



INSTALLATION GUIDE

LPU and Grounding Kit



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About this guide

This guide describes how to install the LPU and Grounding Kit (Cambium part number C000065L007B).

This kit can be used to protect the following product families:

- PTP 650
- PTP 670
- PTP 700
- PMP 450i, PTP 450i, PMP 450m

The kit contains two lightning protection units and LPU ground cables. One kit is used for each of the PSU and AUX copper Cat5e Ethernet interfaces to the Outdoor Unit (ODU).

Users of this guide will require expertise in outdoor radio equipment installation.

Related documents

For full installation instructions, refer to the User Guide for the appropriate product.

Important regulatory information

USA specific information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Waste Electrical and Electronic Equipment (WEEE)

For instructions on waste disposal of used products, refer to:

<http://www.cambiumnetworks.com/support/compliance/>

ATEX/HAZLOC Installation Guidance

ATEX Certificate: EMT16ATEX0051X

IECEX Certificate: IECEX EMT 16.0028X

Special conditions for ATEX/HAZLOC Installation of the PTP-LPU:

1. Connection and disconnection of terminals and plugs when the equipment is energised is strictly prohibited.
2. Only ATEX certified AC + DC Enhanced Power Injector models (EMT16ATEX0052X / IECEX EMT 16.0029X) provided by Cambium Networks Ltd may be used in conjunction with the equipment.
3. The connections into the hazardous areas from the AC + DC Enhanced Power Injector (EMT16ATEX0052X/ IECEX EMT 16.0029X) to the LPU are at incandive energy levels and so they shall be made using protective shielded cable that provides protection from impact and damage in accordance with EN/IEC 60079-14.

Supporting Documents:

LPU and Grounding Kit Installation Guide (this document):

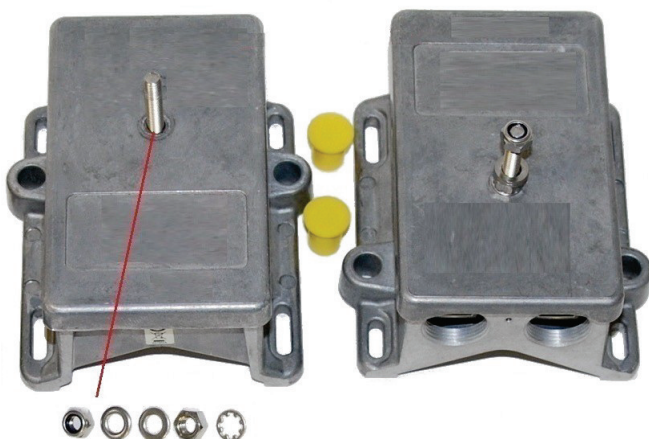
PTP-LPU Hazardous Location Installation Guide:

Components and tools

LPU and grounding kit (Cambium part number C000065L007B)

This kit contains the following components:

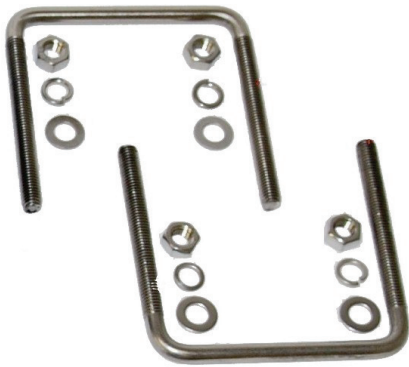
Lightning protection units (LPUs), Model Number A005030
LPU grounding point nuts and washers



ODU to top LPU drop cable (600 mm)
EMC strain relief cable glands



U-bolts, nuts and washers for mounting LPUs



ODU to top LPU ground cable (M6 lugs at both ends), bolt and washers



Bottom LPU ground cable (M6 and M10 lugs)



ODU to grounding system ground cable (M6 and M10 lugs), bolt and washers



Warning The LPU contains insulation tape fitted to the top of the printed circuit board. Do not remove this tape, as hazardous voltages are present within the unit.



Note If LPUs are being installed, use only the five EMC cable glands supplied in the LPU and grounding kit (with black caps). Do not use the non-EMC cable glands (with silver caps) supplied in the ODU kits (with silver caps), as they are only intended for non-surge applications.



Note Ensure that the LPUs and ODU are connected using the correct Cat5e cable and connectors, as described below.

Outdoor Cat5e cable (drop cable) and accessories

For copper Cat5e connections from the ODU to the PSU, LPUs and other devices, use Cat5e cable that is gel-filled and shielded with copper-plated steel, for example Superior Essex type BBDGe.



Attention Always use Cat5e cable that is gel-filled and shielded with copper-plated steel. Other types of drop cable are not supported for use with the LPU.

Order Superior Essex type BBDGe cable from Cambium Networks in 330 m (1000 ft) or 100 m (328 ft) lengths:

Cambium description	Cambium part number
1000 ft Reel Outdoor Copper Clad CAT5E	WB3175
328 ft (100 m) Reel Outdoor Copper Clad CAT5E	WB3176

Other lengths of this cable are available from Superior Essex.

RJ45 connectors are required for plugging Cat5e cables into ODUs, LPUs, PSUs and other devices.



Note The parts listed in this table work with Superior Essex type BBDGe cable (as supplied by Cambium Networks). They may not work with other types of cable.

Order RJ45 connectors and crimp tool from Cambium Networks:

Cambium description	Cambium part number
Tyco/AMP, Mod Plug RJ45, 100 pack	WB3177
Tyco/AMP Crimp Tool	WB3211

Copper drop cable shields must be bonded to the grounding system in order to prevent lightning creating a potential difference between the structure and cable, which could cause arcing, resulting in fire risk and damage to equipment. One grounding kit is required for each grounding point on the PSU, Aux and copper SFP drop cables.

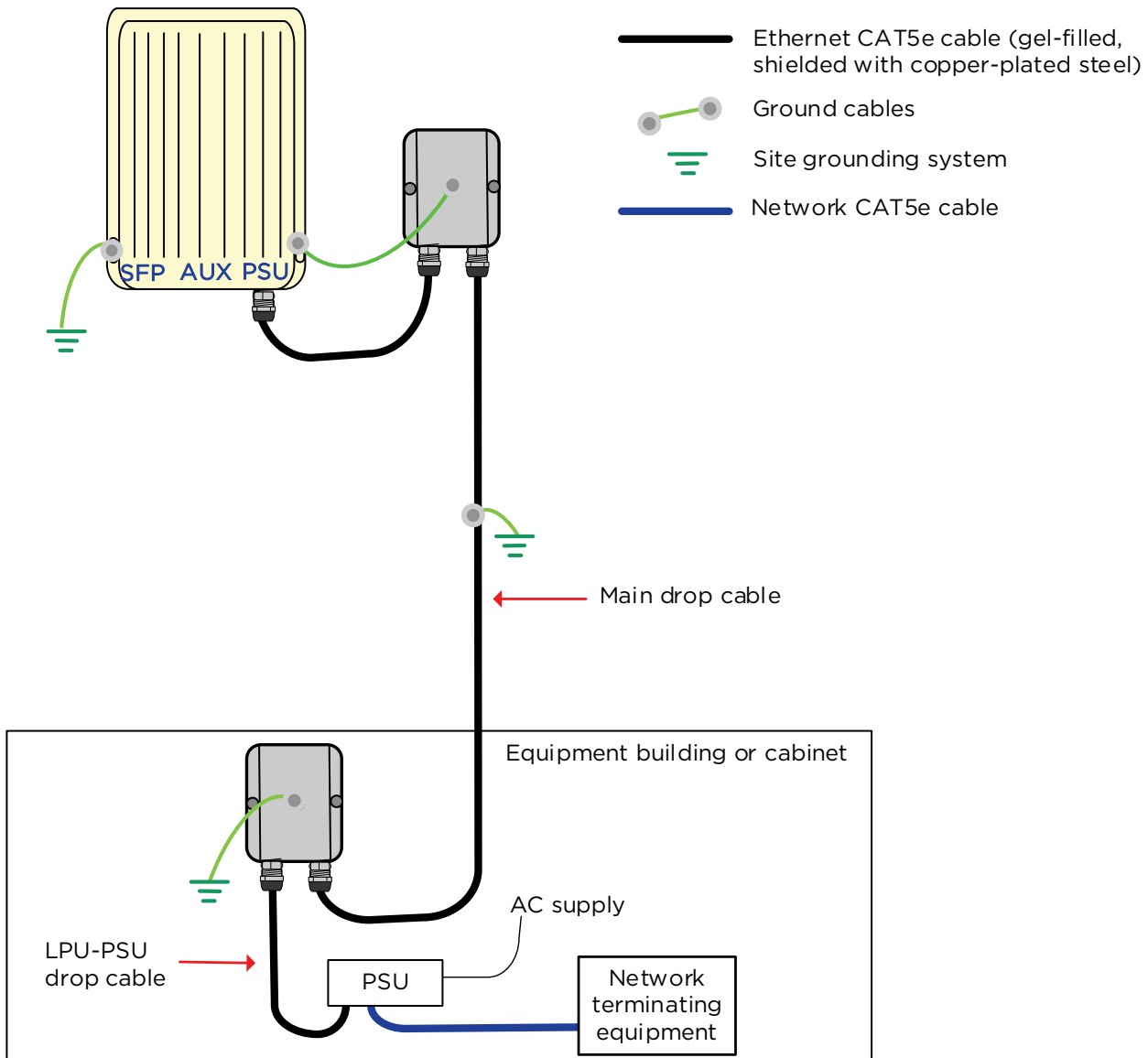
Order Cable Grounding Kits from Cambium Networks:

Cambium description	Cambium part number
Cable Grounding Kit For 1/4" And 3/8" Cable	01010419001

Typical deployment

A PTP 650/670/700, PMP 450i, PTP 450i or PMP 450m site typically consists of a high supporting structure such as a mast, tower or building for the outdoor equipment (ODU and optional external antenna); and an equipment building or moisture-proof enclosure for the indoor equipment (PSU).

In the basic configuration, there is only one Ethernet interface, a copper Cat5e connection from the ODU (PSU port) to the PSU and network terminating equipment, as shown here:



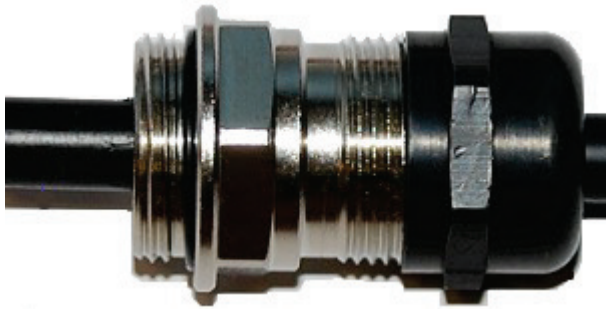
In more complex configurations, there may be up to three copper Cat5e Ethernet interfaces to the ODU. The PSU and AUX interfaces each require one LPU and Grounding Kit (Cambium part number C000065L007B). The LPUs are not suitable for installation on copper SFP interfaces.

If the tower is higher than 61 m (200 ft), the drop cable shield must be grounded at the tower midpoint, and at additional points as necessary to reduce the distance between ground cables to 61 m (200 ft) or less. In high lightning-prone areas, reduce the spacing between grounding points to 15 m (49 ft).

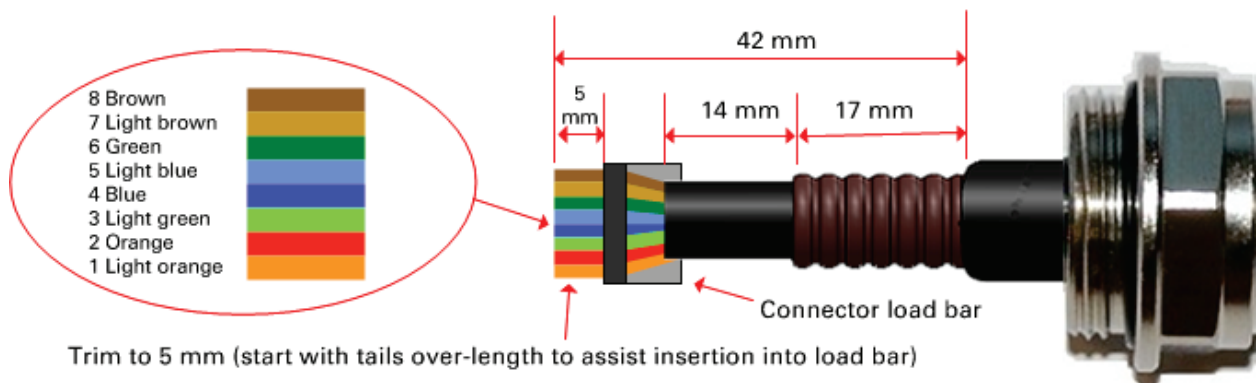
Drop cable preparation

Main drop cable and LPU-PSU drop cable

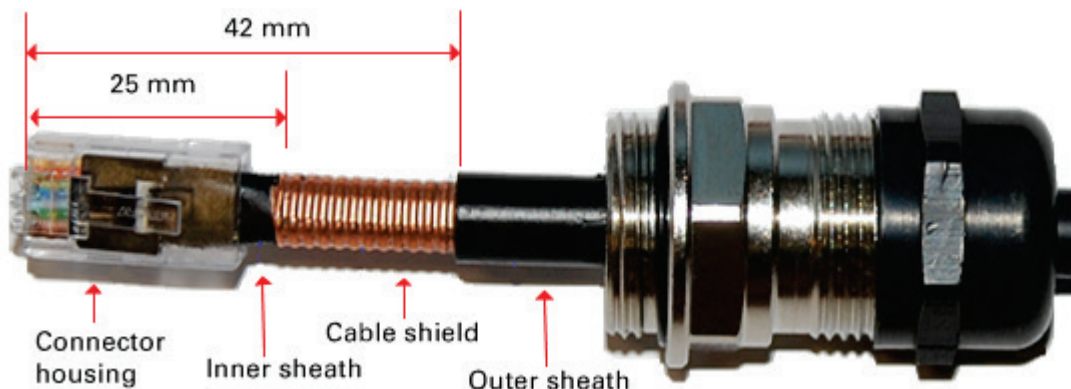
- 1 Cut two lengths of drop cable: one from top LPU to bottom LPU and one from bottom LPU to PSU.
- 2 Thread two glands over the main drop cable (one at each end). Thread one gland over the LPU-PSU drop cable (at LPU end only). Do not tighten the gland nuts:



- 3 At the LPU ends of these cables, strip the cable ends and fit RJ45 connector load bars:



- 4 At the LPU ends of these cables, fit the RJ45 connector housings as shown. To ensure there is effective strain relief, locate the cable inner sheath under the connector housing tang:



Consult the appropriate User Guide for information about preparing the PSU end of the drop cable.

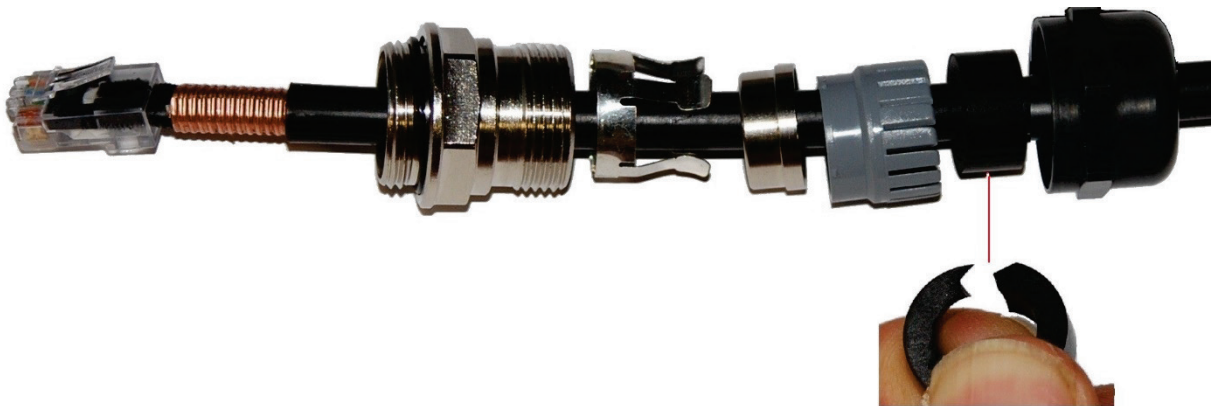
ODU-LPU drop cable

This cable is provided in the LPU kit. Thread two glands over the ODU-LPU drop cable (one at each end). As this cable is supplied terminated with RJ45 connectors, disassemble the glands and thread their components over the RJ45 connector as shown.

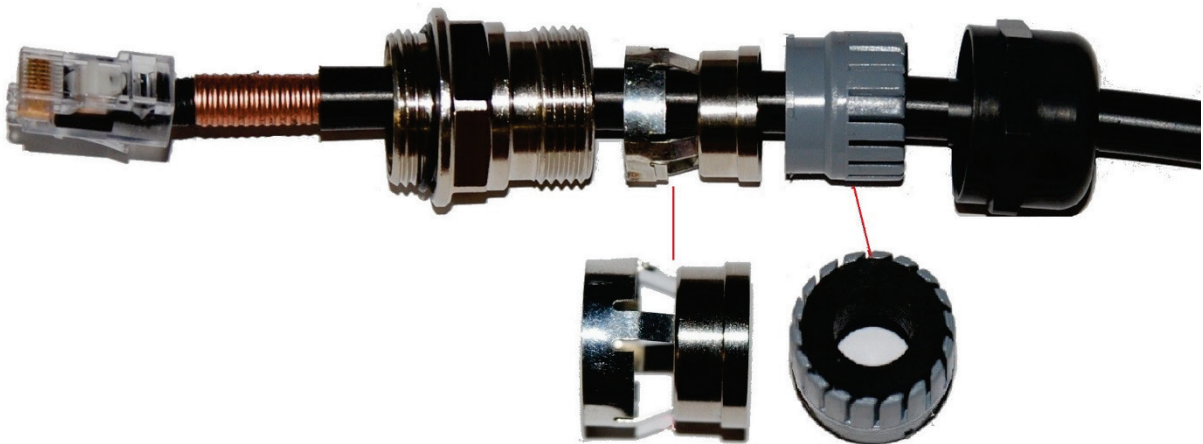
- 1 Disassemble the gland:



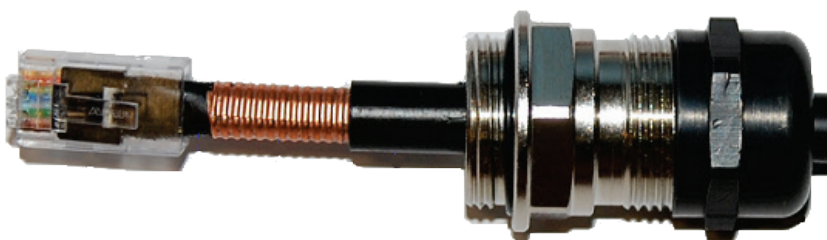
- 2 Thread each part onto the cable (the rubber bung is split):



- 3 Assemble the spring clip and the rubber bung (the clips go inside the ring):



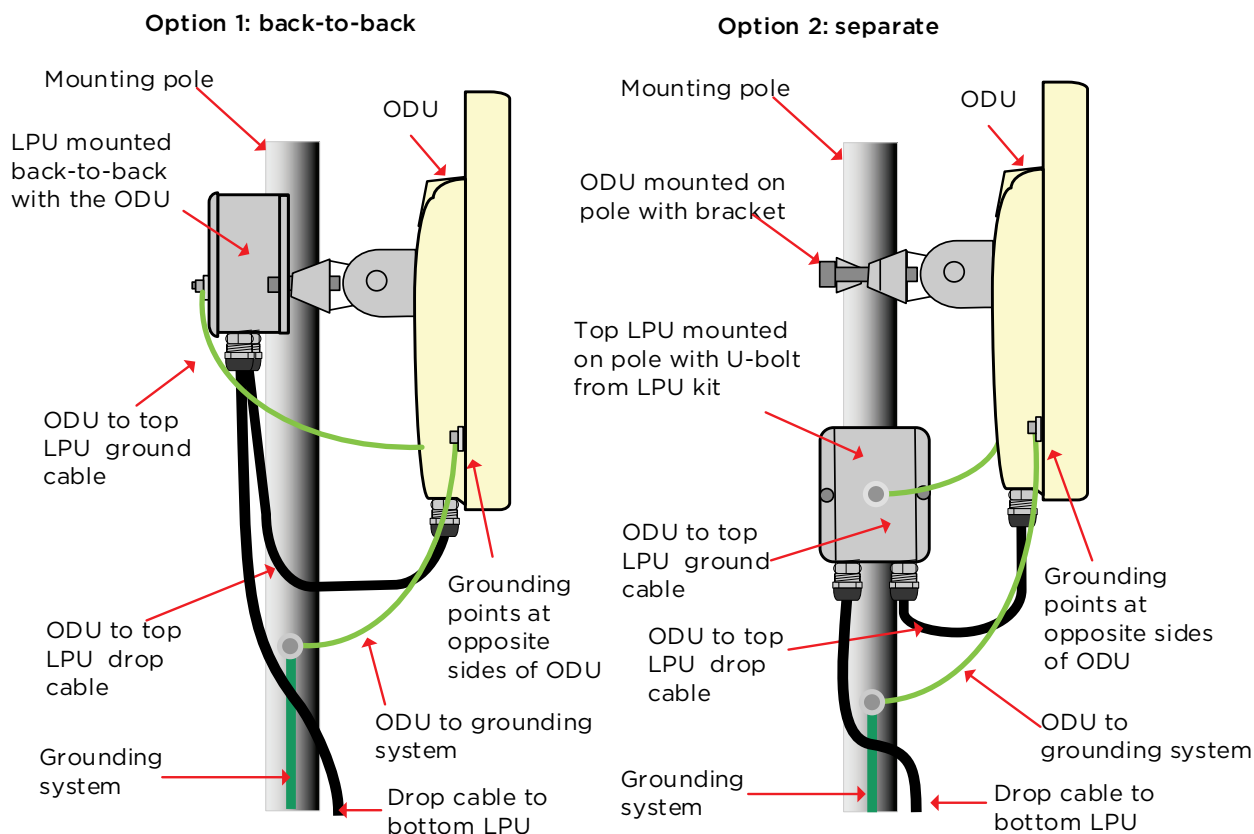
- 4 Fit the parts into the body and lightly screw on the gland nut (do not tighten it):



Installing and grounding the LPUs

Top LPU

- 1 Select the preferred mounting option - back-to-back or separate:



- 2 Mount the ODU and top LPU, ensuring that the LPU is vertical with cable entry points facing downwards. Tighten both ODU bracket bolts to a torque of 14 Nm (11 lb ft).
- 3 Connect the ODU (PSU port) to the top LPU (either port) using the 600 mm drop cable supplied in the LPU kit, following the procedure in [Connecting drop cables to the LPU and ODU](#) on page 12.
- 4 Ensure that the main drop cable is fixed to the tower or building. Connect the top LPU (other port) to the main drop cable, following the procedure in [Connecting drop cables to the LPU and ODU](#) on page 12. Fasten the two drop cables such that they are not coiled together and do not cross each other.
- 5 Fasten one ground cable to each ODU grounding point using the M6 (small) lugs: one is for the top LPU (M6 lug at other end) and the other is for the tower or building (M10 lug at other end). PTP 650/670/700 is illustrated below, but the same procedure applies to PMP 450i, PTP 450i and PMP 450m. It does not matter which cable goes on which grounding point. Tighten both grounding bolts to a torque of 5 Nm (3.9 lb ft):

M6 lug

M6 lug



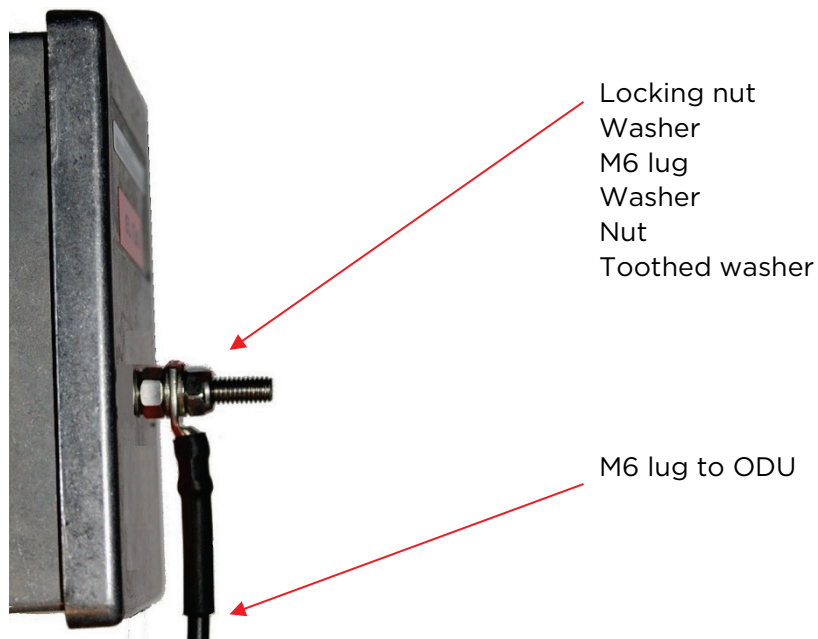
M6 lug to top LPU

M10 lug to ground

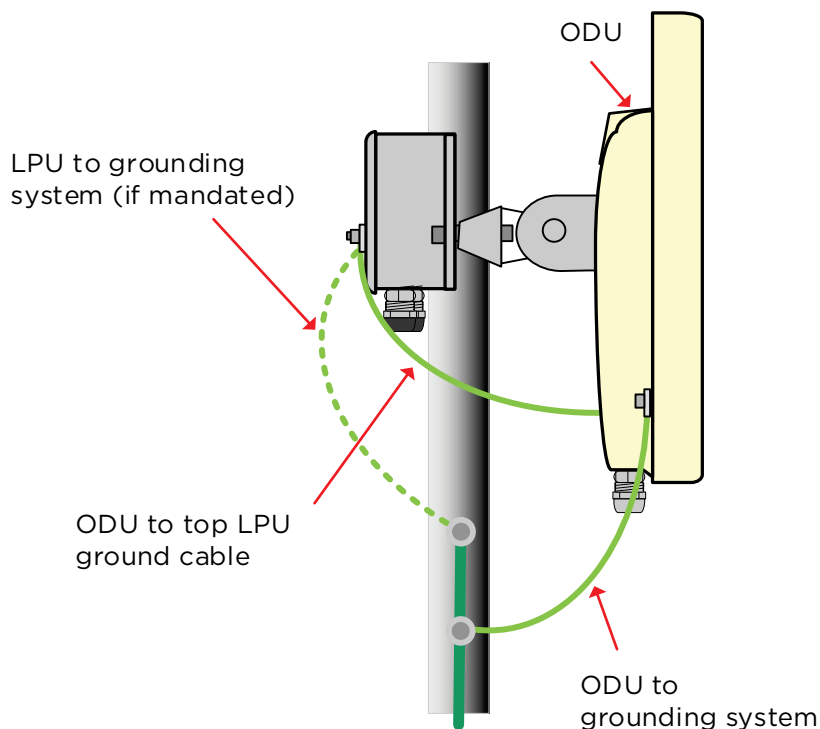
Bolt
Toothed washer
M6 lug
Toothed washer



- 6 Fasten one ground cable to the top LPU using the M6 (small) lug. Tighten both nuts to a torque of 5 Nm (3.9 lb ft):

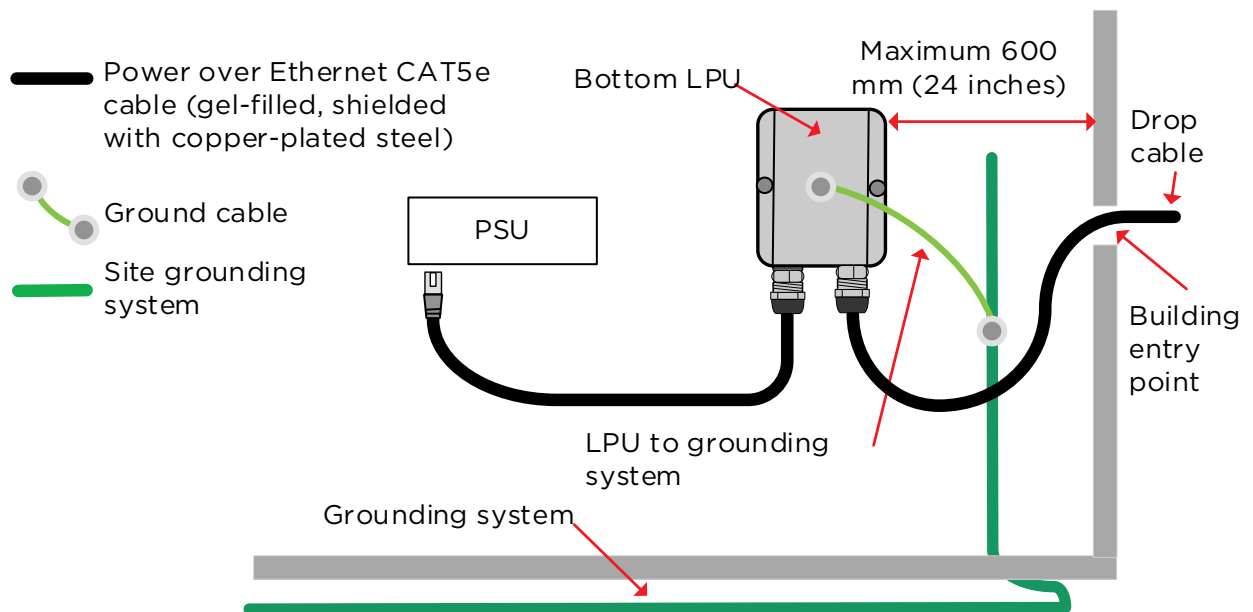


- 7 Select a tower or building grounding point within 0.3 meters (1 ft) of the ODU bracket on the same metal. Remove paint from the surface and apply anti-oxidant compound. Fasten the ODU grounding cable to this point using the M10 (large) lug.
- 8 If local regulations mandate the independent grounding of all devices, add a third ground cable to connect the top LPU directly to the grounding system:

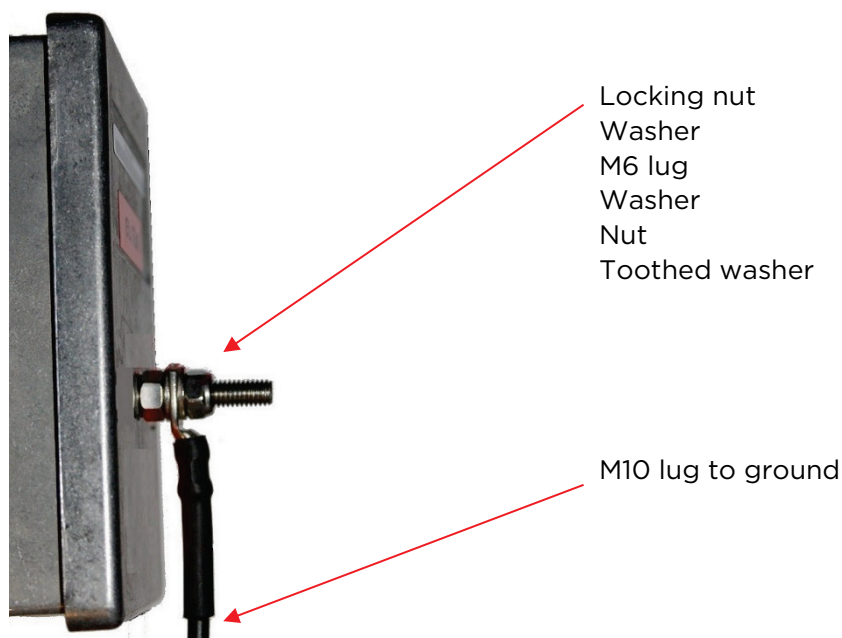


Bottom LPU

- 1 Select a mounting point for the bottom LPU within 600 mm (24 in) of the building entry point. The LPU can be inside or outside the building. Mount the LPU vertically with cable entry points facing downwards:



- 2 Connect the two drop cables into the RJ45 ports of the bottom LPU, following the procedure in [Connecting drop cables to the LPU and ODU](#).
- 3 Fasten one ground cable to the bottom LPU using the M6 (small) lug. Tighten both nuts to a torque of 5 Nm (3.9 lb ft):

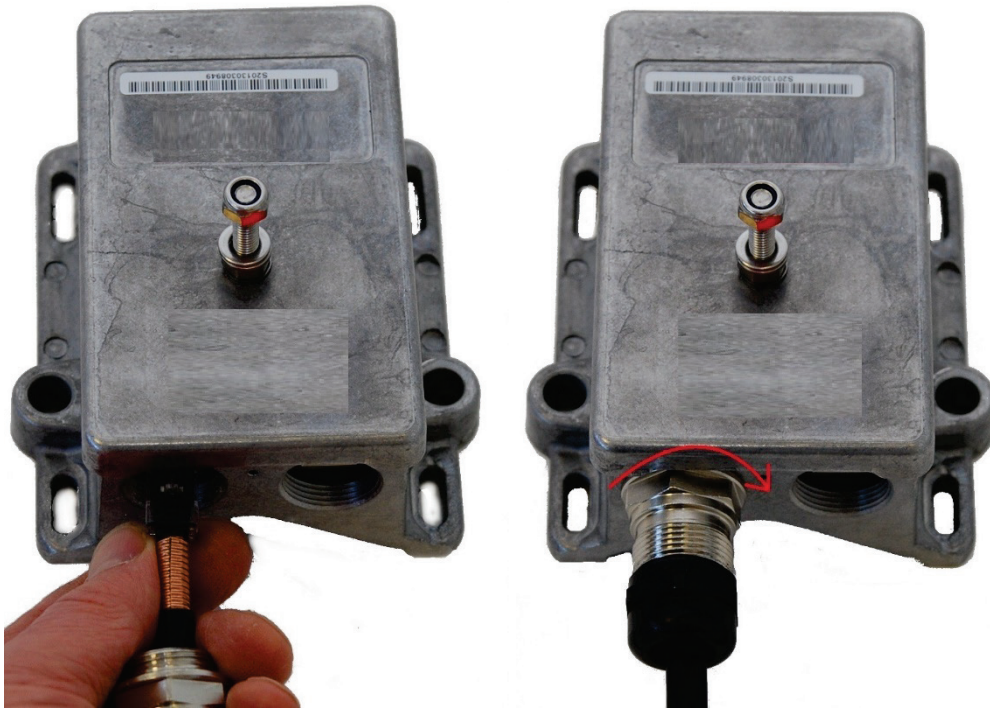


- 4 Select a building grounding point near the LPU bracket and on the same metal. Remove paint from the surface and apply anti-oxidant compound. Fasten the LPU ground cable to this point using the M10 (large) lug.

Connecting drop cables to the LPU and ODU

(LPU illustrated)

- 1 Plug the RJ45 connector into the socket in the unit, ensuring that it snaps home. Fit the gland body to the RJ45 port and tighten it to a torque of 5.5 Nm (4.3 lb ft):



- 2 Fit the gland nut and tighten until the rubber seal closes on the cable. Do not over-tighten the gland nut, as there is a risk of damage to its internal components:



- 3 To dismantle the gland, loosen the nut first, before removing the gland body.

Test resistance in the power cable

Before connecting the bottom end of the copper Cat5e drop cable to the PSU or network terminating equipment, connect it to a cable adaptor and test that the resistances between pins are within the correct limits. If any of the tests fail, examine the drop cable for wiring faults.

Connection to a terminated cable can be achieved reliably by use of a suitable cable adaptor. One example is the Modapt adaptor manufactured by The Siemon Company.

Cable length		Maximum Resistance (Ohm) between RJ45 pins
Ft	m	1 & 2, 3 & 6, 4 & 5, 7 & 8
0	0	0.8
33	10	2.8
66	20	4.8
88	30	6.8
131	40	8.8
164	50	10.8
197	60	12.8
230	70	14.8
262	80	16.8
295	90	18.8
328	100	20.8

Minimum Resistance (Ohm) between Adaptor pins		
1 & Screen	8 & Screen	1 & 7
> 100 K	> 100 K	> 2 K



Note Ensure that these resistances are within 10% of each other by multiplying the lowest resistance by 1.1. If any resistance is greater than this, the test has failed.



Note There is no need to measure resistance between Pins 4-5 and 7-8 for the AUX Port of PMP 450i or PTP 450i, because the Aux Port does not support 1000BASE-T.

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