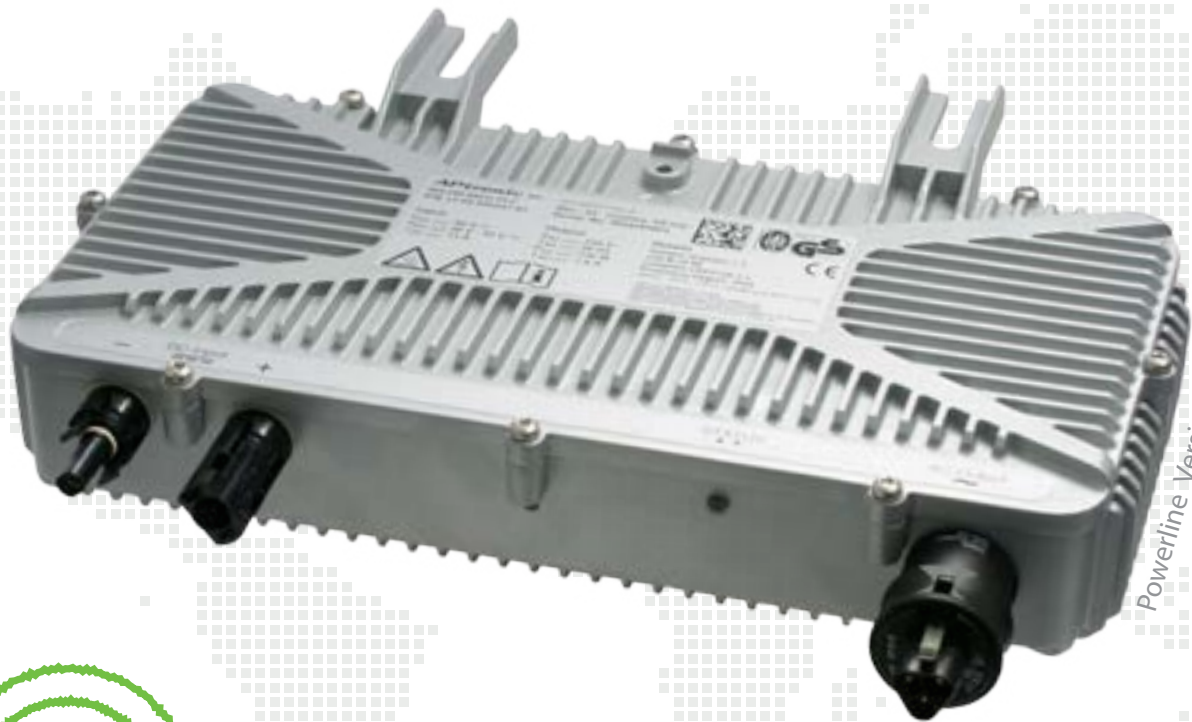


# Micro-Inverter

Product Overview



Powerline Version



# Overview

## *AEconversion: company and product information*



### Why Micro-Inverter?

The AEconversion Micro-Inverter is individually connected to one or two PV-modules and converts the direct current into grid compliant alternating current. Through the individual connection in PV-systems using micro-inverters, the PV-modules are able to work independently at their maximum capability. In addition, by performing maximum power point tracking (MPPT) on a modular level, the inverter is able to harvest the highest possible output from each module and bring shading and module mismatching effects to a minimum. Anti-islanding (MSD/ENS) according to VDE-AR-N 4105 is already integrated in the AEconversion Micro-Inverter so that the user can further decrease system costs, since an external device is no longer necessary.

AEconversion offers a variety of micro-inverter versions and options to suit all kinds of installations, starting with the smallest residential systems up to large roof installations and building facades.

### Who is AEconversion?

AEconversion GmbH & Co. KG is a newly formed independent corporation, originating from APtronic's solar-division under the management of APtronic Co-Founder and former CEO. APtronic-Solar core personnel, technology, products and facilities for R&D and manufacturing have been transferred to AEconversion with its registered office in Germany.

AEconversion is dedicated to the renewable energy sector, including but not limited to the development, production and distribution of micro-inverters for PV applications.

# Features

## Advantages of AConversion Micro-Inverters



### Maximum Power Point Tracking

### „System Efficiency“

The key to the highest possible output is “Maximum Power Point Tracking” (MPPT) on a modular level.

In string-inverter based systems, MPP-Tracking is carried out for the entire array, often leaving modules working below their highest possible operating point.

In micro-inverter systems, MPP-Tracking is performed on a modular level, by varying the electrical operating point of the module’s cells according to their IV-Curve (Current-Voltage-Curve) to produce the highest possible power for that module. However, the MPP-Tracking can only work as efficient as their tracking range permits.

### „Module Compatibility“

The AConversion Micro-Inverters are compatible with 48-, 54-, 60-, 72-, 80- and 96-cell modules due to their extra-wide MPP-Tracking range. The product variety with an input power of 250 watts up to 500 watts and an input voltage of 45 volts up to 90 volts offers more choices for increasing panel variety.



### Anti-Islanding integrated

### „MSD“

The Mains Monitoring Switching Device (MSD) according to VDE-AR-N 4105 is already integrated in AConversion Micro-Inverters. This ensures that each inverter definitely separates itself from the power source during a power outage or network disconnection. MSD also prevents island formation and feeding back into the grid, which could possibly lead to dangerous consequences. In contrast to other micro-inverters, besides a performance line protection, the AConversion Micro-Inverter does not need further monitoring or shut down devices. This simplifies every installation and reduces installation time and costs.

# Benefits

## Technological Benefits of Micro-Inverters

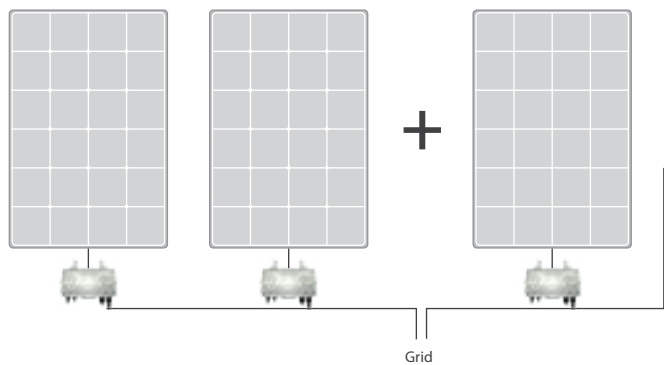
### „Avoidance of high energy losses“

The AConversion Micro-Inverter can increase the energy harvested, by eliminating sources causing high energy losses. In case of a shadow, snow, dirt, leaves, or other obstructions on a PV-module in a system using central or string inverters, the energy harvest of the entire string drops dramatically.

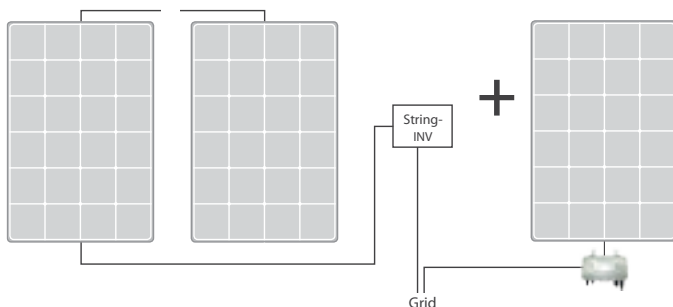
Due to the individual MPP-Tracking in micro-inverter-based PV systems, a shadow on one module does not affect others and therefore has only a minimal effect on the energy yield of the systems.



### Shading Effects on PV-System



Picture: Retrofitting Micro-Inverter system



Picture: Retrofitting String-Inverter system

### „Carefree Retrofitting“

With little effort, each system can be transformed and expanded with additional modules depending on needs and available capital.

Independently of whether the existing system consists of micro-inverters or is intended to expand a string system with new modules: with micro-inverters, you have all the freedom to upgrade your system at any time.



### Scalable Installations

# Products

## Versions of Micro-Inverters

### Communication Versions

#### RS-485 Communication

Communication via RS-485 data line offers advantages over long distances and in electrically noisy environments. The micro-inverters are connected to the data-logger via RS-485 cabling. In this way, the performance of individual PV modules and their respective micro-inverter is sent to the data logger and can be displayed for instance on the PC using the monitoring software.



#### Powerline Communication

Communication with Powerline is carried out through the existing AC wiring, so that no additional communication cables or connectors at the micro-inverter are required. The inverters are connected to other inverters using the AC cabling and distribution blocks, forming AC power circuits. For the Powerline-Version, all AC power circuits are connected to a Powerline Gateway, which provides the connection to the utility grid and to the monitoring device (Data-Logger or PC).

#### Without Communication

For small PV-systems or in systems where no communication is required, the micro-inverters without communication is suited best as a low-cost option.

### Technical Versions

#### Inverter Power

INV250-45:	250W   45V
INV350-60:	350W   60V
INV350-90:	350W   90V
INV500-90:	500W   90V

#### Output Voltage

208V
230V
240V

#### Output Frequency

50Hz
60Hz

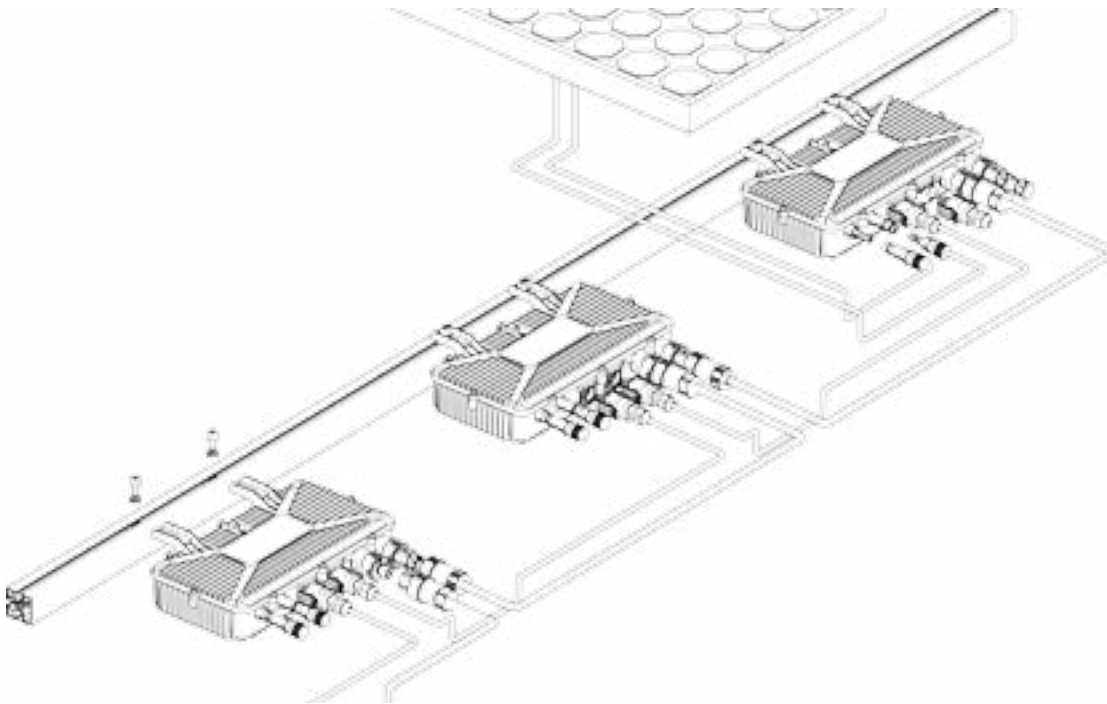
Further technical versions can be set upon request, please contact: [info@aeconversion.com](mailto:info@aeconversion.com)

# RS-485

## *Micro-Inverters with RS-485 Communication*

### “RS-485 Communication”

The AEconversion Micro-Inverter with communication capabilities provided by the RS-485 standard is a reliable way of monitoring a PV-system. Advantages of RS-485 communication include that it can be used efficiently over long distances and in electrically noisy environments. This way of communicating is a widely used reliable industrial standard.



Each micro-inverter is connected to a PV-module using the DC wiring. The DC power is individually converted into grid-compliant AC power. For the RS-485 version, the converted AC power is then directly fed into the utility grid via AC wiring.

The inverter is equipped with two AC terminals on the right side of the connection area. The inverter has two 3-pin AC connectors, which are polarized differently,

so that multiple inverters can be connected to form a continuous AC power circuit.

To enable communication and monitoring, the micro-inverters are additionally equipped with two RJ-45 connectors, with which the micro-inverters can be connected to each other and then either to a RS-485-USB Interface converter or to the data logger as well as to a building management system.

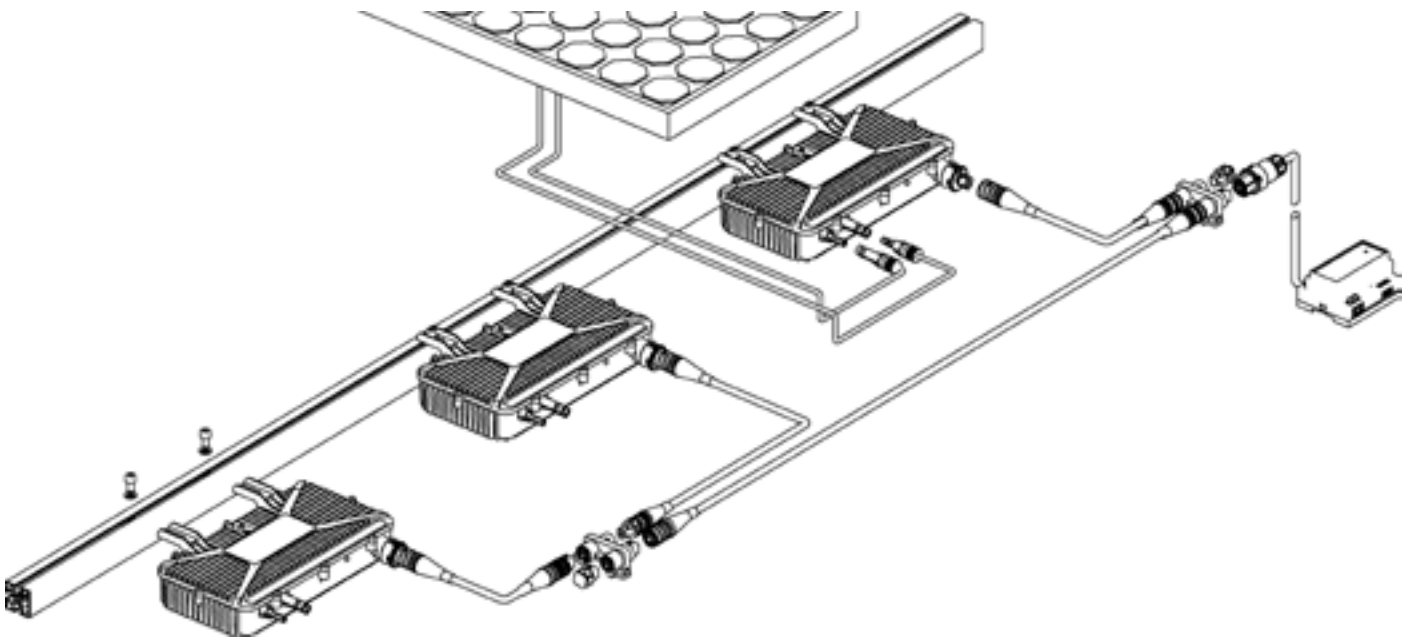
# Powerline

## Micro-Inverters with Powerline Communication



### „Powerline Communication“

A trendsetting way of communication between a PV-system and a monitoring station is realized using the Powerline standard. A great advantage of powerline communication is that it is carried out using the existing AC wiring, making additional communication connectors and wiring for the AEconversion micro-inverter unnecessary.



Each micro-inverter is connected to a PV-module using the DC wiring. The DC power is individually converted into grid-compliant AC power.

The inverter is equipped with a 20A 3-pin AC connector AC terminal on the right side of the connection area. They are connected using AC extension cables and distribution blocks, each with one input and three outputs, to form continuous AC power circuits.

For the powerline version, the converted AC power is fed into the utility grid using the connection to the gateway or data logger. With the gateway, the powerline is converted to a RS-485 connection, which can then be connected to a standard PC or Laptop using an RS485-USB Interface adapter. While connected, momentary and cumulative performance data can be viewed and analyzed on a modular level using AESolar software.

# Technical Data

## Micro-Inverter

		INV250-45	INV350-60	INV350-90	INV500-90
<b>Input</b>	Maximum PV power	250W	350W	350W	500W
	Maximum DC voltage	45V	60V	90V	90V
	Min./Max. start voltage	18V / 45V	18V / 60V	40V / 90V	40V / 90V
	MPP range	20V ... 40V	20V ... 50V	40V ... 80V	40V ... 80V
	Maximum DC current	11A	11A	9A	11A
<b>Output</b>	Maximum AC Power	240W	330W	330W	480W
	Nominal Current	1.0A	1.4A	1.4A	2.1A
	Power factor	> 0.99	> 0.99	> 0.99	> 0.99
<b>Efficiency</b>	Peak inverter efficiency	93.5%	93.5%	95.0%	95.0%
	CEC efficiency	91.4%	91.8%	93.6%	94.0%
	Nominal MPP efficiency	99.8%	99.8%	99.8%	99.8%
<b>50Hz-Version</b>	Nominal AC voltage	230V	230V	230V	230V
	Nominal AC voltage range	184V ... 264V	184V ... 264V	184V ... 264V	184V ... 264V
	Frequency	50Hz			
	Frequency range	47.5Hz ... 51.5Hz			
	Productsafety* EMC	IEC 62103:2003, IEC 62109-1:2010, IEC 55011B, EN 50178:1997 EN 61000-6-2, EN 61000-6-3			
<b>60Hz-Version</b>	Nominal AC voltage	208V or 240V	208V or 240V	208V or 240V	208V or 240V
	Nominal AC voltage range	184V ... 264V	184V ... 264V	184V ... 264V	184V ... 264V
	Frequency	60Hz			
	Frequency range	59.5Hz ... 60.3Hz			
	Productsafety EMC	UL 1741:2010, IEEE 1547:2003, CSA C22.2 FCC Part 15 Class B			
<b>Mechanical Data</b>	Weight	2.5kg			
	Operating Temperature	-25°C ... +70°C			
	Cooling	Natural convection			
	Night time power consumption	30mW			
	Max. altitude a.s.l. Safety class	2000m Class I			
<b>Housing</b>	Dimensions	314mm x 267mm x 66.5mm (BxHxT)			
	Protection Degree	IP65 (50Hz-Version)   NEMA 4 (60Hz-Version)			
	Enclosure material	Aluminum			
<b>Features</b>	MSD / (anti-islanding)	integrated (corresponds VDE-AR-N 4105)			
	Communication Versions	Powerline / RS-485 / No Com			

\*Country specific approvals available and OEM versions on request.

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