Using Extension Wires and Adapter Wires with Power Optimizers — Application Note

Version History

- Version 2.0, October 2024: General updates.
- Version 1.10, May 2023: Added: Using an extension wire between S-Series residential Power Optimizers and a PV Module.
- Version 1.9, December 2022: Version 1.9 (December 2022) Added clarifications for Commercial and Residential Power Optimizer input wire and extension wire options. Added support for S-Series Commercial Power Optimizers with the 1-type suffix in their part number (S1xx-1xxxxxx).
- Version 1.8, November 2022: Added guidelines for use of extension wires between two PV modules connected in series to a Power Optimizer. Added support for SE10KUS inverter.
- Version 1.7, August 2022: Removed S-Series Power Optimizers with the 1-type suffix (Sxxx-1xxxxxx or Sxxxx-1xxxxxx)
- Version 1.6, July 2022: Added maximum wire length for SExxK-RWB inverter.

Contents

Extension Wires

SolarEdge allows the use of extension wires between the following units:

- Power Optimizer and a PV module
- Two PV modules connected in series to a Power Optimizer
- Two Power Optimizers
- Power Optimizer and an inverter

Using an Extension Wires between a Power Optimizer and a PV Module

For S-Series Commercial Power Optimizers with part numbers in the format S1xx-1xxxxxx:

Total round-trip wire length between the Power Optimizer (+) and (-) input terminals of up to 52ft (16m) may be installed per Power Optimizer. 26ft (8m) for DC+, and 26ft (8m) for DC-.

For P-Series Power Optimizers with the 4-type suffix in their part number (Pxxx-4xxxxxx) and for the Mxxxx-Series:

Total round-trip wire length between the Power Optimizer (+) and (-) input terminals of up to 52ft (16m) can be installed per Power Optimizer. 26ft (8m) for DC+, and 26ft (8m) for DC-.

For S-Series Residential Power Optimizers, and P-Series Residential Power Optimizers with the 5-type suffix in their part number (Pxxx-5xxxxxx):

Total round-trip wire length between the Power Optimizer (+) and (-) input terminals of up to 6ft (1.8m) can be installed per Power Optimizer. 3ft (0.9m) for DC+, and 3ft (0.9m) for DC-.

For commercial Power Optimizers, using extension wires is not supported.

Single Phase Inverters with Compact Technology and the M2640 Power Optimizer:

Extension wires of up to 66ft (20m) may be installed. 33ft (10m) for DC+ and 33ft (10m) for DC-).

> **NOTE**
>
> SolarEdge Sense Connect technology monitors S-Series Power Optimizer wire connectors. Extension wire connectors are not monitored by Sense Connect.

Using an Extension Wire Between Two Series-Connected PV modules and a Power Optimizer

You may connect a Power Optimizer to two PV modules (connected in series) using an extension wire provided the following conditions are met:

- Total round-trip wire length between the (+) and the (-) input terminals of the Power Optimizer, including the extension wire between the modules and the module output wires, does not exceed 52.5ft (16m).

- Power Optimizers with the following part numbers are used:
  - Pxxx-4xxxxxx (4-type P Series)
  - Sxxx-1xxxxxx (1-type S Series)

- The connectors at each end of the extension wire must be identical to the PV module output connectors.

> 💬 **NOTES**
>
> - The extension wire between two modules is considered to be auxiliary equipment and is not covered by the SolarEdge warranty.
> - When using a serial input Power Optimizer with up to two PV modules connected in series and installed in landscape orientation, it is recommended to use PV modules with long output wires to avoid using an extension wire between the two PV modules. The output wire length is specified in the Mechanical Characteristics section of the PV Module Datasheet.
> - For planning considerations when connecting multiple PV modules to a Power Optimizer, refer to: https://www.solaredge.com/sites/default/files/application-note-connecting-solaredge-power-optimizers-to-multiple-pv-modules.pdf

Using Extension Wires Between two Power Optimizers or between a Power Optimizer and the Inverter

Extension wires may be installed between two Power Optimizers in the following cases:

- From a Power Optimizer in one row to another Power Optimizer in the next row.

- Around obstacles or pathways within the same row.

- From the end of the PV string to the inverter.

The total length of the extension wire in each string may not exceed the following values:

All Single-Phase Inverters	Three Phase Inverters
1000ft (300m)	SExxK-RWB - 650ft (200m)
	SE17K and below - 1000ft (300m)
	SE9KUS, SE20KUS - 1000ft (300m)
	SE17.5K and above - 2300ft (700m)
	SE10KUS, SE14.4KUS, SE17.3KUS, SE33.3KUS, SE40KUS - 2300ft (700m)

These same rules apply for equivalent power rating units of modular Synergy technology inverters.

S-Series Extension Wires: RMA and Retrofits

When performing a retrofit installation or an RMA replacement you might need to replace a P-Series Power Optimizer with a compatible S-Series Power Optimizer in the same string. Since the length of the output wire for each Power Optimizer series is different, you might need to use an extension wire to connect between the P-Series output wire and the S-Series output wire.

> 💬 **NOTES**
>
> - For RMA purposes, SolarEdge provides the extension wire.
> - SolarEdge Sense Connect technology monitors S-Series Power Optimizer wire connectors. Extension wire connectors are not monitored by Sense Connect.

For P-Series Power Optimizers with output wires up to 1.6m in length, use the 1.5m extension wire.

For MC4 Connectors use one of the following kits:

- OPT-EXT-MC4-1.5MX1 1x Wire KIT1.5m MC4
- OPT-EXT-MC4-1.5MX5 5x Wire KIT1.5m MC4
- OPT-EXT-MC4-2.5MX1 1x Wire KIT2.5m MC4
- OPT-EXT-MC4-2.5MX5 5x Wire KIT2.5m MC4

Adapter Wires

Adapter wires may be used in combination with Power Optimizers. We recommend the following:

- The adapter wire should be prepared by a reliable manufacturer/installer using suitable tools according to the connector and wire assembly instructions.
- The maximum adapter wire length (including the connectors) should not exceed 1ft (30cm).
- The adapter wire should meet all required regulatory and safety standards.

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.

Support Contact Information

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

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

Before contacting SolarEdge, make sure that you have the following information at hand:

- Model and serial number of the product in question.
- The error indicated in SetApp, on the LCD screen, in the monitoring platform, or by the LEDs.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The method of communication with the SolarEdge server if the site is connected.
- The product's software version as it appears in the ID status screen.