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SOLAR INVERTERS

# Solar inverter solutions for building applications

Helping you get more energy  
out of every day



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**ABB has one of the widest portfolios of solar inverters ranging from single- and three-phase string inverters up to megawatt-sized central inverters. This extensive range of solar inverters is suitable for the smallest residential photovoltaic (PV) systems right up to multimegawatt PV power plants.**

**ABB has developed a series of solar inverter solutions to meet the requirements and needs of residential, commercial and industrial buildings, covering a wide range of applications.**

**The offering is complemented by various monitoring solutions as well as a global service network to maximize the return of investment.**

**ABB solar inverters utilize over 40 years of experience and advances made in inverter and power converter technology that has contributed to ABB becoming one the leading solar inverter providers globally.**

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# ABB solar inverter solutions

## The smartest choice for solar building applications

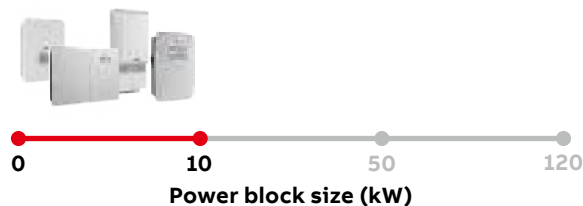
### Residential solar building applications

You can count on smart technology that connects with your smart residential buildings

ABB offers a broad line of residential inverters that can meet the needs of modern homes. Our portfolio includes single-phase and small three-phase string inverters as well as energy storage solutions that make the most of your solar system.

Thanks to ABB's solutions for residential solar buildings PV installers can benefit of a quick and easy installation and commissioning while end users can benefit of an optimized user experience thanks to control and monitoring features that allow the energy management flow in smart homes by simply using any WLAN enabled device (PC, smartphones or tablets).

The future-proof and flexible design of our solutions simplify the integration with smart building automation devices, smart grid integration and with third party monitoring and control systems.



### Commercial and industrial solar building applications

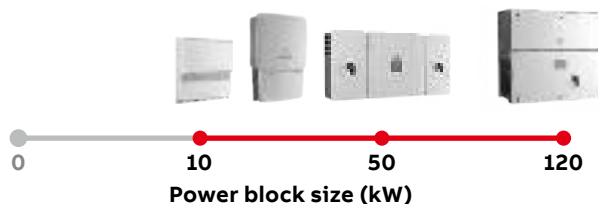
You can count on our flexible solutions whatever the scale and design of your project

ABB offers the broadest portfolio of commercial string inverters on the market, which includes a powerful line of three-phase string inverters for photovoltaic (PV) systems installed in commercial and industrial buildings.

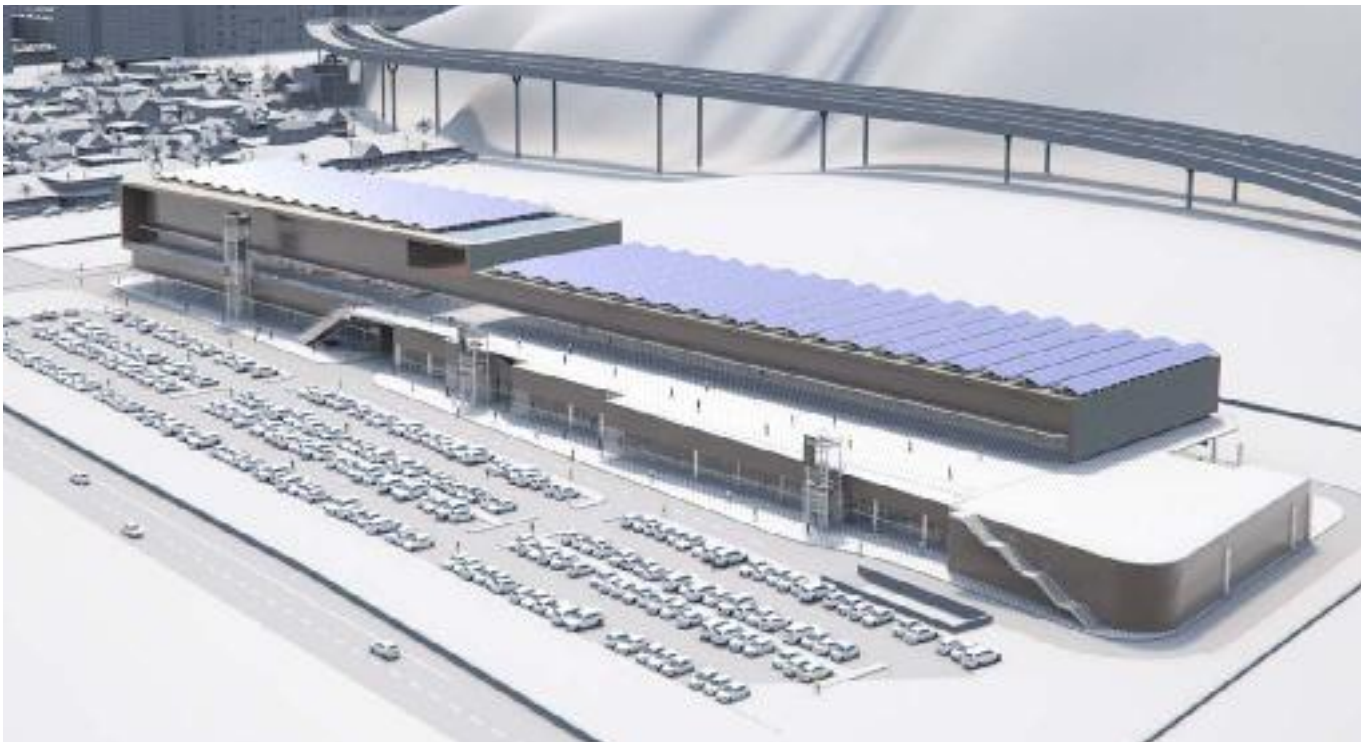
Thanks to their modularity and flexibility, our commercial and industrial inverters are the ideal solution for simplified system planning and design. The wide range of power ratings along with the possibility to install in either vertical or horizontal position make them the brightest choice for any rooftop solution.

Designed to optimize the total cost of ownership in PV projects, our inverters guarantee high total efficiency and reliability. The high power density and reduced installation and maintenance efforts enhance overall cost efficiency.

The solutions are complemented by a series of cloud based advanced communication services which simplify the integration in smart environments.







# Enjoy the new era of digital and renewables with ABB solar inverter solutions

**The solar market has changed in recent years and solar applications are becoming more and more digital.**

The high penetration of renewable energy in some areas of the world, along with the continuously growing demand of a reliable energy supply in others are requiring solar inverters to be more intelligent and easily integrated with complex and smart environments in order to achieve the set target in both self-consumption and power generation.

In modern residential installations, in the era of the smart home vision, the solar inverter is part of a complex system where many different devices communicate with each other over a common communication bus. In addition, this smart system is connected to a cloud-based platform via Internet for monitoring and managing purposes.

In commercial and industrial applications the integration is even more complex and continuously evolving since not only the energy management system but also the building management system is an integral part of the smart ecosystem according to the paradigm of the Internet of Things (IoT).

In any solar application, residential, commercial or industrial, digitalization represents the main enabler that allows solar inverters to be easily and effectively integrated with any smart environment as well as the mean by which solar operators effectively monitor, control and manage their solar assets, both remotely and locally.

With more than 125 years of experience in providing technology, expertise, experience and solutions for both power generation and energy management applications, ABB is able to provide its customers with cutting edge and cost-effective inverter solutions allowing to maximize the results of their business. ABB strives to help you write the future of solar.









# ABB string inverters

From residential to decentralized commercial and industrial applications, our inverters fit any plant

Photovoltaic systems are proven more and more to be one of the most clean and convenient energy sources worldwide. ABB is proud to play an important role in driving the solar innovation, providing its customers with smart solutions that are every day more connected to the digital grid. Whether in residential applications, in modern smart homes that require batteries to store excess energy or even in commercial or industrial decentralized power plants, ABB offers the most cost-effective solution.

## String inverters for residential applications – the efficient choice for home energy

Consisting of both single and small three-phase inverters, ABB's offering can fit the needs of any household that is looking to save on their energy bills while making an environmental friendly choice.

Always in line with our customer's needs, our devices feature enhanced smart functionalities thanks to which homeowners can control and monitor their energy production and own consumption through any mobile device.

## String inverters with integrated energy storage – welcome to the age of the prosumer

ABB's inverters with integrated energy storage represent the line that separates a conscious consumer from a modern prosumer. Thanks to a modern integrated Li-Ion battery, it is now possible to store excess energy and use it when most needed. Households are now the owners of the energy produced from their system, deciding the appropriate moment to use it, without wasting a watt.

## String inverters for commercial and industrial applications – bright future ahead for decentralized power generation

The future of energy is anchored to decentralized production from renewable sources like photovoltaics that have already driven a massive transformation in the way energy is produced, consumed and provided through modern transportation grids.

Photovoltaics are already one of most cost-effective energy sources in many regions of the world and when they complement with digital technologies the benefits for users are at the maximum scale. Thanks to our inverter solutions for decentralized commercial and industrial applications, many companies can achieve greater efficiency and sustainable growth, today as tomorrow.

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01  
String inverter portfolio

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01







# ABB string inverters

## UNO-DM-1.2/2.0/3.3/4.0/4.6/5.0-TL-PLUS 1.2 to 5.0 kW

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01  
UNO-DM-PLUS  
outdoor string inverter

**The new UNO-DM-PLUS single-phase inverter family, with power ratings from 1.2 to 5.0 kW, is the optimal solution for residential installations.**

### One size fits all

The new design wraps ABB's quality and engineering into a lightweight and compact package thanks to technological choices optimized for installations with different orientation.

All power ratings share the same overall volume, allowing higher performance in a minimum space, and have a dual Maximum Power Point Tracker (2 MPPT).

### Easy to install, fast to commission

The presence of Plug and Play connectors, both on the DC and AC side, as well as the wireless communication, enable a simple, fast and safe installation without the need of opening the front cover of the inverter.

The featured easy commissioning routine removes the need for a long configuration process, resulting in lower installation time and costs.

Improved user experience thanks to a built-in User Interface (UI), which enables access to features such as advanced inverter configuration settings, dynamic feed-in control and load manager, from any WLAN-enabled devices (smartphone, tablet or PC).

### Smart capabilities

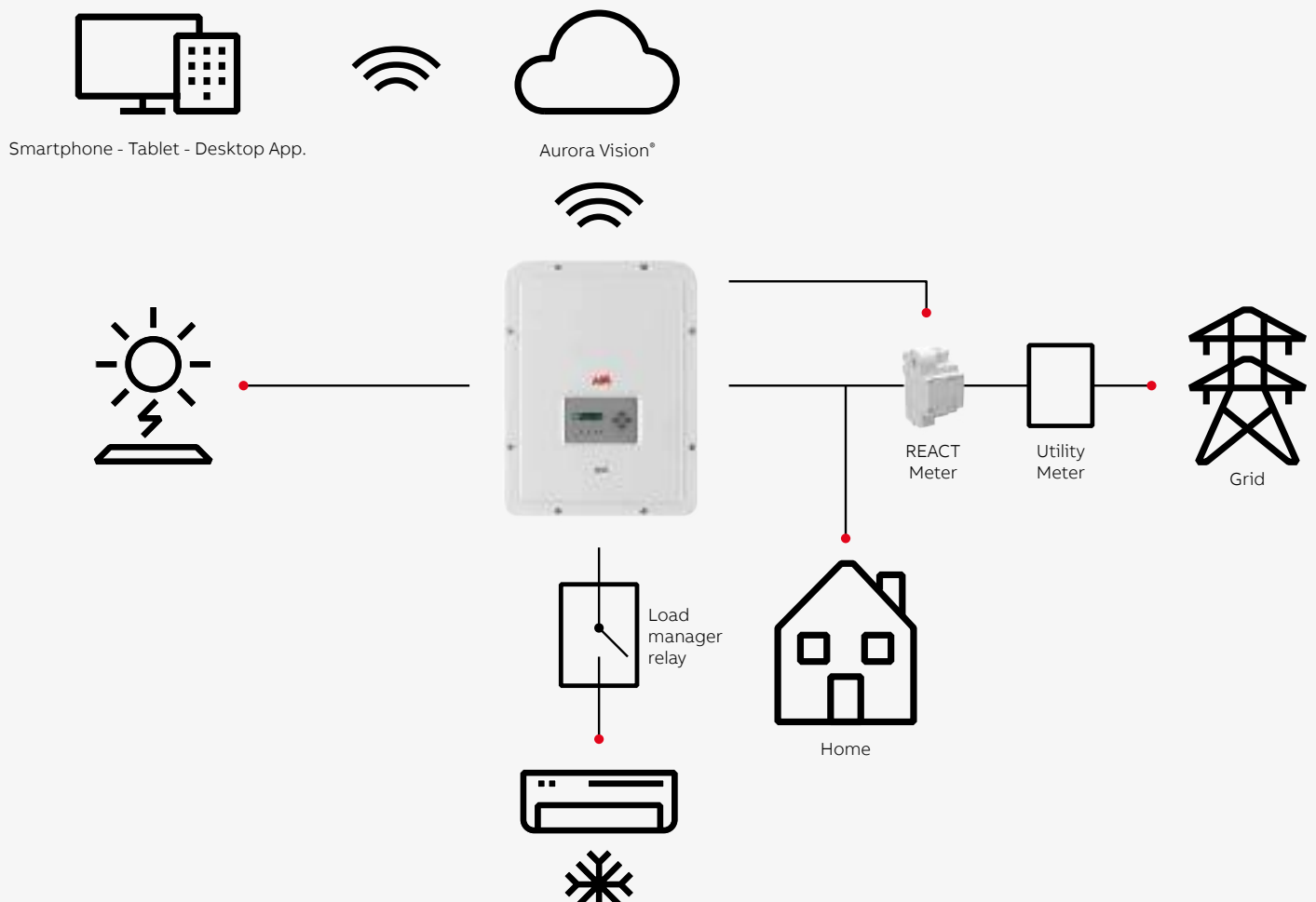
The embedded logging capabilities and direct transferring of the data to Internet (via Ethernet or WLAN) allow customers to enjoy the whole Aurora Vision® remote monitoring experience.

The advanced communication interfaces (WLAN, Ethernet, RS485) combined with an efficient Modbus (RTU/TCP) communication protocol, Sunspec compliant, allow the inverter to be easily integrated within any smart environment and with third-party monitoring and control systems. A complete set of control functions with the embedded efficient algorithm, enabling dynamic control of the feed-in (i.e. zero injection), make the inverter suitable for worldwide applications in compliance with regulatory norms and needs of the utilities.

The future-proof and flexible design enables integration with current and future devices for smart building automation.

### Highlights

- Wireless access to the embedded Web User Interface
- Easy commissioning capability
- Future-proof with embedded connectivity for smart building and smart grid integration
- Dynamic feed-in control (for instance "zero injection")
- Remote Over The Air (OTA) firmware upgrade for inverter and components
- Modbus TCP/RTU Sunspec compliant
- Remote monitoring via Aurora Vision® cloud
- Dual input section with independent MPPT

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**ABB UNO-DM-PLUS series block diagram**

# ABB string inverters

## PVI-5000/6000-TL-OUTD

### 5 to 6 kW

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PVI-5000/6000-  
TL-OUTD outdoor  
string inverter

**Designed for residential and small commercial photovoltaic installations, this inverter fills a specific niche in the product line to cater for those installations producing between 5kW and 20kW.**

This inverter has a dual input section to process two strings with independent Maximum Power Point Tracking (MPPT), high speed and precise MPPT algorithm for real-time power tracking and energy harvesting, as well as transformerless operation for high performance efficiencies of up to 97.0%.

**Suitable for low power installations with reduced string size**

The wide input voltage range makes the inverter suitable for low power installations with reduced string size.

Flat efficiency curves ensure high efficiency at all output levels ensuring consistent and stable performance across the entire input voltage and output power range.

This outdoor inverter has been designed as a completely sealed unit to withstand the harshest environmental conditions.

**Highlights**

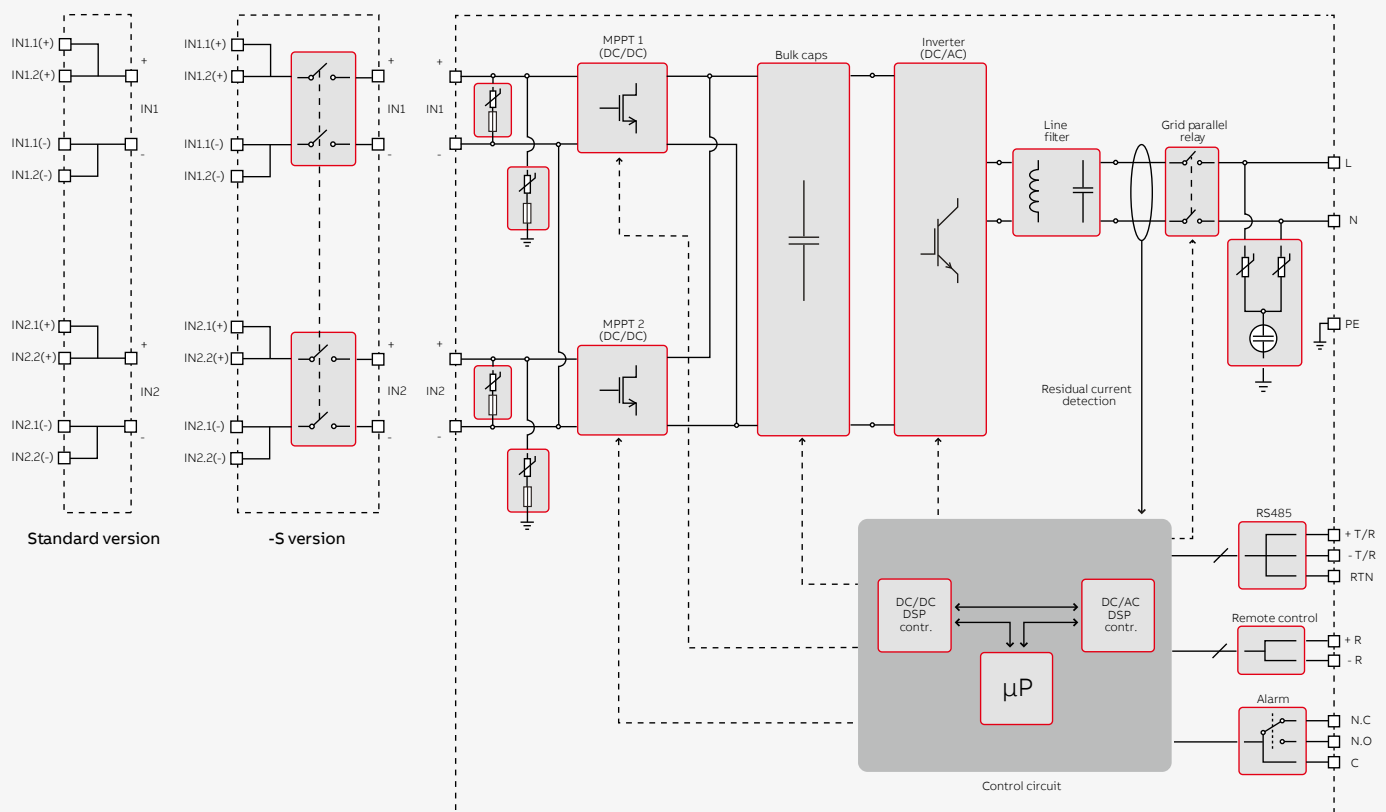
- Single-phase output
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected in the field
- Dual input section with independent MPPT, allows optimal energy harvesting from two sub-arrays oriented in different directions
- Wide input voltage range
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions
- RS-485 communication interface (for connection to laptop or datalogger)



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**ABB PVI-5000/6000-TL-OUTD string inverter block diagram**



# ABB string inverters

## TRIO-5.8/7.5/8.5-TL-OUTD

### 5.8 to 8.5 kW

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01  
TRIO-5.8/7.5/8.5-  
TL-OUTD outdoor  
string inverter

**The all-in-one residential three-phase TRIO-5.8, 7.5 and 8.5 kW inverters deliver performance, ease of use and installation, monitoring and control. With their 98% peak efficiency and wide input voltage range, the residential TRIO inverter means flexible installations and powerful output.**

#### Commercial grade engineering at residential scale

The topology of the larger, commercial TRIO inverters has been redesigned to ensure that the TRIO-5.8/7.5/8.5 models also enjoy high conversion efficiency across a wide range of input voltages. Optional integrated dataloggers and smart grid functionality, remote firmware updating and elegantly simple sliding front covers make these all-in-one devices easy to install and maintain. In short, they are commercial grade engineering at residential scale.

#### Inverters packed with powerful features

The double maximum power point tracker (MPPT) gives maximum installation flexibility for an optimal energy production (TRIO-7.5/8.5 models). This line of inverters can integrate power control, monitoring functionalities and environmental sensor inputs, without requiring external components.

A compact Ethernet expansion card provides data logging functionality for monitoring the main parameters of the plant as well as advanced O&M operations both locally (with the integrated webserver) and remotely (with the AV Plant Portfolio Manager portal), via a LAN connection.

The outer cover with its natural cooling mechanism qualifies at IP65 environmental protection level for external use. It provides maximum reliability and

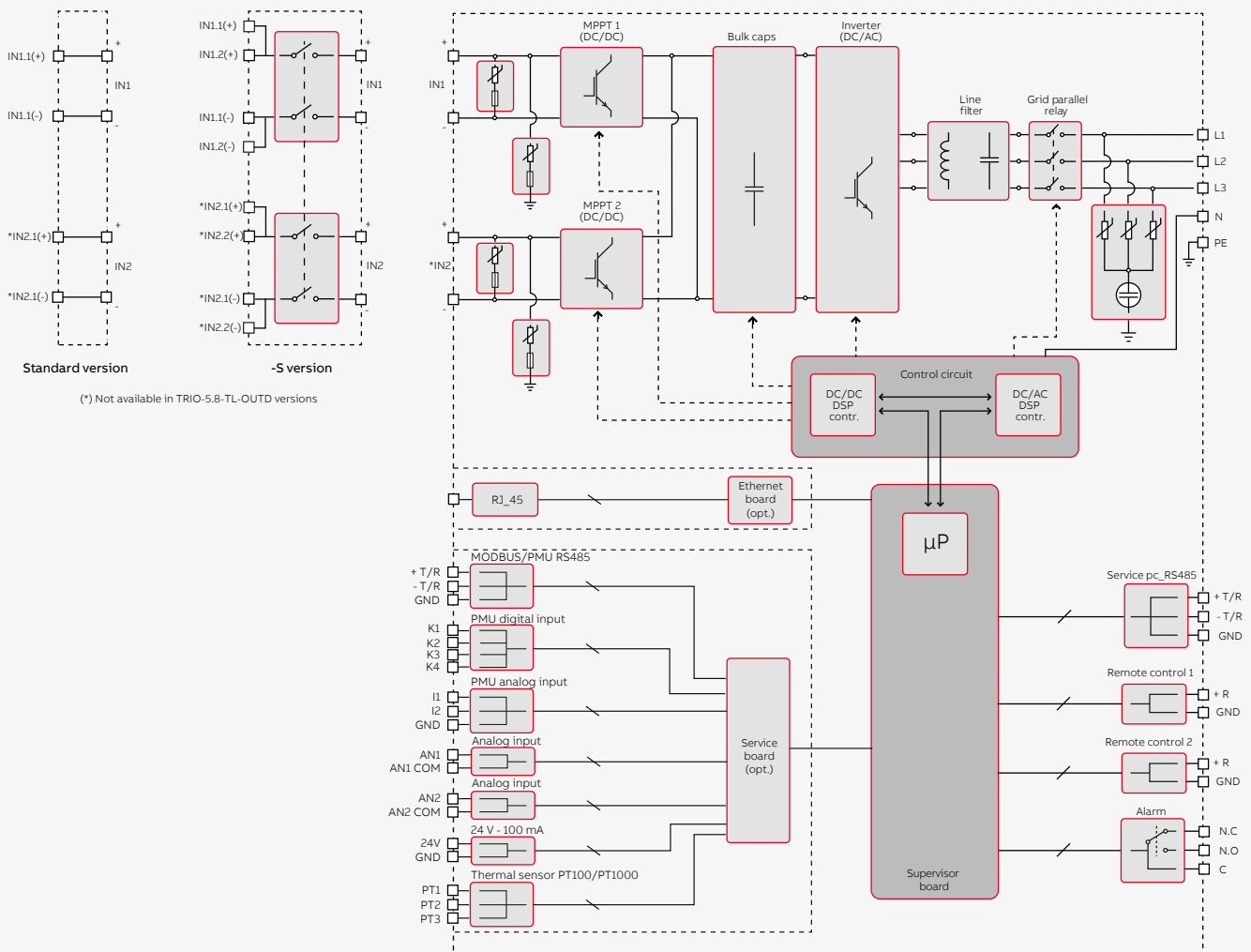
ease of installation, with a sliding front panel giving access to the connection and configuration area without requiring the complete removal of the cover.

#### Highlights

- Three-phase bridge topology for DC/ AC output converter
- Transformerless topology
- Two independent MPPT channels for TRIO-7.5/8.5 allow optimal energy harvesting from two sub-arrays oriented in different directions (one MPPT channel for TRIO-5.8)
- Flat efficiency curves ensure high efficiency at all output levels enabling consistent and stable performance across the entire input voltage and output power range
- Wide input voltage range
- Remote inverter upgrade
- Reactive power management
- DC switch version available (-S)
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions (IP65)
- Sliding cover for the easiest installation and maintenance
- Data logger and smart grid functionalities integrated on expansion cards:
  - PMU expansion card option, with external sensor inputs for monitoring environmental conditions and additional RS-485 for Modbus protocol
  - Ethernet expansion card option with integrated web server and remote monitoring capability via web portal (Modbus/TCP supported)
- Availability of auxiliary DC output voltage (24 V, 100 mA)

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ABB TRIO-5.8/7.5/8.5-TL-OUTD string inverter block diagram



# ABB string inverters

## PVI-10.0/12.5-TL-OUTD

### 10 to 12.5 kW

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01  
PVI-10.0/12.5-TL-OUTD  
outdoor string inverter

**Designed for commercial usage, the PVI-10/12.5, three-phase inverter is highly unique in its ability to control the performance of the PV panels, especially during periods of variable weather conditions.**

The high speed and precise Maximum Power Point Tracking (MPPT) algorithm provides real-time power tracking and improved energy harvesting.

**Two independent MPPTs and efficiency ratings up to 97.8%**

This transformerless device has two independent MPPTs and efficiency ratings of up to 97.8%.

Flat efficiency curves ensure high efficiency at all output levels ensuring consistent and stable performance across the entire input voltage and output power range.

The wide input voltage range makes the inverter suitable for low power installations with reduced string size.

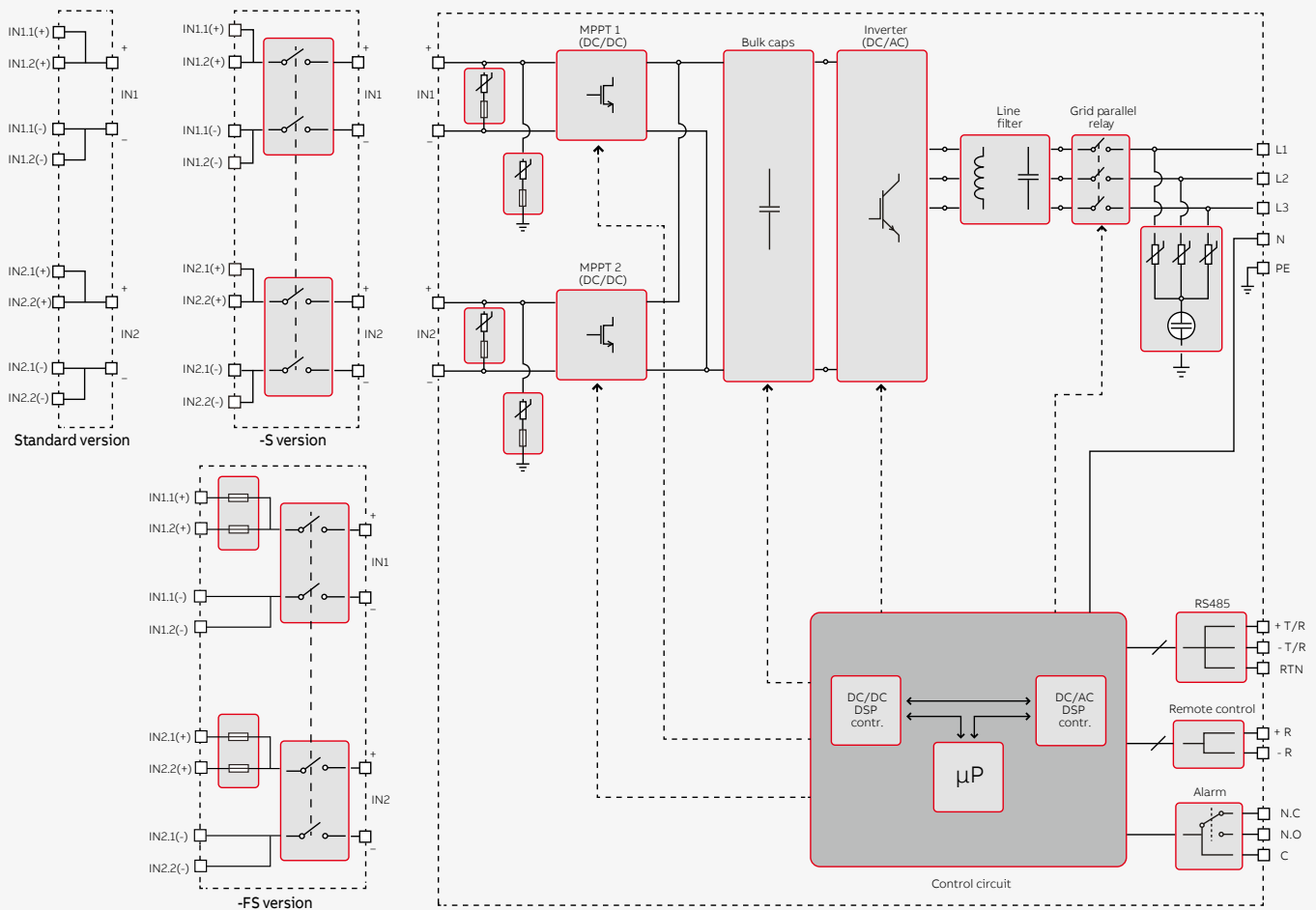
**Highlights**

- True three-phase bridge topology for DC/AC output converter
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected in the field
- Wide input voltage range
- Dual input section with independent MPPT allows optimal energy harvesting from two sub-arrays oriented in different directions
- Integrated DC disconnect switch in compliance with international standards (-S and -FS versions)
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions
- RS-485 communication interface (for connection to laptop or datalogger)



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**ABB PVI-10.0/12.5-TL-OUTD string inverter block diagram**



# ABB string inverters

## TRIO-20.0/27.6-TL-OUTD

### 20 to 27.6 kW

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01  
TRIO-20.0/27.6-TL-OUTD  
outdoor string inverter

**The TRIO 20.0/27.6 commercial inverter offers more flexibility and control to installers who have large installations with varying aspects or orientations.**

The dual input section containing two independent Maximum Power Point Tracking (MPPT), allows optimal energy harvesting from two sub-arrays oriented in different directions.

The TRIO features a high speed and precise MPPT algorithm for real power tracking and improved energy harvesting.

#### **High efficiency at all output levels**

Flat efficiency curves ensure high efficiency at all output levels guaranteeing consistent and stable performance across the entire input voltage and output power range.

This device has an efficiency rating of up to 98.2%.

The very wide input voltage range makes the inverter suitable for installations with reduced string size.

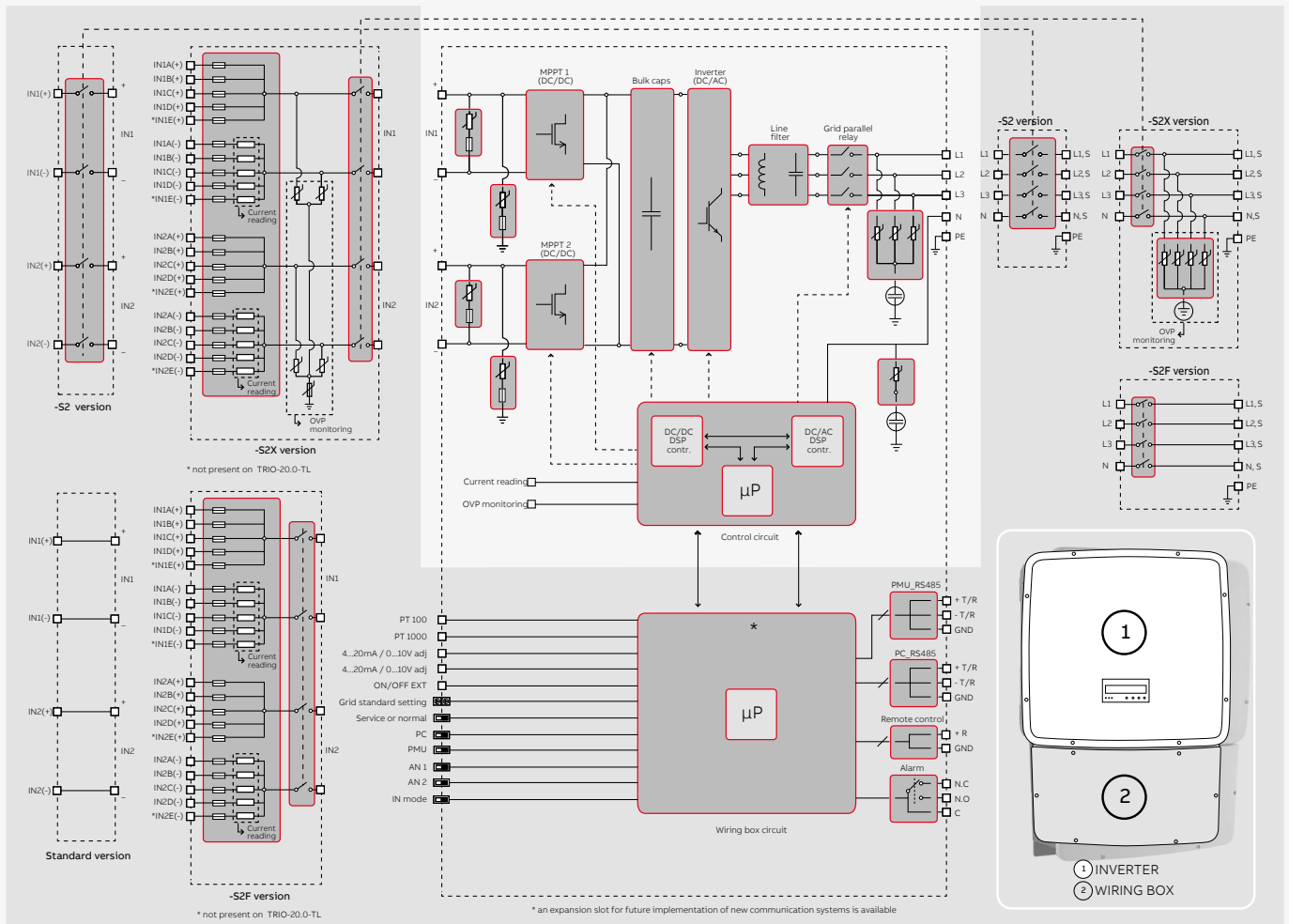
#### **Highlights**

- True three-phase bridge topology for DC/AC output converter
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected in the field
- Detachable wiring box to allow an easy installation
- Wide input voltage range
- Integrated string combiner with different options of configuration which include DC and AC disconnect switch in compliance with international standards (S2, S1J, -S2J, -S2F and -S2X versions)
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions
- Capability to connect external sensors for monitoring environmental conditions
- Availability of auxiliary DC output voltage (24 V, 300 mA)

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ABB TRIO-20.0/27.6-TL-OUTD string inverter block diagram



# ABB string inverters

## TRIO-50.0-TL-OUTD

## TRIO-60.0-TL-OUTD-480

### 50 to 60 kW

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01  
TRIO-50.0/60.0  
outdoor string inverter

**The TRIO-50.0/60.0 inverter is ABB's three-phase string solution for cost efficient large decentralized photovoltaic systems for both commercial and utility applications.**

The TRIO-50.0/60.0 inverter has been designed with the objective to maximize the ROI in large systems with all the advantages of a decentralized configuration for both rooftop and ground-mounted installations.

#### **Modular design**

TRIO-50.0/60.0 has a landscape modular design to guarantee maximum flexibility.

The separate and configurable AC and DC compartments increase the ease of installation and maintenance with their ability to remain separately wired from the inverter module inside the system.

The TRIO-50.0/60.0 comes with the most complete wiring box configurations available including up to 16 DC inputs with fast connectors, monitored fuses, AC and DC switches and monitored type II AC and DC surge arresters.

#### **Flexibility of installation**

The forced air cooling system, designed for a simple and fast maintenance allows for the maximum flexibility of installation. The inverter comes with mounting supports for both horizontal and vertical positions which allow for the best use of space available beneath the solar panels.

#### **Design flexibility**

The double stage conversion topology offers the advantage of a wide input voltage range for maximum flexibility of the system design.

#### **Highlights**

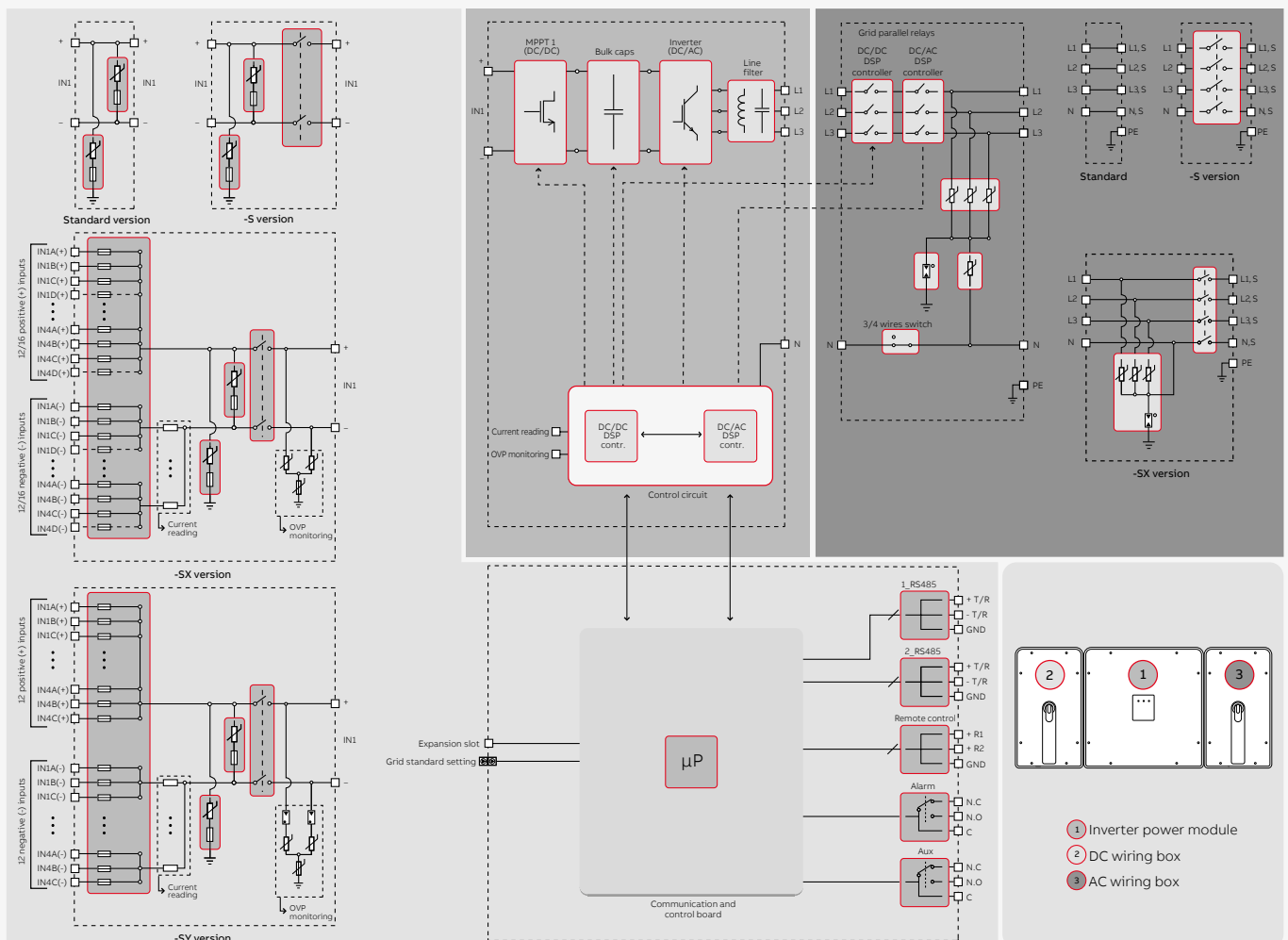
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected directly in the field
- Separate AC and DC compartments are available in different configurations
- Wide input range
- Both vertical and horizontal installation
- New 60 kW version available (480 Vac)



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ABB TRIO 50.0/60.0-TL-OUTD string inverter block diagram



# ABB string inverters

## TRIO-TM-50.0-400 / TRIO-TM-60.0-480 50 to 60 kW

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01  
TRIO-TM-50.0/60.0  
outdoor string inverter

**The TRIO-TM-50.0/60.0 is ABB's latest three-phase string solution for cost efficient large decentralized photovoltaic systems for both commercial and utility applications.**

This new addition to the TRIO family, with 3 independent MPPT and power ratings of up to 60 kW (480 V version), has been designed with the objective to maximize the ROI in large systems with all the advantages of a decentralized configuration for both rooftop and ground-mounted installations.

### Modular design

The TRIO-TM-50.0/60.0 has a modular design to guarantee maximum flexibility, thanks to the different versions available.

The separate and configurable AC and DC compartments increase the ease of installation and maintenance with their ability to remain separately wired from the inverter module inside the system.

The TRIO comes with the most complete wiring box configurations available including up to 15 DC inputs with fast connectors, string protection fuses, AC and DC switches and type II AC and DC surge arresters.

### Design flexibility

The double stage conversion topology offers the advantage of a wide input voltage range for maximum flexibility of system design.

The TRIO-TM comes with a forced air cooling system, used also in the previous TRIO products, designed for a simple and fast maintenance, allowing a maximum flexibility of plant design. The inverter comes with mounting supports for both horizontal and vertical installations, which allow for the best use of space available beneath the solar panels.

Embedded multi communication interfaces (WLAN, Ethernet, RS485) combined with a Sunspec compliant Modbus protocol (RTU/TCP) allow the inverter to be easily integrated with any third party monitoring and control systems.

### Improved commissioning and maintenance

Thanks to the build-in Web User Interface (WUI) the installer can commission the inverter wirelessly and change advanced parameters by using any standard WLAN enabled device (smartphone, tablet or PC).

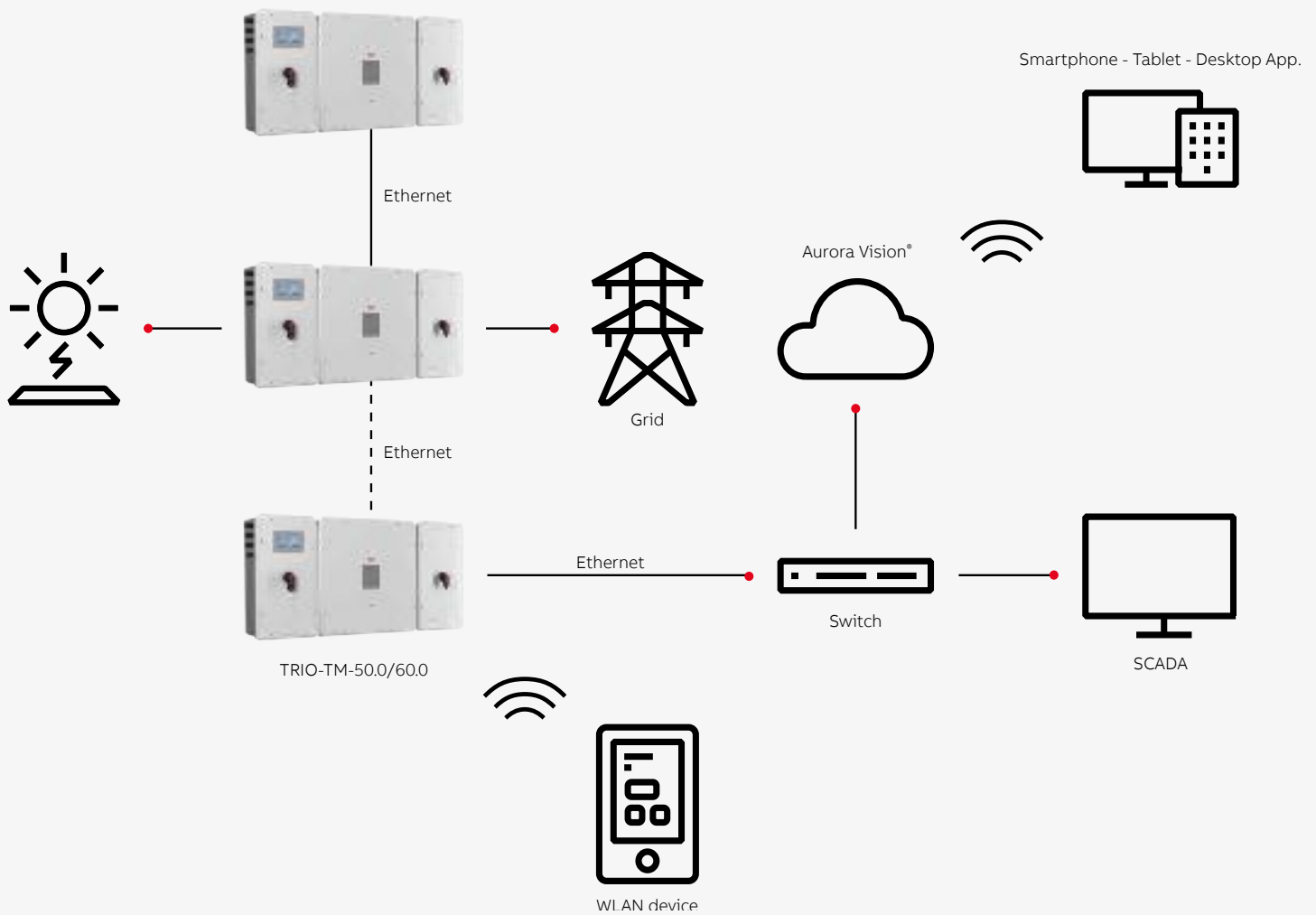
Integrated logging capability allows remote monitoring of the plant without the need of any additional external loggers.

Remote firmware update of the inverter system and components via Aurora Vision®.

### Highlights

- 3 Independent MPPT
- Transformerless inverter
- Double stage topology for a wide input range
- Large set of specific grid codes available which can be selected directly in the field
- Separate AC and DC compartments are available in different configurations
- Both vertical and horizontal installation
- 2 available sizes, 50 and 60 kW with 400 and 480 Vac of output voltage, respectively
- Wireless access to embedded user interfaces
- Ethernet daisy chain enabled
- Modbus TPC/RTU Sunspec compliant
- Remote monitoring and firmware update via Aurora Vision® (logger free)

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**ABB TRIO-TM-50.0/60.0 string inverter block diagram**

# REACT. Photovoltaic inverter with integrated energy storage

## All the energy you need is in your home

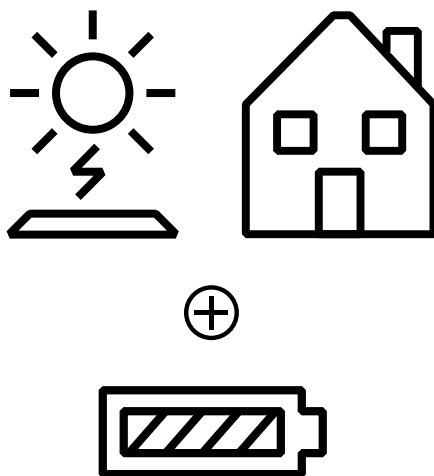
### Energy that never sets

Thanks to REACT system, ABB can offer you an innovative solution for collecting and storing energy and making it available when needed, after sunset, during the evening and first thing in the morning. Finally, with REACT the advantages of a photovoltaic system are clear as the sun: efficiency, savings, flexibility.

Making a photovoltaic system more efficient and more practical gives greater comfort and flexibility in the use of electricity.

#### REACT is at the heart of a PV energy system

The innovative side of REACT is how it manages the energy your photovoltaic system produces, by storing it inside a high performance battery. The REACT system also optimizes energy usage by aligning energy production with the levels of consumption, thanks to the integrated load manager.



### Never without energy

In case of a black-out of the power grid, REACT continues to supply some devices thanks to the auxiliary energy output, which feeds off the availability of photovoltaic energy or from electricity stored in the battery.

### Energy that lasts over time

The high performance of the battery, which can be expanded to accommodate the specific requirements of different types of homes, is combined with an interface (load manager) that enables to switch on particular household appliances.

The end result of these two elements (storage and management) is the ability to make the best use of the energy created by your PV system. This avoids consumption peaks by spreading the electricity load in order to keep usage within the capacity of the energy produced.

Thanks to the MyREACT app which can be downloaded onto a smartphone or tablet, the user will be able to monitor, while at home or away, how much renewable energy is being produced and manage it.





# ABB PV + Storage

## REACT-3.6/4.6-TL

### 3.6 to 4.6 kW

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01  
REACT-3.6/4.6-TL  
PV + Storage inverter

**REACT stores and allows to make the most of the energy produced by a residential photovoltaic system.**

REACT is an innovative photovoltaic inverter, equipped with a built-in 2 kWh battery that lets you store your unused energy generated during the day for use later when you really need it.

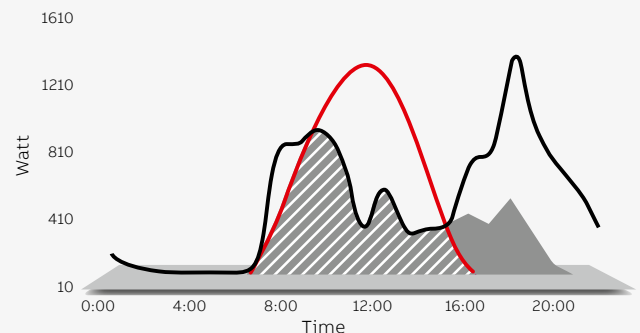
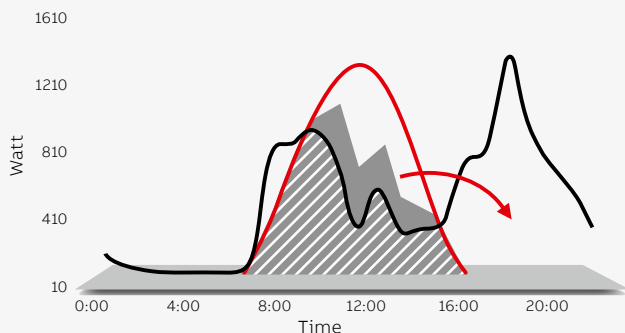
Taking full advantage of the energy generated by your photovoltaic system, REACT allows you to achieve greater energy self-sufficiency.

**The advantages of REACT are:**

- Coordination of all the energy flows with the goal of aligning PV energy production and home consumption
- Integrated load manager for control of energy consumption
- Auxiliary AC back-up output
- MyREACT: dedicated mobile app for control and monitoring
- Integrated Li-Ion battery with 2 kWh capacity, expandable up to 3x (6 kWh)

**Highlights**

- Single-phase grid-connected inverter
- Two independent MPPT inputs
- Transformerless topology
- Energy meter for management of energy flows



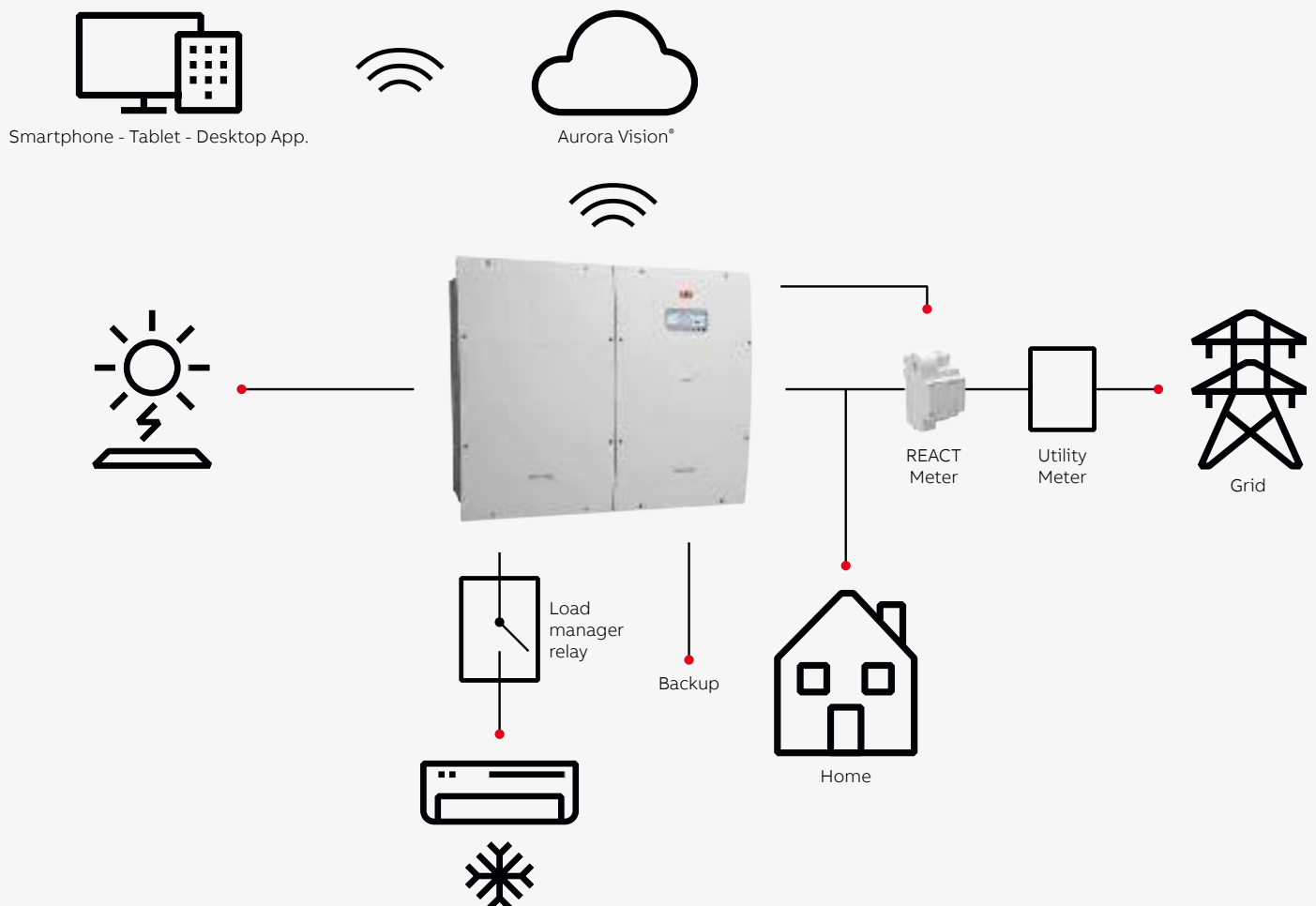
— Energy consumption    — Photovoltaic energy    ▨ Self-consumption    ■ Battery

A photovoltaic system produces more energy in the middle hours of the day, but by contrast energy usage is greater in the evening hours.

Thanks to REACT, user can store the energy not consumed during the day and make use of it when really needed.



ABB REACT-3.6/4.6-TL block diagram



# Monitoring and communications

## Aurora Vision® Plant Management Platform

Aurora Vision® Plant Management Platform is a scalable web-based platform enabling customers to remotely manage their PV plants in all market segments. According to the specific customer needs, it is available in three different versions:

- **Plant Portfolio Manager** which helps operators to manage a portfolio of power plants
- **Plant Viewer** for viewing residential and commercial sites in an easy to view manner
- **Plant Viewer for Mobile** which is a mobile version of Plant Viewer

### **Plant Portfolio Manager reduces mean time to repair**

Optimizing mean time to repair of a solar plant includes early fault detection by real-time data acquisition and email alerting. By down to string level granularity of monitoring and intelligent fault descriptions, the type of repair needs and potential spare parts can be identified, minimizing the need for multiple truck rolls. Identification of fault locations minimizes the time on plant. Automatic reset of alarm events after a repair is completed provides instant feedback to the stakeholders.

### **Plant Portfolio Manager improves portfolio management**

With the availability of tools, such as the map based portfolio overviews and innovative severity analysis charting, optimization of routing of maintenance personnel could lead to dramatic reductions in cost and improved customer satisfaction.

### **Plant Portfolio Manager reduces cost of service operation**

Designed not only for the end-user, but also for collaboration with ABB's service team, Plant Portfolio Manager can be used by ABB service personnel to remotely diagnose and troubleshoot inverters and other on-site equipment, such as energy meters, combiner boxes and weather stations.

### **Plant Portfolio Manager improves lost energy**

With the innovative analysis tool Symmetry Analysis, locating underperforming plants, inverters, strings or even panels, is available to any user. The sooner a fault or an issue is detected, the sooner it can be fixed which results in a better overall yield. Instant key performance indexes promote teams to keep plants running optimally.

### **Plant Portfolio Manager self-service with Plant Viewer**

Even home owners benefit directly from the unified plant management platform, by selecting to self-register their system or having their installer manage their system for them. There is no need to install software in the home owner's computer, no need to backup energy performance data. Everything is accessible through a standard web browser, tablet or smart phone.



# Plant Portfolio Manager

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01  
Aurora Vision®  
Plant Portfolio Manager

The Plant Portfolio Manager gives the installer all the information needed to monitor and operate a fleet of residential PV plants. It can be configured to allow customers and installers to jointly manage any plant or to allow customers complete control of their site at the end of an installation. Users of Plant Portfolio Manager can see aggregate information about all the plants they have under management. They can quickly triage installation and operational issues across different plants to give project teams the details they need to quickly prioritize actions to minimize truck rolls. Users can drill down into any plant under management to track plant assets.

## Portfolio Management

Plant Portfolio Manager's Portfolio View tracks the performance of all plants under management for executive, financial and operations teams by providing a portfolio summary view of the entire fleet of PV plants, allowing drill down into highest priority performance challenges, as well as identifying assets that are not meeting desired performance ratios. By the use of Key Performance Indicators, asset managers can focus on the most urgent problems first to minimize lost energy production.

## Plant Summary and Diagnostics

Plant Portfolio Manager's Plant Summary tool tracks and reports on all the key information about your plant's assets such as meters, combiners, inverters, environmental units and

loggers. Meter data is especially important to plant operators to maximize plant operational efficiency because it provides the information needed to do detailed root cause production analysis. Root cause production analysis can track issues based on such things as asset dependencies, energy production, irradiance and temperature to improve operational efficiency by reducing effort and time to resolution for plant operation issues. Some performance issues such as dirty or partially obscured panels are more difficult to diagnose than others. However, when comparing inverters to one another, operators can more readily identify performance trends leading to better inverter maintenance and higher energy yields. Using Symmetry Analysis, plant operators can identify and fix these challenging performance issues by comparing devices with each other.



# Plant Viewer

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02  
Aurora Vision®  
Plant Viewer

Plant Viewer is a web based tool designed for residential customers. Home owners using Plant Viewer can see how well their solar power plant is operating. They can view plant information over the course of a day, week, month or year, without interfering with how the plant is being operated. It is an easy way for the home owner to demonstrate the environmental benefits of their home PV plant to family and friends. Clear and dynamic graphics show how much potential pollution is being prevented by generating solar electricity.

Access to Plant Viewer is controlled by the plant installer to give the home owner as much access to the plant as the installer wants to provide.





# Plant Viewer for Mobile

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03  
Aurora Vision®  
Plant Viewer for Mobile

**The Plant Viewer for Mobile gives solar power plant owners a flexible and cost-effective solution for monitoring their solar power systems “on the go”.**

This application enables existing Plant Portfolio Manager or Plant Viewer users to track their solar power system production using the iOS/Android smart phone or tablet of their choice.

This meets future mobile device power plant monitoring needs using any Aurora Vision® enabled logger with ABB micro, string, and central inverters.

Accessing Plant Viewer for Mobile is as easy as 123:

1. Install Plant Viewer for Mobile app from the Apple Store (for Apple devices) or Google Play (for Android devices)
2. Login to your newly installed application using your user Plant Portfolio Manager or Plant Viewer user account and password
3. View your solar system's energy production on the smart phone or tablet of your choice!

## Highlights

- Integrates with the full line of ABB monitoring and communication products to remotely diagnose and address customer issues
- Use established Plant Portfolio Manager or Plant Viewer to user login account
- Use a PC web browser and a favourite mobile device; both options can be used simultaneously
- This solution works with solar power systems self-registered by homeowners
- Integrates with Aurora Vision® Plant Management Platform to enable or disable access to system information
- See current and past energy generation values to track energy production over the life of one or more plants
- Mail yourself detailed energy information for further investigation
- Displays weather information from weather stations installed at the solar power plant site
- Works on iOS and Android devices that support iOS 8.x and Android 4.x

# ABB monitoring and communications

## VSN300 Wifi Logger Card



01  
VSN300 Wifi Logger Card

**The VSN300 Wifi Logger Card is an advanced expansion board for ABB's UNO and TRIO string inverters which provides residential and commercial users with an advanced and cost-effective solution for monitoring and controlling their photovoltaic system.**

The VSN300 Wifi Logger Card is easy to install, for new and most existing string inverters by using the inverter's internal expansion slot.

The built-in IP networking connectivity and innovative Wi-Fi commissioning techniques enable this card to be easily configured for most Wi-Fi networks and access points without installing any additional external devices.

### **Complete, remote and local monitoring with Wifi Logger Card and mobile app.**

Users have a complete remote and local monitoring experience when combining VSN300 Wifi Logger Card with ABB's mobile app; "Plant Viewer for Mobile", available for both iOS and Android based devices.

The local web server in VSN300 Wifi Logger Card adds the ability to use a standard web browser to access inverter data.

The Wi-Fi Certified™ mark assures interoperability, security, easy installation and reliability.

With innovative commissioning and upgrade features, the VSN300 Wifi Logger Card provides the best user experience for ABB's customers. Not only is the VSN300 Wifi Logger Card suitable for most of ABB's string inverters currently deployed, but it also takes advantage of the Hyperlink bus found in new inverters for obtaining real-time data that can be used for grid control power management.

### **Highlights**

- The Wi-Fi Certified™ mark assures interoperability with IEEE 802.11b/g/n networks over the 2.4 GHz band
- Easily installed on new and existing UNO and TRIO string inverters
- IEEE 802.11b/g/n (2.4 GHz) support
- Local and remote monitoring in one solution
- High performance non-volatile data logging
- High-speed inverter data exchange through Hyperlink [where available]
- Modbus TCP server for SCADA integration
- SunSpec certified Modbus mapping for easy integration
- Secured and encrypted data transfer to Aurora Vision® Plant Management Platform
- Remote reading and writing of inverter parameters for advanced operations
- California Rule 21 ready

# ABB monitoring and communications

## VSN700 Data Logger

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01  
VSN700 Data Logger

**The high-performance VSN700 Data Logger provides simple and quick commissioning with device discovery and automatic IP addressing as well as remote management features.**

This SunSpec compliant datalogger records data and events from inverters, energy meters, weather stations, and other photovoltaic plant devices, and acts as an Internet gateway to send the data securely and reliably to the Aurora Vision® Plant Management Platform for performance monitoring, condition monitoring and data reporting.

### Three performance levels

The VSN700 Data Logger is available in three performance levels to fit anyone's budget and functionality:

VSN700-01 Data Logger is available to those residential customers who only need to monitor up to five (5) singlephase inverters.

VSN700-03 Data Logger is a cost-optimized logger for small commercial installations with up to ten (10) single and three-phase string inverters and one weather station (VSN800 Weather Station).

VSN700-05 Data Logger provides both customer data management and inverter command and control for commercial and utility PV system operation, as well as SCADA integration.

### Highlights

All VSN700 Data Logger models include:

- Data management system with serial and Ethernet ports for data and event logging
- Quick installation and fast plug and play commissioning with device discovery mechanism
- Network Provisioning with dynamic IP addressing (DHCP client and server)
- Reliable and secure transmission of operational data to Aurora Vision® Plant Management Platform
- Remote configuration and management capabilities, including firmware upgrades over the Internet using Plant Portfolio Manager
- Simple end-user UI using Plant Viewer

VSN700-05 Data Logger (Max) includes the following additional functionalities:

- No software limitation on number of devices logged
- Modbus TCP server using SunSpec compliant Modbus maps for easy SCADA system integration, data collection, and inverter command execution
- Support for most ABB inverters, meters, smart combiners and weather stations (see VSN700 Data Logger model comparison table)

# ABB monitoring and communications

## VSN800 Weather Station

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01  
VSN800-12  
Weather Station

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02  
VSN800-14  
Weather Station

**The VSN800 Weather Station automatically monitors site meteorological conditions and photovoltaic panel temperature in real-time, transmitting sensor measurements to the Aurora Vision® Plant Management Platform.**

The VSN800 contains the essential environmental sensor set needed for solar monitoring. The expanded sensor set enables plant management across a broad range of plant sizes. VSN800 is a companion to the VSN700 Data Logger, where it is fully compatible and integrates seamlessly with the Aurora Vision® Plant Management Platform.

### **Shipped preconfigured and ready for installation requiring no special tools**

The VSN800 Weather Station is delivered ready for installation and requires the installer to mechanically mount the modules on a user-supplied mast, connect power and communication, and initialize the automatic system commissioning process from the VSN700. No special software, or on-site calibration is required.

The all-in-one weather station reduces the installation, support and maintenance cost while improving the robustness and manageability of the PV plant monitoring solution.

The basic sensor set provides data needed to calculate a performance ratio allowing a plant operator to track solar array performance against expected energy production.

The advanced sensor set improves monitoring of weather conditions that can effect energy production. The extra irradiance sensor for mounting at the plane of the array allows more accurate measurement of irradiance that is incident in the plane of the solar panels.

The wind speed and direction sensor gives the operator information about how the wind may be cooling the panels and some indication of how much dust may be accumulating on the panels.

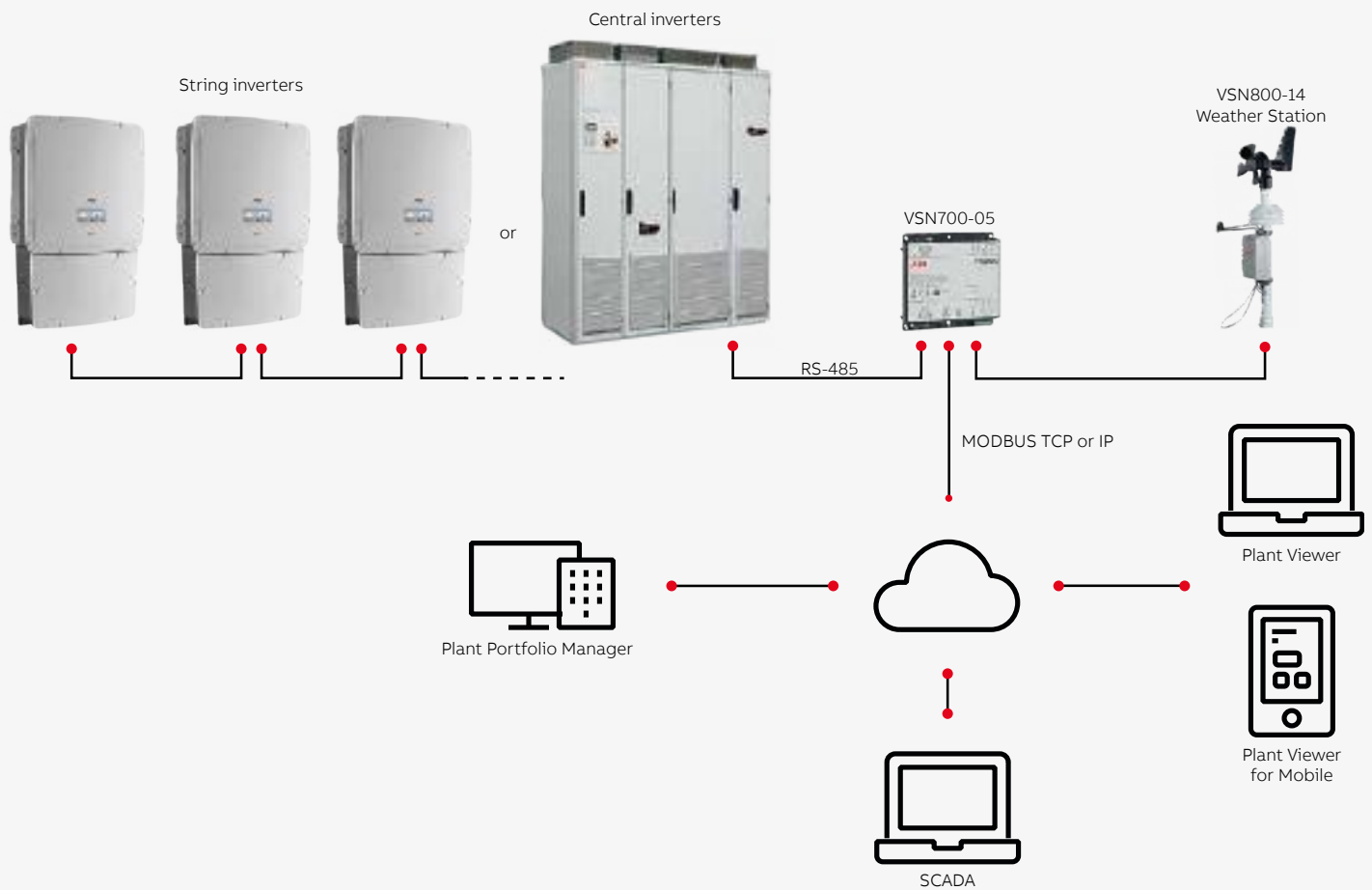
### **Highlights**

- Two models offered for basic and advanced sensor sets
- VSN800-12 includes a basic sensor set: ambient temperature, solar irradiance, and back of module temperature
- VSN800-14 includes additional advanced sensors: plane of array irradiance and wind direction and speed
- Sensors, data acquisition unit, and RS-485

### Application with VSN300 Wifi Logger Card



### Commercial and utility application with VSN700-05





# Life cycle services for solar inverters

## Strong expertise with local support

**The services offered for ABB solar inverters span over the whole lifetime of the solar power plant. To support this ABB has developed a solar inverter life cycle management model aimed at providing proactive services to maximize availability and performance. This model provides optimum support to end users over the whole lifetime of the solar power plant securing the value of solar power plant assets to the owner.**

### **Pre-purchase**

ABB pre-sales support helps our customers to select the right inverter and services for their applications. This ensures higher yield and performance of the entire system and compatibility with customer requirements.

### **Order and delivery**

Orders can be placed through any ABB office, and spare parts can also be ordered online through the web. Our sales and service network offers timely deliveries worldwide.

### **Installation and commissioning**

ABB certified engineers can advise or undertake the commissioning of the solar inverters and supervise the installation.

### **Operation and maintenance**

ABB helps ensure a long lifetime for its solar inverters by providing on-site preventive maintenance. Preventive maintenance consists of annual inspections and component replacements according to specific maintenance schedules. Reconditioning provides more in-depth maintenance which is carried out at ABB's authorized service workshops. Reconditioning of the solar inverter includes full inspection, thorough cleaning, individual component analysis and replacement, and complete testing.

### **Upgrade and retrofit**

We can advise on the latest hardware and software upgrades that can continue to maximize the performance of your solar inverters even if the grid codes change.

### **Life cycle model**

The Life cycle model divides a product's life cycle into four phases: active, classic, limited and obsolete. Each phase has different implications for the end user in terms of services provided.

### **Benefits of life cycle management**

Life cycle management maximizes the value of the solar inverter and its maintenance investments by:

- Ensuring spare parts and ABB competence availability throughout the lifetime
- Enabling efficient product support and maintenance for improved reliability
- Adding functionality to the initial product by upgrading or retrofitting
- Providing a smooth transition to new technology at the end of the product lifetime

The ABB service offering:

- ABB Service agreements
- Tailor-made Service contract
- Technical availability
- Spares availability
- Training
- Technical support
- Extended warranties
- ABB global service network



# ABB solar inverters around the globe

## Installed base over 26 GW

ABB delivered Solar Solutions  
(Products & Systems)

	Percentage	GW
● <b>EMEA</b>	60%	15.6
● <b>Americas</b>	16%	4.2
● <b>APAC</b>	24%	6.2









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