Application Note: Two String Design with SE33.3k / SE66.6k / SE100k Inverters and the S1200 Power Optimizer

Version History

- Version 1.1, July 2023:
  - Added information re limiting inverters operating at 850VDC to maximum of 20 Power Optimizers per string.
  - Added applicability to Taiwan.
- Version 1.0, May 2023: Initial release

Contents

Overview

This application note establishes guidelines for designing and configuring 33.3kW inverter units operating at 850V and connected to fewer than 81 PV modules in a two-string design.

Applicable Inverter Models

These guidelines only apply to the following SolarEdge Three Phase Inverters, connected to a 230V/400V AC Grid.

- SE33.3K
- SE66.6K
- SE100K

Applicable Power Optimizer

- S1200

Supported Regions:

- Europe
- Taiwan

Background and Design Planning Considerations

When connected to an inverter with a fixed string voltage of 750V_{DC}, S1200 Power Optimizers can deliver 15kW of continuous power per string. To reach the full power capacity of the SE33.3K Three Phase Inverter, 3 PV strings must be connected to each inverter unit. Each string has a minimum requirement of 14 Power Optimizers (27 Modules). This means that you need a minimum of 81 PV modules and 42 Power Optimizers per individual SE33.3K Inverter unit.

The requirement for the minimum Power Optimizer count per string as shown in the table below, is specified in the applicable datasheet and enforced in SolarEdge Designer.

Minimum String Length	14 Power Optimizers
	27 PV Modules

Minimum string limitations for SE33.3K inverters and S1200 Power Optimizers

Designing and Configuring an Inverter to Support a Two-String Design

This section describes the conditions necessary for allowing the design and configuration of an inverter to support a two-string design. This is allowed only in the following cases:

- For the SE33.3K you must use fewer than 81 PV modules.
- For the SE66.6K you must use fewer than 162 PV modules.
- For the SE100K you must use fewer than 243 modules.

Using the configuration described in this document without complying with these conditions automatically voids the inverter warranty.

In addition, you must comply with the following conditions:

- The design includes at least 15 Power Optimizers for each string.
- The design uses only S1200 Power Optimizers.

Designing a Two String Installation in SolarEdge Designer

Preliminary steps:

1. In SolarEdge Designer, select the Inverter **"SE33.3K for S1200 < 81 Modules"**.

Note that Designer automatically chooses the S1200 Power Optimizer.

2. Connect at least 15 Power Optimizers for each string, but not more than 20.

IMPORTANT NOTES

- Even though Designer does not permit more than 20 optimizers per string, such a design is allowed and approved by SolarEdge.
- As an example: designing with an inverter having one string connected to 22 Power Optimizers and a second string having 18 Power Optimizers is permitted even though Designer does not validate it.
- If the design has more than 80 PV modules, use the inverter configured for 750V as usual.

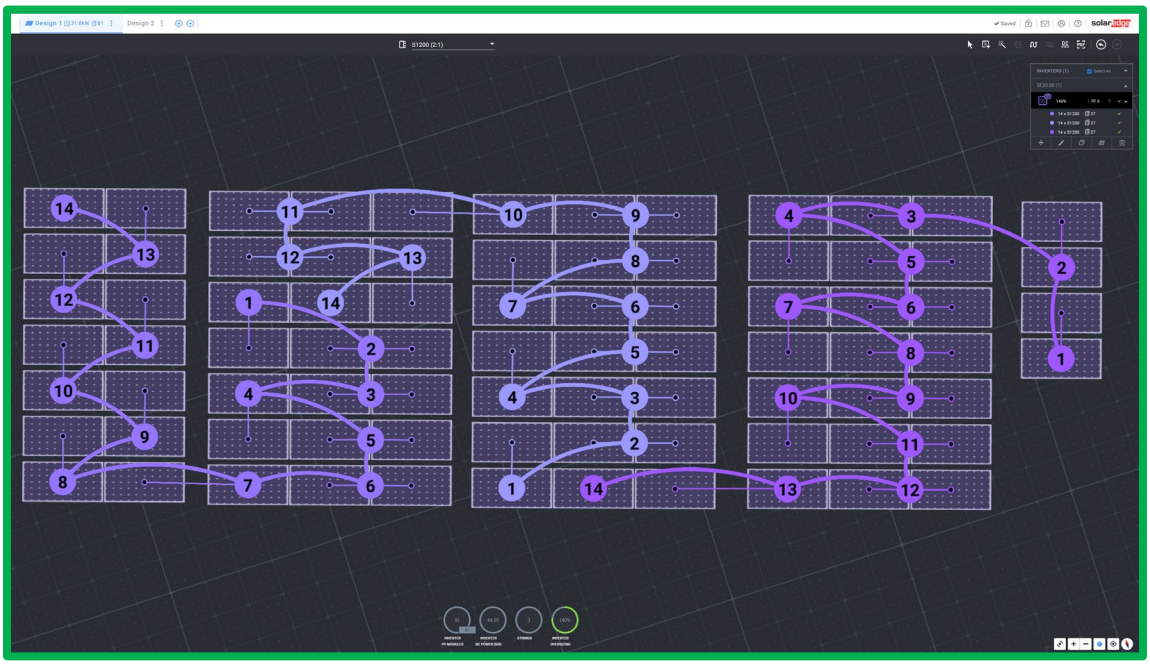
Examples

The following examples illustrate the use of 80 or 81 550Wp PV Modules, connected to S1200 Power Optimizers and the SE33.3K inverter. The inverter is configured either at the default 750 Vdc or at 850Vdc.

The examples are valid for the SE33.3K, the SE66.6K, and the SE100K Synergy Inverter Units, and are based on the general site layout shown below.

Example 1 - Valid Design ✓

- 81x550W$_P$ PV modules in a 3 string 750V$_{DC}$ design using the SE33.3K 230V/400V Grid Inverter.

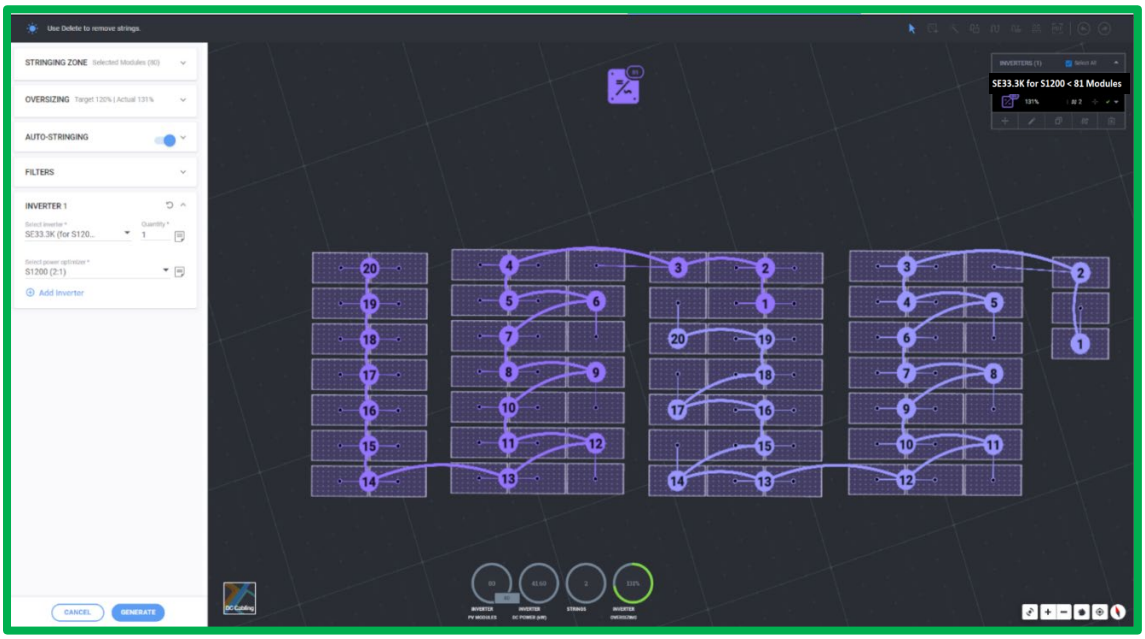


Example 2 - Valid Design ✓

- 80 PV modules in a two-string design using the SE33.3K configured to work at 850V$_{DC}$.

Note: "**SE33.3K for S1200 < 81 Modules"** is chosen in Designer

- Each string is planned to include at least 15 (but not more than 20) Power Optimizers.

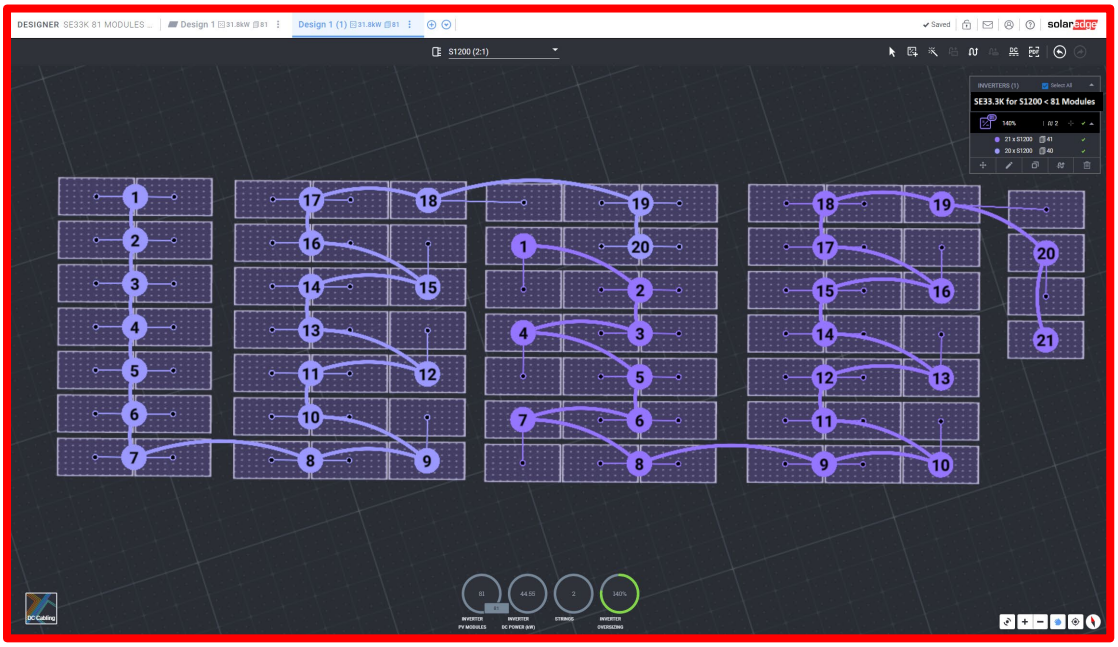


Example 3 - Invalid Design ✗

- 81 PV Modules in a two-string design using SE33.3K configured to work at 850Vdc.

Note: "**SE33.3K for S1200 < 81 Modules"** is chosen in Designer

- This configuration is not allowed in Designer since it requires 21 Power Optimizers in one of the strings.

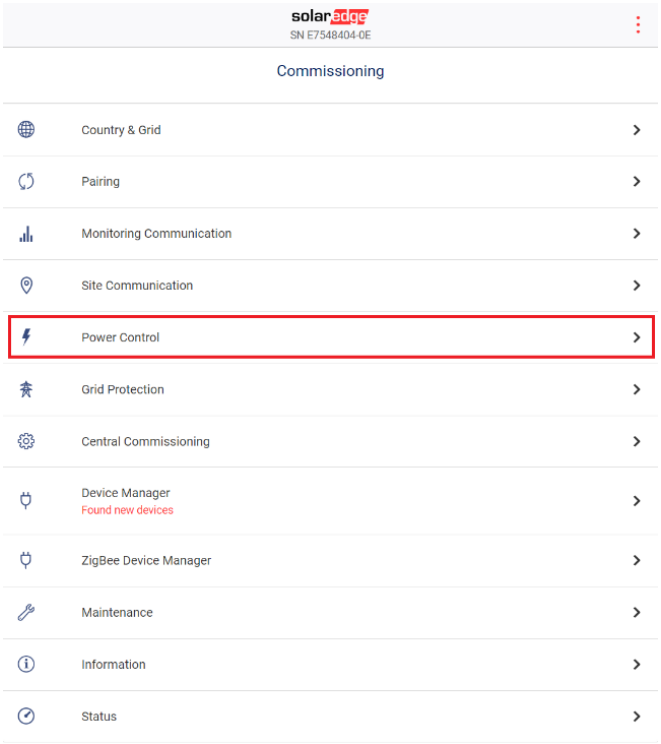


Commissioning the System Using SolarEdge SetApp

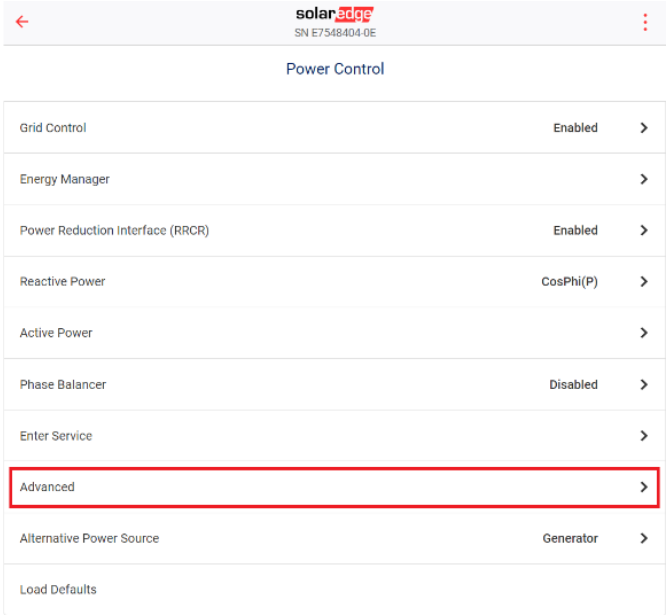
When commissioning the inverter, you must set the **Fixed String Voltage** to **850V** manually via SetApp.

Setting the Fixed String Voltage

3. In SetApp, in the "Commissioning" screen, tap **Power Control.**



1. In the Power Control screen, tap **Advanced**.



2. In the Advanced Power Control screen, tap **Fixed String Voltage**.

3. In the **Fixed String Voltage** screen, tap **850 Vdc**. A check mark appears next to 850 Vdc, and the Fixed String Voltage is set to 850Vdc.