solaredge

Installation guide for Solar Edge inverters

Version 2.6

solar**edge**

Legal Notice

Important Notice

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The terms of purchase of SolarEdge products should apply.

The content of these documents is reviewed continuously and modified, if necessary. However, discrepancies can not be excluded. No guarantees are made for the completeness of these documents.

Compliance with emission standards

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

- Reorient or move the antenna.
- Increasing the distance between the equipment and the receiver (and its antenna).
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio / TV technician for assistance. Changes or modifications not expressly approved by the party responsible for compliance could void the user's permission to use the equipment.

support and contact information

For technical questions about our products, please contact us:

Australia	1800 465 567	support@solaredge.net.au
Germany	+ 49 89-45459730	support@solaredge.de
APAC (Asia Pacific)		support-asia@solaredge.com
Belgium	080073041	support@solaredge.be
France	0800917410	support@solaredge.f r
Italy	800784824	support@solaredge.it
Japan	+ 81.3.5530.9360	support@solaredge.jp
UK	0800 028 1183	support@solaredge.uk
USA & Canada	1 877 360 5292	ussupport@solaredge.com
Greece	00800125574	
Israel	+ 972 73 240-3118	support@solaredge.com
Netherlands	08000221089	
For the rest of the world	+ 972 73 240-3118	
Fax	+ 972 73 240-3117	

Before contacting us, make sure you have the following information handy:

- The model numbers of the inverter and power optimizer
- The product serial number in question
- The error indicated on the display of the inverter, or the SolarEdge Monitoring Portal, if such indication appears.

- The system configuration information, including the type and the number of connected modules, and the number and length of the channels.
- The communication method to the SolarEdge Monitoring Portal, if the site is connected
- The software version of the inverter as it appears on the status of the identifier screen (see page 40)

Contents

HANDLING INSTRUCTIONS AND SECURITY

During the installation, testing and inspections, compliance with all instructions of handling and safety is mandatory.

SAFETY SYMBOLS

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

	WARNING !
	Indicates danger. It calls attention to a procedure which, if not performed correctly 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.

	WARNING :
	Indicates danger. It calls attention to a procedure which, if not performed correctly or adhered to, could result in **damage or destruction of the product.** Do not proceed beyond a warning until the indicated conditions are fully understood and met.

	NOTE :
	Indicates additional information on the current topic.

	SECURITY ELEMENT IMPORTANT:
	Indicates information on security issues.

SAFETY INSTRUCTIONS

WARNING !

The cover should be opened only after turning off the ON / OFF switch at the bottom of the inverter. It disables the DC voltage inside the inverter.

Wait five minutes before opening the cover. Otherwise there is a risk of electric shock due to the energy stored in the capacitors.

ON / OFF switch

ON = 1 OFF = 0
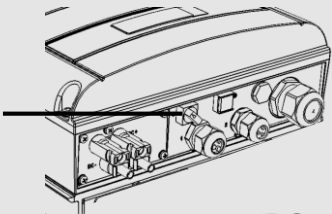
WARNING !

Before operating the inverter, make sure the AC power cord and wall outlet are properly connected to the earth.

WARNING !

The opening of the inverter and the repair or power tests must be performed by qualified personnel familiar with this UPS.

WARNING !

Do not touch the solar panels or any other rail system connected when the dimmer switch is on, unless grounded.

WARNING :

This unit must be used according to the specifications of operation, as described in the latest datasheet specifications, available on the website of SolarEdge

http://www.solaredge.com/groups/products/overview.

WARNING :

The inverters are IP65 class. Unused connectors and cable glands must be sealed with the gaskets supplied.

NOTE :

Use PV modules classified in accordance with the IEC 61730 standard class A.

NOTE :

The symbol appears to grounding points on the SolarEdge equipment. This symbol is also used in this manual.

NOTE :

The following warning symbols appear on the warning label

UPS:

Symbol	Warning
	Risk of electric shock
5 minutes	Risk of electric shock from energy stored in the capacitor. Do not remove the cover as 5 minutes after disconnecting all power sources.
	Hot surface - To reduce the risk of burns, do not touch.

Chapter 1: System Overview

SolarEdge

System Overview

The SolarEdge power conversion solution optimizes energy production of all types of solar photovoltaic (PV) while reducing the average cost per watt. The following sections describe the various components of the system.

SolarEdge Power Optimizer

SolarEdge power optimizers are DC-DC converters connected to PV modules to maximize energy recovery by performing independent monitoring of maximum power point tracking (MPPT) at the module level.

power optimizers regulate the tension on the chain at a constant level, regardless of the length of the string and the environmental conditions. power optimizers include a safety voltage function for automatically reducing the output of each power optimizer to 1 Vpp in case of failure or when disconnected from the inverter or when the ON / OFF switch of UPS is turned off. Each power optimizer also transmits module performance data on the DC power line to the inverter. Two types of power optimizers are available:

- A power optimizer added to the module - connected to one or more modules
- An integrated power optimizer module - integrated in a module

SolarEdge inverter

The inverter SolarEdge effectively converts the DC power from AC power modules which can be introduced into the main AC terminal site and from there to the power line. The inverter also receives each power optimizer surveillance data and transmits them to a central server (the SolarEdge Monitoring Portal; this requires an Internet connection).

SolarEdge Monitoring Portal

The SolarEdge Monitoring Portal enables you to monitor the technical and financial performance of one or more SolarEdge sites. It provides information on current and past performance of each module individually and on the system as a whole.

Installation procedure

The following section is to describe the procedure for installing and configuring a new site SolarEdge. Many items also apply to the modification of an existing site.

Connecting the power optimizers and the modules on a chain	page 11
Record serial numbers of the power optimizers	Pages 14 and 27
Inverter installation	page 16
Connection strings and AC power to the inverter	Pages 21 and 23
Commissioning and activation of the installation	page 24
Connecting the inverter to the SolarEdge Monitoring Portal	page 27
UPS configuration	page 30

List of installation equipment

Standard tools can be used for installation of the SolarEdge system. The following is a recommendation of the equipment required for installation:

- Allen screwdriver for M6 / M8 screws
- Standard flathead screwdriver set
- Voltage Tester Screwdriver
- Drill motor and drill bits suitable for the surface on which the inverter is installed.
- Material suitable for attaching the inverter mounting bracket to the surface on which it will be connected
- Stainless steel screws M6 (1/4 ") / M8 (5/16"), nuts and washers for fastening the power optimizer in the rack
- Crimping tool MC4
- Wire cutter
- Wire strippers for cables
- Multimeter

For the communication options installed, you may also need the following:

- For Ethernet:
  - pair Ethernet cable twisted CAT5 / 6
  - RJ-45 plugs
  - Crimping tool RJ-45
- For RS485:
  - twisted pair of four or six son
  - Set of precision watchmaking screwdriver

Transport and storage of the inverter

Transporting the UPS in its original packaging, facing up and without exposure to unnecessary shocks. If the original packaging is not available, use a similar box that can support the weight of the inverter (refer to the weight of the inverter in *Appendix B: Specifications* on page 61) with a handle system and can be closed completely.

Store the inverter in a dry place where the ambient temperature is between -25 ° C - + 65 ° C / -13 ° F 149 ° F.

Chapter 2: Construction of optimizers

power

Security

The following notes and warnings apply when installing power optimizers:

WARNING !

When modifying an existing installation, turn the ON / OFF switch of the inverter and the AC circuit breaker on the main switchboard CA.

WARNING !

The input and output connectors are not waterproof until mating. Open connectors must be connected to another connector or be sealed with waterproof caps.

WARNING :

This unit must be operated within the operating specifications in this document.

WARNING :

Cut the connector of the input cable or output of the power optimizer is prohibited and void the warranty.

WARNING :

The power optimizers comply with IP65 / NEMA4 standard. Choose a mounting location where optimizers will not be immersed in water.

WARNING :

If you intend to mount optimizers directly on the module or module frame, first consult the module manufacturer for instructions regarding the mounting location and, where applicable, the impact on the module warranty . Drilling holes in the module frame can be done according to the instructions of the module manufacturer.

WARNING :

The installation of SolarEdge system without ensuring compatibility module connectors with Optimizer connectors may be dangerous and could cause functionality problems as defects of grounding, resulting in switching the inverter.

To ensure mechanical compatibility of the SolarEdge optimizers and modules they are connected:

• • Use identical connectors from the same manufacturer and the same type for both the power and the modules optimizer; or

• • Make sure the connectors are compatible as follows:
  • The connector manufacturer should explicitly verify compatibility with the SolarEdge connector optimizer; and

  • A third test report from one of the following external laboratories (TUV, VDE, Bureau Veritas UL, CSA, Intertek) must be obtained regarding the verification of the compatibility of connectors.

SECURITY ELEMENT IMPORTANT:

The modules with SolarEdge power optimizers are safe. They have only a low safety voltage before the inverter is switched on. As power optimizers are not connected to the inverter or the inverter is in the OFF position, each power optimizer will output a safe 1V voltage.

Installation Instructions

- This chapter refers only to power optimizers added to the module. For integrated module models, refer to the installation instructions provided with the integrated module.
- The power optimizer can be placed in any orientation.
- Position the power optimizer sufficiently close to its modulus so that their cables can be connected.

- To allow heat to dissipate, to maintain a free space of 2.5 cm / 1 " distance between the power optimizer and other surfaces.
- The guidelines for minimum and maximum length of the chain are set out in the specifications of the power optimizer.
- Refer to the SolarEdge site designer for verification of the chain length. The site designer SolarEdge is available on the website of the SolarEdge http://www.solaredge.fr/groups/support/downloads **Under the software tools.**
- The completely shaded modules can result in temporary cessation of power optimizers. This will not affect the performance of other power optimizers on the chain, as the minimum number of chain power optimizers connected to non-shaded modules. If under normal conditions, optimizers connected to non-shaded modules are fewer than the minimum required, add other optimizers in the string.

- Do not let the connectors discovered power optimizers. Open connectors must be connected to each other.

Step 1, Mounting the Power Optimizers

1 Determining the power optimizer mounting location and use of media
   fixing the power optimizer to fix it to the bearing structure (see Figure 1)

2 If necessary, mark the locations of the mounting holes and drill holes.

> **WARNING :**
> Do not drill through the power optimizer or through the mounting holes. drilling vibrations may damage the power optimizer and void the warranty.

3 Securing each power optimizer on the rail using bolts, nuts and steel washers
   Stainless M6 (1/4 ") / M8 (5/16").

4 Verify that each power optimizer is securely attached to the support structure or
   module.

> **NOTE :**
> Record the serial numbers and locations of power optimizers, as described in *Provide information about the installation* page 28

Step 2, Connecting a module to an optimizer
power

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

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

Mounting Bracket

Exit

Input - Connect the module
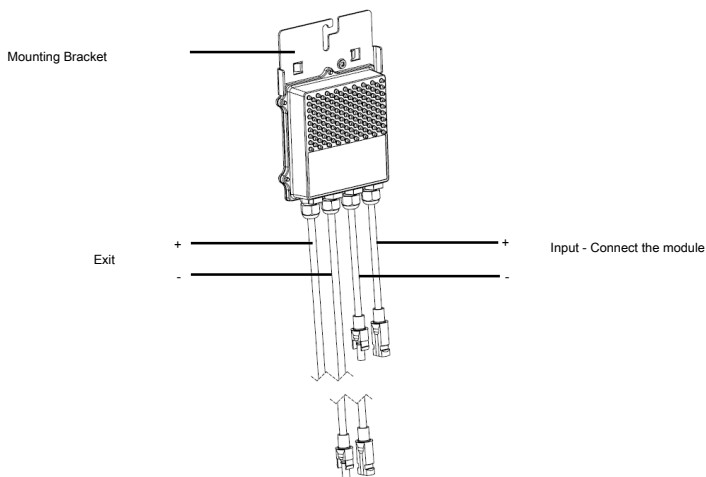
Figure 1: Connectors of the power optimizer

NOTE :

Images are for illustrative purposes only. Refer to the label on the product to identify the input over and under and output connectors.

Step 3, Connecting Power Optimizers
channels

You can build strings in parallel of unequal length, that the number of power optimizers on each channel may be different. maximum and minimum chain lengths are shown in the data sheet of power optimizers. Refer to the SolarEdge site designer for verification of the chain length.

NOTE :

The string length must not exceed 300m from the CC + to CC UPS. Use DC cables of 4 mm² minimum.

1 Connect the output connector Minus (-) of the first channel power optimizer
      output connector Plus (+) of the second chain power optimizer.

2 Connect the rest of optimizers on the channel in the same way.
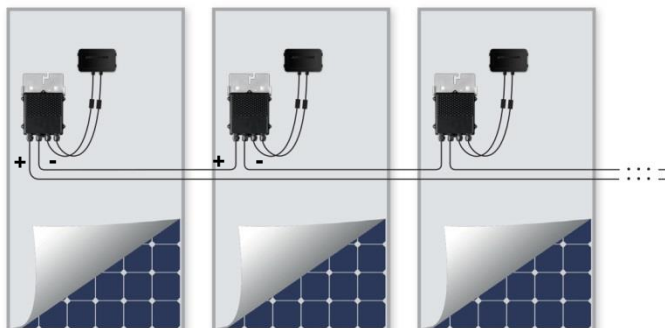
Figure 2: power optimizer connected in series

3 If you intend to monitor the system, using the monitoring portal
SolarEdge, save the physical location of each power optimizer, as described in *Provide information about the installation* on page 28.

> **BAIL:**
> Do not leave power optimizers connectors discovered and disconnected. Open connectors must be coupled to each other.

Step 4, correct connection of the Audit

the power optimizer

Once the module is connected to a power optimizer, the power optimizer sends a safe 1V voltage. Therefore, the total voltage of the string will be equal to ~ 1V multiplied by the number of power optimizers connected in series on the chain. For example, if 10 power optimizers are connected in a chain, then 10V will be produced.

- Make sure that the modules are exposed to sunlight during this process; otherwise, the power optimizers can not be turned on. If you use a tracker, the power optimizer is only turned on if the tracker follows the sun and the module provides at least 2W.

- In SolarEdge systems, due to the introduction of power optimizers between PV modules and the inverter, the **significance of the current terms of short circuit I_{sc} and open circuit voltage V_{oc} is different from that of traditional systems. For more information on the voltage and current string of SolarEdge systems, refer to the** *Technical Note V_{oc} and I_{sc} in SolarEdge systems* available at link

  http://www.solaredge.com/files/pdfs/isc_and_voc_in_solaredge_sytems_technical_note.pdf

- Insulation measuring with a measuring device, up to 1000 V is acceptable.

► **To check the correct connection of the power optimizers:**

1 Measuring the voltage of each string individually before their connection to other
chains or the inverter. Verify the correct polarity by measuring the polarity of the channel using a voltmeter.
Use a multimeter with a measuring accuracy of at least 0.1 V.

2 For troubleshooting problems with operation of power optimizers, see
you *Troubleshooting power optimizers* on page 60.

Chapter 3: Installation of the inverter

Install the inverter either before or after the installation of modules and power optimizers.

> **WARNING :**
> Leave at any time the connectors at the base of the inverter rest on the ground, as this may damage them. Let rest the inverter on the floor, place it on the back, front or side.

Package contents of the inverter

- SolarEdge inverter
- A mounting bracket
- Two Allen screws to the inverter to the mounting bracket
- This installation guide
- The Quick Installation Guide
- The activation of the inverter instructions (can include an activation card)

Identifying the Inverter

Refer to the sticker on the UPS indicating its **Serial number** and his **Electrical Specifications.** Report serial number when you contact SolarEdge support. The serial number is also required when opening a new site in the SolarEdge Monitoring Portal. In the following sections, unless otherwise indicated, instructions apply to the inverters both single and three phase, although only one graphic example is presented.

The interfaces of the inverter

The following figure shows the connectors and the components of the inverter, at the base of the inverter. The ON / OFF switch and the LCD indicator light may vary depending on the inverter model:

DC Input Panel LCD and LED ON / OFF switch

Indicator light LCD sealed sheet

IT

Gland communication

Fan
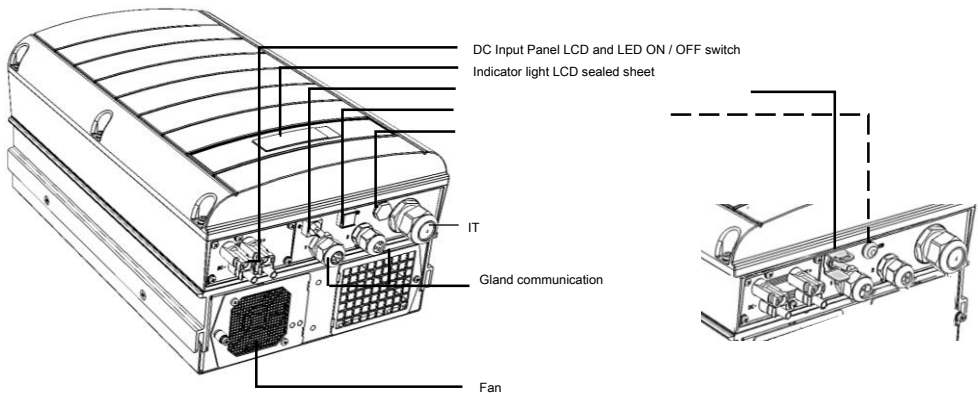
Figure 3: Connectors of the inverter (three-phase example)

• **LCD panel:** displays information and UPS configuration settings

• **LED LCD:** Three LEDs indicate the following statuses of the UPS (see Figure 4)

Color Description		functionality
Green	Energy production	**We** - The inverter produces energy. **Turn signal -** Standby. The inverter is in standby mode until the working voltage is reached. The inverter then goes into production mode and produces energy. **off -** The inverter does not produce energy. This is perhaps the night mode, when the ON / OFF switch of the inverter is turned off or when an error occurs.
Yellow	Communication module and inverter off	Turn signal : • monitoring information received from a power optimizer • The inverter is under extinction.
Red	Breakdown	**We -** An error has occurred. Refer to the *Appendix A: Errors and Troubleshooting* on page 52 for more information. **Turn signal -** The inverter is under extinction.

All LEDs are lit during the configuration of the inverter.

LCD

LEDs:
Green
Yellow
Red

LCD LED Indicator
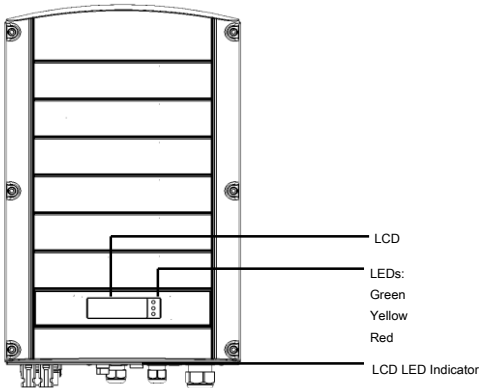
Figure 4: Front view of the inverter

• **AC output**

external caliber of the AC cable:

•   Single-phase inverters: PG21 (9-16mm diameter)

•   three-phase inverter: M32 (15-21mm in diameter)

• **DC inputs:** for connection of the PV system

> **WARNING :**
> Do not remove the six screws CC metal panel since it can damage the sealing on the inverter and void the warranty.

- **ON / OFF switch:** turn the switch ON position initiates the operation of the power optimizers and allows the inverter to start exporting energy to the power grid. The closure of the switch reduces the voltage of the power optimizer to a low intensity safety voltage and prevents the export of energy. When this switch is off, the inverter control circuit remains energized.

- **LCD light button:** press this button lights up the LCD for 30 seconds. Also, you can press this button to access the options in the setup menu, as described on page 32.

- Two **communication cable glands,** with a diameter of 20 mm each for the connection of communication options of the inverter. Each gland has three openings. refer to the *Chapter 6: Communication Setup* on page 43 for more information.

Mounting the Inverter

The inverter is provided with one of two types of mounting bracket. The assembly steps in the

following sections refer to these types of media
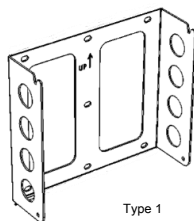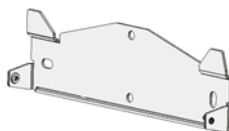
Type 1   Type 2

Figure 5: Mounting Media Types

> **NOTE:**
> Make sure the surface or the mounting structure can support the weight of the inverter and fastening.

> **WARNING :**
> HEAVY OBJECT. The weight of the single-phase inverter 20-21 kg and 33 kg three-phase inverter. To avoid muscle tear or injury in the back, use proper lifting techniques, and if necessary - a lifting aid LTo remove or replace the inverter.

1 Determine the mounting location of the inverter on a wall or on a pole, as follows:

- To allow for heat dissipation, keep sufficient space between the UPS and other objects:

  - 20 cm / 8 "at the top and the bottom of the inverter
  - 10 cm / 4 "to the right and to the left of the inverter

- • When installing inverters one above another, leave at least a space of 40 cm / 16 "between the inverters.
  When installing inverters side by side, follow the free space following specifications:

	Single-phase UPS	Three-phase UPS
Pitches with an upper annual average temperature **below 25** VS	20 cm / 8 "between the inverters	20 cm / 8 "between the inverters
Pitches with an upper annual average temperature **above 25** VS		40 cm / 16 "between the inverters

- ● Position the mounting bracket against the wall / pole and mark the location of punched holes (refer to Appendix C: Mechanical Specifications
- ● Dimensions of the inverter and the mounting bracket on page 68):
  - • For type 1 - Ensure that the U-shaped notches are oriented upwards and the marking "up" is properly oriented, as illustrated below:
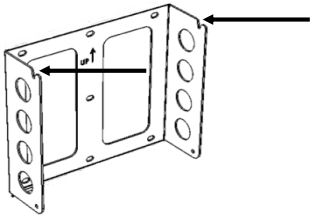
Figure 6: Mounting with U-shaped notches face upwardly

- • For type 2 - Ensure that the flat portion of the support is downwardly as shown in Figure 8
- • Use at least two holes for the support. Additional holes can be used to secure the bracket. Identify holes and how much will be used depending on the type and material of the mounting surface.

2 Drill the holes and mount the bracket. Check that the support is firmly attached to the surface of mounting.

3 Hang the inverter on the support (Figure 7 and Figure 8), lift the inverter on the sides, or enter the inverter from the top and from the bottom to lift the UPS in its place

- • For type 1 - Use the screws on the top of the inverter as shown below. Leave the flat inverter against the wall or pole.
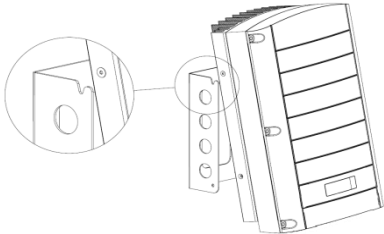
Figure 7: Hang the inverter on the bracket - Type 1

- • For type 2 - Align the two notches in the notch of the inverter with the two triangular mounting flanges of the support and lower the inverter jusqu'`à it is placed evenly on the support.

Mounting
Flange

nick
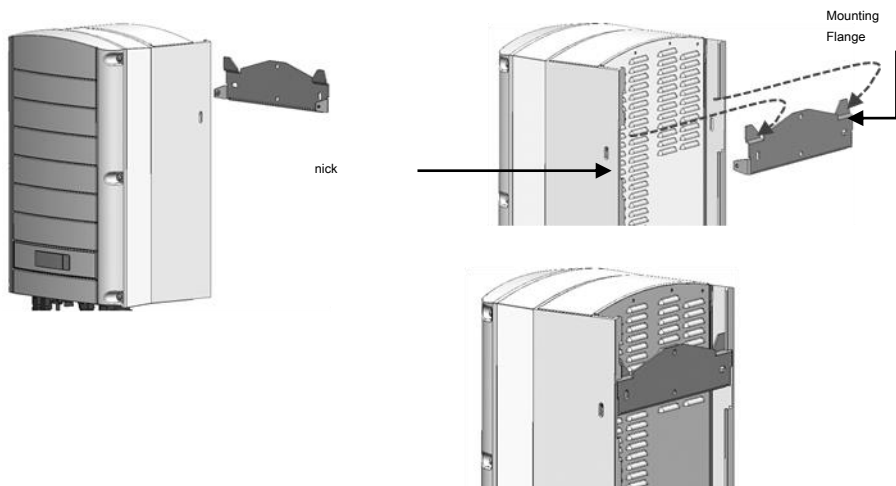
Figure 8: Hanging the inverter to support - Type 2

4   Insert two screws through the fin outside the heat sink on both sides of the inverter and in the support. Tighten the screws using a torque of 4.0 N * m / 2.9 ft * lb.

media type 1

type support 2

Bracket Screw

Bracket Screw
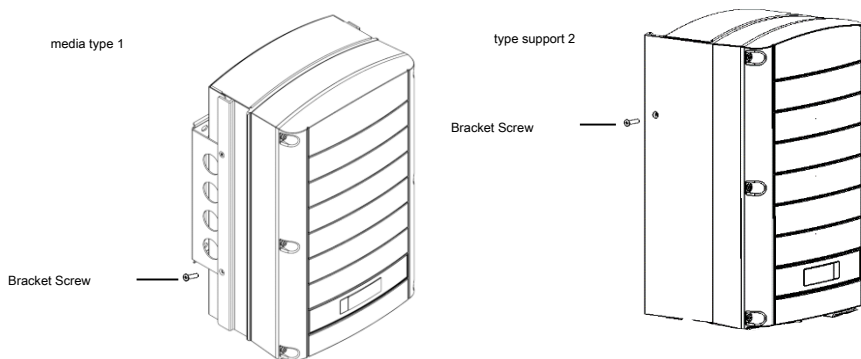
Figure 9: Insertion of the stand mounting

AC connection to the inverter

Refer to the *Appendix B: Specifications* on page 61, for inverters specifications in different countries.

Guidelines for network connection

NOTE :

The three-phase inverters require a connection to a neutral phase at any time (only networks with a neutral connection are supported).

- For installation on a network without neutral phase, several single-phase inverters can be used.

- For more information on wiring, refer to Note recommended AC wiring application available on the SolarEdge SolarEdge website on http://www.solaredge.com/files/pdfs/application-note-recommended-wiring.pdf
- When connecting several single-phase inverters in a system connected to a three-phase system, the phase balancing may be required by an operator of public service or network. The balancing of the phases is supported by SolarEdge inverters. For detailed information, refer to *u Manual balancing phase SolarEdge*

  available on the SolarEdge website
  http://www.solaredge.com/files/pdfs/phase_balancing_connection_guide.pdf .

Connecting to CA

Use a cable with three phase connection for a son or a son five cable for three phase connection. The maximum size of the son of the terminals at the entrance of 16mm².

1 Switch off the circuit breaker CA.

2 Open six Allen screws from the UPS cover and gently remove the lid vertically
before lowering.

WARNING :

When removing the lid, make sure not to damage internal components. SolarEdge can not be held responsible for any damage resulting component imprudent removal of the cover.

3 insulating strip of 58 mm / 2.32 "of the external cable and insulating tape 8 mm / 0.32" internal thread.

0. 32 in / 8 mm

2. 00 in / 50 mm
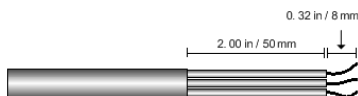
Figure 10: Insulating tape - CA (3 cable son)

4 Open the packing of the AC cable and insert the cable into the cable gland (see Figure 3)

WARNING !

Turn off the AC before connecting terminals CA. Connect the ground wire to ground the equipment before connecting the AC line and neutral son.

5 Depending on the type of inverter (single or three phase), connect the AC cable, as follows.

Login first PE wire (ground).

UPS monopha sé	
Wire Type	**Connecting to the terminal**
Protective earth	PE
Line	The
Neutral	NOT

PE L N
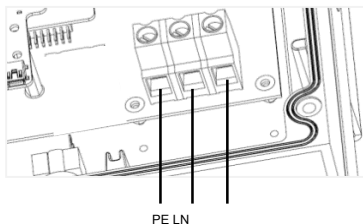
Figure 11: CA terminal of the inverter phase

Three-phase UPS	
Wire Type	**Connecting to the terminal**
Line 1	L1
line 2	L2
line 3	L3 (supplies the internal power supply)
Protective earth	PE
Neutral	NOT

L1 L2 L3 N   (EP)
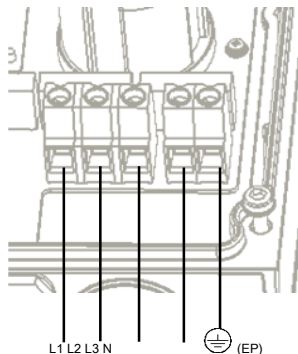
Figure 12: AC terminal of the three-phase inverter

NOTE :

If the Power Control is enabled, the connection order of the lines of the grid inverter is important. A difference of 120 degree phase **between L1 to L2 and L2 to L3 between must be maintained (L1-L2-L3 and not, for example L1-L3-L2). A phase difference of 120 ° between** L1 and L2, between L2-L3 should be maintained. If the network lines are not in that order, an error will be displayed on the LCD and the inverter will not produce energy.

6 Tighten the screws of each terminal with a torque 1,2 - 1.5 N * m / 0.88 to 1.1 lb ft *.

7 Check that the son are fully inserted and can be removed easily.

8 Tighten the gland of the AC cable with a torque of 2.8 to 3.3 N * m / 2.0 to 2.4 lb ft *.

9 Check that there is no not connected to the inverter wire and screws are unused terminals tight.

Connecting to the inverter chains

Connect the system to the DC input pairs. If necessary, connect additional strings in parallel with a grouping box / connection cables before connecting them to the inverter.

NOTE :

Making functional electrical earth of the negative pole or positive DC side is prohibited because the inverter has no transformer. The connection to the land of module frames and mounting equipment for PV modules is admitted ..

NOTE :

The fixed input voltage SolarEdge architecture allows parallel channels being of different lengths. Therefore, they do not need to have the same number of power optimizers, as the length of each string is within the allowed limits.

Connect the DC connector of each string to the DC + and DC- connectors according to the labels on the inverter.
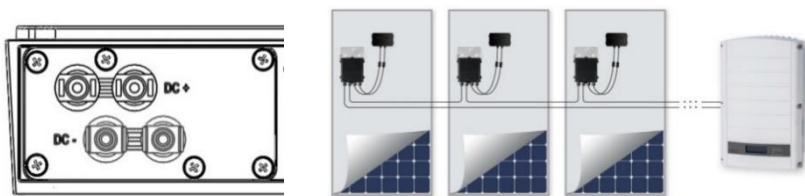
Figure 13: DC connections of the inverter

Selecting a residual current device

SECURITY ELEMENT IMPORTANT:

All SolarEdge inverters incorporate a residual current device (RCD) internal certified to provide protection against possible risks of electric shock and fire in case of malfunction of the solar module, cables or inverter. There are two triggers for RCD as required for certification (DIN VDE 0126-1 -1). The default value for the protection against electric shock of 30 mA, and a current of 300mA slow growth.

If an external RCD is required by local regulations, check the type of RCD required by the local electrical code. SolarEdge recommends using a type-A RCD. The recommended value of the RCD is 100mA or 300mA unless a lower value is required by the local power grid. When required by local regulations, the use of an RCD type B, is permitted. In installations where the local electric network requires the use of an RCD reduces leakage, parasitic capacitive discharge current will trigger RCD. Use the following steps to avoid this problem:

- Select an appropriate RCD to ensure proper operation of the installation. A 30mA RCD can also trigger at 15 mA (in accordance with IEC 61008). Good quality RCD to ring at a higher value.

- PV modules with low stray capacitance on the chassis are preferable. For more detailed information, refer to the *Application Note selecting RCD for SolarEdge inverters,* available on the website of SolarEdge http://www.solaredge.com/files/pdfs/seapplication-rc

Chapter 4: Commissioning of the facility

The next chapter describes how to activate the system, the commissioning of the installation, and verification of system operation.

Step 1 System activation

1 Make sure the on / off switch on the inverter is off. Turn the breaker CA.

> **WARNING !**
> RISK OF ELECTRIC SHOCK. Do not touch uninsulated son when the UPS cover is removed.

2 Activate the inverter according to the activation instructions provided in the package of the inverter.

3 Check that the inverter is configured for the right country: press the LCD illumination button up obtaining the status screen ID:

```
ID: # # # # # # # # # DSP 1/2: 1. 0 2 1 0/1. 0 0 5 2 CPU: 0 0 0 2. 0 4 7 1 P ays
FRA
```

4 If necessary, do the following before closing the lid of the inverter:
- Country settings, or configuration of the inverter user buttons of the internal LCD - see *Chapter 5: User Interface* page 29
- Connection of communication options - refer to *Chapter 6: Communication Setup* Page 43

5 Attaching the inverter cover and secure by tightening the screw with a torque of

9.0 N * m / 6.6 ft * lb. For proper sealing, first tighten the screws in the corners, then the two central screws. The following figure illustrates the recommended order:
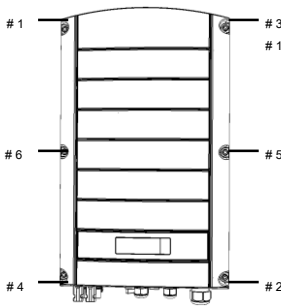
Figure 14: screw tightening Order

6 If another external DC switch is installed between the power optimizers and (s)

inverter (s), then turn it on.

A similar status screen the following appears on the LCD panel of the UPS:

```
V ac [v] V dc [v] P ac [w]
2 4 0, 7              1 4, 1              0, 0
P _ OK: 0 0 0/0 0 0 <S _ OK>
                              OFF
```

7 Verify that the following information appears on the LCD panel:

- **P_OK:** only appears during the first telemetry reception from the power optimizers. It indicates that the connection with power optimizers at least one power optimizer sends control data. If P_OK does not appear, check the power optimizer, string and DC input connections.

- **000/000:** only appears during the first telemetry reception from the power optimizers. Indicates the number of power optimizers that have been set in pairs on this inverter. At this point, the number should be 000, since no power optimizer has been paired.

- **S_OK:** the connection to the SolarEdge Monitoring Portal is successful (should appear only if the inverter is connected to the server). S_OK if not displayed and the inverter is connected to the server, refer to the *Appendix A: Errors and Troubleshooting* Page 52
- **Vac [V] -** the AC output voltage. Check that the value is correct.
- **Vdc [V] -** the DC input voltage of the longest chain connected to the inverter. A safe 1V voltage will be required for each power optimizer in the string.

NOTE :
A measurement error of ± 3V on the LCD screen of the inverter is acceptable.

- **Pac [W] -** the AC output power (will be **0.0** if the UPS is off).
- **OFF** - The ON / OFF switch of the inverter is in the OFF position.

Step 2, Pairing Power Optimizers to

UPS

Once all connections are made, all the power optimizers must be logically paired to their inverter. Power optimizers do not start producing power until they are coupled with an inverter. This step describes how to assign each inverter to a power optimizer from which it can produce energy. Perform this step when the modules are exposed to sunlight.

1 Make sure the ON / OFF switch is off.

2 Press and hold the LCD illumination button for about **10 seconds.** The message
following appears:

> M aintenirbout. app. pr. match. The â cherpourallermenu

Hold for 5 seconds until the following message:

> P airage
> T orld. interrupsur ON

3 Turn the ON / OFF switch of the inverter **during 5 seconds.** If you wait longer
5 seconds, the inverter is leaving the pairing mode.

The following message appears indicating that the inverter is currently conducting coupling.

> P airage
> R Estant [sec] 1 8 0

4 Wait until completion of the coupling (seconds remaining is 0). If the pairing fails,

error message is displayed. In this case, repeat the coupling steps. If the problem persists, contact SolarEdge support. When the pairing is successful, the following message appears:

5 Pairing Pairing made the system boot process begins:

- To the extent that the UPS is on, the power optimizers start producing power and the inverter starts converting AC

> ⚠️ **WARNING !**
> When the ON / OFF switch of the inverter turned on, the DC cables carry a high voltage and power optimizers have no safe 1V output.

- If the inverter starts the energy conversion after the initial connection to the AC, the inverter enters the standby mode until the working voltage is reached. This is indicated by the flashing green LED on the inverter.

- When the inverter is in standby mode, it monitors the network and checks the correct voltage and frequency of the network. The following message appears:

> **R awakening. . . R Estant: 0 5 1 S ec**

The countdown indicates the seconds remaining until the device comes into production mode. This time is consistent with local regulations and generally it is three to five minutes.

- When the countdown is completed, the UPS switches to Production mode and produces power. This is indicated by the steady light of the green LED on the inverter.

Step 3 Check the health

Once the reactivation time completed, a status screen similar to the following screen appears on the LCD panel of the UPS:

> **V ac [v] V dc [v] P ac [w]**
> **2 4 0 7 3 7 1 9 2 3 4. 9 3 P _ OK: XXX / YYY <S _ OK>**
>
> **WE**

1 Check the following:

- LED UPS green lights permanently.
- The ON indicator / STOP on the LCD panel displays **WE.**
- **P_OK: XXX / YYY:** A connection is established with power optimizers and at least one power optimizer sends monitoring data. Optimizers send telemetry at a frequency of 10 minutes. Initially after the coupling, both XXX and YYY values display 000 and increases when coupled power optimizers are reported.

> ✏️ **NOTE :**
> Sometimes it takes up to 20 minutes for all power optimizers to transmit their telemetry and be counted on the LCD screen.

- **S_OK** appears, if the inverter is connected to the SolarEdge Monitoring Portal
- **Vac [V]** indicates the AC output voltage measured on the network.
- **Vdc [V]** indicates the DC input voltage, which should be between 250V and 450V for single-phase inverters or between 550V and 950V for three-phase inverters.
- **Pac [W]** indicates the total output power of CA produced.

2 Note the serial number on the label # of the inverter. This information is used in the portal
SolarEdge supervision to identify this inverter and is needed for opening a new site in the monitoring portal.

Your energy conversion system SolarEdge is now operational.

Step 4, Reporting and Monitoring Data installation

NOTE :
This step requires the connection of one of the communication options. Refer to *Chapter 6: Communication Setup* on page 43.

The SolarEdge monitoring system

The SolarEdge Monitoring Portal provides access to SolarEdge site information, including updated information
displayed in a physical or logical layout. The Monitoring Portal is described in detail in *User Guide SolarEdge
Monitoring Portal,* available on the website at SolarEdge http://www.solaredge.com/files/pdfs/solaredgemonitoring-portal-user-guide.pdf.

The SolarEdge Monitoring Portal can display the physical arrangements and logical system installed, as follows:

- **logical layout:** shows a diagram of the logic arrangement of the system components, for example inverters, strings and modules and their electrical connections. This view allows you to view which modules are connected to each string, which strings are connected to each inverter and so on.

- **Physical layout:** shows a diagram of the physical layout of the system components, for example inverters, strings and modules and their electrical connections. This view provides an overview of the current location of a computer component.

The use of the portal, you can:

- View the latest performance of specific components.
- Find underperforming components, such as modules, comparing their performance to that of other components of the same type.
- Locate the location of the alert components using the physical layout.
- See how components are connected to each other.
- Pairing remote power optimizers

To view the logical layout, insert the serial number of the inverter in the new site created in the application. When communication between the inverter and the control server is established, the logic arrangement will appear.

To display the physical layout, you have to draw the map of the locations of installed power optimizers. To generate a physical map, use the iPhone application Site Mapper or perform a mapping model, which must be completed with removable stickers (see *Provide information about the installation* below).

The logical and physical mapping can be used to solve a problem using the SolarEdge Monitoring Portal.

If you have not sent the physical mapping of the installed power optimizers SolarEdge Monitoring Portal will show the logical layout indicating which power optimizers are connected to which inverter, but will not show strings or the physical location of optimizers power.

The inverter may be connected to SolarEdge Monitoring Portal via a LAN or via an external modem connected to the RS232 port of the UPS. Alternatively, you can connect the UPS to another UPS already connected to the server, in a master-slave configuration. **refer to the** *Chapter 6: Communication Setup* **on page 43.**

Provide information about the installation

paper model

Fill the physical layout model using barcode stickers on each 2D detachable power optimizer. Once completed the form, scan it and upload the scanned file on the SolarEdge Monitoring Portal for site registration. For example a paper model, see http://www.solaredge.com/files/pdfs/physical-layout-template.pdf.

iPhone Site Mapper

Use the Application Site Mapper SolarEdge iPhone to scan 2D barcodes power optimizers and inverters. The application creates an XML file that can be downloaded from the SolarEdge Monitoring Portal for site registration. The Site Mapper SolarEdge can be downloaded from the Apple iTunes Store. For more information, see *Site Mapper SolarEdge Computer Guide* or to *Demo Movie Site Mapper* available on the website at SolarEdge http://www.solaredge.com/groups/installer-tools/site-mappe

Creating a site on the SolarEdge Monitoring Portal

Create for the Monitoring Portal using the registration form available on the following link: http://www.solaredge.com/groups/site-registra . Fill in all required information on the form, including information relating to your installation, and details of the logical layout and physical.

Chapter 5: User Interface

User buttons LCD

The four buttons are located inside the inverter above the LCD panel and are used to control the menus on the LCD screen, as shown below:
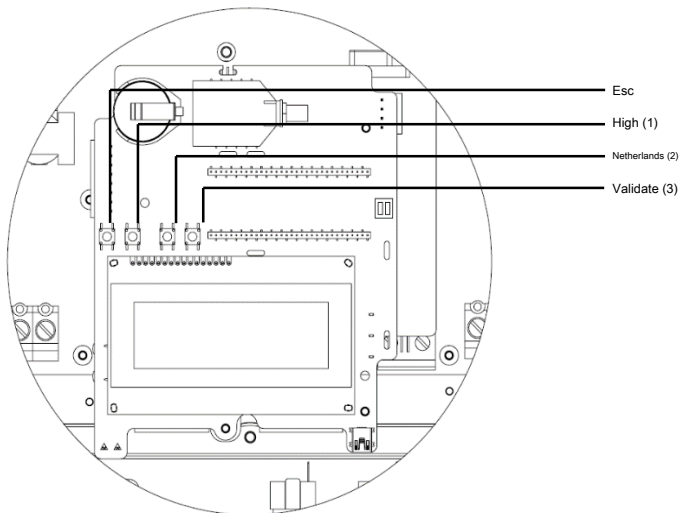
Figure 15: Internal User Buttons LCD

- **Esc:** Moves the cursor to the beginning of the currently displayed parameter; returns to the previous menu and cancel a modification value with an extended pressure (until **broken** appears).

- **High (1), Netherlands (2):** Moves the cursor one menu item to another, moves between characters of a display item, and alternates between the possible characters when setting a value.

- **Proceed to (3):** Selects a menu option and accepts a modification value with an extended pressure (until **Applied** appears).

Use the three buttons to the right to enter 123 in the password entry. The LCD and the buttons can be

used for the following:

- **Setup Mode:** after installing the inverter, the field technician will perform the basic configuration of the inverter, as described in *UPS configuration using the user buttons* page 30

- **Operating mode:** LCD screen allows the user to verify that the UPS is working properly. Refer to *Screens of the UPS status* on page 38 for a description of this option. Use the LCD light button to toggle through the informative displays.

- **Error messages:** In case of problems, an error message may appear on the LCD screen, refer to the *Appendix A: Errors and Troubleshooting* on page 52 and *UPS configuration using the user buttons* on page 30 for more information.

UPS configuration - Configuration Mode

You can configure the UPS using one of the following options:

- **User Buttons The internal LCD (** below). When using this option, the UPS cover is removed.

- **The external LCD light button (** page 32). When using this option, remove the inverter cover is not necessary. This configuration option includes a less detailed setup menu.

Configuring the UPS using the buttons

of the internal LCD user

After installation of the inverter, a field technician will perform the basic configuration of the inverter

1 Place the ON / OFF switch of the inverter OFF (CA remains on actives).

⚠	**WARNING !**
	If the UPS is operating, the following message is displayed.

> **DANGERTENSIONDC! NEPASDECONNECTER!**
>
> **VDC: 7 2, 0**

This message is displayed until the DC voltage, ie safe (50V). Do not open the lid until the voltage is safe or until at least five minutes have passed.

2 Remove the cover from the UPS: Open the six Allen screws from the UPS cover and remove Gently front cover vertically lowering.

⚠	**WARNING !**
	RISK OF ELECTRIC SHOCK, do not touch uninsulated son when the UPS cover is removed.

3 Press the key **Validate** for at least 5 seconds. The following message appears:

> **V euillezins e rermotdepasse**
>
> * * * * * * * * .

4 Use the three internal LCD user buttons to type in the following password:

12312312. The following message appears:

> **P ays <ENG> L angue <uk> C ommunication R e g. P ower D**
> **isplay M aintenance I nfo**

The inverter is now in Setup mode and all its LEDs are on. The inverter automatically exits Setup mode if no button is pressed for more than 2 minutes.

The following illustration shows the hierarchical tree of the menu options, which are described in the *Options in the setup menu* Page 34

**P ays <G ermany> L angue <eng> C ommunication R e g. P
ower D isplay M aintenance I nfo**

country:

**E U nis States + G reece + J apan + T + A
hailand ustralia F rance ermany**

G reece C ontinent G reece I the I srael I taly

.
.
.

Language :

**E nglish A llemand spagnol E
F rench I talian**

Communication [1]:

S erver <LAN> C onf LAN

**C onf RS 4 8 5 - 1 <S> C onf Z ig B ee <S> C onf W i - F i
<N / A> RS 2 3 2 C onf**

I / OC onfig. <MTR>

Rég.de power: [2]

**G rid ontrol C <A side> M anagement. E nergy C tu p Men. RRCR
<ST> C nfg P uiss R eactiv C nfg P uiss. A ctive R e C onf veil.**

E quilib. phases <ST> P (f) A è vanc

C hrgmtval. D e must

---

[1] If Wi-Fi is connected, the ZigBee Conf menu is not displayed and vice versa.

[2] The phase balancing is applicable to single phase inverters only.

(Continued from previous page)

> **P ays <I talie> L angue <eng> C ommunication R e g. P ower D isplay M aintenance I nformation**

display:

> **T emperature <C> LCDT ime <3 0> TLMT ime <1 5>**

Maintenance :

> **D ateetheure R e init. R e init counters. factory**
>
> **Million. at . JSW - C SDS Art iagnostics**

Info:

> **V ersions**
> **J J ournalerreurs ournalavert.**
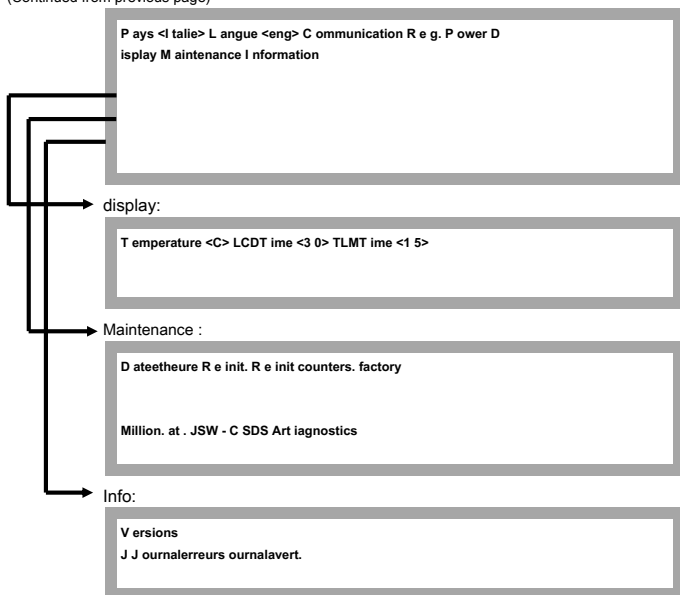
UPS configuration with the light button

external LCD

Use the LCD light button to the configuration of the communication or for displaying the error log and the alerts without opening the cover of the inverter. Some menus are available when you use this configuration option; However, the functionality is the same as when using the user buttons on the LCD.

1 Place the ON / OFF switch of the inverter to the OFF position.

2 Press and hold the light button on the LCD until the message the following appears:

> **M aintenirbout. app. pr. match. L cherpourallermenu R est**
>
> **3 sec**
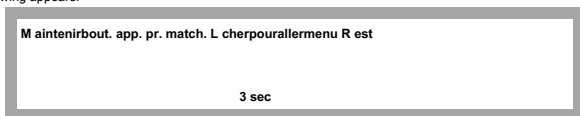
Release the button displays the following menu:

> **A ppair. O ptimisr. L angue <eng> C ommunication I nfo**
>
> **M aintenance S nettle**
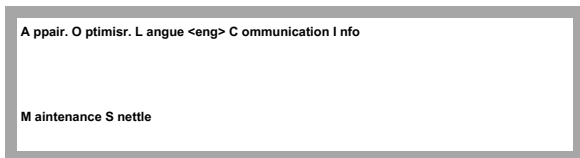
3 Briefly (one second) to scroll to the next menu item, and press

length (three seconds) to select the option. You can use options **Exit** on these menus to go up one level in the menu or exit the mode Setup Menu.

The figure below illustrates the hierarchical tree of the menu options that appear when you use the light button:

A ppair. O ptimisr. L angue <eng> C ommunication M aintenance I nfo S nettle

Language :

E nglish A llemand spagnol E F rench I talian S nettle

Communication [1]:

S erver <LAN> C onf RS 4 8 5 - 1 <S> C onf Z ig B ee <S> C onf W i - F i <N / A> I / OC onfig. <MTR> S nettle

Info:

V ersions J J ournalerreurs ournalavert. Exit

Maintenance :

D ateetheure R e init. R e init counters. factory

Million. at . j SW - C SDS Art iagnostics S nettle
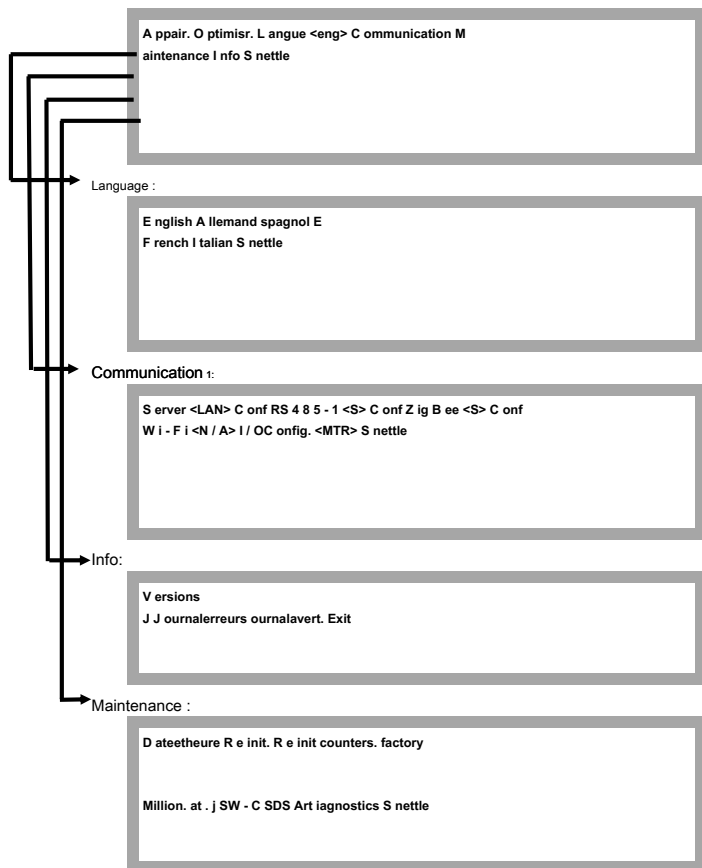
The options in these menus are described in the following section.

---

[1] If Wi-Fi is connected, the ZigBee item does not appear and vice versa.

solaredge

Options UPS configuration menu

Learn how to use the menus on the LCD screen to configure the inverter. Setup is available only when the ON / OFF switch is in the OFF position. To do this, use the user buttons the internal LCD or LCD light button to move between and select menu options.

Country network

The configuration of the country and the network is available using the internal user buttons only.

1 Select **Country** to indicate the country in which the inverter is installed and the network
which it is connected. This parameter can get preconfigured. If that is the case, make sure it is set to the correct country.

⚠ **WARNING !**
The inverter must be set to the correct country, to ensure that it complies with regulations country network and functioning properly with it

The list of countries is displayed. If no country is configured, the value is **< None>.**

NOTE :
If the inverter is not configured to any country, it will not produce energy, and the following message on the LCD screen: **No country selected**

A plus sign (+) next to the country indicates that another menu is available for the selection of network options.

2 Confirm your selection of countries on the confirmation screen: Switch on **YES** and press
sure **Validate.**

Language

1 Select the Language option to set the language in which the LCD screen should display.

2 Confirm the language selection on the confirmation screen: Switch on **YES** and press
sure **Validate.**

Communication

1 Select **Communication** to define and configure the communication option used
by the inverter to communicate with the SolarEdge Monitoring Portal and the communication option used
for communication between multiple inverters.

2 Select **Server** to define which mode of communication is used for communication
between the inverter and the SolarEdge Monitoring Portal. Refer to *Chapter 6: Communication Setup* on page 43 for
a complete description of these communication options.

NOTE :
This menu only shows the communication options installed in the inverter.

3 The following example shows a hierarchical tree of the menu options on the menu
Communication. For more detailed information about all the configuration options, refer to the *Application of
communication options Note* available on the SolarEdge website at http://www.solaredge.com/files/pdfs/solaredgecommunication
.

Communication ₁:

S erver <LAN> C onf LAN

C onf RS 4 8 5 - 1 <S> C onf Z ig B ee <S> C onf W i - F i
<N / A> C onf RS 2 3 2

I / OC onfig. <RRCR>

Server :

LANRS 4 8 5 Z Z igbee
igbee W i - F i RS 2 3 2
N o

Conf LAN:

C IP onfig
D e f. DHCP <A side> D e f. IPD e f. M ascus D e f.
Asserelle P D e f. DNS

D e f. A dr. S erver D e f. P ort S erver

Conf RS485-1:

Ypeappareil T <SE> P rotocol <M> Device ID <1> D Detected. SLV
<0>

Conf ZigBee (enabled only if the indoor unit is connected):

Ypeappareil T <SE> P rotocol <ERA> Device ID <1> IDPAN

S canner C anal hrg C. ZB pard e f. D Detected. SLV <0>

Conf WiFi (enabled only when the module is connected):

S cannerlesr é S é aisirlacl buckets

C hargerlesparam è é be trespard

RS232 (next page) I / O Config.

₁ If Wi-Fi is connected, the ZigBee elements do not appear and vice versa.

RS232 Conf:

Ypeappareil T <SE> P rotocol <GSM> D e f. typmodem Qu finish
APN

D e N omutil finish. D e f. password

I / O Config .:

T ypeappareil <RRCR>

Reg. power

For more detailed information on active power control options, responsive, see the *Application Note the power control,* available on the SolarEdge website at http://www.solaredge.com/files/pdfs/application_note_power_control_configuration.pdf.

G rid C ontrol <I na> G ement. E nergy C onfig. RRCR <A side> E
quilib. P hase <I na> C hrgmtvald é be

NOTE :

The Phase Balancing is only applicable on single-phase inverters. For detailed information, refer to *SolarEdge phase balancing Manual,* available on the SolarEdge website at

http://www.solaredge.com/files/pdfs/phase_balancing_connection_guide.pdf

Enabling the network control option opens up other options on the menu, as shown on page 31.

Viewing

Select **Display** to configure the following three options:

T emperature <F> LCDT ime <3 0> TLMT ime <1 5>

Temperature : select units Celsius or Fahrenheit.

- **LCD Time <30>:** The number of seconds the backlight of the LCD screen is activated after pressing the light button on the LCD. Set a value in a range between 10-120 seconds.

- **TLM Time <15>:** The number of minutes during which the LCD backlight is on for the window display *Telemetry*. Set a value in a range between 1-120 minutes.

Maintenance

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

D D iagnostics ateetheure R e init. R e init counters. factory

Million. at . JSW - C SD Art

- **Diagnostics: Shows the insulation status display (** refer
  http://www.solaredge.com/files/pdfs/application_note_isolation_fault_troubleshooting.pdf) And allows
  ll'activation function Offset night for three phase inverters (see
  Using SolarEdge inverters with offset housing PV - Application Note).

- **Date and hour :** used to set the real time clock. If you are connected to the SolarEdge Monitoring Portal to the
  date and time are automatically configured and only the time zone must be set.

- **Reset. counters:** Reset the accumulated energy meters sent to the SolarEdge Monitoring Portal.

- **Reset. factory :** Carry out a general reset of the default settings of the inverter.

- **M.à.J SW-SD card:** Perform a software update via SD card.

information

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

V ersions
J J ournalerreurs ournalavert.

- **versions:** displays the firmware versions of the inverter:

ID: # # # # # # # # # DSP 1: 0 0 0 1. 0 2 1 0. 0 1 8 8 DSP 2: 0 0 0 1 0 0 3
4. 0 0 0 0 CPU: 0 0 0 2. 0 0 3 7. 0 0 0 0

- • **ID:** The identifier of the inverter.
- • **DSP 1/2:** The firmware version of the DSP digital control panel
- • **CPU:** The firmware version of the communication card

NOTE :

Keep these numbers available when you contact support SolarEdge.

- **Error Log:** displays the last five errors.
- **Journal warn. :** displays the last five alerts.

Displays the status of the UPS - Operating Mode

Press the lighted button external LCD lights the LCD backlight. Other pressures following display screens one after the other.

initial status of the inverter

```
V ac [v] V dc [v] P ac [w]
2 4 0. 7              3 7 1. 9              2 3 4. 9 3
P _ OK: XXX / YYY <S _ OK>
                                                    WE
```

- **Vac [V]:** The output voltage CA.
- **Vdc [V]:** The DC input voltage.
- **Pac [W]:** The AC output power.
- **P_OK: XXX / YYY:** a connection to the power optimizer is established and at least one power optimizer sends monitoring data. XXX is the number of power optimizers for which telemetry was received in the last two hours. YYY is the number of coupled power optimizers identified during the last coupling procedure. If XXX and YYY values differ, there may be a problem in one or more power optimizers.

- **S_OK:** The connection to the Monitoring Portal SolarEdge successful (appears only if the inverter is connected to the server).

- **ON / OFF:** Indicates the position of the ON / OFF switch of the inverter.

Status of the main inverter

```
V ac [v] V dc [v]                        P ac [w]
2 4 0, 7              3 7 1 9              3 2 1 0. 0
F ac [H z] O _ s OP k                     T emp
5 0. 0                  January 1         February 8. 2
```

- **Vac [V]:** The output voltage CA.
- **Vdc [V]:** The DC input voltage.
- **Pac [W]:** The AC output power.
- **Fac [Hz]:** The AC output frequency.
- **OPs_Ok:** Number of optimizers sending telemetry (indicating that they are coupled)
- **Temp [C or F]:** The temperature of the heat sink of the inverter

Statute of the energy meter

Displays the total energy produced during the last day, month, year and since installation of the inverter.

J our [W]: 0. 0
M onth [KW h]: 0. 0
A nn e e [KW h]: 0. 0 T otal [KW h]: 0. 0

 If an electricity meter is connected to the inverter, the following status screen is displayed with an indication of the total energy reading:

C ompteur S tatus: <OK> <M essage S rreur> T otal [W h]:
XXXXXXX

- **Status:** Displays OK if the meter communicates with the communication card.
- **<Error Message>:** If an error of the internal counter is displayed here, contact SolarEdge support.
- **Total (Wh)** The power reading by the counter. The value displayed in this line depends on the type of meter connected to the inverter and its location:
  - If a bidirectional counter is connected to a consumption point, this value is the energy consumed.

  - If the meter is installed at the point of production of connection, this value is the energy produced by the site.

  - If the meter is installed at the connection point to the network, this value is the energy supplied to the network.

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

> **NOTE :**
> The accumulated data according to the internal real-time clock.

Status Telemetry

This window shows the last telemetry received from the power optimizer. The display changes each telemetry transmission by a power optimizer.

To verify the correct operation of the installation, the installer can check the telemetry window for a certain period in order to observe the reporting process of the power optimizers.

M odule #: 0 0 0 C 1 ED 9-0 3
Energy E [W h]: 0
V dc _ O [v]: 4 0. 5
V dc _ I [v]: September 2. 5

- **Module #:** Serial number of the power optimizer
- **Energy:** Energy power optimizer
- **Vdc_O:** output voltage of the power optimizer
- **Vdc_I:** input voltage of the power optimizer (Module voltage)

Status ID

This window shows the software version of the inverter and the country for which the inverter is configured.

```
ID: # # # # # # # # # DSP 1/2: 1. 0 2 1 0/1. 0 0 3 4 CPU: 0 0 0 2. 0 1 1 1 P ays
FRA
```

Communications Server Status

```
S erver: LAN                                <S _ OK>
S tatus:                                    <OK>
            XXXXXXXX
<Messaged ERROR>
```

- **Server:** The connection method to the SolarEdge Monitoring Portal to
- **S_OK:** The connection to the SolarEdge Monitoring Portal is successful (should appear only if the inverter is connected to the server).
- **status:** displays OK if the inverter establishes a successful connection and communication with the server / device specific (LAN, RS485 or ZigBee module).
- **XXXXXXXX:** Ethernet communication connection status to eight bits: a string of 1's and 0 is displayed.

  1 indicates OK, 0 indicates an error. For a list of possible errors and how to resolve them, see *Troubleshooting communication problems* Page 52
- **Error message,** according to the failure See *Troubleshooting communication problems* on page 52 for more information.

PI status

This window describes the Ethernet configuration: IP, mask, gateway and MAC (Media Access Control) of the inverter.

```
IP            1 9 2. January 6. 8 2. 1 1 9
MSK 2 5 5. 2 5 5. 2 5 5. 0 GW
              1 9 2. January 6. 8 2. 1
MAC 0-2 7-0 2-0 0-3 9 - 6 3
```

ZigBee status

This window describes the ZigBee configuration:

```
PANID: XXXXX
C h: XX / XXXXRSSI: <L> ID: XXXXXXXXMID: XXXXXX
```

- **RSSI:** the intensity of the power of the ZigBee the reception signal closest in the SolarEdge system. L = low, M = medium, H = high and () = no signal.
- **PAN ID:** The pan ID transceiver ZigBee
- **Ch.:** The channel of the transceiver ZigBee
- **ID:** The ID of the transceiver ZigBee

- **MID:** Master ID Master ZigBee module. This field is displayed only in devices with ZigBee router modules (slave). This field is displayed after successful ZigBee association. If a ZigBee module is not connected, a message *no ZigBee* is displayed instead of the field **MID.**

Wi-Fi state

This window describes ka WiFi configuration:

> IP: 1 9 2. January 6. 8 2. GW 1 1 9: 1 9 2. January 6. 8 2. 1 SSID:
> xxxxxxxx RSSI: <L / M / H / ->

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

Status communication ports

> D ev P rot # #
> RS 4 8 5 - 1 <TO> <S> <- -> Z ig B ee <SE> <MPS> <- ->

- **##:** The total number of slaves detected on the specific port
- **DEV:** The type of device that has been configured on a specific port (port-based feature), as follows:

  - **SE:** SolarEdge Device (default)
  - **MTR:** Counter income
  - **LGR:** Recorder not SolarEdge
- **PROT:** The protocol type for which the port is configured:
  - For SolarEdge device:
    - o **S: slave SolarEdge**
    - o **M:** master SolarEdge
    - o **DM:** Counter income For more information on the electric meter, refer to the *Application Note* at the address
      http://www.solaredge.com/files/pdfs/connecting-revenue-grade-meter-tosolaredge-devices.pdf

    - o **P2P:** ZigBee Point-to-Point
    - o **BPM:** ZigBee multipoint master (for a ZigBee coordination module)
    - o **MPS:** multipoint slave ZigBee (for a router module ZigBee)
  - **SS:** SunSpec - for a recorder not SolarEdge

Status fan status - Three-phase UPS

This window applies to three-phase inverter and provides information on the state of external and internal fans of the inverter:

```
FAN 1: E npanne FAN 2: E nfonct.
```

Each fan can have one of the following statuses:

- **Tbd .:** OK Fan.
- **Out of order:** this status will indicate a system error and not necessarily a faulty fan. Sauté the AC circuit breaker and restart it can clear this status. If the state does not change, replace the fan. For more information, see *Fan replacement 2* on page 75.

power control status [1]

```
PWRCTRL:                    ADISTANCE
PWRL mimics:                1 0. 0 4 W k
C P bone hi:                           0. 9
P roduction:                    7 0 0 0 W
```

- **PWR CTRL:** power control status:
  - **REMOTE -** Communication with RRCR or intelligent energy manager is confirmed / validated.

  - **LOCAL** - The power is controlled locally (eg, by a fixed limit.), This inverter or limits the production of PV energy to its share of the limit of the feed energy, resulting from the loss of communication with the manager smart energy. If this status appears, check the communication with the intelligent energy manager or the communication with the meter.

- **PWR Limit:** the maximum energy output of the inverter is defined by one of the energy limit options:

  - RRCR
  - Intelligent power management (power limit)
  - P (f)
  - Q (U)
- **Cos Phi:** The ratio between the active power and reactive
- **Production:** The energy produced by the inverter

For more information, refer to the following application notes:
  - *Note application of energy control,* available on the website of SolarEdge
    http://www.solaredge.com/files/pdfs/application_note_power_control_configuration.pdf
  - *Application Note on the power limit,* available on the website of SolarEdge to
    http://www.solaredge.com/files/pdfs/products/feed-in_limitation_application_note.pdf.

---

[1] Available on the version of the firmware 2.7xx / 3.7xx and superior communication card (CPU).

Chapter 6: Configuring communication

power optimizers send information to the inverter via the DC power supply lines (the output circuit PV). No wires or configuration is required for this purpose. The information is then sent from the inverter to the SolarEdge Monitoring Portal Internet. To send data from the inverter, a communication link to be established, as described in this chapter. The configuration of the communication is not required for the recovery of energy and is only required to use the SolarEdge Monitoring Portal. This chapter also describes the configuration of the communication between multiple inverters to a master / slave configuration.

> **WARNING :**
> When connecting communication cables, be sure that the ON / OFF switch at the base of the inverter is in the OFF position, and the CA is in the OFF position. When configuring communication parameters, make sure the ON / OFF switch is in the OFF position, and the CA is ON.

communication connectors

Two glands communication are used for various communication options of the inverter. Each gland has three openings. The table below describes the fo nctionnalités ch at that opening. Unused openings must remain sc she is.

Cable gland Opening #		functionality	Cable size (diameter)
1 (PG16)	A small	**External antenna cable (ZigBee, Wi-Fi)**	2-4 mm
	two large	Ethernet (CAT5 / 6)	4.5 to 7 mm
2 (PG13.5)	trios	RS485, power reduction, electric meters	From 2.5 to 5 mm

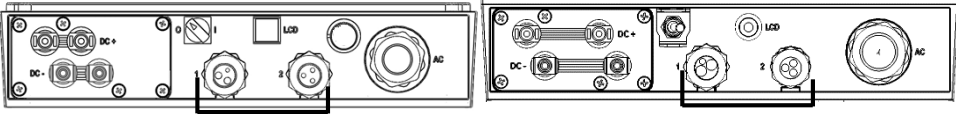**Figure 16: Communication Cable glands**

The communications card has a standard RJ45 connection box for Ethernet connection [1] and bormier 9-pin for RS485 connection and a mini-USB connector for connection to a portable computer as shown below:
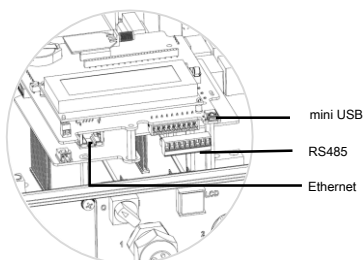

mini USB

RS485

Ethernet

Figure 17: Internal connectors

Types of Communication

- **Ethernet:** page 45, LAN connection
- **RS485:** page 47, communication type most commonly used for connecting multiple SolarEdge devices on the same bus in a master-slave configuration. The type 485 can also be used as an interface for external devices not SolarEdge, such as electricity meters and data loggers.

- **ZigBee:** page 50, optional wireless communication (purchased separately).
- **Wireless :** page 50, optional wireless communication (purchased separately).

Removing the UPS cover

If the cover is not already removed (eg, during the initial installation, while the CA is not yet connected), use the following procedure to remove the cover for communication connections purposes.

1 Place the switch on the inverter ON / OFF OFF position.

2 Disconnect the AC of the inverter by turning off the switches of the panel of the main circuit.
Wait 5 minutes for the capacitors to discharge.

3 Open six Allen screws from the UPS cover and carefully remove the cover
vertically before lowering.

> **WARNING :**
> When removing the lid, make sure not to damage internal components. SolarEdge can not be held responsible for damaged components as a result of carelessness in removing the cover.

---

[1] An additional option of Internet connection using an 8-pin terminal block is also available. See
http://www.solaredge.com/files/pdfs/ethernet-communication-using-8-pin-terminal-block.pdf .

Creating an Ethernet (LAN)

This communication option to use an Ethernet connection to connect a UPS to the monitoring portal via a LAN cable.

NOTE:

The lines of communication should be protected by surge protection specified in cases where a voltage spike induced risk exists. For details, see:

http://www.solaredge.com/files/pdfs/lightning_surge_protection.pdf
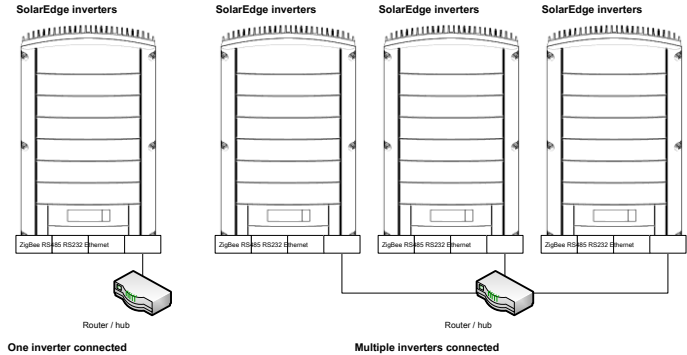
Figure 18: Example Ethernet connection

1 Remove the cover from the inverter as described in the *Removing the cover* on page 44.

2 Open gland # 1.

3 Remove the plastic film of the large opening which has a section in the connector rubber and insert an Ethernet CAT5 / 6 through the opening.

WARNING :

The inside of the gland includes a tight fitting rubber, which must be used to ensure a good seal.

Standard CAT5 / 6 son have eight (four twisted pairs) as shown in the dess diagram below o us. The thread colors vary from cable the other.

pin RJ45 #	Wire color ₁		10Base-T 100Base-TX signal
	T568B	T568A	
1	White / Orange	White / Green	transmission +
2	Orange	Green	transmission -
3	White / Green	White / Orange	Receive +
4	Blue	Blue	Reception
5	White / Blue	White / Blue	Reception

₁ The UPS connection does not support changes polarity RX / TX. The management of Ethernet crossover cables depends on the capabilities of the switch.

pin RJ45 #	Wire color [1]		10Base-T 100Base-TX signal
	T568B	T568A	
6	Green	Orange	Reception
7	White / Brown	White / Brown	reserved
8	Brown	Brown	reserved
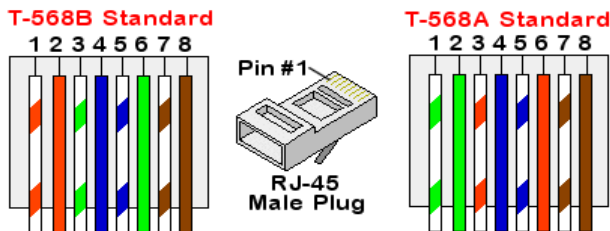
Figure 19: Standard wiring

3 Use a pre-set via the cable gland until the RJ45 jack on the map

communication of the inverter, or in the case of a cable drum and connect it as follows:

- Insert the cable through the cable gland 1
- Remove the outer insulation of the cable with the uncrimping or cable-cutting tool and strip the eight son.

- Insert eight son in the RJ45 connector, as described in Figure 19.
- Use a crimping tool to crimp the connector.
- Use a crimping tool to crimp the connector.
- Connect the Ethernet connector to the RJ45 plug on the communication board of the inverter.

RJ45 Ethernet interface
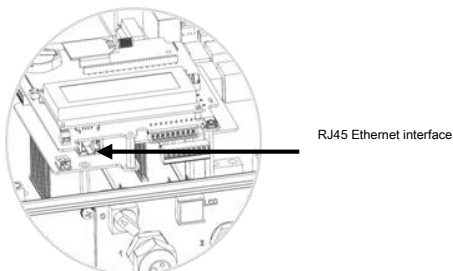
Figure 20: RJ45 Ethernet connector

4 On the side of the router / switch, use a pre-crimped cable or use a crimping tool to
prepare the RJ45 communication connector: insert the eight son in the RJ45 connector in the same order as in
Figure 19.

5 Connect the RJ45 connector to the RJ45 port Ethernet switch or router. You
can connect more than one inverter on the same switch / router or on different switches / routers, if
applicable. Each inverter sends its data independently controlled on the SolarEdge Monitoring Portal.

6 The inverters are configured by default LAN. If the reconfiguration is required:
- make sure the ON / OFF switch is in the OFF position.
- Turn on the AC UPS by turning the switch on the main distribution panel.

> **WARNING !**
>
> RISK OF ELECTRIC SHOCK, do not touch uninsulated son when the UPS cover is removed.

- Use the User button to configure the connection, as described in
Communication on page 34.

> **NOTE :**
>
> If your network has a firewall, you may need to configure it to allow connection to the following address:
>
> - Destination address: prod.solaredge.com
> - TCP Port: 22222 (inbound and outbound data)

7 Check the connection, as described in *Connection Verification* **on page 50.**

Creating an RS485 Bus

The RS485 option allows the creation of a bus connected inverters, consisting of a maximum of 31 Slave inverters and
a master inverter. Using this option, inverters are connected to each other on a bus (channel) via their RS485
connector. The endings of the first and last inverter in the chain must be ON.

> **NOTE:**
>
> If an electric meter is connected to your UPS via an RS485 port, the port can be used to create a RS485 bus between inverters.

> **NOTE:**
>
> The lines of communication should be protected by surge protection specified in cases where a voltage spike induced risk exists. For details, see:
>
> http://www.solaredge.com/files/pdfs/lightning_surge_protection.pdf

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

► **To connect the RS485 communication bus:**

1 Remove the cover from the inverter as described in the *Removing the cover* Page 44

2 Remove the gasket of one of the apertures in the gland communication # 2 and
insert the cable through the opening.

3 Pull the terminal connector 9-pin RS485 / RS232, as shown below:

485
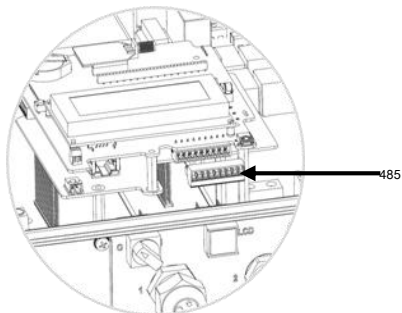
Figure 21: Terminal 485

4 Loosen the screw pine **A (+) B (-)** and **BOY WUT** on the left of the RS–485 terminal block.

RS485-2 (not used) Terminal

GA (Data +) B

(Data-)
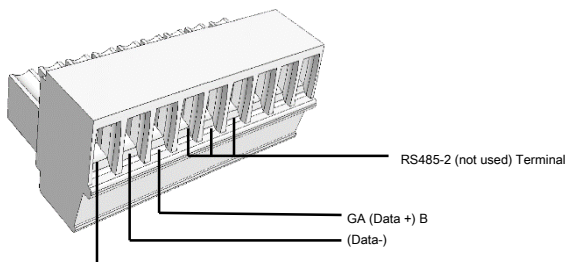
Figure 22: RS485 terminal

5 Insert the ends of the son in the pine **G, A** and **B** listed above. Using a twisted pair cable with 4 or 6 son for this connection. You can use any color thread for each connection **A, B** and **BOY WUT,** so that the same color thread is used for all the pins A, the same color for all the pins B and the same color for all G. Pines

6 Connect all the pins B, A and G of all inverters. The following figure shows the diagram
connection:
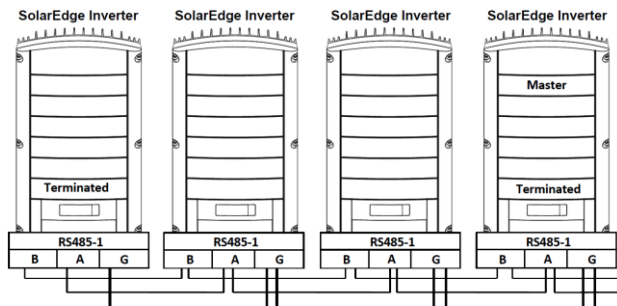
Figure 23: Connections inverters on a chain

NOTE :

Do not perform cross-connections of son **B, A** and **BOY WUT.** Do not insert son in RS485-2 pines.

7 Tighten the terminal screws.

8 Check that the son are fully inserted and can be removed easily.

9 Push the RS485 terminal firmly to the end into the connector on the right side of the
communication card.

10 The first and last termination SolarEdge device (inverter / SMI / gateway
control and communication, etc.) in the chain by the switching of a DIP switch termination located inside the UPS
must be ON (set the switch up). The switch is located on the communication card and is marked **SW7.**

Move the switch to the left up
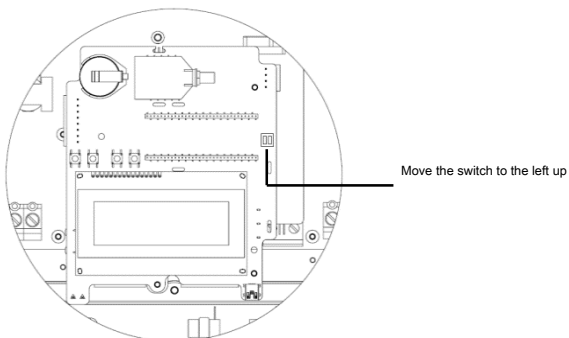
Figure 24: Termination switch RS485

NOTE :

Only the first and last device in the chain SolarEdge be on ons. The other inverters in the chain must have the terminating switch to OFF (lowered position).

► **To connect to the Monitoring Portal:**

1 Designate a single inverter as a connection point between the RS485 bus and Monitoring Portal
   SolarEdge. This inverter will be used for master inverter.

2 Connect the master to the SolarEdge Monitoring Portal via the LAN communication options,
   ZigBee or Wi-Fi.

► **To configure the RS485 communication bus:**

All inverters are configured by default as a slave. If the reconfiguration is required:

1 Make sure the ON / OFF switch is in the OFF position.

2 Turn on the AC UPS by turning the switch on the main distribution panel.

⚠	**WARNING !**
	RISK OF ELECTRIC SHOCK, do not touch uninsulated son when the UPS cover is removed.

3 Use the User buttons to configure the connection, configure the inverter designated as
   master, select one of the following options in the menus of the LCD:

   • **Communication • Server • LAN, or Wi-Fi ZibBee**
   • **Conf. RS485-1 • device type •** *SolarEdge*
   • **Conf. RS485-1 • Protocol •** *Master*
   • **Conf. RS485-1 •** *Detect. SLV*

   The system starts automatically detecting inverters SolarEdge slaves connected to the master inverter. The UPS
   will return the correct number of slaves. If this is not the case, check the connections and connections.

4 Check the master connection to the SolarEdge Monitoring Portal, as described in *Verification*
   connection page 51.

Creating a ZigBee connection

This communication option allows a ZigBee connection for one of the following options:

   • Connect the inverter to the SolarEdge Monitoring Portal
   • Create a bus master / slave of connected inverters

The ZigBee kit is purchased separately and comes with a user manual, which should be examined before connecting. It is
available on the website of SolarEdge at http://www.solaredge.com/groups/products/communication **(In ZigBee)**

Creating a Wi-Fi

This communication enables use Wi-Fi to connect the inverter to the SolarEdge Monitoring Portal.

The wireless kit can be purchased separately and assembled during the installation of the system. The wireless kit comes with
a user manual, which must be consulted before connecting. It is available on the website of SolarEdge at http://www.solaredge.com/groups/p
(In wireless).

Connection Verification

1 Close the lid of the inverter (see page 24).

2 Turn on the AC UPS by turning the switch on the main distribution panel.

3 Wait until the inverter connects to the SolarEdge Monitoring Portal. This can take up to two minutes.

A status screen similar to the following screen will appear on the LCD screen:

V ac [v] V dc [v] P ac [w]	
2 4 0 7 5 2 V	0, 0
	<S _ OK>
	OFF
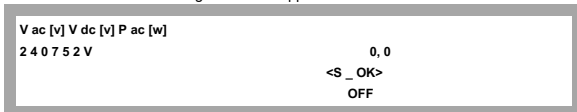
S_OK: indicates that the connection to the SolarEdge Monitoring Portal was successful. If S_OK does not appear, see *Appendix A: Errors and Troubleshooting* on page 52.

Appendix A: Errors and Troubleshooting

This appendix describes the error messages that appear on the LCD screen when an error occurs UPS and how to solve them.

Troubleshooting communication problems -

S_OK is not displayed

If S_OK does not appear, do the following:

► **To troubleshoot Ethernet communication:**

When Ethernet communication is used, the window *Communications Server Status,* as described on page 41, can be used to identify the location of the error

```
S erver: LAN <S _ OK> S tatus: <OK>

            XXXXXXXX
<M essaged error>
```

XXXXXXXX is a string of 1's and 0 displaying the status of connection and eight bits of communication. 1 indicates OK and 0 indicates an error. Possible errors and their resolution are detailed in the following table:

bit location	Error message	Error Description	help
1 st	LAN offline	A mistake by the Ethernet physical wire connection: the Ethernet connection or the physical Ethernet cable is not connected correctly	Check cable and allocation of output pins and the **cable connection. Go back to** *Creating an Ethernet (LAN)* **on page 45.**
2 th	DHCP failed, or setup DHCP INVALID.	The inverter was unable to obtain an IP address from the DHCP server, or DHCP / static IP settings in the gateway are not the same as the router.	Check the router configuration and UPS. Consult your IT network.
3 th	ping pass failure.	The connection to the router is not available: Ping to first switch / r routeu defective local (LAN error)	Check the physical connection to the switch / router. Verify that the link LED on the router / switch is turned on (phy-link indication). If OK contact your IT network, otherwise replace the cable or change it to a cross connection in a direct connection

bit location	Error message	Error Description	help
4 th	Failed ping server G	The Internet connection is not available: Ping google.com failed	Connecting a laptop and check the internet connection. If Internet access is unavailable, contact your administrator or Internet service provider. For wireless networks, make sure the username and password are defined in the PA / ISP router.
5 th	Failed ping server x	Ping to the redundant server failed #x	Check the address of the SolarEdge server, as Conf LAN submenu
6 th			
7 th			• Address: prod.solaredge.com
8 th	TCP connection failed	The connection to the SolarEdge server has not been established: the communication with the server has failed	• Port: 22222 Check with your network administrator if a firewall or other device blocks the transmission

► **To troubleshoot RS485 communication:**

1 If, after the slave detection success, the number of slaves reports in the master is more

smaller than the actual number of slaves, check the display of the communication status of each slave server UPS.

The following screen will appear:

> **S erver RS 4 8 5 S tatus:**
>   **okay**

2 If the message **Not Found Master** appears, the master device is not reactive or cable RS485

is not connected, check the master device connections and repair if necessary.

► **Additional Troubleshooting:**

1 Make sure the modem or hub / router is working properly.

2 Verify that the connection to the internal connector to the communications card is

correctly established.

3 Check that the selected communication option is configured correctly.

4 Use a method independent of the SolarEdge inverter to check whether the network and modem

working properly. For example, connect a laptop to the Ethernet router and connect to the Internet.

5 Check if a firewall or other network filter is blocking communication.

6 For ZigBee troubleshooting, refer to the installation manual ZigBee.

Error Codes

The error code numbers may differ depending on the type of inverter (single or three phase) as described in the table below.

The error messages include an error number and a description in the following format:

C oded XXX error

XXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXX

An error message is displayed for 30 seconds after which the inverter waits the necessary time to reconnect and restart. Meanwhile, the LCD displays the reactivation message and the time remaining reconnection.

WARNING !

All warnings and cautions in this manual must be observed when troubleshooting errors.

Error # single phase	AC # Error	LCD Message	Description	help
N / A	1-4	wind down. #	One of the fans is not working	Check *Status Fan Status* - *Three-phase UPS* on page 42 (a replacement kit is available from SolarEdge).
4, 5, 8, 12, 18-23, 39, 42, 45	45, 48, 50-53, 94, 108-111,113	software error	Internal software error	If the error persists, contact SolarEdge support.
N / A	112	Wrong AC connection The connections lines of the inverter are incorrect, for example: Line 1 AC network is connected to line 2 of the inverter, **and there is no 120₀ between L1** and L2 and L3 to L2 on the inverter side.		Switching between connections L1 and L2 or L2 and L3
9, 13	N / A	AC overvoltage	The internal hardware that measures AC current has measured substantially high output currents. This can occur because of changes in AC voltage or a switching load near the site.	If the fault persists: • Check the AC connection of the inverter. • Check with the network operator if a large surge source or irregular load exists near the site. • If the network does not pose any problems, contact SolarEdge support.

Error # single phase	AC # Error	LCD Message	Description	help
10, 37, 38	76, 77, 90	Earth Current - RCD current discharge	earthen. The internal hardware that measures the defects of ground, measured from ground currents considerably high.	The shortcomings of ground may occur due to insufficient insulation to the ground. **WARNING !** ⚠ RISK OF ELECTRIC SHOCK, do not touch uninsulated son when the UPS cover is removed. All precautions must be taken in resolving this error. Only a qualified technician should handle this problem, and only after having taken the necessary precautions. **1 Set the switch on the inverter** ON / OFF OFF. **2 Wait five minutes for** input capacitors discharge **3 Disconnect the AC circuit breaker** **4 Disconnect the inputs of** DC. **5 Connect each DC string** separately, move the boards and the switch of the inverter ON / OFF to ON, until the error appears on the defective line. • Do not connect strings with an error grounded at the inverter. • For documentation on the possible motives of ground current error and solutions, contact SolarEdge support. • An approved installer must fix the faulty string before connecting to the inverter.

Error # single phase	AC # Error	LCD Message	Description	help
14	58/59/60	AC Voltage Too High (L1 / 2/3)	Overvoltage CA. The internal hardware for measuring the AC voltage indicates a suddenly considerably higher output voltage.	If the fault persists: • Check the AC connection to the inverter • Check that the inverter is set to the correct country. • Check with the network operator if a large surge source or irregular load exists near the site. • Make sure the size of the lead wire match the distance between the inverter and the location of the network connection. • Use a larger gauge wire for the AC output • Refer to the *AC wiring Application Note* available on the website of SolarEdge at http://www.solaredge.com/files/pdfs/application-noterecommended-wiring.pdf
15	102	DC Voltage Too High	DC overvoltage. The DC input voltage exceeds the maximum level supported.	The SolarEdge system normally eliminates DC overvoltage errors. When the DC voltage is detected, the inverter section power optimizers and restarts. If the fault persists: • Turn off the ON / OFF switch of the inverter. If after five minutes, the LCD panel does not indicate a low voltage safety (1V by optimizer), check what the failed system, and recheck the connections with the UPS. • Do either Troubleshooting power optimizers on page 60 • Reactivation of all inverters on the site, as described in *Chapter 4: Commissioning of the facility* on page 24.
16	123	hardware error	Error in hardware.	If the fault persists, contact SolarEdge support.

Error # single phase	AC # Error	LCD Message	Description	help
17	104	Temp. too high	Excessive temperature. If the fault persists:	• Make sure the spaces are sufficient around the inverter. • Make sure no dirt or obstruction is present in the fins of the heat sink. • Reinstall the UPS in a cooler location
24	N / A	Failure Temp Sensor. Temperature sensor broken or not connected.		If the fault persists, contact SolarEdge support.
25	121	Fault Isolation	PV defective insulation. The inverter has detected the PV solar panel is not properly isolated from ground currents. The insulation will be checked each time the inverter starts.	If the fault persists • Check the PV system for insulation and earth leakage current problems. • Only an authorized PV installer can fix the faulty line before connecting it to the inverter • Refer http://www.solaredge.com/files/pdf s / application_note_isolation_fault_ troubleshooting.pdf .
26	122	AC Fault Relay	AC relay failed during reactivation tests.	If the fault persists: • Unplug the network UPS CA. • Contact SolarEdge support.
27	95, 106, 120, 125, 126	hardware error	Error in hardware.	If the fault persists, contact SolarEdge support.
28	N / A	Error sensor RCD	The RCD measure failed during the test phase of reactivation	If the fault persists, contact SolarEdge support.
29-30	N / A	equi error. phases	The monitoring hardware that checks the balance of each phase (L1-N and L2-N) has exceeded the allowable limits	• Check the network connection. • Check the GND wire connection. • Check the connections of L1, L2 and neutral. • Checking symmetrical load between L1 and L2. • Check with the operator of the local network.

Error # single phase	AC # Error	LCD Message	Description	help
31, 33	64/65/66	AC Voltage Too High (L1 / 2/3)	Line voltage above the limit permitted in this country.	• Check that the inverter is configured to the correct country. • Turn off the inverters in the site and check the AC voltage. • If the inverter is far from the grid connection point, use a larger gauge wire CA. • Consult the network operator. • If permitted by local authorities, use the SolarEdge Configuration Tool to change settings.
32, 41	61/62/63, 67/68/69	AC Voltage Too Low The voltage network is below the limit permitted in this country.		• Check that the inverter is configured to the correct country. • Consult the network operator. • If permitted by local authorities, use the SolarEdge Configuration Tool to change settings.
34	79/80/81	Freq. Too High AC (L1 / 2/3)	The frequency is above the limit permitted in this country.	A treated in the same manner as the error 32.
35	82/83/84	Freq. AC Too Low (L1 / 2/3)	The frequency is below the limit permitted in this country.	A treated in the same manner as the error 32.
36	72/74/75	DC injection (L1 / 2/3)	DC power detected on the AC output	If the fault persists, contact SolarEdge support.
40	N / A	islanding	The AC voltage is out of range. The inverter is stopped due to islanding.	When AC voltage returns the inverter should restart after the reconnection time that depends on the country's network connection codes. If the problem persists, consult the network operator whether frequent AC disruptions occur on the site.
43	N / A	Internal Hardware Error	Internal hardware error If the problem persists, contact SolarEdge support.	
44	44	No select countries.	The inverter is not configured to any country.	Select the country, as described on page 34

Error # single phase	AC # Error	LCD Message	Description	help
46		Phase Unbalance	unequal power of the three phases	**Edit the option to Balancing phases** LCD menu of the inverter **Disable.** Refer to *Reg. power* on page 36 and *the balancing Manuel phases SolarEdge* available on the website of SolarEdge at http://www.solaredge.com/files/pdf s / phase_balancing_connection_guid e.pdf
N / A	103, 146	DC Voltage Too Low / UCC Min	The input voltage C is below the minimum level supported.	Switch off the inverter and then on again. If this problem persists, contact SolarEdge support.
N / A	49	Communication error	Internal Error Software.	If the fault persists, contact SolarEdge support.
N / A	78	SE GridMon Synch	The mains voltage and frequency are unstable.	If the fault persists, contact SolarEdge support.
N / A	91/92/93, 96/97/98	ISE Op. TZ (L1 / 2/3)	Network error	If the fault persists, contact SolarEdge support.
N / A	99-101	Voltage too high CA (L1 / 2/3)	Network error	Switch off the inverter and then on again. If this problem persists, contact SolarEdge support.
N / A	105	Temp. too low	Under temperature.	If the problem persists, replace the UPS in a warm place.
N / A	124	Earth Current - RCD Hardware error internal.		If the fault persists, contact SolarEdge support.

Troubleshooting power optimizers

Problem	Possible reason	Possible solution
The string voltage is 0V	The output of one or more power optimizer is disconnected	Connect all power optimizers outputs
The chain tension is not to 0V but is less than the number of optimizers	One or more power optimizers are not connected to the chain	Connect all power optimizers
	One or more modules are not properly connected to the inputs of power optimizers	Connect the modules to inputs optimizers
	Incorrect polarity of the connection on one of the chains	Check the polarity of the output of the string using a multimeter and correct if necessary.
The tension on the chain is higher than the number of system optimizers	One or more optimizers supplementary system are connected to the chain	Check whether an additional power optimizer is connected to the chain. If not, skip to the next solution.
WARNING ! ⚠ If the measured voltage is too high, the system may not be security voltage. PROCEED WITH CAUTION! A deviation of ± 1% per chain is reasonable ..	A module is directly connected to the chain, without a power optimizer.	Verify that only power optimizers connected to the chain and that no module output is connected without a power optimizer. If the problem persists, proceed to the next step.
	Failure of a power optimizers	• Disconnect the cables connecting the power optimizer on the chain. • Measure the output voltage of each power optimizer to locate the power optimizer that does not 1V output voltage safety. • If a fault on a power optimizer is detected, check its connections, polarity, modulus, and tension. • Do not continue before finding the problem and replace the defective power optimizer. • If a malfunction can not be bypassed or resolved, skip the defective power optimizer, thus connecting a shorter string.
	The SafeDC mode previously been disabled using the key SolarEdge	Enable SafeDC using SolarEdge key
The coupling of the UPS failed	Power optimizers are shaded	If you have connected the inverter to the SolarEdge Monitoring Portal using one of the communication options, you can perform remote coupling. Before leaving the site, make sure the power inverter on / off or on and the S_OK indication appears on the LCD screen to indicate connection to the Monitoring Portal.

Appendix B: Specifications

Single Phase UPS

	sE2200	SE3000 SE3500	SE4000 SE4000		- 16A	SE5000 SE6000	Unit	
Exit								
AC output power rating	2200	3000	3500	4000	4000	5000₁	6000	W
Maximum power output CA	2200	3000	3500	4000	4000	5000₁	6000	W
Rated output voltage CA	220/230/240							Vac
AC output voltage range	184 to 264.5							Vac
Rated frequency AC	**50/60 • 5**							Hz
Maximum current output DC	12	**16.5₂**	19.52	22	16	27	27	AT
Maximum protection against overcurrent current	12	**16.5₂**	19.52	22	16	27	27	AT
residual current detector / detector gradual residual current	300/30							my
CA startup current (peak / duration)	57.5 /0.6							A / ms
maximum fault current output	38							AT
Beach Power Factor	+ / - 0.9 to 1.0							
Protection level	class I							
Utility Monitoring, islanding protection, configurable thresholds country	Yes							
Overvoltage category	III							
Entrance								
Maximum DC power recommended₃ (Module STC)	2400	3300	3900	4400	5000	5500	6600	W
Transformerless without grounding	Yes							

₁ 4985W when the country is set for Australia and 4600W in Germany or the Czech Republic.

₂ 16A when the country is set to Denmark, Portugal, the UK and Poland. For other countries, contact SolarEdge.

₃ Limited to 135% of the power CA.

	sE2200	SE3000	SE3500	SE4000	SE4000	- 16A	SE5000	SE6000	Unit
Maximum input voltage	500								Vdc
nominal DC input voltage	350								Vdc
Maximum Input Current	8.5	11.5	13.5	15.5		15.5	19.5	23	adc
Maximum recharge current	0								adc
Protection against polarity reversal	Yes								
Grounding fault detection	Sensitivity 600 kOhms								
Category against overvoltage	III								
maximum efficiency of the inverter	97.6								%
European Weighted Efficiency	97.6	**97.6** [1]	97.5	97.5		97.5	97.4	97.4	%
night consumption	<2.5								W
features surcharges ents									
interfaces Communication supported	RS485, RS232, Ethernet, ZigBee (optional)								
Standard Compliant s									
security	IEC-62103 (EN50178), IEC-62109 project								
Network connection Standards	VDE-AR-N-4105, VDE 0126-1-1, AS-4777, DR-1663, DK 5940								
emissions	IEC61000-6-2, CEI61000-6-3, IEC61000-3-11, IEC61000-3-12, FCC Part 15 Class B								
Compliant	Yes								
Specifications Washroom we									
AC output	Diameter press étoupe9-16								mm
DC input	1 pair of MC4				2 pairs of MC4				
Dimensions (L x W x H)	540 X 315 x 172				540 X 315 x 191				mm
Weight	2 .2				21.7				kg
Cooling	Natural convection								
Noise (typical)	<50								DBA
Operating temperature range [2]	-20-50 (M40 version of -40 to + 50)								° C

[1] 97.5 SE3000 with the AC current limit 16A

[2] For the UPS power derating see the application note at http://www.solaredge.com/files/pdfs/se-temperature-derating-note.pdf

	sE2200	SE3000 SE3500	SE4000 SE4000		- 16A	SE5000 SE6000	Unit	
Humidity during operation - without condensation	<95							%
Protection class / Category environmental	IP65 - outside and inside							
maximum altitude	2000							M
Classification Pollution Degree (interior Exterior)	2/3							
Mounting support (Support supplied)								

2 Available in Germany, Austria and Denmark; for other countries, contact SolarEdge.

SolarEdge Installation Guide - MAN-01-00060-2.6

63

Three Phase inverters

	SE4k	SE5k	SE7k	SE8k	SE9k	SE10k	SE12.5k	SE15k	SE16k	SE17k	Unit
Exit											
AC output power rating	4000	5000	7000	8000	9000	10000	12500	15000	16000	17000	GOES
Maximum output power AC	4000	5000	7000	8000	9000	10000	12500	15000	16000	17000	GOES
Rated output voltage CA - line by line / line to neutral (nominal)	380/220; 400/230; 415/240										Vac
AC output voltage range	184 to 264.5										Vac
AC frequency (nominal)	50/60 ± 5										Hz
maximum intensity DC output (per phase)	6.5	8	11.5	13	14.5	16	20	23	25.5	26	AT
Protection against maximum current of the overcurrent	6.5	8	11.5	13	14.5	16	20	23	25.5	26	AT
residual current detector / detector gradual residual current	300/30										my
Supported networks - three phase	3 / N / PE; 230/400										
CA startup current (peak / duration)	154/0050										A / ms
maximum fault current output	33					40					AT
power factor range	+ / - 0.9 to 1.0										
Protection class	class I										
Utility Monitoring, islanding protection, power factor configurable, configurable thresholds countries	Yes										
category protection against overvoltage	III										

	SE4k	SE5k	SE7k	SE8k	SE9k	SE10k	SE12.5k	SE15k	SE16k	SE17k	Unit
Entrance											
Maximum DC Power[1] Recommended (Module STC)	4400	5500	7700	8800	9900	11000	13700	16500	17600	18700	W
Without transformer, without grounding						Yes					
Maximum input voltage						950					Vdc
Nominal voltage entréeCC						750					Vdc
Maximum Input Current	7	8.5	12	13.5	15	16.5	21	22	23	23	adc
Maximum recharge current						0					adc
Protection against polarity reversal						Yes					
Grounding fault detection						Sensitivity 1 M ohm					
Category against overvoltage						III					
maximum efficiency of the inverter						98					%
European Weighted Efficiency	97.3	97.3	97.3	97.5	97.5	97.6	97.7	97.6	97.7	97.7	%
night consumption						<2.5					W
features knew Additional Features											
Communication Interfaces supported						RS485, RS232, Ethernet, ZigBee (optional)					
Compliance st andards											
security						IEC-62103 (EN50178), IEC-62109 project					
connection standards to réseaus						VDE-AR-N-4105, VDE 0126-1-1, AS-4777 RD-1663, DK 5940					
emissions						IEC61000-6-2, CEI61000-6-3, IEC61000-3-11, IEC61000-3-12, FCC Part 15 Class B					
WEEE Compliant						Yes					
Specifications in stalling											
AC output						Diameter press étoupe- diameter 15-21					mm
DC input						2 pairs of MC4					

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[1] **Limited to 135% of the power CA.**

	SE4k	SE5k	SE7k	SE8k	SE9k	SE10k	SE12.5k SE15k		SE16k	SE17k	Unit
Height maximum installation	2000										m
Dimensions (W x D x H)	540 X 315 x 260										mm
Weight	33.2										kg
Beach of **operating temperature** ₁	-20-60 (M40 version of -40 to + 60)										° C
humidity operation without condensation	<95										%
Cooling	Fan (replaceable by the user)										
characteristic sound	<50										DBA
Protection class / Category environmental	Exterior and interior IP65-										
maximum altitude	2000										m
Pollution degree classification (interior Exterior)	2/3										
Mounting support (support provided)											

Breaker Size / fuse recommended to use the point of the SolarEdge inverter on the network connection:

Inverter	maximum output current (A)	Caliber Suggested fuse (A)
sE2200	12	16
SE3000	16.5	20
SE3500	19.5	25
SE4000	22	25
SE4000-16A	16	20
SE5000	27	32
SE6000	27	32
SE4k	6.5	10
SE5k	8	10
SE7k	11.5	16
SE8k	13	16
SE9k	14.5	20
SE10k	16	20
SE12.5k	20	25
SE15k	23	25

₁ For the decommissioning of power of the inverter refer to the application note at: http://www.solaredge.com/files/pdfs/se-temperature-derating-note.pdf

Inverter	maximum output current (A)	Caliber Suggested fuse (A)
sE2200	12	16
SE16k	25.5	32
SE17k	26	32

Appendix C: Mechanical Specifications

Dimensions of the inverter and mounting bracket

The following figures show the dimensions of the inverter and the mounting brackets for the inverters single and three phase.

Type 1 - Weight of the mounting bracket 2.87 lbs. / 1.3 kg Type 2 -

Weight Mounting Bracket 0.9 lbs. / 0.4 kg

Single phase UPS and Type 1 mount
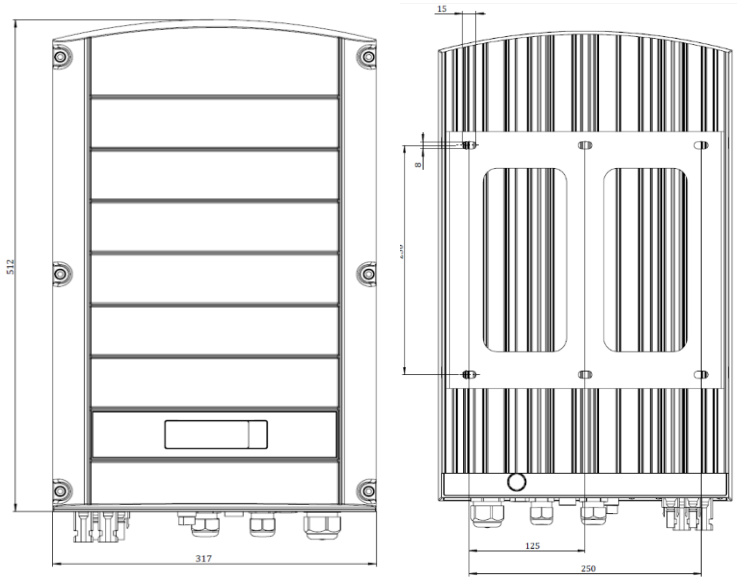
Figure 25: Single-phase inverter with a media type 1 - Front and Rear view
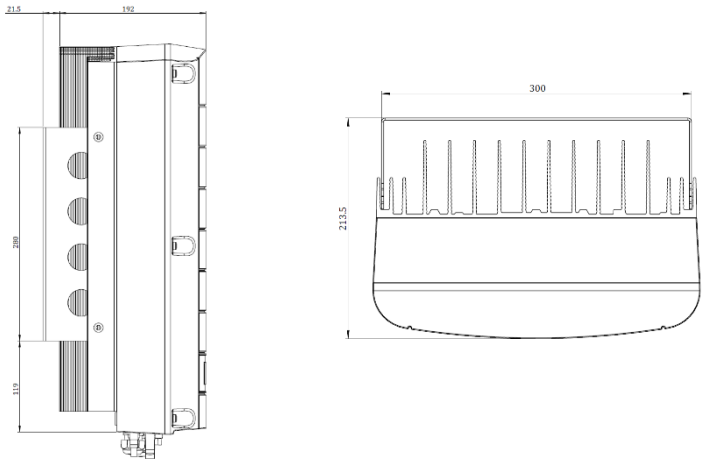
Figure 26: Single-phase inverter with a media type 1 - side view and from above
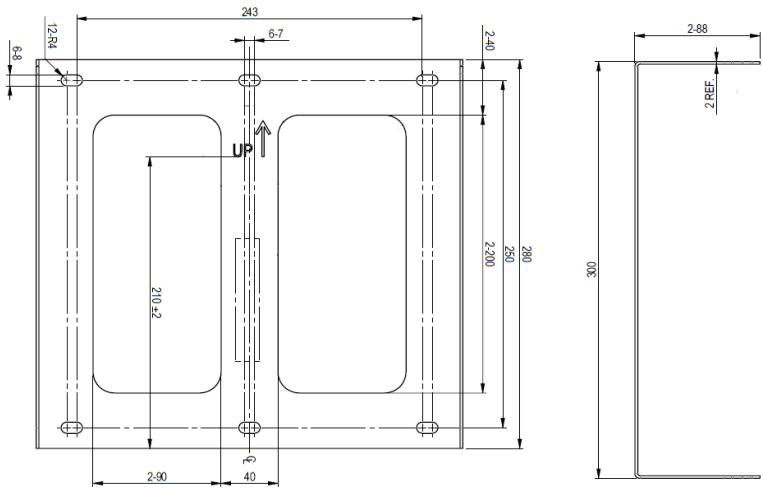
Figure 27: Mounting bracket of the single-phase inverter - Type 1

Three-phase UPS and Type 1 mount
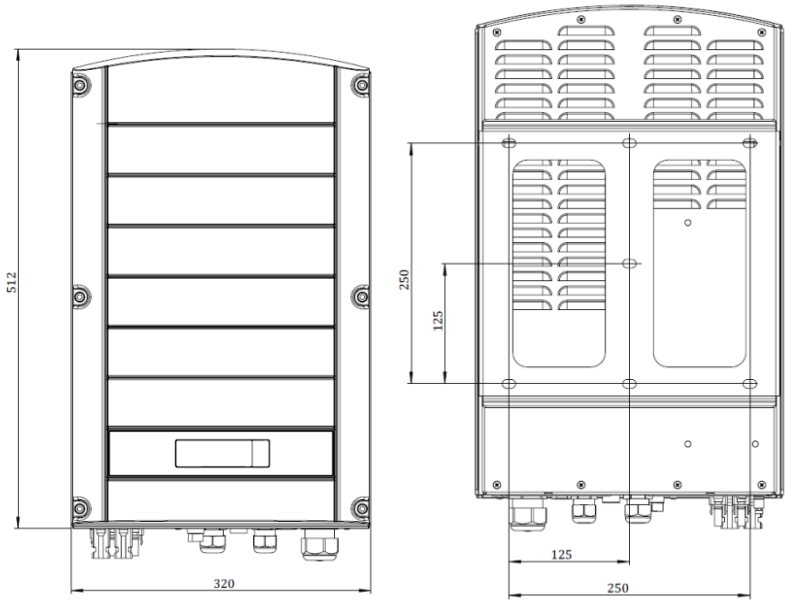
Figure 28: Three phase inverter with a media type 1 - Front and Rear view
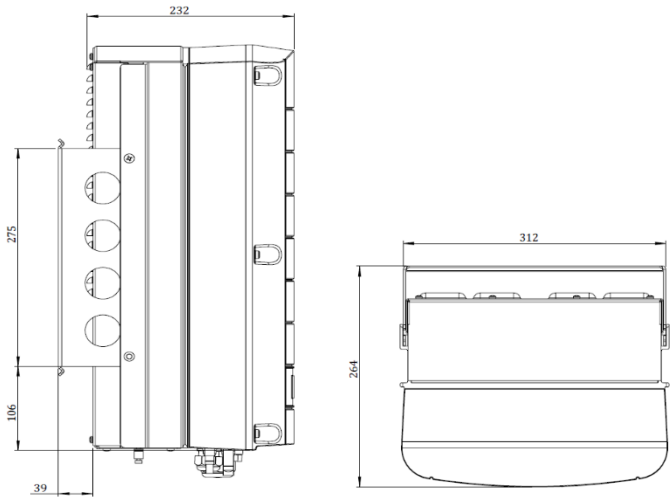
Figure 29: Three phase inverter with a media type 1 - side view and from above
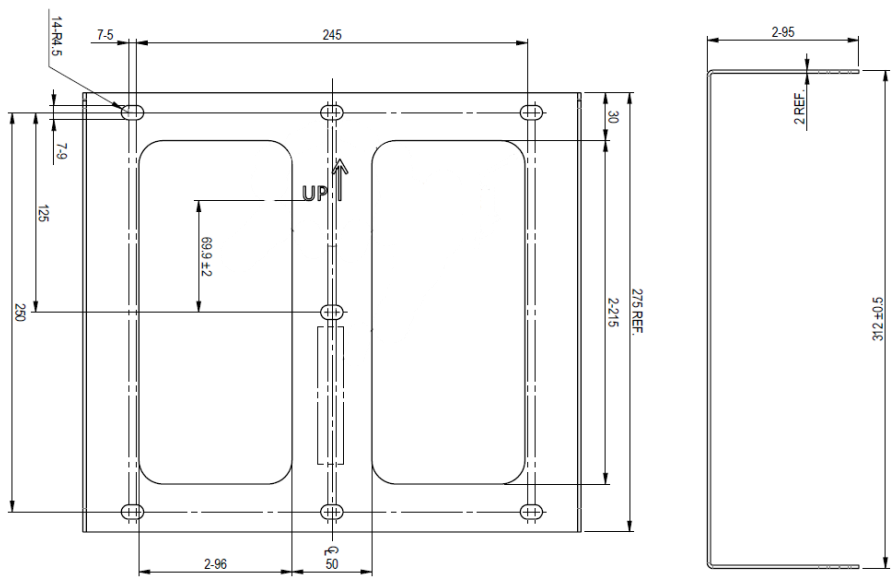
Figure 30: Mounting bracket of the three-phase inverter - Type 1

single phase inverter and type 2 bracket
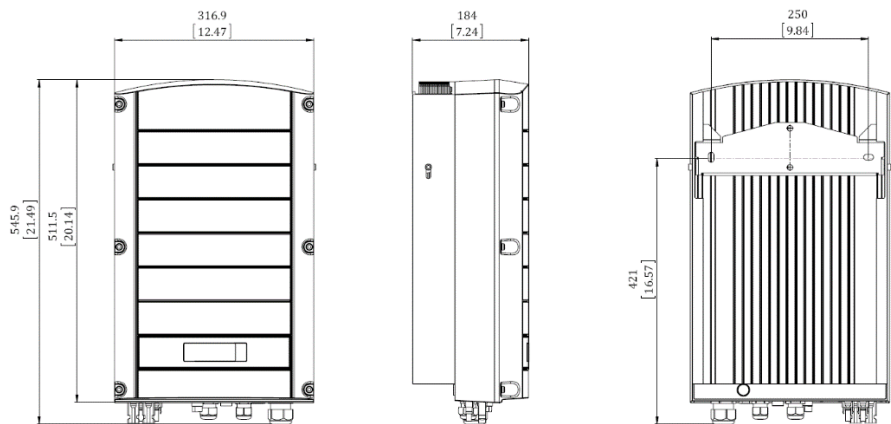
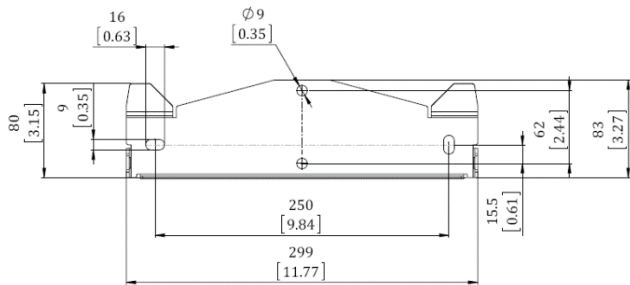**Figure 31: single-phase inverter with a media type 2 - view of front, side and rear**

Figure 32: Mounting bracket of the three-phase inverter - Type 2

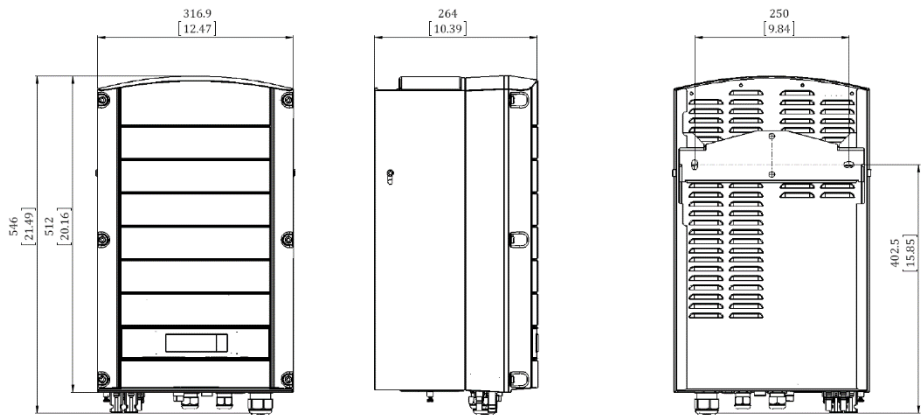## three-phase inverter and type 2 bracket

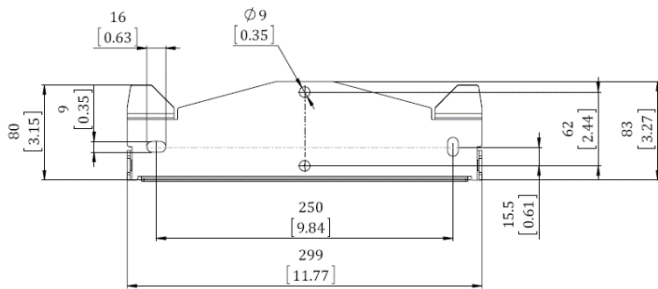**Figure 33: Three phase inverter with a media type 2 - view of front, side and rear**

Figure 34: Mounting bracket of the three-phase inverter - Type 2

Appendix D: DC Security

When AC power of the inverter is switched off (by closing the AC circuit breaker on the site), or when the switch ON OFF of the inverter is OFF, the DC voltage drops to a 1V voltage safety voltage optimizer.

SolarEdge inverters are certified to the following standards as disconnection devices for PV generators, which means that they can replace a disconnected DC:

- IEC 60947-3: 1999 + Corrigendum: 1999 + A1: 2001 + Corrigendum 1: 2001 + A2: 2005;
- DIN EN 60947-3
- VDE 0660-107: 2006-03
- IEC 60364-7-712: 2002-05
- DIN VDE 0100-712: 2006-06.

In accordance with these standards, the disconnection mechanism works as follows:

1 Place the ON / OFF switch of the inverter at the base of the inverter OFF,

or unplug the AC closing the AC breaker on the site. The DC voltage on the LCD screen of the UPS starts to decrease.

If the AC circuit breaker was extinguished, the LCD does not display. In this case, wait five minutes.

2 When the DC voltage reaches the safe voltage, PV connectors at the input of

UPS can be disconnected. Galvanic separation is then between the PV panel and the inverter.

Disconnection is safe even under single fault conditions.

⚠	**WARNING !**
	Under fault condition, the DC voltage safety is guaranteed only when using modules to:
	95 Voc when using single-phase inverter
	70 Vov when using three-phase inverter

Appendix E: Maintenance and Replacement

fan

The three-phase inverter has two fans, one internal and requires a SolarEdge technician to replace it (fan 1) and the other is accessible from the outside of the inverter (fan 2). A replacement kit is available from SolarEdge.
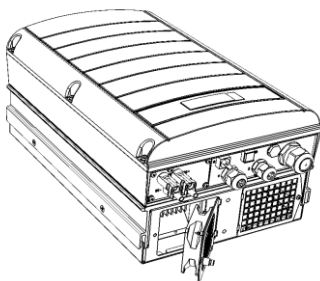

Figure 35: Fan inverter 2

Fan Interview

1 Maintain the fan and the screen clean by blowing out the dust accumulated, or at least one annually.

2 Check the screen the status of the fan status on the LCD (refer to *Status status fan - Three-phase UPS* Page 42

3 If any of the following events occurs, replace the fan as described below:

- When the fan stops working
- **Fan Status indicates Born does not work ;** before replacing the fan, turn off the AC inverter and check if the status is cleared
- The following error message appears:

  > V entilateur 2 enpanne

Fan replacement 2

1 Place the ON / OFF switch of the inverter OFF and wait until the LCD shows that the DC voltage is safe (<50 V), or wait five minutes before proceeding to the next step.

⚠️ **WARNING !**
If you do not see the inverter panel, or if a fault is indicated on the LCD, wait five minutes for the inverter input capacitors discharge.

2 Switching off the AC switch of the main distribution panel.

3 Use a Phillips screwdriver to loosen the single screw of the fan cover.

4 Open the door of the fan.
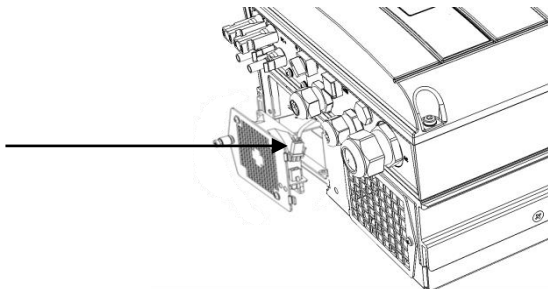
5 Disconnect the fan and remove the fan.

Figure 36: Fan Connector

6 Connect the fan connector on the new fan.

7 Close the door of the fan and tighten the cover screws.

8 Check *Status fan status* - as described on page 42.

Appendix F: Replacing and Adding
system components

> **NOTE :**
> If you are permanently dismantle the facility or part of it, be sure to use the methods of withdrawal dictated by local regulations.

Replacing an inverter

1 Place the ON / OFF switch of the inverter OFF and wait until the LCD shows

that the DC voltage is safe (<50 V), or wait five minutes before proceeding to the next step.

> **WARNING !**
> If you do not see the inverter panel, or if a fault is indicated on the LCD, wait five minutes for the inverter input capacitors discharge.

2 Disconnect the AC of the inverter by turning off the switches of the panel of the main circuit.

3 Open the cover of the inverter as described in *Removing the cover* on page 44.

4 Disconnect plugs DC and AC inverter son.

5 Remove the two screws securing lower the inverter on the mounting bracket and remove

the inverter from the mounting bracket.

> **NOTE :**
> If you remove the old inverter and do not immediately install a new one, use an insulation tape to isolate each of the AC and DC son.

6   Place the new inverter on the mounting bracket, insert the inverter fixing screws on the mounting bracket.

7 Follow the instructions *Chapter 3: Installation of the inverter* and *Chapter 4: Commissioning of Installation*

Adding, removing, or replacing the optimizers
power

1 Place the ON / OFF switch of the inverter OFF and wait until the LCD shows

that the DC voltage is safe (<50 V), or wait five minutes before proceeding to the next step.

> **WARNING !**
> *If you do not see the inverter panel, or if a fault is indicated on the LCD, wait five minutes for the inverter input capacitors discharge.*

2 Switching off the AC switch of the main distribution panel.

3 Disconnect and connect the power optimizers needed.

4 Effect coupling and other procedures in *Chapter 4: Commissioning of Installation* on page 24 of all inverters with power optimizers those added or removed.

5 In the Monitoring Portal, replace the series of power optimizer number retired with

the serial number of the new installed power optimizer.

Si vous avez des questions techniques concernant nos produits, veuillez contacter notre support par le biais du portail de service SolarEdge:
http://www.solaredge.com/groups/support/services

Amérique du Nord	(N° vert) 1877 360 529 2
Australie	(N° vert) 1800 46 55 67
Allemagne	089 454 597 30
France	(N° vert) 0800 917 410
Italie	(N° vert) 800 784 824
Japon	(N° vert) 81 3 5530 9360
Royaume Uni	(N° vert) 0800 028 1183
Belgique	(N° vert) 0800 730 41
Israël	073 240 311 8
International	972 (0) 73 240 311 8
Fax	972 (0) 73 240 311 7
Email à l'adresse:	support@solaredge.com

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