

Application Note: Connecting Multiple PV Modules to SolarEdge Power Optimizers

Version History

- Version 1.1 (March 2020)
 - Added M1600 power optimizer connection instructions.
 - Added M2640 power optimizer connection instructions.
 - Added use of connector seals.
 - Removed SolarEdge branch cables.
- Version 1.0 (April 2017) – Initial Release

General Guidelines

Connecting multiple PV modules to SolarEdge power optimizers (in series or in parallel) is allowed, as long as:

- All modules are of the same type.
- The cumulative module power does not exceed the power optimizer rated input DC power¹.
- The maximum input voltage (V_{oc}) at lowest temperature does not exceed the absolute maximum input voltage of the power optimizer (refer to the power optimizer datasheet to determine the absolute maximum input voltage). If connecting multiple modules in series, the cumulative voltage must be used.



NOTE

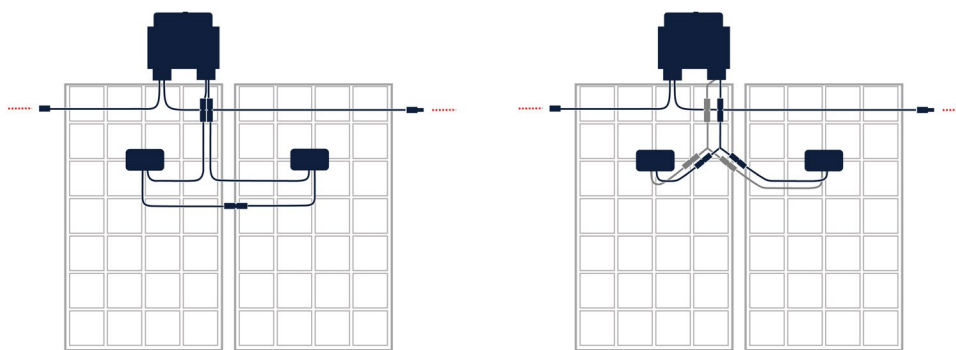
Connection of high voltage PV modules in series to SolarEdge power optimizers may result in a cumulative open circuit voltage that will exceed the maximum input voltage and may potentially damage power optimizers.

- The maximum input current does not exceed the maximum input short circuit current of the power optimizer (refer to the power optimizer datasheet to determine the maximum input short circuit current). If connecting multiple modules in parallel, the cumulative current must be used.



NOTE

Connection of PV modules with high short circuit current in parallel to SolarEdge power optimizers may result in a cumulative current that will exceed the maximum input current and may potentially damage power optimizers.



Serial (left) and Parallel (right) Connection

The SolarEdge Designer can be used to check the compatibility of the modules with the different power optimizers. Designer can be accessed using the following link: <https://www.solaredge.com/products/installer-tools/designer>.

For guidelines on how to use extension and adapter cables with power optimizers, see:

<https://www.solaredge.com/sites/default/files/se-extension-cables-with-power-optimizer-application-note.pdf>

¹ The rated power of the module at STC may not exceed the power optimizer “Rated Input DC Power”. Modules with up to +5% power tolerance are allowed. For information on compatibility with bi-facial modules, see:

https://www.solaredge.com/sites/default/files/compatibility_of_bi_facial_modules_with_SE_optimizers.pdf

**NOTE**

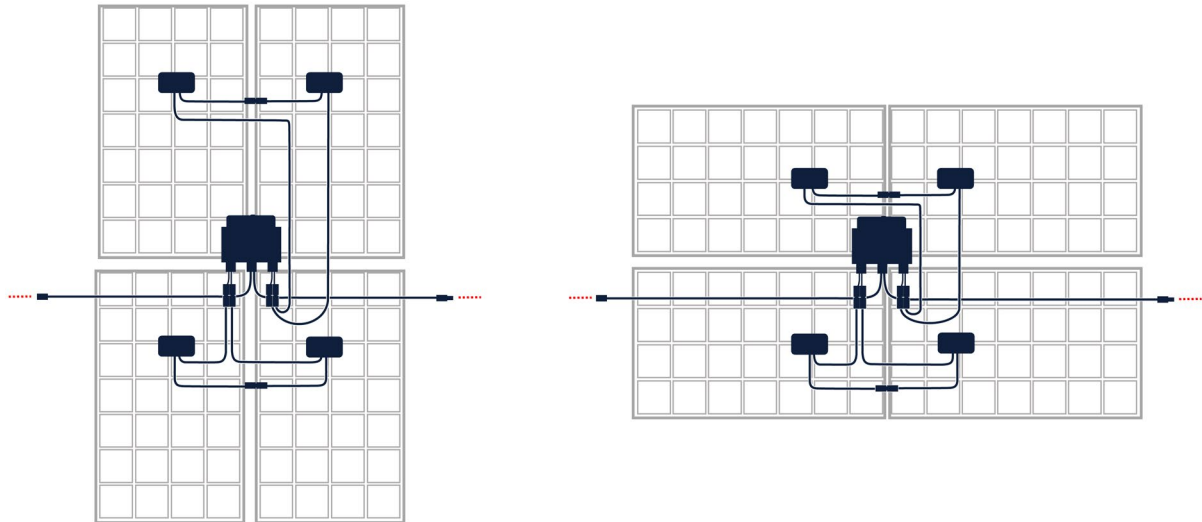
Power optimizers P485 and P800p have dual input for the connection of two modules in parallel. If connecting a single module to these power optimizers, seal the unused input connectors with the supplied pair of seals.

M1600 Power Optimizer

The M1600 power optimizer has two inputs, **primary and secondary, labeled on the power optimizer**. Each input allows the connection of up to two modules, four in total per power optimizer.

When connecting modules to a M1600 power optimizer, follow these guidelines:

- Supported configurations: two rows of modules (or multiples of two), portrait or landscape.



- Only serial connection of two modules to an input is allowed.
- At least one module must be connected to the primary input at all times.
- In case the number of PV modules in the string is not a multiple of 4, it is allowed to install one M1600 power optimizer connected to two or three PV modules. Do not leave M1600 inputs unconnected.
- It is not allowed to mix M1600 with any other power optimizer models in any string, connected to the same inverter.

M2640 Power Optimizer

The M2640 power optimizer is designed to work exclusively with Single phase inverters with compact technology. The power optimizer has four inputs for connecting four to eight modules in 1:1 or 2:1 to input configuration.

When connecting modules to a M2640 power optimizer, follow these guidelines:

- Modules using the same input must be connected in series and have the same orientation (portrait or landscape).
- For best production, all modules should face the same direction.
- In case of eight modules, the system can be used with four modules facing one direction, and four modules facing another direction. In this case, to maximize efficiency, use two inputs for one direction and two for the other.

