



Cambium Networks™











INSTALLATION GUIDE

DC LPU and Grounding Kit

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About this guide

This guide describes how to install the DC LPU and Grounding Kit (Cambium part number C000000L114A).

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

- 3 GHz PMP 450m (power port only)

The kit contains two lightning protection units (LPUs) and LPU ground cables. One kit is used for the DC power port of the PMP 450m Outdoor unit (ODU).

Copper Cat5e Ethernet interfaces to the ODU should be protected with the LPU part number C000065L007B.

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.

Waste Electrical and Electronic Equipment (WEEE)

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

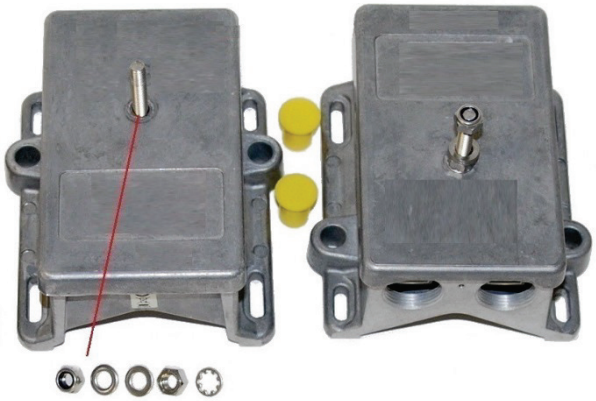
http://www.cambiumnetworks.com/support/compliance/

Components and tools

LPU and grounding kit (Cambium part number C000000L114A)

This kit contains the following components:

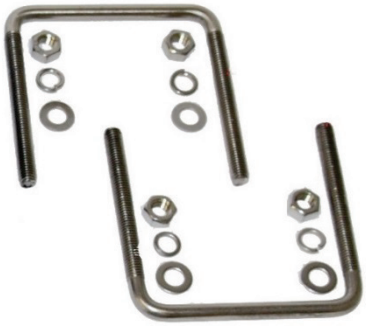
Lightning protection units (LPUs)
LPU grounding point nuts and washers



EMC strain relief cable glands



U-bolts, nuts and washers for mounting LPUs



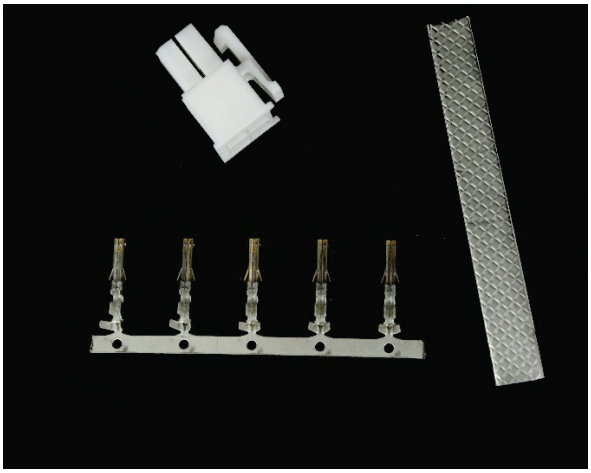
ODU to top LPU ground cable
(M6 lugs at both ends), bolt and washers



ODU to grounding system ground cable,
bottom LPU ground cable (2pcs, M6 and M10 lugs), bolt and washers



4-pin connector kits (4 kits, one shown)



Note When installing LPUs, use only EMC cable glands supplied in the ODU and LPU kits (with black caps). Do not use the non-EMC cable glands supplied in other kits (with silver caps), as these may only be used in ODU installations without LPUs.

Note The four-pin connector may be supplied with a black or white shell.

Outdoor power cable and accessories

For power connections from the ODU to the PSU, LPUs and other devices, use 2-pair (4-core) power cable that has conductor size 0.75mm^2 or 1.0mm^2, a UV-resistant sheath and is shielded with copper-braid.

Suitable cable is Lapp type 1032126 (0.75mm^2) or 1032131 (1.0mm^2).

Four-pin connectors are required for plugging power cables into ODUs and LPUs.

Order spare power connectors and the crimp tool from Cambium Networks:

Cambium description	Cambium part number
DC Power connector kit, 18 AWG, packet of 10 (for 0.75mm^2 cable)	N000000L123A
DC Power connector kit, 16 AWG, packet of 10 (for 1.0mm^2 cable)	N000000L124A
Molex crimp tool (Molex 63819-0901) for 18 AWG crimp terminals	N000000T001A
Molex crimp terminal removal tool (for rework) (Molex 11-03-0044)	N000000T002A

Cable shields must be bonded to the grounding system 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 power cable.

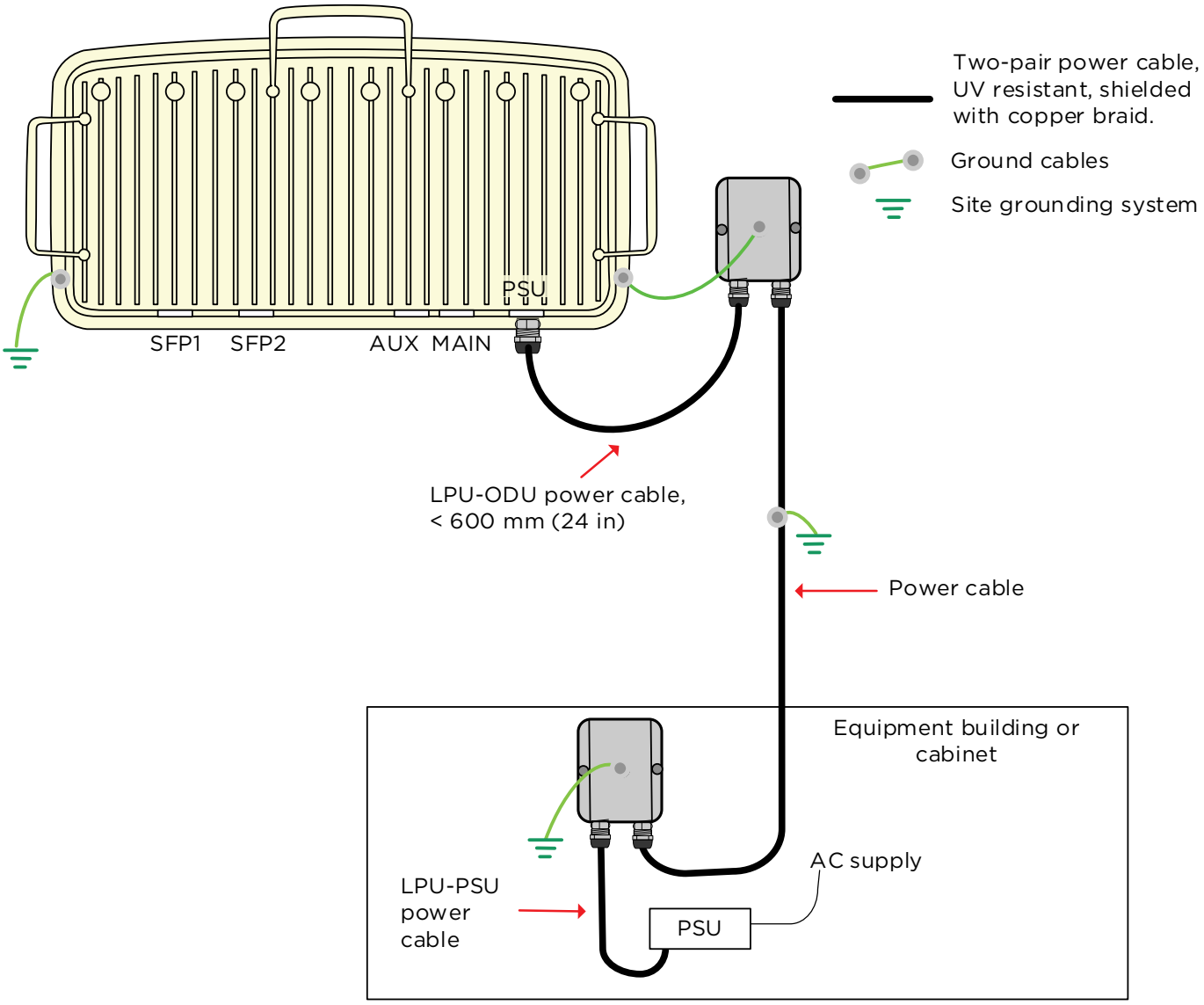
Order Cable Grounding Kits from Cambium Networks:

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

Typical deployment

A PMP 450m site typically consists of a high supporting structure such as a mast, tower or building for the outdoor equipment (ODU); and an equipment building or moisture-proof cabinet for the indoor equipment (PSU).

In the basic configuration, there is a power cable and one or more Ethernet cables. Only the power cable and DC LPUs are shown here:

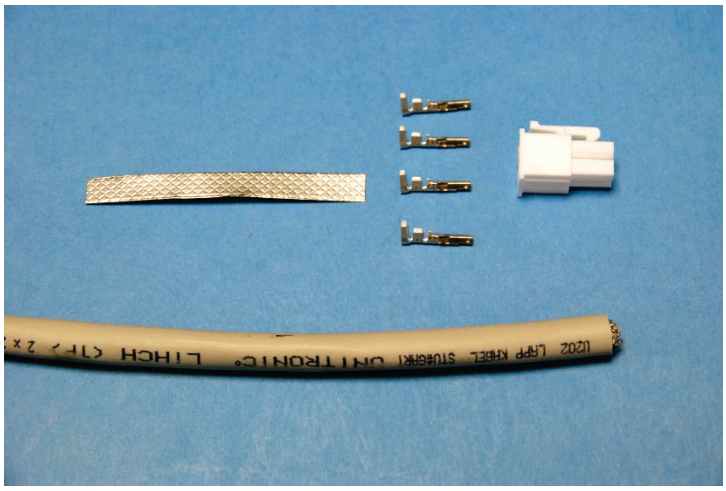
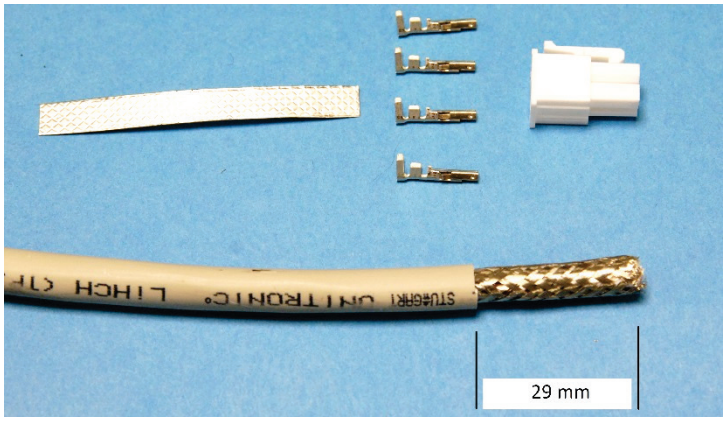
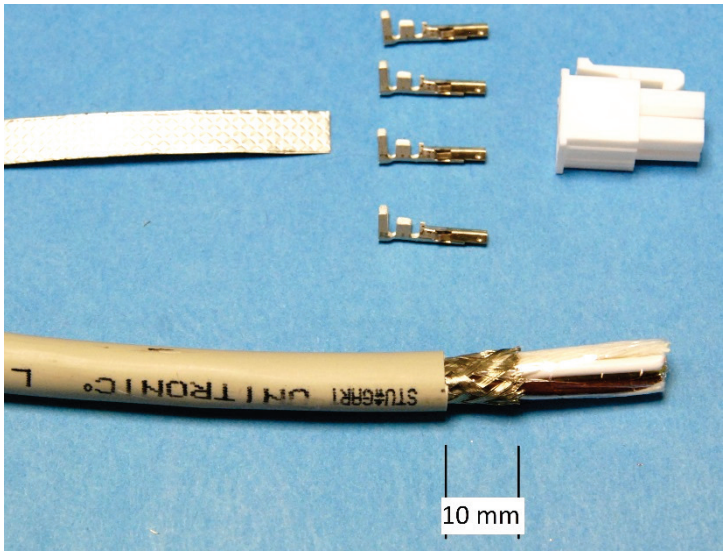


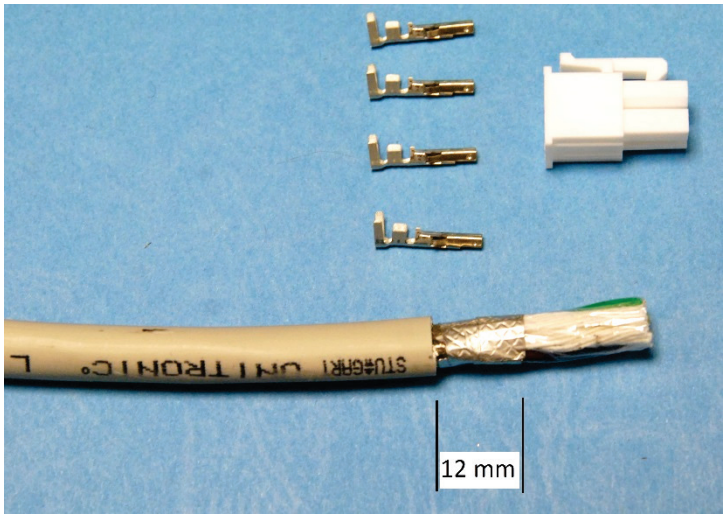
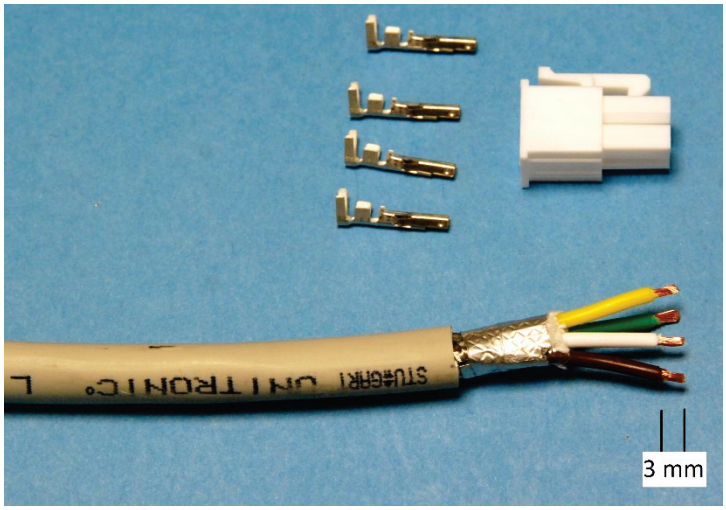
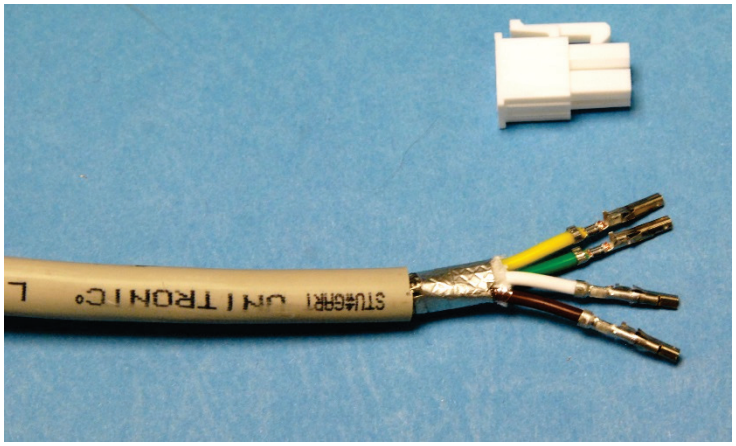
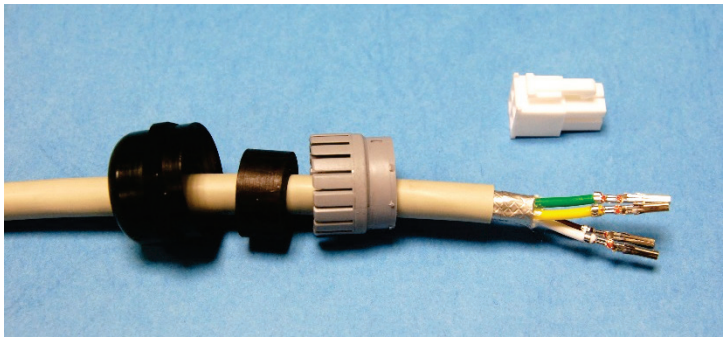
Copper Cat5e Ethernet interfaces should be protected using an LPU and Grounding Kit (Cambium part number C000065L007B).

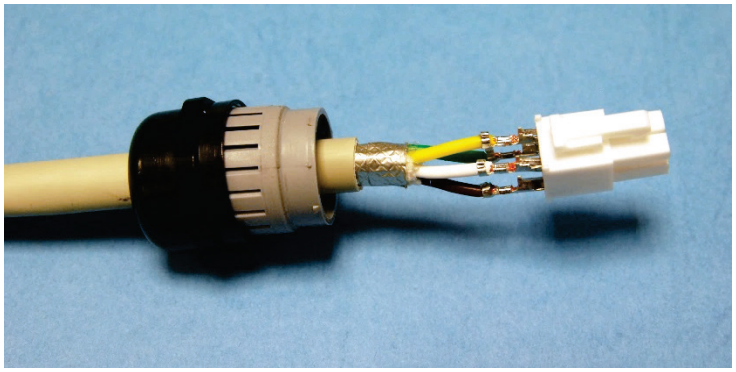
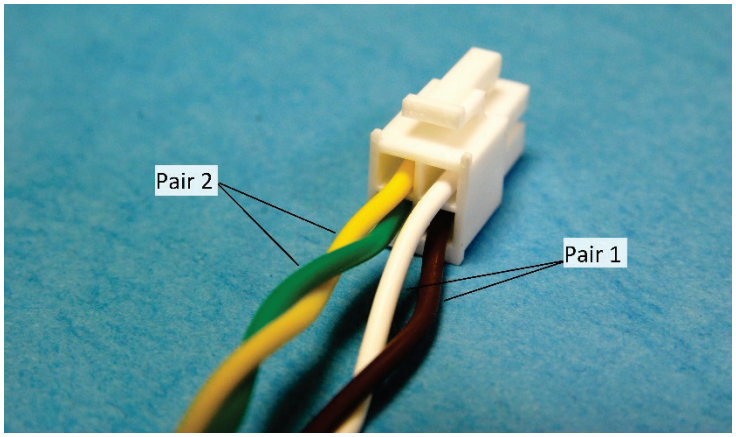
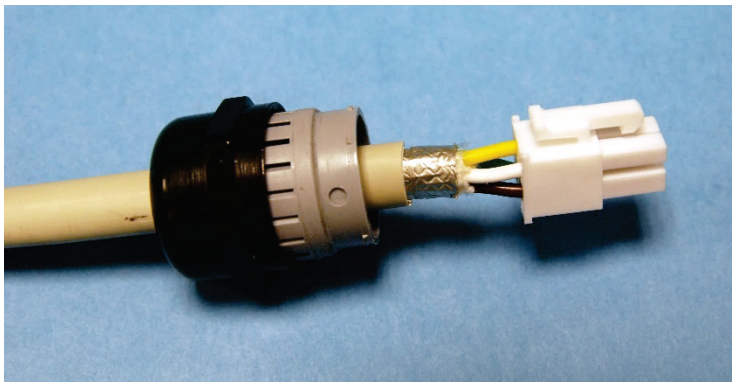
If the tower is higher than 61 m (200 ft), the power cable shield must be grounded at the tower midpoint, and at additional points as necessary to reduce the distance between ground points to 61 m (200 ft) or less. In high lightning-prone areas, reduce the spacing between grounding points to 15 m (49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

Power cable preparation and termination

Prepare the power cables for connection at the ODU or LPUs as shown in the following illustrations. Cable construction and colours may vary between suppliers. The termination at the PSU is not illustrated.

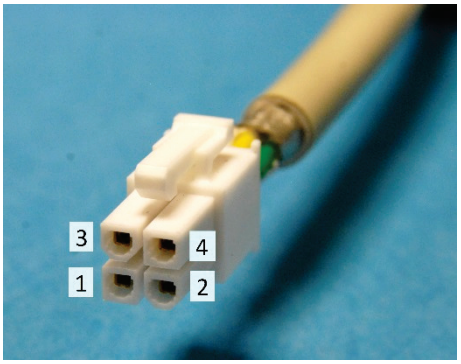
1		Cable, and connector kit Ensure that you have the parts shown. Connector kits may contain a 5th (spare) crimp terminal.
2		Remove 29 mm of the outer sheath
3		Trim the braid back to a length of 10 mm. Ensure that there are no loose strands.

4		Remove the backing from the tin-plated copper tape, then wrap the tape firmly around the braid for 12 mm (so the tape extends 2mm beyond the trimmed braid). Ensure again that there are no loose strands.
5		Trim away any wrappings and filling. Strip 3 mm of insulation from the end of each wire. The wires must be of equal length.
6		Fit the crimp terminals to each wire. Ensure that the outer “wings” secure only the insulation, and that the inner “wings” secure only the conductor (copper).
7		Fit the gland nut, seal and cage over the wire. Important: do this before fitting the plug body.

8		Fit the crimp teminals into the plug body. The crimp “wings” are uppermost, facing the plug latch. Ensure that the nut, seal and cage are fitted before fitting the plug.
9		A 4-core cable arranged as 2 twisted pairs is recommended. It is important that the pairs are connected as shown in the picture. The colours shown are those in the Lapp 1032126 (0.75mm^2) and 1032131 (1.0mm^2) cables.
10		Push the crimp terminals fully into the plug body. Move the plug body from side to side to ensure that all 4 terminals are snapped into place.

Connector pin numbering

The plug pins are numbered as shown below.

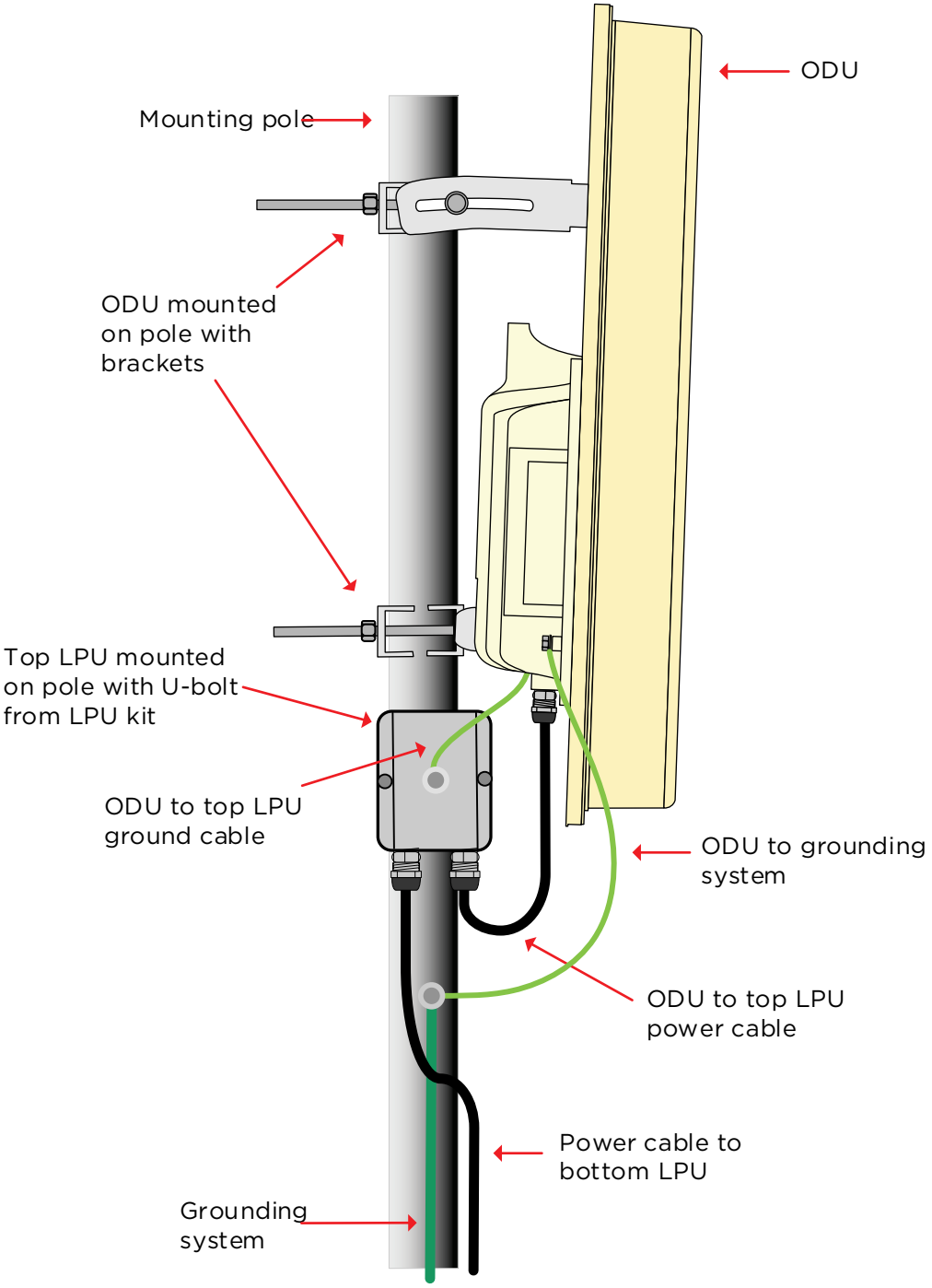


Pin	Power supply connection
1, 2	Positive
3, 4	Negative

Installing and grounding the LPUs

Top LPU

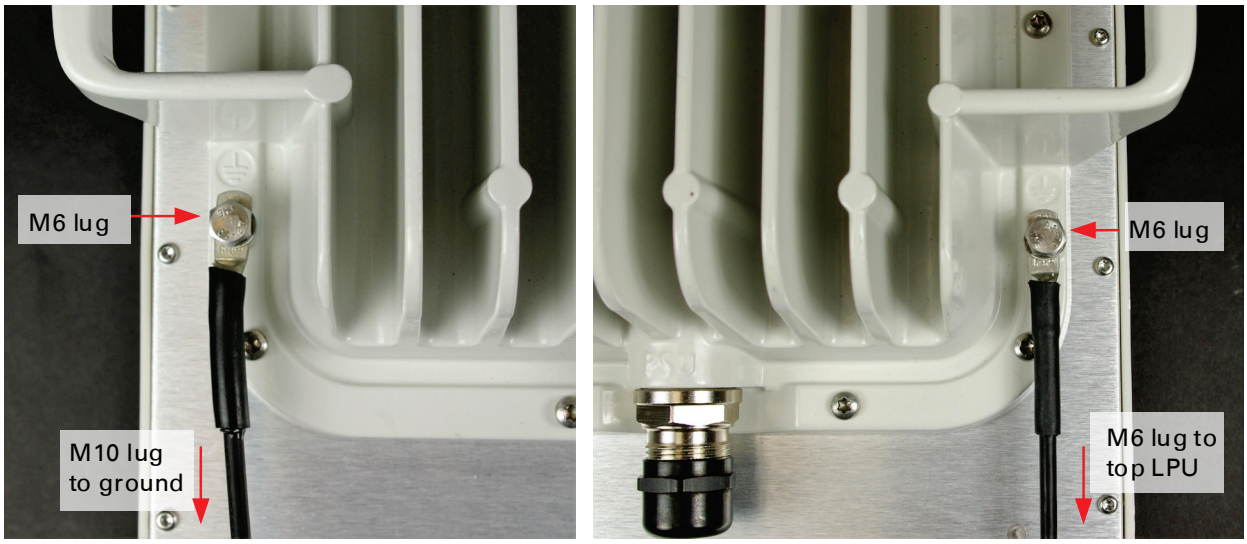
1 Mount the ODU and top LPU, ensuring that the LPU is vertical with cable entry points facing downwards. Tighten all ODU bracket bolts to a torque of 14 Nm (11 lb ft).

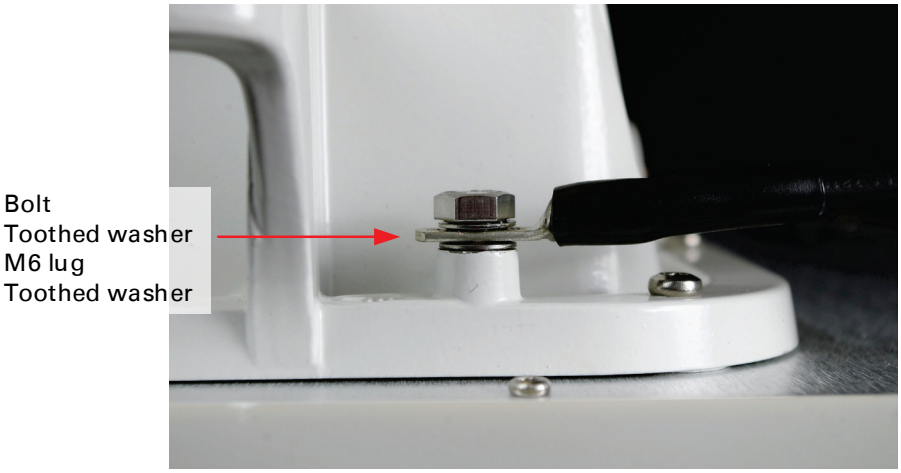


2 Connect the ODU (PSU port) to the top LPU (either port), following the procedure in Connecting power cables to the LPU on page 11. Ensure that this cable is shorter than 600 mm (24 inches).

3 Ensure that the power cable is fixed to the tower or building. Connect the remaining port of the top LPU to the power cable, following the procedure in Connecting power cables to the LPU on page 11. Fasten the two power cables such that they are not coiled together and do not cross each other.

4 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). Tighten both grounding bolts to a torque of 5 Nm (3.9 lb ft)



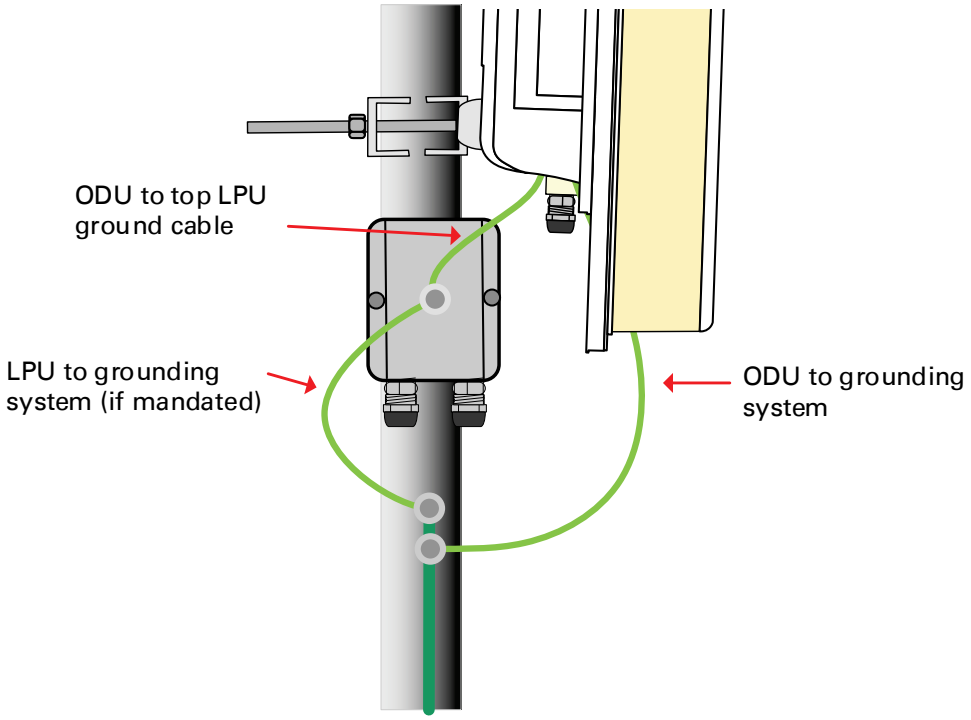


5 Fasten one ground cable to the top LPU using the M6 (small) lug. Tighten both nuts to a torque of 5 Nm (3.9 lb ft):



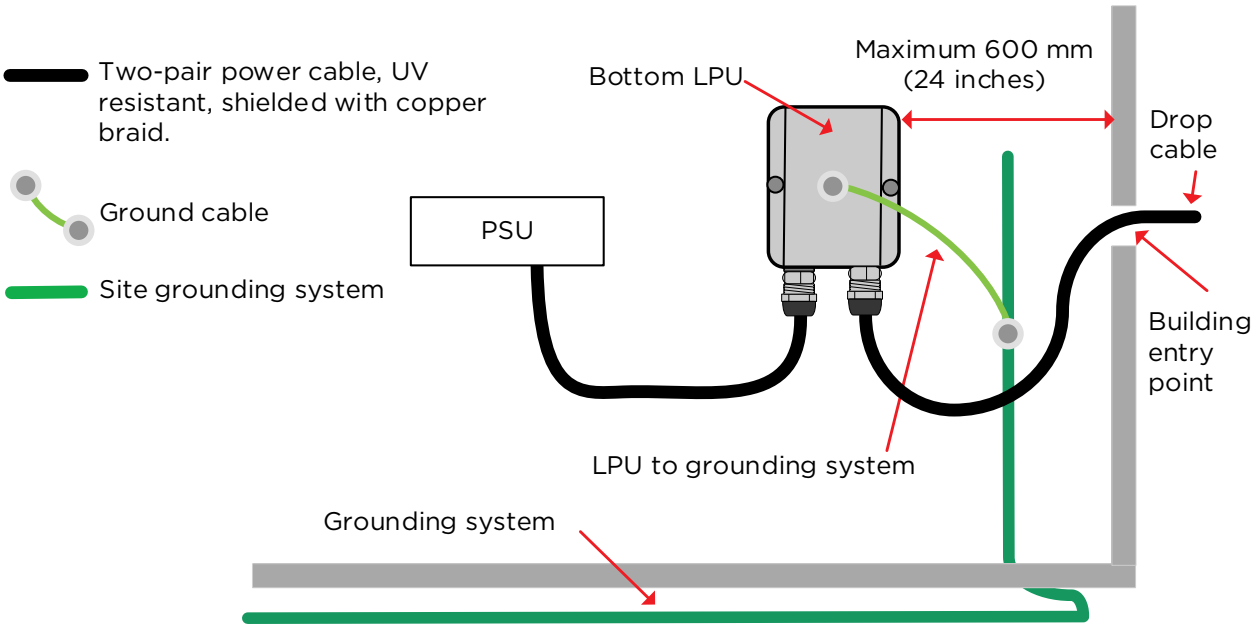
6 Select a tower or building grounding point within 0.3 meters (1 ft) of the ODU bracket on the same metal. Remove paint from the surface and apply anti-oxidant compound. Fasten the ODU grounding cable to this point using the M10 (large) lug.

7 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:



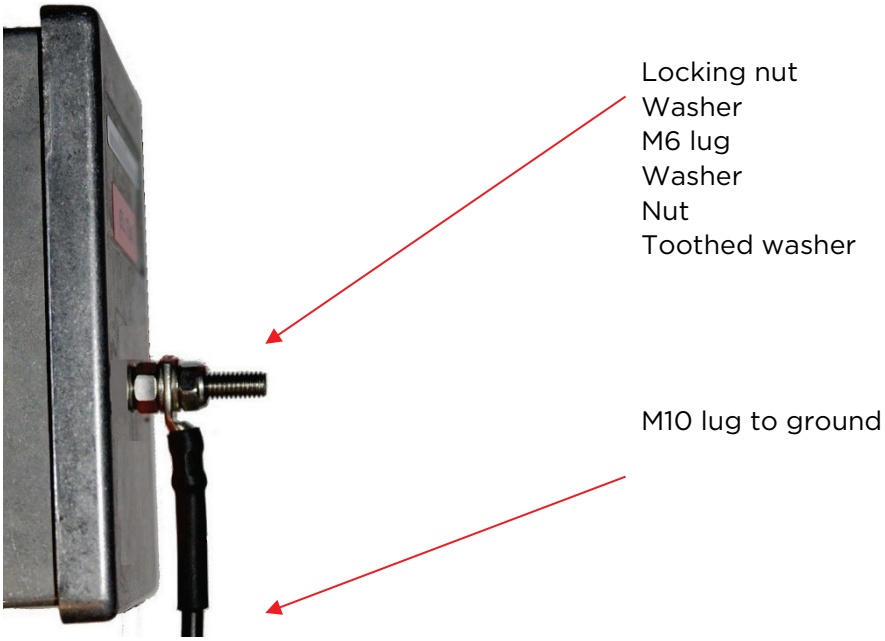
Bottom LPU

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 power cables into the ports of the bottom LPU, following the procedure in Connecting power cables to the LPU.

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):

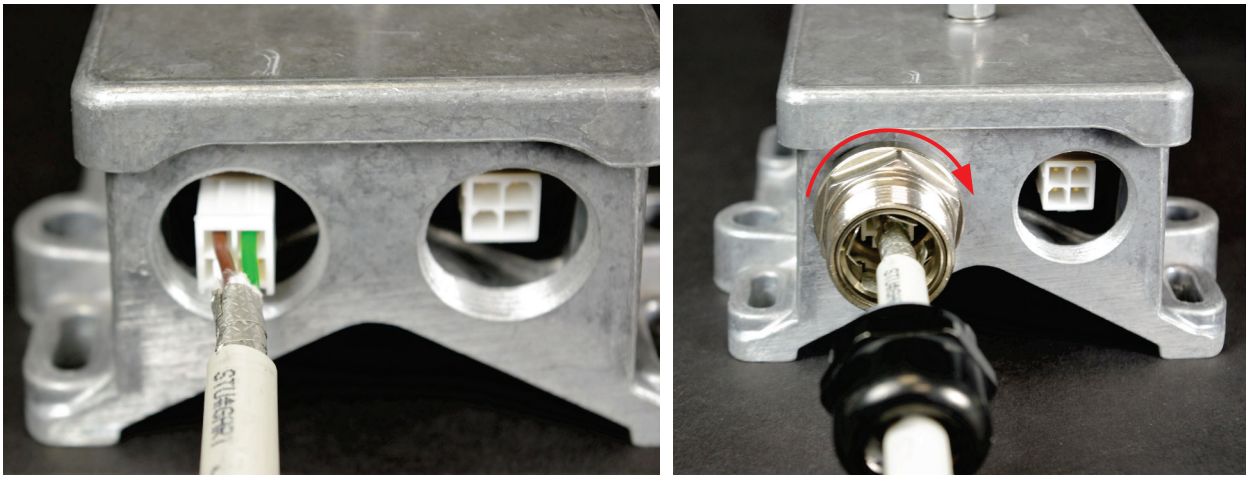


4 Select a building grounding point near the LPU bracket and on the same grounding structure. Remove paint from the surface and apply anti-oxidant compound. Fasten the LPU ground cable to this point using the M10 (large) lug.

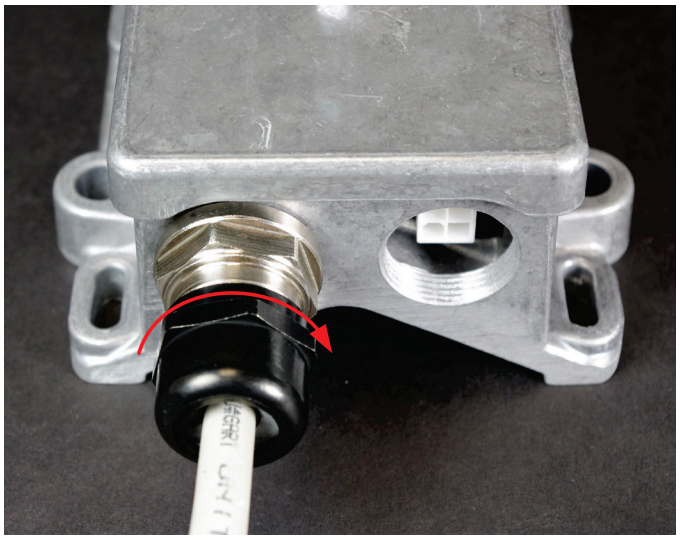
Connecting power cables to the LPU

1 Thread the plug through the gland body.

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



3 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:



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

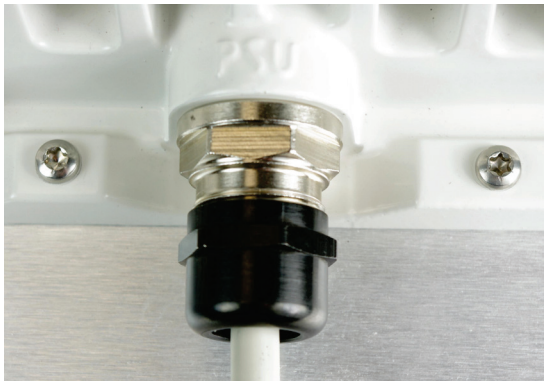
Connecting power cables to the ODU

1 Thread the plug through the gland body.

2 Plug the connector into the socket in the unit, ensuring that it snaps home. Fit the gland body to the ODU power port and tighten it to a torque of 5.5 Nm (4.3 lb ft). Fit the gland nut and tighten until the rubber seal closes on the cable. Do not over-tighten the gland nut.







Test resistance in the power cable

Before connecting the bottom end of the power cable to the PSU, measure the resistances between pins. If any of the tests fail, examine the power cable for wiring faults. The table below gives the expected resistances from the bottom of the cable up to the ODU (which must be connected) and back again. It should be the same with or without DC-LPUs fitted.

Cable length		**Approximate resistance (Ohm), using 0.75mm² cable**		
Ft	**m**	Between pins 1 & 2 and Between pins 3 & 4	Between pins 1 and 3 and Between pins 2 and 4	Between any pin and the cable shield
0	0	0.5		
33	10	1.0		
66	20	1.5		
99	30	2.0		
131	40	2.5		
164	50	3.0	>10K (all cable lengths)	> 100K (all cable lengths)
197	60	3.5		
230	70	4.0		
262	80	4.5		
295	90	5.0		
328	100	5.5		



Note Ensure that the 1-2 and 3-4 resistances are within 10% of each other by multiplying the lower resistance by 1.1. If the other resistance is greater than this, the test has failed.

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