SolarEdge Winter Webinars

South East Europe

February – March 2022

Your Presenters Today

Fabio Albertini

Sales Manager South East Europe
fabio.albertini@solaredge.com

Irene Miranda

Inside Sales South East Europe
irene.miranda@solaredge.com

Winter Webinars Program

Training events for South East Europe

Monday, Feb 21st	3pm CET / 4pm EET	SolarEdge Home
Wednesday, Feb 23rd	3pm CET / 4pm EET	SolarEdge Commercial Solution
Monday, Feb 28th	3pm CET / 4pm EET	Concept of operation and our smart design tool
Wednesday, Mar 2nd	3pm CET / 4pm EET	Get the most out of SolarEdge monitoring

solaredge

Our Smart Solution for Commercial and Industrial PV Systems

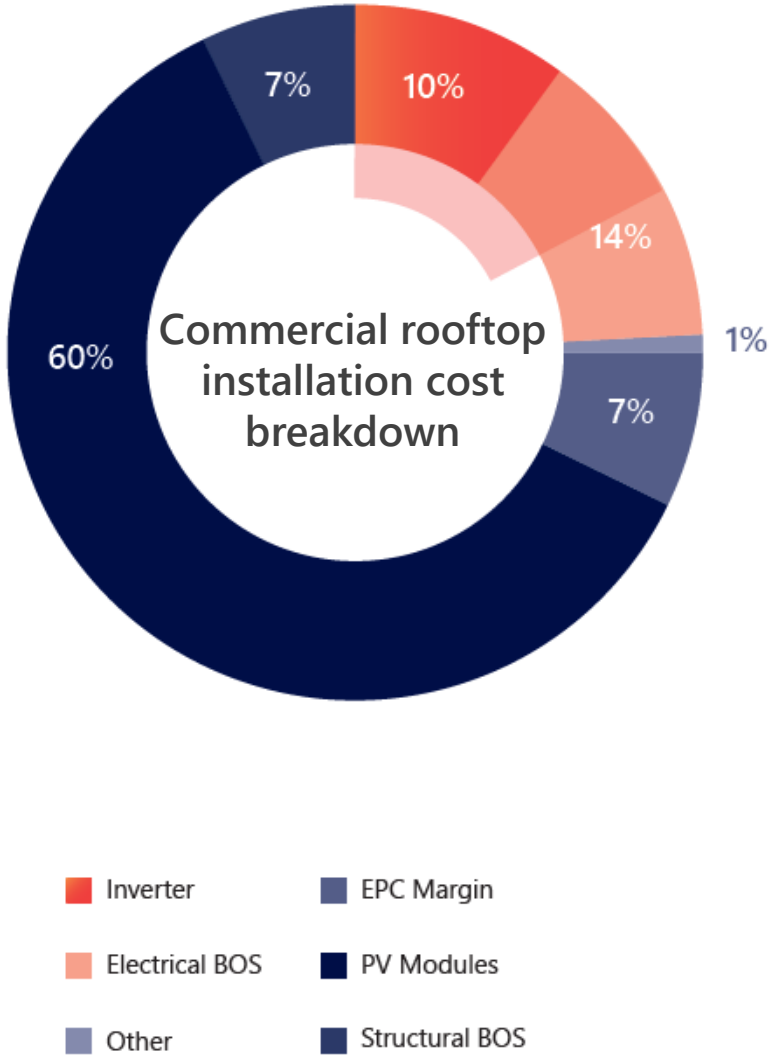
solaredge

Today's agenda

- The benefits of our smart commercial solution
- The SolarEdge Safety solutions
- The complete portfolio for C&I systems
- Q&A

Inverter's Significance

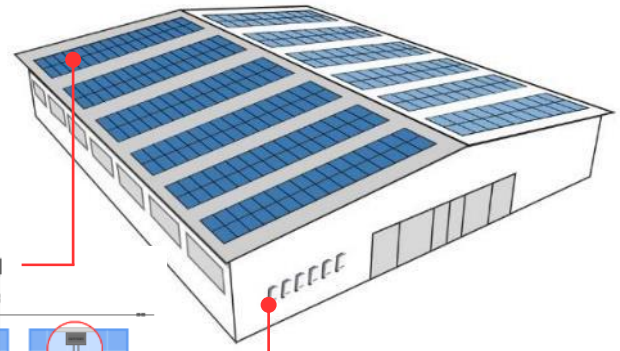
- Inverters account for <10% of the system cost but,
  - Influence up to 20% of system cost
  - Manage 100% of system production
  - Are the "brains" of the system
  - Mitigate O&M expenses through PV asset management solutions



Inverter selection is critical for the long term financial performance of a PV system

Source: Based on SolarEdge market analysis, assuming total cost of ~€1/Wp

The Full SolarEdge Commercial Solution



Power Optimizers
P605–P1100

Inverters
16kVA – 120kVA

Monitoring Platform

Commercial Gateway

Environmental Sensors and Satellite-based PR

Grid Interaction

Professional Services

Products in the price list

Power Plant Controller*, Alternative Power Solution

* Certified for Zero-Export in Spain; Certification planned for Austria and Germany

Solutions quoted on demand

Customized Monitoring Interface, End-2-end integrations

SolarEdge Offers Four Key Benefits

More Energy

Increased energy yield & faster return on investment through module-level MPPT

Lower O&M Costs

Full visibility of system performance & remote troubleshooting

Enhanced Safety

Safety during installation, maintenance, firefighting, & other emergencies

Flexible Design

Maximum space utilization with minimum design time

Higher Lifetime Value with SolarEdge PV Solution

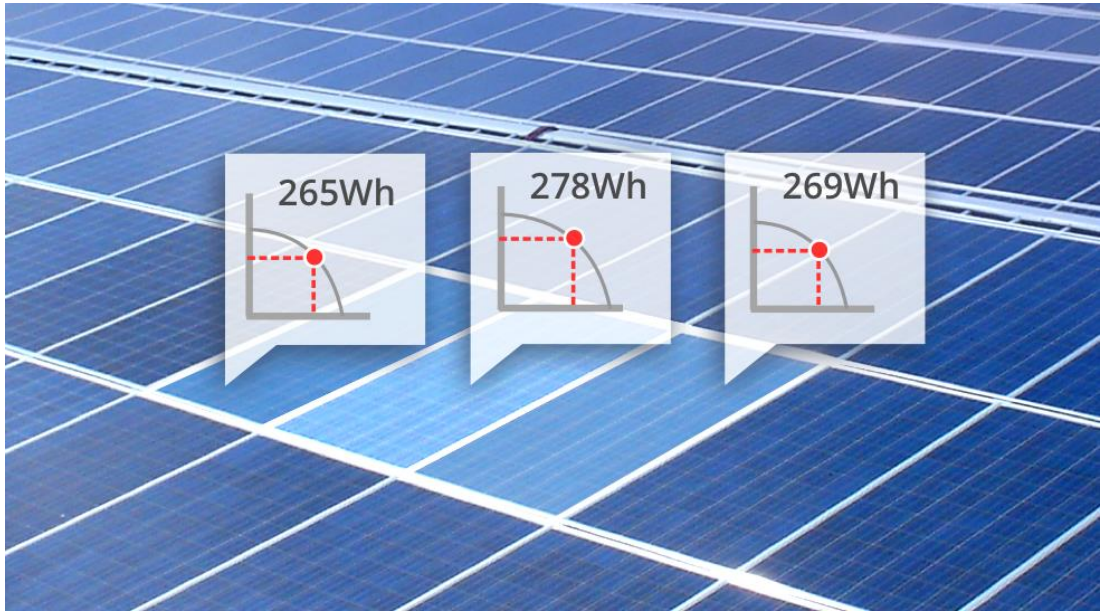
Increase Revenue

Decrease Expenses

Mitigate Risk

Lifetime Revenue

- MPPT per module:
  - SolarEdge is designed for higher energy yield
  - Each module produces maximum power independently of other modules in the string
  - Underperforming modules do not affect the production of the whole string



Approximately 3% higher energy yield *

* SolarEdge estimates that on many commercial sites, power optimizers can recover approximately 3% more energy in year one. As modules age, this mismatch continues to increase leading to an additional 2% potential recovery for systems optimized by SolarEdge.

solaredge

More Energy by Design

Power optimizers enable installation of:

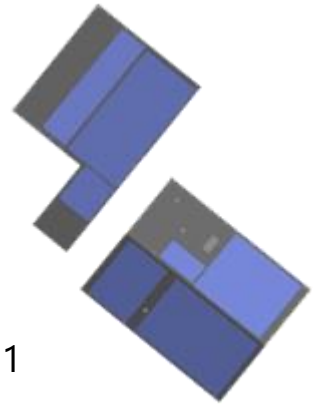
- Modules in partially shaded areas
- Strings of uneven lengths
- Strings in multiple orientations and different roof facets

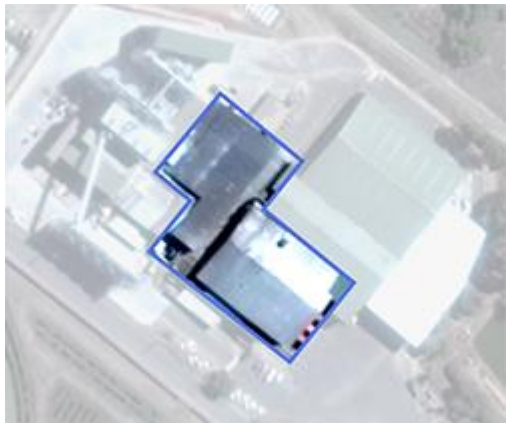
Flexible site design > More modules on the roof > More power

Traditional Inverter:
312 kWp

SolarEdge System:
396 kWp

= 27% added power





solaredge

Higher Lifetime Value with SolarEdge PV Solution

Increase Revenue

Decrease Expenses

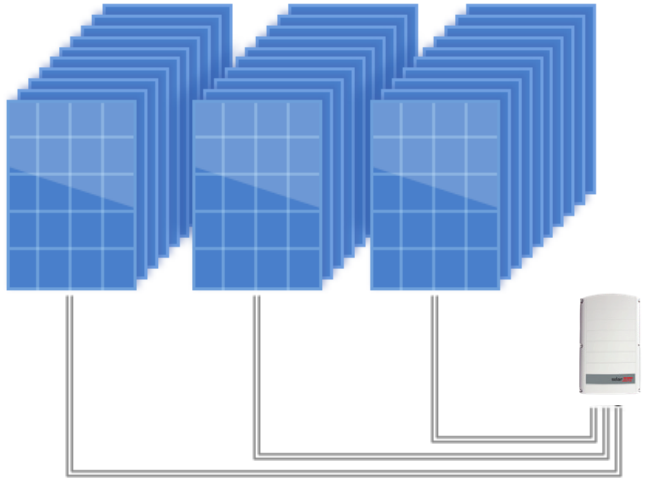
Mitigate Risk

Reduced BoS Costs by Flexible Design

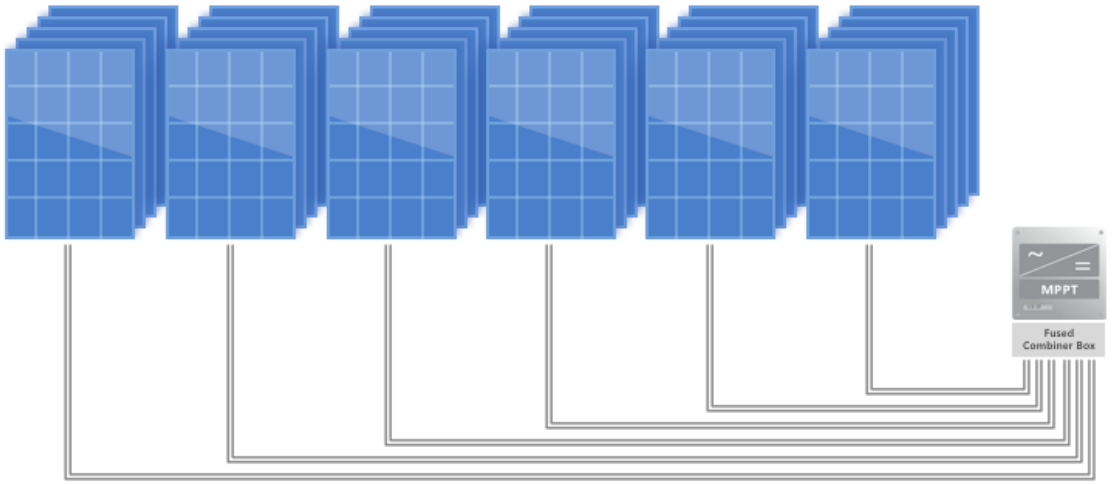
Up to 60 modules per string → Fewer strings → Less wiring, combiner boxes, fuses, etc. → **Up to 50% reduction in BoS cost**

Fewer strings → Less onsite self-crimping at string end → **Reduced risk of failure & fire**

SolarEdge DC Optimized Inverter



Traditional Inverter



solaredge

Lower O&M Costs with Module-Level Monitoring

- SolarEdge's module-level monitoring
  - Free for 25 years
  - Offers full control and visibility
  - Remote troubleshooting
  - Cost saving maintenance

Lower O&M Costs with Module-Level Monitoring

- Remote troubleshooting
  - Pinpoint underperforming modules to their physical location, prior to sending a technician onsite
  - Easy detection of PID and burnt bypass diode
  - Remote module voltage measurement

Bypass diode failing

Good modules, with full voltage

Underperforming module, with reduced voltage

solaredge

The SolarEdge Safety Solution

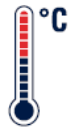
The Importance of PV Safety

- Millions of PV systems are installed worldwide, and they're generally safe, posing no danger to people or property
- Maximizing PV safety is in the interest of all system stakeholders
  - Protection of people and property must always be #1 priority
  - Avoiding PV fires enhances reputation of the industry
  - Mitigating safety hazards leads to increased system uptime and higher energy production
  - Helps satisfy insurance requirements
- For many applications, no reason to wait for new regulations before advancing improved safety measures e.g. car airbags were introduced prior to legislation
- Similar to car safety ratings, PV systems can also be graded according to their safety level

PV Safety is About a Holistic Solution Approach

Ensure system's DC voltage is reduced to a safe level when the system shuts down

Early arc fault detection and prevention



Active and continuous inverter protection

Module-level monitoring

Allow rapid discharge of conductors to safe voltage levels when required

A truly safe PV system should be based on a comprehensive solution that addresses the various safety requirements and is evidenced by a field-proven track record

A Holistic Safety Solution For True Peace of Mind

solaredge

Which Car Do You Think is Safer to Drive?

Fewer components

More components
(with advanced safety features)

solaredge

Be Smart. Be Safe. Apply Best Design Practices

When it comes to PV safety, less isn't more

- Does adding more PV components and connections = more safety risks, as some people claim?
- Not when they are designed to actually enhance PV safety

SolarEdge POV

- Installing fewer PV components and connections limits the ability to achieve higher levels of safety
- While smart technologies may require additional components, they significantly enhance system safety and ROI through:
  - Module-level shutdown
  - Heat detection
  - Arc fault circuit interruption (AFCI)
  - Module-level monitoring, providing pinpointed fault detection
  - Inherent system design to avoid extra costs, installation time and room for error
- When it comes to PV safety, less is not more

Be Smart. Be Safe

- Installing fewer PV components and connections limits the ability to achieve higher levels of safety
- While smart technologies may require additional components, they significantly enhance system safety and ROI through:
  - Module-level shutdown
  - Heat detection
  - Arc fault detection and interruption (AFCI)
  - Module-level monitoring, providing pinpointed fault detection
  - Inherent system design to avoid extra costs, installation time and room for error

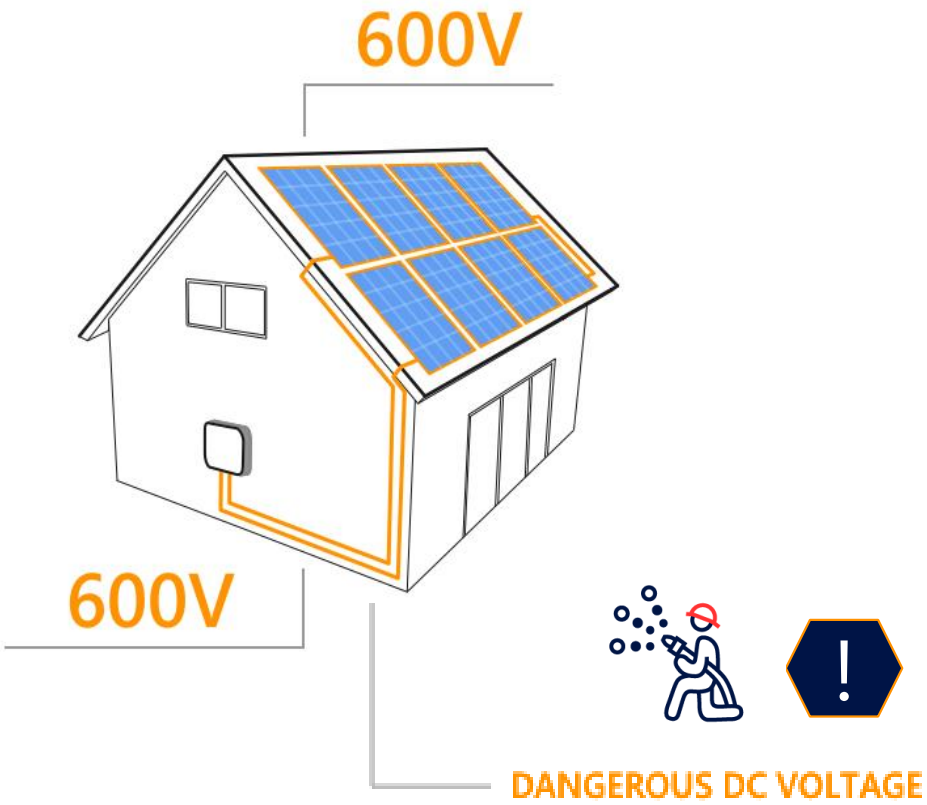
Overcoming Safety Challenges of Conventional String Inverters

solaredge

You Can’t Turn Off the Sun

PV systems continue to generate high DC voltage when disconnected from the AC grid

- When connected in a string, voltages in residential and commercial solar arrays can reach 600-1500V
- Potentially dangerous to installers during installation and maintenance personnel during O&M
- Firefighters commonly cut off building power so they have a safe environment in which to operate
  - High DC voltage restricts safe emergency response work



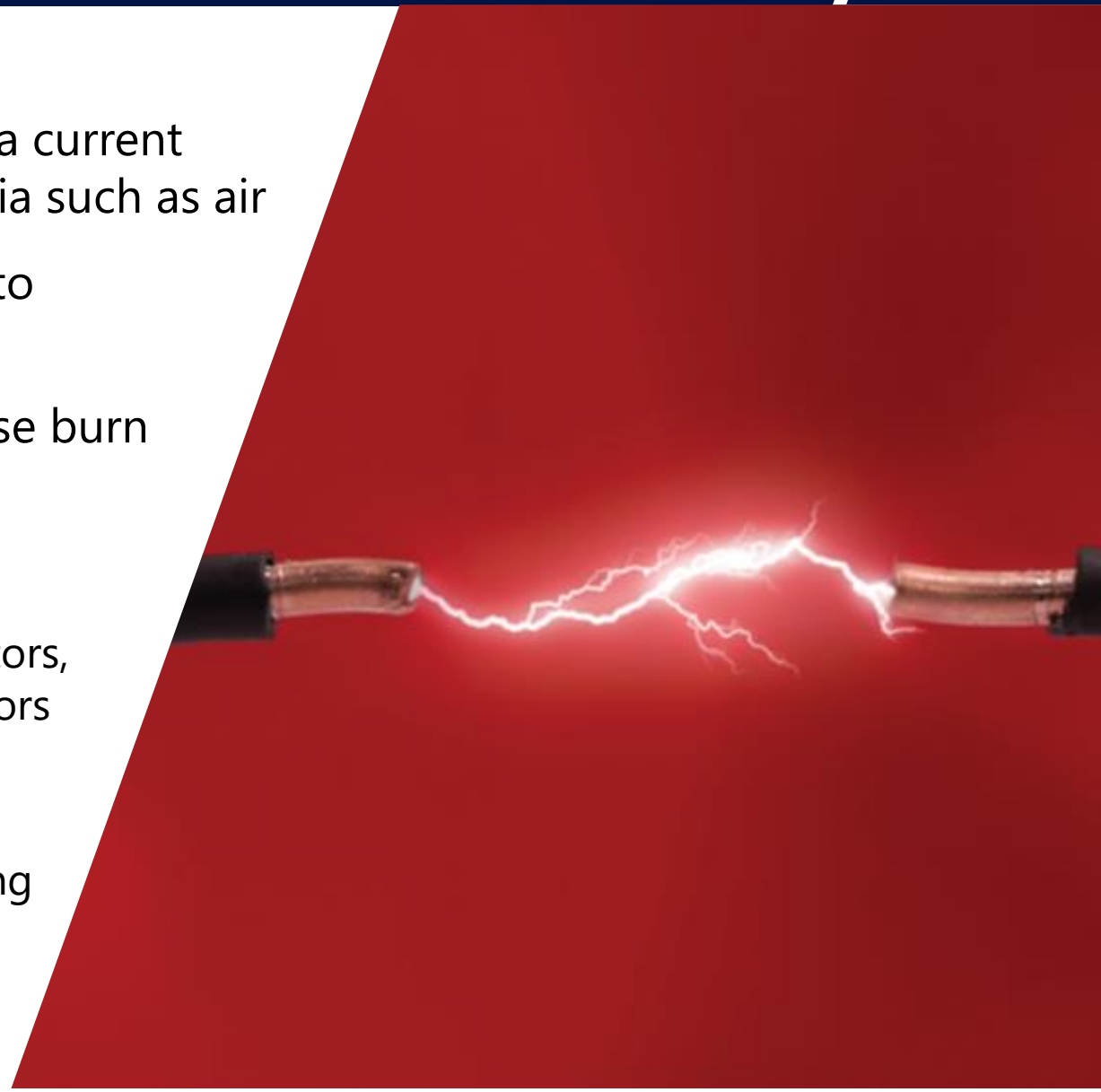
solaredge

Advanced Safety with SolarEdge's SafeDC™

- Whenever AC power is off, DC wires are designed to de-energize in order to protect installers, maintenance personnel, and firefighters
- Power Optimizers are designed to drop to 1VDC in any of these cases:
  - A building is disconnected from the electrical grid
  - The inverter is turned off
  - Insulation faults e.g. in cases of flooding or structural collapse (detected by the inverter)
- Thermal sensors in Power Optimizers connected to each module detect temperature over threshold (85 ˚C)

Electric Arcs Can Also Pose a Risk

- **What are electric arcs?**
  Ongoing high-energy discharges, resulting from a current passing through a normally non-conductive media such as air
- Creates a shock hazard or potential for fires due to electrification of the installation
- Arcs generate heat, which can cause fires and pose burn risk to those working in close proximity
- Common causes:
  - Faulty or improperly connected cables or connectors, corrosion, animals chewing wires, failed DC isolators
  - Over-heating of PV system component
  - Arc risk (while still low) increases with system aging due to degradation of connections and cables



Arc Fault and Heat Detection

Conventional Systems

- They may have fewer overall connections, but the smaller number of connections are not protected against arcs or over-heating
- Third-party solutions are possible, but they increase installation costs, raise reliability and compatability concerns, offer limited integration with PV system e.g. monitoring

SolarEdge Systems

- Smart, automatic protection provided by detecting arcing faults at all connections (as module connectors), before they lead to fires
- Solution is fully integrated into the SolarEdge ecosystem, at no extra cost
- Thermal issues are pinpointed to their exact location, saving maintenance crew critical time onsite
- Enhancing the American UL1699B standard, a smart inverter auto-reconnect mechanism exists, maximizing system uptime until the issue is resolved

solaredge

Raising the Safety Bar Even Higher

- Next generation three phase commercial inverters, up to 40kW
  - Includes option surge protection devices, protecting DC, AC, and RS485 ports
- The new Synergy technology inverters, up to 120kW
  - Include thermal sensors built-in to each DC/AC terminal block
  - Supports AC & DC wiring validation to reduce installation errors
  - Provides two protection levels: if abnormal temperature is detected the system will send automatic alerts, and in severe cases will even shut down the inverter

New Three Phase Inverter with Synergy Technology

solaredge

The Full SolarEdge Safety Suite

- SolarEdge is an industry leader in safety, incorporating safety technology across multiple platforms, meeting the most advanced international standards

SafeDC™

Ensures system's DC voltage is reduced to a safe level when the system is shut down, within up to five minutes

+

Rapid Shutdown

Allows fast discharge of conductors to safe voltage levels, within 30 seconds

+

Arc Fault Protection

Provides the ability to detect and terminate an arc through inverter shutdown

+

Module-Level Monitoring

Sends automatic notifications on system issues, preventing potential safety risks

solaredge

Robust for Tough Environments

- Humidity resistant — operates at humidity levels of up to 95% (non-condensing)
- Wide temperature range (-40°C to +60°C)
- Dust and water tight (inverters - IP65)
- Option to mount the inverter horizontally under the modules (10° inclination)
- Ammonia resistant
  - Commonly produced in aquatic environments by decaying plant material

solaredge

Longer Warranties with SolarEdge

- Inverters require at least one replacement during system lifetime
- Funds need to be set aside to cover replacement costs

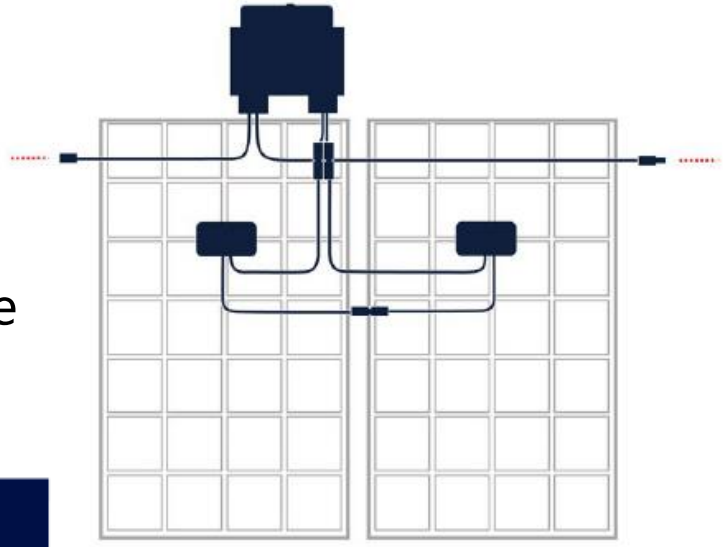
- With SolarEdge:
  - Longer standard warranty of 12 years
  - Warranty expansion option for 20 years
  - Lower-cost inverter replacement after warranty: ~40% less than traditional inverters

Commercial and Industrial Solutions

solaredge

Power Optimizers for Commercial PV Systems

- From P605 to P1100 (1100)
- Suitable to be connected with 2 modules in series (most of the cases)
- Compatible from SE16K and above
- In case of string with ODD numbers of modules one optimizers can be connected to just 1 modules per string



Power Optimizer Model (Typical Module Compatibility)	P800p (for up to 2 x 96-cell5'' PV modules)	P850 (for up to 2 x high power or bi-facial modules)	P950 (for up to 2 x high power or bi-facial modules)	P1100 (for up to 2 x high power or bi-facial modules)	
INPUT					
Rated Input DC Power[1]	800	850	950	1100	W
Connection Method	Dual input for independently Connected modules	Single input for series connected modules			
Absolute Maximum Input Voltage (Voc at lowest temperature)	83	125			Vdc
MPPT Operating Range	12.5 - 83	12.5 - 105			Vdc
Maximum Short Circuit Current per Input (Isc)	7	14.1*		14.1	Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.6				%
Overvoltage Category	II				

solaredge

P950 / P1100

- Commercial optimizer with Series 2:1 connection
- Support modules up to 475W - 550W
- Supports up to 14.1A Isc, 125V Voc
- String power up to 15kW (depend on inverters)
- 2 string design in order to allow for flexible DC oversizing
- Applications:
  - Commercial & Industrial rooftop and ground mounted systems
- Benefits:
  - Cost effective solution for high power and high current modules

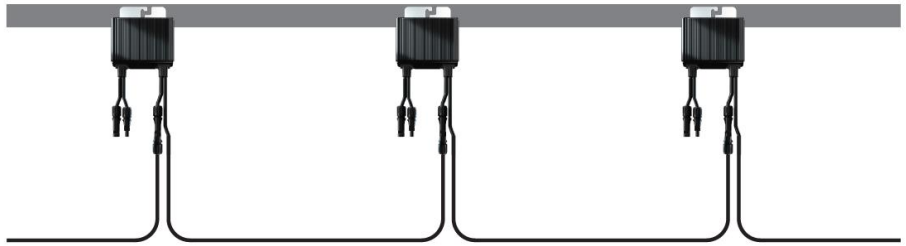
S-Series Power Optimizers

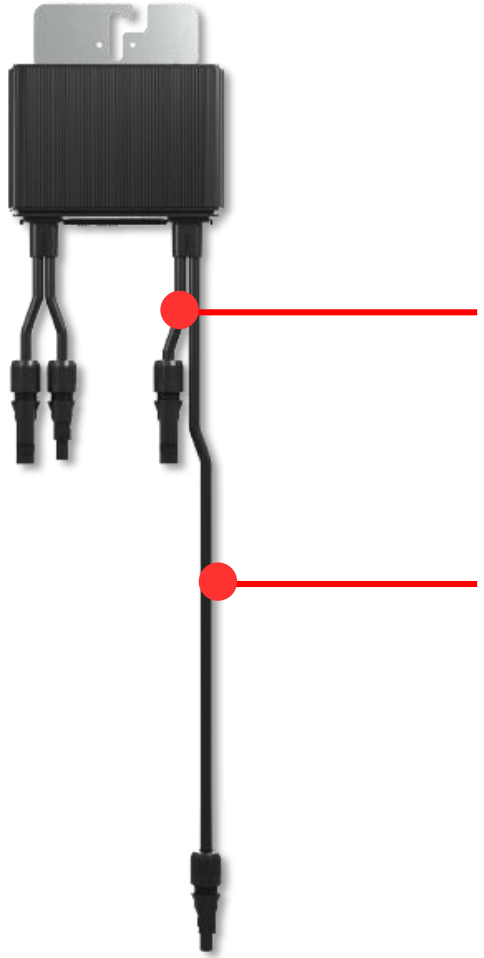
Even great things can be better, and this is exactly what we are doing with the next-generation of residential Power Optimizers

Now our newest generation of Power Optimizers do even more to protect people and property

New and Improved Cable Layout Management

- Simplified layout for easier cable connections (3 short cables + 1 long cable)
- Reduced exposure to isolation faults as connectors are now “floating” closer to the Power Optimizer unit itself. Installers will therefore need to spend less time onsite resolving such issues
- Simpler project design - support higher power rating and higher input current up to 14.5A
- Easier logistics - fewer residential Power Optimizer product models (fewer SKUs, easier project design, easier RMA process, hold less safe stock for replacement)





solaredge

New commercial inverter: Up to 33kW

150% inverter oversizing

Integrated Type 2 DC surge protection
Optional RS485 and Type 2 AC surge protection

~ 25% lighter than previous model: 45kg → 32kg

Reduced wiring & labor cost with support for 3-wire connection

Better resistance to DC isolation faults:

- Minimum ISO <167kΩ per inverter
- Meeting <100mA RCD per inverter unit requirement cutting costs of installing multi-inverter systems

Future-ready for SolarEdge's commercial energy storage solution

- **25kW, 30kW, 33.3kW @ 400V**

solaredge

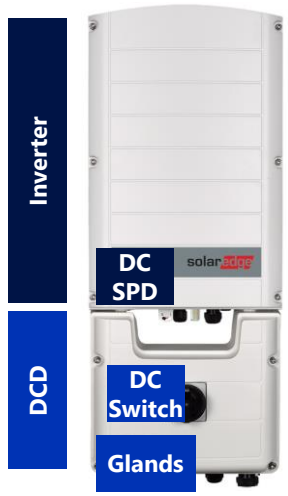
SE25K/30K/33.3K – Four configurations for Europe

1. Base
= Inverter and DC SPD

SE25K-RW00IBN**M**4
SE30K-RW00IBN**M**4
SE33.3K-RW00IBN**M**4

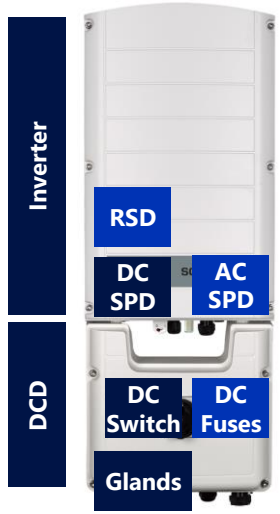
2. Glands
= *Base* + DCD
+ Multiple Glands

SE25K-RW00IBN**R**4
SE30K-RW00IBN**R**4
SE33.3K-RW00IBN**R**4



3. Full
= *Glands* + RSD+
AC SPD + Fuses

SE25K-RW00IBN**Z**4
SE30K-RW00IBN**Z**4
SE33.3K-RW00IBN**Z**4



Three Phase Inverters with Synergy Technology up to 120kW

Providing in-depth system visibility that streamlines the installation and commissioning processes for commercial and industrial PV installations.

Less time onsite, lower costs

- Innovative installation and commissioning process
- Automated validation and reporting

Maximize system performance

- Larger capacity:
  Up to 100kW @400Vac
  Up to 120kW @480Vac
  150% oversizing
- PID rectifier

Simple installation and servicing

- Modular and lightweight units managed by a single point of control

Enhanced robustness (advanced safety and protection)

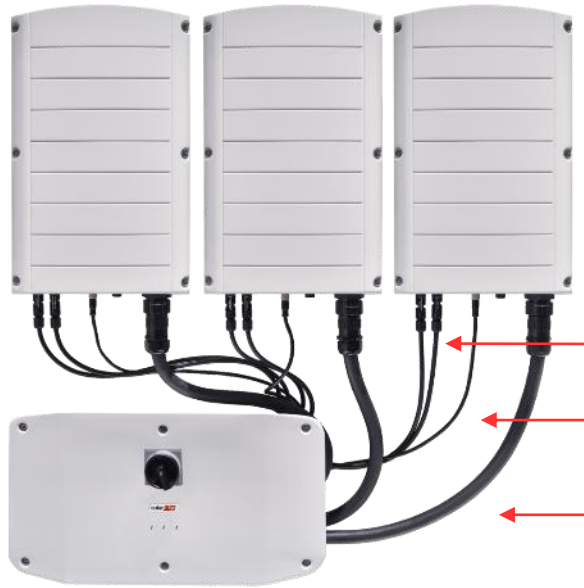
- Thermal sensors on DC, AC terminal blocks
- Monitored* and field replaceable surge protection devices

* Applicable only for DC and AC SPDs

The Anatomy of the Inverter

Synergy Units

- Identical dimensions for (two or three) units, for easy operation and logistics



Synergy Manager

- Single management interface
- Contains the communication board

DC (+ and -) cable

Communication cable

AC cable

solaredge

Three Phase Inverters with Synergy Technology up to 120kW

A new generation of three phase inverters:

- Providing an installation experience with in-depth insights for straightforward commissioning
- Taking PV safety to the next level
- Combining larger capacity with ease of installation

66.6kW @400V

90kW, 100kW @400V
120kW @480V

solaredge

Innovative Installation and Commissioning Process

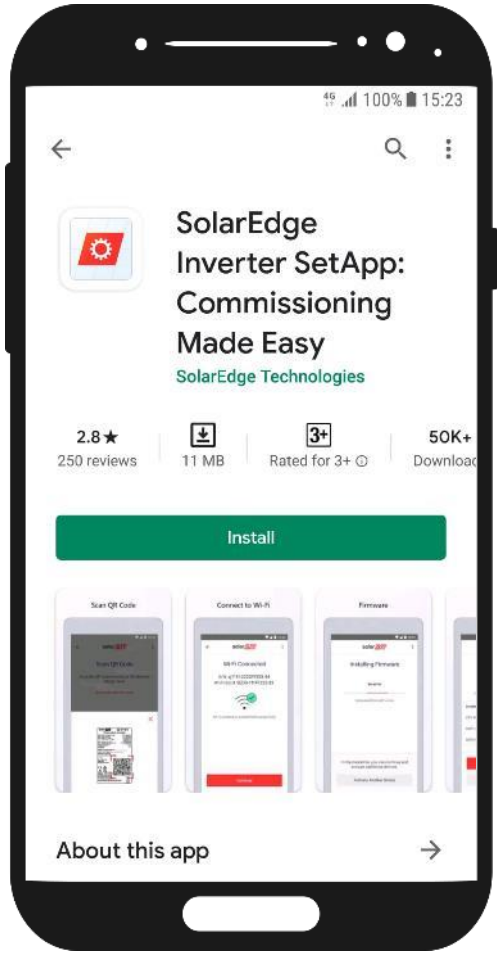
Pre-commissioning for easy and straightforward installation validation including:

PV modules

Wiring

Communication infrastructure

Other critical components



Installer Benefits

- Faster, streamlined installation and commissioning flow that can also save you money by minimizing time spent onsite for a specific project
- Resolve any system issues, before AC is connected
- Get clear progress report of the installation

solaredge

Modularity

Three identical Synergy units working independently from each other

- Higher system up-time
- Easy inventory management

solaredge

Increased Power

Up to 100kW
for 400V grid

Up to 120kW
for 480V grid

- 150% inverter oversizing

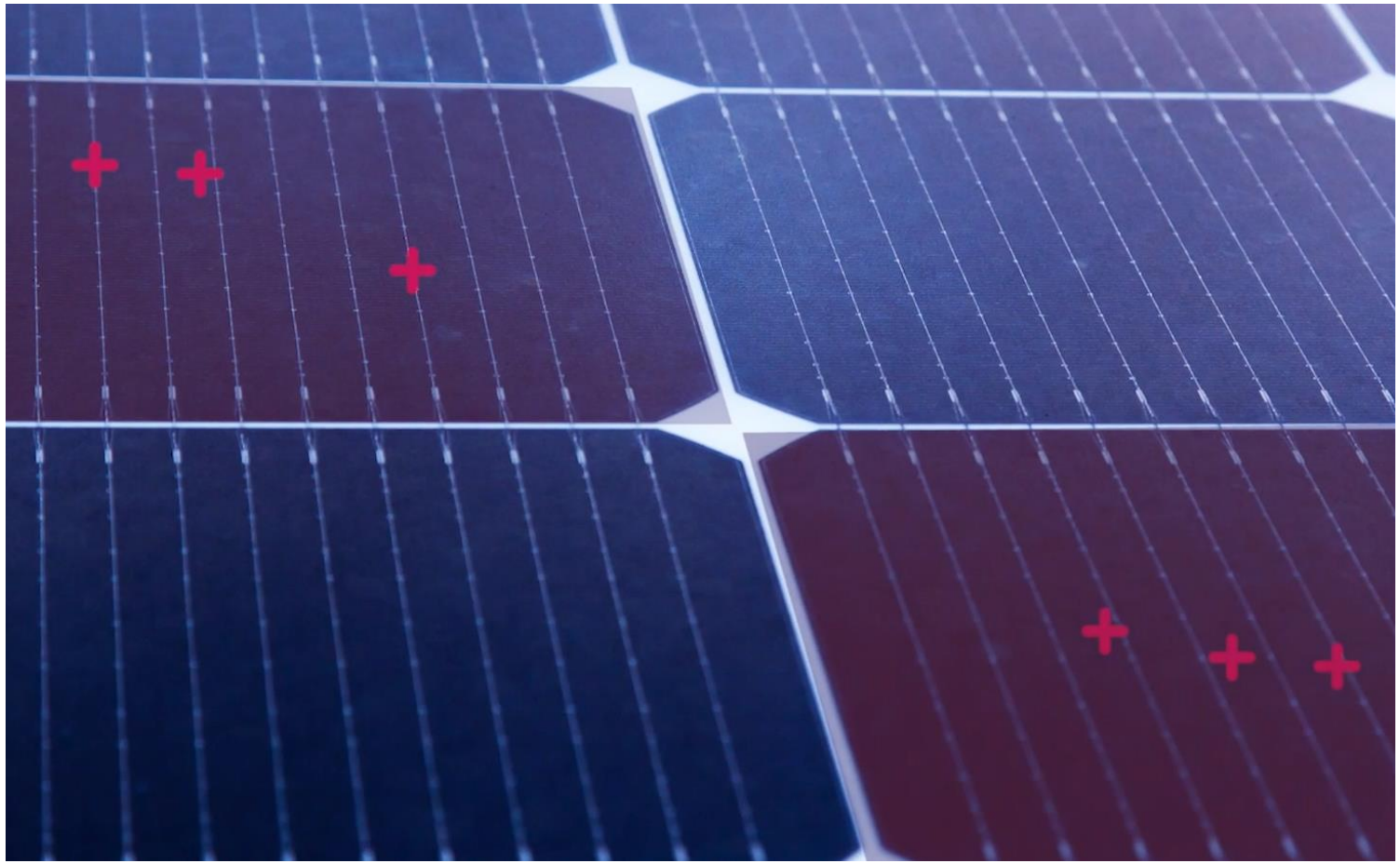
solaredge

Mitigate PV Modules Performance Degradation

Potential Induced Degradation (PID) Rectifier

Built-in nighttime solution

- Keep the energy production at its maximum
- Avoid the installation of external devices and lower costs



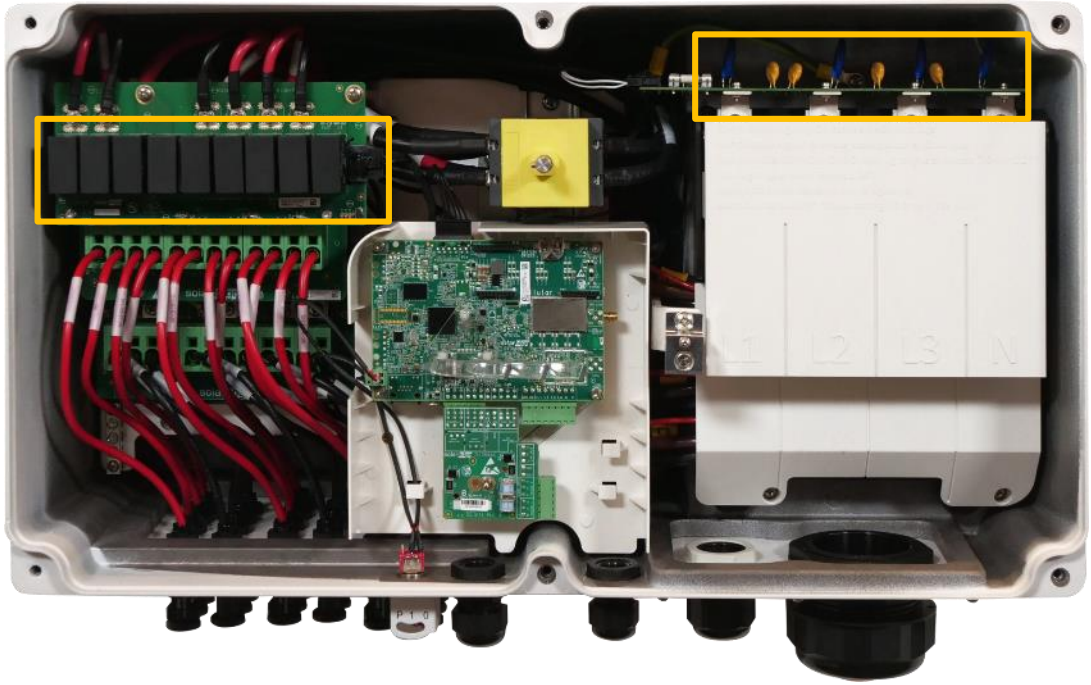
solaredge

Surge Protection Devices

Type 2 DC & optional AC surge protection devices

Monitored and field replaceable

- Withstand surges caused by lightning or grid events
- In case of an event, alert is sent via the monitoring platform and the user receives a notification
- Alert is reset automatically upon SPD replacement



SPD Kits For Replacement
DC SPD kits for 5 Synergy Managers with 3 Units
DC SPD kits for 5 Synergy Managers with 2 Units
AC SPD kits for 5 Synergy Managers

solaredge

Available versions

	P/N SYNERGY MANAGER	SYNERGY UNITS	INPUTS	SPD CA	SPD CC	DC SWITCH	DC FUSES
EU BASE (MC4)	SE66.6K-RW00IBNM4	2	MC4	ⓘ	✓	✗	✗
	SE90K-RW00IBNM4	3					
	SE100K-RW00IBNM4						
	SE120K-RW08IBNM4 @480VAC						
EU SWITCH	SE66.6K-RW00IBNQ4	2	MC4	ⓘ	✓	✓	✗
	SE90K-RW00IBNQ4	3					
	SE100K-RW00IBNQ4						
	SE120K-RW08IBNQ4 @480VAC						
EU FUSE	SE66.6K-RW00IBNC4	2	MC4	ⓘ	✓	✓	✓
	SE90K-RW00IBNC4	3					
	SE100K-RW00IBNC4						
	SE120K-RW08IBNC4 @480VAC						

	P/N SYNERGY UNIT	RAPID SHUTDOWN
BASE	SESUK-RW00INNN4	NO
RSD	SESUK-RWR0INNN4	YES

ⓘ * To be ordered separately (p/n SE-AC-SPD-SM)

solaredge

Questions?

SolarEdge LIVE Roadshow South East Europe

We are coming to the major cities of your country like Bucharest, Athens, Sofia, Zagreb and many more...

From end of March till June
Live training events focused on sales and technical tools to optimize your business with SolarEdge

Pre-registration available later this week!

Thank You!

Cautionary Note Regarding Market Data & Industry Forecasts

This power point presentation contains market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.