Application Note – Connecting Two Modules in Parallel using a Single-Input Power Optimizer and a Branch Cable

Version History

- Version 1.3, July 2023: Changed SenseConnect to Sense Connect
- Version 1.2, July 2023: Fixed document footer.
- Version 1.1, June 2023: Changed branch cable picture.
- Version 1.0, May 2023: Initial release.

Contents

Overview

This application note establishes guidelines for connecting two (2) PV Modules in a parallel connection configuration to one S-Series Commercial Power Optimizer to support the transition from P-Series P800p (Dual input) Power Optimizers to the new S-Series Single input Power Optimizers.

Applicable Power Optimizers

- S1000 , S1200

Supported PV Modules

S-Series Power Optimizers support connecting two (2) PV Modules in parallel. The PV Modules must comply with electrical parameters as specified in the table.

PV Module Parameter	Requirement
STC Power rating	Compliant with Optimizer max Input power
Open Circuit Voltage (Voc*) after applying relevant Voltage Temp Coefficient to the lowest expected temperature.	Below 125V
Short Circuit Current (Isc)	Below 7.5A

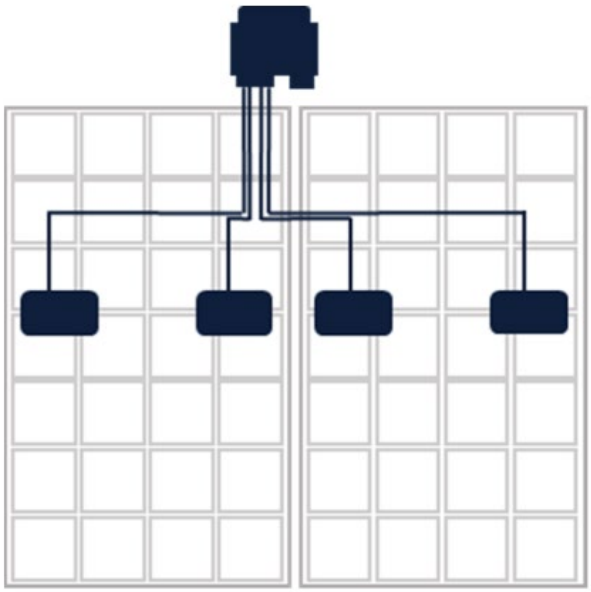
*For calculating Actual Max Achieved Voc use Solaredge Designer

An example of the specification for a supported PV Module that you can use in this application:

Electrical Data	
Nominal Power (P_{nom})	485W
Power Tolerance	+5/0%
Panel Efficiency	22.4%
Rated Voltage (V_{mpp})	78.8V
Rated Current (I_{mpp})	6.16A
Open Circuit Voltage (V_{oc})	92.7V
Short Circuit Current (I_{sc})	6.55A

Background

SolarEdge P-Series Commercial Power Optimizers (including the P800p with Dual Input), previously supported parallel 2:1 connection of PV Modules. The configuration shown below is no longer supported by S-Series Commercial Power Optimizers, and an alternative Module connection must be done to provide a Solution for the PV Modules that match the characteristics given in the "Supported PV Modules " Section above.



Connecting 2 PV Modules to a dual input commercial Power Optimizer (P800p)

P800p Dual input Power Optimizer

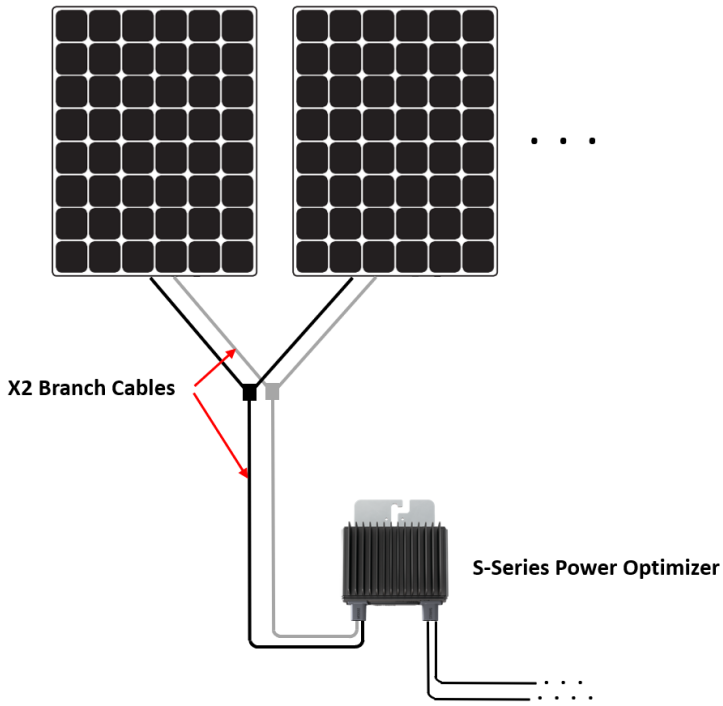
Connecting two PV Modules in Parallel to one S-Series Commercial Power Optimizer

- Verify that the Modules are compliant with the electrical specification according to the "Electrical Considerations" Section in this Application Note.
- For each Power Optimizer use a compliant Branch Cable (Y-Splitter) to split the inputs. The Branch Cable must comply with all the requirements in the ***"Serial Input Power Optimizer - Multiple Modules in Parallel - Input Branch Cable"*** section in this Application Note.
- Installers must be extra cautious not to exceed the Power Optimizer's electrical specifications when connecting the modules in a parallel configuration. Incorrect connection voids the warranty.

Two (2) Branch Cables

S-Series Power Optimizer

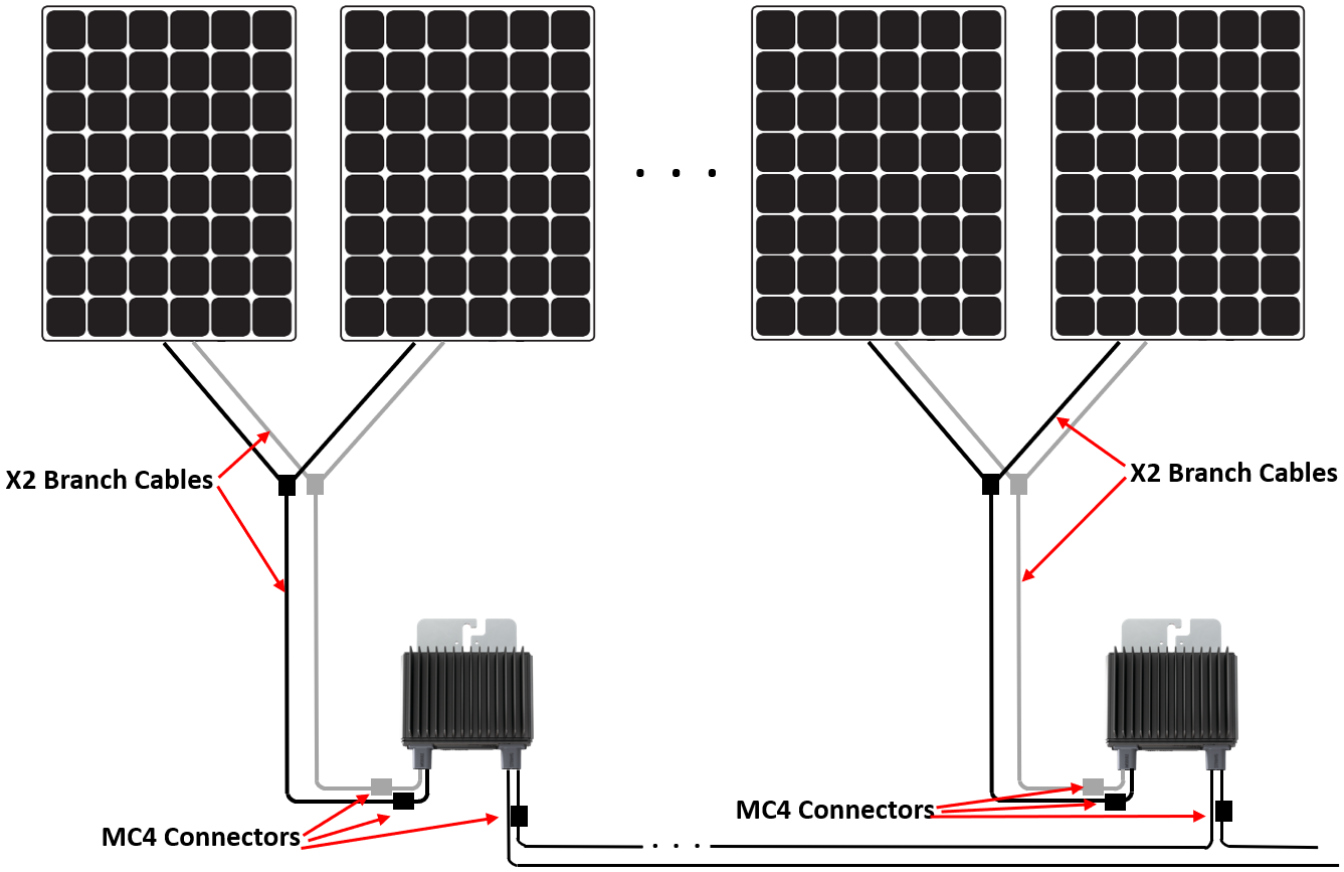
This combination of Branch Cables and S-Series Power Optimizer replaces the P800p Power Optimizer



Two (2) Branch Cables connecting two (2) PV Modules to an S-Series Power Optimizer

NOTE

In S-Series Power Optimizers Solaredge Sense Connect does not support monitoring of Branch Cable to PV Module connectors as they are are not directly connected to the Power Optimizer's short input cables.



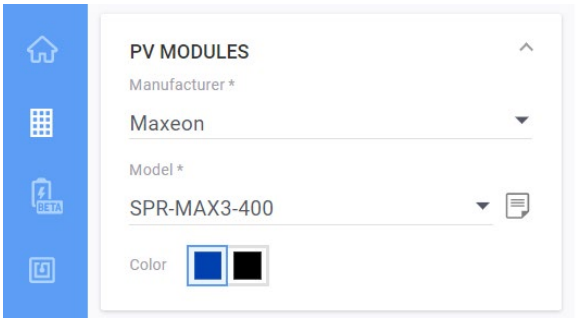
Sense Connect feature supported only at the MC4 connectors at the Power Optimizers short cables.

Using SolarEdge Designer

An example of using SolarEdge Designer for planning an installation

Planning with Maxeon 3 PV Modules: (400Wp , 6.58A Isc , 75.6V Voc)

1. In the Module Placement page, select the PV Module you are using.



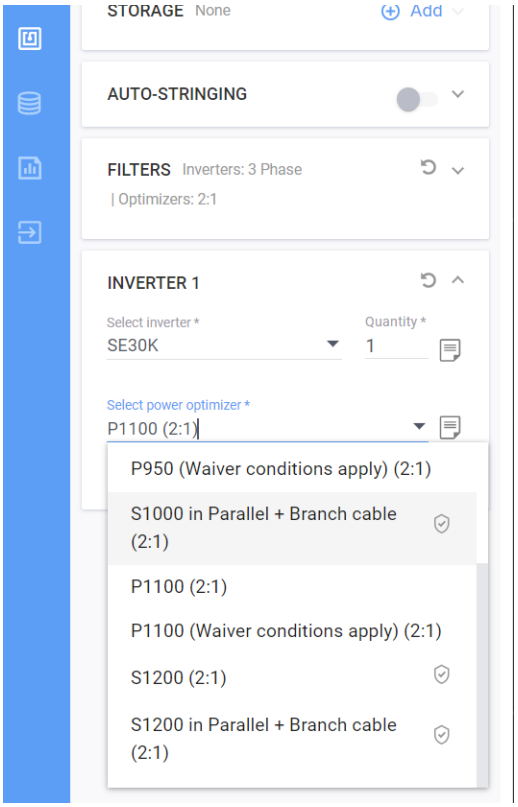
2. Verify that the Module specification shown on the screen is correct when compared to the actual specification of the PV Modules used.
   Check that the PV Module electrical characteristics comply with the Supported PV Modules section.

MODULE DATASHEET

Manufacturer			Maxeon	
Model			SPR-MAX3-400	
Electrical Data	**STC**	**Max Achieved**	**Mechanical Data**	
Peak Power (Pmax)	400 W	395 W	Cell Type	Mono-Si
Voc	75.6 V	81.86 V	Connector	MC4
Isc	6.58 A		Cells #	104
Vmpp	65.8 V		Substrings #	3
Impp	6.08 A		Length	1,690 mm
Min/Max Power Tolerance	0/5 %		Width	1,046 mm
Temp. Coeff. of Pmax	-0.27 %		Depth	40 mm
Temp. Coeff. of Voc	-0.23 %		Cable Length Minus	1,000 mm
Temp. Coeff. of Isc	0 %		Cable Length Plus	1,000 mm

✓ This module is available for users on my account

3. In the Select Power Optimizer dropdown menu, select Sxxx in Parallel + Branch Cable (2:1)



4. Proceed with Stringing.