

# Grounding and Lightning Protection



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When installing on poles without lightning protection systems, the ODU or external antenna should be placed on the pole at a height that is at least 1 meter below the top of the pole. In this case, there is a significant probability that the lightning strikes the pole and not the ODU or antenna. The pole should be properly grounded: connected to the building lightning protection circuit according to your local regulations. When lightning strikes the external antenna, the current goes through the coaxial cable to the ODU case, which is connected through the ODU clamp to the pole - the pole is grounded. The direct lightning strike to the FTP service cable (ODU-IDU) is partially terminated on the grounded IDU case. Partial termination means that the direct lightning strike will probably destroy an FTP cable. The service cable pickups from the electromagnetic impulses are terminated on the IDU case by the winding shield, and further - on the IDU grounding.



## NOTE

The end of the FTP service cable that is connected to IDU should be assembled with a shielded RJ-45 connector. The other end of the FTP service cable (connected to ODU) should be assembled with unshielded RJ-45 connector.

IDU is grounded via a three-conductor power cord and a grounded socket. The data & power wires pickups are terminated via IDU protection scheme (three-conductor power cord and a grounded socket).



## NOTE

Antenna pole, tower, ODU and lightning arrestor should be connected to the common ground ring. Grounding cables should be no less than 10AWG thick and must use corrosion-resistant connectors. At the end of the FTP cable that connects to the IDU should be used an RJ-45 connector with grounding. At the other end of the cable (connected to the ODU) should be used an RJ-45 connector without grounding.

Special attention should be paid if the antenna used is not DC-shorted. In this case, an additional lightning arrestor should be used between the antenna and ODU.

Grounding diagram is shown in the picture below.

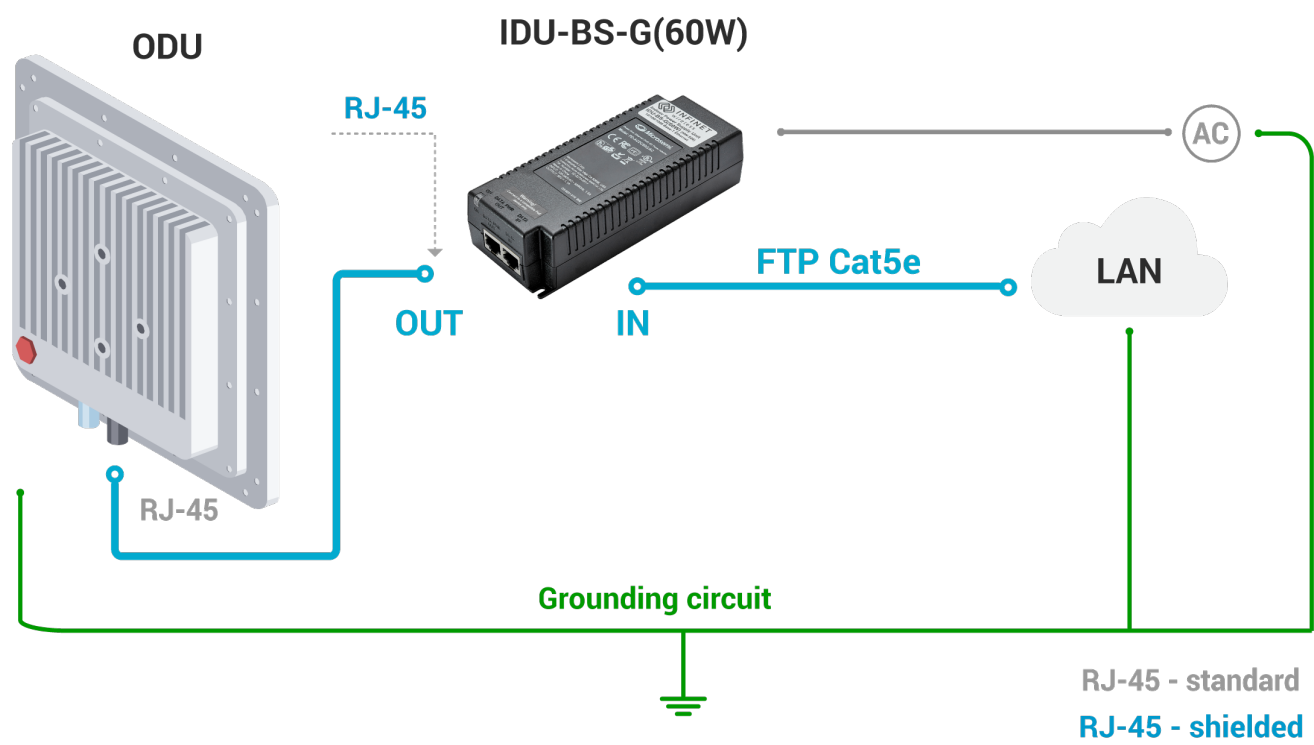


Figure - Grounding Connections Schematics when using IDU-BS-G/IDU-BS-G(60W)

## Grounding when using AUX-ODU-INJ-G

AUX-ODU-INJ-G is an optional accessory, which may be used to connect third-party DC power sources to the ODU (for example, to power the unit from solar power or wind power sources).

AUX-ODU-INJ-G should be properly assembled, mounted and grounded.

### AUX-ODU-INJ-G Mounting

AUX-ODU-INJ-G can be installed on a pole, using hose clamps (2). Attach the grounding cable (min cross-section 2.5 mm<sup>2</sup>) to the case, using grounding bolt (3).

Item	Name
1	Cable gland
2	Clamps

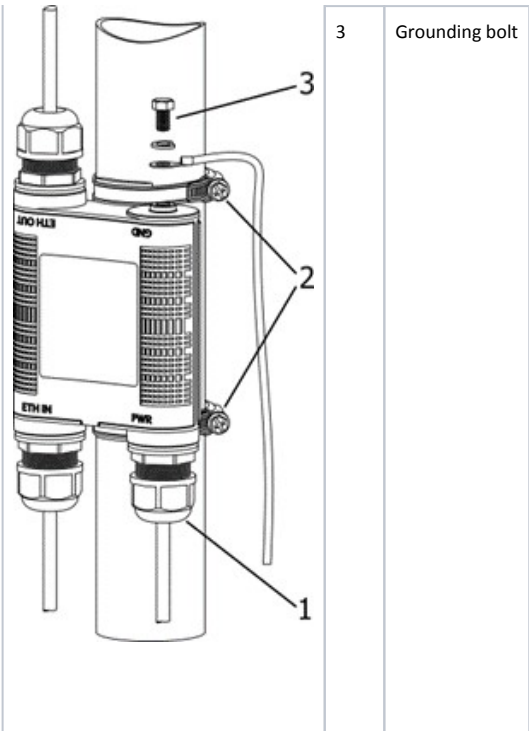


Figure - AUX-ODU-INJ-G Assembly Scheme



**CAUTION**

Missing or bad grounding may leave the unit vulnerable to lightning damage.

**AUX-ODU-INJ-G Cable Gland Assembly**

In order to ensure that the cable gland remains sealed under any environmental conditions, please, follow the assembly sequence according to procedure below:

- 1) Put the cable gland nut (1), the split sealing grommet (2) and the cable gland threaded coupling (3) onto the cable FTP Cat5e
- 2) Crimp the connector onto the cable using the crimping tool:



**CAUTION**

Make sure that the connector is well crimped. A loose connector can damage the device. Please note that such damage is not covered by the warranty.

- For connection to "ETH IN" terminate the cable with the unshielded RJ-45 connector (4) according to the EIA/TIA-568B
- For connection to "ETH OUT" terminate the cable with the shielded RJ45 connector (5) according to the EIA/TIA-568B (to provide grounding circuit)
- For connection to "PWR" terminate a cable with the power connector (6).



**NOTE**

Allowed to use a pre-crimped cable with RJ-45 connectors.

- 3) Insert the connector of the pre-terminated cable into the corresponding socket until you hear a click.
- 4) Screw the cable gland threaded coupling (3) into the port and tighten it. Do not apply excessive force.
- 5) Tighten the sealing grommet (2) by the cable gland nut (1). Do not apply excessive force.

Item	Name
1	Cable gland nut

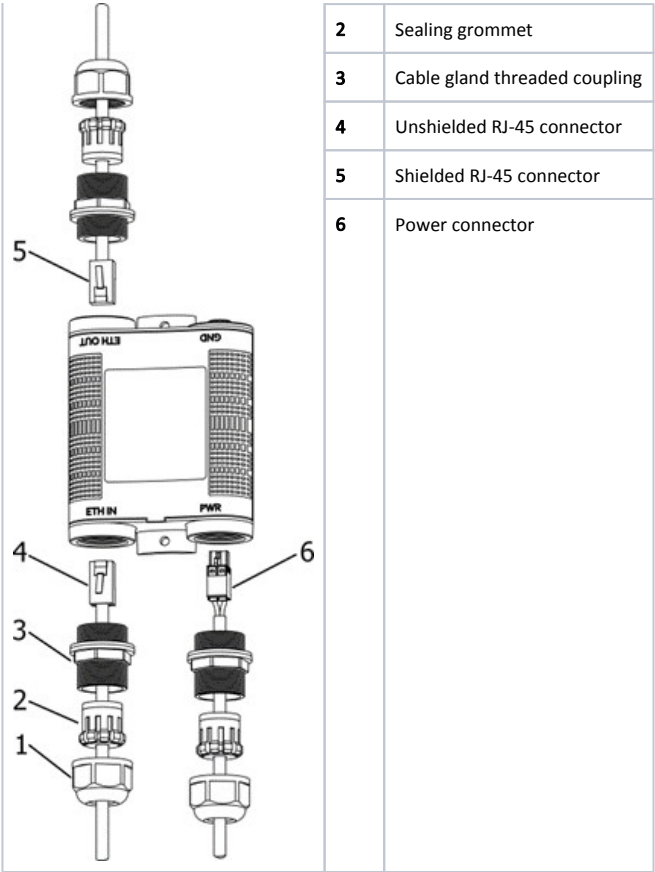


Figure - AUX-ODU-INJ-G Cable Gland Assembly

Power connector scheme is below

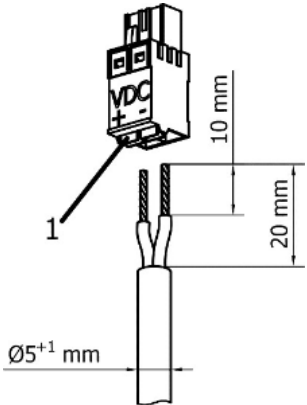


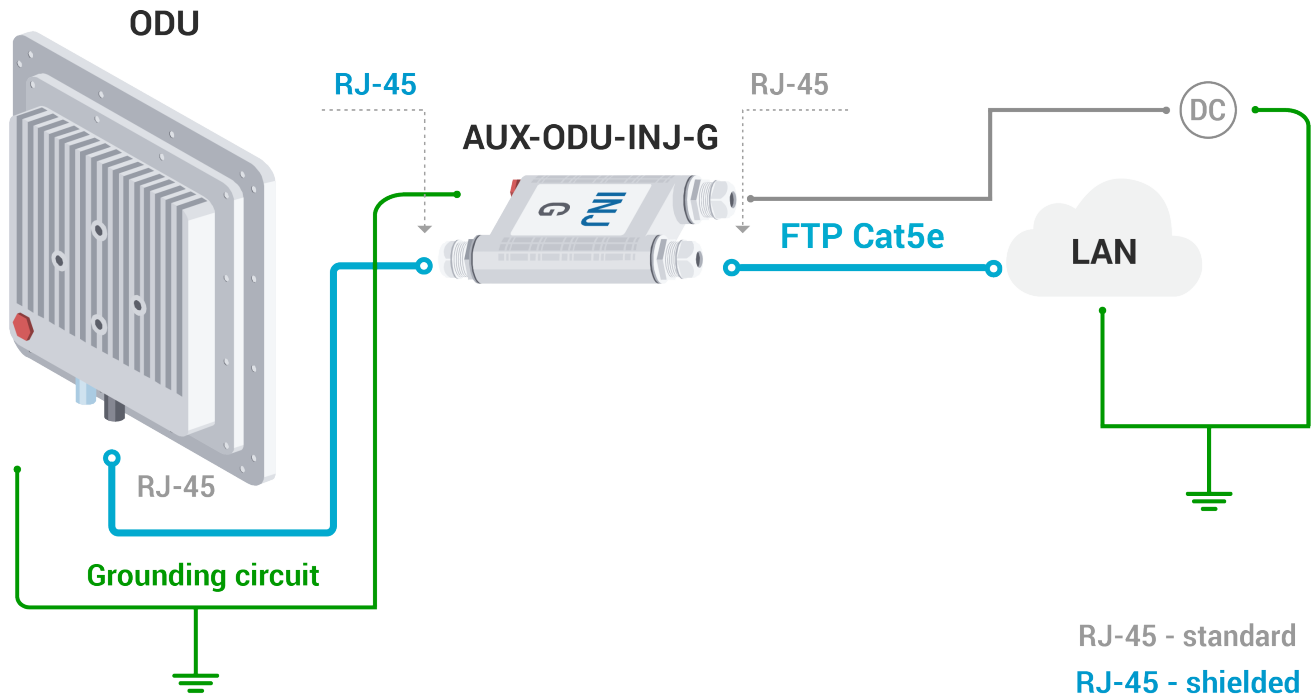
Figure - AUX-ODU-INJ-G power connector

Follow requirements:

- 1. Press on these catchers (1) when the cable is terminated;
- 2. Use the round cable with diameter from 5mm to 6mm with conductor cross-section from 0.5mm to 2.5mm;
- 3. FTP Cat5e cable may be used.

AUX-ODU-INJ-G Grounding Scheme

The grounding and lightning protection initial procedures when using AUX-ODU-INJ-G are similar to those when using regular IDU.



## Grounding when using AUX-ODU-LPU-L

AUX-ODU-LPU-L is an optional accessory which may be used to serve as a line protection unit for the ODU and for the indoor network equipment connected to the Ethernet port of the IDU. AUX-ODU-LPU-L should be properly assembled, mounted and grounded.

General recommendations for installations of lightning protection units:

- Install the lightning protection unit on both ends of the cable to protect both the outdoor and the indoor unit. The purpose of the LPU at the top is to protect the ODU from a surge of lightning strike which can hit the long FTP cable run along the height of the pole or on the roof of the building. The purpose of the LPU at the bottom is to protect the IDU and customer equipment.
- Use the lightning protection unit to protect all circuits for signal transmission and power supply (video, audio, management signals, Ethernet, etc.)
- Regularly (especially before the periods with high thunderstorm activity) check the integrity of lightning protection units, grounding elements and bonding conductors.
- The ports of the AUX-ODU-LPU-L device are symmetrical, i.e. the correspondence of ports position to the external unit and the power supply does not matter.

Make sure to install the two LPU devices as shown in the scheme below.

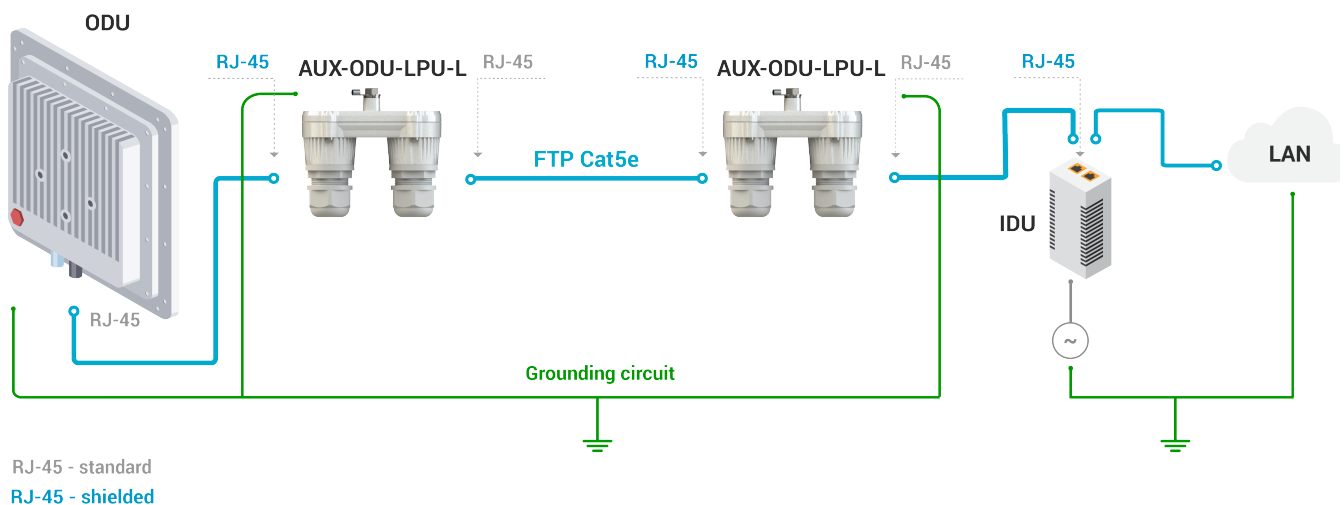


Figure - Connection scheme

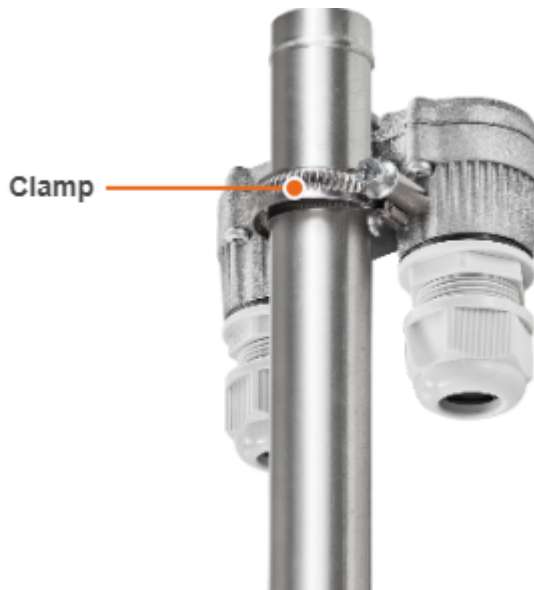


### CAUTION

Please note grounding cables should not be connected to the mast. All devices must use separate grounding cable that should be connected to the grounding circuit. The best scenario is when grounding cables are lined parallel to the Ethernet cable.

## AUX-ODU-LPU-L Mounting

AUX-ODU-LPU-L is installed on a mast, using clamp. Attach the grounding cable (min cross-section  $2.5 \text{ mm}^2$ ) to the case, using grounding bolt. An M6x10 grounding bolt is included in the supply list.



**Figure - AUX-ODU-LPU-L Mounting**

During AUX-ODU-LPU-L mounting it is necessary to provide a small loop of the FTP cable that should be below the cable gland. This ensures that water is not constantly channeled towards the connector. It will also serve as a cable compensation for the cable linear expansion as the temperature difference result.



Figure - Cable loop



**CAUTION**

Missing or bad grounding may leave the unit vulnerable to lightning damage.

### AUX-ODU-LPU-L Cable Gland Assembly

In order to ensure that the cable gland remains sealed under any environmental conditions, please, follow the assembly sequence according to the procedure below:

- **Step 1:** Insert the sealing insert into the clamping claw.
- **Step 2:** Assemble the cable gland by putting the thread-lock sealing nut, clamping claw with sealing insert and body onto the cable as shown on the figure.
- **Step 3:** Insert the clamping claw with sealing insert into the body as shown on the figure.
- **Step 4:** Crimp the standard RJ-45 connector onto the cable using crimping tool. Pin-out scheme: T568B wiring standards.



**CAUTION**

Make sure that the RJ-45 connector is well-crimped. A loose connector can damage the device. Please note that such damage is not covered by the warranty.

- **Step 5:** Insert the RJ-45 connector into the corresponding socket until you hear a click.
- **Step 6:** Screw the cable gland body into the port and tighten it. Do not apply excessive force.
- **Step 7:** Tighten the thread-lock sealing nut. Do not apply excessive force.

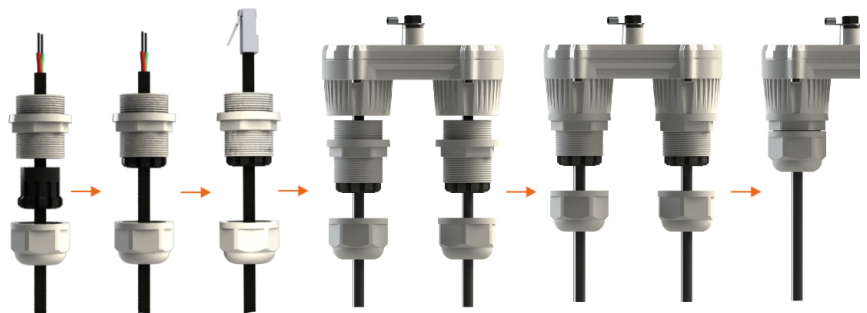


Figure - Cable gland assembly

## Grounding when using AUX-ODU-LPU-G

AUX-ODU-LPU-G is an optional accessory which may be used to serve as a line protection unit for the ODU and for the indoor network equipment connected to the Ethernet port of the IDU.

AUX-ODU-LPU-G should be properly assembled, mounted and grounded.

General recommendations for installations of lightning protection units:

- Install the lightning protection unit on both ends of the cable to protect both the outdoor and the indoor unit. The purpose of the LPU at the top is to protect the ODU from a surge of lightning strike which can hit the long FTP cable run along the height of the pole or on the roof of the building. The purpose of the LPU at the bottom is to protect the IDU and customer equipment.
- Use the lightning protection unit to protect all circuits for signal transmission and power supply (video, audio, management signals, Ethernet, etc.)
- Regularly (especially before the periods with high thunderstorm activity) check the integrity of lightning protection units, grounding elements and bonding conductors.

Make sure to install the two LPU devices as shown in the scheme below. The ports connection order does not matter for LPU.

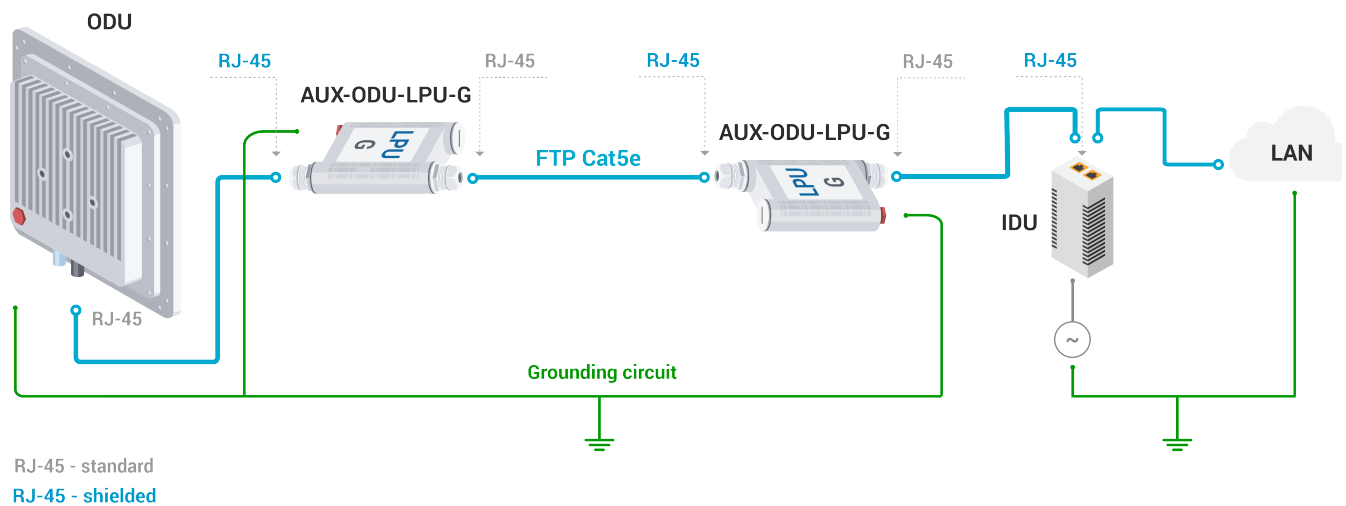


Figure - AUX-ODU-LPU-G Assembly Scheme



### CAUTION

Please note grounding cables should not be connected to the mast. All devices must use separate grounding cable that should be connected to the grounding circuit. The best scenario is when grounding cables are lined parallel to the Ethernet cable.

## AUX-ODU-LPU-G Mounting

AUX-ODU-LPU-G can be installed on a pole, using hose clamps. Attach the grounding cable (min cross-section  $2.5 \text{ mm}^2$ ) to the case, using grounding bolt. An M6x10 grounding bolt is included in the supply list.



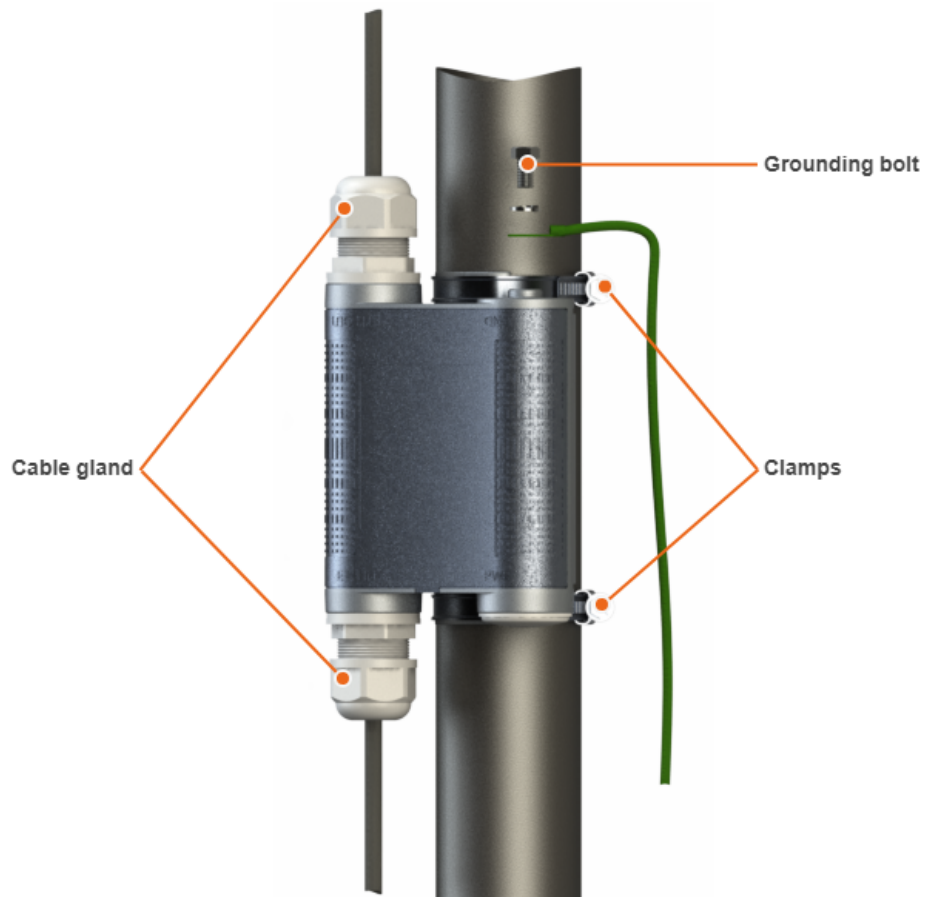


Figure - AUX-ODU-LPU-G Mounting

During AUX-ODU-LPU-G mounting it is necessary to provide a small loop of the FTP Cat5e cable that should be below the cable gland. These ensure that water is not constantly channeled towards the connectors. It will also serve as a cable compensator for the cable linear expansion as the temperature difference result.

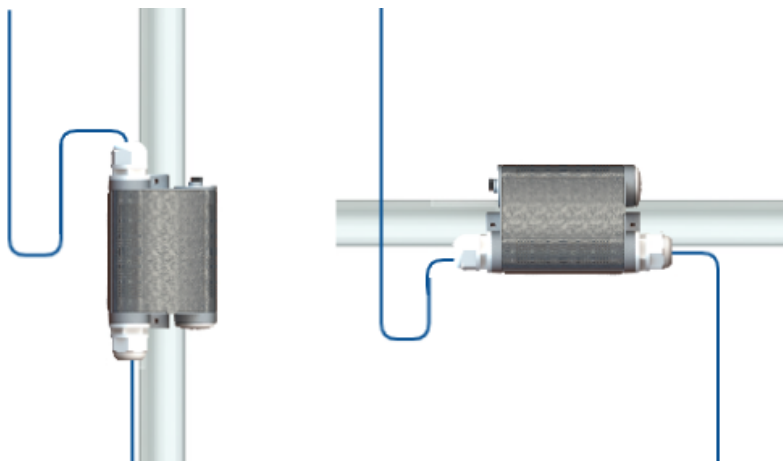


Figure - Cable loop

**CAUTION**

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## AUX-ODU-LPU-G Cable Gland Assembly

In order to ensure that the cable gland remains sealed under any environmental conditions, please, follow the assembly sequence according to the procedure below:

- **Step 1:** Insert the sealing insert into the clamping claw.
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**CAUTION**

Make sure that the RJ-45 connector is well-crimped. A loose connector can damage the device. Please note that such damage is not covered by the warranty.

- **Step 5:** Insert the RJ-45 connector into the corresponding socket until you hear a click.
- **Step 6:** Screw the cable gland body into the port and tighten it. Do not apply excessive force.
- **Step 7:** Tighten the thread-lock sealing nut. Do not apply excessive force.

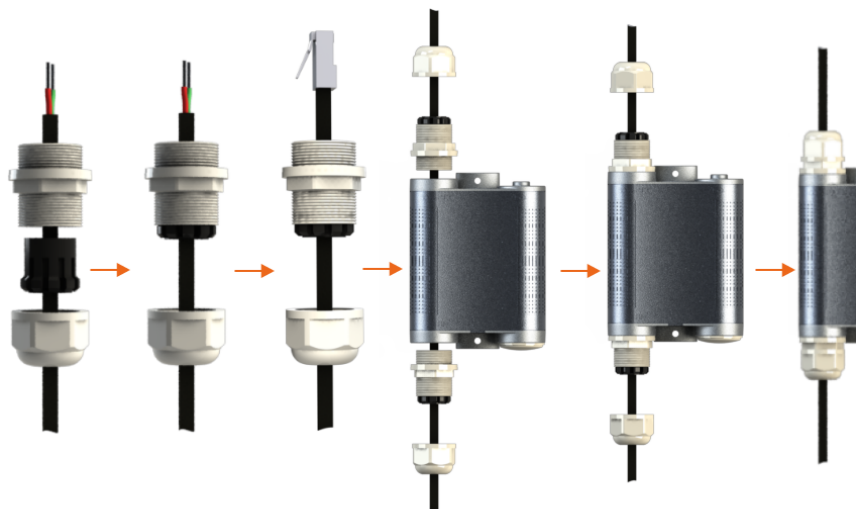


Figure - AUX-ODU-LPU-G Cable Gland Assembly Scheme