

QUICK MANUAL - INV-EU RS485

This Quick Manual provides basic information for the installation of the AEconversion Micro-Inverter. For detailed information, please refer to the Installation Manual provided on CD.

WARNING!

All electrical installations must be done by in compliance with local and national electrical codes.

CE Mark

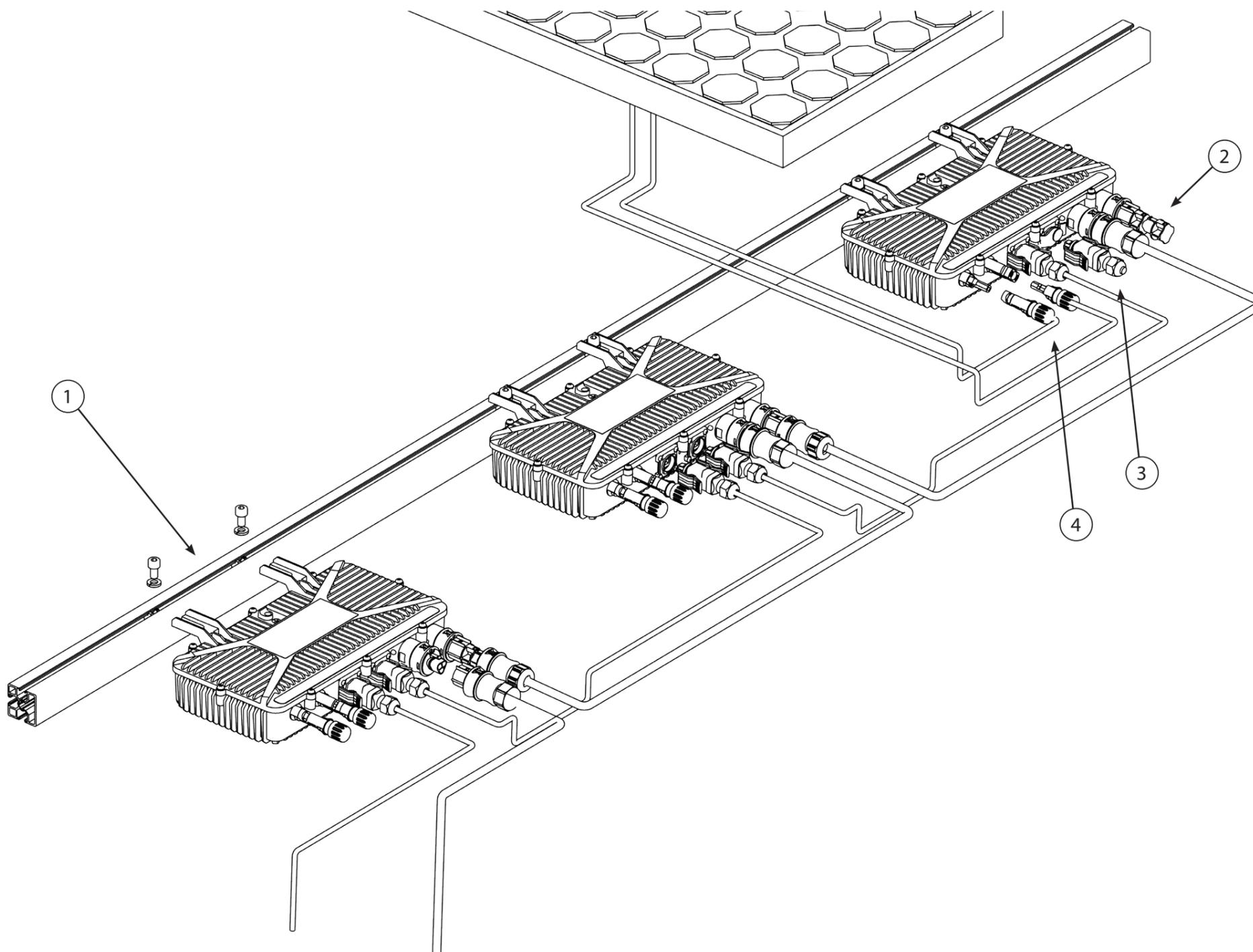
The CE mark documents that according to the label the inverter fulfills the following essential requirements of relevant directives:

- Directive on the Electromagnetic Compatibility with the Directive 2004/108/EC
- Low Voltage Directive (Directive 2006/95/EC)

Accessories needed

"✓" - Included / "x" - not included in scope of delivery

- | | |
|----------------------------------------------------------------|---|
| 1 - Mounting accessories for PV racking system | x |
| 2 - Cover for female AC connector | ✓ |
| - Male connector with strain relief | x |
| - Female connector with strain relief | ✓ |
| - Connection Cable | x |
| 3 - RJ45 connector / terminating plug (14-05-500422-1) | x |
| 5 - PV-modules including male and female connector Amphenol H4 | x |



- ① - Mark the appropriate center of each PV module on the framework for inverter placement.
- Attach the Micro-Inverter using hardware accessories that are suitable for the framework used in the PV System, i.e. screws and sliding blocks.
 - Ensure a minimum distance of 20 mm between the roof top and the bottom of the inverter. In addition, a distance of 25 mm between the back of the PV module and the top of the inverter should be complied with.

- ② - Connect the last Micro-Inverter to the next one using AC connector cabling and continue with following inverters.
- Ensure that the maximum allowable number of inverters is not exceeded in one branch. (see table)
 - Any unused AC Connectors must be covered with an end cap.
 - The end of the AC wire of one branch must be switched to a circuit breaker with a current rating of 16A (20A) and a characteristic of type B. (see table)

- ③ - Connect the RJ45 connector with the RS-485 interface of the inverter. All unused ports must be closed with a protective cap.
- The last RJ45 socket must be terminated with a 120 Ω terminating plug.
 - The end of the RS-485 cable can be connected to a data logging system.

- ④ - Make a note of the serial numbers of each inverter and the corresponding PV module. It will help you later to create an overview of your PV system.
- Connect the PV module to the Micro-Inverter using the DC Cabling.
 - Switch in the circuit breaker to energize the AC line.

	EU/50Hz/230V Installations: 16A Circuit Breaker	Non-EU/50Hz/230V Installations: 16A Circuit Breaker	Non-EU/50Hz/230V Installations: 20A Circuit Breaker
Type of inverter	Max. number of inverters in one branch		
INV250-45 EU	12	12	15
INV350-60 EU	9	9	11
INV350-90 EU	9	9	11
INV500-90 EU	6	6	8

Symbols used

This manual uses the following types of safety symbols that are to be noted for the installation and operation of the inverter. Some of these symbols are also included on the label, which is located on the top side of the inverter and gives information on technical data as well as type and serial number of the device.



DANGER! The term „danger“ describes an issue which, if ignored can cause personal injury.



ATTENTION! With the term „attention“, a circumstance is listed which may cause property damage if disregarded.



NOTE! The term „Note“ lists an issue for which its observance leads to an improvement in the operation.



INSTRUCTIONS FOR USE!

Under „Instructions for Use“, it is pointed out that installation and operating instructions are to be read and understood before installation or repair.



CAUTIONS, HOT SURFACE! Under „Caution, hot surface“ should be noted that surfaces of equipment may be hot and create a burn hazard.



SPECIAL DISPOSAL INSTRUCTIONS! With „Note Separate Disposal“, it is pointed out that this product may not be disposed of with normal garbage. An improperly conducted disposal can lead to damage to the environment.

Target Audience

This manual is for the installer and operator of this inverter type.



ATTENTION!

This guide assumes knowledge corresponding to a recognized professional qualification as an electrician.

Safety and Regulations

The micro-inverter converts the power generated by the PV modules from direct current into grid compliant alternating current and supplies it to the power grid. For damages resulting from failure to follow these instructions, we assume no liability. When installing the inverter, please note all assembly and installation instructions for all parts and components of the system.

General Information and Safety Instructions

In order to ensure faultless and safe operation of this equipment, proper transport, expert storage, installation, operation and maintenance is required. During the operation of this equipment, certain equipment parts carry hazardous voltages that can cause serious injury or death. Always follow the following instructions to minimize the risk of injury or death. When commissioning for the first time or when the inverter was not supplied with a PV power for a longer time, the inverter can require some connection attempts over a period of 5 minutes to go in feeding operation. The voltage of the PV generator and the AC voltage must be within the tolerance band for the feeding operation. For adjustment, maintenance and repair work, the inverter must be disconnected from the AC voltage and the voltage of the PV generator. To disconnect the inverter securely from the network, the installed circuit breaker used in that phase must be activated, with a breaking capacity of 16A and the tripping characteristic „type B“ (eg ABB S201-B16). Afterwards, the AC connectors can safely be removed from the inverter. The relevant safety regulations for work on voltages must be complied with. Once the PV modules are exposed to light, these provide DC voltages which are permanently present at the connectors of the modules. This voltage can be of dangerous quantities. The voltage is also present at the connectors when the inverter is turned off.

General ambient conditions

The Micro-Inverter at hand corresponds on the AC side to the Overvoltage category III, the PV side corresponds to the Overvoltage category II. Relative Humidity: 0% ... 98%, non-condensing.

Intended use and liability

The AEconversion micro inverter converts the power generated by the PV modules from direct current into grid compliant alternating current and supplies it to the power grid. Any other or additional use is considered improper. The manufacturer / supplier shall not be liable for any resulting damages. The risk is carried solely by the operator. Intended use also includes compliance with the instructions and installation manual. The inverter can be operated with a permanent connection to the public electricity grid. The inverter is not designed for mobile use. Changes to the inverter are generally prohibited. For any changes in the system a qualified electrician must be called in.

Storage, Transportation, Operation and Maintenance

For storage, transport, operation, and maintenance, the following warnings are to be noted:



- Proper grounding, wire sizing and appropriate short-circuit protection must be provided to ensure safe operation.
- Never remove the solar generator from the inverter, while it is connected to the network.
- Make sure before carrying out visual inspections and maintenance, that the power supply is switched off and secured against restarting.
- Please note the threats, warnings, and precautions given in these operating and installation instructions.



- Do not under any circumstances interfere with or manipulate the inverter or any other parts of the system.
- Inappropriate alterations can cause damage!
- All contacts should be kept dry and clean!
- Transport the inverter only in the given packaging.

Assembly, Installation and Electrical Connection

The following warnings must be observed:



- Installation of this unit must comply with the safety regulations (eg DIN, VDE) and all other relevant national or local regulations.
- If you mount the inverter at high altitude, avoid possible falling risks.
- Do not plug electrically conductive parts into the plugs and sockets! Tools and working conditions must be dry.
- The electrical connection to the central building should be performed only by a licensed electrician.



- Do not under any circumstances interfere with or manipulate the inverter or any other parts of the system.
- Inappropriate alterations can cause damage!

Intended use also includes compliance with the instructions and installation manual. Some of the documents that you need for the registration and inspection of your photovoltaic system are included in the installation instructions. The grid connection of the inverter must end in a sub-distribution. The feeding phase of the grid connection must be made in a sub-distribution using a circuit breaker with a breaking capacity depending on Inverter Type and Installation, for example EU/50Hz/230V and Non-EU/50Hz/230V Installation use 16A and the tripping characteristic „type B“ (eg ABB S201-B16). The device is grounded through the PE terminal of the AC supply line. The design of the connected PV generator must provide that the maximum DC input voltage is NOT exceeded in any arising environmental condition. Grounding of the PV generator is allowed but not required for the operation of the inverter.

For more details refer to manual on CD.

50Hz Micro-Inverter: County-Specific Data Overview

AT - Austria (PN# -02)

Nom. AC voltage range: 184 V ... 264 V
AC frequency range: 47.5 Hz ... 51 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, ÖNROM E8001-4-712, EN 50178:1997

UK - United Kingdom (PN# -07)

Nom. AC voltage range: 207 V ... 264 V
AC frequency range: 47.5 Hz ... 50.5 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, ERG83/1, EN 50178:1997

BB - Barbados (PN# -43)

Nom. AC voltage range: 195.5 V ... 253V
AC frequency range: 47.5 Hz ... 51 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, VDE 0126-1-1:2006, EN 50178:1997

GR - Greece (PN# -08)

Nom. AC voltage range: 184 V ... 264V
AC frequency range: 49.5 Hz ... 50.5 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, VDE 0126-1-1:2006 with deviations, EN 50178:1997

BE - Belgium (PN# -03)

Nom. AC voltage range: 195.5 V ... 253V
AC frequency range: 47.5 Hz ... 50.5 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, EN 50178:1997, VDE 0126-1-1:2006, with parameter settings C10/11-2009.05

NL - Netherlands (PN# -10)

Nom. AC voltage range: 195.5 V ... 253V
AC frequency range: 48 Hz ... 51 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, VDE 0126-1-1:2006 with limits of EN 50438:2007, EN 50178:1997

CH - Switzerland (PN# -18)

Nom. AC voltage range: 184 V ... 264 V
AC frequency range: 47.5 Hz ... 50.2 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, VDE-AR-N 4105, EN 50178:1997, VDE0126

TR - Turkey (PN# -12)

Nom. AC voltage range: 184 V ... 264 V
AC frequency range: 47.5 Hz ... 50.2 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, VDE-AR-N 4105, EN 50178:1997, VDE0126

DE - Germany (PN# -01)

Nom. AC voltage range: 184 V ... 264 V
AC frequency range: 47.5 Hz ... 51.5 Hz

Product Safety: IEC 62103:2003, IEC 62109-1:2007, IEC 55011B, VDE-AR-N 4105, EN 50178:1997

DC INPUT DATA	INV250-45	INV350-60	INV350-90	INV500-90
Maximum PV power	250 W	350 W	350 W	500 W
Max. DC voltage	45 V	60 V	90 V	90 V
Min./Max. voltage	18 V / 45 V	18 V / 60 V	40 V / 90 V	40 V / 90 V
MPPT range	20 V ... 40 V	20 V ... 50 V	40 V ... 80 V	40 V ... 80 V
Max. DC current	11 A	11 A	9 A	11 A
AC OUTPUT DATA				
Maximum AC power	240 W	330 W	330 W	480 W
Nominal AC voltage	230 V	230 V	230 V	230 V
Nom. current	1.0 A	1.4 A	1.4 A	2.1 A
Frequency	50.0 Hz	50.0 Hz	50.0 Hz	50.0 Hz
Power factor	> 0.99	> 0.99	> 0.99	> 0.99
EFFICIENCY				
Peak inverter efficiency	93.5 %	93.5 %	95.0 %	95.0 %
European efficiency	91.4 %	91.8 %	93.6 %	94.0 %
Nominal MPP efficiency	99.8 %	99.8 %	99.8 %	99.8 %
MECHANICAL DATA	for all INV versions			
Operating temperature range	-25 °C ... +70 °C			
Night time power consumption	30 mW			
Dimensions chassis (LxWxH)	314 x 267 x 66.5 mm			
Weight / max. altitude	2.5 kg / 2000m			
Cooling	Nat. Convection			
Enclosure environmental rating	Outdoor - IP65			
Enclosure material	Aluminum			
Degree of pollution	Pol deg II			
SAFETY STANDARDS	for all INV versions			
Safetyclass	Class I			
EMC	EN 61000-6-2, EN 61000-6-3			

