

## INSTALLATION MANUAL

V24-1



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## Introduction

This manual will present the tools and procedure needed to install the IOLITEiw-3xMEMS-ACC (device) including the wiring of the cables.

The same procedure should be followed when installing the cables to the other product types of the same product family, including but not limited to:

- IOLITEiw-3xMEMS-ACC-8g
- IOLITEiw-3xMEMS-ACC-40g
- IOLITEiw-3xMEMS-ACC-8g-T
- IOLITEiw-3xMEMS-ACC-40g-T
- IOLITEiw-3xMEMS-ACC-S
- IOLITEiw-3xMEMS-ACC-INC

The cover of the sensor needs to be removed in order to make the RJ45 ports accessible. The cable glands and bend relieves need to be tightened onto the sensor and finally the cover is put back in place. Detailed step by step instructions are presented in the remaining of this document.



### Important

Only the cables approved by Dewesoft should be used in order to ensure the IP67 rating of the cable glands. If different cables are used, the user should perform a test to ensure that the cable glands will properly grip the cable and achieve the IP67 rating. Clamping range: 6 .. 9 mm

## Tools needed

- 1.) 3 mm Allen/imbus key wrench
- 2.) 4mm Allen/imbus key wrench



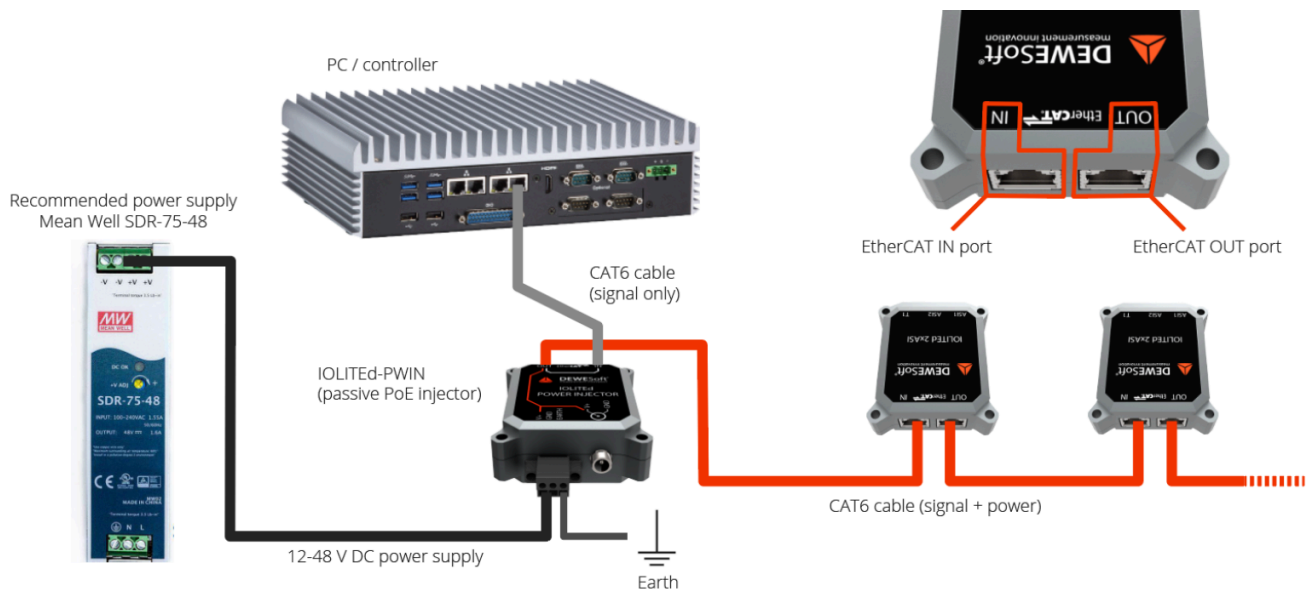
- 3.) 19 mm wrench with an open circular end



- 4.) Threadlocking compound, example: Loctite 243

## Basic wiring and system requirements

The devices should be connected to the industrial PC according to the schematic from the device datasheet using Dewesoft IOLITE POWER-INJECTOR.



The required power supply: Mean Well SDR-75-48

The minimum industrial PC requirements are listed below. The values are minimal and assume no mathematics or other plugins running on the PC. In case of additional mathematical channels higher CPU specs might be required.

Required PC specifications (1-10 devices connected):

- CPU: 4 core, 2 GHz per core, Intel i3 minimum
- RAM: 8 GB

Required PC specifications (10-20 devices connected):

- CPU: 4 core, 2.5 GHz per core, Intel i5 minimum
- RAM: 16 GB

Required PC specifications (20-50 devices connected):

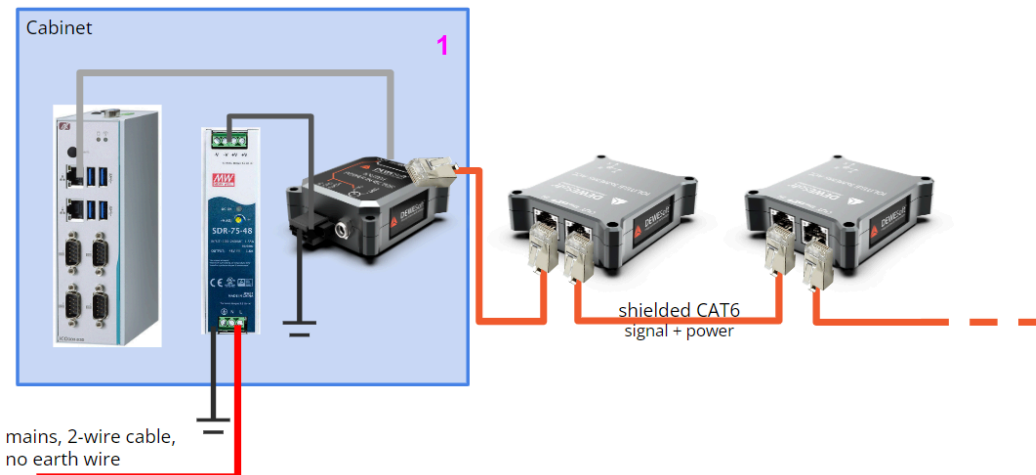
- CPU: 8 core, 3 GHz per core, Intel i7 minimum
- RAM: 16 GB

Maximum number of EtherCAT devices that can be connected to the same PC: 50

## Wiring requirements for long chains

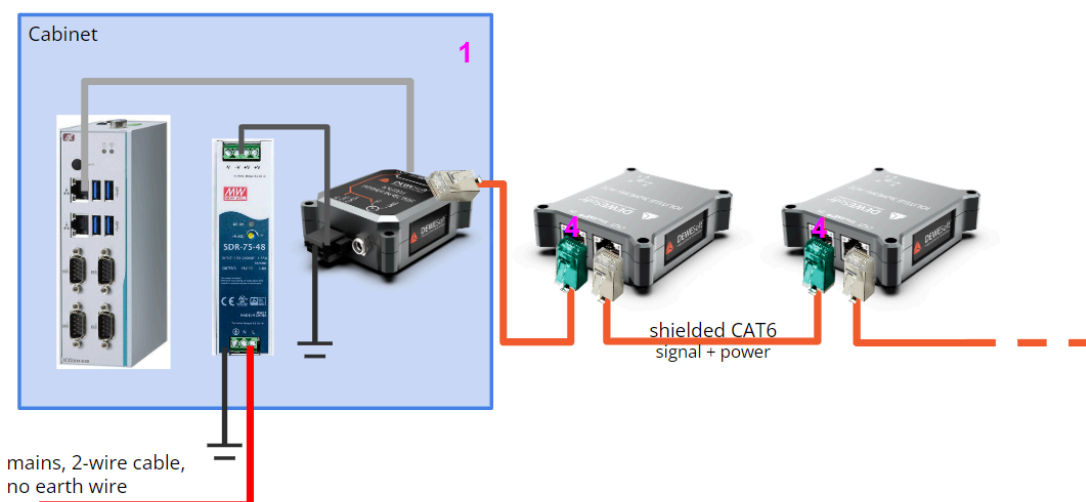
The exact wiring of the chain depends on the local conditions such as the overall length of the chain, conductivity of the structure, type of power supply, existence of additional power injectors along the chain, availability of local earth connections etc. The most common configurations are presented here.

### Single power injector, non-conductive structure (i.e. concrete bridge)



The power supply and power injector should be installed in an electrical cabinet. A single network cable connects the devices outside of the cabinet. The cable shield may be connected at each end of the cables, effectively forming a continuous shield connection along the chain. This is only allowed if the structure to which the devices are mounted is not conductive (i.e. concrete bridge).

### Single power injector, conductive structure (i.e. steel bridge)



In this case, especially in case of long cables, there is a risk of ground loop formed by the cable shield, device housing and the structure itself. It is therefore necessary to either break the shield at each IN port by using a non-conductive plastic RJ45 connector (4). Using non-shielded cables is not a viable solution as the cables themselves always need to be shielded. In this case it is also important to ensure the conductivity of the device housing to the conductive structure by using tooth washers to cut into the anodization layer of the device housing.



**Note:** since tooth washers purposefully damage the anodization protection layer and increase the risk of galvanic corrosion, it is preferable to isolate the device housing from the conductive structure (via a non-conductive mounting plate) and therefore follow the wiring for a non-conductive structure, especially in marine or humid environments.

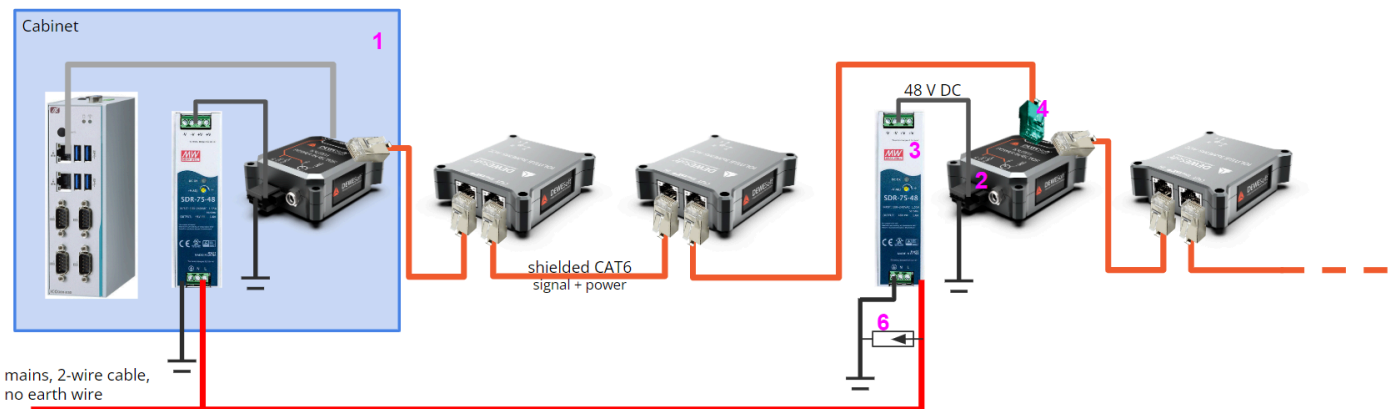
**Additional information:** Power injector internal wiring schematics can be found in [Appendix](#).

## Multiple power injectors

The following configurations include an external power injector which is necessary due to voltage drop in case of long chains. The configurations are presented in the order from the most recommended to the least recommended in terms of EMI immunity.

The internal schematic of the IOLITE POWER-INJECTOR is available in Appendix 1.

## Multiple power injectors, non-conductive structure (i.e. concrete bridge), AC line to external power supply, local earth available



This schematic shows the most recommended wiring in case external power injectors need to be used. The industrial PC, Ethercat power supply and power injector are typically inside the main electrical cabinet (1), together with appropriate surge protection for the power supply system used on installation site (TN or TT).

If additional external power injector (2) is needed (due to voltage drop in a long chain), it is recommended that it is powered by a local power supply (3) which means the main AC line needs to be wired to it. This is the most robust wiring against EMI disturbances.

The external power injector and power supply must both have the EARTH pins connected locally. It is necessary to perform resistance measurement between the EARTH terminals and local earthing point according to EN-60364 to ensure functionality (i.e. <0.1 ohm resistance at 10 A test current).

To avoid a ground loop, it is important to break the daisy chained network cable shield by placing an unshielded RJ45 connector (4) at the IN port of the external power injector.

To protect external power supplies from lightning strike, it is recommended that surge protection (6) is added to each external power supply.

**Note on conductive structures (i.e. steel bridge):** if the chain is long, the structure is conductive and device housings cannot be isolated from the conductive structure (i.e. by a non-conductive mounting plate), the shield needs to be broken at every device's IN port and tooth washers should be used for attaching the device to the structure as explained in the initial section (see the section on "[Single power injector, conductive structure](#)").

Multiple power injectors, non-conductive structure (i.e. concrete bridge),  
AC line to external power supply, no local earth

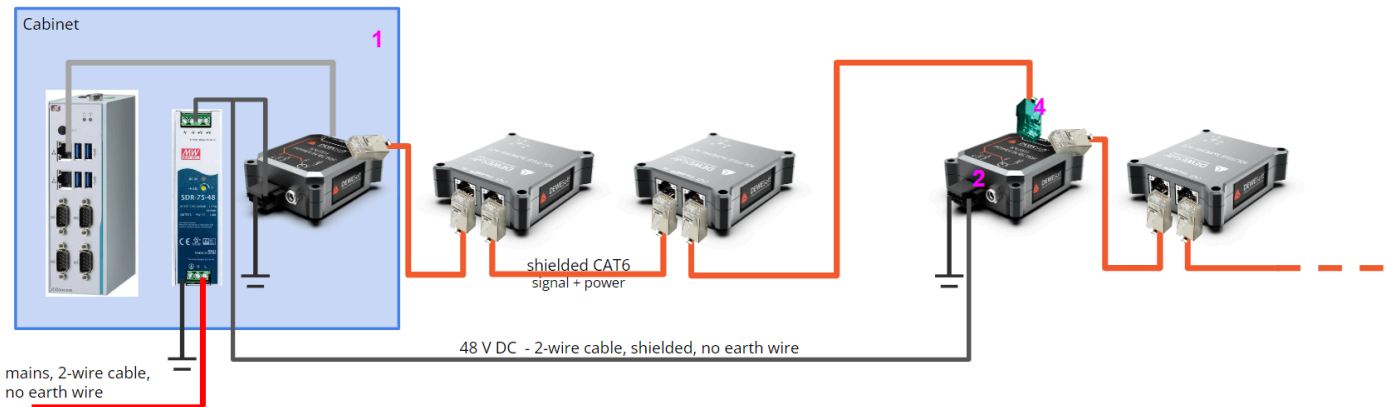


If it is not possible to connect the external power supply and power injector EARTH pins to local earth, there must be an isolation transformer (7) in the MAINS line to the external power supply to protect against electric shock.

In this wiring it is recommended that the RJ45 connector (4) at the power injector IN port is shielded as there is no ground loop created by earthing, therefore it is desirable to continue the shield connection along the full chain.

**Note on conductive structures (i.e. steel bridge):** if the chain is long, the structure is conductive and device housings cannot be isolated from the conductive structure (i.e. by a non-conductive mounting plate), the shield needs to be broken at every device's IN port and tooth washers should be used for attaching the device to the structure as explained in the initial section (see the section on "[Single power injector, conductive structure](#)").

## Multiple power injectors, non-conductive structure (i.e. concrete bridge), DC line to external power supply, local earth available



This schematic shows the wiring in case it is not possible to install an external power supply and therefore a 48 V DC power cable is wired to the external power injector.

It is important that the DC cable is shielded for immunity against EMI disturbances.

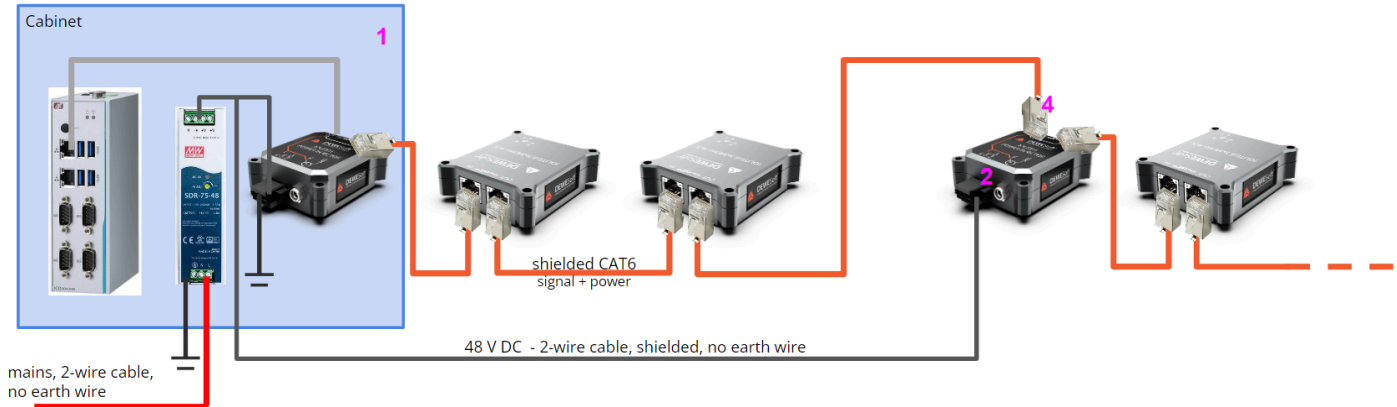
The external power injector must have the EARTH pins connected locally. It is necessary to perform resistance measurement between the EARTH terminal and local earthing point according to EN-60364 to ensure functionality (i.e. <0.1 ohm resistance at 10 A test current).

To avoid a ground loop, it is important to break the daisy chained network cable shield by placing an unshielded RJ45 connector (4) at the IN port of the external power injector.

**Please note:** the maximum wire diameter of the power injector input DC cable is 1 mm<sup>2</sup> (18 AWG) in order to fit the input connector including the ferrule. Therefore the voltage drop might be significant if the length of the DC cable is more than 100 m.

**Note on conductive structures (i.e. steel bridge):** if the chain is long, the structure is conductive and device housings cannot be isolated from the conductive structure (i.e. by a non-conductive mounting plate), the shield needs to be broken at every device's IN port and tooth washers should be used for attaching the device to the structure as explained in the initial section (see the section on ["Single power injector, conductive structure"](#)).

## Multiple power injectors, non-conductive structure (i.e. concrete bridge), DC line to external power supply, no local earth



This schematic shows the wiring in case it is not possible to install an external power supply and therefore a 48 V DC power cable is wired to the external power injector.

It is important that the DC cable is shielded for immunity against EMI disturbances.

If it is not possible to connect the external power injector to local earth, it is recommended that the RJ45 connector (4) at the power injector IN port is shielded as there is no ground loop created by earthing, therefore it is desirable to continue the shield connection along the full chain.

**Please note:** the maximum wire diameter of the power injector input DC cable is 1 mm<sup>2</sup> (18 AWG) in order to fit the input connector including the ferrule. Therefore the voltage drop might be significant if the length of the DC cable is more than 100 m.

**Note on conductive structures (i.e. steel bridge):** if the chain is long, the structure is conductive and device housings cannot be isolated from the conductive structure (i.e. by a non-conductive mounting plate), the shield needs to be broken at every device's IN port and tooth washers should be used for attaching the device to the structure as explained in the initial section (see the section on "[Single power injector, conductive structure](#)").

## Instructions for connecting the EtherCAT communication cables to the device - quick method

If the cables already come with the M16 cable glands preinstalled (like seen in the picture below), it is possible to connect the cables to the device without opening the top cover. In that case the cable gland is already pre-mounted on the cable, therefore the device does not have the cable gland installed yet.



1. Slide the RJ45 connector into the threaded hole of the device. Make sure that the RJ45 clip is facing downwards as seen in the pictures below.



2. Insert the RJ45 into the connector inside the device. It cannot be seen, but with little practice the insertion should be easily achievable. Make sure to hear a click of the RJ45 clip.
3. Screw the mounting thread of the cable gland into the device and tighten it with a 19 mm wrench. Since in this method we cannot install the counter nut on the inside of the housing, it is advisable to apply some threadlocker on the mounting thread of the cable gland.



4. Before tightening of the squeeze nut make sure to push the cable firmly inside the device. Then tighten the squeezing nut of the cable gland to ensure the cable is tightly gripped and the connection is waterproof.



5. Repeat the same for the second cable.

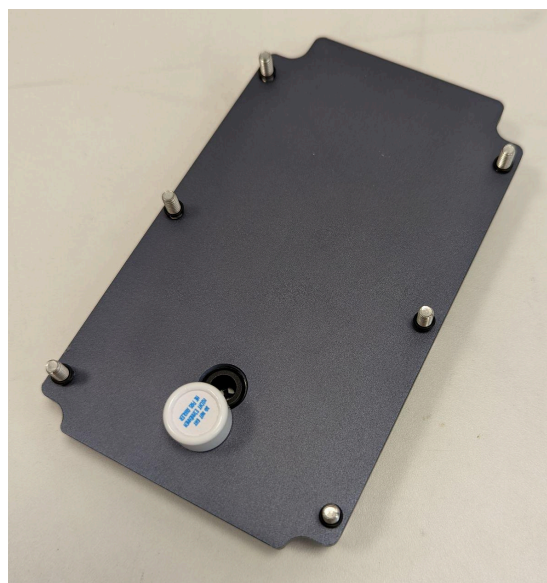
The above procedure is especially useful and fast for planned long-term installations. In case the cable needs to be disconnected, the top cover of the device needs to be opened. The next section describes the longer procedure of connecting the cables by opening the top cover of the device.

## Step-by-step instructions for connecting the EtherCAT communication cables to the device

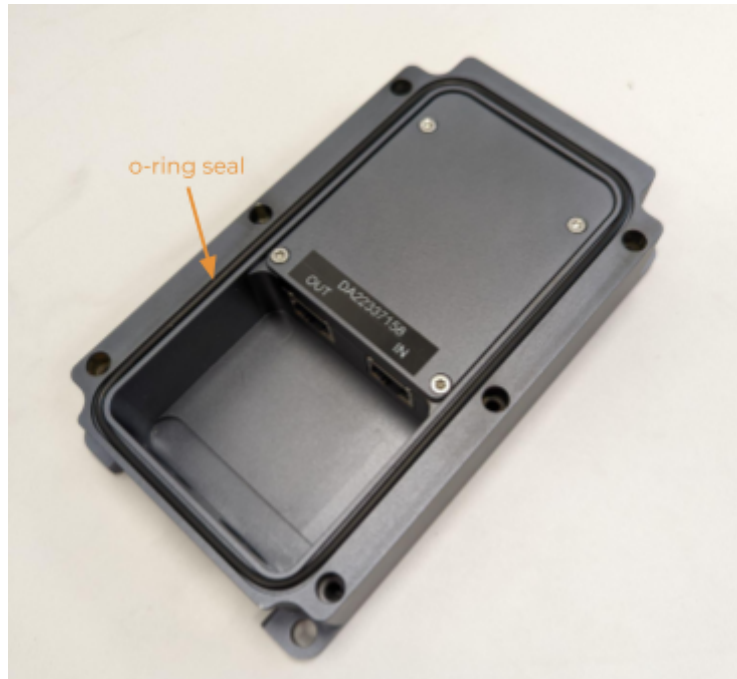
1. The first step is to unscrew the 6 cylindrical head screws (tool needed: Allen/imbus key 3 mm), denoted with orange arrows. The screws are only lightly attached with the rubber washers not yet squeezed. Untightening the screws will detach the cover plate.



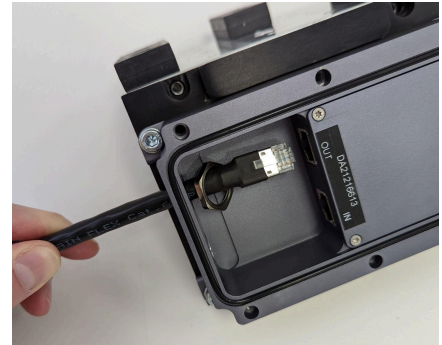
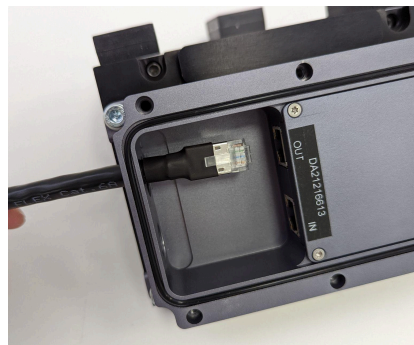
2. There are retaining rings on the screws (see the figure below), so that the screws don't fall out of the holes. However, care still needs to be taken in order not to detach the retaining rings as well. Silica gel capsule is glued to the cover.



3. After removing the cover plate, care needs to be taken for the o-ring seal not to fall out of the groove. If it does fall out, it needs to be put back in place before placing the cover plate back again at the end of the procedure.

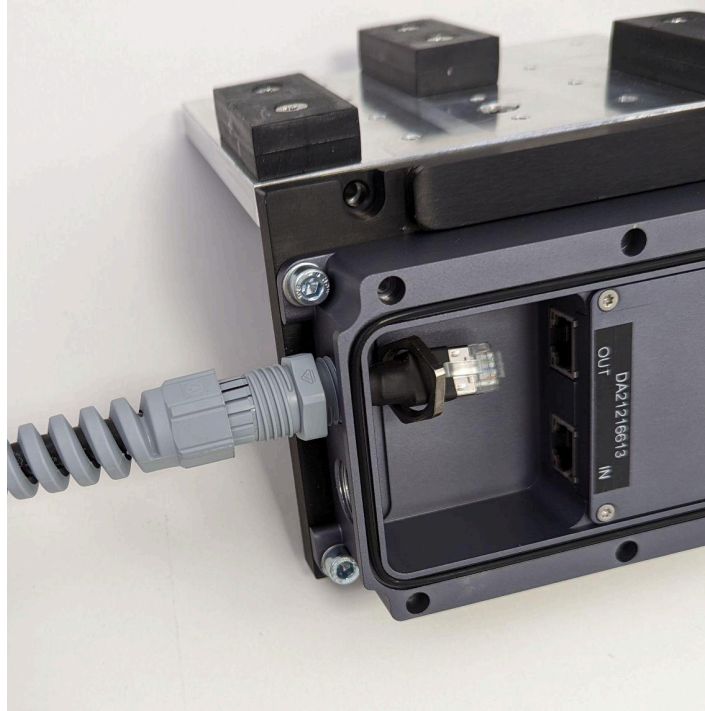


4. Cable glands might be already placed on the device or might be supplied separately. If cable glands are mounted on the device, they need to be removed to follow the procedure below.
5. Carefully place the RJ45 connector through the threaded hole and through the counter nut as shown below.

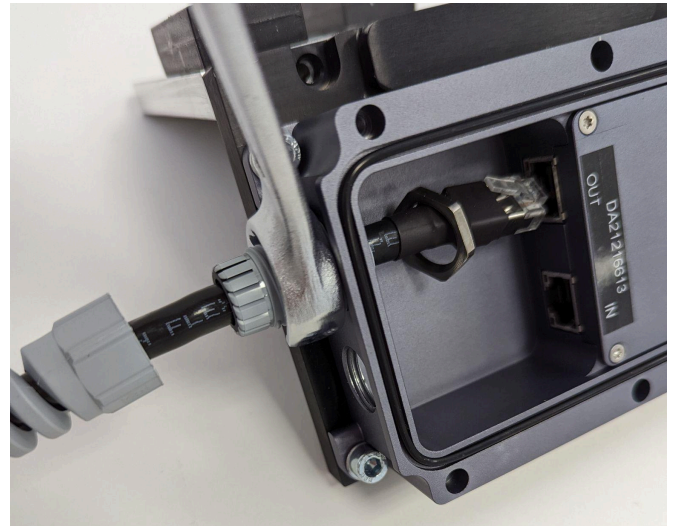
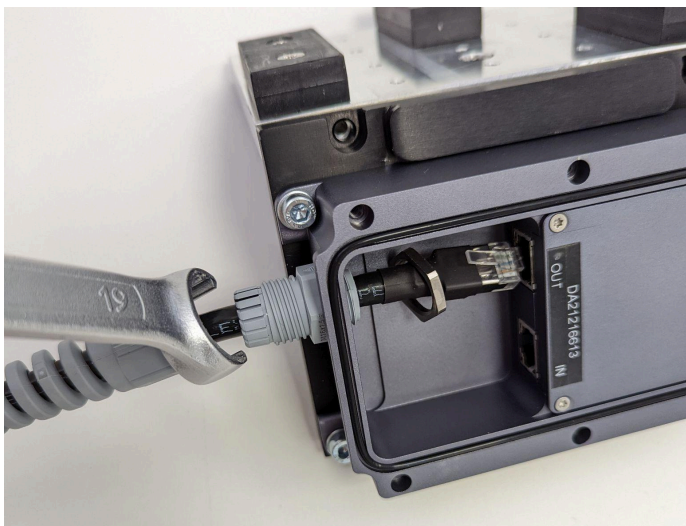


6. The cable gland should be already placed on the cable behind the RJ45 connector. It consists of two parts: the seal part and the tightening part which could also be a bend relief. For easier installation you can separate them by unscrewing the tightening part / bend relief from the seal part.

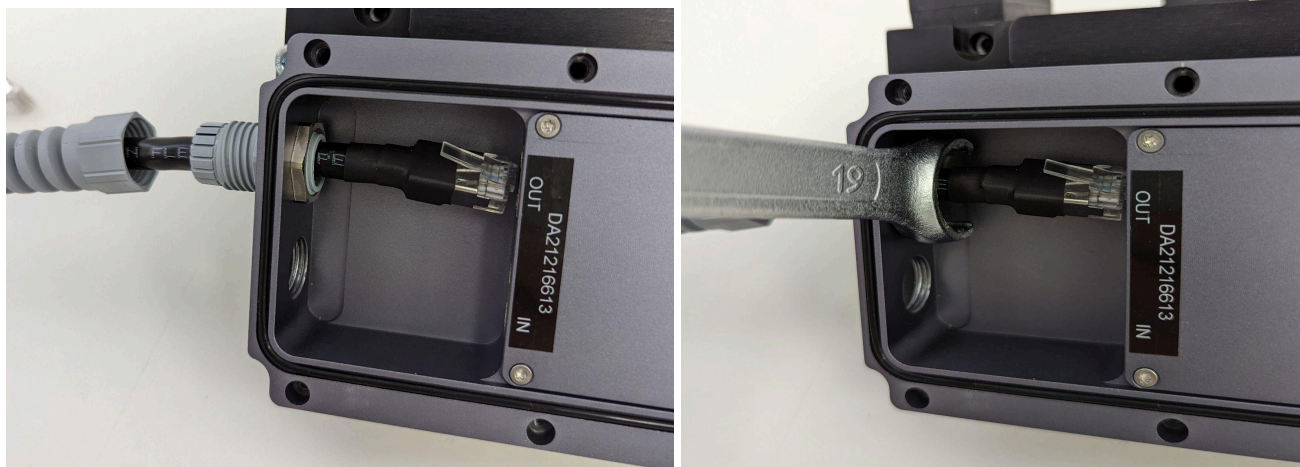
Screw the gland into the thread hole of the sensor as shown below.



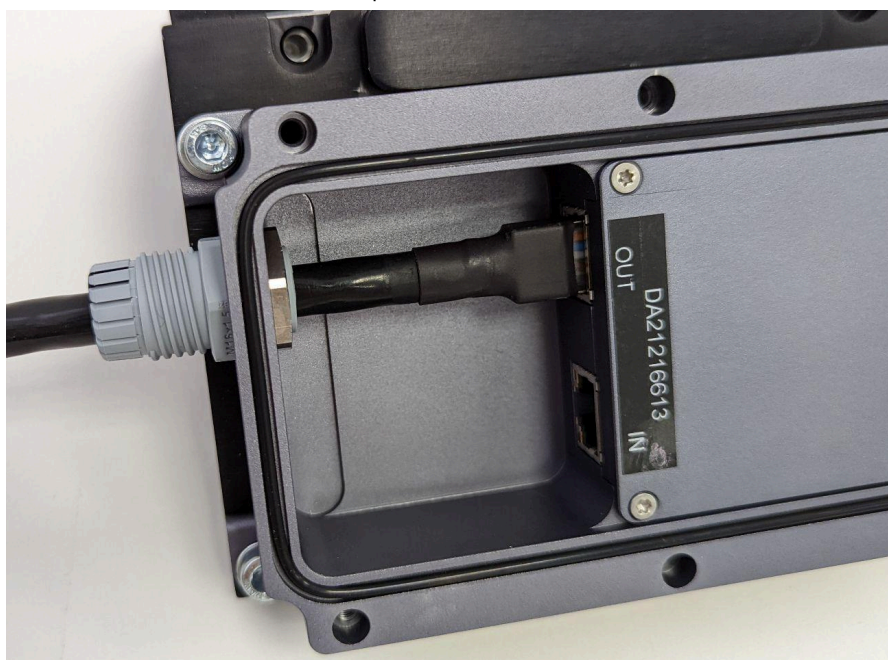
7. Tighten the gland by gripping the nut with a 19 mm wrench. For easier manipulation a specially cut 19 mm wrench should be used.



8. Tighten the counter nut on the inside of the device, again using the special 19 mm wrench.



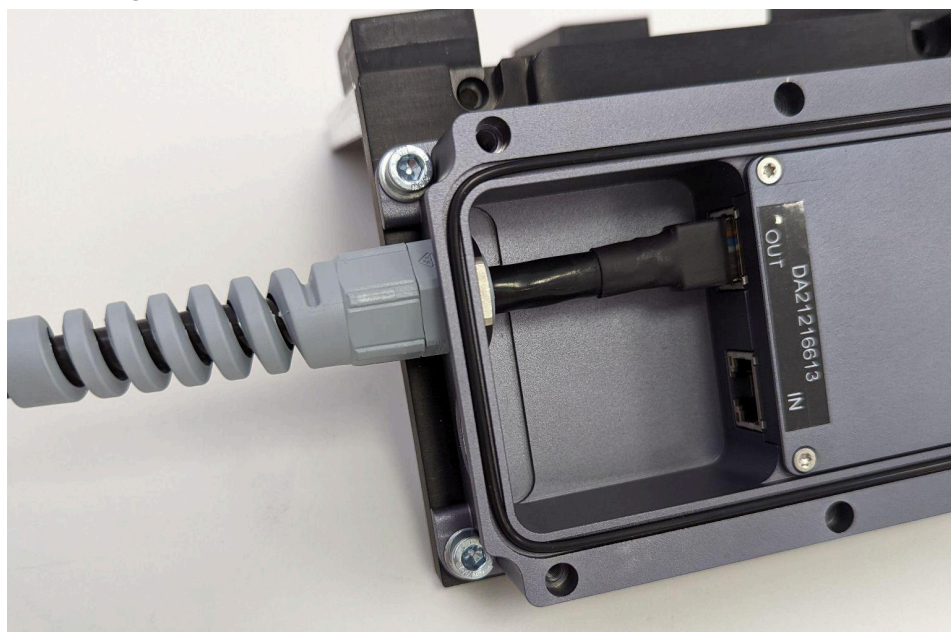
9. Plug the RJ45 connector into the RJ45 port of the sensor.



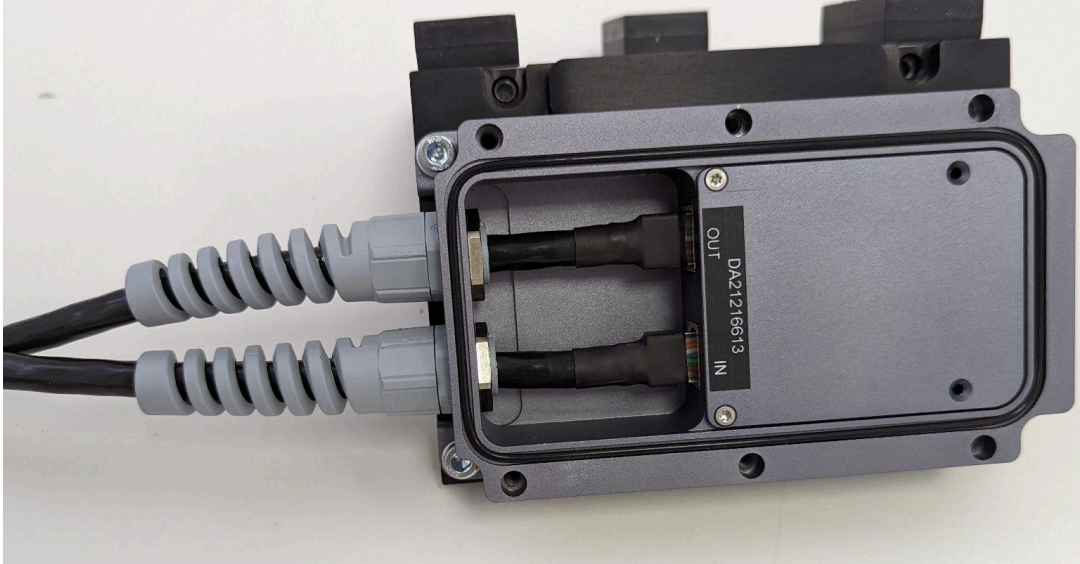
- 10.** Screw the bend relief on the cable gland and make sure to fully insert the cable into the sensor as shown with the red arrow on the figure below. Before tightening the gland, the connector must be fully pushed inside the port! Tighten the bend relief with the special 19 mm wrench.



- 11.** A tightened cable gland is shown below.



12. If the sensor needs to have both cables connected, repeat the same procedure to mount the other cable as well.



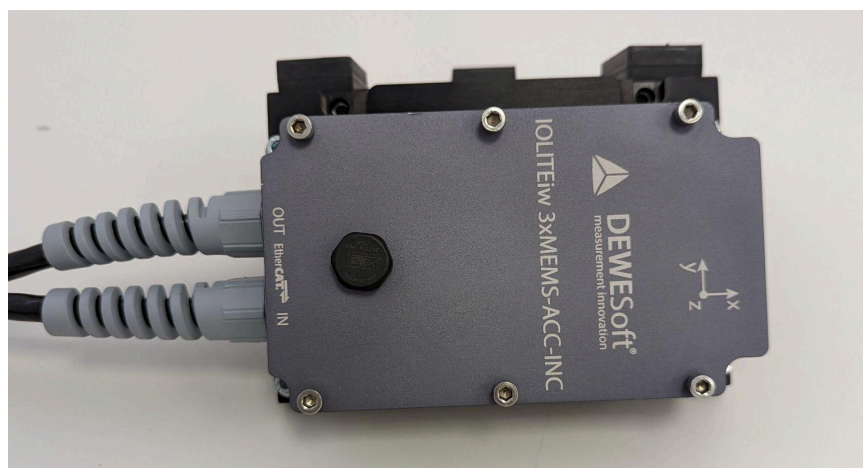
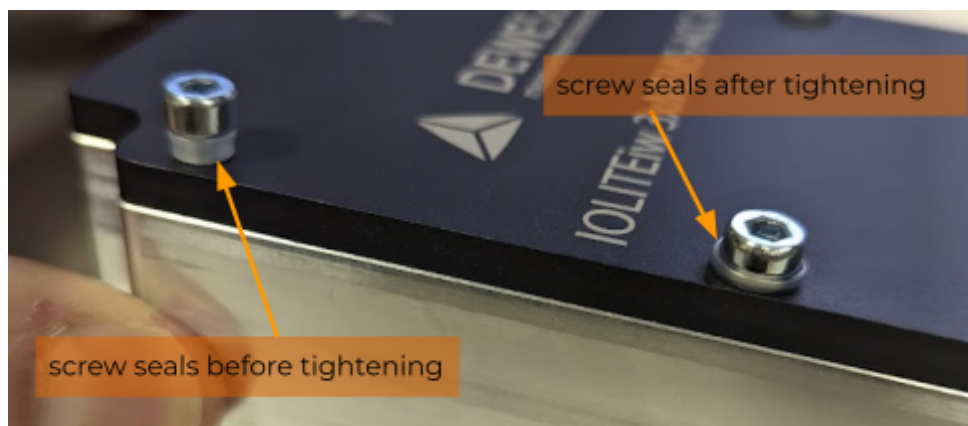
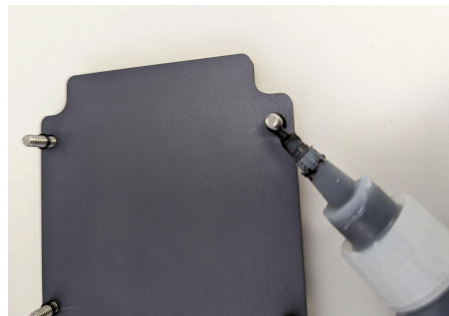
**Note:** An alternative procedure is possible in which the cable gland is only untightened (to the maximum clamping range) but not removed. In that case the cable can be inserted through the cable gland and the connector is crimped after the cable is already passing through the device housing.

- 13.** Attach the cover plate back onto the sensor by applying the threadlocking compound to the screws and tightening them with a 3 mm Allen/imbus key.

**Important:** Tightening torque for the M4 screws: **1.5 Nm** (higher torque might damage the thread in the sensor housing while lower torque might not press the main O-ring seal enough)

**Note:** there are also individual seals mounted around the M4 screws which get squeezed into a washer-shape when the 1.5 Nm is applied. Those seals are used for galvanically isolating the stainless steel screws from the aluminum housing.

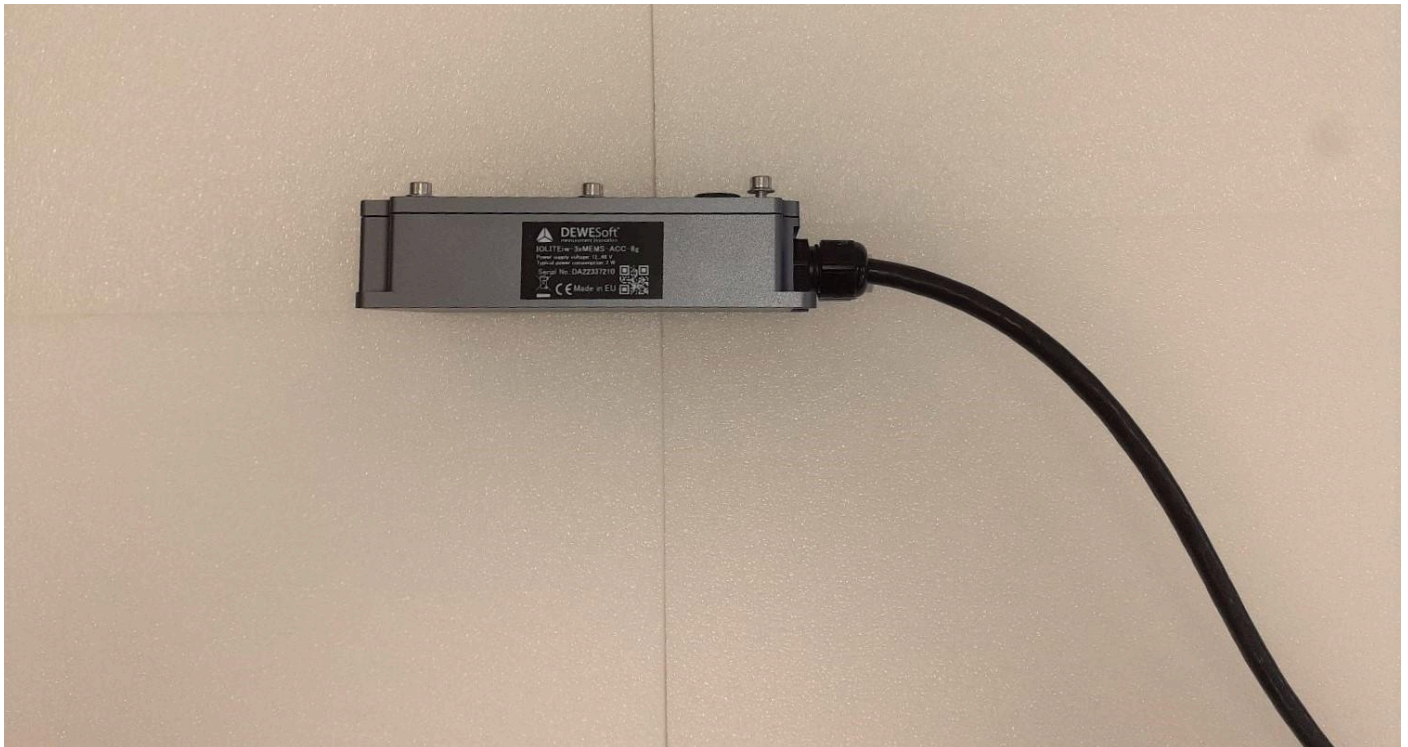
Alternatively the seals can be applied directly to the screw head (green coating).



**Tip:** if for whatever reason you want to unplug the RJ45 connector from the RJ45 port, you can easily release it by using the 3 mm imbus key wrench as seen on the figures below.



- 14.** The cables must be firmly attached to the measured structure in close proximity of the device in order to prevent any loads on the cables pulling them in either direction with respect to the cable glands.
- 15.** The cables must also be routed in downward direction immediately after exiting the device before being turned upwards if necessary. This is to prevent water flowing along the cable into the cable glands.



## Attaching the device to the measured object

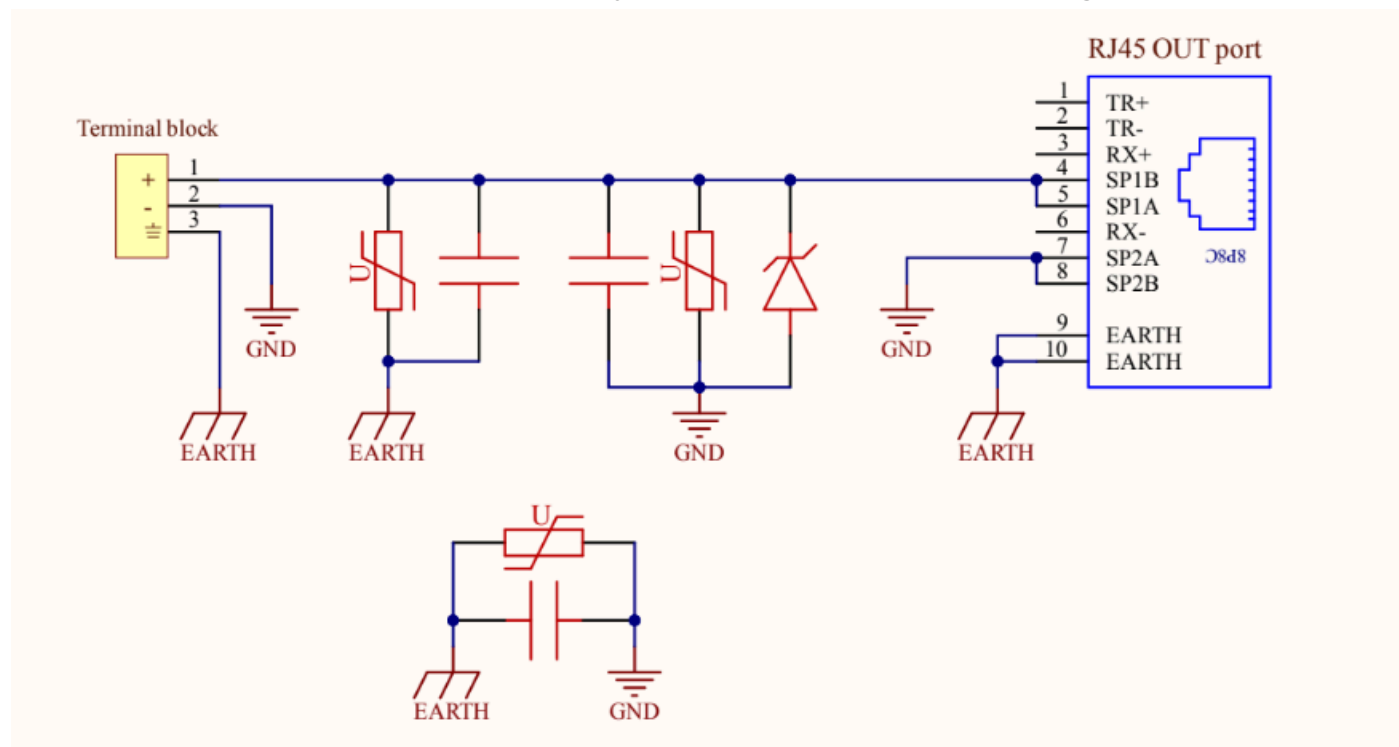
The device needs to be firmly attached to the measured object in order to correctly detect its vibrations. Four 6 mm diameter holes are available for mounting the device with M5 Allen/imbus screws. All four holes should be used. The length of the screws will depend on the mounting surface, but they should be at least 12 mm long. Material of the screws should be stainless steel A4 (316 / 1.4401).



## Appendix 1: IOLITE-POWER-INJECTOR internal GND / EARTH schematic

The figure below shows a simplified internal schematic of the power injector in order to provide insight in case different installation configurations need to be designed by the user.

Note: EARTH in the schematic below is directly connected to the external housing of the device.



## About this document

This is the installation manual for IOLITEiw-3xMEMS-ACC device family.

### Legend

The following symbols and formats will be used throughout the document.



#### **Important**

It gives you important information about the subject.  
Please read carefully!



#### **Hint**

It gives you a hint or provides additional information about a subject.



#### **Example**

Gives you an example of a specific subject.

## Warranty information

### Notice

The information contained in this document is subject to change without notice.

### Note:

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The copy of the specific warranty terms applicable to your Dewesoft product and replacement parts can be obtained from your local sales and service office. To find a local dealer for your country, please visit <https://dewesoft.com/support/distributors>.

## Calibration

Every instrument needs to be calibrated at regular intervals. The standard norm across nearly every industry is annual calibration. Before your Dewesoft data acquisition system is delivered, it is calibrated. Detailed calibration reports for your Dewesoft system can be requested. We retain them for at least one year, after system delivery.

## Support

Dewesoft has a team of people ready to assist you if you have any questions or any technical difficulties regarding the system. For any support please contact your local distributor first or Dewesoft directly.

Dewesoft d.o.o.  
Gabrsko 11a  
1420 Trbovlje Slovenia

Europe Tel.: +386 356 25 300  
Web: <http://www.dewesoft.com>  
Email: [Support@dewesoft.com](mailto:Support@dewesoft.com)  
The telephone hotline is available Monday to Friday from 07:00 to 16:00 CET (GMT +1:00)

## Service/repair

The team of Dewesoft also performs any kinds of repairs to your system to assure a safe and proper operation in the future. For information regarding service and repairs please contact your local distributor first or Dewesoft directly on <https://dewesoft.com/support/rma-service>.

## Restricted Rights

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## Printing History

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# Safety instructions

Your safety is our primary concern! Please be safe!

## Safety symbols in the manual



### Warning

Calls attention to a procedure, practice, or condition that could cause the body injury or death



### Caution

Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

## General Safety Instructions



### Warning

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Dewesoft d.o.o. assumes no liability for the customer's failure to comply with these requirements.

All accessories shown in this document are available as an option and will not be shipped as standard parts.

## Environmental Considerations

Information about the environmental impact of the product.

## Product End-of-Life Handling

Observe the following guidelines when recycling a Dewesoft system:

## System and Components Recycling

Production of these components required the extraction and use of natural resources. The substances contained in the system could be harmful to your health and to the environment if the system is improperly handled at its end of life! Please recycle this product in an appropriate way to avoid unnecessary pollution of the environment and to keep natural resources.



This symbol indicates that this system complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further information about recycling on the Dewesoft web site [www.dewesoft.com](http://www.dewesoft.com)



Restriction of Hazardous Substances

This product has been classified as Monitoring and Control equipment and is outside the scope of the 2002/95/EC RoHS Directive. However, we take care of our environment and the product is lead-free.

## General safety and hazard warnings for all Dewesoft systems

Safety of the operator and the unit depend on following these rules.

- Use this system under the terms of the specifications only to avoid any possible danger.
- Read your manual before operating the system.
- Observe local laws when using the instrument.
- DO NOT touch internal wiring!
- DO NOT use higher supply voltage than specified!
- Use only original plugs and cables for harnessing.
- You may not connect higher voltages than rated to any connectors.
- The power cable and connector serve as Power-Breaker. The cable must not exceed 3 meters, the disconnect function must be possible without tools.
- Maintenance must be executed by qualified staff only.
- During the use of the system, it might be possible to access other parts of a more comprehensive system. Please read and follow the safety instructions provided in the manuals of all other components regarding warning and security advice for using the system.
- With this product, only use the power cable delivered or defined for the host country.
- DO NOT connect or disconnect sensors, probes or test leads, as these parts are connected to a voltage supply unit.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non-interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals.
- Please note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, please read the corresponding specifications in the product manual carefully.

- The inputs must not, unless otherwise noted (CATx identification), be connected to the main circuit of category II, III and IV.
- The power cord separates the system from the power supply. Do not block the power cord, since it has to be accessible for the users.
- DO NOT use the system if equipment covers or shields are removed.
- If you assume the system is damaged, get it examined by authorized personnel only.
- Adverse environmental conditions are Moisture or high humidity Dust, flammable gases, fumes or dissolver Thunderstorm or thunderstorm conditions (except assembly PNA) Electrostatic fields, etc.
- The measurement category can be adjusted depending on module configuration.
- Any other use than described above may damage your system and is attended with dangers like short-circuiting, fire or electric shocks.
- The whole system must not be changed, rebuilt or opened.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until the safe operation can be verified by service-trained personnel. If necessary, return the product to Dewesoft sales and service office for service and repair to ensure that safety features are maintained.
- If you assume a more riskless use is not provided anymore, the system has to be rendered inoperative and should be protected against inadvertent operation. It is assumed that a more riskless operation is not possible anymore if the system is damaged obviously or causes strange noises. The system does not work anymore. The system has been exposed to long storage in adverse environments. The system has been exposed to heavy shipment strain.
- Warranty void if damages caused by disregarding this manual. For consequential damages, NO liability will be assumed!
- Warranty void if damage to property or persons caused by improper use or disregarding the safety instructions.
- Unauthorized changing or rebuilding the system is prohibited due to safety and permission reasons (CE).
- Be careful with voltages >25 VAC or >35 VDC! These voltages are already high enough in order to get a perilous electric shock by touching the wiring.
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not be covered!
- Only fuses of the specified type and nominal current may be used. The use of patched fuses is prohibited.
- Prevent using metal bare wires! Risk of short circuit and fire hazard!
- DO NOT use the system before, during or shortly after a thunderstorm (risk of lightning and high energy over-voltage). An advanced range of application under certain conditions is allowed with therefore designed products only. For details please refer to the specifications.
- Make sure that your hands, shoes, clothes, the floor, the system or measuring leads, integrated circuits and so on, are dry.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- Avoid operation in the immediate vicinity of high magnetic or electromagnetic fields, transmitting antennas or high-frequency generators, for exact values please refer to enclosed specifications.
- Use measurement leads or measurement accessories aligned with the specification of the system only. Fire hazard in case of overload!

- Lithium ion batteries are classified as not hazardous when used according to the recommendations of the manufacturer described in Battery Safety Data Sheet, which is available for download from [this link](#).
- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatise the system unpowered to room temperature.
- Do not disassemble the system! There is a high risk of getting a perilous electric shock. Capacitors still might be charged, even if the system has been removed from the power supply.
- The electrical installations and equipment in industrial facilities must be observed by the security regulations and insurance institutions.
- The use of the measuring system in schools and other training facilities must be observed by skilled personnel.
- The measuring systems are not designed for use in humans and animals.
- Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Please be careful with the product. Shocks, hits and dropping it from already- lower level may damage your system.
- Please also consider the detailed technical reference manual as well as the security advice of the connected systems.
- This product has left the factory in safety-related flawlessness and in proper condition. In order to maintain this condition and guarantee safety use, the user has to consider the security advice and warnings in this manual.

#### EN 61326-3-1:2008

IEC 61326-1 applies to this part of IEC 61326 but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.7 of IEC 61326-1.

Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this product family standard, IEC 61326-3-1.

Devices and systems according to IEC 61508 or IEC 61511 which are considered as “operationally well-tried”, are excluded from the scope of IEC 61326-3-1.

Fire-alarm and safety-alarm systems, intended for the protection of buildings, are excluded from the scope of IEC 61326-3-1.

Documentation version history

Version	Date	Notes
V23-1	2023-02-01	Initial version
V23-2	2023-12-18	Long chain wiring requirements Quick cable connection method
V24-1	2024-02-19	Note on marine environments Power injector internal schematic