.
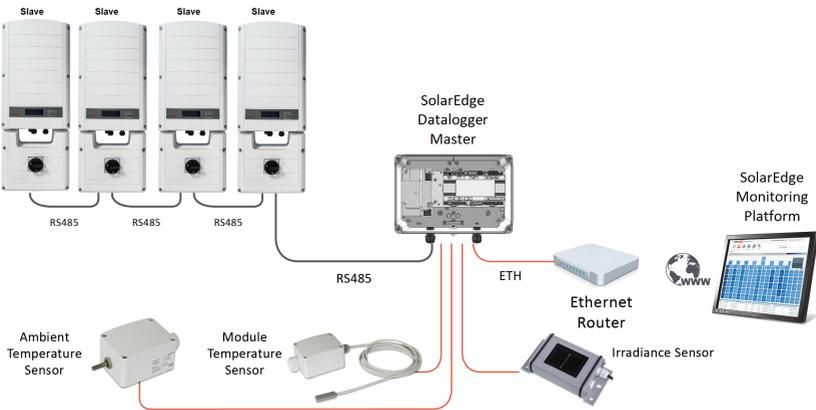
Figure 19: Example of sensor connection to the SolarEdge Data Logger

Connecting Sensors to the Data Logger

For connection of the irradiance and temperature sensors available from SolarEdge refer to *Sensor Connection Example* on page 34.

Sensors are directly connected to the Data Logger via the sensor interface connector. Use the supplied 7-pin terminal block. *Figure 20* shows the location of the sensors connector on the Data Logger.

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
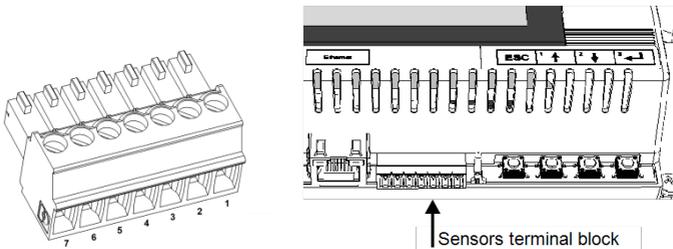
Figure 20: Sensor Interface Inputs

→ 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 34
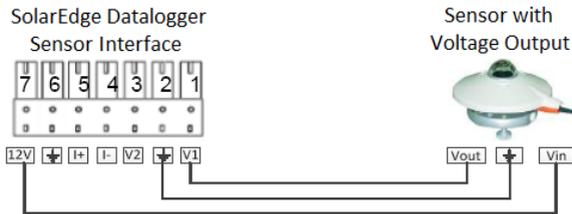
	CAUTION!
⚠	Excessive voltage on the sensor input can damage the SolarEdge Data Logger. Refer to input ranges specified in the *Technical Specifications.*
	ATTENTION!
	Une tension excessive à l'entrée du senseur peut endommager le Data Logger de SolarEdge. Referrez vous aux plages d'entrée spécifiées 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.
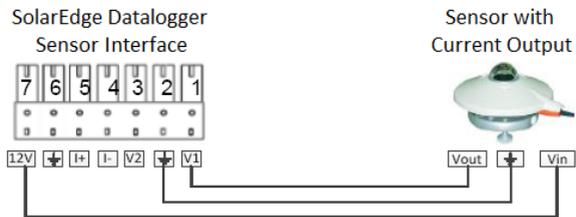
Figure 21: Current sensor (4-20mA) positive connection

- 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 Data Logger. Refer to input ranges specified in the *Technical Specifications*.

ATTENTION!

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 Data Logger 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:
  - **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 Data Logger. 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 Data Logger

→ To enable the sensors in the Data Logger:

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

```
P l e a s e   e n t e r
  P a s s w o r d
* * * * * * * *
```

The Data Logger 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:

```
L a n g u a g e   < E n g >
C o m m u n i c a t i o n
P o w e r   C o n t r o l
D i s p l a y
M a i n t e n a n c e
I n f o r m a t i o n
```

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

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

```
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
```

→ To configure sensors in the Data Logger:

> **NOTE**
>
> When using sensors provided by SolarEdge, enabling the sensors as described above automatically sets their configuration (available from SolarEdge Data Logger 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 26.

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 – 2 V
0 – 3 0 m V
```

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

```
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
```

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

```
P 0   < 0 . 0 , 0 . 0 >
P 1   < 1 . 0 0 0 , 1 . 0 0 0 >
```

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

```
S e t   P o i n t
( V , D e g C )
1 0 , 7 0
```

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

6. 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 43.

```
S e n s o r s
1 : X X X . X X X   D e g C
V 2 : X X X . X X X   W / m 2
I   : D i s a b l e d
```

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.
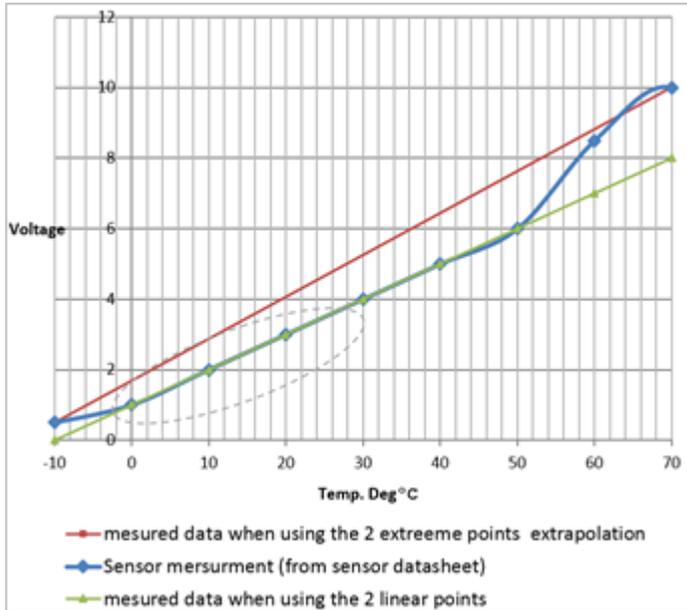
Figure 22: Example of sensor graph

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,-10>
P1 <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 Data Logger selected range. The SolarEdge Data Logger then extrapolates the sensor linear graph based on these two points.

```
P0 <1,0>
P1 <5,50>
```

Sensor Connection Example

This section describes how to connect three of the sensors available from SolarEdge to the Data Logger. 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 Data Logger:
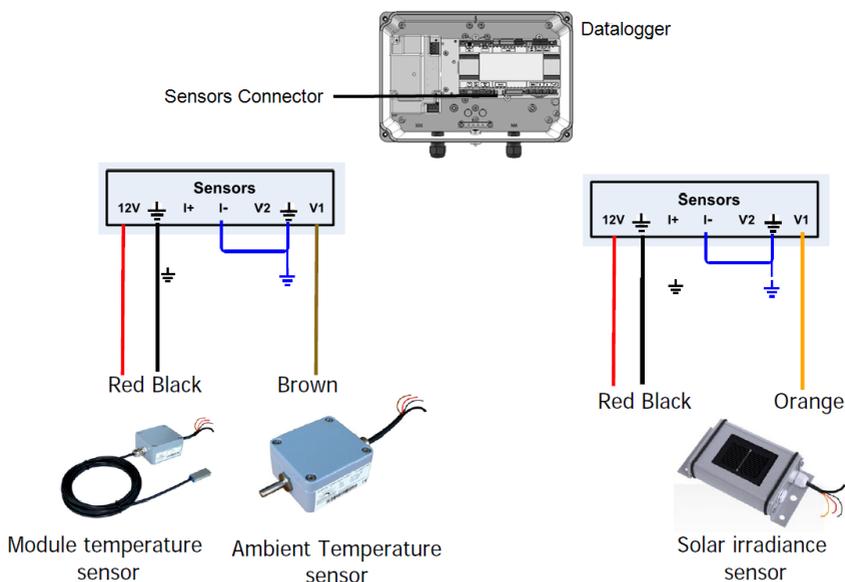
Figure 23: Sensors connection diagram

→ To connect an ambient or module temperature sensor to the power supply and to the Data Logger:

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 Data Logger:

1. Connect the thin wires to the Data Logger sensors connector as follows (see *Figure 24*):

   ▬ Orange - to V1

   ▬ Black - to Ground

   ▬ Red - to 12V

   ▬ Leave the thicker black wire (Shield) unconnected.
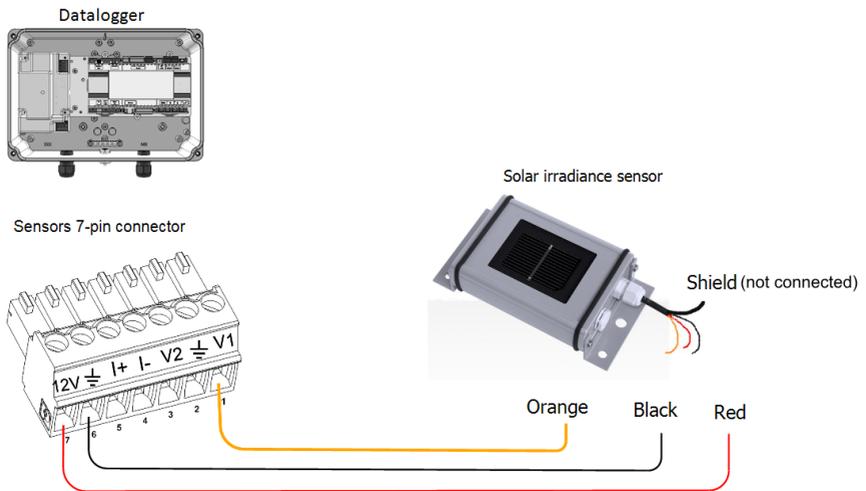
Figure 24: Solar irradiance sensor connection

NOTE

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

→ To enable the sensors in the Data Logger:

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 Data Logger 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 Data Logger:* on page 32

Chapter 5: LCD – Status Screens and Setup Options

This chapter describes the LCD display of the SolarEdge Data Logger. The LCD screen displays status information of the Data Logger 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 46.

Additional presses display the following screens one after the other.

Initial Status

```
R R C R : D i s a b l e d
S e n s o r s : D i s a b l e d
S e r v e r : L A N   < S _ O K >
T o t a l   #   o f   S l a v e s : - -
```

- **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 Data Logger

ID Status

This screen displays the ID of the Data Logger and the software version.

```
I D :         # # # # # # # #   # #
D S P 1 :             1 . 0 2 1 0
C P U :   0 0 0 3 . 1 9 x x
C o u n t r y :   U S A 1
```

Server Communication Status

```
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 >
```

> **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 *Cellular Status* on page 40 and *GSM Status* on page 40).

- **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 Data Logger established successful connection and communication with the specified server port/device (LAN, RS485 or ZigBee Plug-in).
- **xxxxxxxx**: 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 60. For a list of the possible errors and how to troubleshoot them, refer to *Errors and Troubleshooting* on page 60.
- **Error message**, according to failure. Refer to https://www.solaredge.com/sites/default/files/troubleshooting_for_se_inverter_insallation_guide_addendum_na.pdf.

IP Status

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

```
I P  1 9 2 . 1 6 8 . 2 . 1 1 9
M S K  2 5 5 . 2 5 5 . 2 5 5 . 0
G W  1 9 2 . 1 6 8 . 2 . 1
M A C  0 - 2 7 - 0 2 - 0 0 - 3 9 - 3 6
```

ZigBee Status

This screen describes the ZigBee configuration:

```
P A N : X X X X X
C H : X X / X X X X  R S S I : < L >
M I D : X X X X  X X
Z i g B e e  R e a d y
```

- **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.

Cellular Status

If a cellular (CDMA) Plug-in is connected, this screen replaces the Server status screen:

```
S e r v e r : C e l l      < S _ O K >
S t a t u s :              < O K >
M N O :  < X X X X X X >    S i g : 5
< E r r o r   m e s s a g e >
```

- **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 Cellular Plug-in.
- **S_OK**: The last communication to the SolarEdge monitoring platform was successful (appears if the inverter is connected to the platform).
- **Sig**: The signal strength, received from the Cellular Plug-in. A value between 0-5, (0 = no signal, 5 = excellent signal).
- **Error message** per communication connection status failure

GSM Status

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

```
S e r v e r : C e l l   < S _ O K >
S t a t u s :           < O K >
M N O :  < x x x x x x x >  S i g : 5
< E r r o r   m e s s a g e >
```

- **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 38.
- **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 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

- **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 ZigBee 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-na.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:      7.0kW
Site  Prod:      10.0kW
Site  Export:    4.0kW
Self-consume: 6.0kW
```

- **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 https://www.solaredge.com/sites/default/files/export_limitation_application_note_NA.pdf.

Sensors Status

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

```
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 Data Logger configuration options.

→ To enter Setup mode:

1. Verify that the SolarEdge Data Logger is connected to a power outlet.

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

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

The Data Logger is now in Setup mode and all its LEDs are lit. The Data Logger 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 Data Loggerto communicate with the SolarEdge monitoring platform

    - The communication option used to communicate between multiple SolarEdge devices or other external non-SolarEdge devices, such as energy meters or loggers.

> **NOTE**
>
> The Server menu shows only the communication options installed in the Data Logger.

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.us/files/pdfs/solaredge-communication_options_application_note_v2_250_and_above.pdf.

Communication[1],[2]:

```
S e r v e r < L A N >
L A N   C o n f
R S 4 8 5 – 1   C o n f < S >
R S 4 8 5 – 2   C o n f < S >
Z i g B e e   C o n f < S >
C e l l u l a r   C o n f
S l a v e   D e t e c t
```

---

[1] When using the SolarEdge Cellular Plug-in with the provided SIM card, the Cellular Conf menu is unavailable.

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

Server:

```
L A N
R S 4 8 5
Z i g b e e
C e l l u l a r
N o n e
```

LAN Conf:

```
I P   C o n f i g
S e t   D H C P   < e n >
S e t   I P
S e t   M a s k
S e t   G a t e w a y
S e t   D N S
S e t   S e r v e r   A d d r
S e t   S e r v e r   P o r t
M o d b u s   T C P < D i s >
```

RS485-X Conf:

```
D e v i c e   T y p e   < S E >
P r o t o c o l   < M >
D e v i c e   I D   < 1 >
S l a v e   D e t e c t   < # >
L o n g   S L V   D e t e c t   < # >
S l a v e   L i s t   < # >
M u l t i - I n v .   S e t
```

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

```
D e v i c e   T y p e < S E >
P r o t o c o l < M P S >
D e v i c e   I D < 1 >
P A N   I D
S c a n   C h a n n e l
L o a d   Z B   D e f a u l t s
```

GPIO Conf:

```
D e v i c e   T y p e   < R R C R >
```

Power Control

```
R R C R   C o n f .
L o a d   D e f a u l t s
```

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

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 Data Logger 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 26.

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): A preassembled RGM or any external Energy Meter
  - **RGM2**: A second external Energy Meter
  - **ZB**: ZigBee MAC address
  - **Cell**: MEID (CDMA) or IMEI (GSM)

Chapter 6: Setting Up Monitoring through the Data Logger (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 Data Logger serving as the connection point to the monitoring platform. The Data Logger 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 Data Logger.

Only communication products offered by SolarEdge are supported.

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

Ethernet

Ethernet is used for a LAN connection. For connection instructions refer to *Creating an Ethernet (LAN) Connection* on page 50.

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/Data Logger) 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 Plug-in: Purchased separately, the RS485 Plug-in provides an additional RS485 port (referred to as RS485-E) for the Data Logger for enhanced communications. The plug-in is a 3 pin terminal block which is installed on the communication board. 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*

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

ZigBee

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

The Smart Energy ZigBee connections require a ZigBee plug-in and an external antenna, available from SolarEdge.

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

The Smart Energy products are provided with an installation guide, which should be reviewed prior to connection. Refer to https://www.solaredge.com/products/device-control#/.

This option enables wireless connection of one or several devices to a ZigBee Gateway, for wireless communication to the 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.

Creating an Ethernet (LAN) Connection

Overview

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

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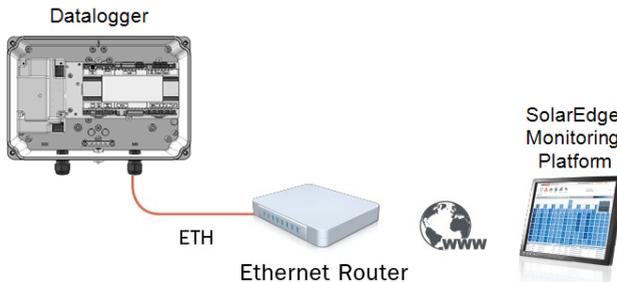

Figure 25: Example of Ethernet connection

Ethernet Communication Configuration Options

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

Communication:

```
S e r v e r < L A N >
L A N   C o n f
R S 4 8 5 – 1   C o n f < S >
R S 4 8 5 – 2   C o n f < S >
Z i g B e e   C o n f < S >
C e l l u l a r   C o n f
S l a v e   D e t e c t
```

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 Data Logger, 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 Data Loggerand 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 Data Logger according to the LAN settings.

- **Set Gateway**: Set the default gateway address of the SolarEdge Data Loggeraccording to the LAN settings.

- **Set DNS**: Set the DNS of the SolarEdge Data Logger according to the LAN settings.

- **Set Server Addr**: Set the IP address of the SolarEdge monitoring platform. This option is predefined in the SolarEdge Data Loggerto 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 Data Logger 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.

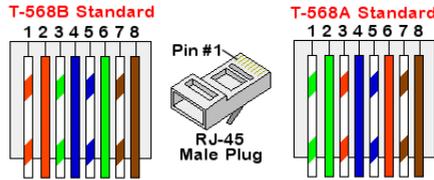| RJ45 Pin #	Wire Color		10Base-T Signal 100Base-TX Signal
	T568B	T568A	
1	White/Orange	White/Green	Transmit+
2	Orange	Green	Transmit-
3	White/Green	White/Orange	Receive+
4	Blue	Blue	Reserved
5	White/Blue	White/Blue	Reserved
6	Green	Orange	Received-
7	White/Brown	White/Brown	Reserved
8	Brown	Brown	Reserved

Figure 26: 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 Data Logger 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 43.

2. Set the Data Logger as the master of the RS485 bus and perform slave detection as described in Creating an RS485 Bus Connection.

3. To configure the LAN to Static IP select the following in the LCD menus on the Data Logger:
   - ▰ 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 50.

5. Verify the that the status field in the Server Communication Status window displays S_OK:

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

6. Exit the Setup mode.

Appendix A: Mounting the ZigBee Plug-in in the Data Logger

> **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 Data Logger cover.

5. Unscrew the nut and washer on the ZigBee Plug-in.

6. Connect the ZigBee Plug-in in a Data Logger 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 Data Logger socket and no pins are left out of their socket.
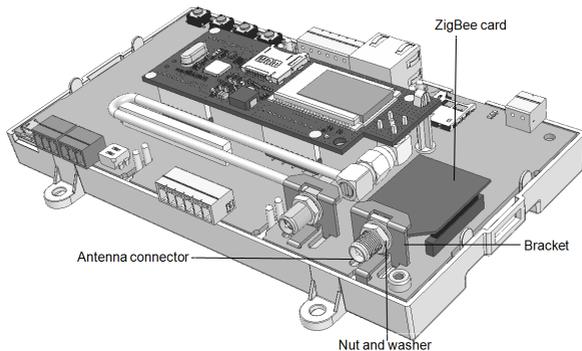
- the card is firmly in place.

Figure 27: ZigBee Plug-in on a Data Logger board

3. Screw in the nut and washer on the ZigBee Plug-in

4. Connect the antenna.

5. Replace the Data Logger cover.

Appendix B: Inserting the GSM Modem in the Data Logger

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 Data Logger cover.

5. If there is no SIM card installed in the modem, insert one into the slot on the GSM modem.
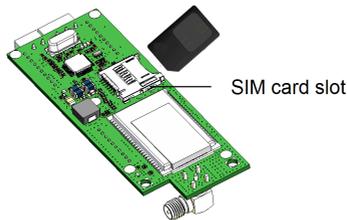

Figure 28: Inserting the SIM card into the GSM modem

→ **To install the GSM modem in the Data Logger:**

1. Insert the top of the plastic spacer through the opening in the GSM modem, as shown in *Figure 29*.
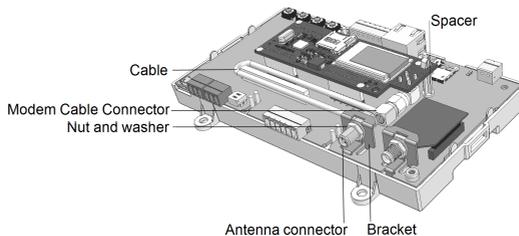

Figure 29: GSM modem on a Data Logger board

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 Data Logger board.

4. Re-attach and tighten the nut and washer.

5. Place the GSM modem on the Data Logger board and ensure that:

   - the three rows of pins are correctly positioned in the Data Logger sockets and no pins are left out of their socket.

   - the GSM modem is firmly in place on the Data Logger board.

6. Connect the antenna to the antenna connector.

7. Replace the Data Logger cover.

8. Power on AC.

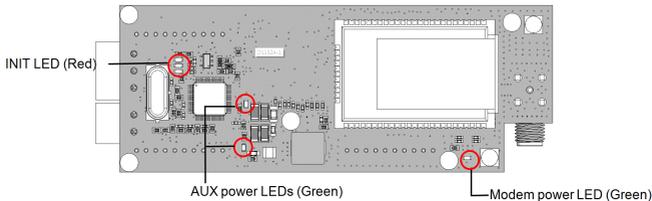9. Check that all the cellular modem LEDs are lit. If not, refer to *Errors and Troubleshooting* on page 60.

INIT LED (Red)

AUX power LEDs (Green)

Modem power LED (Green)

Figure 30: Cellular modem LEDs

Appendix C: Replacing the Data Logger Component

→ To replace the CCG component:

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. Remove the cover of the Data Logger.

5. Loosen and remove the 4 screws at the sides of the Data Logger component as shown in the below figure.
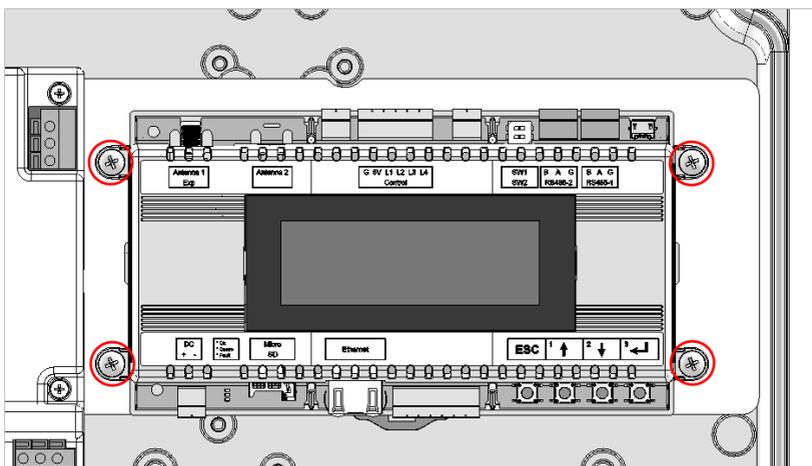
6. Remove the Data Logger component.

Figure 31: Data Logger component screw locations

7. Insert the replacement Data Logger component and attach it to the base using the four screws you removed earlier. Required torque is 1.2 N*m (11 Lb*in).

8. Replace the Data Logger cover.

9. Power on AC.

Appendix D: Replacing the Power Supply Unit

→ To replace the Power Supply Unit (PSU):

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. Remove the cover of the Data Logger.

5. Disconnect the 2-wire twisted cable from the J4 connector on the PSU as shown in the below figure.

6. Loosen and remove the 4 screws at the sides of the PSU, as shown in the below figure.

7. Remove the PSU from the Data Logger.
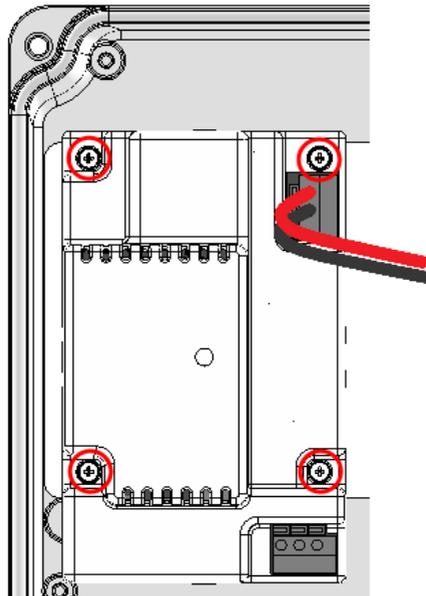
Figure 32: PSU component wiring and screw locations

8. Insert the replacement PSU and attach it to the base using the four screws you removed earlier. Required torque is 0.5 N*m (4.5 Lb*in).

9. Reconnect the 2-wire twisted cable to the J4 connector as shown in the above figure. Connect the red wire to (+) and the black wire to (-).
10. Replace the cover of the Data Logger.
11. Power on AC.

Appendix E: 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:

```
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 >
```

xxxxxxxx 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 *Creating an Ethernet (LAN) Connection* on page 50
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.

Bit Location	Error Message	Cause and Troubleshooting
5th		Ping or connection to SolarEdge server failed. Check the SolarEdge server address, under **LAN Conf** submenu:
6th	Server x Ping Failed	Address: prod.solaredge.com
7th		Port: 22222
8th	Tcp Connect. Failed	Check with your network administrator whether a firewall or another device is blocking transmission.

1. If **No Communication** is displayed on the SolarEdge Data Logger, 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.us/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.

Appendix F: Mechanical Specifications

Dimensions in mm [in]:
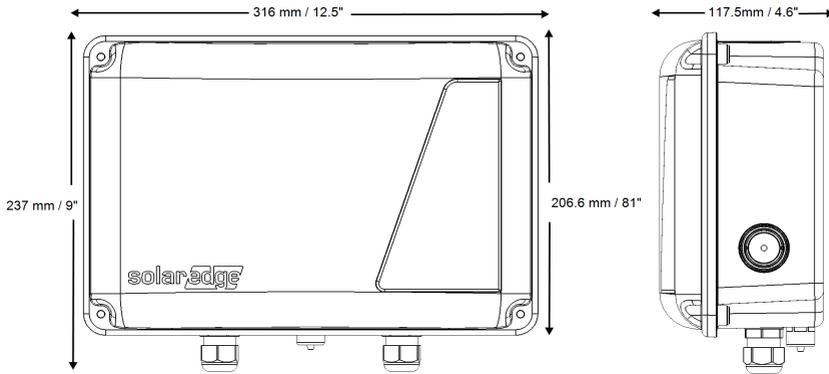
Appendix G: Technical Specifications

Power	Description			Units
AC Input Voltage (Nominal)	208 or 277			Vac
AC Input Voltage Range	184-305			Vac
AC Frequency	50 / 60 ± 5			Hz
Max AC Input Current	100			mA
Supply Voltage	9-14			Vdc
Connector Type	terminal block			
Power Consumption	<2 W (typical)			W
Analog Sensor Inputs: 3	**Range**		**Accuracy/Resolution**	
Input 1	0–30 mV or 0–2V			
Input 2	0–2V or 0–10V		±1% f.s. / 10-bit	
Input 3	-20 mA – 20 mA			
Communication Interfaces	**Type**		**Max. Length**	
Ethernet Interface	10/100-BaseT		100 / 330	m / ft
Wireless Connections	ZigBee card[1], 2G/3G GSM modem[1]			
Power Control Interface	4 control pins, 5V, GND		50 / 165	m / ft
RS485 Interface	Two separate ports may be used for local connection		1000 / 3300	m / ft
Supported RS485 Devices				
SolarEdge Devices	Yes			
Revenue Grade Meters[2]	Yes			
Non-SolarEdge Logger	Yes			
Environmental				
Operating Temperatures	-25°C to +60°C / -4°F to +140°F			°C / °F

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[1]Sold separately. See individual product specifications for supported locations

[2]For a list of recommended sensors, refer to https://www.solaredge.com/se-supported-devices

Standard Compliance			
Safety	UL60950-1, IEC-60950-1	
EMC	FCC Part 15 class B, IEC61000-6-2, IEC61000-6-3	
Mechanical			
Mounting Type	Wall/pole mount (brackets supplied)	
Dimensions (HxWxD)	8.1 x 12.4 x 4.6 inch / 206.6 x 316 x 117.5 mm	in./mm
Weight	3.9 lbs. / 1.8 kg	lbs. / kg
Protection Rating	NEMA Type 3R	
Conduit Entry Diameters	0.75 / 1.00	in.

If you have technical queries concerning our products,
please contact our support through the SolarEdge service
portal: www.solaredge.com/service/support

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