Installation Guide

Inline Energy Meter with SolarEdge Energy Net Communications

For Europe and Australia

Version 1.0

Disclaimers

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

Emission Compliance

This equipment has been tested and found to comply with the limits applied by the local regulations.

These limits are designed to provide reasonable protection against harmful interference. 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.

CAUTION!

Where EN55011 Class A is deemed applicable, the following requirements apply:

- This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.
- This equipment should be connected to inverters with a rated power > 20 kVA and is intended to be installed in a large photovoltaic power generating system by a professional.
- This equipment should be physically separated from residential environments by a distance greater than 30 m, and can be equipped with additional filtering if necessary.

Version History

- Version 1.0 (August 2021) - FIrst issue

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HANDLING AND SAFETY INSTRUCTIONS

Safety Symbols Information

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

	WARNING! Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **injury or loss of life**. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.
	CAUTION! Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **damage or destruction of the product**. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.
	NOTE Denotes additional information about the current subject.
	IMPORTANT SAFETY FEATURE Denotes information about safety issues.

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

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

Chapter 1: The SolarEdge Inline Energy Meter with SolarEdge Energy Net Communications

The SolarEdge Inline Energy Meter (also referred to as "the inline meter") is used to measure the power and energy of the photovoltaic (PV) system.

The inline meter:

- Fits in a standard EU electrical cabinet
- Supports a direct connection of up to 65A per phase, for three phase and single phase grid connections
- Is supplied with integrated current transformers - eliminating the need to install external CTs

The three phase inline meter (part number: MTR-240-3PC1-D-A-MW) supports both single-phase and three-phase grid connections.

The single phase inline meter (part number: MTR-240-1PC1-DW-MW) supports single-phase grids only.

NOTE

This installation guide provides instructions for configuration of the inline meter using SetApp. To connect the inline meter to display inverters, purchase the relevant communication board kit from SolarEdge. See *Energy Net Support* on page 14 to select the required kit.

SolarEdge Energy Net Wireless Connectivity

The inline meter supports wireless communication with the inverter using the SolarEdge Energy Net connectivity. To establish communications, the inverter must also support SolarEdge Energy Net.

Alternatively, serial RS485 connectivity can be implemented.

Package Contents

- SolarEdge Inline Energy Meter

NOTE

For the complete list of part numbers that this manual applies to, refer to the technical specification in the Appendix *Supplemental Documentation* on page 43.

- RS485 Terminal Block
- Quick Installation Guide

Terminology

The following terms are used in this document:

- **Export**: The power injected to the grid.
- **Import**: The power purchased from the grid.
- **Export/Import meter**: A meter that is installed at the grid connection point and measures the energy/power exported/imported to/from the grid.
- **Consumption**: The power consumed at the site. Consumption power is calculated as the sum of self-consumption power and import power.
- **Consumption meter**: A meter that is installed at the load consumption point and measures the energy/power consumed by the site.
- **Self-consumption**: The PV power consumed by the site and not fed into the grid.
- **Production**: The power produced by the PV system.
- **Production meter**: A meter that is installed at the inverter output or site AC connection, and measures the energy/power produced by the PV system or site.
- **External production meter**: A meter that is used for production metering of 3rd party generators, or for AC coupling with non-SolarEdge inverters.
- **Site production meter**: A meter that is installed at a SolarEdge inverter output, and reads the energy produced by all the inverters at the site.
- **Site limit**: The power level (in kW) that the inverter falls back to once an export limit event is triggered.

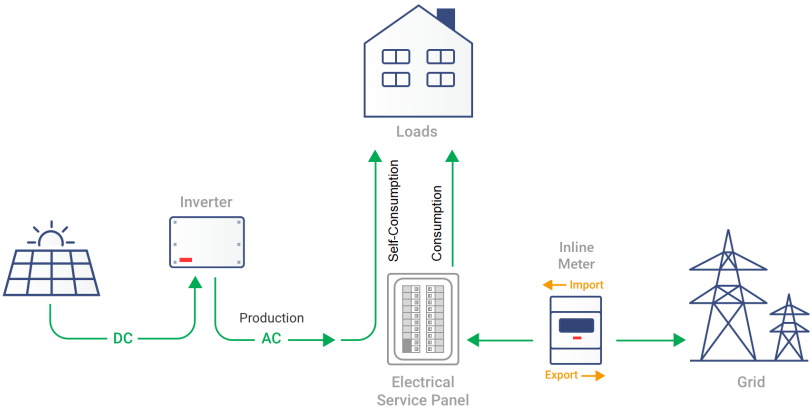


Figure 1: Terminology Illustration

Metering Applications

The SolarEdge inverter reads data from the inline meter, typically using one of the scenarios illustrated in the figures below:

- Production metering, using a meter installed at the output power connection of the inverter. Production metering functions (inverter production, external production, site production) are supported in software version 4.14.xx and above.
- Export/import metering, using a meter installed at the grid connection point
- Consumption metering, using a meter installed at the load consumption point

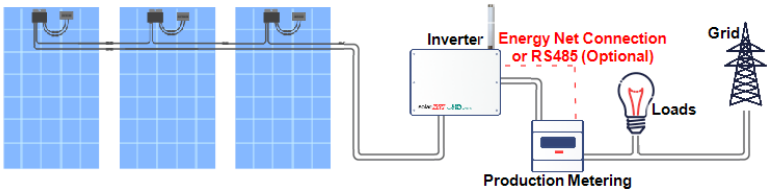


Figure 2: Typical installation with production meter

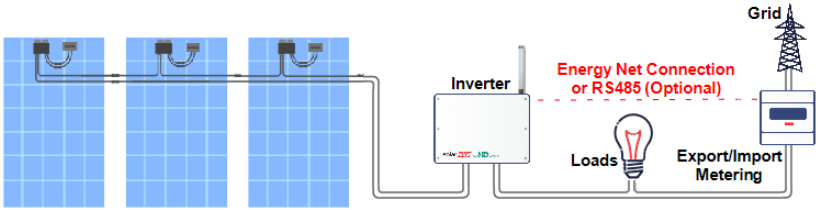


Figure 3: Typical installation with export/import meter

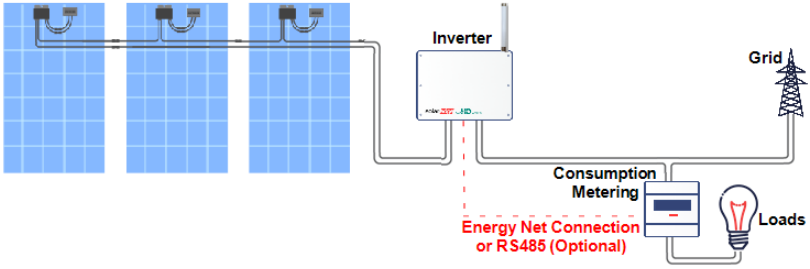


Figure 4: Typical installation with consumption meter

NOTE

The AC wires connected to the main terminal block of the inline meter can be swapped - allowing the grid to be connected to *either* the upper terminal blocks or the lower terminal blocks. For further details, see *Installing the Inline Meter* on page 17

NOTE

Up to three meters can be connected to a single inverter. Each meter should perform a different function. Any combination of Energy Net and Modbus/RS485 communication is supported.

Meter Connection Options

In a *single* inverter system, the inline meter is connected directly to an RS485 port of the inverter, or communicates over a wireless SolarEdge Energy Net channel.

NOTE

Hereafter, when an RS485 connection is mentioned in this installation guide, the user may opt alternatively to connect the inline meter to the inverter using a wireless SolarEdge Energy Net connection (the inverter should support Energy Net Communications).

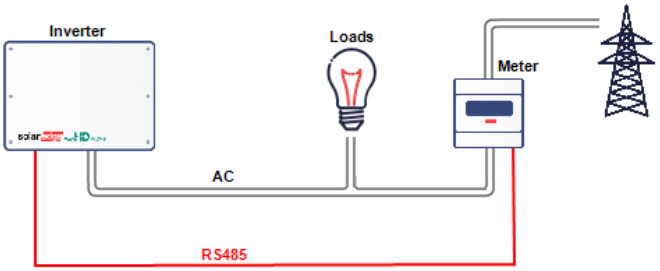


Figure 5: Single-inverter connection with export/import meter using RS485 link

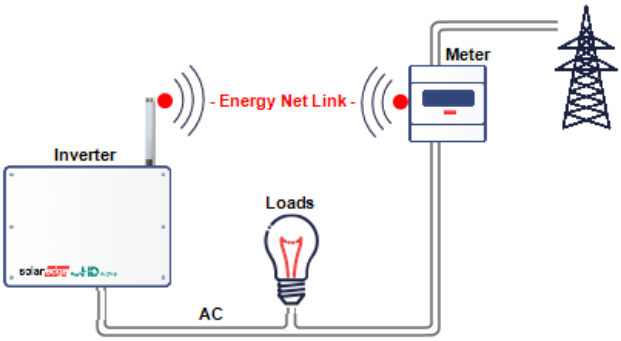


Figure 6: Single-inverter connection with export/import meter using SolarEdge Energy Net wireless link

In a *multiple* inverter system:

- The inline meter is connected to an RS485 port of one of the inverters.
- If the inverter has a second RS485 port, use this port to connect between the inverters.
- If the inverter has only one RS485 port, use an RS485 Plug-In (available from SolarEdge) to connect the inverters.

Meter Interfaces

This section describes the SolarEdge inline meter's interfaces.

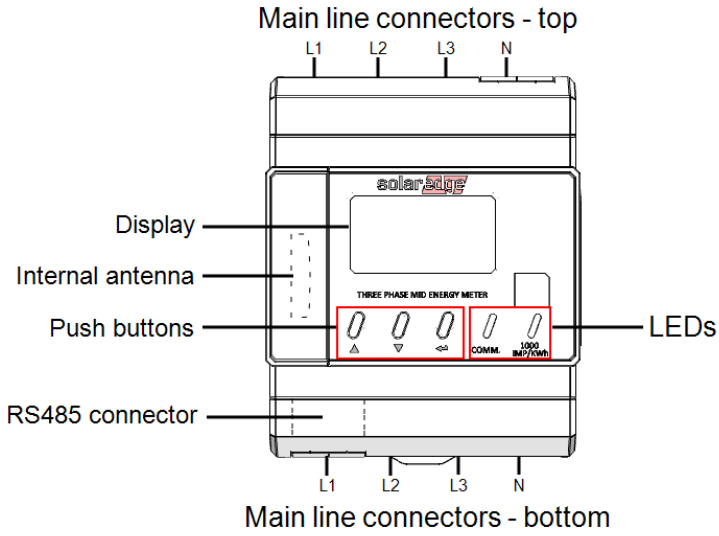


Figure 7: Inline Meter Interfaces

- **Main line connectors:** inputs/output terminal blocks
- **RS485:** detachable connector for wired connectivity with the inverter
- **Internal antenna:** for wireless connectivity with the inverter
- **Three push buttons:** to operate the inline meter display
- **LEDs:** used to monitor meter status:
  - Orange: meter operation
  - Blue: Energy Net/RS485 communication status
- **Display:** used to view energy readings and to configure the inline meter.

LEDs

The inline meter utilizes the orange and blue LEDs in the front of the unit (see the figure above) in order to indicate the meter's status:

- Orange: energy measurements
- Blue: Energy Net/RS485 communication status

Function	LED	Indication
Energy measurements	Orange	Blinking rate of 1000 pulses per hour indicates 1 kWh of measured energy.
Communication status	Blue	• Blinking: Meter is searching for an Energy Net network, or is not connected to RS485 bus. • Lit: Meter is in the reboot state, or has successfully paired with the Energy Net network, or was successfully connected to the RS485 bus. • Fast blinking during configuration of the inline meter.

Display Screen and Push Buttons

Display Screen

The inline meter display screen is used for basic configuration and operation of the meter, and for reapplying factory default settings.

Push Buttons

Button	Function	Combination
Left	• Up • Push the left button for 5 seconds in order to reset the meter.	Push the Left and Middle buttons simultaneously for 5 seconds in order to initiate an Energy Net network search session.
Middle	Down	
Right	Enter	

Energy Net Support

The inline meter supports wireless communication with the inverter over SolarEdge Energy Net. The inverter should be equipped with a communications board supporting Energy Net (and with the Energy Net module).

Access the following link for a list of all optional kits and their part numbers that can be used with the inverter:

https://www.solaredge.com/sites/default/files/se-energy-net-plug-in-datasheet.pdf

Notes:

- All kits should be purchased separately.
- Solaredge Energy Net modules are supplied with an external antenna that is to be mounted on the inverter.
- Some Solaredge Energy Net modules and kits are supplied in sets of 5 units.

Chapter 2: Meter Installation

Installation Guidelines

AC wiring specifications:

- If an AC wiring extension is required, use the same type of AC wiring that is used in the cabinet.

RS485 wiring specifications:

- Cable type: Min. 3-wire shielded twisted pair (a 4-wire cable may be used)
- Wire cross-section area: 0.2-1 mm^2 (a CAT6 cable may be used)

NOTE

If using RS485 cable longer than 10 meters in areas where there is a risk of induced voltage surges by lightning, it is recommend to use surge protection devices. If grounded metal conduits are used for routing the communication wires, there is no need for a lightning protection device.

Additional Guidelines:

- The inline meter is considered “permanently connected equipment” and requires a disconnect means (circuit breaker, switch, or disconnect) and overcurrent protection (fuse or circuit breaker).
- The rating of any switches, disconnects, fuses, and/or circuit breakers is determined by the inline meter's current rating, the mains voltage, and the current interruption rating required.
- The switch, disconnect, or circuit breaker must be located near the inline meter and be easily operated.
- Use grouped circuit breakers when monitoring more than one line.
- The circuit breakers or fuses must protect the mains terminals labeled L1, L2, and L3. In the rare case in which neutral has overcurrent protection, the overcurrent protection device must interrupt both neutral and the ungrounded conductors simultaneously.
- The circuit protection / disconnect system must meet IEC 60947-1 and IEC 60947-3, as well as all national and local electrical codes.

Installing and Connecting the Inline Meter

NOTE

Make sure the inline meter's rating is within maximum permitted current limitations.

In export/import applications, check that the rating of the main circuit breaker is within maximum permitted current limitations.

Mounting the Inline Meter

→ To mount the inline meter on a DIN rail:

The inline meter is designed for permanent installation in indoor locations. It is intended for installation in switch cabinets or in small-installation distributors on a 35 mm mounting rail as per DIN EN 60715.

Mount the inline meter on the DIN rail as shown in the figure below. Fit the slot on the back of the meter over the DIN rail (see steps 1 and 2), and secure it in place on the DIN rail using the latching mechanism at the bottom of the meter.

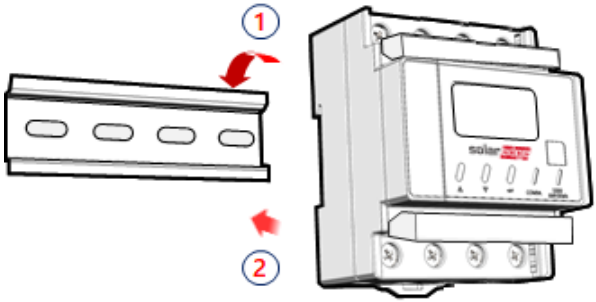


Figure 8: Mounting the inline meter on a DIN-rail

→ To detach the inline meter from the DIN rail:

1. Disconnect all AC wires and RS485 cable (if connected), or Energy Net antenna.
2. Detach the meter from the DIN rail by releasing the lever at the bottom of the meter, and then separating it from the rail.

Installing the Inline Meter

This section contains the following installation instructions:

- *General Installation Guidelines* on page 17
- *Installing the Three Phase Inline Meter* on page 18
- *Installing the Single Phase Inline Meter* on page 21

General Installation Guidelines

The valid wiring schemes are as follows:

- **Class B (meter accuracy: ±1%).** AC grid-side lines are connected to the upper terminal blocks of the inline meter.
- **Class A (meter accuracy: ±2%).** AC load-side lines are connected to the upper terminal blocks of the inline meter.

NOTE

The difference between accuracy classes A and B results from the differing current path through the meter in each scheme. For best performance, choose Class B if possible.

General guidelines for installing the inline meter:

1. Turn off the AC power (main circuit breakers) before connecting the inline meter.
2. Using one of the below wiring schemes, connect the AC wiring to the terminal blocks at the top and the bottom of the inline meter.

NOTE

Insert a flat-head screwdriver in the dedicated slot to open the screw covers. Use cable with a cross-section of 1.0 - 26.0 mm^2.

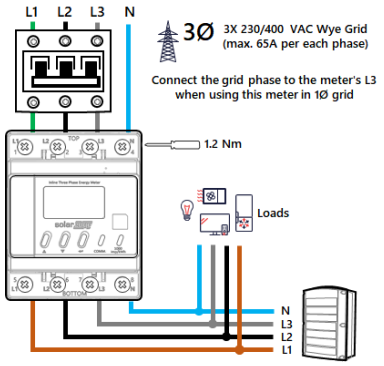
CAUTION

DO NOT use a circuit breaker with a rated current of more than 65A.

Installing the Three Phase Inline Meter

For Export/Import Metering Applications

3Ø Meter Wiring - Accuracy class B (1%)



3Ø Meter Wiring - Accuracy class A (2%)

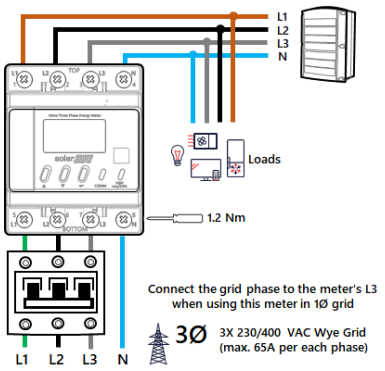


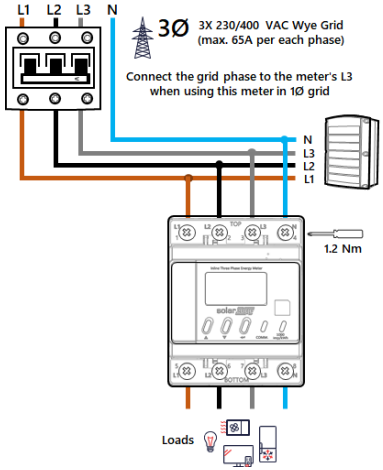
Figure 9: Export/Import Metering - Three Phase Wiring Schemes

NOTE

If the inline meter is connected to a single phase grid, connect phase 3 and N. The two installation schemes depicted in the figure above are valid for single-phase grids as well.

For Consumption Metering Applications

3Ø Meter Wiring - Accuracy class B (1%)



3Ø Meter Wiring - Accuracy class A (2%)

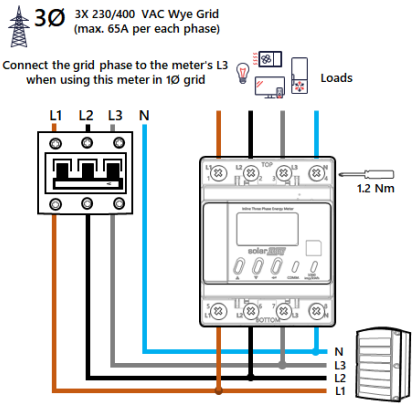


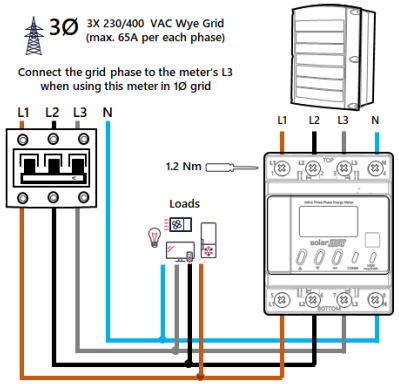
Figure 10: Consumption Metering - Three Phase Wiring Schemes

NOTE

If the inline meter is connected to a single phase grid, connect phase 3 and N. The two installation schemes depicted in the figure above are valid for single-phase grids as well.

For Inverter Production, Site Production, and External Production Metering Applications

3Ø Meter Wiring - Accuracy class B (1%)



3Ø Meter Wiring - Accuracy class A (2%)

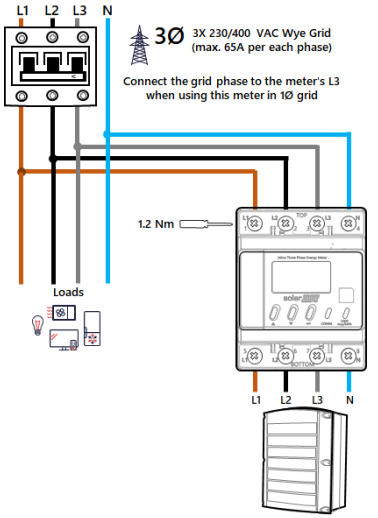


Figure 11: Production Metering - Three Phase Wiring Schemes

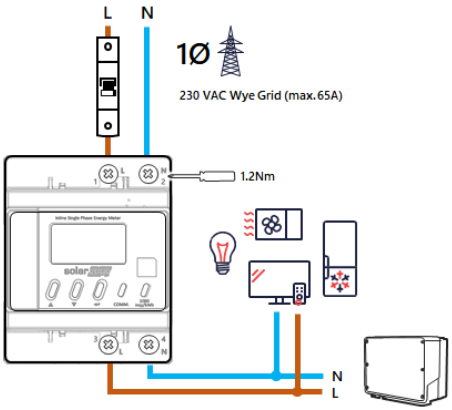
NOTE

If the inline meter is connected to a single phase grid, connect phase 3 and N. The two installation schemes depicted in the figure above are valid for single-phase grids as well.

Installing the Single Phase Inline Meter

For Export/Import Metering Applications

1Ø Meter Wiring - Accuracy class B (1%)



1Ø Meter Wiring - Accuracy class A (2%)

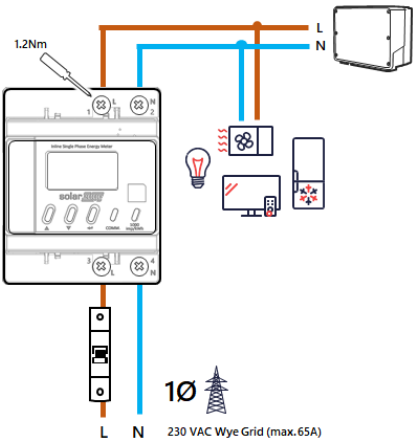
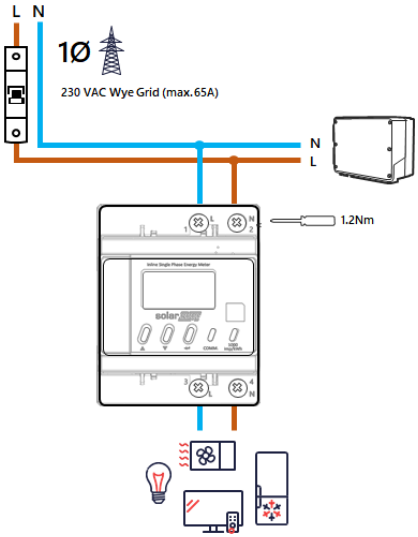


Figure 12: Export/Import Metering - Single Phase Wiring Scheme

For Consumption Metering Applications

1Ø Meter Wiring - Accuracy class B (1%)



1Ø Meter Wiring - Accuracy class A (2%)

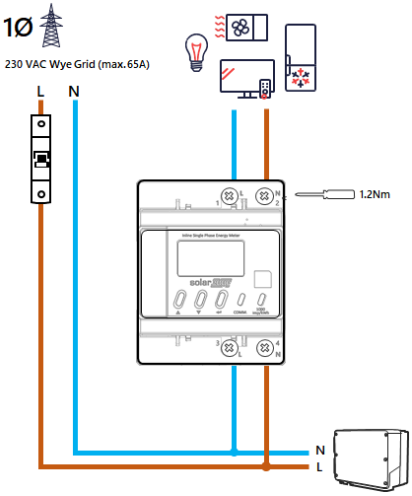
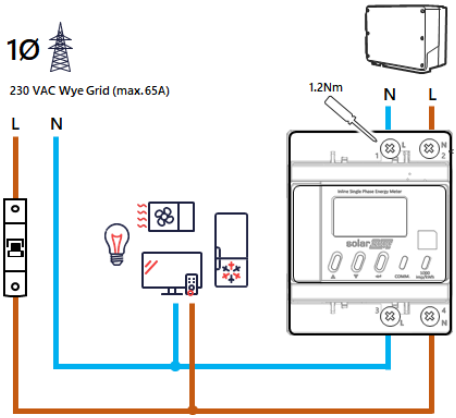


Figure 13: Consumption - Single Phase Wiring Scheme

For Production Metering Applications

1Ø Meter Wiring - Accuracy class B (1%)



1Ø Meter Wiring - Accuracy class A (2%)

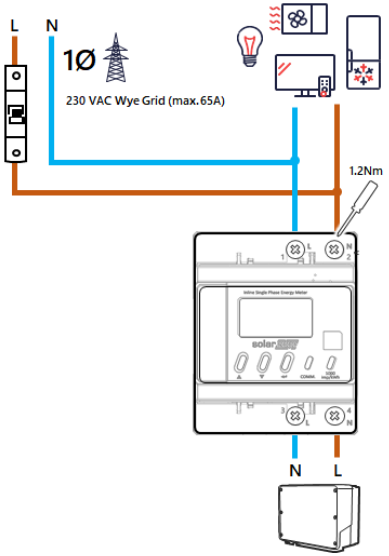


Figure 14: Production Metering - Single Phase Wiring Scheme

Wired Connection of the Inline Meter and the Inverter (Optional)

You may opt to establish a wired, RS485 connection between the inline meter and the inverter, as shown in the figure below.

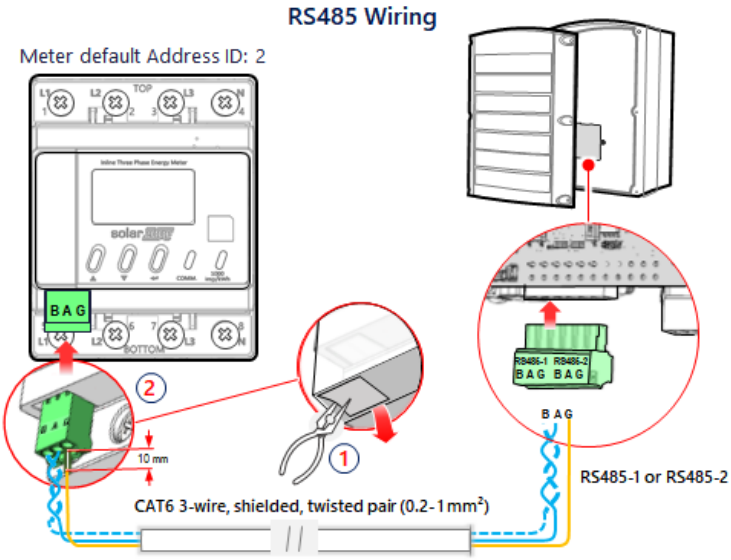


Figure 15: Wired connection between inline meter and inverter

→ To wire the inline meter's RS485 connection:

1. To establish RS485 communication with the inverter, connect the RS485 twisted pair cable to the 3-pin connector supplied with the inline meter, using a CAT6 cable:
   a. Detach the RS485 connector from the inline meter.
   b. Prepare the three wires, exposing 10 mm of insulation .
   c. Connect the wires to the A+ and B- terminals. Make sure the wires are twisted.
   d. Connect the shield to the G terminal.
   e. Re-attach the RS485 connector to the meter.

NOTE

The maximum supported length of the RS485 cable is 1000 meters.

→ To wire the inverter's RS485 connection:

1. Prepare to connect to one of the available RS485 ports of the device, as shown below:
   - Inverter RS485-1. Pull out the RS485 connector located on the communication board.

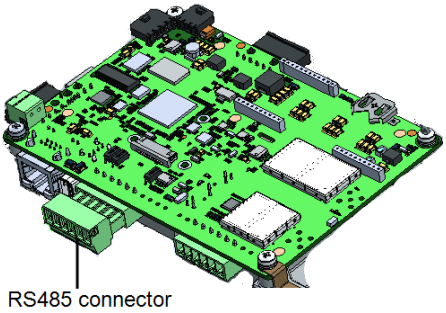


Figure 16: Inverter RS485 connectors

2. Connect the meter's RS485 B, A, and G connectors to the B, A, and G connecters in the inverter.
3. If the inverter is at the end of the RS485 bus, terminate the bus by switching a termination DIP switch inside the inverter to ON (top position).

NOTE

For StorEdge inverters, set a termination DIP switch inside the inverter to OFF.

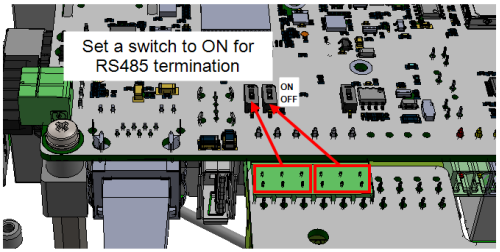


Figure 17: RS485 termination switch on inverter

Chapter 3: Configuration

SolarEdge Device Firmware Version

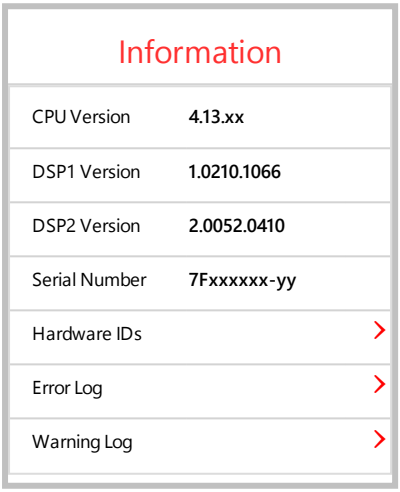
To ensure proper communication with the inline meter, make sure that the inverter communication board firmware (CPU) version is up-to-date.

NOTE

If the inverter uses an earlier firmware version, it will automatically upgrade the CPU to the required version upon connection of the inverter to SetApp. In the event that an upgrade is required, open SetApp, making sure that your smart phone has an Internet connection. This will enable it to download the most up-to-date CPU version.

→ To check the inverter CPU version using SetApp:

1. Select **Commissioning** ➔ **Information** to view the CPU Version.



Device Configuration

This section describes basic configuration of SolarEdge inverters for use of the inline meter. In addition, a configuration that is specific to the application being used is required in some cases. Refer to the following documents:

- Export Limitation - https://www.solaredge.com/sites/default/files/feed-in_limitation_application_note.pdf

To configure two connected meters, refer to *Installing Multiple Meters* on page 39.

NOTE

Calculated meter readings, such as self-consumption, are calculated using the data measured by the inline meter and the inverters. Calculated meter readings are only sent when Energy Manager is enabled (for details refer to: https://www.solaredge.com/sites/default/files/feed-in_limitation_application_note.pdf).

Device Configuration using SetApp

Configuring the Inline Meter Connection using SetApp

→ To configure the inline meter for RS485 communication using SetApp:

1. From the SetApp main menu, select **Site Communication**, and select the port to which the inline meter is connected - **RS485-1** or **RS485-2**.
2. Select **Protocol >> Modbus (Multi-Device)**
3. Return to the RS485-x Menu and select **Add Modbus Device >> Meter**. A meter identified as "Meter n" (where n = 1, 2, 3...) is created. The RS485-x Menu reappears.
4. Select **Meter n**. The RS485-x Meter n Menu appears.
5. Select **Device ID** and enter the Modbus address corresponding to the inline meter's Modbus address. You can view and change the meter's Modbus address using the meter's display and push buttons. Refer to *Inline Meter Display Screen Operation* on page 31.
6. Select **Meter Function**, and choose one of the following options:
   - **Inverter Production:** The inline meter is installed at the inverter output and reads the energy produced by the inverter (valid for version 4.14.xx and above).
   - **Export+Import**: The inline meter is installed at the grid connection point and reads both export and import energy.
   - **Consumption**: The inline meter is installed at the load consumption point and reads the energy consumed by the site.
   - **Site Production:** The inline meter is installed at the inverter output and reads the energy produced by inverters at the site (valid for version 4.14.xx and above).
   - **Ext. Production**: The inline meter is used for export limitation with 3rd party generators and for AC coupling with non-SolarEdge inverters (valid for version 4.14.xx and above).
7. Select **AC-Grid Connection (Top / Bottom)** and specify whether the AC grid is connected to the upper terminal blocks or the bottom terminal blocks.

Configuring the Inline Meter Connection using the SetApp Device Manager

→ To configure the inline meter for Energy Net communication using the SetApp Device Manager:

1. From the SetApp Commissioning menu, select **Device Manager**.
2. From the Device Manager's New Devices page, select **Inline Meter >> Configure**.
3. Select **Meter Function**, and choose one of the options listed in step 5 of *To configure the inline meter for RS485 communication using SetApp:* on page 28. If the "Production" function was selected, enter the **Serial Number** of the inverter to be metered.
4. Select **AC-Grid Connection (Top / Bottom)**, and specify whether AC inputs are connected to the upper terminal blocks or the bottom terminal blocks.
5. To complete the configuration, select **Set and View Status** to view inline meter status details.

Notes:

- During the SetApp Device Manager's operation, the inline meter's blue LED will blink rapidly, signaling that the meter is being configured.
- If the AC grid is connected to the upper terminal blocks, the meter accuracy is 1% (Class B). If the AC grid is connected to the lower terminal blocks, the meter accuracy is 2% (Class A).
- Once powered on, the inline meter will search for an Energy Net network to join, for up to 48 hours. After 48 hours, the meter will stop searching for a network. Push the Up and Down buttons simultaneously for 5 seconds in order to initiate another search session.
- Push the Up and Down buttons simultaneously for 5 seconds in the following cases:
  - When a new communications board is installed in the inverter
  - When connecting to a new inverter
  - When switching from RS485 configuration to Energy Net
- To switch connectivity from RS485 to Energy Net, use SetApp to remove the RS485 meter from the connected device list. Push the Up and Down buttons simultaneously for 5 seconds in order to initiate Energy Net search session. Use the SetApp Device Manager to connect the meter to the inverter (see *To configure the*

inline meter for Energy Net communication using the SetApp Device Manager: on page 29).

- To switch connectivity from Energy Net to RS485, use SetApp to remove the Energy Net meter from the connected device list. Connect the RS485 cable and use SetApp to configure the meter (see *To configure the inline meter for RS485 communication using SetApp:* on page 28).

Inline Meter Display Screen Operation

The inline meter supports initial meter configuration and operations using the meter's display screen and push buttons. To change settings, unlock the meter using the "1231" password. Supported operations include:

- Factory reset. Resetting the meter's configuration parameters and energy counter to factory default values.
- The main screen displays export and import power readings, as shown in the figure below.

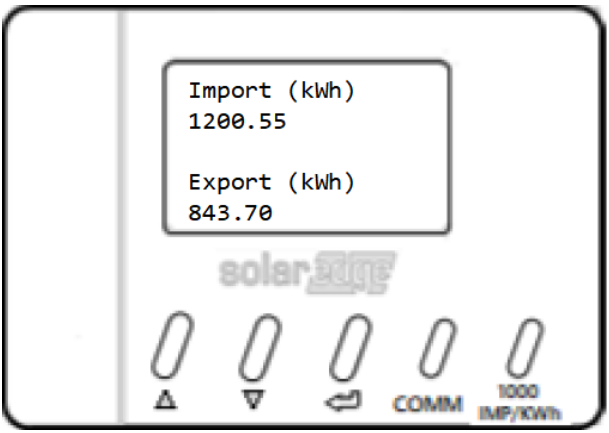


Figure 18: Display Screen Export and Import Power Readings

- **MODBUS ID** - This operation is used to set the inline meter's expected Modbus ID. The Modbus ID should match the meter's Modbus ID as configured in SetApp.
- Select **RS485 Term** to set the inline meter's RS485 termination (120 ohm) to ON or OFF (default = ON).
- Select **Info** to view the inline meter's firmware version.

The Inline Meter display screen automatically returns to the default Export/Import Energy Values screen following 30 seconds of inactivity. When the default screen is displayed, the display screen shuts down following 120 seconds of inactivity. Press any key to light the display.

A guide to display screen navigation appears in the figure below.

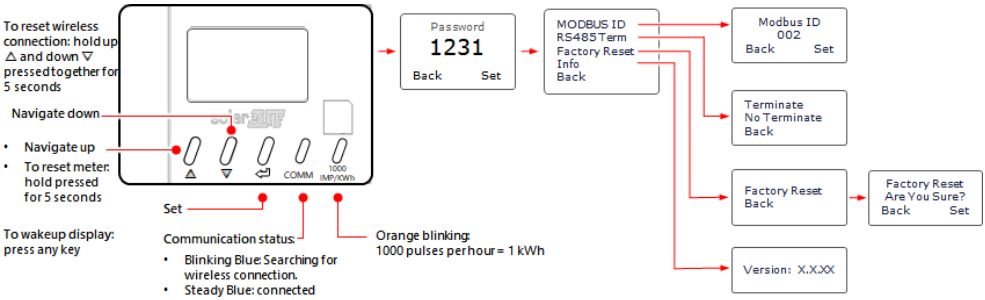


Figure 19: Display Screen Navigation

Verifying the Inline Meter Connection

Verifying the Inline Meter Connection using SetApp

→ To verify the inline meter connection using SetApp:

1. From the SetApp main menu, select **Status**.
2. If the inline meter is connected to the inverter via RS485:
   On the Status page, scroll down to the **Communication** status section. Check that one or more meters is connected to the RS485-1 or RS485-2 bus.

Communication		
LAN Connected	**RS485-1** Modbus 2 of 2	**RS485-2** SE Follower None
Cellular N/A	**Wi-Fi** NC	**ZigBee** NC

3. Continue scrolling to the **Meters** section. If there is more than one meter/function, there is a status sub-section for each one. An example appears below. The following information is displayed:
   - **Type and function**: Displays the function performed by the inline meter.
   - **Status**:
     - Displays 'OK' if the meter is communicating with the inverter.
     - <**Error message**>: If an internal error occurs in the meter, it will be displayed here. To resolve the error, refer to *Troubleshooting Meter Connection* on page 36.
   - **Power**: The total power read by the meter
   - **Energy**: The total energy read by the meter

Meters	
Production Meter	
SN: XXXXXXXX	
RS485-2	**Status**
Modbus ID #2	OK
Power	**Energy**
7.60 kW	13.68MWh
Export Meter	
SN: XXXXXXXX	
GPIO S0 meter	
1000 pulses per kWh	
Power	**Energy**
7.60 kW	13.68MWh

Verifying the Meter Connection using SetApp When Connected via Energy Net

→ To verify the inline meter connection using the SetApp Device Manager:

1. From the SetApp Commissioning menu, select **Device Manager**.
2. On the Device Manager page, select a specific meter (in case there is more than one meter installed). The following information is displayed:
   - **Meter Function**: Displays the function performed by the inline meter.
   - **Communication Type**: The method of communication with the inverter - either SolarEdge Energy Net (wireless) or RS485 (wired).
   - **Serial Number**: The serial number of the inline meter.
   - **Power**: The total power read by the meter.
   - **Energy**: The total energy read by the meter.
   - **FW Version**: The inline meter's firmware version.
   - **Address**: The SolarEdge Energy Net network address, or Modbus ID.
3. Select **View Status** to view meter status details:
   - Per phase: current, voltage, power
   - Total power and energy values
   - If the export/import metering function is in use, an arrow indicates the instantaneous energy direction flow, per phase.
4. Additional options:
   - **Remove Device**: Select to delete the meter.
   - **More Information**: Select to receive additional operational guidance regarding the meter.

Appendix A: Troubleshooting Meter Connection

This section describes how to troubleshoot meter-related installation and performance errors.

For troubleshooting dual-meter connections, refer to *Installing Multiple Meters* on page 39.

Troubleshooting the Meter using SetApp

Power Failure

If the inline meter does not power on, check the following:

- Make sure that the main circuit breaker is switched to ON.
- If the inline meter is functioning as a three phase meter in a single phase grid:
  - Make sure that the phase AC line is connected to the L3 connector on the meter.
  - Make sure that the neutral AC line is connected to the N connector on the meter.

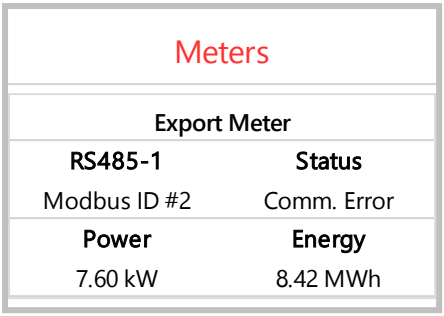
Communications Failure

The following are indications of a connectivity failure between the inverter and the meter:

- If **NC** (not connected) appears for a meter in the RS485-1 or RS485-2 sub sections of the Communication page.

Communication		
LAN Connected	**RS485-1** Modbus 2 of 2	**RS485-2** SE Follower None
Cellular N/A	**Wi-Fi** NC	**ZigBee** NC

- If the following error message appears in the bottom left-hand corner of the Inverters section of the Status page: "Error 3x6E: Meter Comm. Error"
- If the status in the Meters section of the Status page is "Comm. Error"



- If the inline meter is not detected by Energy Net, "New Device" will not appear in SetApp under "Device Manager" in the Commissioning page.

If a connectivity failure occurs, check the following:

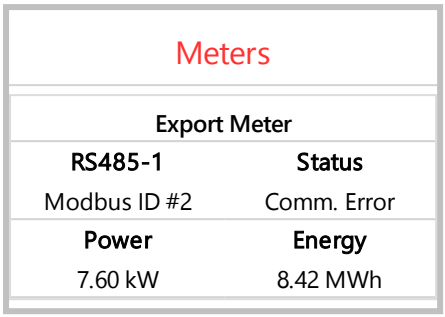
- If Energy Net is employed:
  - Make sure that an Energy Net module (see *Energy Net Support* on page 14) and an external antenna are installed in the inverter.
  - If the inline meter is installed in a metal cabinet, or you suspect that there is a range issue, an external antenna for the meter may be required (see the appendix *Supplemental Documentation* on page 43).
- If RS485 wiring is used to connect the meter and the inverter, check that the wiring is in accordance with the guidelines in *To wire the inverter's RS485 connection:* on page 25
- Check that the meter is configured as required in the chapter *"Configuration" on page 26*.
- Check for water damage or sealing problems:
  - Inspect the entire conduit run for possible points of water penetration, and fix leaks.
  - Ensure that proper outdoor rated components are used.
- Use a Voltmeter to measure the voltage on the meter's AC wiring. The L1 – L2 – L3 line to line voltage should be 208-240 Vac.

The Energy value is not advancing

Make sure the correct meter function is selected.

Make sure that the AC Grid Connection is configured correctly.

Check the Energy value in the Meters section of the Status page, as shown in the figure below:



If the Energy [in MWh] value displays a steady value even though the the site is consuming power, check the following:

- There are no loose connections at the inverter connectors and at the meter, specifically the AC wiring on the meter's AC wiring connector.
- Check for water damage or sealing problems:
  - Inspect the entire conduit run for possible points of water penetration, and fix leaks.
  - Ensure that proper outdoor rated components are used.

Appendix B: Installing Multiple Meters

You can connect up to three meters on the same RS485 bus and over SolarEdge Energy Net.

To connect two meters, install two wires into each screw terminal by twisting the wires together, inserting them into terminal, and securely tightening. RS485 wiring is daisy-chained between meters, as described in the following figure:

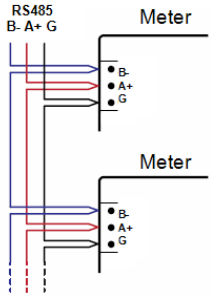


Figure 20: RS485 chain of meters

Connecting Two Meters

→ To connect the inline meter and an additional meter to the inverter on the same RS485 bus:

1. Connect the twisted pair wiring to the meters as shown in the figure above.
2. Wire the RS485 connections between the meters and the inverter.
3. For a SolarEdge energy meter with Modbus connection, set the 120 ohm termination DIP switches as follows.
   a. If the meter is the closest to the inverter, the meter should be set for **No Termination**. Both switch 1 and switch 2 should be in the UP position.
   b. If the meter is the furthest from the inverter, the meter should be set for **Termination**. Both switch 1 and switch 2 should be in DOWN position.
4. Set Modbus IDs to available addresses as follows:
   a. For Modbus energy meters, set the address using the DIP switches.
   b. For inline meters, set the address using the meter's LCD display and buttons.

Configuring the Dual-Meter Connection

Configuring Dual-Meter Connection Using SetApp

In the sample configuration described below, a SolarEdge energy meter with Modbus connection is configured as a production meter, and is set to address 1, while an inline meter is configured as an export/import meter, and is set to address 2.

→ To configure the SolarEdge energy meter with Modbus connection using SetApp:

1. Verify that the meter at address 1 is configured as a production meter. From the SetApp main menu, select **Communication ➔ RS485-x ➔ Meter 1**
2. Verify the value of the following parameters:
   - **Meter Function ➔ Inverter Production**
   - **Protocol ➔ SolarEdge**
   - **Device ID ➔ 1**
3. Select **Meter 2** to configure the export/import meter in the following steps:
4. Select **Meter Function**, and select **Export+Import**.
5. Set the inline meter's Modbus ID to address 2.

Verifying Meter Connections

Verifying the Meter Connections using SetApp

To verify the connectivity of two meters using SetApp, refer to *Verifying the Inline Meter Connection using SetApp* on page 33

Troubleshooting Dual-Meter Connections

Troubleshooting Dual-Meter Connections using SetApp

To troubleshoot the connectivity of two meters using SetApp, refer to *Troubleshooting the Meter using SetApp* on page 36

Appendix C: Monitoring Platform - Meter Data

If your device is connected to the SolarEdge server, you can view the meter's readings in the monitoring platform. Verify that the meter type is set correctly in the Admin page > Logical Layout > Meter details:

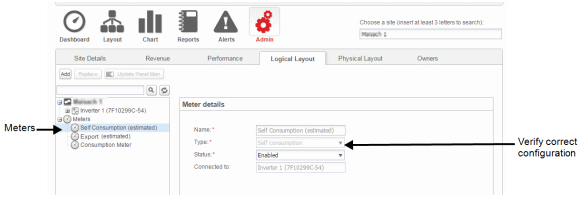


Figure 21: Setting the Meter details in the monitoring platform

Calculated meter readings (also referred to as "virtual meters"), such as self-consumption, are calculated using the data measured by the meter and the inverters.

The data from the inverters and from installed meters is displayed in the Dashboard and Charts tabs of the monitoring platform. The displayed data depends on the meter(s) location: grid connection point (export), or load consumption point (consumption). The following tables detail the displayed information per meter location.

No meter installed:

Data	Displayed in Monitoring Dashboard	Displayed in Monitoring Charts
Production (inverter/site)	✔	✔
Consumption	X	X
Self-consumption	X	X
Export	X	X
Import	X	X

Export meter:

Data	Displayed in Monitoring Dashboard	Displayed in Monitoring Charts
Production (inverter/site)	✔	✔
Consumption	✔ (calculated)	✔ (calculated)
Self-consumption	✔ (calculated)	✔ (calculated)
Export	X	✔
Import	X	✔

Consumption meter:

Data	Displayed in Monitoring Dashboard	Displayed in Monitoring Charts
Production (inverter/site)	✔	✔
Consumption	✔	✔
Self-consumption	✔ (calculated)	✔ (calculated)
Export	X	✔ (calculated)
Import	X	✔ (calculated)

Appendix D: Supplemental Documentation

Inline Energy Meter with SolarEdge Energy Net Communications

For complete technical specifications, see the following datasheet:

https://www.solaredge.com/sites/default/files/se-Inline-energy-meter-datasheet.pdf

For installation guidelines on the inline meter's external antenna kit, see the following installation guide:

https://www.solaredge.com/sites/default/files/se-inline-energy-meter-antenna-installation.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 SetApp mobile application, on the monitoring platform, or by the LEDs, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The product's software version as it appears in the status screen.


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