FIMER

Solar inverter solutions for building applications

FIMER 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 multi-megawatt PV power plants.

FIMER 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 on investment.

FIMER solar inverters utilize over 50 years of experience and advances made in inverter and power converter technology that have contributed to FIMER becoming one the largest providers of power electronic solutions.

Filippo Carzaniga
Chairman of the Board

Table of contents

FIMER solar inverter solutions

Residential

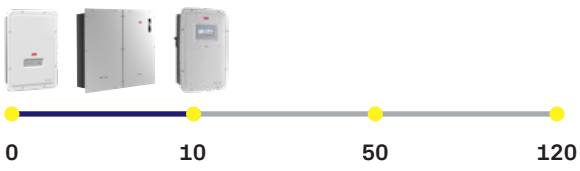
You can count on smart technology that connects with your smart residential buildings.

FIMER 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 FIMER's solutions for residential solar buildings PV installers can benefit from a quick and easy installation and commissioning while end users can benefit from an optimized user experience thanks to control and monitoring features that allow the energy management flow in smart homes by simply using any Wi-Fi 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.



Power block size (kW)

Commercial and industrial

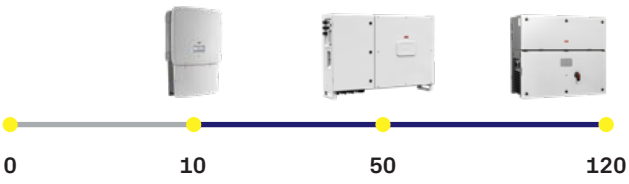
You can count on our flexible solutions whatever the scale and design of your project.

FIMER 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 a 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 best 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.



Power block size (kW)

Enjoy the new era of digital and renewables with FIMER 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 means by which solar operators effectively monitor, control and manage their solar assets, both remotely and locally.

With more than with more than 50 years of experience in providing technology, expertise, experience and solutions for both power generation and energy management applications, FIMER is able to provide its customers with cutting edge and cost-effective inverter solutions allowing to maximize the results of their business. FIMER strives to help you write the future of solar.

A New Era in Solar

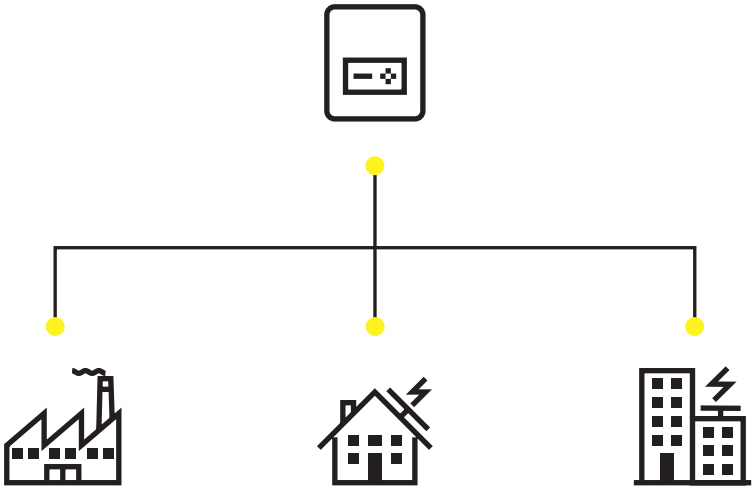
From residential to decentralized commercial and industrial applications, our inverters fit any plant

Photovoltaic systems have proven more and more to be one of the most clean and convenient energy sources worldwide. FIMER 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, FIMER 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, FIMER's offering can fit the needs of any household that is looking to save on their energy bills while making an environmentally 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
FIMER'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.




TISSOT ARENA

FIMER string inverters
UNO-DM-PLUS-Q
1.2 to 6.0 kW

The UNO-DM-TL-PLUS-Q single-phase inverter family, with power ratings from 1.2 to 6.0 kW, is the optimal solution for residential installations.

One size fits all
The design wraps FIMER'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 are available with both single (from 1.2 to 3.0 kW models) and dual (from 3.3 to 6.0 kW models) Maximum Power Point Trackers.

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.

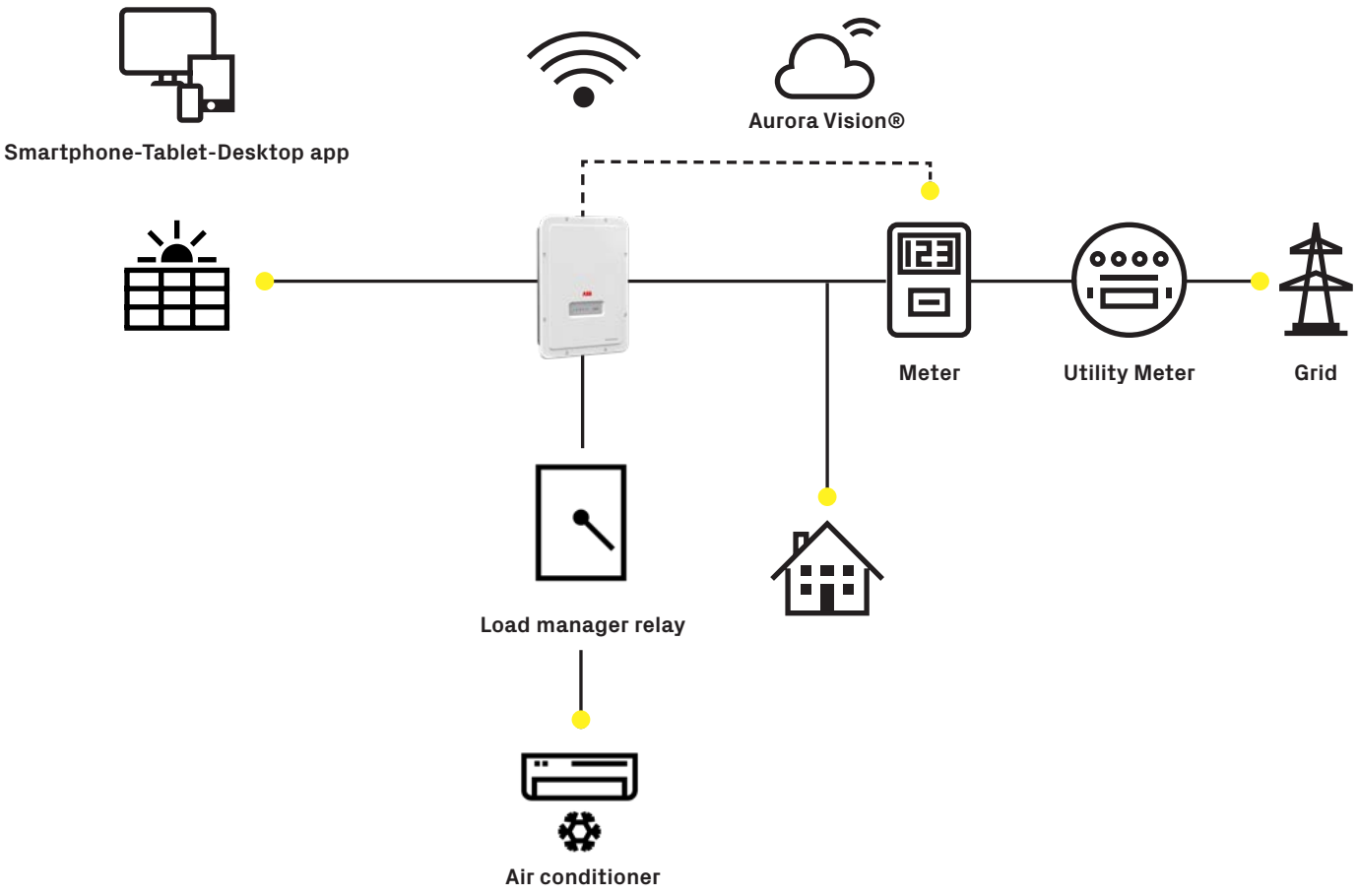
The featured easy commissioning routine removes the need for a long configuration process, resulting in lower installation time and costs.
Improved user experience thanks to the build in User Interface (UI) which enables access to features such as advanced inverter configuration settings, dynamic feed-in control and load manager, from any Wi-Fi enabled device (smartphone, tablet or PC).

Smart capabilities
The embedded logging capabilities and direct transferring of the data to Internet (via Ethernet or Wi-Fi) allow customers to enjoy the whole Aurora Vision remote monitoring experience.
The advanced communication interfaces (Wi-Fi, 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.

Energy Viewer
This new tool allows residential customers to remotely monitor the performance of their own solar plant and provides all information necessary to increase energy self-reliance and self-sufficiency.

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 firmware upgrade for inverter and components
- Modbus TCP/RTU Sunspec compliant
- Lifetime free of charge access to Aurora Vision

FIMER UNO-DM-PLUS-Q block diagram



FIMER string inverters TRIO-5.8/7.5/8.5-TL-OUTD

5.8 to 8.5 kW

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.

TCP/IP connectivity can be also added by plugging in an optional expansion board (Ethernet or Wi-Fi) for providing 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 version)
- 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 or VSN300 Wi-Fi Logger card (optional) with integrated web server
  - Availability of auxiliary DC output voltage (24 V, 100 mA)

FIMER string inverters
PVI-10.0/12.5-TL-OUTD

10.0 to 12.5 kW

Designed for commercial use, the PVI-10.0/12.5, 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)
- VSN300 Wi-Fi Logger Card as optional for adding Wi-Fi radio, Modbus TCP/Sunspec features as well as access to all Aurora Vision functionalities
- Lifetime free of charge access to Aurora Vision

FIMER string inverters
TRIO-20.0/27.6-TL-OUTD

20.0 to 27.6 kW

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

The dual input section featuring 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.

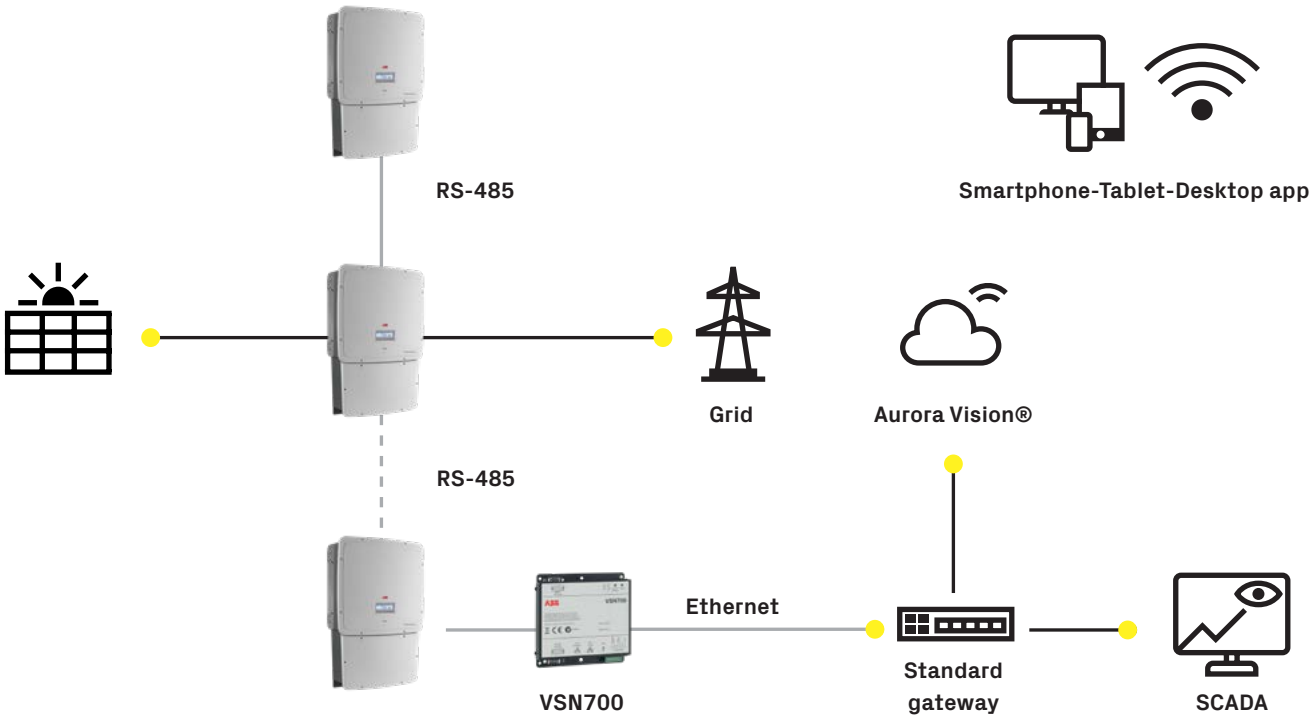
High efficiency at all output levels
Flat efficiency curves ensure high efficiency at all output levels guaranteeing consistent and stable performance across the entire input voltage and output power range.

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 length.

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 upon commissioning
- Detachable wiring box to allow an easy installation
- Wide input voltage range
- Integrated string combiner with different configurations 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 operation use under any environmental conditions
- Capability to connect external sensors for monitoring environmental conditions
- Availability of auxiliary DC output voltage (24 V, 300 mA)
- VSN300 Wi-Fi Logger Card enables wireless access to Aurora Vision with DC input channel monitoring
- Lifetime free of charge access to Aurora Vision

FIMER TRIO-20.0/27.6-TL-OUTD block diagram



FIMER string inverters
PVS-50.0/60.0-TL
50.0 to 60.0 kW

The PVS-50/60-TL is FIMER's cloud connected three-phase string solution enabling cost efficient large decentralized photovoltaic systems for both commercial and utility applications.

This string inverter solution, with 3 independent MPPT and power ratings of up to 60 kW, 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.

Compact design
Thanks to technological choices aimed at optimizing installation times and costs, the product design features the power module and wiring box enclosed in a single compact chassis thus saving installation resources and costs.
The inverter comes in multiple versions also allowing the possibility to connect to third-party DC string combiners.

Ease of installation
The horizontal and vertical mounting possibility creates flexibility for both rooftop and ground mounted installations.
Moreover the cover is equipped with hinges and locks that are fast to open and reduce the risk of damaging the chassis and interior components when commissioning and performing maintenance actions.

Advanced cloud connected features
Standard wireless access from any mobile device makes the configuration of inverter and plant easier and faster. Improved user experience thanks to a built-in User Interface (UI) enables access to advanced inverter configuration settings.
The Installer for Solar Inverters mobile app and configuration wizard enable a quick multi-inverter installation, saving up to 70% commissioning time.

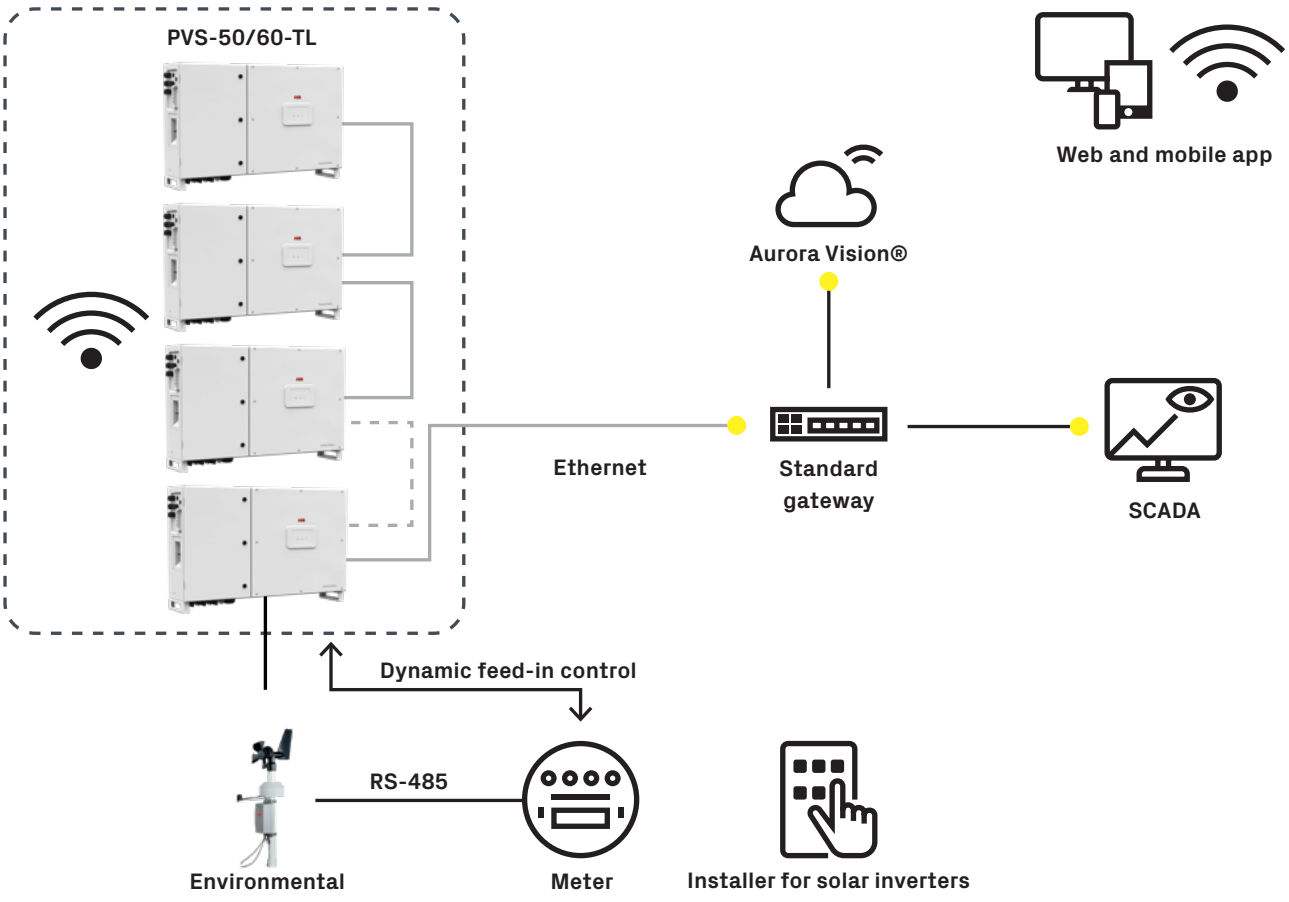
Fast system integration
Industry standard Modbus (RTU/TCP)/SUNSPEC protocol enables fast system integration. Two ethernet ports enable fast and future-proof communication for PV plants.

Plant portfolio integration
Monitoring your assets is made easy, as every inverter is capable to connect to Aurora Vision cloud platform to secure your assets and profitability in long term.

Highlights
- Up to 3 independent MPPT
- Two power ratings: 50 kW at 400 V_{ac} and 60 kW at 480 V_{ac}
- Horizontal and vertical installation
- Easy access to wiring box thanks to hinges and cam latches positioned on cover
- Power module and wiring box in a single compact chassis
- Wi-Fi interface for commissioning and configuration
- Reactive power management capability
- Remote monitoring and firmware upgrade via Aurora Vision cloud platform (logger free)
- Provides 10% extra power in case of limited ambient temperature
- Improved operating altitude. Can work up to 4000 mt.
- Built-in dynamic export limitation control algorithm

wi-fi

FIMER PVS-50.0/60.0 block diagram



FIMER string inverters PVS-100/120-TL

100 to 120 kW

The PVS-100/120-TL is FIMER's cloud connected three-phase string solution for cost efficient decentralized photovoltaic systems for both ground mounted and large commercial applications.

This platform, for extreme high power string inverters with power ratings up to 120 kW, maximizes the ROI for decentralized ground mounted and large rooftop applications. With up to six MPPT, energy harvesting is optimized even in shading situations.

Extreme power with high integration level
The extreme high power module up to 120 kW saves installation resources as less units are required.
Due to its compact size further savings are generated in logistics and in maintenance. Thanks to the integrated DC/AC disconnection, 24 string connections, fuses and surge protection no additional boxes are required.

Ease of installation
The horizontal and vertical mounting possibility creates flexibility for both ground mounted and rooftop installations. Covers are equipped with hinges and locks that are fast to open and reduce the risk of damaging the chassis and interior components when commissioning and performing maintenance actions.

Standard wireless access from any mobile device makes the configuration of inverter and plant easier and faster. Improved user experience thanks to a build in User Interface (UI) enables access to advanced inverter configuration settings.

The installer mobile APP, available for Android/iOS devices, further simplifies multi-inverter installations.
The design supports both copper and aluminum cabling even up to 185 mm^2 cross section to minimize the energy losses.

Fast system integration
Industry standard Modbus/SUNSPEC protocol enables fast system integration. Two ethernet ports enable fast and future proof communication for PV plants.

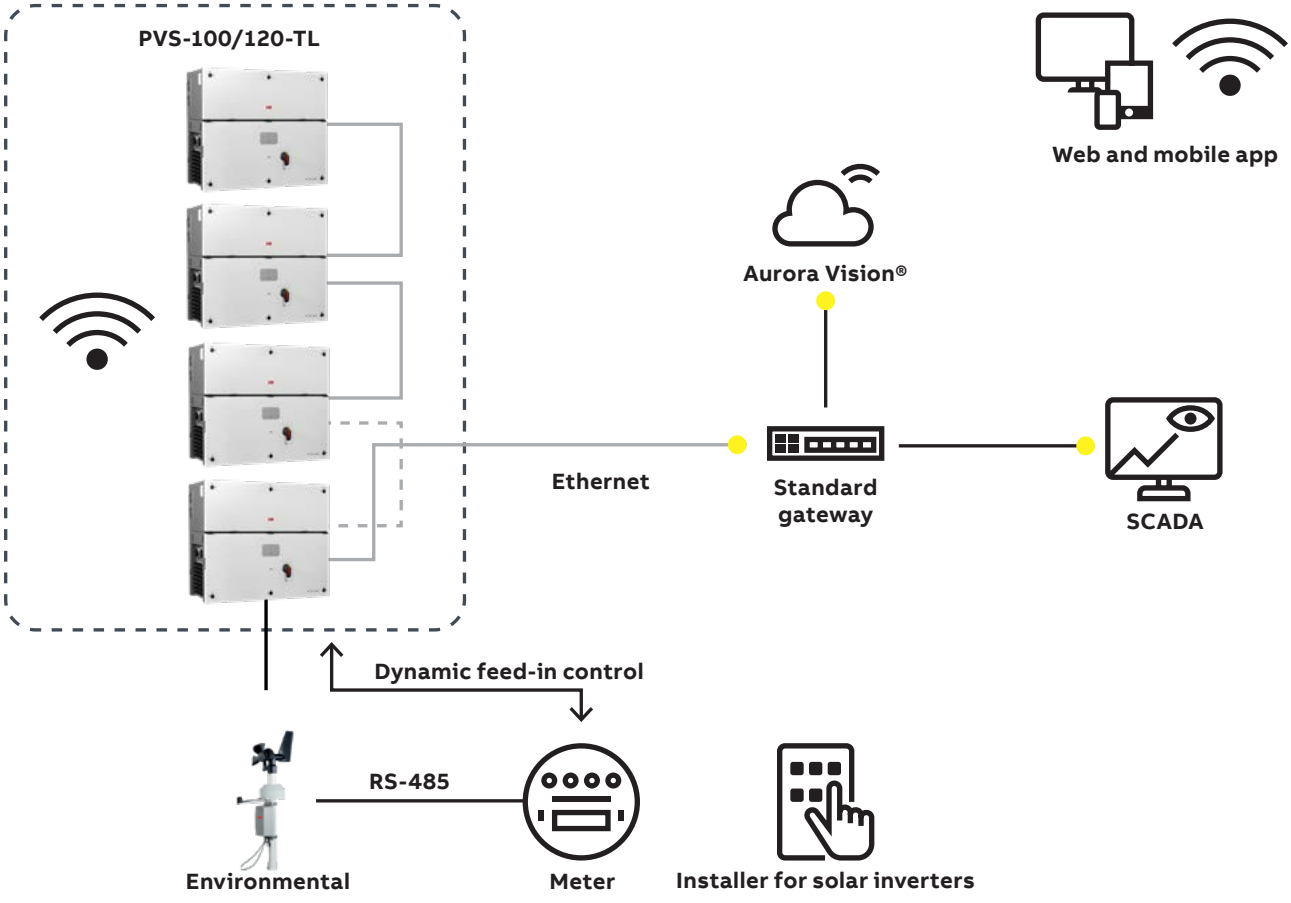
Plant portfolio integration
Monitoring your assets is made easy as every inverter is capable to connect to Aurora Vision cloud platform to secure your assets and profitability in long term.

Design flexibility and shade tolerance
Available in different versions, thanks to the double stage conversion topology and the modular design, PVS-100/120 guarantees maximum flexibility for the system design on rooftops or hilly ground. The separate and configurable wiring compartment, available with six MPPT as well as with two parallelable MPPT, allows the inverter to satisfy any plant condition and any customer need.
With this technological choice energy harvesting is optimized even in shading situations.

Highlights
- Up to 6 independent MPPT
- Transformerless inverter
- 120 kW for 480 Vac and 100 kW for 400 Vac
- Wi-Fi as standard for configuration
- Two ethernet ports for plant level communication
- Large set of specific grid codes available which can be selected directly in the field
- Double stage topology for a wide input range
- Both vertical and horizontal installation
- Separate wiring compartment for fast swap and replacement
- IP66 Environmental protection
- Maximum efficiency up to 98.9%

wi-fi

FIMER PVS-100/120 block diagram



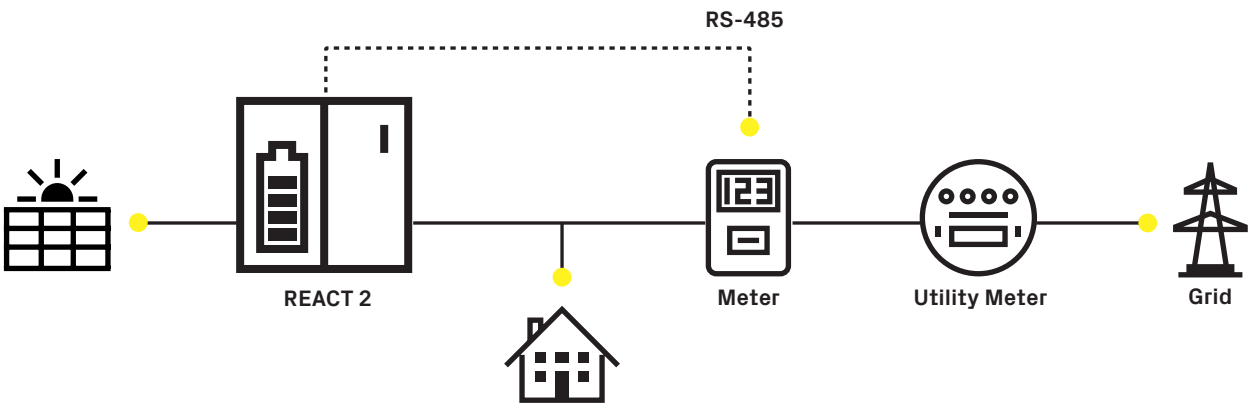
Prosumers pave path to energy self-reliance for sustainable living

An emerging generation of renewable energy users are producing and consuming their own power, as the vision of a zero-emissions future becomes mainstream

A growing group of “prosumers” — renewable energy users who produce and consume their own power — are driving demand for solutions that support self-reliant living, cutting their own electricity bills while helping society mitigate climate change via reduced carbon emissions.
But prosumers aren’t roughing it.

The availability of connected solutions, which can remotely manage energy usage, control heating or even launch a favorite playlist, means that self-reliant homes are rapidly becoming venues for more comfortable and convenient lifestyles.
It’s all part of the rise of the “clean energy economy,” where intelligent buildings equipped with photovoltaic (PV) cells and turnkey solar power storage solutions are enabling families and businesses to achieve energy self-sufficiency.
For prosumers ready to turn their dreams of energy independence into reality, FIMER has combined the solar inverter with energy storage capability, in a modular system called REACT 2.
REACT 2 does dual duty to support up to 90 % energy self-sufficiency: the inverter portion of the system delivers AC for household power, and it also sends excess electricity to the unit’s lithium-ion battery, available with storage capacities from 4 kWh to 12 kWh, where it’s stored for later use.
In real-world operation, excess electricity is typically produced by rooftop solar cells during peak hours of sunlight. It’s stored by the REACT 2 for use after dark, during the night, and early in the morning. The upshot is that prosumers are never without energy.

The security of “always on” power is one reason why the majority of prosumer don’t go entirely “off the grid”.
Maintaining a connection back to the utility supports excess demand that can not be met by self-production, provides backup in the case of local equipment failure and enables prosumers to sell excess power back to the utility.

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FIMER PV + Storage
REACT 2
3.6 to 5.0 kW

REACT 2 is FIMER's photovoltaic energy storage system, allowing to store excess energy and optimize the energy use in residential applications.

Available in power ratings of 3.6 and 5.0 kW, REACT 2 has one of the industry's highest energy efficiency rates, providing up to 10% more energy than lower voltage battery systems.

For new and retrofit installations
Thanks to the possibility of both AC and DC side connection, REACT 2 is the ideal solution for new systems or the retrofitting of existing ones, allowing homeowners to improve their energy self-consumption and save on their energy bills.

Wide battery capacity
Providing a totally flexible solution, REACT 2 offers a wide storage capacity, which can be expanded from 4 kWh to 12 kWh, depending on the number of batteries used, and can achieve up to 90 percent energy self-reliance.
The addition of further battery units can take place anytime during the lifetime of the system.

Design flexibility
The different set-up configurations available allow maximum installation flexibility and optimization of available spaces. Quick and easy to install thanks to the simple plug and play connection, both on inverter and battery side.

Reliable back-up
REACT 2 provides back-up power to specific home appliances, during a grid outage thanks to solar and battery energy.

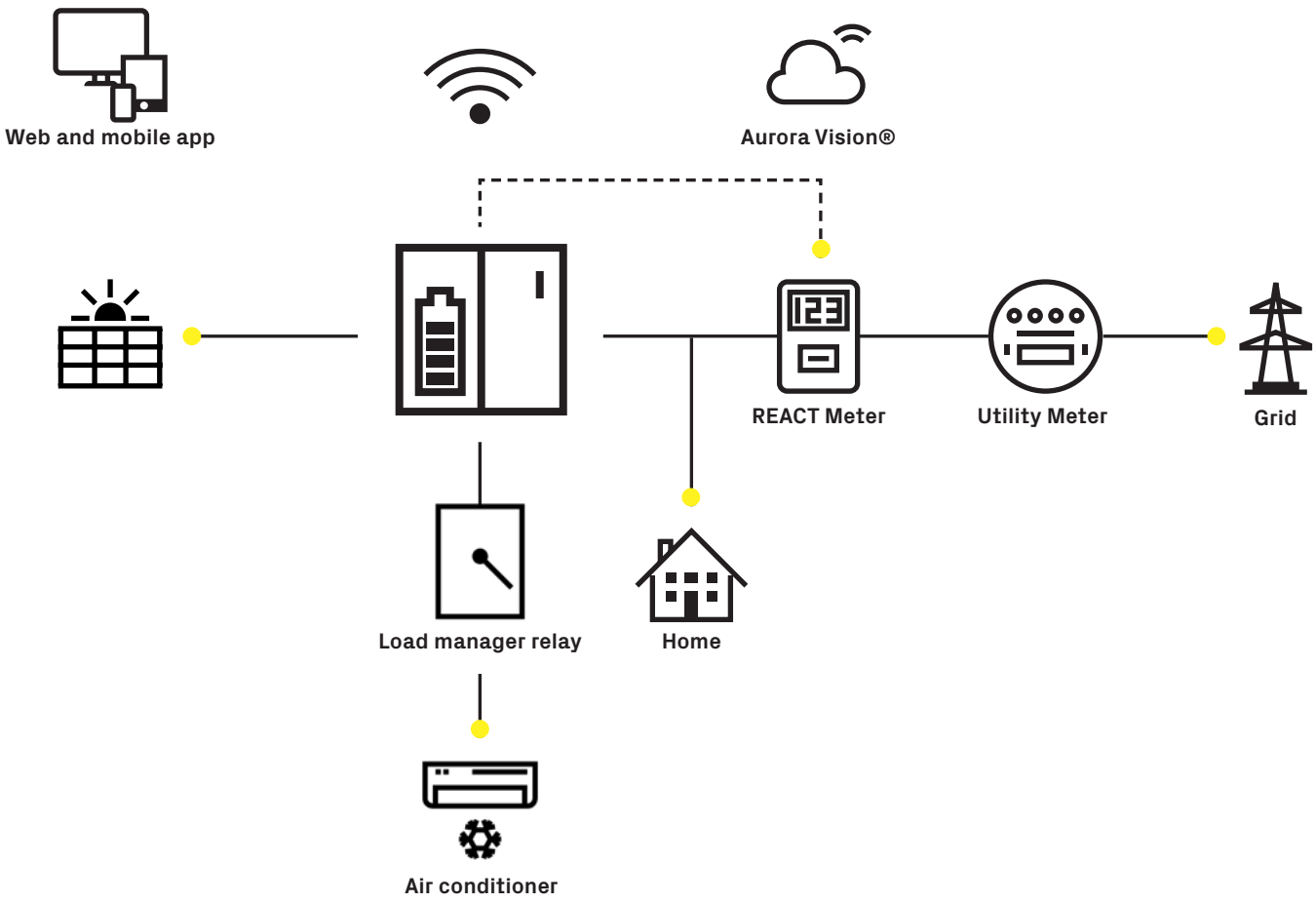
Smart connectivity
Future proof technology enables a full smart home experience with advanced communication features and load management capabilities.

The embedded data logger and direct transferring of data to a secure cloud platform allows customers to monitor and keep their system under control through the dedicated mobile app.

The advanced communication interfaces combined with a standard Modbus communication protocol, Sunspec compliant, allow the inverter to be easily integrated within any smart environment and with third party monitoring and control systems.

Highlights
- Li-Ion battery unit for energy storage (from min 4 kWh to 12 kWh)
- Industry leading energy efficiency
- Suitable for new and existing applications
- Battery units can be upgraded anytime during lifetime of system
- Flexible and modular design, optimizes installation space
- Simple and safe installation with plug and play connection
- System monitoring through dedicated mobile app
- Modbus TCP/RTU Sunspec compliant

FIMER REACT 2 block diagram



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, four different products are available:

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
Energy Viewer for solar plants allows monitoring the energy flows, self-consumption and self-sufficiency within solar plants

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 e-mail 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 leave 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 FIMER's service team, Plant Portfolio Manager can be used by FIMER 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 possible through any type of user account. 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.


Back
Energy Balance
DAY
WEEK
MONTH
YEAR
TOT
2020-08-23
2020-08-29
Balance
Solar
Consumption
Stacked
Grouped
Energy (kWh)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
23 Aug
25 Aug
27 Aug
29 Aug
Time - (Days)
to Grid
to Battery
Solar Direct Consumption

Plant Portfolio Manager

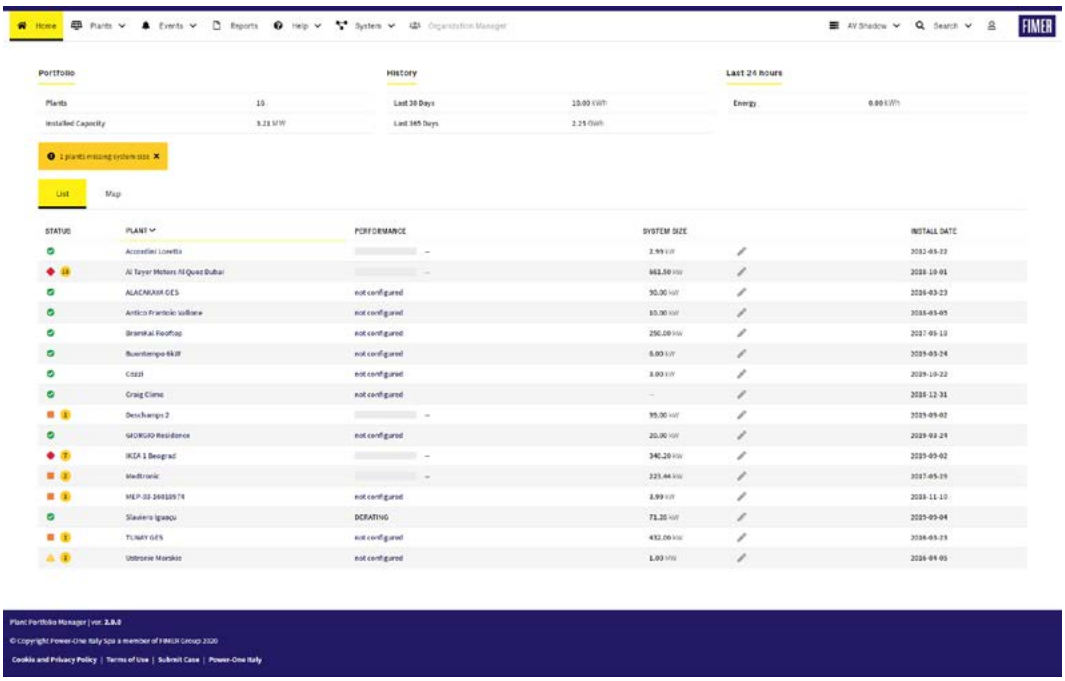
Plant Portfolio Manager is a cloud based professional web portal enabling to monitor key energy and performance metrics and manage an entire portfolio of solar power plant.

Plant Portfolio Manager provides the tools needed to complete the installation and operation of a power plant of any size which includes the ability to:

- Create new customer accounts, setup new power plants and provision monitoring at a given plant
- Configure, operate and troubleshoot devices throughout your portfolio of power plants
- Generate custom and scheduled reports for billing, finance and customers
- Remotely upgrade inverter firmware
- Evaluating the performance of the a solar plant and detecting real time under performing conditions

Low cost portfolio management
Solar installers, operators and investors control or outsource as much or little of their installation and operation responsibilities as makes sense for their business by sharing Aurora Vision's tools with business partners.
With Aurora Vision, solar installers, operators and investors can share the same remote diagnostic tools to collaboratively resolve solar power plant issues while simultaneously reducing the need for remote power plant visits.

Extensible and modular solution
Plant Portfolio Manager is integrated with FIMER inverters and balance of system devices from both FIMER and a broad array of 3rd party vendors. It provides out of box integration with meters, sensors, weather stations and combiners to provide fast, cost effective enablement of plant operations management.



Rapid plant and device diagnostics
Analyze electrical and environmental characteristics of assets such as plants and devices which make up various part of your plant such as FIMER inverters, meters, string combiners, weather stations and sensors.

Improved plant performance
Optimize the operation and maintenance functions for a specific plant using performance information to rapidly identify and resolve issues.

Lifecycle management of plant assets
Manage type, location, performance configuration of plant devices.

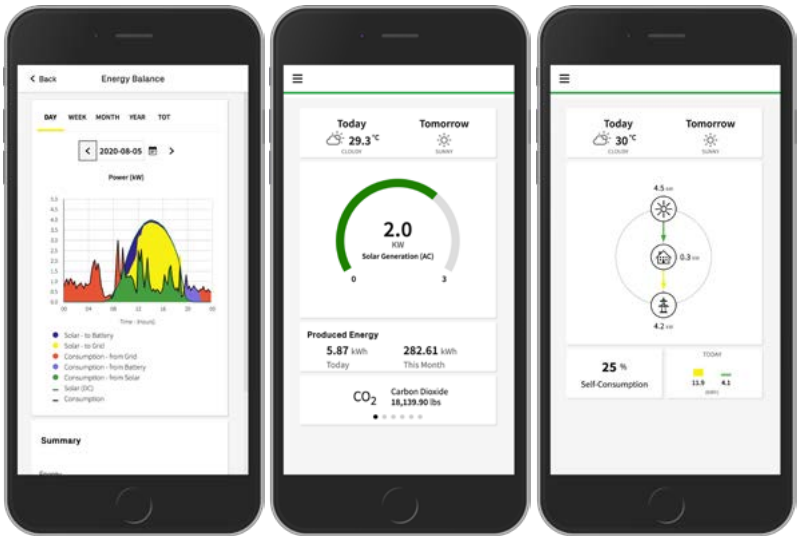
Operators can manage individual devices for compliance, control, and performance objectives.

Standard and custom portfolio reports
Plant Portfolio Manager provides report access to all your data over the lifetime of your plant along with all the key data generated by your devices. Use standard or custom reports with various performance criteria for any duration for a single plant, set of plants or the entire portfolio of plants. Reports can be executed once or scheduled on a daily/ weekly/ monthly basis to export all data in ExcelTM or CSV formats.

Energy Viewer

Energy Viewer is the new Aurora Vision® product enabling customers to remotely monitor the performance of their own solar plants as well as all energy flows within a
building, with and without an energy storage installed.
Energy Viewer for solar plants is a very powerful and useful tool for whom aim to optimize the self-consumption
and self-sufficiency of their own solar plants.
As any other Aurora Vision® product this new premium level mobile app can be used life time free-of-charge.

- Works on iOS (version 11.x or greater) and
- Android (version 7.x or greater)
- Fully integrated with Aurora Vision® cloud
- platform
- Graphs of all the energy flows within solar plants
- Self-consumption and self-sufficiency KPIs
- calculation
- Remote firmware (FW) updated of all the solar assets



Plant Viewer for Mobile

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

Plant Viewer for Mobile delivers an easy way to monitor your home solar power system on an iOS/Android smart phone or tablet.
With Plant Viewer for Mobile, homeowners can remotely monitor their solar power plants to track the energy produced in real time.

Customize, collaborate, and monitor energy production.
Homeowners have the choice of self-registering their site to privately monitor their home energy production. As an alternative, homeowners can collaborate with installers to share energy generation data to jointly monitor their energy production.
Installers can collaborate with homeowners using Plant Portfolio Manager. Installers can use their Plant Portfolio Manager login account to access powerful capabilities appropriate for solar power professionals or view the homeowners plant through the Plant Viewer for Mobile application.

Highlights

- Real-time energy production monitoring including, hourly and daily tracking history
- Track energy production in multiple plant locations
- View historical energy production information in excel format
- Track temperature, wind and irradiance information using add-on options sold with your solar power system
- Compatible with the latest iOS and Android devices
- Act as wireless local display for inverter with VSN300 installed in (no Internet connection needed)

This tool is also available as desktop version, named Plant Viewer.

Monitoring and Communication VSN300 Wi-Fi Logger Card

The VSN300 Wi-Fi Logger Card is an advanced expansion board for FIMER's UNO and TRIO string inverters which provides residential and commercial users with an advanced and cost-effective solution for monitoring the performance of their photovoltaic system.

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

The local web server in VSN300 Wi-Fi 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 Wi-Fi Logger Card provides the best user experience for FIMER's customers.
Not only is the VSN300 Wi-Fi Logger Card suitable for most of FIMER'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 of inverter parameters for advanced operations

Monitoring and Communication VSN700 Data Logger

This high-performance VSN700 data management system allows solar customer to connect their commercial, industrial and utility scale photovoltaic systems with the Aurora Vision cloud for enabling condition monitoring and O&M remote cloud services in a very cost effective manner.

This SunSpec compliant datalogger records data and events from inverters, energy meters, weather stations, and other photovoltaic plant devices[1)], 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.

VSN700-01/VSN700-03/VSN700-05

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) single-phase 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.

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 FIMER inverters, meters, smart combiners and weather stations

Monitoring and communications VSN800 Weather Station

The weather stations belonging to the VSN800 family allow the monitoring of a series of environmental and panel data through Aurora Vision cloud platform, being equipped with temperature, irradiation and wind sensors.

The VSN800 contains the essential environmental sensor set needed for solar monitoring. The expanded sensor set allows a wider monitoring of environmental parameters.
VSN800 is the perfect companion to the VSN700 Data Logger products and it can directly be connected to the RS-485 port of the new PVS string inverter families.

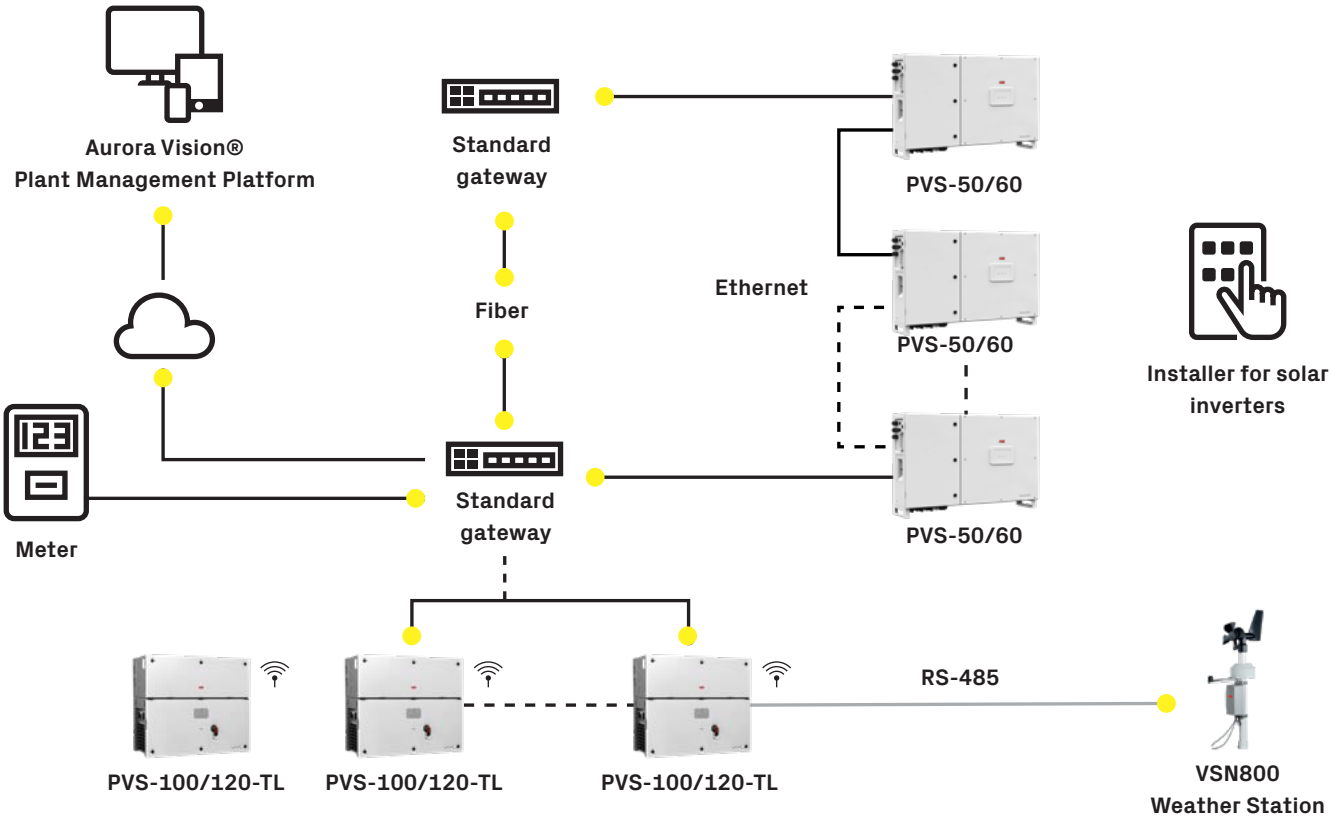
Shipped preconfigured and ready for installation requiring no special tools
The VSN800 Weather Station is delivered ready for installation and requires the installer to mechanically mount the modules on a user-supplied mast, connect power and communication, and initialize the automatic system commissioning process. 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 the VSN800-12 model is equipped with 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 the VSN800-14 model is equipped with improves monitoring of weather conditions that can affect 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.

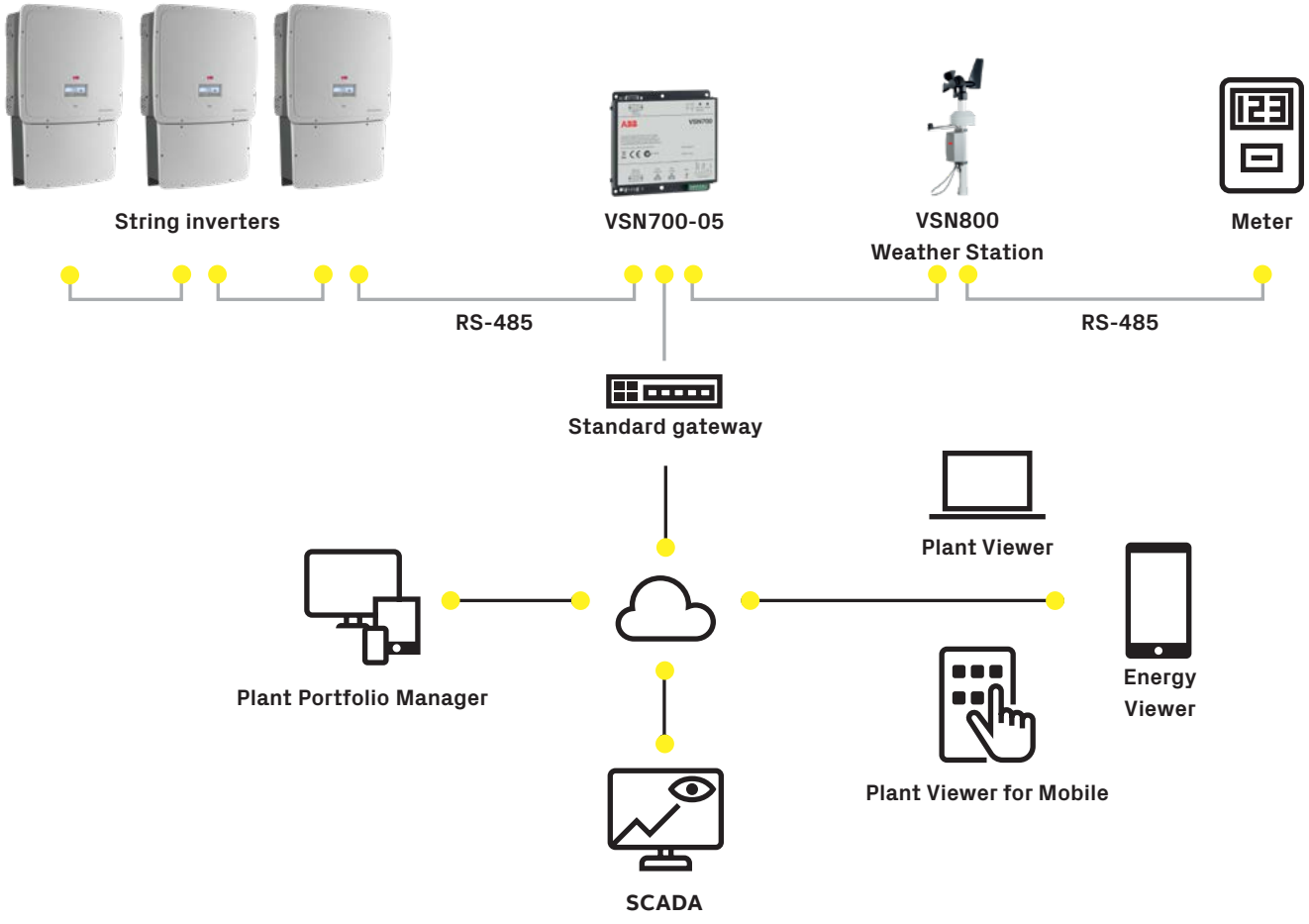
The wind speed and direction sensor gives the operator information about how the wind may be cooling the panels and some indication of how much dust may be accumulating on the panels.

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
- Can be connected directly to the RS-485 port of the new PVS string inverter families.

Application with PVS string inverters



Application with TRIO and PVI string inverters



Export limitation solution

The new generation of FIMER PVS-string inverters is even more smart thanks to the innovative built-in distributed control algorithm which allows meeting export limits without the need of installing any additional system or device*.

The new innovative FIMER Export limitation solution allows solar plant owners to get the maximum energy from their inverters, without needing to invest in additional external systems, and is compliant with the export limits set by grid operators and utilities worldwide. It is the only IP based solution currently on the market** that does not require the installation of any additional components besides PVS series string inverters and a supported and standard modbus meter, allowing for great advantage in terms of both investments and ownership costs, plant reliability and system complexity.

All PVS series string inverters come with an innovative distributed control algorithm built-in which, once quickly configured through the Installer for solar inverters set-up wizard, allows the entire plant to dynamically follow the load curves in compliance with the most restrictive regularity norms worldwide.

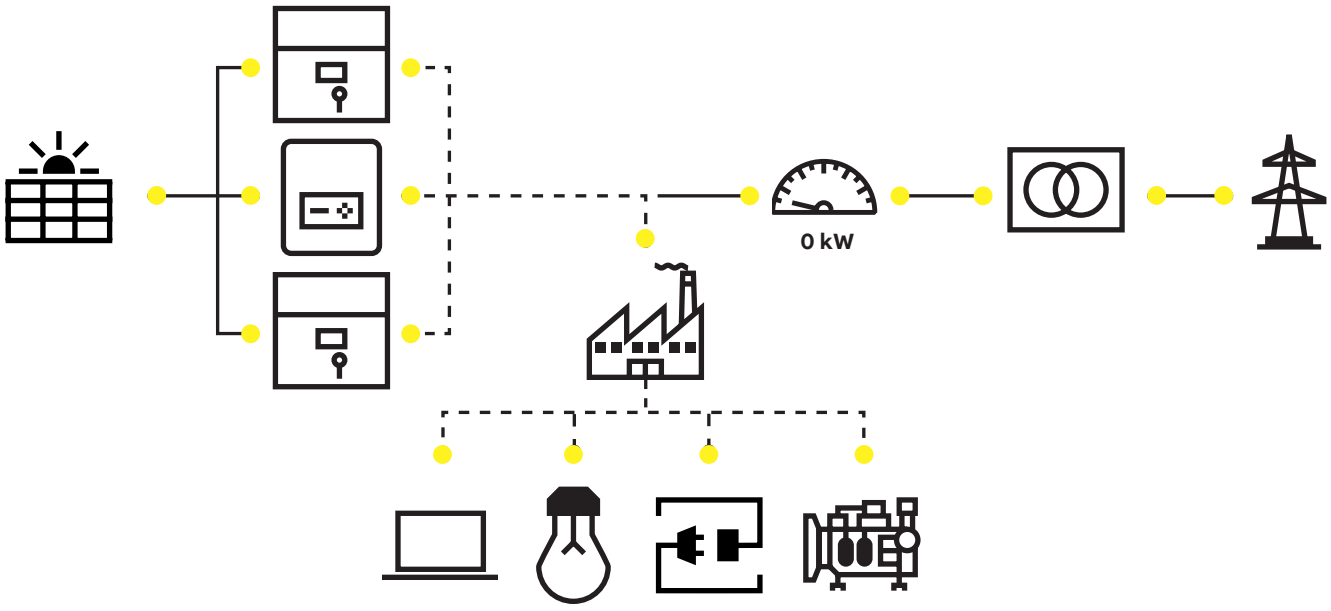
To get the solution properly configured and working, the supported standard meter needs to be installed at the point of connection and paired to the inverters just once, by either direct RS-485 serial line, to the inverter's serial port, or over Ethernet cable, to the router of the Local Area Network to which all the inverters are connected to.

According to the specific meter installed, the new FIMER export limitation algorithm can work indistinctly in small commercial installations, with just a few inverters connected to the low voltage stage, as well as in a large commercial/utility-scale plants, where up to maximum 15 units (a higher number of units may be authorized upon request) per plant are connected to the grid by middle voltage stage.

Highlights

- IP based solution
- Distributed control algorithm built-in the inverter just standard meter needed and no external controller required
- PVS string inverters supported (15 units per plant)
- Just a standard Modbus meter (either RS-485 or Ethernet) needed
- System setting through the Installer for solar inverters mobile app
- Fully integrated with Aurora Vision cloud
- Control can be activated on both low and medium point of connection
- High performance control solution
- Compliant with modern regulatory norms worldwide (such as : AS/NZS 4777.2:2015, G100, Thailand MEA) and Failsafe requirements

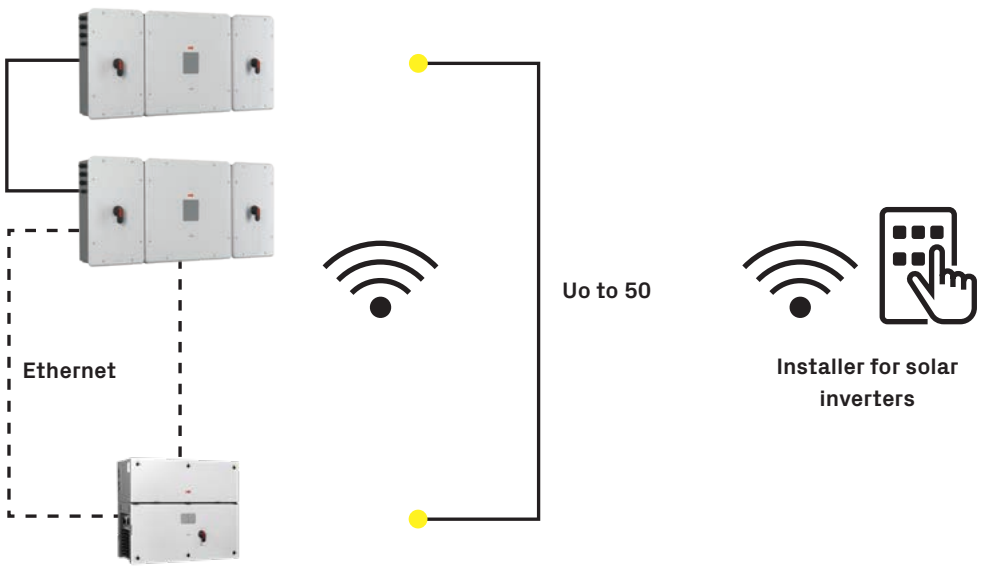
* With the exception of a standard Modbus meter from the ones supported.
** To date



Installer for solar inverters

Installer for solar inverters
The new Installer for solar inverters mobile app allows installers of large-scale solar plants to commission multiple inverters simultaneously, easily and effectively.
This mobile app allows a single installer to finalize the commissioning of up to 50 inverters at a time with a saving of up to 80% of commissioning time.
Multi-inverter commissioning, FW update, network forming, export limitation setting up and secured access to the app by any valid Aurora Vision account give the Installer for solar inverters the title of essential professional tool for commissioning any modern solar plant.

Highlights
- Claiming inverter via QR code scanning
- Up to 50 inverters commissioned at a time
- Automatic assigning of both static IP address and RS-485 slave ID
- Multi-inverter FW update
- Intuitive installation wizard
- Export Limitation setting up
- Monitoring device setting up
- Works on iOS (version 11.x or greater) and Android (version 6.0.1.x or greater)
- Export Limitation setting up



Life cycle services for solar inverters. Optimizing the performance of your solar plant

The FIMER solar service offering spans over the whole lifetime of the solar power plant. To support this, FIMER has developed a 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
FIMER 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 FIMER office, and spare parts can also be ordered online through the web. Our sales and service network offers timely deliveries worldwide.

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

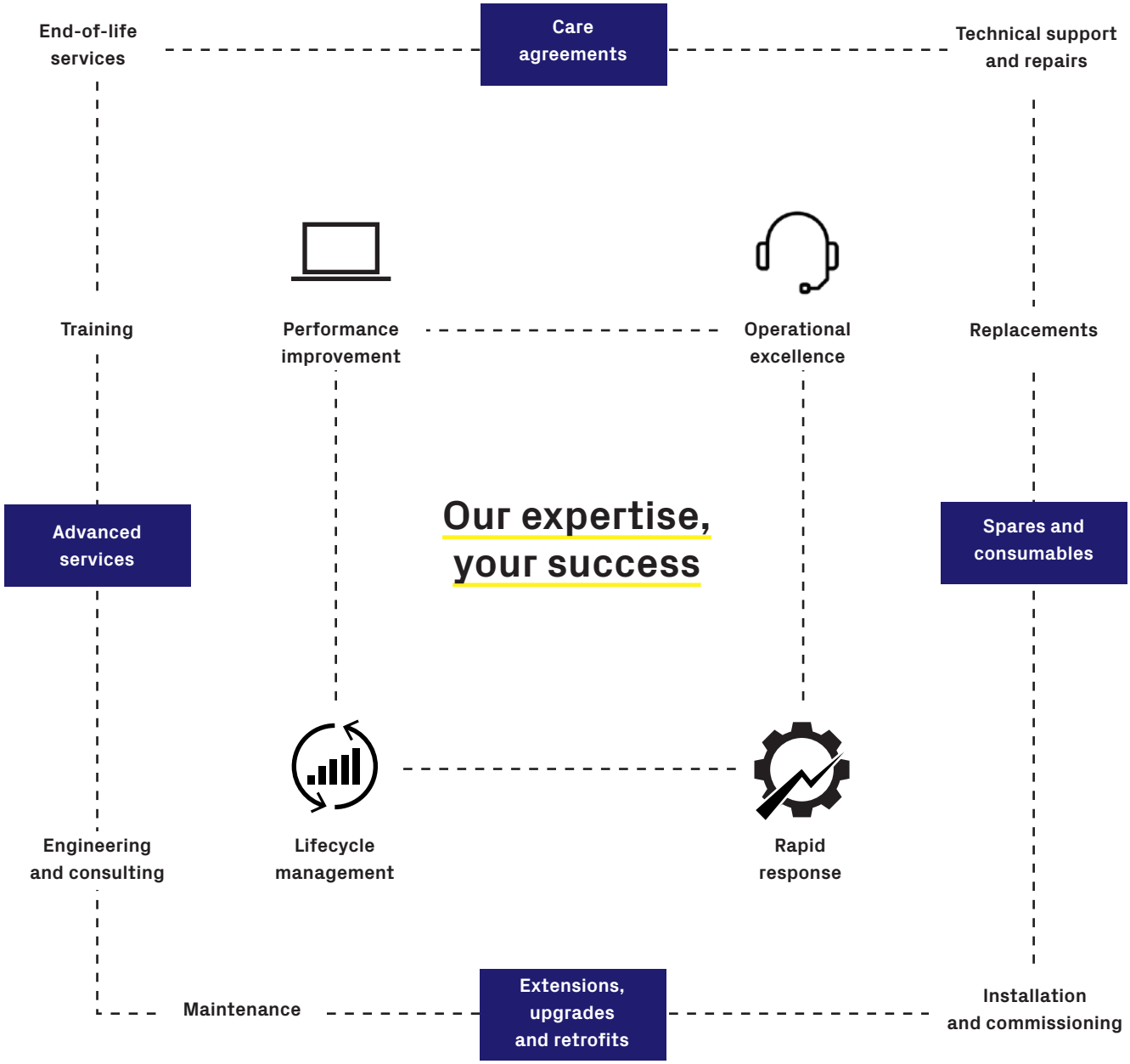
Operation and maintenance
FIMER helps to ensure a long lifetime for its solar inverters by providing on-site preventive maintenance. Preventive maintenance consists of annual inspections and component replacements according to specific maintenance schedules. Reconditioning provides more in-depth maintenance which is carried out at FIMER'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 andsoftware 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.

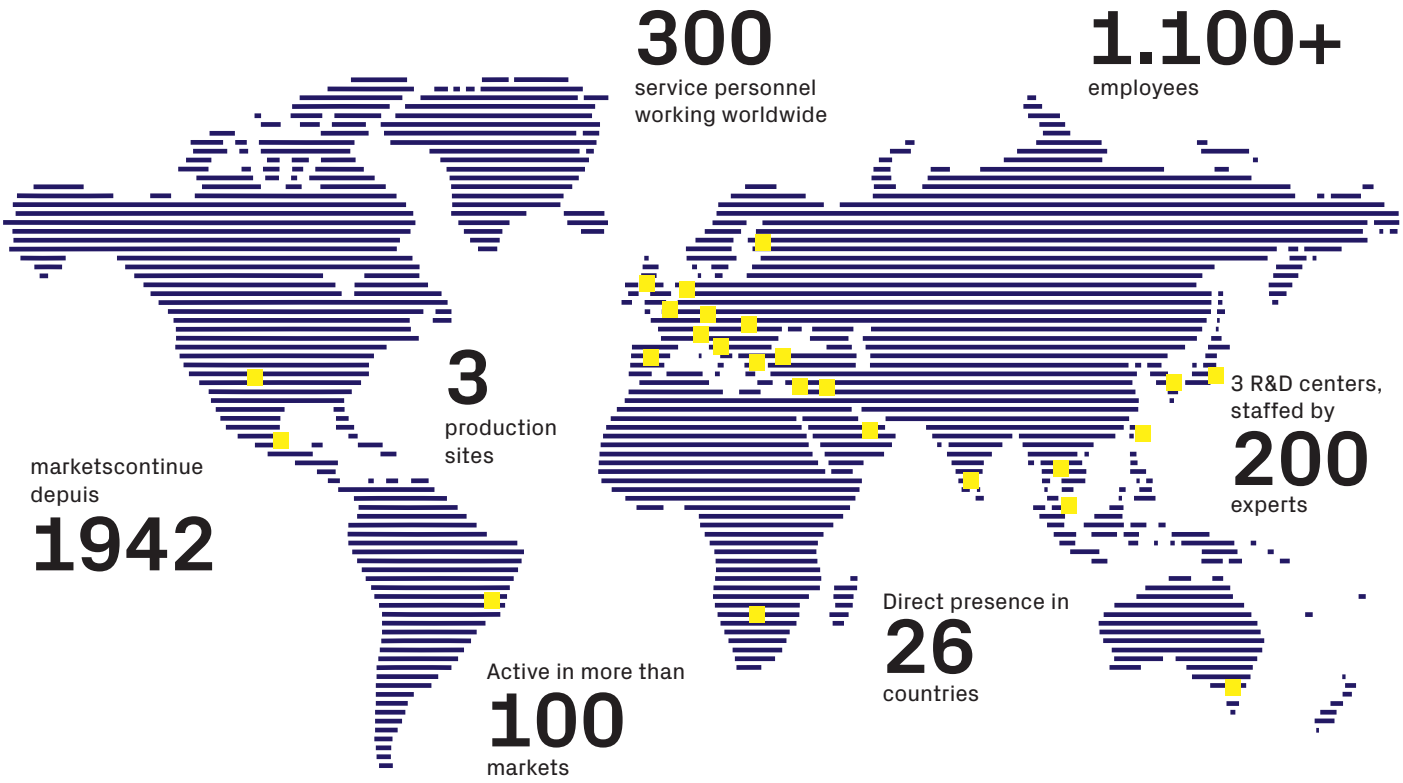
Benefits of life cycle management
Life cycle management maximizes the value of the solar inverter and its maintenance investments by:
- Ensuring spare parts and FIMER competence availability throughout the lifetime
- Enabling efficient product support and maintenance for improved reliability
- Adding functionality to the initial product by upgrading or retrofitting
- Providing a smooth transition to new technology at the end of the product lifetime

FIMER Solar Care is a modular set of services for predictable care of your asset and peace of mind over the full lifetime of the solar plant.
The offering includes:
- Availability of spares
- Extended warranties
- Preventive maintenance
- Corrective maintenance
- Response time
- Uptime guarantee
- Training
- Technical support


End-of-life services
Care agreements
Technical support and repairs
Training
Performance improvement
Operational excellence
Replacements
Advanced services
Our expertise, your success
Spares and consumables
Engineering and consulting
Lifecycle management
Rapid response
Maintenance
Extensions, upgrades and retrofits
Installation and commissioning

Shaping the future of energy

With global innovation



For a bright solar future

More than
90%
of our business is solar

We offer more than
11 GW
solar inverter capacity

More than
25 years
of solar experience

The
broadest
solar portfolio on the market

For supercharged electric mobility

Active in electric vehicle infrastructure since
2017

More than
23.500
charging stations installed

We have the power to support you. Count on us

Together we can take on any challenge

Stronger. Better. FIMER.

FIMER

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