Commercial Engineering Guidelines – North America

This document contains information that a Designer or Engineer should take into consideration when designing a commercial PV system with SolarEdge inverters. A dedicated SolarEdge Field Applications Engineer can assist with any questions you may have.

Training

SolarEdge offers technical training for Commercial EPCs, Designers, and Engineers. Prior to designing your first SolarEdge PV system contact your Regional Sales Manager to schedule a technical training session. Training videos and on-demand webinars are also available on the SolarEdge Website and SolarEdge YouTube channel.

Grid Requirements

Grid Connections

SolarEdge offers inverters for both the 120/208V and 277/480V grid configurations. 120/208V inverters can be configured for a 4-wire WYE connection or a 3-wire Delta (no neutral) connection. 277/480V inverters only support a 4-wire WYE connection.

For further information on SolarEdge supported AC grid types refer to Chapter 1 of the SolarEdge Installation Guide.

Generators on Site

A SolarEdge inverter may be installed in a site with a generator, however must not operate at the same time as the generator. Operating an inverter and a generator simultaneously will void the warranty.

SolarEdge requires installing a physical or electronic interlock which will prevent the generator and inverter from operating simultaneously. Interlock procurement, installation, maintenance and support are the responsibility of the installer. Damage to the inverter due to incorrect interlock installation or use of an interlock that is incompatible with the SolarEdge system will render the SolarEdge warranty invalid.

Generators are not always visible; inquire about the existence of any emergency or backup power systems. Review any existing electrical diagrams and ensure that any backup generation system will remain isolated from the PV plant in the event of a power outage.

Medium Voltage Transformers

In commercial photovoltaic (PV) systems, transformers are often required in order to connect larger installations to a medium-voltage (MV) power grid, especially in cases where the PV system is not co-located with an existing low voltage system. Such installations are typical of ground mount installations. The Medium Voltage Transformer Connection of Commercial Systems application note provides guidelines for selecting, designing and connecting a medium voltage transformer to a commercial PV system with SolarEdge three phase inverters.

System Design and Equipment Selection

Site Designer

A System Designer or Engineer should use the SolarEdge Site Designer tool to determine the correct optimizer and inverter combination and configuration. Most PV modules fall into standardized groupings of size and power; Site Designer includes a large database of PV modules and permits users to add new modules that are not currently in the database.

Optimizer Selection

“Commercial Optimizers” are a category of optimizers that utilize a 2:1 module to optimizer ratio; smaller 1:1 “General Optimizers” may also be used. Refer to the Site Designer tool to determine the correct ratio and connection scheme when selecting optimizers.

Inverter Oversizing

Oversizing inverters is a common industry practice of having a higher total PV module DC power rating than the inverter AC nameplate rating. Oversizing SolarEdge inverters within the permitted range will not harm the power optimizers or the inverters. Refer to the Oversizing of SolarEdge Inverters Technical Note for further information.

Environmental Sensors

Environmental sensors are used to monitor a site's irradiance, temperature, wind conditions, and calculate the performance ratio (PR). Sensors are connected to the SolarEdge Control and Communication Gateway (CCG) and the measurements are displayed in the SolarEdge Monitoring Portal.

Up to three sensors can be connected to a single CCG:

- Two sensors with voltage outputs (V1, V2), each with a different voltage range
- One sensor with a current input (I)

For additional information see the references below:

Environmental Sensors - Reference	
Environmental Sensors	Application Note: Installing Environmental Sensors
CCG Installation Guide	SolarEdge Control & Communication Gateway Installation Guide

Site Layout and Inverter Location

Determine the mounting location for the inverters. It is possible to install inverters in a common location or distribute them throughout the array. While there are advantages and disadvantages to each option, the determination should be made on a site-specific basis, taking into consideration the following criteria:

- Cost of AC material and labor as impacted by inverters' locations
- Losses caused by voltage drops
- Labor costs during installation, commissioning and O&M operations
- Communication wiring
- Compliance with NEC 2014/17 Rapid Shutdown requirements

Make sure that the location selected meets the requirements as described in *Chapter 3* of the SolarEdge Inverter Installation Guide.
Take into consideration the maximum distance between the inverter and the last optimizer in the string, the minimum clearance specifications, and the limitations of the chosen communication topology.

Communications Planning

It is essential to create a detailed communications plan that describes the communication method employed between the SolarEdge inverter(s) and the internet connection source. SolarEdge inverters include both an Ethernet and a Modbus RS485 port, but other accessories, such as GSM cellular modems with data plans and Control and Communication Gateways, are available. Note that the CCG requires a 120 Vac power source.

To find the right solution for your installation, refer to the Communications page on the SolarEdge Website or to the *Communication Options Application Note*. For further information about the CCG, refer to the SolarEdge Control & Communication Gateway Installation Guide.

Overvoltage Surge Protection

Consider proper surge protection for SolarEdge products in the field from overvoltage surges caused by lightning strikes, grid overvoltage events, and ground faults. Properly installed surge protection devices can reduce the likelihood of permanent damage to inverter components, CCGs, communication devices and interconnected meters. Please refer to the Overvoltage Surge Protection Technical Note.

Power Control

SolarEdge inverters support various active and reactive power controls through various mechanisms. All inverters include default country settings and the ability to configure these settings. For additional information, please see the references below:

Power Control / Export Limitations – Reference	
Power Control Configuration	Application Note - SolarEdge Inverters, Power Control Options
Export Limitation Configuration	Export Limitation Application Note
Electricity Meter Installation	SolarEdge Electricity Meter Installation Guide
SolarEdge Three Phase RGM for Commercial Installation	SolarEdge Three Phase Revenue Grade Meters for Commercial Installations

SolarEdge Design Support

A Field Applications Engineer (FAE) can assist you with any inquiry or technical design issue. If you have not been assigned an FAE please contact your SolarEdge Regional Sales Manager. You can also call the SolarEdge US Support number (510) 498-3200 option 2 or email us at ussupport@solaredge.com.