



Installation Guide

**Single Phase Energy Hub  
Inverter with Prism Technology  
with SetApp Configuration**

Version 1.3

# Disclaimers

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## FCC Compliance

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

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

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

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

# Revision History

## Version 1.3 (July 2020)

- Added the requirement for a soft start device installation, in case of high-consumption loads in *The storage system battery must be powered off before and during wiring.* on page 10.
- Added the requirement to check the feature is supported by FW version *Connecting Multiple Inverters through RS485* on page 43.

## Version 1.2 (May 2020)

- Product name changed to *Single Phase Energy Hub Inverter with Prism Technology.*
- Updated *"Activating, Commissioning and Configuring the System"* on page 45.
- Added *Connecting Multiple Inverters through RS485* on page 43.
- Added *Energy Hub Inverter Troubleshooting* on page 62.

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# HANDLING AND SAFETY INSTRUCTIONS

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

## Safety Symbols Information

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

### WARNING!

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



### AVERTISSEMENT!

*Dénote un risque: il attire l'attention sur une opération qui, si elle n'est pas faite ou suivie correctement, pourrait causer des blessures ou un danger de mort. Ne pas dépasser une telle note avant que les conditions requises soient totalement comprises et accomplies.*

### CAUTION!

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



### ATTENTION!

*Dénote un risque: il attire l'attention sur une opération qui, si elle n'est pas faite ou suivie correctement, pourrait causer un dommage ou destruction de l'équipement. Ne pas dépasser une telle note avant que les conditions requises soient totalement comprises et accomplies.*

### NOTE

Denotes additional information about the current subject.



### IMPORTANT SAFETY FEATURE

Denotes information about safety issues.



## IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

## CONSIGNES DE SÉCURITÉ IMPORTANTES

CONSERVEZ CES INSTRUCTIONS

### WARNING!



The inverter cover must be opened only after switching the inverter ON/OFF/P switch located at the bottom of the inverter to OFF. This disables the DC voltage inside the inverter. Wait five minutes before opening the cover. Otherwise, there is a risk of electric shock from energy stored in the capacitors.

### AVERTISSEMENT!

*Ne pas ouvrir le couvercle de l'onduleur avant d'avoir coupé l'interrupteur situé en dessous de l'onduleur. Cela supprime les tensions CC et CA de l'onduleur. Attendre cinq minutes avant d'ouvrir le couvercle. Sinon, il y a un risque de choc électrique provenant de l'énergie stockée dans le condensateur.*

### WARNING!



Before operating the inverter, ensure that the inverter is grounded properly. This product must be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the product.

### AVERTISSEMENT!

*Avant d'utiliser l'onduleur monophasé, assurez-vous que l'onduleur est correctement mis à la terre. Ce produit doit être raccordé à un système de câblage fixe, métallique, l'équipement-le conducteur de mise à la terre doit être exécuté avec les conducteurs de circuit et raccordé à l'équipement borne de mise à la terre ou de plomb sur le produit.*

### WARNING!



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

### AVERTISSEMENT!

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

### WARNING!



The Connection Unit meets all requirements for a code-compliant installation of this system. The DC Disconnect Switch disconnects both the positive and negative conductors.

### AVERTISSEMENT!

*Le sectionneur externe (inclus) répond aux exigences de conformité pour l'installation de ce système. Le coupeur CC ouvre les conducteurs positifs et négatifs.*



**WARNING!**

The inverter input and output circuits are isolated from the enclosure. This system does not include an isolation transformer and should be installed with an ungrounded PV array in accordance with the requirements of NEC Articles 690.35 and 690.43 National Electric Code, ANSI/NFPA 70, 2011 (and Canadian Electrical Code, Part I, for installations in Canada).

Equipment grounding is the responsibility of the installer and must be performed in accordance with all applicable Local and National Codes.

**AVERTISSEMENT!**

*Les circuits d'entrée et de sortie de l'onduleur sont isolés de l'enveloppe. Ce système n'inclut pas d'isolation galvanique (transformateur) et devra être installé sans mise à la terre du champ PV et en accord avec les articles 690.35 et 690.43 du National Electric Code (NEC), ANSI/NFPA 70, 2011 (et du Code Electrique Canadien, Partie 1, pour les installations faites au Canada). La mise à la terre des équipements est la responsabilité de l'installateur et doit être faite en accord avec les toutes les règles locales et nationales applicables.*

**WARNING!**

The inverter must be connected to a dedicated AC branch circuit with a maximum Overcurrent Protection Device (OCPD) of 50A.

The SE10000H-US and SE11400H-US must be connected to a dedicated AC branch circuit with a maximum Overcurrent Protection Device (OCPD) of 80A.

**AVERTISSEMENT!**

*Les onduleurs doivent être connectés à un branchement AC dédié avec un disjoncteur de 50A.*

*Les onduleurs SE10000H-US et SE11400H-US doivent être connectés à un branchement AC dédié avec un disjoncteur de 80A*

**WARNING!**

SolarEdge products can expose you to chemicals including antimony trioxide, which is known to the State of California to cause cancer. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**AVERTISSEMENT!**

*Les produits SolarEdge peut vous exposer à des agents chimiques, y compris trioxyde d'antimoine, identifiés par l'État de Californie comme pouvant causer le cancer. Pour de plus amples informations, prière de consulter [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).*

**CAUTION!**

This unit must be operated according to the technical specification datasheet provided with the unit.

**ATTENTION!**

*Cette unité doit être utilisée selon les spécifications de fonctionnement, comme décrit dans la dernière fiche technique des spécifications.*

**CAUTION!**

**HEAVY OBJECT.** To avoid muscle strain or back injury, use proper lifting techniques, and if required - a lifting aid.

**ATTENTION!**

*Objet lourd. Pour éviter la fatigue musculaire ou des blessures au dos, utilisez des techniques de levage appropriées et, si nécessaire - un auxiliaire de levage lors du retrait.*

**NOTE**

The Connection Unit is NEMA type 3R rated . Unused conduit openings and glands should be sealed with appropriate seals.


**NOTE**

Use only copper conductors rated for a minimum of 75°C/ 167°F.

**NOTE**

This inverter is provided with an IMI (Isolation Monitor Interrupter) for ground fault protection.

**NOTE**

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

**NOTE**

A SolarEdge inverter may be installed in a site with a generator. SolarEdge requires installing a physical or electronic interlock, which will signal to the inverter when the grid has been disconnected. Interlock procurement, installation, maintenance and support are the responsibility of the installer.



Damage to the inverter due to incorrect interlock installation or use of an interlock that is incompatible with the SolarEdge system will render the SolarEdge warranty invalid.

For more information, refer to

<https://www.solaredge.com/sites/default/files/se-inverter-support-of-voltage-sources.pdf>.



**WARNING!**

Before operating the system, ensure that the been grounded properly.

**AVERTISSEMENT!**

*Avant d'utiliser l'onduleur monophasé, assurez-vous que l'onduleur est correctement mis à la terre.*

**WARNING!**

When handling the storage system battery, adhere to all manufacturer safety instructions.

**AVERTISSEMENT!**

*Durant la manipulation de la batterie, adhérez à toutes les instructions de sécurité du fabricant.*

**WARNING!**

The storage system battery must be powered off before and during wiring.

To power off the battery:

1. Turn off the circuit breaker.
2. Turn off the disconnect/auxiliary power switch.



To power the battery back on:

1. Turn on the disconnect/auxiliary power switch.
2. Turn on the circuit breaker.

For details, see *Powering the LG Chem Battery Off and On* on page 71.

**AVERTISSEMENT!**

*La batterie doit être éteinte avant et durant le câblage:*

*Pour éteindre la batterie:*

1. *Fermez le disjoncteur.*
2. *Fermez l'interrupteur auxiliaire.*

*Pour rallumer la batterie:*

1. *Ouvrez l'interrupteur auxiliaire.*
2. *Ouvrez le disjoncteur.*

*Pour plus de détails, consultez *Powering the LG Chem Battery Off and On* page 71.*

**CAUTION!**

This unit must be operated under the specified operating conditions as described in the technical specifications supplied with the unit.

*Cette unité doit être opérée suivant les instructions trouvées dans le manuel*

*fourni avec le produit.*

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**NOTE**

The battery used must be NRTL certified.

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**NOTE**

For battery decommissioning and disposal, follow the manufacturer requirements and instructions.

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**NOTE**

Backing up high-consumption loads, such as whole home air conditioners and well pumps, requires the installation of a soft start device (not supplied by SolarEdge) on the AC supply of these loads.

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# Chapter 1: Overview

The single phase Energy Hub inverter with prism technology is SolarEdge's all-in-one solution that uses a single phase DC optimized inverter to manage and monitor solar power generation, energy storage, EV charging and smart energy devices. When installed with a battery and the Backup Interface, homeowners are automatically provided with backup power in the event of grid interruption to power home loads. In addition, solar energy can be stored in a battery for Smart Energy Management applications such as export control, offering demand response and peak shaving, and performing time of use shifting for reduced electric bills.

## The Energy Hub Solution Components

- **Energy Hub inverter** - manages battery and system energy, in addition to its traditional functionality as a DC-optimized PV inverter.  
The **Connection Unit**, located at the bottom of the inverter, allows simple installation and connectivity to other system components and includes a DC Safety Switch.
- **One or two batteries (optional)** - DC-coupled batteries designed to work with the SolarEdge system. The batteries can be connected to the system optionally and require the Backup Interface to be installed.
- **Backup Interface** - controls disconnection of house loads from the grid and integrates the following components to enable grid-tied solar backup and Smart Energy Management. The Backup Interface must be installed to allow the operation of batteries.
  - **Energy Meter** - is used by the inverter for export, import, production and consumption readings, and for Smart Energy Management applications, such as: export limitation, time-of-use profile programming and maximizing self-consumption.
  - **Auto-transformer** - handles the phase load balancing.
  - **200A microgrid interconnection device** - disconnects the house loads from the grid in case of a power outage.
  - **Generator hardware support** - supports connection for up to 15kW alternative power supply. Generator connection requires supporting inverter firmware.
- **Smart EV charger (optional)**

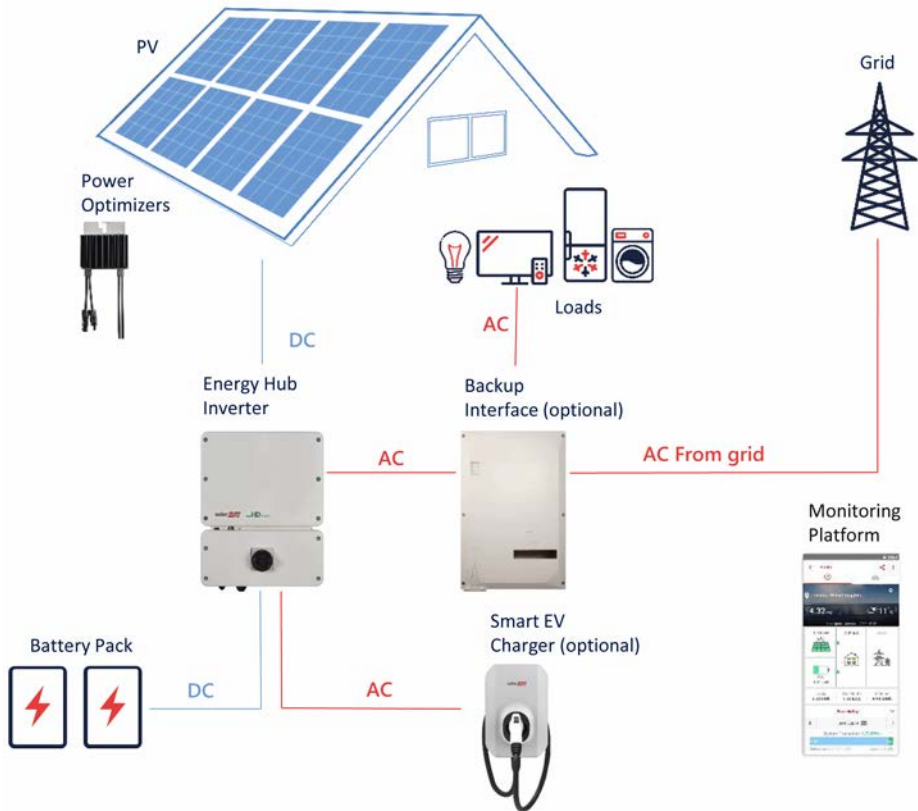


Figure 1: Energy Hub system components

**NOTE**



- Additional SolarEdge inverters (without batteries) can be connected over RS485. The inverters will participate in export limitation, Smart Energy Management and backup operation.
- PV modules connected to power optimizers are not mandatory for charge/discharge profile programming.

## Installation Equipment List

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

- Allen screwdriver for 5mm screw type for the inverter enclosure screws

- Standard flat-head screwdrivers set
- Non-contact voltage detector
- Cordless drill (with a torque clutch) or screwdriver and bits suitable for the surface on which the inverter and optimizers will be installed and for opening the Connection Unit drill guides. Use of an impact driver is *not* allowed.
- Mounting hardware (stainless bolts, nuts, and washers) for attaching:
  - the mounting brackets to the mounting surface
  - the power optimizer to the racking
- Wire cutters
- Wire strippers
- Voltmeter

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

- For Ethernet:
  - CAT5/6 twisted pair Ethernet cable with RJ45 connector
  - If using a CAT5/6 cable spool: RJ45 plug and RJ45 crimper
- For RS485:
  - Four- or six-wire shielded twisted pair cable
  - Watchmaker precision screwdriver set

## Inverter Transport and Storage

Transport the inverter in its original packaging, facing up and without exposing it to unnecessary shocks. If the original package is no longer available, use a similar box that can withstand the weight of the inverter (refer to the inverter weight in the specification datasheet provided with the unit), has a handle system and can be closed fully.

Store the inverter in a dry place where ambient temperatures are -13°F to 140°F / -25°C to +60°C.

## Chapter 2: Installing the Power Optimizer

### Safety

**WARNING!**

The metallic enclosure of the power optimizer must be grounded in accordance with the product's listing and local and national codes.

**AVERTISSEMENT!**

*L'enceinte métallique de l'optimiseur de puissance doit être mise à la terre en accord avec les réglementations locales et nationales.*

**WARNING!**

When modifying an existing installation, turn OFF the inverter ON/OFF/P switch, the DC Safety Unit and the AC circuit breaker on the main AC distribution panel.

**AVERTISSEMENT!**

*Avant de faire ces étapes, éteignez l'onduleur monophasé en mettant sur OFF l'interrupteur ON/OFF/P situé au bas de l'onduleur.*

**CAUTION!**

Power optimizers are IP68/NEMA6P rated. Choose a mounting location where optimizers will not be submerged in water.

**ATTENTION!**

*Les optimiseurs de puissances sont compatibles à la norme IP68/NEMA6P. Choisissez le lieu de montage tel que l'optimiseur ne puisse pas être submergé par l'eau.*

**CAUTION!**

This unit must be operated according to the operating specifications provided with the unit.

**ATTENTION!**

*Cette unité doit être opérée suivant les instructions trouvées dans le manuel fourni avec le produit.*

**CAUTION!**

Cutting the power optimizer input or output cable connector is prohibited and will void the warranty.

**ATTENTION!**

*Sectionner les câbles d'entrées ou de sortie de l'optimiseur est interdit et annule sa garantie.*



**CAUTION!**

All PV panels must be connected to a power optimizer.

**ATTENTION!**

Tous les modules doivent être connectés à un optimiseur de puissance.

**CAUTION!**

If you intend to mount the optimizers directly to the panel or panel frame, first consult the panel manufacturer for guidance regarding the mounting location and the impact, if any, on panel warranty. Drilling holes in the panel frame should be done according to the panel manufacturer instructions.

**ATTENTION!**

*Pour installation à même le module ou la monture du module, consultez d'abord le fabricant du module sur la position et son impact sur la garantie du module. Le perçage de trous dans le cadre du module devra se faire suivant les instructions du fabricant.*

**CAUTION!**

Installing a SolarEdge system without ensuring compatibility of the panel connectors with the optimizer connectors may be unsafe and could cause functionality problems such as ground faults, resulting in inverter shut down. To ensure mechanical compatibility of the power optimizers' connectors with the PV panel' connectors to which they are connected:

- Use identical connectors from the same manufacturer and of the same type on both the power optimizers and on the panels; or

- Verify that the connectors are compatible in the following way:



- The panel connector manufacturer should explicitly verify compatibility with the SolarEdge optimizer connector; and

- A third-party test report by one of the listed external labs (TUV, VDE, Bureau Veritas UL, CSA, InterTek) should be obtained, verifying the compatibility of the connectors.

For more information, refer to

<https://www.solaredge.com/sites/default/files/optimizer-input-connector-compatibility.pdf>



**ATTENTION!**

Les connecteurs du module doivent être mécaniquement compatibles avec les optimiseurs de puissance. Sinon, le système SolarEdge installé peut être dangereux ou causer des problèmes fonctionnels, tels que les défauts de terre, qui peuvent provoquer un arrêt de l'onduleur. Afin d'assurer la compatibilité mécanique entre les optimiseurs de puissance SolarEdge et les modules auxquels ils sont connectés:

- Utiliser des connecteurs identiques du même fabricant et du même type aussi bien pour les optimiseurs de puissance que pour les modules.



- Vérifiez que les connecteurs sont compatibles de la manière suivante:
  - Le fabricant du connecteur doit explicitement vérifier la compatibilité avec le connecteur SolarEdge.
  - Un rapport de test de tierce partie doit être effectué par l'un des laboratoires externes indiqués ci-dessous: (TUV, VDE, Bureau Veritas UL, CSA, Intertek), qui vérifiera la compatibilité des connecteurs.

Pour plus d'informations, consultez

<https://www.solaredge.com/sites/default/files/optimizer-input-connector-compatibility.pdf>

**IMPORTANT SAFETY FEATURE**

Modules with SolarEdge power optimizers are safe. They carry only a low safety voltage before the inverter is turned ON. As long as the power optimizers are not connected to the inverter or the inverter is turned OFF, each power optimizer will output a safe voltage of 1V.

## Package Contents

- Power optimizers
- Stainless steel grounding lock washers

## Installation Guidelines

- For the minimum and maximum number of power optimizers in a string (string length), see the power optimizer datasheets. Refer to the Designer for string length verification. The Designer is available on the SolarEdge website at: <https://www.solaredge.com/us/products/installer-tools/designer#/>.
- The length of home-run cables from the first and last power optimizer to the inverter (total cable length) may not exceed the following values:

Single Phase Inverters	Three Phase Inverters
All - 1000 ft. /300 m	SE9KUS, SE20KUS - 1000 ft. /300 m SE14.4KUS, SE17.3KUS, SE33.3KUS, SE40KUS - 2300 ft. /700 m

- Do not use extension cables between a panel and a power optimizer, between two panels connected to the same power optimizer, or between two power optimizers other than in the following cases:
  - Power optimizers with the 4-type suffix in their part number (Pxxx-4xxxxxx) - extension cables of up to 16 m can be installed per optimizer (8 m for DC+ and 8 m for DC-).
  - Power optimizers manufactured starting from working week 42, 2019, as indicated in the serial number (Example: S/N SJ5019A-xxxxxxx - working week 50, 2019) - extension cables of up to 16 m can be installed per power optimizer (8 m for DC+ and 8 m for DC-).
  - Extension cables can be installed between power optimizers only from row to row, around obstacles or pathways within a row, and from the end of the string to the inverter, as long as the total cable length is not exceeded.
- For connecting power optimizers to the inverter, use cables with a minimum cross-section of 11 AWG/ 4 mm<sup>2</sup> DC cables.
- Frame-mounted power optimizers are mounted directly on the panel frame, regardless of racking system (rail-less or with rails). For installation of frame-mounted power optimizers, refer to [http://www.solaredge.com/sites/default/files/installing\\_frame\\_mounted\\_power\\_optimizers.pdf](http://www.solaredge.com/sites/default/files/installing_frame_mounted_power_optimizers.pdf).
- The power optimizer can be placed in any orientation.
- If connecting more panels than power optimizer inputs in parallel, use a branch cable. Some commercial power optimizer models have a dual input.



- Position the power optimizer close enough to its panel so that their cables can be connected.
- Make sure to use power optimizers that have the required output conductor length.
- Completely shaded panels may cause their power optimizers to temporarily shut down. This will not affect the performance of the other power optimizers in the string, as long as the minimum number of unshaded power optimizers connected in a string of modules is met. If under typical conditions fewer than the minimum power optimizers are connected to unshaded panels, add more power optimizers to the string.
- Equipment grounding tightening torques: 4-6 AWG: 45 lb-in, 8 AWG: 40 lb-in, 10-14 AWG: 35 lb-in.
- To allow for heat dissipation, maintain clearance as specified below.

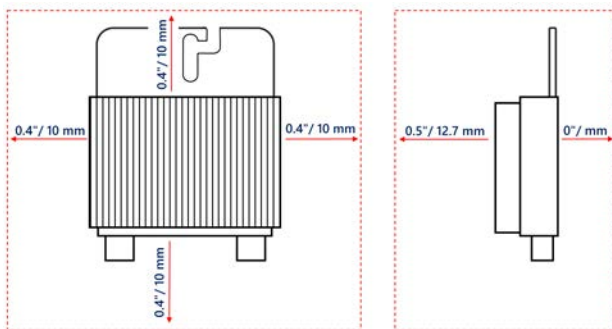


Figure 2: Power optimizer clearance

- When installing panels in a confined space, for example, if installing Building-integrated photovoltaic (BIPV) panels, ventilation measures may be needed to ensure the power optimizers are not be exposed to temperatures outside their specifications.

## Step 1: Mounting and Grounding the Power Optimizers

For each of the power optimizers<sup>(1)</sup>:

1. Determine the power optimizer mounting location and use the power optimizer mounting brackets to attach the power optimizer to the support structure (See *Figure 3*). It is recommended to mount the power optimizer in a location protected from direct sunlight. For frame-mounted power optimizers follow the instructions supplied with the optimizers, or refer to [https://www.solaredge.com/sites/default/files/installing\\_frame\\_mounted\\_power\\_optimizers.pdf](https://www.solaredge.com/sites/default/files/installing_frame_mounted_power_optimizers.pdf).
2. If required, mark the mounting hole locations and drill the hole.



### CAUTION!



Drilling vibrations may damage the power optimizer and will void the warranty. Use a torque wrench or an electric drill with adjustable clutch that meets the mounting torque requirements. *Do not* use impact drivers for mounting the power optimizer.

*Do not* drill through the power optimizer or through the mounting holes.

### ATTENTION!

*Les vibrations résultant du perçage peuvent endommager l'optimiseur de puissance et annulera la garantie. Utilisez une clé dynamométrique ou une perceuse électrique avec embrayage adaptable compatible avec les moments indiqués. Ne pas utiliser des tournevis à percussion pour fixer l'optimiseur. Ne pas percer à travers l'optimiseur de puissance ou ses trous de fixation.*

3. Attach each power optimizer to the rack using M6 (1/4") stainless steel bolts, nuts and washers or other mounting hardware. Apply torque of 9-10 N\*m / 6.5-7 lb\*ft. For 3NA series power optimizers, SolarEdge recommends mounting the power optimizer on a rail with the smooth side facing out, so that the power optimizer body will prevent its rotation.

<sup>(1)</sup>Not applicable to smart panels.

4. Use the following methods<sup>(1)</sup> to ground the power optimizer:

**WARNING!**



The metallic enclosure of the power optimizer must be grounded in accordance with the requirements of the local and national codes.

**AVERTISSEMENT!**

*L'enveloppe métallique de l'optimiseur de puissance doit être mise à la terre en accord avec les réglementations locales et nationales.*

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

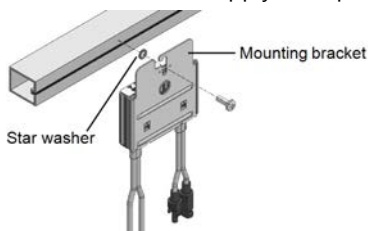


Figure 3: Power optimizer installation and grounding using a star washer

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<sup>(1)</sup>These methods have been evaluated by a nationally recognized testing laboratory as part of the optimizer evaluation. The SolarEdge-supplied grounding lug kit has been evaluated only for use with SolarEdge power optimizers. It is not intended or listed to be used as a general purpose grounding lug with other electrical equipment.

- For mounting on rails with sliding nut fasteners:** If the star washer cannot be used, use the SolarEdge grounding plate (purchased separately) between the railing and the flat side of the mounting bracket. Use mounting specific hardware as needed. Apply a torque of 9.5 N\*m / 7 lb\*ft. See *Figure 4*.

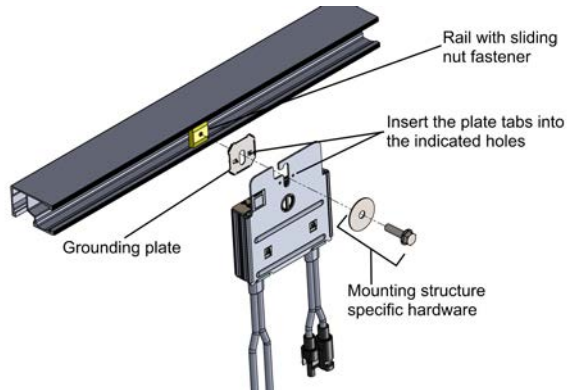


Figure 4: Power optimizer installation and grounding using a grounding plate

- For mounting on un-grounded structures (such as a wooden structure):** If the star washer or the plate cannot be used, use the SolarEdge grounding lug (purchased separately) with an equipment-grounding conductor according to the supplied instructions. The grounding terminal accepts a wire size of 6-14 AWG, and must be sized for equipment grounding per NEC 250.122 requirements. Tighten the screws connecting the power optimizer to the frame and the grounding terminal screw. Apply a torque of 9.5 N\*m / 7 lb\*ft.

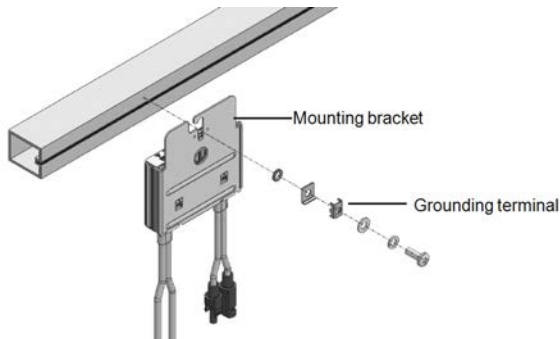


Figure 5: Power optimizer grounding terminal

5. Verify that each power optimizer is securely attached to the panel support structure.
6. Record power optimizer serial numbers and locations, as described in *Reporting and Monitoring Installation Data* on page 51.

## Step 2: Connecting a PV panel to a Power Optimizer



### NOTE

Images are for illustration purposes only. Refer to the label on the product to identify the plus and minus input and output connectors.

For each of the power optimizers:

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

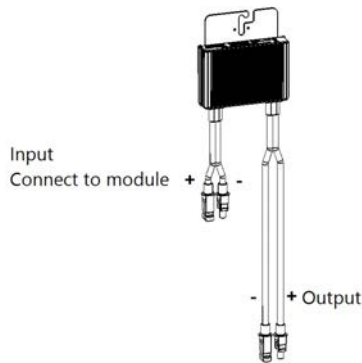


Figure 6: Power optimizer connectors

## Step 3: Connecting Power Optimizers in Strings

You can construct parallel strings of unequal length, that is, the number of power optimizers in each string does not have to be the same. The minimum and maximum string lengths are specified in the power optimizer datasheets. Refer to the [Designer](#) for string length verification.



1. Connect the Minus (-) output connector of the string's first power optimizer to the Plus (+) output connector of the string's second power optimizer.
2. Connect the rest of the power optimizers in the string in the same manner.



**WARNING!**

If using a dual-input power optimizer and some inputs are not used, seal the unused input connectors with the supplied pair of seals.

**AVERTISSEMENT!**

*Si un optimiseur à double entrées est utilisé et que certaines entrées ne sont pas connectées, fermez ces entrées avec la paire de couvercles fournie.*

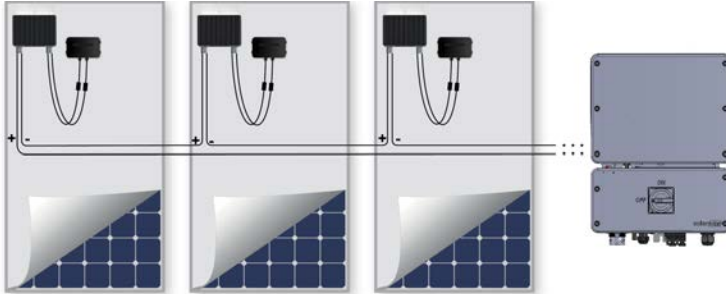


Figure 7: Power optimizers connected in series

3. If you intend to monitor the installation, using the monitoring platform, record the physical location of each power optimizer, as described in *Creating Logical and Physical Layout using Installation Information* on page 52.

## Step 4: Verifying Proper Power Optimizer Connection

When a panel is connected to a power optimizer, the power optimizer outputs a safe voltage of 1V ( $\pm 0.1V$ ). Therefore, the total string voltage should equal 1V times the number of power optimizers connected in series in the string. For example, if 10 power optimizers are connected in a string, then 10V should be produced.

Make sure the PV panels are exposed to sunlight during this process. The power optimizer will only turn ON if the PV panel provides at least 2W.

In SolarEdge systems, due to the introduction of power optimizers between the PV panels and the inverter, the short circuit current  $I_{SC}$  and the open circuit voltage  $V_{OC}$  hold different meanings from those in traditional systems.

For more information about the SolarEdge system's string voltage and current, refer to the  $V_{OC}$  and  $I_{SC}$  in *SolarEdge Systems Technical Note*, available on the SolarEdge website at:

[https://www.solaredge.com/sites/default/files/isc\\_and\\_voc\\_in\\_solaredge\\_systems\\_technical\\_note.pdf](https://www.solaredge.com/sites/default/files/isc_and_voc_in_solaredge_systems_technical_note.pdf)



→ To verify proper power optimizer connection:

- Measure the voltage of each string individually before connecting it to the other strings or to the inverter. Verify correct polarity by measuring the string polarity with a voltmeter. Use a voltmeter with at least 0.1V measurement accuracy.

**NOTE**

Since the inverter is not yet operating, you may measure the string voltage and verify correct polarity on the DC wires inside the Connection Unit.

For troubleshooting power optimizer operation problems, refer to *Power Optimizer Troubleshooting* on page 64.

## Chapter 3: Installing the Inverter

Install the inverter either before or after the panels and power optimizers have been installed.

### Inverter Package Contents

- One Energy Hub inverter
- One mounting bracket
- Two Allen screws for fastening the inverter to the mounting bracket
- One 9V battery
- Installation guide

### Identifying the Inverter

Refer to the sticker on the inverter that specifies its **Serial Number** and its **Electrical Ratings**. Provide the serial number when contacting SolarEdge support. The serial number is also required when opening a new site in the SolarEdge monitoring platform.

### Inverter Interfaces

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

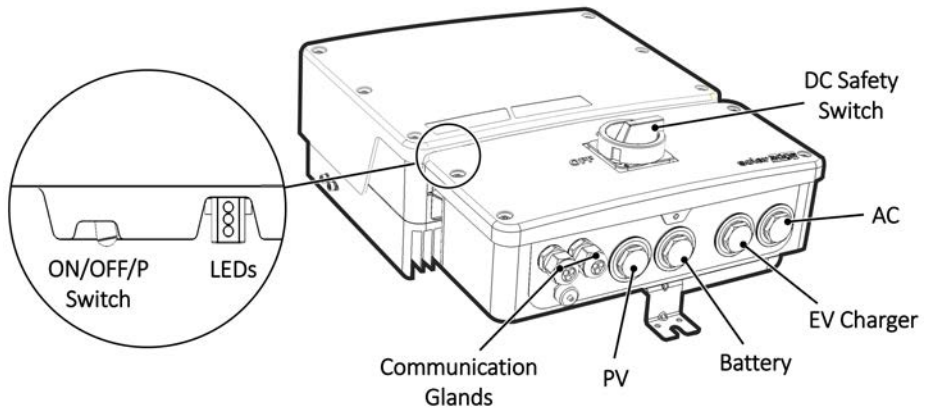


Figure 8: Inverter Interfaces

- **AC conduit entry** - For AC connection to the grid or Backup Interface
- **PV conduit entry** - For DC connection to SolarEdge Power Optimizers
- **EV conduit entry** - For AC connection to the Standalone EV Charger
- **Battery conduit entry** - For DC connection to the battery
- **DC Safety switch** - connects and disconnects the DC power to the system
- **Two communication glands:** for connection of inverter communication options. Each gland has three openings.
- **ON/OFF/P switch:**

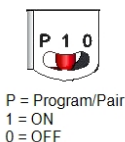


Figure 9: ON/OFF/P switch

- **ON (1)** - Turning this switch ON (after power optimizer pairing) starts the operation of the power optimizers, enables power production and allows the inverter to begin exporting power to the utility grid.
- **OFF (0)** - Turning this switch OFF reduces the power optimizer voltage to a low safety voltage and inhibits exportation of power. When this switch is OFF, the control circuitry remains powered up.

- **P** - Moving and releasing the switch allows viewing system information via the LEDs, and performing the following functions:

P Position Duration	Function	Comments
Switch moved to P for <b>2 seconds</b> , then released.	<ul style="list-style-type: none"> <li>• Displays (via LEDs) production information for 5 seconds, or error type indications (if exist) for 5 seconds.</li> <li>• Activates the Wi-Fi access point for connecting to the SetApp</li> </ul>	<p>While the switch is in P, all LEDs are ON.</p> <p>When the switch is released all LEDs turn OFF for 0.5 sec and then display the production or error indication.</p>
Switch moved to P for <b>more than 5 seconds</b> , then released.	Starts pairing	Pairing is indicated by all 3 LEDs blinking simultaneously.

- **LEDs:** three LEDs indicate, by color and state (on/ off/ blinking<sup>(1)</sup>/ flickering<sup>(2)</sup>/alternating<sup>(3)</sup>), different system information, such as errors or performance indications. For more information, refer to <https://www.solaredge.com/leds>.

The main LED indications are:

- Blue ON - the inverter is communicating with the monitoring platform
- Green ON - the system is producing
- Green blinking - AC is connected but the system is not producing
- Red ON - system error



(1)Blinking = Turns ON and OFF for the same duration

(2)Flickering = Turns ON for 100 mS and turns OFF for 5 seconds

(3)Alternating = alternate LED flashes

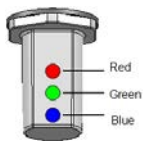


Figure 10: LEDs

The following table describes system performance information by LED color and ON/OFF/P switch position.

Indication	ON/ OFF/ P Switch Position	LED Color			Comment
		Red	Green	Blue	
Power optimizers not paired	ON (1)	OFF	Blinking	<ul style="list-style-type: none"> <li>▪ S_OK: ON</li> <li>▪ No S_OK: OFF</li> </ul>	S_OK: ON communication with the monitoring platform is established.
Pairing		Blinking	Blinking	Blinking	
Wake-up/ Grid Monitoring		OFF	Blinking	Blinking	
System Producing		OFF	ON	<ul style="list-style-type: none"> <li>▪ S_OK: ON</li> <li>▪ No S_OK: OFF</li> </ul>	
Night mode (no production)		OFF	Flickering	<ul style="list-style-type: none"> <li>▪ S_OK: ON</li> <li>▪ No S_OK: OFF</li> </ul>	
Inverter is OFF (Safe DC)	OFF (0)	OFF	Blinking	<ul style="list-style-type: none"> <li>▪ S_OK: ON</li> <li>▪ No S_OK: OFF</li> </ul>	
Inverter is OFF (DC not safe)		Blinking	Blinking	<ul style="list-style-type: none"> <li>▪ S_OK: ON</li> <li>▪ No S_OK: OFF</li> </ul>	
Inverter configuration or reboot	ON / P	ON	ON	ON	

Indication	ON/ OFF/ P Switch Position	LED Color			Comment
		Red	Green	Blue	
Inverter firmware upgrade	ON / P	Alternating	Alternating	Alternating	The upgrade process can take up to 5 minutes
Error	Any	ON	ON/ OFF/ Blinking/ Flickering	ON/ OFF / Blinking	Refer to <i>Errors and Troubleshooting</i> on page 61

The following table describes production percentage of AC information by LED color and ON/OFF/P switch position.

Indication	ON/ OFF/ P Switch Position	LED Color			Comment
		Red	Green	Blue	
Percentage of AC Production: 0 %	ON (1)	OFF	OFF	OFF	This indicates power production as percentage of rated peak AC output power
Percentage of AC Production: 0 - 33 %		OFF	ON	OFF	
Percentage of AC Production: 33 - 66 %		OFF	OFF	ON	
Percentage of AC Production: 66 - 100 %		OFF	ON	ON	

## Mounting the Inverter

The inverter is supplied with a mounting bracket kit:

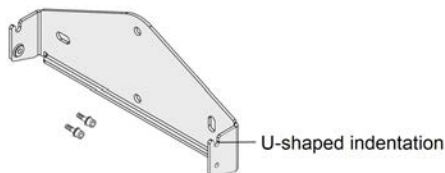


Figure 11: Mounting bracket

NOTE



Make sure the mounting surface or structure can support the weight of the inverter.

CAUTION!



SolarEdge inverters and power optimizers can be installed at a minimum distance of 50 m/ 164 ft from the shoreline of an ocean or other saline environment, as long as there are no direct salt water splashes on the inverter or power optimizer.

ATTENTION!

*Les onduleurs SolarEdge peuvent être installés à une distance minimum de 50m de la ligne d'eau de l'océan ou autre environnement salin, tant qu'il n'y a pas d'éclaboussements d'eau salée directs sur l'onduleur.*

1. Determine the inverter mounting location, on a wall, stud framing or pole. It is recommended to mount the inverter in a location protected from direct sunlight.
2. To allow proper heat dissipation, maintain the following minimum clearance areas between the inverter and other objects:

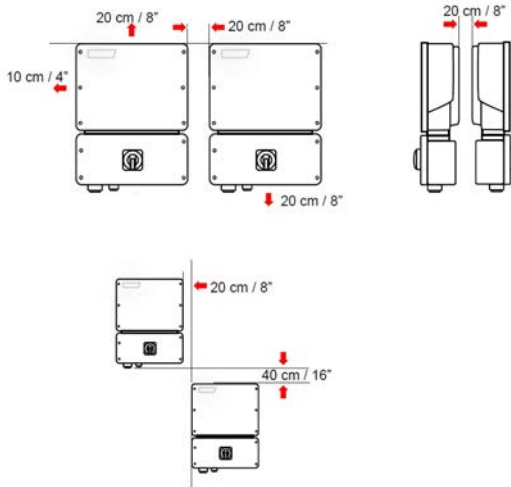


Figure 12: Clearance areas

- If installing a single inverter:
  - 8" (20 cm) from the top of the inverter.
  - At least 4" (10 cm) from the bottom of the inverter; if conduit entry to the Connection Unit will be from the bottom, leave sufficient clearance for the



conduits as well.

- 4" (10 cm) from the right and left of the inverter.
- If installing multiple inverters:
  - When installing inverters side by side, leave at least 20 cm (8") between inverters.
  - When installing inverters one above of the other, leave at least 16" (40 cm) between inverters.
- 3. Position the mounting bracket against the wall/ pole and mark the drilling hole locations (refer to for inverter and mounting bracket dimensions).
- 4. Drill the holes and mount the bracket. Verify that the bracket is firmly attached to the mounting surface.
- 5. Hang the inverter on the bracket:
  - a. Lift the inverter from the sides, or hold it at the top and bottom of the inverter to lift the unit into place. Do not lift holding the Safety Switch as it may be damaged.
  - b. Lower the inverter onto the U-shaped indentations, as shown below. Let the inverter lay flat against the wall or pole.
  - c. Insert the two supplied screws through the outer heat sink fin on both sides of the inverter and into the bracket.

Tighten the screws with a torque of 4.0 N\*m / 2.9 lb.\*ft.

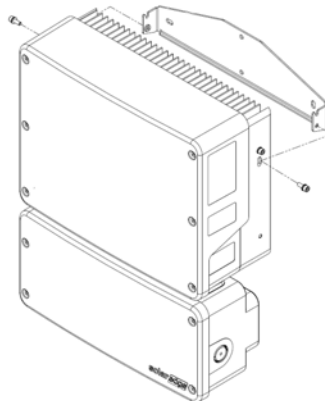


Figure 13: Hanging the inverter on the brackets

6. Optionally, secure the Connection Unit bracket to the wall/pole, using 3 screws:

**NOTE**

In case of inverter replacement with the Connection Unit still mounted, it is recommended to use all 3 holes.

- a. Mark the location of the bracket screw for the Connection Unit, and optionally the two additional bracket holes.

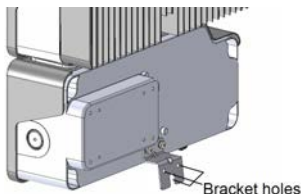


Figure 14: Connection Unit bracket

- b. Remove the inverter from the wall/ pole.
  - c. Drill the hole for the Connection Unit bracket.
  - d. Hang the inverter on the mounted brackets.
  - e. Fasten the Connection Unit bracket using a standard bolt.
7. Insert the screws at the top of the inverter brackets and fasten the brackets together.
  8. Verify that all the brackets are firmly attached to the mounting surface.

## Selecting a Residual Current Device (RCD)

**IMPORTANT SAFETY FEATURE**

All SolarEdge inverters incorporate a certified internal Residual Current Device (RCD) in order to protect against possible electrocution and fire hazard in case of a malfunction in the PV array, cables or inverter. There are two trip thresholds for the RCD as required for certification. The default value for electrocution protection is 30 mA, and for slow rising current is 300 mA.

If an external RCD is required by local regulations, check which type of RCD is required for the relevant electric code. Install the residual-current device (RCD) in accordance with the applicable local standards and directives. SolarEdge recommends using a type-A RCD. The recommended RCD value is 100 mA or 300 mA unless a lower value is required by the specific local electric codes. When required by local regulations, the use of an RCD type B is permitted.

**NOTE**

For multiple inverters, an RCD per inverter is required.

In installations where the local electric code requires an RCD with a lower leakage setting, the discharge current might result in nuisance tripping of the external RCD. The following steps are recommended to avoid nuisance tripping of the external RCD:

- Select the appropriate RCD for correct operation of the installation: An RCD with a rating of 30 mA may actually trip at a leakage as low as 15 mA (according to IEC 61008). High quality RCDs will typically trip at a value closer to their rating.
- Configure the trip voltage of the inverter's internal RCD to a lower value than the trip current of the external RCD. The internal RCD will trip if the current is higher than the allowed current, but because the internal inverter RCD automatically resets when the residual currents are low it saves the manual reset.

For detailed information, refer to the *RCD Selection for SolarEdge Inverters Application Note*, available on the SolarEdge website at [http://www.solaredge.com/sites/default/files/application\\_note\\_ground\\_fault\\_rcd.pdf](http://www.solaredge.com/sites/default/files/application_note_ground_fault_rcd.pdf).



## Chapter 4: Installing the Battery

Install the battery in accordance with the manufacturer instructions.

In addition, follow these guidelines:

- Make sure the battery's circuit breaker switch is OFF.
- For easy access to battery connectors, it is recommended to connect the cables to the battery and to set all battery DIP switches to their correct positions *before* mounting the battery.
- Measure the necessary length between the and the battery for all cables.
- Mark polarity on DC cables.

## Chapter 5: Connecting the Inverter

This chapter explains how to connect the inverter to:

- AC grid
- DC strings of modules with power optimizers
- Smart EV Charger
- Battery

### Installing Conduits

Before connecting the inverter, install all conduits in the following order.

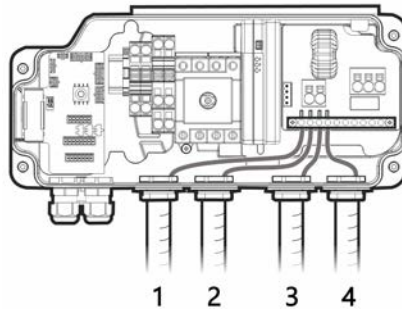


Figure 15: Conduit installation

#### → To install a conduit:

1. Switch the DC Safety Switch to OFF.
2. Release the four Allen screws of the Connection Unit cover and remove the cover.

#### CAUTION!



When removing the cover, make sure not to damage internal components. SolarEdge will not be held responsible for any components damaged as a result of incautious cover removal.

3. Install a conduit of the required diameter:
  - To install a 1" conduit, remove the conduit plug together with the reducing washer.
  - To install a 3/4" conduit, use the reducing washer.
4. If required, ground the conduit by connecting it to the grounding bar, as shown above.

## Connecting the Inverter to AC Grid

For connecting the inverter to AC grid, use a 14-4 AWG cable.

For more wiring information refer to the *SolarEdge Recommended AC Wiring Application Note*, available on the SolarEdge website at <http://www.solaredge.com/files/pdfs/application-note-recommended-wiring.pdf>.



→ To connect to AC grid:

1. Turn off the AC circuit breaker on the distribution panel.
2. Strip 2.8" / 70 mm of the external cable insulation and strip 0.32" / 8 mm of the internal wire insulation.

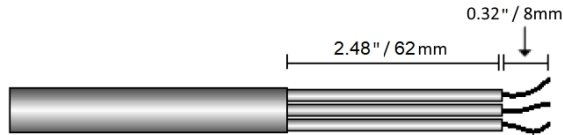


Figure 16: Insulation Stripping – AC Cable

3. Pass the AC cable through the conduit.
4. Connect the wires to the AC terminals as shown below.

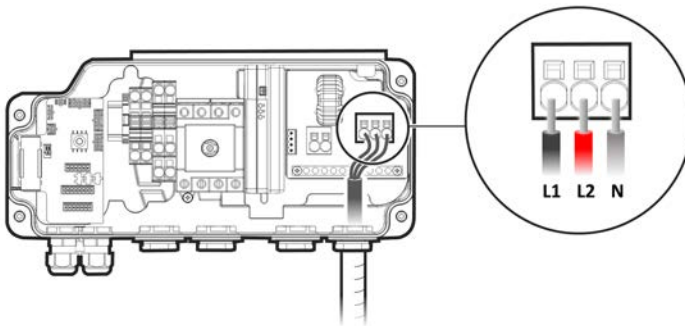


Figure 17: AC connection

## Connecting the DC Strings to the Inverter

Connect the string to the DC input pairs. If required, connect additional strings in parallel using an external combiner box/branch cables before connecting to the inverter.

## NOTE

Functional electrical earthing of DC-side negative or positive poles is prohibited because the inverter has no transformer. Grounding (earth ground) of panel frames and mounting equipment of the PV array panels is acceptable.

## NOTE

SolarEdge's fixed input voltage architecture enables the parallel strings to be of different lengths. Therefore, they do not need to have the same number of power optimizers, as long as the length of each string is within the permitted range.

→ To connect to DC strings:

1. Strip 5.16"/8 mm of the DC wires insulation.
2. Pass the DC wires through the conduit.
3. Connect the wires to the DC terminals as shown below. Observe the correct polarity as labeled on the terminals.

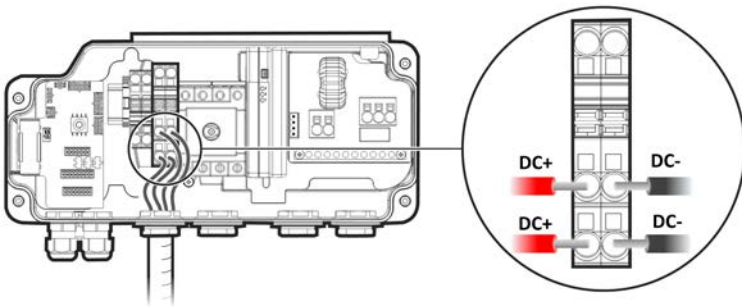


Figure 18: Inverter DC Connections

## Connecting the Battery (Optional)

### WARNING!

The storage system battery must be powered off before and during wiring.

To power off the battery:

1. Turn off the circuit breaker.
2. Turn off the disconnect/auxiliary power switch.



To power the battery back on:

1. Turn on the disconnect/auxiliary power switch.
2. Turn on the circuit breaker.

For details, see *Powering the LG Chem Battery Off and On* on page 71.

### AVERTISSEMENT!

*La batterie doit être éteinte avant et durant le câblage:*

*Pour éteindre la batterie:*

1. *Fermez le disjoncteur.*
2. *Fermez l'interrupteur auxiliaire.*

*Pour rallumer la batterie:*

1. *Ouvrez l'interrupteur auxiliaire.*
2. *Ouvrez le disjoncteur.*

*Pour plus de détails, consultez Powering the LG Chem Battery Off and On page 71.*

When connecting the battery to the inverter, use the following cable types:

■ **DC** - a pair of PV DC cables, DC cable 10 AWG (10-14 AWG), 600V insulated

■ **Communication** - 24 AWG (16-24AWG), 600V insulated or CAT5

→ **To connect the battery:**

1. Connect the DC and communication cables to the battery, as explained in the manual that comes with the battery.
2. Pass the other end of the communication cable through Communication gland 2.
3. Remove the 8-pin connector from the port labeled **2nd Inv-Battery** on the communication board.



4. Connect the communication cable wires to the 8-pin connector, as shown below.

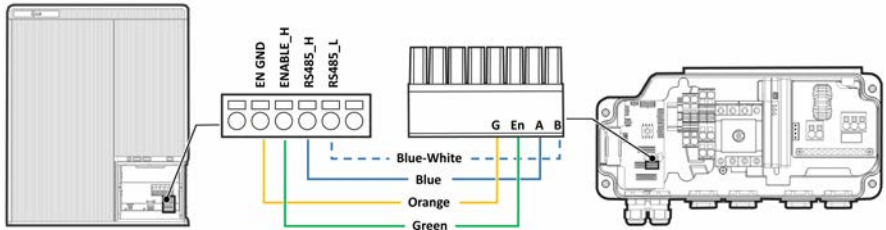


Figure 19: Communication cable connection - LG Chem battery to the inverter

5. Make sure the three DIP switches above the connector are in the down position (down - for RS485-2 the SolarEdge protocol; up - for RS485-1 the Modbus protocol).
6. Pass the other end of the DC cable through the Battery conduit.
7. Connect the wires to the DC terminals, as shown below.

#### WARNING!



Make sure to connect the power cables at correct polarity. Connecting the power cables at reverse polarity may result in damage to the inverter or battery.

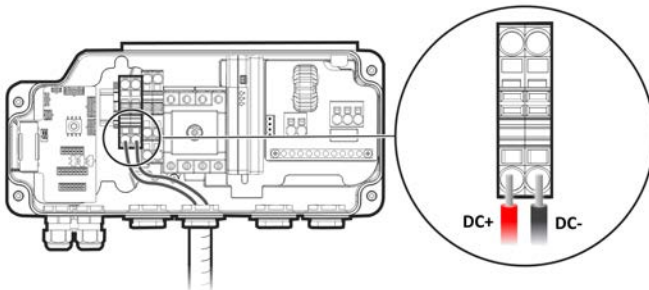


Figure 20: DC cable connection - LG Chem battery to the inverter

## Connecting the Backup Interface

The Backup Interface must be installed to allow the operation of batteries.

When connecting the Backup Interface to the inverter, use the following cable types:

- **AC** - 14-6 AWG cable
- **Communication** - 5-wire shielded twisted pair cable, 24 AWG (16-24 AWG), 600V

insulated or CAT5

➤ 12V power - 16 AWG cable

➔ To connect the Backup Interface:

1. Connect the AC, communication and 12V power cables to the Backup Interface, as explained in the installation manual that comes with the Backup interface.
2. Connect the other end of the AC cable to the inverter, as explained in *Connecting the Inverter to AC Grid* on page 37.
3. Open Communication gland 1 and pass the other end of the communication cable through the gland.
4. Remove the 7-pin connector from the port labeled **Backup Interface** on the communication board.
5. Connect the communication cable wires to the 7-pin connector, as shown below.

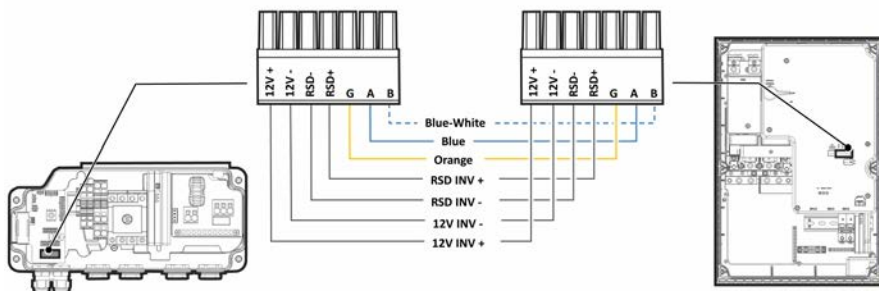


Figure 21: Connecting the Backup Interface

## Connecting the Smart EV Charger (Optional)

When connecting the Smart EV Charger to the inverter, use the following cable types:

➤ AC - 14-4 AWG cable

➤ **Communication** - 5-wire shielded twisted pair cable, 24 AWG (16-24 AWG), 600V insulated or CAT5

➔ To connect the Smart EV Charger:

1. Connect the AC cable and communication cable to the Smart EV Charger, as explained in the installation manual that comes with Smart EV Charger.
2. Pass the other end of the AC cable through the EV Charger conduit.
3. Connect the wires to the AC terminals, as shown below.

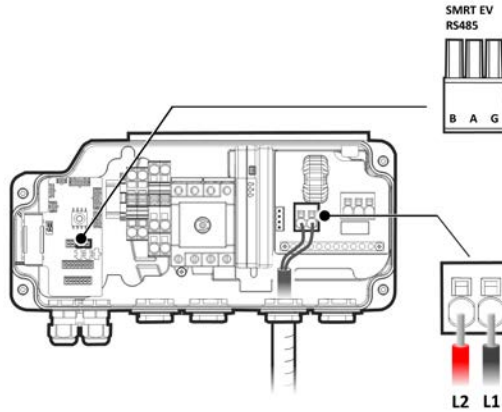


Figure 22: EV Charger Connection

4. Open Communication gland 2 and pass the communication cable through the gland.
5. Connect the communication cable to the 3-pin connector labeled **SMRT EV RS485**.

## Installing the 9V Battery

A 9V battery is supplied with the inverter to enable the inverter to start production in case of a power outage.

→ **To install the 9V battery:**

1. Connect the snap-on clip to the battery contacts.
2. Insert the battery into the battery holder in the Connection Unit.

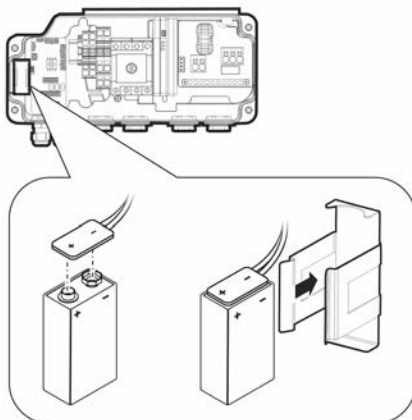


Figure 23: Installing the 9V Battery

3. Close the Connection Unit covers with the Allen screws.

## Connecting Multiple Inverters through RS485

Before connecting multiple inverters, make sure your inverters' firmware version supports this feature. For further information, contact SolarEdge support.

You can add inverters to your system to increase on-grid and backup power production. Up to two additional Single phase inverters with HD-Wave technology or Energy Hub inverters may be connected to a single Energy Hub inverter.

If a battery and Backup Interface are installed, the AC output from the additional inverters must be connected to the Backup Interface. Use a circuit breaker (CB-UPG-xx-01) purchasable from SolarEdge. For more information, refer to the *Backup Interface Installation Guide*.

When connecting multiple inverters, use the following cable types:

- **Communication** - 24 AWG (16-24AWG), 600V insulated or CAT5
- **12V- RSD cable** - 16 AWG cable

→ **To connect an additional Energy Hub inverter:**

1. On both inverters, pass the communication cable through Communication gland 2.
2. On the first inverter, connect the cable to the **2nd Inv RS485** connector.

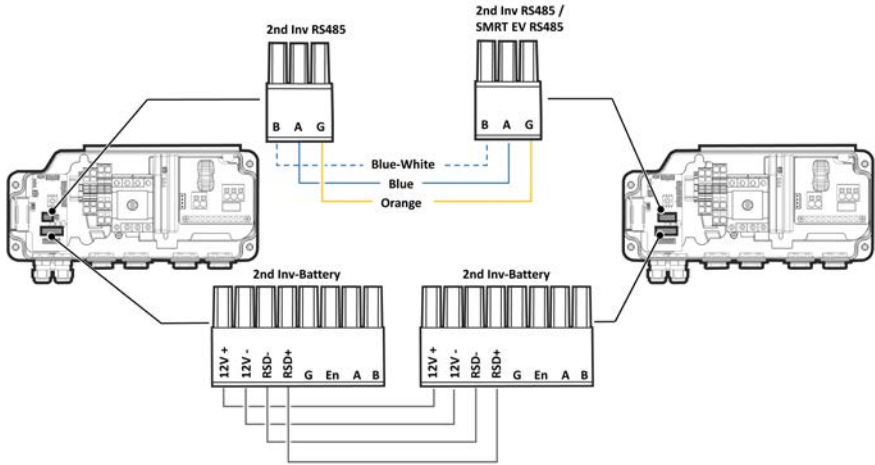


Figure 24: Connecting two Energy Hub inverters

3. On the second inverter, connect the cable to either the **2nd Inv RS485** connector or the **SMRT EV RS485** connector.
4. On both inverters, pass the 12V- RSD cable through Communication gland 2 and connect it to the **2nd Inv-Battery** connector.
5. Pull the cables lightly to make sure they are properly connected.
6. Close and tighten the communication glands.

→ **To connect an additional HD-Wave inverter:**

1. On the HD-Wave inverter, connect one end of the communication cable to the **RS485-1** connector on the communication board. For more information, refer to the *HD-Wave inverter Installation Guide*.
2. Pass the other end of the communication through Communication gland 2 of the Energy Hub inverter.
3. Connect the cable to the **2nd Inv RS485** connector on the communication board.
4. Pull the cables lightly to make sure they are properly connected.
5. Close and tighten the communication glands.

## Chapter 6: Activating, Commissioning and Configuring the System

You can connect communication options at this stage, as described in *Setting Up Communication to the Monitoring Platform* on page 54.

After completing all connections, activate and commission the system using the inverter SetApp mobile application. You can download the SetApp from the Apple App Store and Google Play before arriving at the site.



Internet connection is required for the download, one-time registration, and logging in, but not required for using the SetApp.

### Step 1: Activating the Installation

During system activation, a Wi-Fi connection is created between the mobile device and the inverter and the system firmware is upgraded.

#### Before activation

- Download, register (first time only) and log-in to SetApp on your mobile device. Verify that the application is updated with the latest version.
- If applicable, turn on all devices (battery, Energy Meter, Backup Interface) connected to the inverter, so that the devices may be auto-detected.

#### → To activate the inverter:

1. Turn ON the AC circuit breaker on the main distribution panel.
2. Open SetApp and follow the on-screen instructions (scan the inverter bar-code; move the ON/OFF/P switch to P position for 2 seconds and release).

SetApp creates a Wi-Fi connection, upgrades the inverter firmware and activates the inverter.

3. When the activation is complete, do one of the following:
  - Select **Connect to Another Device** to continue activating additional inverters.
  - Select **Start Commissioning** for pairing and other system configuration.

## Step 2: Commissioning and Configuring the Installation

This section describes how to use the SetApp menus for commissioning and configuring the inverter settings.

Menus may vary in your application depending on your system type.

→ To access the Commissioning screen:

Do one of the following:

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

### Setting Country, Grid and Language

The inverter must be configured to the proper settings in order to ensure that it complies with the country grid code and functions.

1. From the **Commissioning** screen select **Country & Grid**.
2. From the **Country & Grid** drop-down list, select the required option and tap **Set Country & Grid**.
3. From the **Language** drop-down list, select your language and tap **Set Language**.

## Pairing

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



### WARNING!

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

### AVERTISSEMENT!

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

When the inverter starts converting power after the initial connection to the AC, the inverter enters Wake up mode until its working voltage is reached. This mode is indicated by the flickering green inverter LED.

When working voltage is reached, the inverter enters Production mode and produces power. The steadily lit green inverter LED indicates this mode.

4. Tap **OK** to return to the **Commissioning** menu.

## Communication

Communication settings can be configured only after communication connections are complete. Refer to *Setting Up Communication to the Monitoring Platform* on page 54.

- Select **Monitoring Communication** to configure communication with the monitoring platform.
- Select **Site Communication** to configure communication between multiple SolarEdge devices or external non-SolarEdge devices, such as batteries or loggers. For more information, see *Configuring Communication with Other Devices* on page 48 below.



## Power Control

The Grid Control option may be disabled. Enabling it opens additional options in the menu.

The Energy Manager option is used for setting power export limitation, as described in the *Export Limitation Application Note*, available on the SolarEdge website at

[https://www.solaredge.com/sites/default/files/export\\_limitation\\_application\\_note\\_NA.pdf](https://www.solaredge.com/sites/default/files/export_limitation_application_note_NA.pdf).



For P(Q) diagram refer to

[https://www.solaredge.com/sites/default/files/application\\_note\\_p\\_q\\_diagram\\_of\\_se\\_inverters\\_en\\_and\\_na.pdf](https://www.solaredge.com/sites/default/files/application_note_p_q_diagram_of_se_inverters_en_and_na.pdf).



### NOTE



SolarEdge inverters with “Grid Support” functionality (as marked on the inverter certification label), are compliant with UL 1741 Supplement A. The functionality is built into the inverter and no additional external device is required.

## Step 3: Verifying Proper Activation and Commissioning

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

Your SolarEdge power harvesting system is now operational.

## Configuring Communication with Other Devices

If the above devices have not been auto-detected during system activation, configure them as explained below.

→ To set up communication with the battery:

1. Access SetApp and select **Commissioning** > **Site Communication**.
2. From the **Site Communication** screen, select **RS485-1** > **Protocol** > **Modbus (Multi-**

Device).

3. Return to the previous screen and select **Add Modbus Device > Battery**.
4. Verify the battery information by selecting **Battery 1 → Battery Information**.

→ To set up communication with the Energy Meter:

If you are setting up communication with the meter before the battery, first perform Steps 1-3 above. After that, proceed with the steps below.

If the Backup Interface is installed as part of your system, configure the Backup Interface's meter as described below.

1. In the **RS485-1** screen, select **Add Modbus Device → Meter**.
2. Set the Energy Meter's **CT Rating** according to the CT specifications. If the CT rating value returns to 0, check communication with the CT.
3. Select **Meter 2 → Meter Function → Export+Import (E+I)**.

→ To set up communication with the Smart EV Charger

1. Access SetApp and select **Commissioning > Site Communication**.
2. Configure the Energy Hub inverter to be the leader by selecting **RS485-2 > Protocol > SolarEdge > SolarEdge Leader**.
3. Configure the Smart EV Charger to be the follower by selecting **RS485-2 > Protocol > Follower Detect**.

## Running a Battery Self-test

Run a battery self-test to check the battery's charge and discharge functionality.

→ To run a battery self-test:

1. Make sure the battery's circuit breaker switch is ON.
2. Switch the inverter ON/OFF/P switch to ON.
3. In SetApp, select **Commissioning → Maintenance → Diagnostics → Self-Test → Battery Self-Test → Run Test**.
4. Wait for all tests to complete and check the results in the summary table.  
If any of the tests have failed, see the table below for possible solutions:

Test Results	Solution
Charge failed	Check that the power and communication cables between the battery and inverter are properly connected.
Discharge failed	Check that the power and communication cables between the battery and inverter are properly connected.
Communication	Check that the communication cables between the battery and inverter are properly connected.
Inverter switch is off	Switch the inverter ON/OFF/P switch to ON.

→ To show the last test results:

- Select **Commissioning** → **Maintenance** → **Diagnostics** → **Self-Test** → **Battery Self-Test** → **Show Last Results**.

## Enabling StorEdge Applications

This section describes how to configure your system to use StorEdge applications. Before enabling StorEdge applications, run a battery self-test, as described above.

### Backup Power Applications

The produced power is stored in the battery to be used during power outages. When the grid voltage is down, the Backup Interface automatically switches to the Backup mode, disconnecting from the grid, while the Energy Hub inverter supplies power to the backed-up loads. This application requires connection to the Backup Interface and backed-up loads (pre-selected or the entire home).

The application can be used in one of two ways:

- **Backup-only** – energy stored in the battery is discharged for backup power only, that is, when there is no power from the grid
- **Backup with Smart Energy Management**– use some of the battery energy for backup power, and the rest for maximize self-consumption(MSC) or charge/discharge profile programming (for time of use arbitrage) applications.

The Backup application can be used whether or not PV modules are installed at the site. The backup function is disabled by default and can be enabled for on- grid only application, if backup is not needed.

To start using StorEdge applications, you first need to enable the Backup Configuration functionality (disabled by default). If Backup Configuration is disabled, the system will use the battery energy in the following cases:

- When PV production is not sufficient in MSC
  - When using one of charge/discharge profiles that requires battery discharge
- However stored energy will not be used to back up the loads in case of power outage.

→ To enable Backup Configuration:

- Open SetApp and select **Commissioning > Power Control > Energy Manager > Backup Configuration > Backup > Enable**.

After the Backup Configuration is enabled, the Backup Interface is automatically configured.

→ To enable a StorEdge application:

1. Select **Power Control > Energy Manager > Energy Control**.
2. Select one of the following applications:
  - **Backup only** - Set the system to supply power to backed-up loads only in case of a power outage.
  - **Time of use** - Set a charge/discharge profile and the level of charging the battery from AC.
  - **Maximum Self Consumption (MSC)** - Set the system to maximize self-consumption, and then the level of stored energy to be reserved for backup.

## Reporting and Monitoring Installation Data

Monitoring the site requires connecting the inverter to the monitoring platform, using any of the wired or wireless options available from SolarEdge. Refer to *Setting Up Communication to the Monitoring Platform* on page 54.

## The Monitoring Platform

The monitoring platform provides enhanced PV performance monitoring and yield assurance through immediate fault detection and alerts at the panel, string and system level.

Using the platform, you can:

- View the latest performance of specific components.
- Find under-performing components, such as panels, by comparing their performance to that of other components of the same type.

- Pinpoint the location of alerted components using the physical layout.

The monitoring platform enables accessing site information, including up-to-date information viewed in a physical or logical view:

- **Logical Layout:** Shows a schematic tree-layout of the components in the system, such as: inverters, strings, panels, meters and sensors, as well as their electrical connectivity. This view enables you to see which panels are connected in each string, which strings are connected to each inverter, and so on.
- **Physical Layout:** Provides a bird's eye view of the actual placement of panels in the site, and allows pinpoint issues to the exact location of each panel on a virtual site map.

If you do not report the mapping of the installed power optimizers, the monitoring platform will show the logical layout indicating which power optimizers are connected to which inverter, but will not show strings or the physical location of power optimizers.

The monitoring platform includes a built-in help system, that guides you through the monitoring functionality.

For more information, refer to <https://www.solaredge.com/products/pv-monitoring#/>.



## Creating Logical and Physical Layout using Installation Information

To display a logical layout, insert the inverter serial number in the new site created in the monitoring platform. When the communication between the inverter and the monitoring server is established, the logical layout is displayed.

To display a physical layout, you need to map the locations of the installed power optimizers. To map the locations, use one of the methods described in the next sections.

### Designer

Designer recommends inverter and power optimizer selection per site size and enables report generation. You can create a project in Designer and export the site design with the string layout to the monitoring platform.

For more information, refer to

<https://www.solaredge.com/products/installer-tools/designer#/>.



### Mapper Application

Use the Mapper smart phone application to scan the power optimizer and inverter 2D bar-codes and create a virtual map of a PV site for enhanced monitoring and easier maintenance.

## The Mapper

- Simple on-site registration of new systems.
- Creating, editing and verifying system physical layout.
- Scanning and assigning the power optimizer serial number to the correct panel in the system physical layout.

For detailed information, refer to the *Mapper* demo movies:

- [Creating new sites using the Mapper mobile application](#)



- [Mapping existing sites using the Mapper mobile application](#)



## Physical Layout Editor

1. If you are a registered installer, access the monitoring platform site creation page at <https://monitoring.solaredge.com/solaredge-web/p/home#createSites>. If you have not yet signed up, go to <https://monitoring.solaredge.com/solaredge-web/p/createSelfNewInstaller>.
2. Fill out all required information in the screen, which includes information about your installation, as well as details about its logical and physical mapping.



## Using a Paper Template

Fill out the Physical Layout Template (downloadable from the SolarEdge website <http://www.solaredge.com/files/pdfs/physical-layout-template.pdf>) using the detachable 2D barcode stickers on each power optimizer. Once the form is completed, use the Mapper to scan the 2D codes and create the map in the monitoring platform. Optionally, you can send the sticker sheet to SolarEdge Support for physical layout creation.



# Chapter 7: Setting Up Communication to the Monitoring Platform

The inverter sends the following information to the monitoring platform:

- Power optimizer information received via the DC power lines (the PV output circuit)
- Inverter information
- Information of any other connected devices

This chapter describes how to set up communication between:

- The inverter and the monitoring platform through the Internet (wired/ wireless)
- Multiple inverters for a leader-follower configuration

Communication setup is not required for power harvesting, however it is needed for using the monitoring platform .

## CAUTION!



When connecting the communication cables, make sure that the ON/OFF/P switch on the Connection Unit is turned OFF, and the AC is turned OFF.

When configuring the communication parameters, make sure that the ON/OFF/P switch on the Connection Unit is OFF, and the AC is turned ON.

## ATTENTION!

*Lors de la connexion des câbles de communication, assurez-vous que l'interrupteur MARCHE/ARRÊT à la base de l'onduleur soit en position ARRÊT, et le CA est en position ARRÊT. Lors de la configuration des paramètres de communication, assurez-vous que l'interrupteur MARCHE/ARRÊT soit en position ARRÊT, et le CA est en position MARCHE.*

## Communication Options

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

Only communication products offered by SolarEdge are supported.

### Ethernet

Ethernet is used for a LAN connection. For connection instructions refer to *Creating an Ethernet (LAN) Connection* on page 57

## RS485

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

## Wireless Gateway, Wireless Repeater(s)

The Wireless Gateway collects inverter data using a dedicated Wi-Fi connection and connects to the monitoring platform with the help of a home router. Wireless Repeater(s) extend the Wi-Fi signal range between the Wireless Gateway and inverter. Wireless Gateway and Wireless Repeaters can be purchased separately from SolarEdge. For more information, refer to <https://www.solaredge.com/sites/default/files/se-wireless-gateway-wireless-repeater-installation-guide.pdf>.



## Cellular

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

The Cellular Plug-in is provided with a user manual, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-cellular-plug-in-for-inverters-with-setapp-installation-guide.pdf>



## ZigBee

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

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

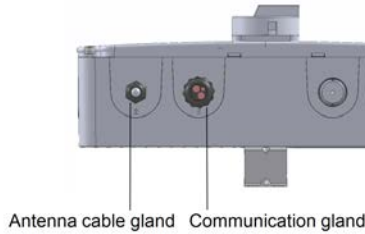
The ZigBee Plug-in for Smart Energy is provided with an installation guide, which should be reviewed prior to connection. Refer to <https://www.solaredge.com/sites/default/files/se-zigbee-plug-in-for-setapp-installation-guide.pdf>





## Communication Connectors

Opening for cable size (diameter)	Connection type
2.5 - 5 mm	RS485
4.5 - 7 mm, with cut	Ethernet (CAT5/6)
2 - 4 mm, with cut	Antenna cable for wireless communication



The communication board has the following connectors:

- Standard RJ45 terminal block for Ethernet connection
- USB
- RS485 connector

The SolarEdge Wi-Fi antenna, ZigBee or Cellular Plug-ins can be connected to the communication board for optional wireless connection.

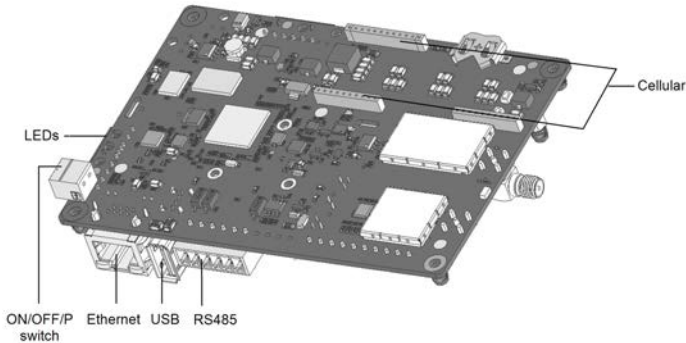


Figure 25: Communication board connectors

## Removing the Inverter Cover

1. Switch the inverter ON/OFF/P switch to OFF. Wait 5 minutes for the capacitors to discharge.

2. Turn the DC Safety Unit (if applicable) to OFF.
3. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel.
4. Open the Allen screws of the inverter cover and carefully pull the cover horizontally before lowering it.

**CAUTION!**

When removing the inverter cover, make sure not to damage the internal components. SolarEdge will not be held responsible for any components damaged as a result of incautious cover removal.

**ATTENTION!**

*Lors du retrait du couvercle, assurez-vous de ne pas endommager les composants internes. SolarEdge ne peut être tenue pour responsable des composants endommagés à la suite d'une imprudence dans le retrait du couvercle.*

## Removing the DC Safety Unit Cover (if applicable)

1. Turn OFF the AC breaker of the distribution panel and the safety switch (if applicable).
2. Open the DC Safety Unit cover: Release the four Allen screws and remove the cover.

**CAUTION!**

When removing the DC Safety Unit cover, make sure not to damage the internal components. SolarEdge will not be held responsible for any components damaged as a result of incautious cover removal.

**ATTENTION!**

*Lors du retrait du couvercle, assurez-vous de ne pas endommager les composants internes. SolarEdge ne peut être tenue pour responsable des composants endommagés à la suite d'une imprudence dans le retrait du couvercle.*

## Creating an Ethernet (LAN) Connection

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

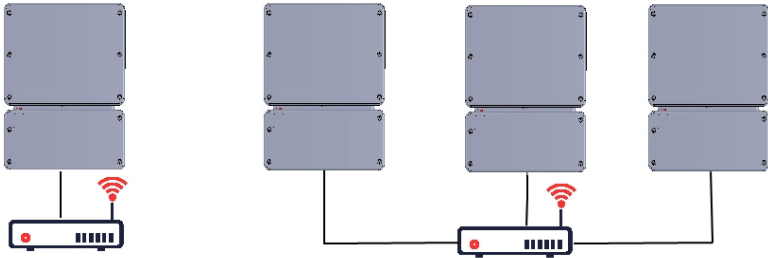


Figure 26: Example of Ethernet connection

Ethernet cable specifications:

- Cable type – a shielded Ethernet cable (Cat5/5E STP) may be used
- Maximum distance between the inverter and the router – 100 m/ 330 ft.

#### NOTE

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

For details refer to:

[https://www.solaredge.com/sites/default/files/overvoltage\\_surge\\_protection\\_na.pdf](https://www.solaredge.com/sites/default/files/overvoltage_surge_protection_na.pdf).



#### → To connect the Ethernet cable:

1. Remove the inverter covers as described in *Removing the Inverter Cover* on page 56.
2. Open the communication gland #1.

#### CAUTION!

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

#### ATTENTION!

*La cote interne du gland contient une rondelle qui doit être utilisée pour une bonne étanchéité.*

3. Remove the plastic seal from one of the large openings.
4. Remove the rubber fitting from the gland and insert the CAT5/6 cable through the gland and through the gland opening in the inverter.
5. Insert the cable through the opening in the Connection Unit towards the communication board.
6. Push the cable into the cut opening of the rubber fitting.

CAT5/6 standard cables have eight wires (four twisted pairs), as shown in the diagram below. Wire colors may differ from one cable to another. You can use either wiring standard, as long as both sides of the cable have the same pin-out and color-coding.

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

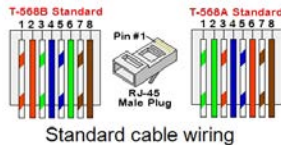


Figure 27: Standard cable wiring

7. Use a pre-terminated cable to connect via gland #1 to the RJ45 plug on the inverter's communication board or, if using a spool of cable, connect as follows:
  - a. Insert the cable through the gland.
  - b. Remove the cable's external insulation using a crimping tool or cable cutter and expose eight wires.
  - c. Insert the eight wires into an RJ45 connector (see Figure 27).
  - d. Use a crimping tool to crimp the connector.
  - e. Connect the Ethernet connector to the RJ45 port on the communication board (see Figure 25).

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

8. For the switch/router side, use a pre-terminated cable or use a crimper to prepare an RJ45 communication connector: Insert the eight wires into the RJ45 connector in the same order as above.
9. Connect the cable RJ45 connector to the RJ45 port of the Ethernet switch or router. You can connect more than one inverter to the same switch/router or to different switches/routers, as needed. Each inverter sends its monitored data independently to the SolarEdge monitoring platform.
10. The inverter is configured by default to LAN.
  - a. Make sure the ON/OFF/P switch is OFF.
  - b. Turn ON the AC to the inverter by turning ON the circuit breaker on the main distribution panel.
  - c. Turn ON the Connection Unit.

**WARNING!**

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

- d. Configure the connection as described in *Communication* on page 47.

**NOTE**

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

- Destination Address: prod.solaredge.com
- TCP Port: 22222 (for incoming and outgoing data)

11. Verify the connection, as described in *Verifying the Connection* on page 60.

## Verifying the Connection

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

1. Go to **Commissioning > Status**.
2. In the **Summary** section, under **Server Comm.**, make sure **S\_OK** is displayed together with the selected communication option.
3. Scroll down to the **Communication** section and check that the communication options are as required.

# Appendix A: Errors and Troubleshooting

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

## Identifying Errors

Errors may be indicated in various system interfaces: On the inverter bottom panel, a red LED indicates an error. In the monitoring platform and SetApp, errors are displayed with codes.

For more information on the codes displayed for error and warning messages, refer to

[https://www.solaredge.com/sites/default/files/troubleshooting\\_for\\_se\\_inverter\\_insallation\\_guide\\_addendum\\_na.pdf](https://www.solaredge.com/sites/default/files/troubleshooting_for_se_inverter_insallation_guide_addendum_na.pdf). This document describes errors that appear in SetApp, monitoring platform, and LCD (for inverters with LCD). To identify the error types, use the methods described below.



→ **To identify the error type using the inverter LEDs:**

1. Move the ON/OFF/P switch to **P** position for **2 seconds** and release it.
2. Observe the LED lights and use the following table to identify the error type. For more information, refer to <https://www.solaredge.com/us/leds>.



Error type	LED color and state		
	Red	Green	Blue
Arc detected	ON	OFF	OFF
Isolation or RCD problem	Blinking	OFF	OFF
Grid error	OFF	ON	OFF
High temperature	OFF	Blinking	OFF
Pairing failed	OFF	OFF	ON
Other issue	OFF	OFF	Blinking

→ **To identify the error type using the monitoring platform:**

1. Open the site dashboard and click the **Layout** icon.
2. Right-click the inverter and select **Info** from the menu. The inverter details window is displayed.
3. Click the **Errors** tab. The list is displayed.

## Energy Hub Inverter Troubleshooting

Malfunction	Description or Possible Cause	Corrective Action
Battery SOE (state of energy) is below 10%, while solar power is being produced	Continuous discharge; no charging	<ul style="list-style-type: none"> <li>▪ Perform a battery self-test as explained in <i>Running a Battery Self-test</i> on page 49. If the battery self-test is successfully passed, contact SE support.</li> <li>▪ If the battery cannot be charged, check the battery manufacturing date: Identify battery PN. For example: R15563P3SSEG11703177032 (R15563P3SSEG1YYMMDDLNNN); From battery PN identify the production date: In the example above, the manufacturing date is YY = 17, MM = 03, DD = 17. Contact LG Chem regional customer service for technical assistance.</li> </ul>
No power to backed-up loads during a power outage	The loads are not backed up.	<p>Check the following:</p> <ul style="list-style-type: none"> <li>▪ The inverter is producing power.</li> <li>▪ The Backup function is enabled, as explained in <i>Enabling StorEdge Applications</i> on page 50.</li> <li>▪ No error messages are displayed in SetApp.</li> <li>▪ Backed-up load circuit breakers are on.</li> <li>▪ The Backup Interface is in the Backup mode (the green LED on the Backup Interface is continuously ON).</li> </ul>
The inverter does not turn on.	External shutdown is on.	<ul style="list-style-type: none"> <li>▪ If an external shutdown switch is installed, make sure it is in the ON position.</li> <li>▪ If no external shutdown switch is installed, make sure the external shutdown short circuit jumper in the Backup Interface is installed.</li> </ul>
Battery self-test failed	Wrong battery connections	Make sure the DC cables, RS485 and En wires between the battery and inverter are correctly connected.

Error 3x6B	Battery communication error	<ul style="list-style-type: none"> <li>Make sure the RS485 and En wires between the battery and inverter are correctly connected.</li> <li>Make sure the battery is correctly configured, as explained in <i>Configuring Communication with Other Devices</i> on page 48.</li> </ul>
Error 3x6C	Battery internal error	Contact SolarEdge support.

## Troubleshooting Communication

### Troubleshooting Ethernet (LAN) Communication

The possible errors and their troubleshooting are detailed in the following table:

Error Message	Possible Cause and Troubleshooting
LAN cable disconnected	Physical connection fault. Check the cable pin-out assignment and cable connection.
No DHCP	IP settings issue. Check the router and inverter configuration. Consult your network IT.
Configure Static IP or set to DHCP	
Gateway not responding	Ping to router failed. Check the physical connection to the switch/ router. Check that the link LED at the router /switch is lit (indicating phy-link). If OK - contact your network IT, otherwise replace the cable or change it from cross to straight connection.
No Internet connection	Ping to google.com failed. Connect a laptop and check for internet connection. If internet access is unavailable, contact your IT admin or your internet provider.

### Troubleshooting RS485 Communication

- If the message **RS485 Leader Not Found** appears in the Status screen, check the connections to the leader device and fix if required.



- If after follower detection the number of followers displayed for the leader under **RS485-2 Conf → Follower Detect** is lower than the actual number of followers, refer to the following application note to identify missing followers and troubleshoot connectivity problems:




[https://www.solaredge.com/sites/default/files/troubleshooting\\_undetected\\_RS485\\_devices.pdf](https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf)

## Additional Troubleshooting

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

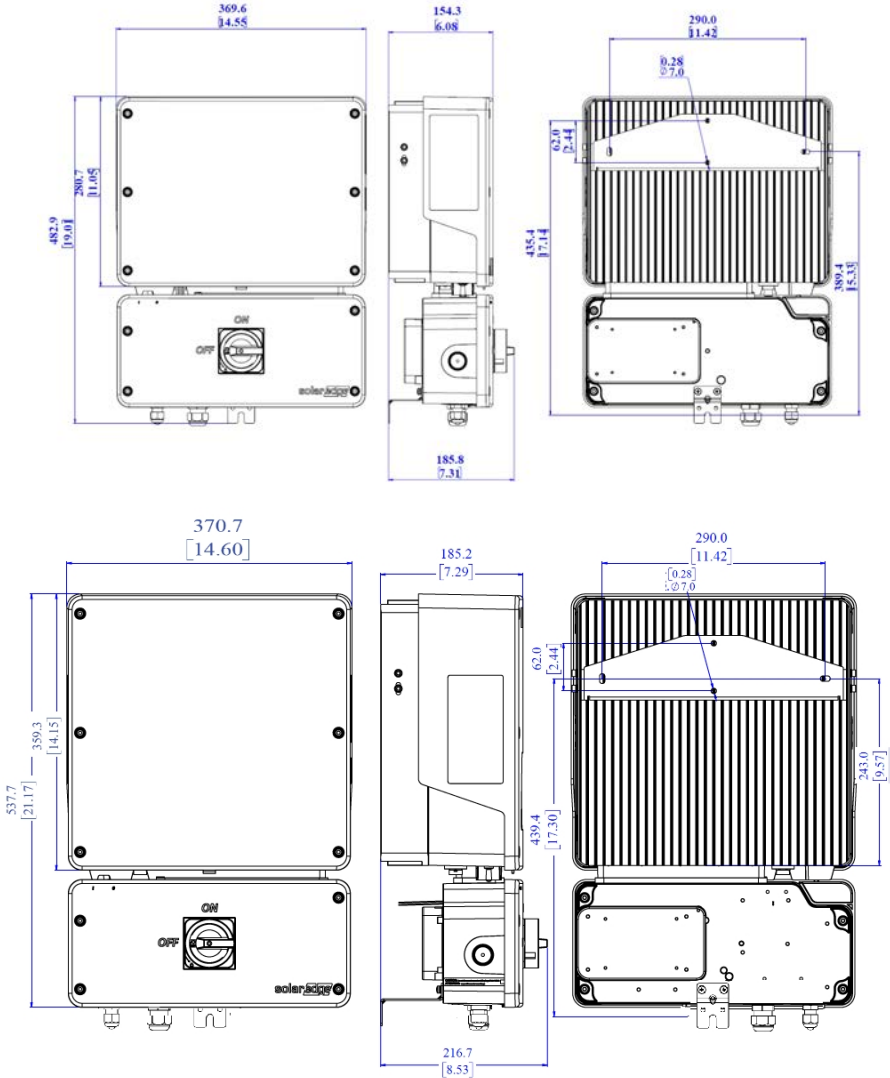
## Power Optimizer Troubleshooting

Malfunction	Possible Cause and Corrective Action
Pairing failed	Power optimizers are shaded. If you connected the inverter to the monitoring platform, retry pairing remotely (during sunlight). Make sure to leave the inverter ON/OFF/P switch ON and that S_OK appears in the status screen.
String voltage is 0V	Power optimizer (s) output is disconnected. Connect all power optimizer outputs.

Malfunction	Possible Cause and Corrective Action
<p>String voltage not 0V but lower than number of optimizers</p>	<p>Power optimizer(s) not connected in the string. Connect all power optimizers.</p> <p>Panel(s) not connected properly to power optimizer inputs (not applicable to smart panels). Connect the panels to the optimizer inputs.</p> <p>String reverse polarity. Check string polarity using a voltmeter and correct if needed.</p>
<p>String voltage is higher than number of optimizers</p> <p><b>WARNING!</b> If the measured voltage is too high, the installation may not have a safe low voltage. PROCEED WITH CARE! A deviation of <math>\pm 1\%</math> per string is reasonable.</p> <p> <b>AVERTISSEMENT!</b> <i>Si la tension mesurée est trop haute, la tension basse de sécurité pourrait manquer dans l'installation. REDOUBLEZ DE PRECAUTION. Une déviation de <math>\pm 1\%</math> par string est raisonnable.</i></p>	<p>Extra power optimizer(s) connected in the string (not applicable to smart panels). Check if an extra power optimizer is connected in the string. If not – proceed to next solution.</p> <p>A panel is connected directly to the string, without a power optimizer (not applicable to smart panels). Verify that only power optimizers are connected in the string and that no panel outputs are connected without a power optimizer. If the problem persists, proceed to the next step.</p> <p>Power optimizer(s) malfunction.</p> <ol style="list-style-type: none"> <li>1. Disconnect the wires connecting the power optimizers in the string.</li> <li>2. Measure the output voltage of each power optimizer to locate the power optimizer that does not output 1V safety voltage. If a malfunctioning power optimizer is located, check its connections, polarity, panel, and voltage.</li> <li>3. Contact SolarEdge Support. Do not continue before finding the problem and replacing the malfunctioning power optimizer. If a malfunction cannot be bypassed or resolved, skip the malfunctioning power optimizer, thus connecting a shorter string.</li> </ol>

# Appendix B: Mechanical Specifications

The following figure provides inverter dimensions in mm [in].



## Appendix C: Replacing and Adding System Components

This appendix includes replacement procedures for the SolarEdge system components.



### NOTE

If you are permanently disassembling the installation or part of it, make sure to use the disposal methods dictated by local regulations.

### Replacing an Inverter

1. Turn OFF the inverter ON/OFF/P switch, and wait until the green LED is blinking , indicating that the DC voltage is safe (<50V), or wait five minutes before continuing to the next step.
2. Disconnect the AC to the inverter by turning OFF the AC circuit breaker of the distribution panel.
3. Turn OFF the Connection Unit.
4. Open the Connection Unit cover : Release the four Allen screws and remove the cover.
5. Open the inverter cover as described in *Removing the Inverter Cover* on page 56.
6. Disconnect the DC and AC cables from the Connection Unit .
7. Disconnect the wires connected to the inverter or between the inverter and the Connection Unit:
  - Antenna cable from the communication board
  - DC and AC wires in the Connection Unit
  - Grounding cable
8. Disconnect the Connection Unit from the inverter by opening the two clips securing the Connection Unit to the inverter: Carefully place a screwdriver between the clip and the enclosure and pull the clip.

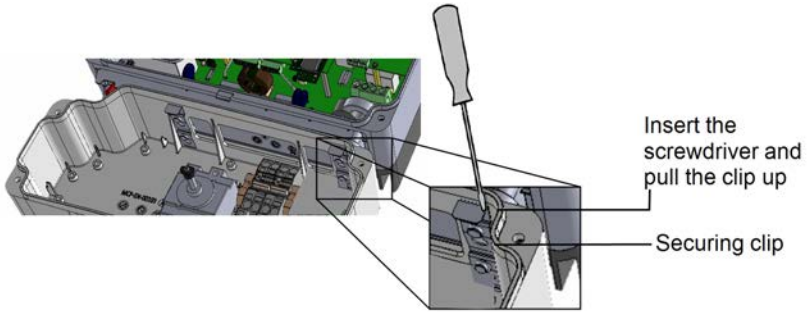


Figure 28: Disconnecting the Connection Unit from the inverter

9. Remove the screws securing the inverter to the mounting brackets and lift the inverter from the mounting bracket.

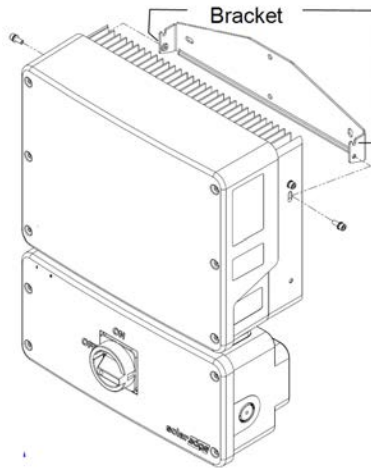


Figure 29: Mounting brackets

**NOTE**

If you remove the old inverter and do not immediately install a new one, then:

- Lock the Connection Unit in the OFF position using a lock on the switch.
- Secure the Connection Unit bracket to the wall/pole, using 3 screws
- Use insulation tape to isolate each of the AC and DC wires.
- Seal the open conduits using duct tape.
- Install the Connection Unit sealing cover supplied with the inverter and secure with retaining clips.



10. Place the new inverter on the mounting brackets and secure it using the screws.
11. Insert the wires from the Connection Unit into the openings in the inverter and the ferrite bead.
12. Fasten the two clips securing the Connection Unit to the inverter.
13. Reconnect the cables: Follow the instructions of *Installing the Inverter* on page 26.
14. Close the inverter and Connection Unit covers.
15. Perform the commissioning steps as described in *Activating, Commissioning and Configuring the System* on page 45.

## Adding, Removing, or Replacing Power Optimizers

1. Turn OFF the inverter ON/OFF/P switch, and wait until the green LED is blinking, indicating that the DC voltage is safe (<50V), or wait five minutes before continuing to the next step.
2. Disconnect the AC to the inverter by turning OFF the circuit breakers on the distribution panel.
3. Turn OFF the Connection Unit.
4. Disconnect and connect the necessary power optimizers.
5. Perform pairing and other procedures described in *Activating, Commissioning and Configuring the System* on page 45 on all inverters to which power optimizers were added or from which power optimizers were removed.

6. In the monitoring platform, use the **Replace** button in the **logical layout** tab (in site Admin). Replace the serial number of the removed power optimizer with the serial number of the newly installed power optimizer. Refer to <https://www.solaredge.com/sites/default/files/se-monitoring-portal-site-admin.pdf>



## Appendix D: Powering the LG Chem Battery Off and On

The LG Chem battery must be powered off and on at different stages of the inverter installation.

LG Chem batteries are available with either of the following two types of powering mechanism design:

- With the **disconnect** switch (requires Firmware version 3.24xx or later):

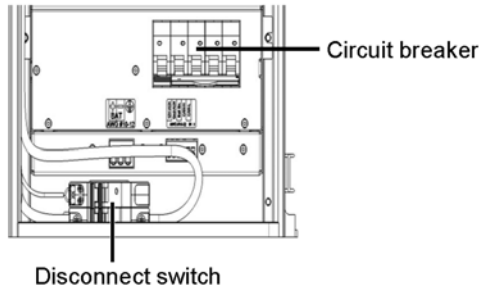


Figure 30: LG Chem battery - disconnect switch

- With the **auxiliary power** switch:

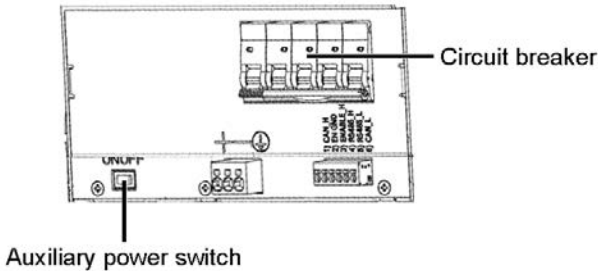


Figure 31: LG Chem battery - auxiliary switch

### ➔ To power off the battery:

1. Turn off the circuit breaker.
2. Turn off the disconnect/auxiliary power switch.

### ➔ To power the battery back on:

1. Turn on the disconnect/auxiliary power switch.
2. Turn on the circuit breaker.



# Single Phase Energy Hub Inverter with Prism Technology - Technical Specifications

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US<sup>(1)</sup>

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	UNITS
<b>OUTPUT - AC ON GRID</b>						
Rated AC Power	3000	3800	5000	6000	7600	W
Maximum AC Power Output	3000	3800	5000	6000	7600	W
AC Output Voltage Range	211-264					Vac
AC Frequency Range (min - nom - max)	59.3 - 60 - 60.5 <sup>(2)</sup>					Hz
Maximum Continuous Output Current	12.5	16	21	25	32	A
GFDI Threshold	1					A
Total Harmonic Distortion (THD)	<3					%
Power Factor	1, adjustable -0.85 to 0.85					
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes					
Charge Battery from AC (if Allowed)	Yes					

<sup>(1)</sup>These specifications apply to inverters with PNs SExxxxH-USS3xxxxx or SE7600H-USSSHxxxx and connection unit PNs DCD-1PH-US-PxH-F-x .

<sup>(2)</sup>For other regional settings please contact SolarEdge support.

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	UNITS
Typical Nighttime Power Consumption	<2.5					W
<b>OUTPUT - AC BACKUP<sup>(1)</sup></b>						
Rated AC Power in Backup Operation	2400	3050	4000	4800	6100	W
Peak AC Power (<10 sec) in Backup Operation	2700	3400	4500	5400	6900	W
AC L-L Output Voltage Range in Backup	211-264					Vac
AC L-N Output Voltage Range in Backup	105-132					Vac
AC Frequency Range in Backup (min - nom - max)	55 - 60 - 65					Hz
Maximum Continuous Output Current in Backup Operation	10	12.7	16.6	20	25.5	A
Peak AC Current (<10sec) in Backup Operation	11.25	14.2	18.75	22.5	30	A
GFDI	1					A
THD	<5					%
<b>OUTPUT - SMART EV CHARGER AC</b>						
Rated AC Power	9,600					W
AC Output Voltage Range	211-264					Vac
AC Frequency Range (min - nom - max)	59.3-60-60.5					Hz
Maximum Continuous Output Current @240V (grid, PV and battery)	40					Aac

<sup>(1)</sup>Not designed for standalone applications and requires AC for commissioning.

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	UNITS
<b>INPUT - DC (PV AND BATTERY)</b>						
Transformer-less, Ungrounded	Yes					
Max Input Voltage	480					Vdc
Nom DC Input Voltage	380			400		Vdc
Reverse-Polarity Protection	Yes					
Ground-Fault Isolation Detection	600k $\Omega$ Sensitivity					

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	UNITS
<b>INPUT - DC (PV)</b>						
Maximum DC Power	6000	7600	10000	12000	15600	W
Maximum Input Current <sup>(1)</sup>	8.5	10.5	13.5	16.5	20	Adc
Max. Input Short Circuit Current	45					Adc
Maximum Inverter Efficiency	99.2					%
CEC Weighted Efficiency	99					%
2-pole Disconnection	Yes					
<b>INPUT - DC (BATTERY)</b>						
Supported Battery Types	LG Chem RESU10H					
Number of Batteries per Inverter	1 or 2 <sup>(2)</sup>					
Maximum Batteries Capacity per Inverter	19.6					
Continuous Power Per Inverter	5000					W
Peak Power	6900					W
Max input Current @240V	18					Adc
2-pole Disconnection	Yes					
<b>SMART ENERGY CAPABILITIES</b>						
Consumption Metering	Built - in <sup>(3)</sup>					

(1) A higher current source may be used; the inverter will limit its input current to the values stated.

(2) When connecting two LG Chem batteries, each battery must have a different part number.

(3) For consumption metering current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	UNITS
Battery Storage	With Backup Interface for service up to 200A; Up to 3 inverters, 15kW backup power, and 60kWh backup capacity					
EV Charging	Direct connection to Smart EV charger					
<b>ADDITIONAL FEATURES</b>						
Supported Communication Interfaces	RS485, Ethernet, Wifi (optional), Cellular					
Revenue Grade Metering, ANSI C12.20	Built - in <sup>(3)</sup>					
Integrated AC, DC and Communication Connection unit	Yes					
Inverter Commissioning	with the SetApp mobile application using built-in Wi-Fi Access Point for local connection					
DC Voltage Rapid Shutdown (PV and Battery)	Yes, according to NEC 2014 and 2017 690.12					
<b>STANDARD COMPLIANCE</b>						
Safety	UL1741, UL1741 SA, UL1699B, UL1998, UL9540, CSA 22.2					
Grid Connection Standards	IEEE1547, Rule 21, Rule 14H					
Emissions	FCC part15 class B					
<b>INSTALLATION SPECIFICATIONS</b>						
AC Output Conduit Size / AWG Range	3/4" maximum / 14-8 AWG		1" maximum / 14-6 AWG			
EV AC Output Conduit Size / AWG Range	3/4" maximum / 14-8 AWG		1" maximum / 14-6 AWG			
DC Input (PV) Conduit Size / AWG Range	3/4" maximum / 14-8 AWG		1" maximum / 14-6 AWG			
DC Input (Battery) Conduit Size / AWG Range	3/4" maximum / 14-8 AWG		1" maximum / 14-6 AWG			
Dimensions with Connection Unit (HxWxD)	17.7 X 14.6 X 6.8 / 450 X 370 X 174					in/mm
Weight with Connection Unit	26 / 11.8		29.1 / 3.2		30.2 / 13.7	lb/kg

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	UNITS
Noise	< 25					dB(A)
Cooling	Natural Convection					
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>(1)</sup>					°F / °C
Protection Rating	NEMA 4X					

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(1) Full power up to at least 50°C / 122°F; for power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>

## Support Contact Information

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



<https://www.solaredge.com/service/support>

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

- Model and serial number of the product in question.
- The error indicated on the product SetApp mobile application or on the monitoring platform or by the LEDs, if there is such an indication.
- System configuration information, including the type and number of panels connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The product's software version as it appears in the status screen.

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