

SolarEdge Quick Installation Guide – North America

For full installation and safety details, you must refer to the *SolarEdge Installation Guide*. Make sure you read, fully understand and follow the detailed instructions in the *SolarEdge Installation Guide* prior to each installation. **Failure to do so could result in injury or loss of life and damage or destruction of the equipment.**

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

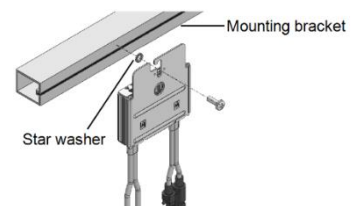
Connecting Power Optimizers to Modules

1 Mount the power optimizers in a shaded location near the PV modules, on the structure or racking to which the module is attached, using the mounting holes. If possible, avoid mounting power optimizers in locations where they will be exposed to direct sunlight. Make sure that each power optimizer is positioned within reach of each module's cables. To allow proper heat dissipation, maintain a 1" / 2.5 cm clearance distance between the power optimizer and other surfaces.

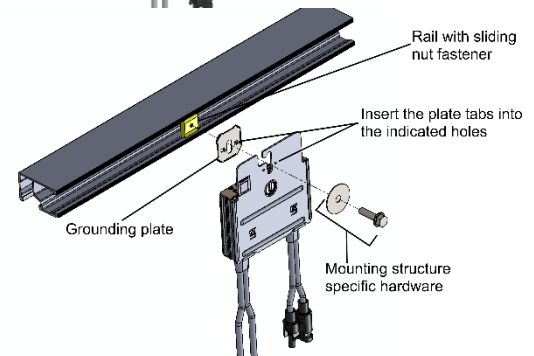
2 Attach each power optimizer to the rack using the 5/16" or 1/4" bolts, nuts and washers.

3 Use the following methods to ground the power optimizer:

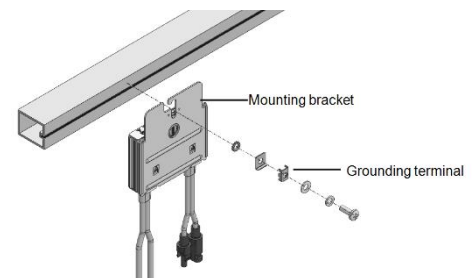
- **For mounting on a grounded metal rail:** Use the provided 5/16" stainless steel grounding star washer between the railing and the flat side of the mounting bracket. The grounding washer should break through the anodize coating of the railing to ensure low resistive connection. Apply torque of 9.5 N*m / 7 lb*ft.



- **For mounting on rails with sliding nut fasteners:** If the star washer cannot be used, use the SolarEdge grounding plate (purchased separately) between the railing and the flat side of the mounting bracket. Use mounting specific hardware as needed. Apply torque of 9.5 N*m / 7 lb*ft.



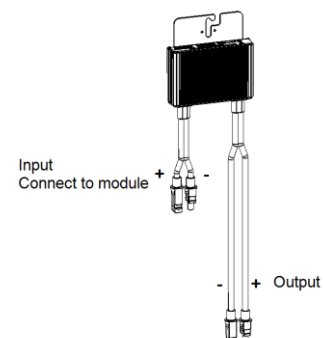
- **For mounting on rails with sliding nut fasteners, or an un-grounded structure** (such as a wooden structure): Connect an equipment-grounding conductor to the grounding terminal according to the instructions supplied with the grounding terminals (grounding terminal kits are available from SolarEdge). The grounding terminal accepts a wire size of 6-14 AWG, and must be sized for equipment grounding per NEC 250.122 requirements. Tighten the screws connecting the power optimizer to the frame and the grounding terminal screw. Apply torque of 9.5 N*m / 7 lb*ft.



4 To benefit from the physical mapping of the installation in the SolarEdge Monitoring Portal, record each power optimizer's serial number and location: Peel off its removable barcode sticker and stick it on the mapping template, or scan the barcode with the SolarEdge iPhone Site Mapper app. Upload the map to the SolarEdge website, using the site registration form.

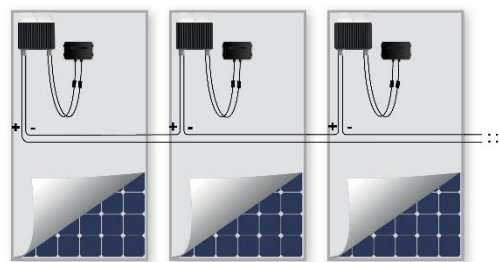
5 Connect the Plus (+) output connector of the module to the Plus (+) input connector of the power optimizer.

6 Connect the Minus (-) output connector of the module to the Minus (-) input connector of the power optimizer.



Connecting Power Optimizers in a String

- 1 Connect the power optimizer outputs in series: Connect the Minus (-) output connector of the string's first power optimizer to the Plus (+) output connector of the string's second power optimizer. Connect the rest of the optimizers in the string in the same way.
 - The minimum and maximum string length should be according to the power optimizer datasheet.
 - Strings **DO NOT** have to be of equal length.
- 2 Verify proper connection of power optimizers: Before the inverter is turned ON, each power optimizer produces *1V safety-voltage*. Use a voltmeter to verify it for each string using a voltmeter. The voltage on a string is the number of modules multiplied by 1V, with a deviation of 10mV per module. Make sure the modules are exposed to sunlight during this process.



NOTE:

If several strings are connected in parallel, verify voltage for each string separately.

Installing the Inverter

- 1 Make sure that the inverter ON/OFF switch at the bottom of the inverter is switched OFF before and during the installation, and that the AC circuit breaker is OFF.
- 2 Use a 5mm Allen key to open the Safety Switch cover screws and remove the cover.



Loosen these screws

- 3 Open the required drill guide pair (bottom, back or sides of the enclosure, sized 3/4" or 1") according to the conduits used in the installation.
- 4 Make sure to leave clearance areas in order to cool the inverter:
 - 8" above
 - At least 4" below (leaving sufficient clearance for conduits entering from the bottom)
 - 4" on either side
 - When installing inverters one above of the other - at least 8" between the top of an inverter and the bottom of a Safety Switch..
 - When installing inverters side by side, follow these clearance specifications:

Location	Single Phase Inverters	Three Phase Inverters	
		Indoor Installation	Outdoor Installation
Locations where the yearly average high temperature ¹ is below 25°C/77°F	8" between inverters	8" between inverters	1.2" between inverters (if inverters are also installed one above the other, maintain the indoor installation clearance)
Locations where the yearly average high temperature ¹ is above 25°C/77°F		16" between inverters	

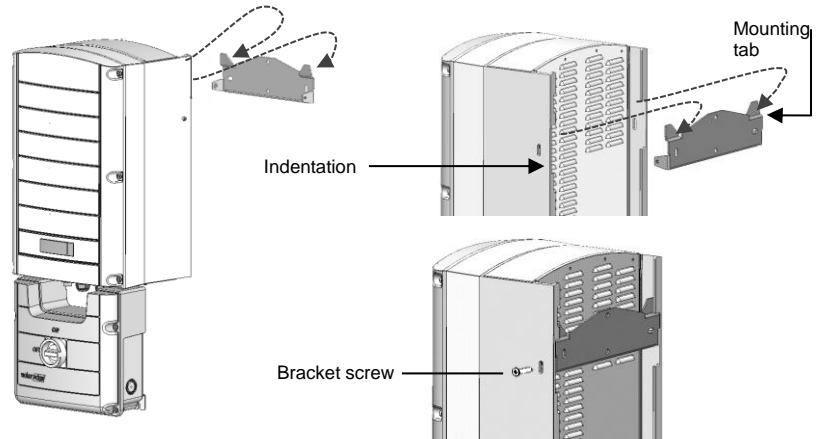
¹ Annual average high temperature – the average of the 12 monthly average highs, for example:

Average High Temperature													Years on Record: 20
C	ANNUAL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	21.5	11.8	12.6	15.4	21.5	25.3	27.6	29	29.4	28.2	24.7	18.8	14

Refer to <http://www.weatherbase.com/> to find the value in your location.

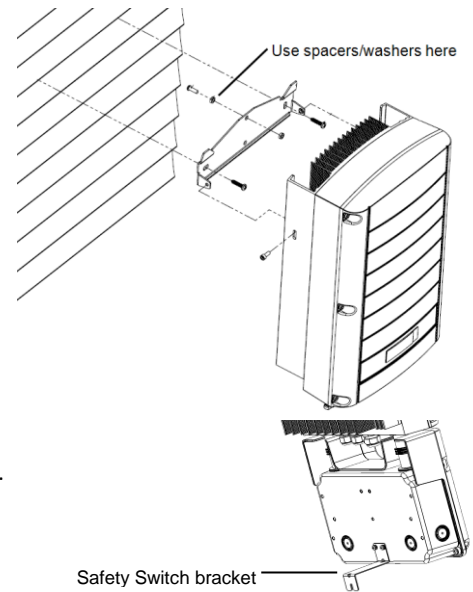
The inverter is supplied with a mounting bracket.

- 5 Install the mounting bracket on the wall with the flat side of the bracket is at the bottom.
- 6 Hang the inverter on the bracket: Align the two indentations in the inverter enclosure with the two triangular mounting tabs of the bracket, and lower the inverter until it rests on the bracket evenly. Secure the inverter to the bracket using the two supplied 5mm screws.



NOTE:

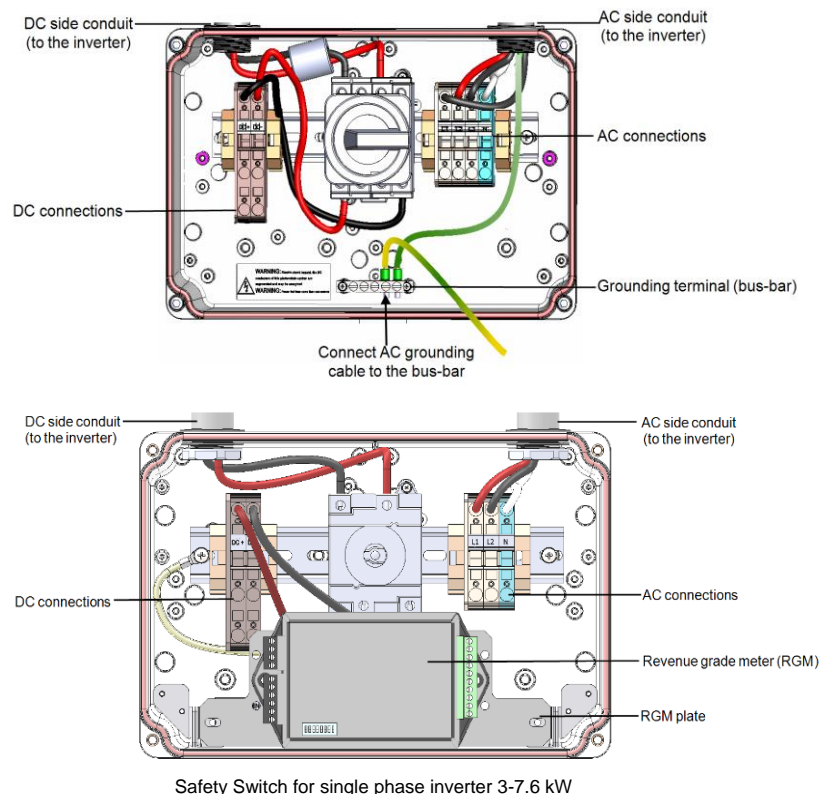
When mounting the inverter on an uneven surface, you may use spacers/washers behind the top mounting hole of the bracket. Depending on the angle, use the appropriate size and number of spacers so that the bracket is perpendicular to the ground. Recommended: a stainless steel 3/4" long screw, with a 1/4" socket button head, two jam nuts and three washers.



- 7 Secure the Safety Switch bracket to the wall:
 - Mark the location of the bracket screw for the Safety Switch and drill the hole.
 - Fasten the bracket using a standard bolt.

Connecting the Strings and the AC to the Safety Switch

Examples of the Safety Switch connections are shown below. For more information, refer to the note supplied in the switch and to the *SolarEdge Installation Guide*.



Safety Switch for single phase inverter 3-7.6 kW

Connecting the AC Grid

If the Safety Switch has a pre-assembled meter (RGM) (in single phase inverters), flip the RGM plate downwards before making the connections.

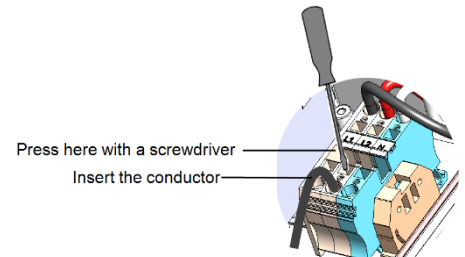


WARNING!

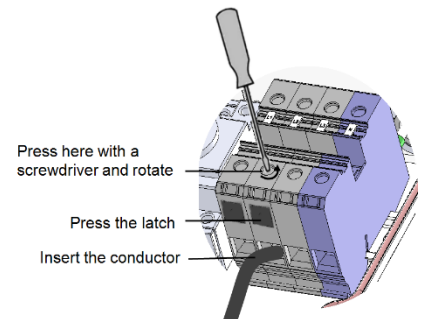
Connect the equipment grounding before connecting the AC wires to the AC terminal block.
Veillez à relier le conducteur de PE (la terre) avant de connecter les fils CA au bornier CA.

- 1 Insert the AC conduit into the AC-side drill guide that was opened.
- 2 Connect the ground cable to the equipment grounding bus-bar. Tighten using a torque of 2.0 N*M / 18 lb-in.
- 3 Connect the line and neutral wires, and check that they are fully inserted and cannot be pulled out easily:

- *Single phase 3-7.6kW and three phase inverters 9kW, 10kW, 20kW inverters* - Use a standard straight-bladed screwdriver to connect the wires to the spring-clamp terminals, according to the labels on the terminal blocks.



- *Single phase 10-11.4 kW and three phase 14.4 & 33.3kW inverters* - Use a 03/16" (5mm) straight flat-blade screwdriver to connect the wires to the appropriate spring-clamp terminals, according to the label on the terminal blocks.
- 4 Verify that there are no unconnected wires.



Connecting the Strings

- 1 Insert the DC conduit into the DC-side drill guide that was opened.
- 2 Connect the DC equipment ground conductor to the equipment grounding terminal block.



NOTE:

Functional Electrical Earthing of DC-side negative or positive is prohibited because the inverter has no transformer. Earthing of module frames and mounting equipment (equipotential bonding) is required per NEC.

- 3 Connect the DC wires, and check that they are fully inserted and cannot be pulled out easily. If the Safety Switch has a pre-assembled RGM (in single phase inverters), flip the RGM plate before making the connections, and then return the plate:
- *Single phase 3-11.4kW and and three phase inverters 9kW, 10kW, 20kW inverters* - Use a standard straight-bladed screwdriver to connect the DC wires from the PV installation to the DC+ and DC- spring-clamp terminals, according to the labels on the terminals. Refer to the figures above.
- *Three phase 14.4kW and 33.3kW inverters* - Use a 03/16" (5mm) straight flat-blade screwdriver to connect the wires to the appropriate spring-clamp terminals, according to the label on the terminal blocks. Refer to the figures above.



CAUTION:

Ensure that the Plus (+) wire is connected to the Plus (+) terminal and that the Minus (-) wire is connected to the Minus (-) terminal.
Veillez à ce que le câble Plus (+) soit connecté au terminal Plus (+) et que le câble Minus (-) soit connecté au terminal Minus (-).

- 4 If more than two strings are required, they can be connected in parallel in an external combiner box before connecting to the switch.



NOTE:

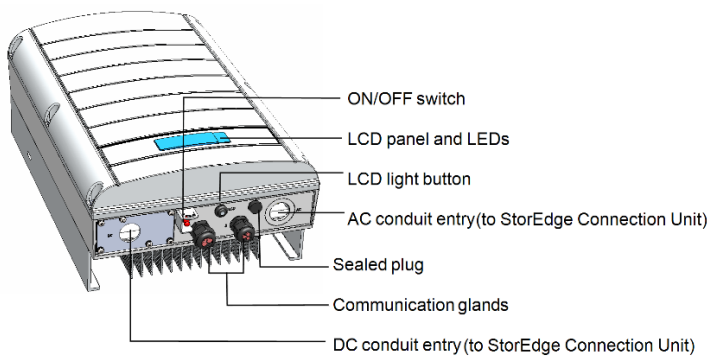
For systems with four PV strings or more, fuses may need to be installed in both the positive and negative conductors as required by NEC Article 690.9. Refer to http://www.solaredge.com/files/pdfs/string_fusing_requirements.pdf.



- 5 If the Safety Switch has a pre-assembled RGM, flip the RGM plate upwards to its original position.
- 6 Close the switch cover.

Inverter Interfaces

The following figure shows the inverter connectors and components, located at the bottom of the inverter.



Commissioning and Activating the Installation

- 1 Verify that the inverter ON/OFF switch is OFF.
- 2 Turn ON the AC breaker.
- 3 Move the Safety Switch to the OFF position.
- 4 Remove the inverter cover: Open the inverter cover's six Allen screws and carefully pull the cover vertically before lowering it.



WARNING!

ELECTRICAL SHOCK HAZARD. Do not touch uninsulated wires when the inverter cover is removed.

RISQUE D'ÉLECTROCUTION. Ne touchez pas les fils non isolés lorsque le couvercle de l'onduleur est retiré.

- 5 Activate the inverter according to the activation instructions supplied in the inverter package.
- 6 Verify that the inverter is configured to the proper country or grid setting: Press the LCD light button until reaching the ID status screen:

```
ID : ##### #
DSP 1 / 2 : 1 . 0 2 1 0 / 2 . 0 0 1 9
CPU : 0 0 0 3 . 1 9 0 7
Country : U S A 2
```

- 7 If required, perform the following additional steps before closing the inverter cover:
 - Country settings or inverter configuration using the internal LCD user buttons, located just above the LCD and are numbered **esc, 1, 2, 3/Enter** from left to right. Enter the menus by pressing **ENTER** for five seconds and then inputting the password 12312312. To verify that the country code is set to USA, select **Country** from the main menu, press **Enter** and select **USA+**. In the next menu that appears, select the desired AC grid configuration.
 - Communication options connection – refer to *Setting up Communication* on page 6.
- 8 Close the inverter cover by tightening the screws with a torque of 9.0 N*m/ 6.6 lb*ft. For proper sealing, first tighten the corner screws and then the two central screws.
- 9 Make sure the Safety Switch is ON. If an additional external DC switch is installed between the power optimizers and the inverter(s) then turn it ON.

A message similar to the following appears on the inverter LCD panel:

```
V a c [ V ]   V d c [ V ]   P a c [ W ]
2 4 0 . 7     1 4 . 1       0 . 0
P _ O K :    0 0 0 / 0 0 0   < S _ O K >
                        O F F
```

- 10 Verify that the following information appears on the LCD panel:
 - **Vac[V]**: Specifies the grid voltage.
 - **Vdc[V]**: The DC input voltage of the longest string connected to the inverter. There should be a safety voltage of 1V for each power optimizer in the string.
 - **Pac[W]**: AC power production. At this stage, it should be 0w.
 - **P_OK**: Specifies the number of properly connected power optimizers.
 - **S_OK**: Indicates the status of the connection to the SolarEdge monitoring portal (if connected).



WARNING!

Before proceeding to the next step, make sure that the cover is closed! High DC Voltage will be present in the inverter following the next step!

Avant d'entamer la prochaine étape, assurez vous que le couvercle est fermé ! Une tension DC très haute sera présente durant l'étape suivante !

Pairing Power Optimizers to the Inverter

- 1 Verify that the ON/OFF switch at the bottom of the inverter is OFF.
- 2 Press and hold down the inverter LCD button for about 10 seconds. The following message is displayed:

```
Keep holding button
for pairing, release
to enter menu...
Remaining: 3 sec
```

Keep holding for 5 seconds until the following is displayed:

```
Pairing
Turn Switch To On
```

- 3 Turn the inverter ON within 5 seconds. If you wait longer than 5 seconds, the inverter exits the pairing mode. The following message is displayed indicating that the inverter is performing the pairing.

```
Pairing
Remaining [sec]: 180
```

- 4 Wait for the completion of the pairing (remaining seconds is 0). If pairing fails, an error is displayed. In this case, repeat the pairing steps.

- 5 When pairing succeeds, the following message is displayed:

```
Pairing
Pairing Completed
```

- 6 At the end of the pairing process, the system will start producing power. Verify on the LCD screen that the number next to P_OK equals the number of installed power optimizers. It may take up to 20 minutes until all the power optimizers are indicated.



WARNING!

After you turn ON the inverter ON/OFF switch, the DC cables carry a high voltage and the power optimizers no longer output a safe 1V output.

Après avoir mis l'interrupteur ON/OFF de l'onduleur monophasé sur ON, les câbles DC portent une haute tension et les optimiseurs de puissance ne génèrent plus la tension de sécurité de 1V.



WARNING!

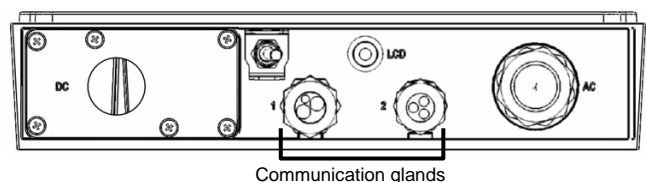
After you turn OFF the inverter ON/OFF switch, wait until the LCD indicates that the DC voltage is safe (<50V), or wait five minutes before opening the cover or disconnecting the strings.

Après avoir tourné l'interrupteur ON/OFF sur OFF, attendre jusqu'à ce que l'écran LCD indique que la tension DC est sécurisée (<50V) ou attendre cinq minutes avant d'ouvrir le couvercle ou de déconnecter les strings.

Setting up Communication

Two communication glands are used for connection of the various inverter communication options. Each gland has three openings. The table below describes the functionality of each opening. Unused openings should remain sealed.

Gland#	Opening	Functionality	Cable Size (diameter)
1(PG 16)	One small	External antenna cable	2-4 mm
	Two large	Ethernet connection (CAT5/6), ZigBee, GSM, Cellular	4.5-7 mm
2 (PG 13.5)	All three	RS485	2.5-5 mm



Cable Specifications

- Ethernet:
 - Cable type – a shielded Ethernet cable (Cat5/5E STP) may be used
 - Maximum distance between the inverter and the router – 100 m/ 330 ft.
- RS485:
 - Cable type: Min. 3-wire shielded twisted pair (a shielded Ethernet cable (Cat5/5E STP) may be used)
 - Wire cross-section area: 0.2- 1 mm²/ 24-18 AWG (a CAT5 cable may be used)
 - Maximum nodes: 32
 - Maximum distance between first and last devices: 1 km /3300 ft.



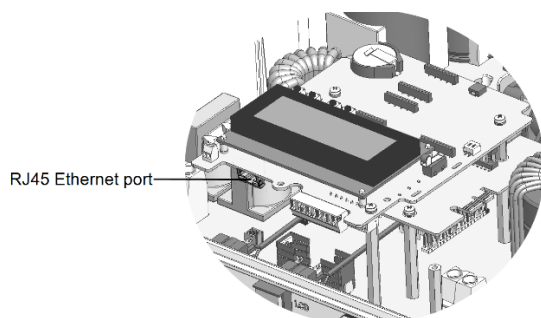
NOTE:

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.us/files/pdfs/lightning_surge_protection.pdf. If not using surge protection, connect the grounding wire to the first inverter in the RS485 chain; make sure the grounding wire is not in contact with other wires. Connect the grounding wire to the grounding bus-bar in the Safety Switch.

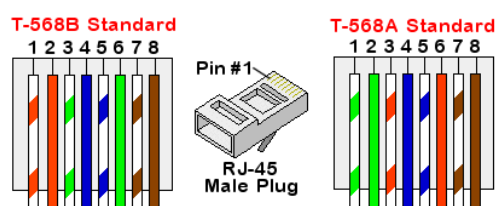


Creating an Ethernet (LAN) connection

- 1 Make sure that the ON/OFF switch at the bottom of the inverter is turned OFF, and the Safety Switch is turned OFF.
- 2 Remove the plastic seal from the large opening that has a cut in communication gland #1 and insert an Ethernet CAT5/6 cable through the opening.



RJ45 Pin #	Color	
	T568B Standard	T568A Standard
1	White/Orange	White/Green
2	Orange	Green
3	White/Green	White/Orange
4	Blue	Blue
5	White/Blue	White/Blue
6	Green	Orange
7	White/Brown	White/Brown
8	Brown	Brown



- 3 Use a pre-terminated cable to connect via gland no.1 to the RJ45 plug on the inverter's communication board, or, if using a spool of cable, connect as follows:
 - Insert the cable through gland no.1.
 - Insert the eight wires into an RJ45 connector, as described in the figure above.
 - Use a crimping tool to crimp the connector.
 - Connect the Ethernet connector to the RJ45 port on the inverter's communication board.
- 4 For the switch/router side, use a pre-terminated cable or use a crimper to prepare an RJ45 communication connector: Insert the eight wires into the RJ45 connector, maintaining the same color coding and pinout on both sides of the Ethernet cable.
- 5 Connect the cable's RJ45 connector to the RJ45 port of the Ethernet switch or router.
- 6 Inverters are configured by default to LAN. If reconfiguration is required:
 - Make sure the ON/OFF switch is OFF.
 - Turn ON the AC to the inverter by turning ON the circuit breaker on the main distribution panel.



WARNING!

ELECTRICAL SHOCK HAZARD. Do not touch uninsulated wires when the inverter cover is removed.

RISQUE D'ÉLECTROCUTION. Ne touchez pas les fils non isolés lorsque le couvercle de l'onduleur est retiré.

- Use the user buttons to configure the connection.

Creating an RS485 connection



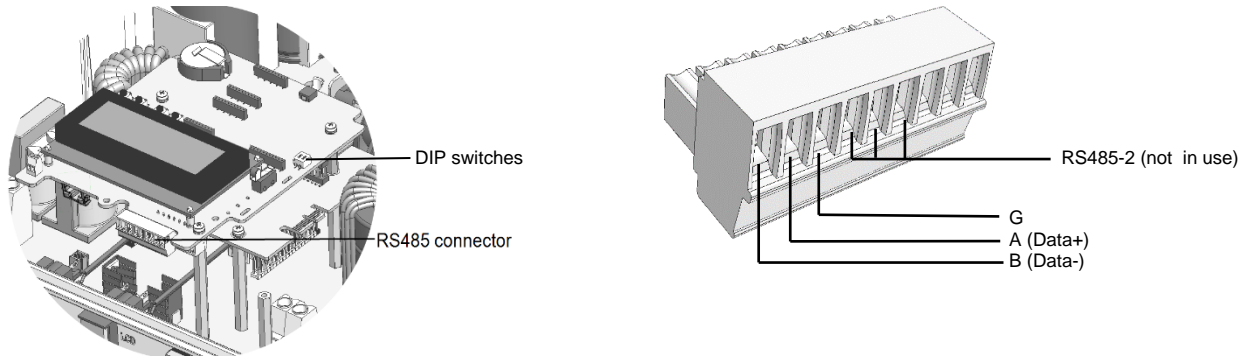
NOTE:

An additional RS485 port (RS485-E) is available from SolarEdge, allowing configuration of multiple RS485 buses for communications in large sites; Refer to http://www.solaredge.us/files/pdfs/RS485_expansion_kit_installation_guide.pdf.






- 1 Make sure that the ON/OFF switch at the bottom of the inverter is turned OFF, and the Safety Switch is turned OFF.
- 2 Remove the seal from one of the openings in communication gland #2 and insert the wire through the opening.
- 3 Pull out the 9-pin RS485/RS232 terminal block connector, and loosen the screws of pins **B**, **A** and **G** on the left of the RS-485 terminal block.
- 4 Insert the ends of wires into the **G**, **A** and **B** pins. Use four- or six-wire twisted pair cable for this connection. 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.
- 5 For creating an RS485 bus - connect all B, A and G pins in all inverters.
- 6 Tighten the terminal block screws, and push it firmly all the way into the communication board.

- 7
- Terminate the first and last inverters in the chain by switching a termination DIP-switch inside the inverter to ON (move the left switch to the top). The switch is located on the communication board and is marked **SW7**.
- 8
- To connect to the SolarEdge monitoring portal, designate a single inverter as the connection point between the RS485 bus and the monitoring portal. This inverter will serve as the master inverter. Connect the master to the SolarEdge monitoring portal via one of the communication options.



Using other communication options

Refer to the installation guide supplied with the communication kits:

Communication option	Refer to	
ZigBee	https://www.solaredge.com/sites/default/files/se-zigbee-home-gateway-installation-guide.pdf	
Cellular - GSM	http://www.solaredge.com/sites/default/files/cellular_gsm_installation_guide.pdf	
Cellular - CDMA	https://www.solaredge.com/sites/default/files/cellular_cdma_kit_installation_guide_na.pdf	

Refer to the *SolarEdge Installation Guide* for detailed installation and safety instructions.

Support and Contact Information

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

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