Application Note: Single String Design Guidelines
For Australia

Version history

- Version 1.1 (March 2021) – Single phase HD-Wave inverter added
- Version 1.0 (February 2021) -Initial release

This application note establishes guidelines for implementing the single string design topology.

> **NOTES**
> - In case of a conflict between these guidelines and local regulations, local regulations shall prevail.
> - If your system uses a battery, we recommend installing two strings even if all the below rules are met, to allow maximizing battery charge and inverter production.
> - Verify yield factor losses when using the single string design on multi-facet roofs. If losses are greater than 1%, it is recommended to use optimisers with a higher output voltage or multiple strings, where possible.

When the inverter AC nameplate is lower or equal to the maximum nominal string power for the connected inverter (mentioned in the optimiser's data-sheet), all power optimisers can be connected to a single string, as long as the following conditions are observed:

- The connected string power does not exceed the total allowed inverter DC/AC oversizing ratio.
- The maximum allowed number of power optimisers per string does not exceed 25 power optimisers for a single phase inverter (see Example 1 below).
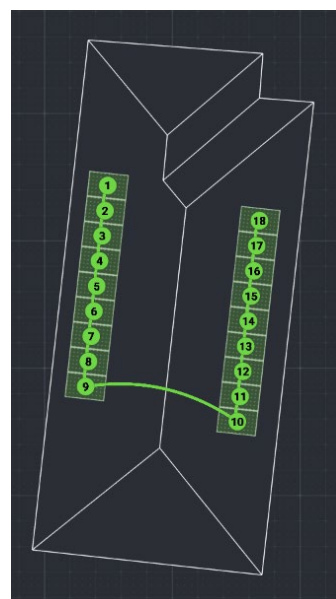
Example 1 – Valid Use

In a system with an SE5000H inverter installed with 18 x 370W modules connected to P401 (133% oversizing), the installed DC capacity will be 6.66kW STC. The inverter AC nameplate is 5kWac, which is lower than the maximum nominal string power of 5.7kW for P401 with the single phase HD-Wave Genesis inverter (15A x 380V=5.7kW). In addition, 18 optimisers are smaller than the maximum allowed optimisers per string with a single phase inverter and the DC capacity of 6.66kW STC can be installed in one string. The inverter nameplate limit will ensure the maximum nominal string power is not exceeded.
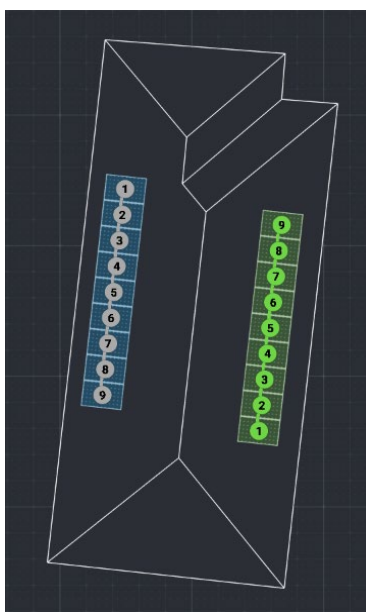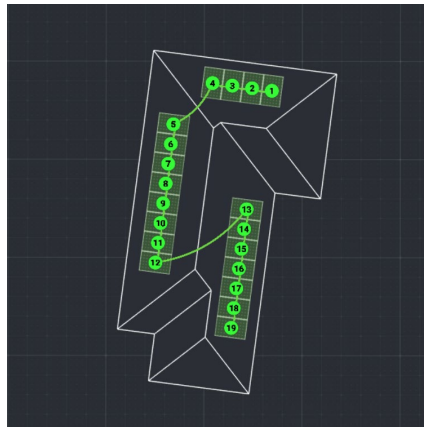
Regular Design	Single String Design

Example 2 – Valid Use

In a system with an SE5K inverter installed with 18 x 370W modules connected to P401 optimisers (133% oversizing), the installed DC capacity will be 6.66kW STC. The inverter AC nameplate is 5kWac, which is lower than the maximum nominal string power of 5.625kW for P401 with three phase inverter (15A x 375V=5.625kW). In addition, 18 optimisers are smaller than the maximum allowed optimisers in one string with a three phase inverter and the DC capacity of 6.66kW STC can be installed in one string. The inverter nameplate limit will ensure the maximum nominal string power is not exceeded.
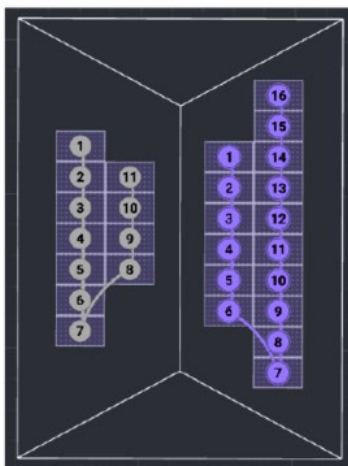
### Single String Design

Example 3 – Invalid Use

In a system with an SE5000H inverter installed with 27 x 370W modules connected to P401 (199.8% oversizing), the installed DC capacity will be 9.99kW STC. The inverter AC nameplate is 5kWac, which is lower than the maximum nominal string power of 5.7kW for P401 with the single phase HD-Wave Genesis inverter (15A x 380V=5.7kW). However, the 27 optimisers are exceeding the maximum allowed optimisers per string with a single phase inverter (25). Therefore, the DC capacity of 9.99kW STC must be installed in **two strings**.

Regular Design

Single String Design
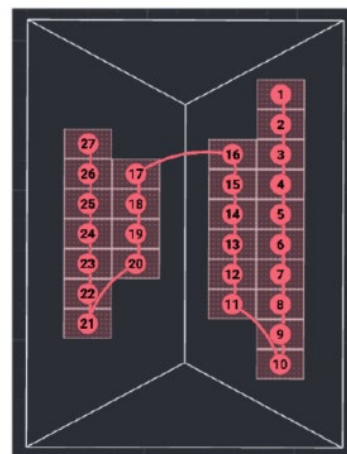
Applicable Inverters

These guidelines apply to the following SolarEdge inverters:

- Single phase inverters SE5000 or lower
- Single phase HD-Wave inverter SE5000H or lower
- Single phase HD-Wave Genesis inverter SE5000H or lower
- Three phase Hybrid inverter SE5K-AUB and lower

Extension of Single String Designs

- Single phase HD-Wave Genesis inverter SE10000H - two strings of 6.67kW are permitted
- Three phase Hybrid inverter SE10K-AUB - two strings of 6.67kW are permitted
- Single phase HD-Wave inverter SE10000H - two strings of 6.67kW are permitted