

Cambium PTP 650 Installation Guide

UNDER DEVELOPMENT



Cambium Networks

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About this guide

This guide is supplied with PTP 650 ODUs. It describes how to install the site equipment for PTP 650 Series links. Users of this guide require expertise in outdoor radio equipment installation.

Related documents

For full PTP 650 installation planning instructions, refer to the *PTP 650 Series User Guide*.

Version information

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Waste Electrical and Electronic Equipment (WEEE)

For instructions on waste disposal of used products, refer to <http://www.cambiumnetworks.com/support>

Safety



Warning

To prevent loss of life or physical injury, observe the below safety guidelines. In no event shall Cambium Networks be liable for any injury or damage caused during the installation of the Cambium PTP 650. Ensure that only qualified personnel install a PTP 650 link.

Power lines

Exercise extreme care when working near power lines.

Working at heights

Exercise extreme care when working at heights.

Grounding and protective earth

The Outdoor Unit (ODU) must be properly grounded to protect against lightning. It is the user's responsibility to install the equipment in accordance with national regulations. In the USA, follow Section 810 of the *National Electric Code, ANSI/NFPA No.70-1984 (USA)*. In Canada, follow Section 54 of the *Canadian Electrical Code*. These codes describe correct installation procedures for grounding the outdoor unit, mast, lead-in wire and discharge unit, size of grounding conductors and connection requirements for grounding electrodes. Other regulations may apply in different countries and therefore it is recommended that installation of the outdoor unit be contracted to a professional installer.

PSU

Always use one of the Cambium PTP 650 Series power supply units (PSU) to power the ODU. Failure to use a Cambium supplied PSU could result in equipment damage and will invalidate the safety certification and may cause a safety hazard.

Alternative DC supplies

If an AC supply is not required or an additional back up DC supply is required, the DC supply is connected to the PSU DC IN terminals. This is the only method of supplying external DC to the ODU. The DC supply must comply with the following requirements:

- The voltage and polarity is correct and is applied to the correct PIDU terminals.
- The power source is rated as Safety Extra Low Voltage (SELV).
- The power source is rated to supply at least 1A continuously.
- The power source cannot provide more than the Energy Hazard Limit as defined by IEC/EN/UL60950-1, Clause 2.5, Limited Power (The Energy Hazard Limit is 240VA).

Powering down before servicing

Always power down and unplug the equipment before servicing.

Lightning protection unit (LPU)

Hazardous voltages are present within the LPU. Do not remove the insulation tape or printed circuit board when the LPU is connected to the power supply.

Primary disconnect device

The main power supply is the primary disconnect device.

External cables

Safety may be compromised if outdoor rated cables are not used for connections that will be exposed to the outdoor environment.

Drop cable tester

The drop cable tester must NEVER be used at the ODU end connected to power from the PIDU. It must only be used at the bottom of the mast with a multimeter. This is because the PIDU voltage exceeds the limit allowed in some countries for safe handling in wet conditions and therefore may create a safety hazard.

RF exposure near the antenna

Strong radio frequency (RF) fields will be present close to the antenna when the transmitter is on. Always turn off the power to the ODU before undertaking maintenance activities in front of the antenna.

Minimum separation distances

Ensure that personnel are not exposed to unsafe levels of RF energy. The units start to radiate as soon as they are powered up. Never work in front of the antenna when the ODU is powered. Install the ODUs so as to provide and maintain the minimum separation distances from all persons. For minimum separation distances, see the *PTP 650 Series User Guide*.

Before connecting or disconnecting the drop cable from the PSU or ODU, always power down the PSU.

Grounding and lightning protection requirements

Ensure that the installation meets the requirements defined in the *PTP 650 Series User Guide*.

Grounding cable installation methods

When routing, fastening and connecting grounding cables, the following requirements must be met:

- Grounding conductor runs are as short, straight and smooth as possible, with bends and curves kept to a minimum.
- Grounding cables must not be installed with drip loops.
- All bends must have a minimum radius of 203 mm (8 in) and a minimum angle of 90°. A diagonal run is preferable to a bend, even though it does not follow the contour or run parallel to the supporting structure.
- All bends, curves and connections must be routed towards the grounding electrode system, ground rod, or ground bar.
- Grounding conductors must be securely fastened.
- Braided grounding conductors must not be used.
- Approved bonding techniques must be used for the connection of dissimilar metals.

Siting ODUs and antennas

ODUs and external antennas are not designed to survive direct lightning strike. For this reason they must be installed in Zone B as defined in *PTP 650 Series User Guide*. Mounting in Zone A may put equipment, structures and life at risk.

Optical SFP module

The optical SFP module is a Class 1 Laser product. When installing it, observe the following safety precautions:

- Do not look into the source of the laser beam (optical receptacle) directly or through an optical system, as this is highly likely to damage vision.
- Always remove power from the system before the optical connection is made or unmade.
- When installing the optical interface, either cap the optical connector, or mate the connector to an appropriate equipment connector.
- Ensure that the indoor end of the optical cable is appropriately labeled to ensure that service personnel are aware the same Class 1 Laser hazard exists.

Components

ODUs

For ODU part numbers, refer to the *PTP 650 Series User Guide*.

PSUs and line cords

The ODU kits (but not single ODUs) are supplied with one PSU and one US or EU line cord as appropriate. Cambium Networks supply additional PSUs and line cords as follows:

Cambium description	Cambium part number
AC Power Injector	N000065L001
AC+DC Power Injector Extended Temperature and Capacity (*)	C000065L002
US Line Cord Fig 8	N000065L003
UK Line Cord Fig 8	N000065L004
EU Line Cord Fig 8	N000065L005
Australia Line Cord Fig 8	N000065L006

(*) The AC+DC Power Injector is required if the ODU has an AUX interface.

Connectorized ODU accessories

For connectorized ODUs, Cambium Networks supply RF cable and connectors as follows:

Cambium description	Cambium part number
50 Ohm Braided Coaxial Cable - 75 meter	30010194001
50 Ohm Braided Coaxial Cable - 500 meter	30010195001
RF CONNECTOR,N,MALE,STRAIGHT FOR CNT-400 CABLE	09010091001

Copper Cat5e Ethernet cable and LPUs

Caution

Always use Cat5e cable that is gel-filled and shielded with copper-plated steel. Alternative types of drop cable are not supported by Cambium Networks.

Note

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

Note

Five EMC strain relief cable glands are included in the LPU and grounding kit.

Cambium Networks supply Cat5e Ethernet cable and LPUs as follows:

Cambium description	Cambium part number
1000 ft Reel Outdoor Copper Clad CAT5E	WB3175
328 ft (100 m) Reel Outdoor Copper Clad CAT5E	WB3176
Cable Grounding Kits For 1/4" And 3/8" Cable	01010419001
Tyco/AMP, Mod Plug RJ45, 100 pack	WB3177
Tyco/AMP Crimp Tool	WB3211
RJ-45 Gland Spare – PG16 style (Qty. 10)	N000065L033
PTP 650 LPU and Grounding Kit	C000065L007

SFP modules

Cambium Networks supplies SFP modules as follows:

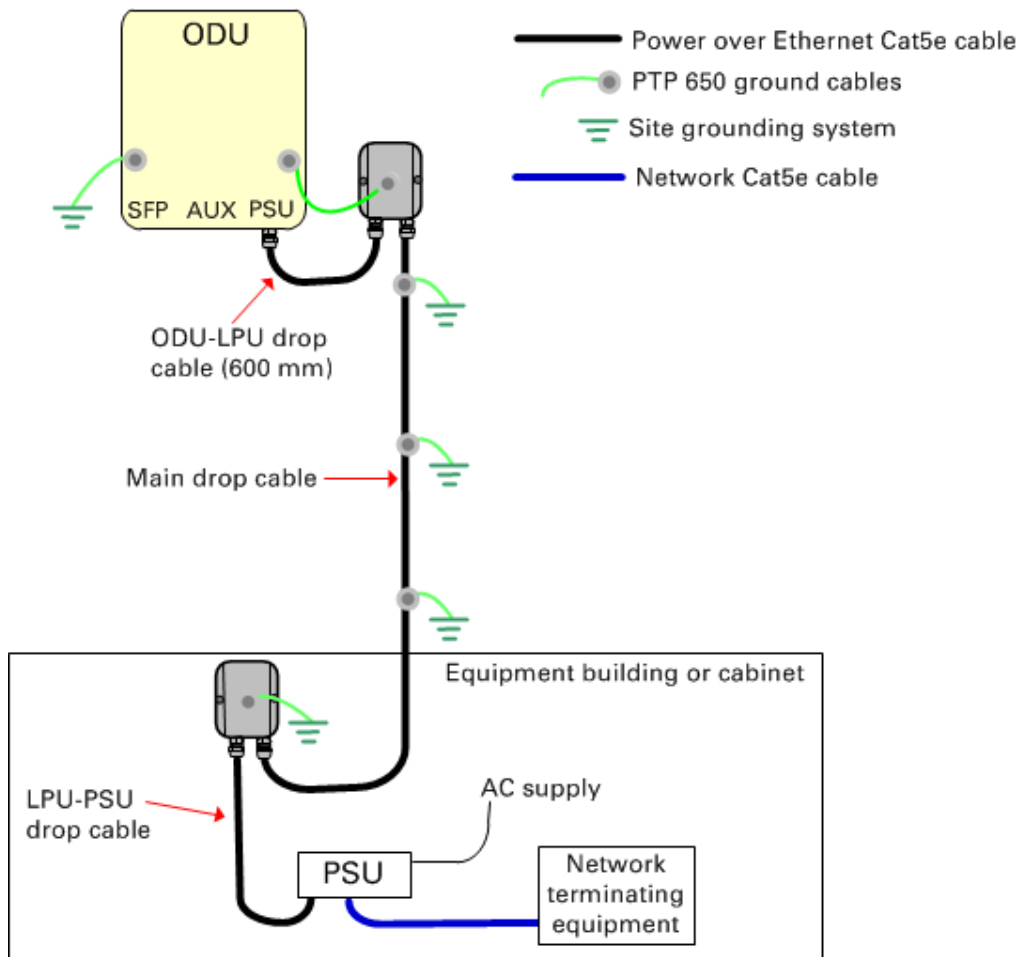
Cambium description	Cambium part number
PTP 650 Optical 1000BaseLX Ethernet SFP Module (*1)	C000065L008
PTP 650 Optical 1000BaseSX Ethernet SFP Module (*1)	C000065L009
PTP 650 Twisted Pair 1000BaseT Ethernet SFP Module	C000065L010

(*1) Order optical cable from a specialist, quoting the optical cable specification in the *PTP 650 Series User Guide*.

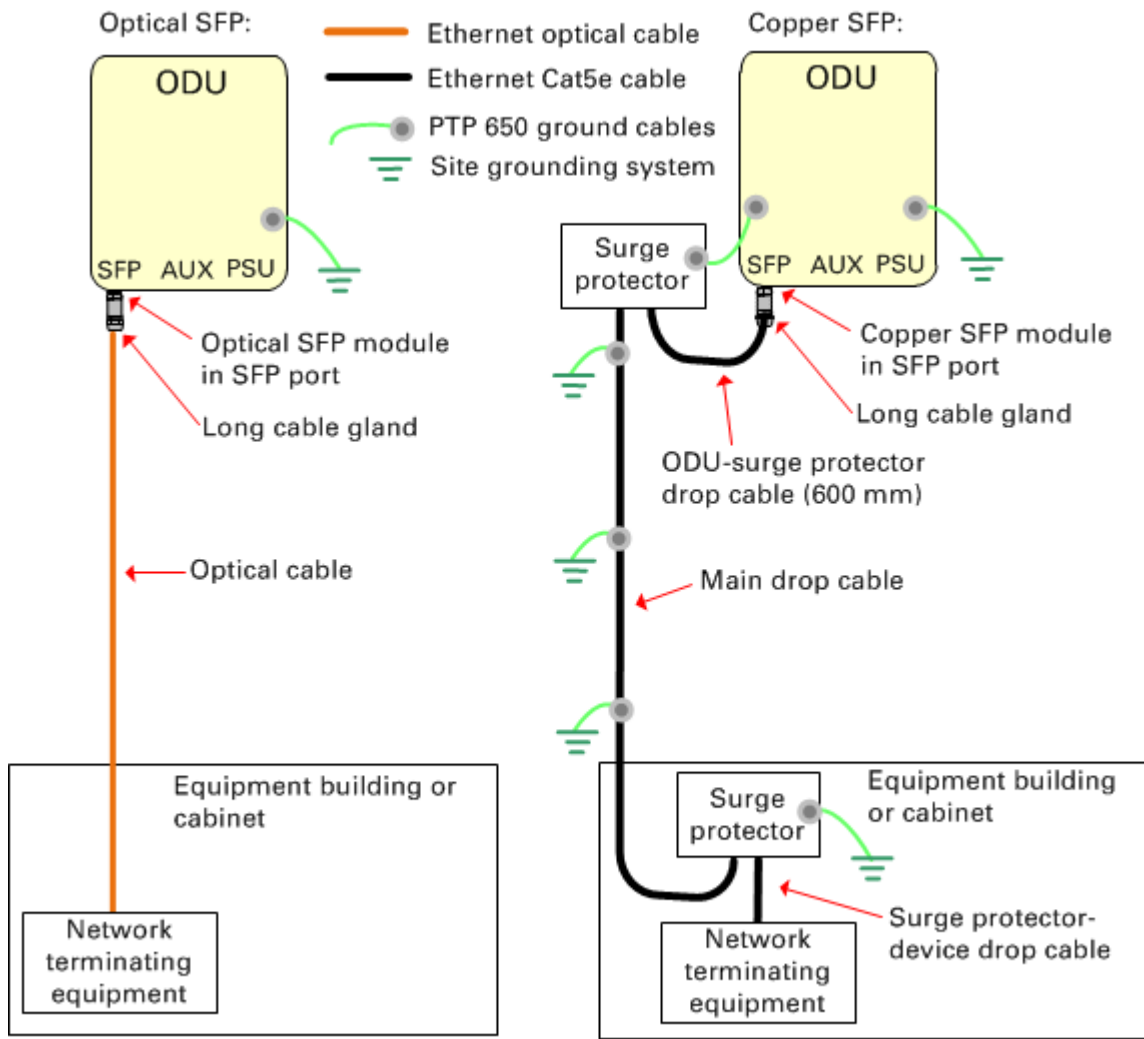
Typical deployment

A PTP 650 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:

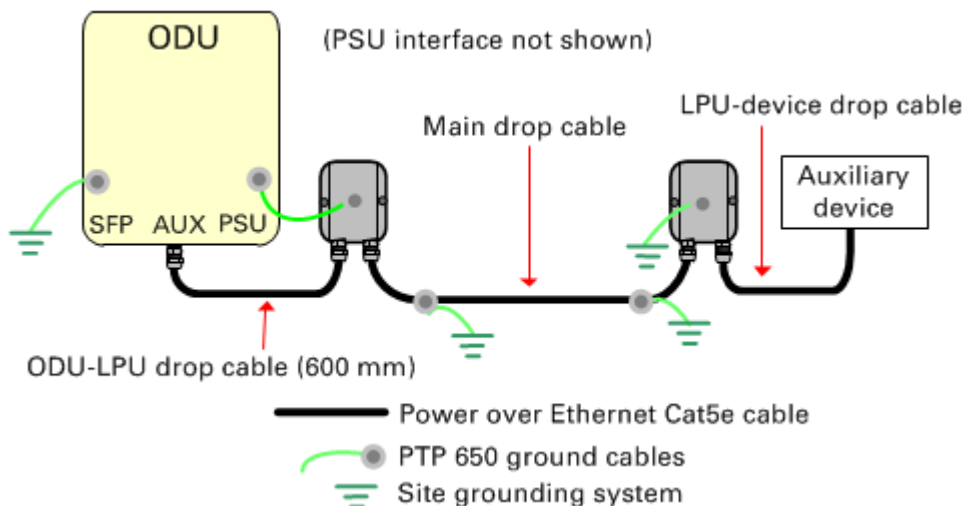


In more advanced configurations, there may be an optical or copper Cat5e SFP Ethernet interface (unpowered) into the ODU (SFP port):



(PSU interfaces not shown)

In more advanced configurations, there may be a copper Cat5e interface (with optional power over Ethernet) into the ODU (AUX port):



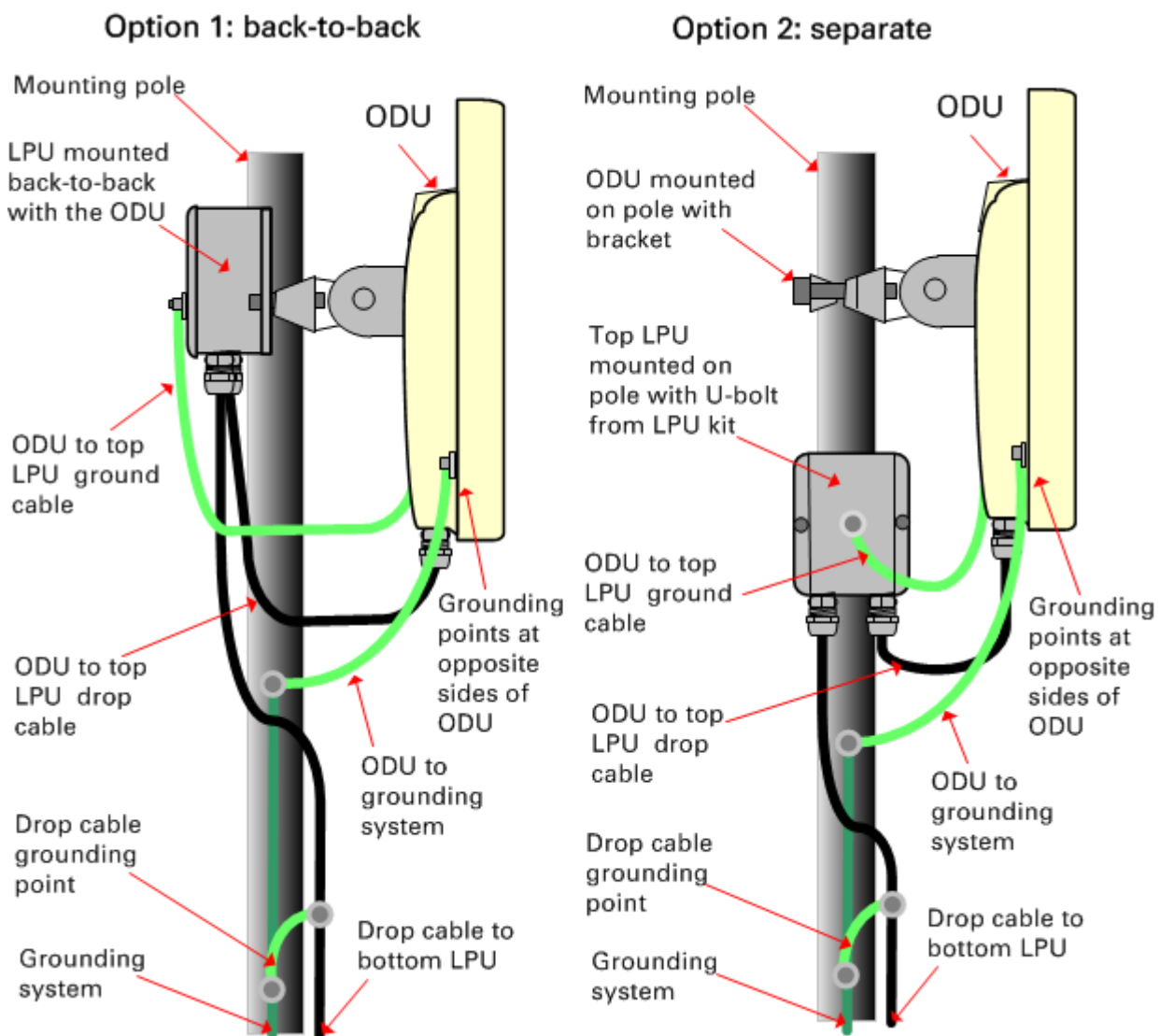
Installing the ODU and top LPU

Note

If LPUs are being installed, use only the five EMC cable glands supplied in the LPU and grounding kit (with black caps). Discard the non-EMC cable glands supplied in the ODU kits (with silver caps), as these may only be used in PTP 650 installations without LPUs.

ODU and top LPU mounting options

Select one of two mounting options for the ODU and top LPU:



The AUX interface requires its own LPUs. The copper SFP interface requires its own surge arrestors (not PTP 650 LPUs). The optical SFP interface does not require LPUs or ground cables.

Mounting the ODU and top LPU



Caution

Do not over-tighten the ODU mounting bracket bolts, as this may lead to failure of the assembly.



Note

ODUs are shipped with blanking plugs protecting the PSU, AUX and SFP ports. Use a large flat blade screwdriver to remove the plugs from those ports that will be connected to interface cables:



- 1 Confirm that the correct mounting bracket kit has been supplied:

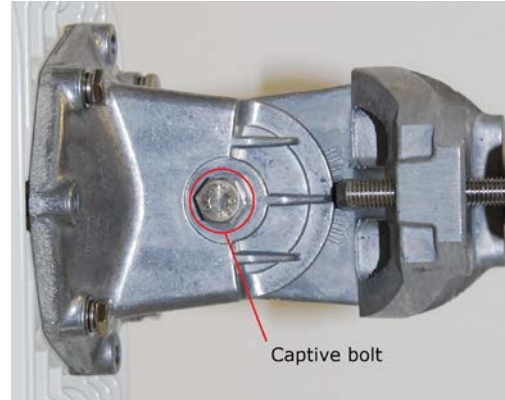
Integrated ODU



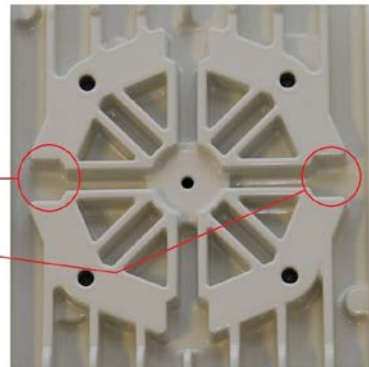
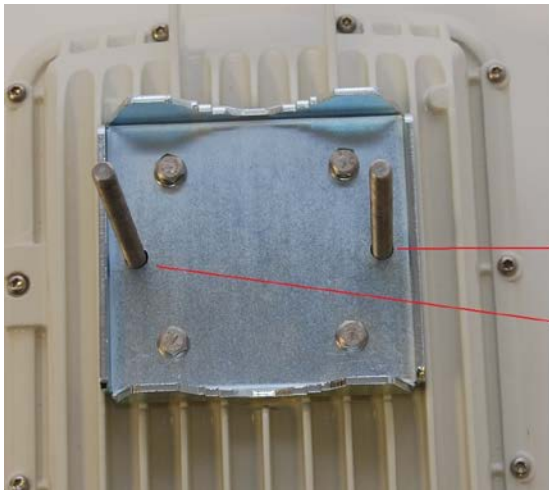
Connectorized ODU



- 2 Integrated ODU only:** Fix the mounting plate to the back of the ODU using the bolts and washers provided. Fix the bracket body to the mounting plate using the captive M8 bolt, ensuring the bolt is tight enough to support the ODU:



- 3 Connectorized ODU only:** Fix the mounting plate and bracket bolts to the back of the ODU using the bolts and washers provided. Use the bracket bolt receptacles as shown:



- 4** Hoist the ODU up to its mounting position.

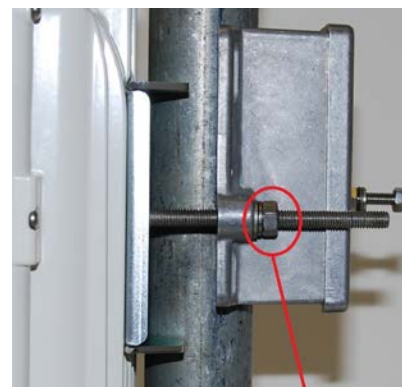
- 5 LPU mounting option 1 (back-to-back) only:**

Discard the ODU bracket strap (it is replaced by the LPU).

Fix the ODU and LPU to the mounting pole using the bolts, flat washers and coil washers provided in the bracket kit. Mount the LPU vertically with cable entry holes facing downwards:

Integrated ODU

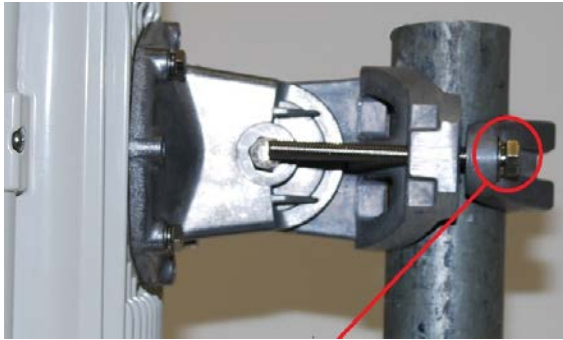
Connectorized ODU



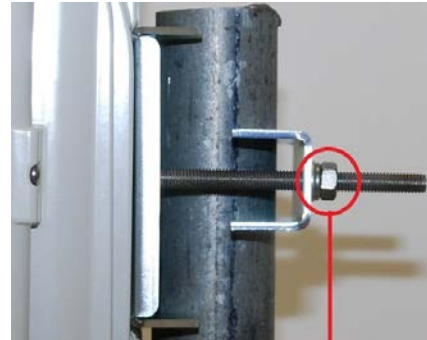
6 LPU mounting option 2 (separate) only:

Fix the ODU to the mounting pole using the bracket strap, bolts, flat washers and coil washers provided in the bracket kit:

Integrated ODU

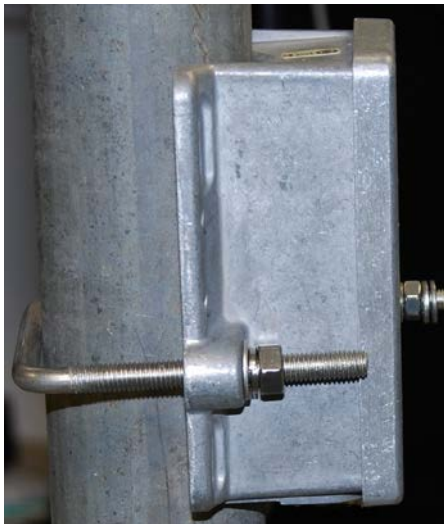


Connectorized ODU

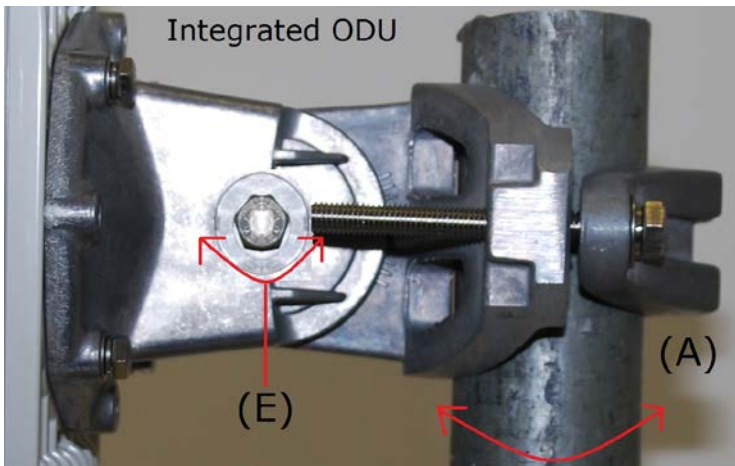


7 LPU mounting option 2 (separate) only:

Use the U-bolt bracket from the LPU kit to mount the LPU on the pole below the ODU. Mount the LPU vertically with cable entry holes facing downwards:



8 **Integrated ODU only:** Adjust the elevation (E) and azimuth (A) of the unit to achieve visual alignment:



9 Tighten all three ODU bracket bolts to the required torque setting of 14 Nm (11 lb ft).

Grounding the ODU and top LPU



Caution

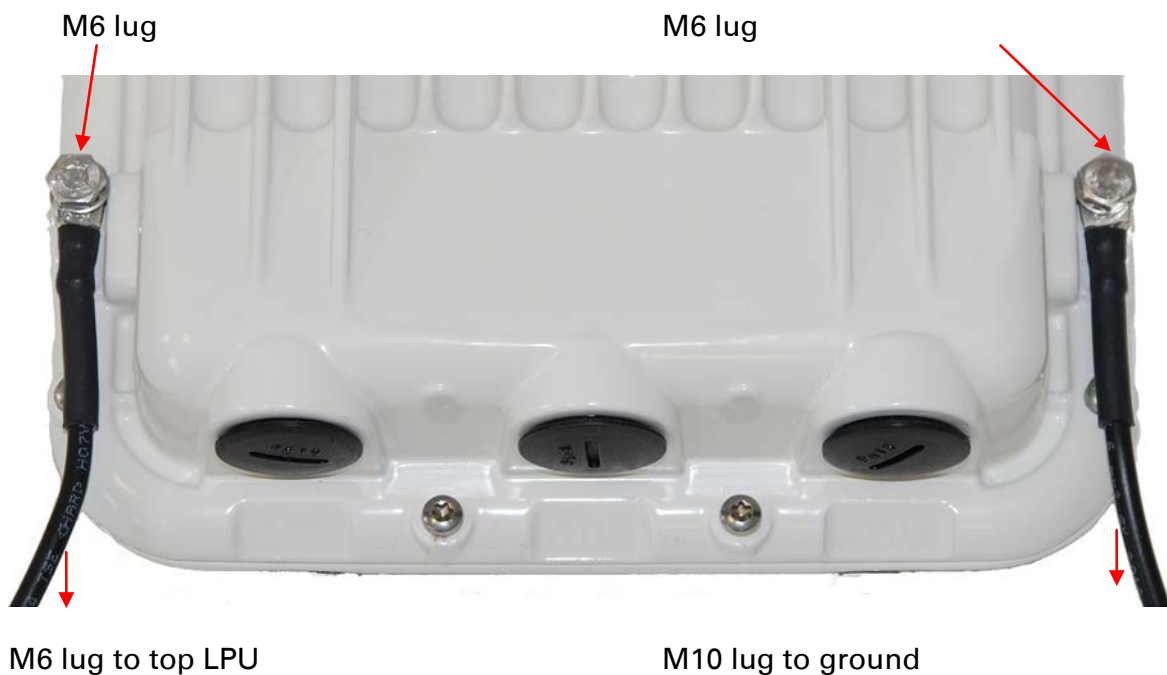
Do not attach grounding cables to the ODU mounting bracket bolts, as this arrangement will not provide full protection.



Note

If two or three drop cables are connected to the ODU, ensure that all top LPUs are grounded at the same ODU grounding point.

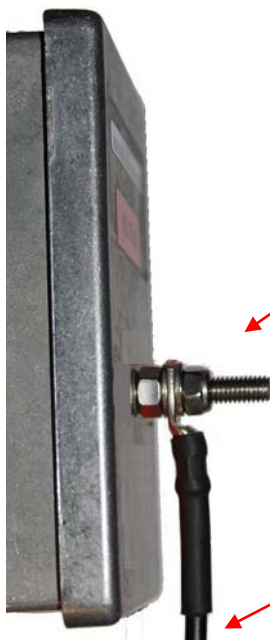
- 1 Fasten one ground cable to each ODU grounding point using the M6 (small) lugs: one is for the top LPU (M6 lug at other end) and the other is for the tower or building (M10 lug at other end). It does not matter which cable goes on which grounding point. Tighten both grounding bolts to a torque of 5 Nm (3.9 lb ft):



Bolt
Toothed washer
M6 lug
Toothed washer



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

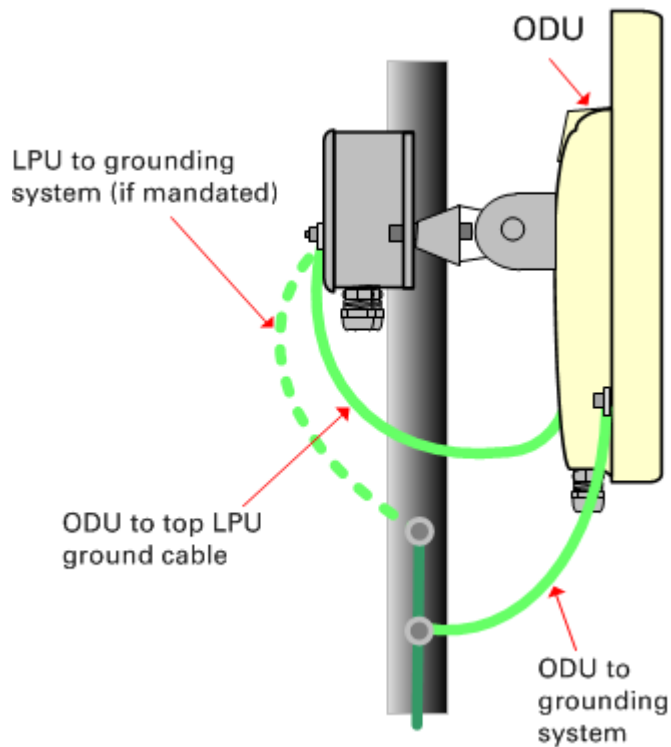


Locking nut
Washer
M6 lug
Washer
Nut
Toothed washer

M6 lug to ODU

- 3 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.

- 4 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:



Installing external antennas

If the ODU is connectorized, mount and connect external antennas.

Caution

To prevent water ingress, always use crimped N-type connectors at the ODU and antenna.

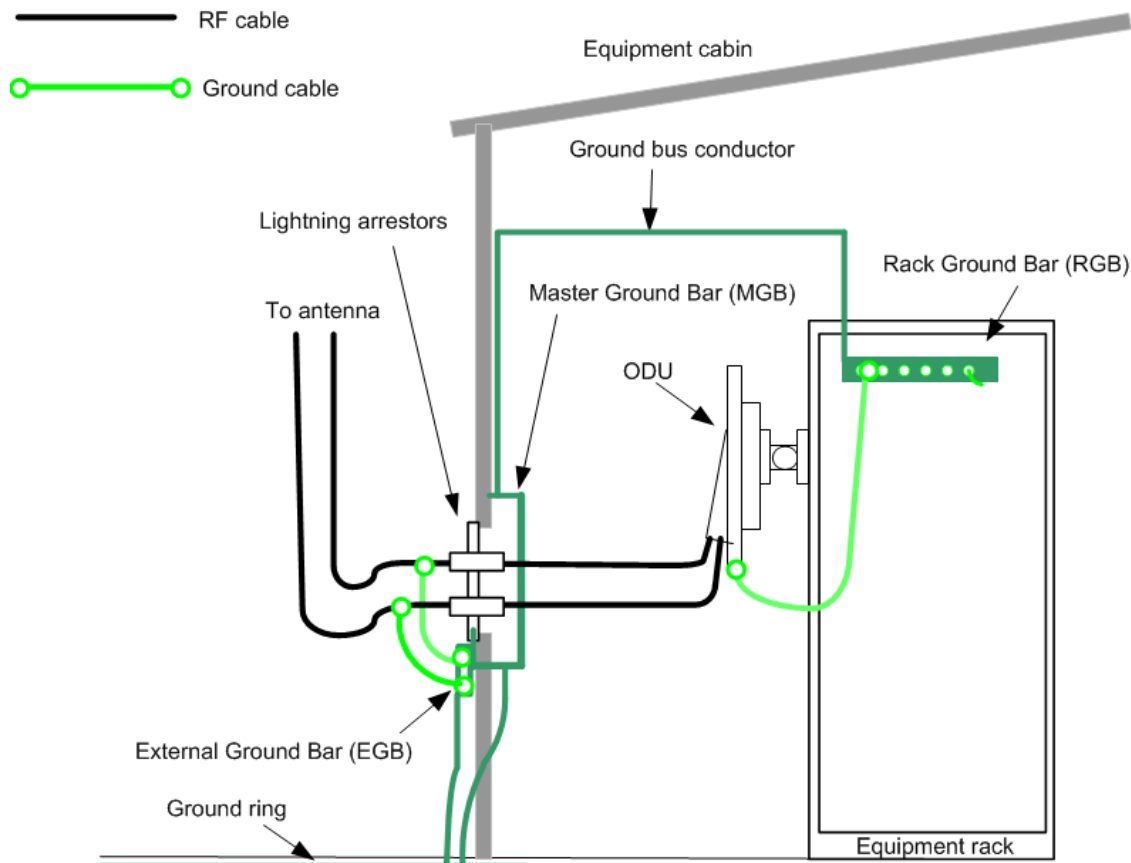
Caution

Ensure that no undue strain is placed on the ODU or antenna connectors. Ensure that the cables do not flap in the wind, as flapping cables are prone to damage and induce unwanted vibrations in the supporting structure.

Note

When using separate antennas to achieve spatial diversity, the antenna cables will be disconnected from the ODU during the alignment procedure. Therefore, do not weatherproof the ODU joints until antenna alignment is complete.

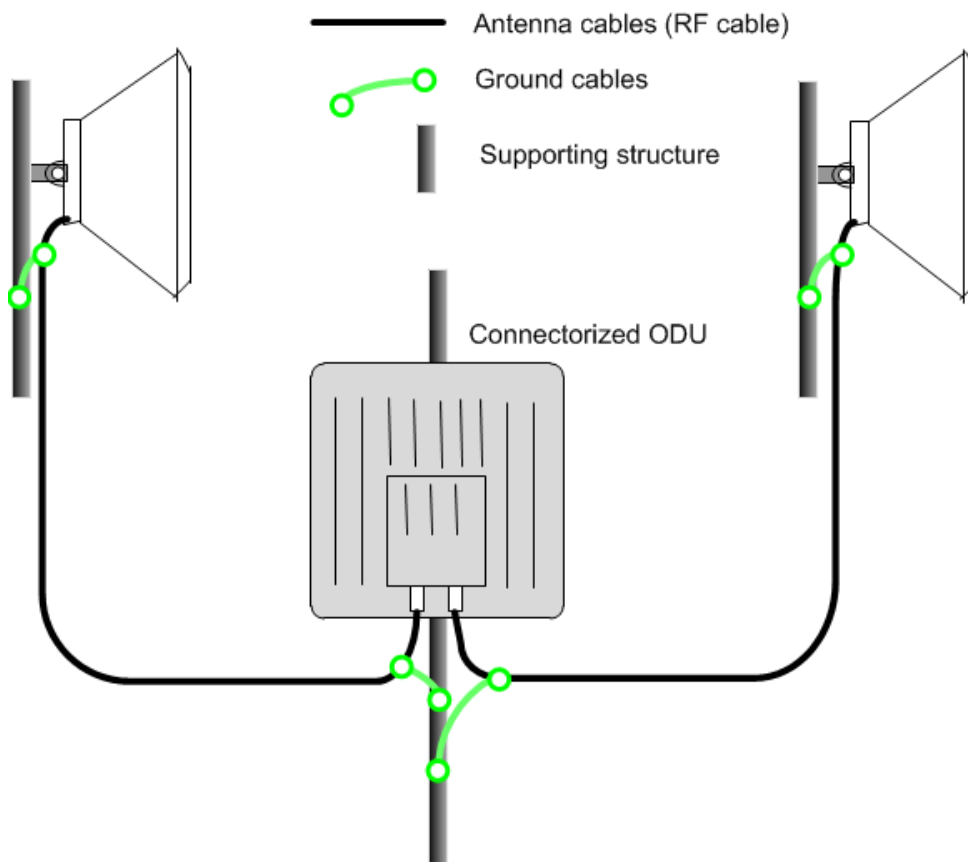
- 1 Mount the antenna(s) according to manufacturer's instructions. When using separate antennas to achieve spatial diversity, mount one with Horizontal polarization and the other with Vertical polarization.
- 2 Connect the ODU to the antenna(s) with cables of type LMR100, LMR200, LMR300, LMR400 or LMR600. Connect the ODU "V" interface to the vertical polarization antenna and connect the ODU "H" interface to the horizontal polarization antenna. Tighten the N type connectors using a torque wrench set to 15 lb in or 1.7 Nm.
- 3 If the ODU is to be mounted indoors, install lightning arrestors at the building entry point. Connect the lightning arrestors to the master ground bar of the building:



- 4 When dressing the antenna cables, form drip loops near the lower ends. These ensure that water is not constantly channeled towards the connectors.
- 5 If the ODU is mounted outdoors, weatherproof the N type connectors in this sequence:
 - A layer of 19 mm (0.75 inch) PVC tape.
 - A layer of self-amalgamating rubber tape.
 - A layer of 50 mm (2 inch) PVC tape.
 - Four layers of 19 mm (0.75 inch) PVC tape.



- 6 Weatherproof the antenna joints in the same way (unless the antenna manufacturer specifies a different method).
- 7 Ground the antenna cables to the supporting structure at the correct points. They should be grounded within 0.3 meters (1 foot) of the ODU and antennas using the Cambium grounding kit (part number 01010419001):



- 8 Dress the antenna cables and attach them to the supporting structure using site approved methods.

Installing the copper Cat5e Ethernet interface

For all installations, install a copper Cat5e Ethernet interface from the ODU (PSU port) to the PSU. For advanced installations, install copper Cat5e Ethernet interfaces from one or both of the SFP and AUX ports to a linked device (see Note below).

Caution

To provide effective protection against lightning induced surges, grounding cables must be installed without drip loops and pointing down towards the ground. The drop cable must not be laid alongside a lightning air terminal.

Caution

To avoid damage to the installation, do not connect or disconnect the drop cable when power is applied to the PSU or network terminating equipment.

Caution

Do not connect the SFP or AUX drop cables to the PSU, as this may cause equipment damage.



Note

These procedures apply when installing copper Cat5e Ethernet interfaces into the SFP or AUX ports of the ODU, but with the following differences:

- In SFP copper Cat5e interfaces, install a copper SFP module in the ODU (SFP port). Connect the SFP drop cable into this module using the long cable gland from the SFP module kit. The *PTP 650 Ethernet SFP Module Installation Guide* (supplied with Cambium Networks SFP modules) describes how to do this.
 - PTP 650 LPUs are not suitable for installation on SFP copper Cat5e interfaces. For SFP drop cables, obtain suitable surge protectors from a specialist supplier.
 - At the remote end of an SFP or AUX drop cable, use an appropriate termination for the connected device (network device, linked ODU, video camera or wireless access point). The below instructions for connection to the PSU may have to be modified.
 - If the connected device is outdoors, not in the equipment building or cabinet, adapt the grounding instructions as appropriate.
-



Note

When installing an optical Ethernet interface into the SFP port of the ODU, follow the *PTP 650 Ethernet SFP Module Installation Guide* (supplied with Cambium Networks SFP modules).

Fitting glands to the ODU-LPU drop cable

Fit EMC strain relief cable glands from the LPU and grounding kit to both ends of the 600 mm length of pre-terminated cable supplied in the LPU and grounding kit.

- 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:



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



Connecting a drop cable to the ODU and LPU

Connect an EMC strain relief cable gland and RJ45 connector to the ODU and LPU.

- 1 Plug the RJ45 connector into the socket in the unit, ensuring that it snaps home:



- 2 Fit the gland body to the ODU or 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:



Correct



Incorrect

Disconnecting a drop cable from the LPU or ODU

Use this procedure if it is necessary to remove an EMC strain relief cable gland and RJ45 connector from the ODU (as illustrated) or LPU.

- 1 Remove the gland nut. Wiggle the drop cable to release the tension of the gland body. When the tension in the gland body is released, a gap opens at the point shown:



- 2 Unscrew the gland body. Use a small screwdriver to press the RJ45 locking tab, then remove the connector:



Cutting the main drop cable

Cut the main drop cable (from the top LPU to the bottom LPU) and fit hoisting grips.

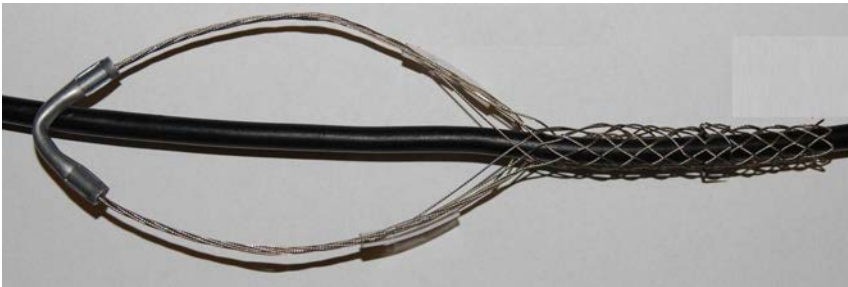
Warning

Failure to obey the following precautions may result in injury or death:

- Use the proper hoisting grip for the cable being installed. If the wrong hoisting grip is used, slippage or insufficient gripping strength will result.
- Do not reuse hoisting grips. Used grips may have lost elasticity, stretched, or become weakened. Reusing a grip can cause the cable to slip, break, or fall.

The minimum requirement is one hoisting grip for each 60 m (200 ft) of cable.

- 1 Cut drop cable to length required from top LPU to bottom LPU.
- 2 Slide one or more hoisting grips onto the top end of the drop cable:



- 3 Secure the hoisting grip to the cable using a special tool, as recommended by the manufacturer.

Terminating the main drop cable

Terminate the main drop cable (from the top LPU to the bottom LPU) with an RJ45 connector and EMC strain relief cable gland at each end.

Warning

The metal screen of the drop cable is very sharp and may cause personal injury.

- ALWAYS wear cut-resistant gloves (check the label to ensure they are cut resistant).
- ALWAYS wear protective eyewear.
- ALWAYS use a rotary blade tool to strip the cable (DO NOT use a bladed knife).

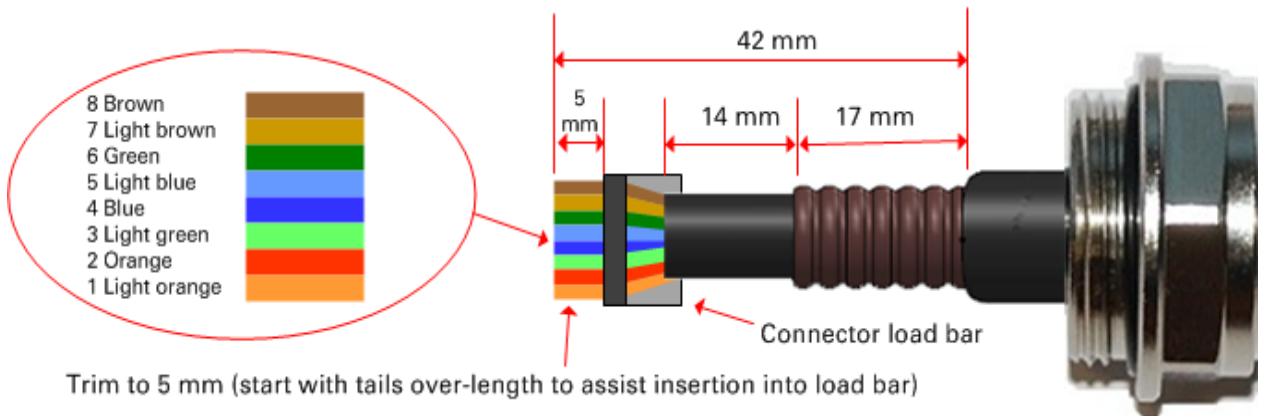
Caution

Check that the crimp tool matches the RJ45 connector, otherwise the cable or connector may be damaged.

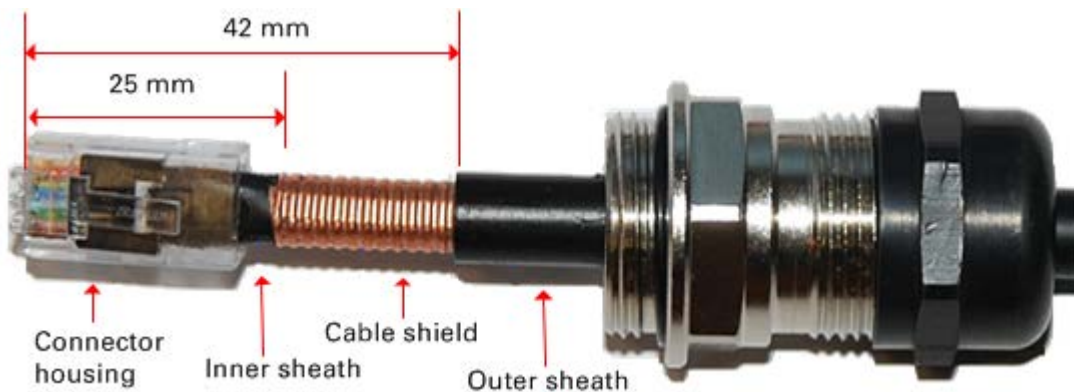
- 1 Thread the cable gland onto the drop cable. Do not tighten the gland nut:



- 2 Strip the cable end and fit the RJ45 connector load bar. To use the rotary blade tool, fit it around the outer cable sheath and rotate the cutter around the cable once or twice, then remove the stripped outer section:



- 3 Fit the RJ45 connector housing as shown. To ensure there is effective strain relief, locate the cable inner sheath under the connector housing tang:



- 4 Repeat steps 1 to 3 to fit an RJ45 connector and cable gland at the other end.

Installing the main drop cable

Install the main drop cable from the top to the bottom LPU.

Warning

Failure to obey the following precautions may result in injury or death:

- Use the hoisting grip to hoist one cable only. Attempting to hoist more than one cable may cause the hoisting grip to break or the cables to fall.
- Do not use the hoisting grip for lowering cable unless the clamp is securely in place.
- Maintain tension on the hoisting grip during hoisting. Loss of tension can cause dangerous movement of the cable and result in injury or death to personnel.
- Do not release tension on the grip until after the grip handle has been fastened to the supporting structure.

- 1 Hoist the top end of the main drop cable up to the top LPU, following the hoist manufacturer's instructions. When the cable is in position, fasten the grip handle to the supporting structure and remove the hoist line.
- 2 Connect the main drop cable to the top LPU by following the procedure [Connecting a drop cable to the ODU and LPU](#) on page 20.
- 3 Make an entry point into the equipment building and run the main drop cable to the site of the bottom LPU.
- 4 Attach the main drop cable to the supporting structure using site approved methods.

Grounding the main drop cable

Connect the screen of the main drop cable to the metal of the supporting structure using a cable grounding kit.

Drop cable grounding points are shown in the *PTP 650 Series User Guide*.

Caution

Install ground cables without drip loops and pointing down towards the ground, otherwise they may not be effective.

- 1 Remove 60 mm (2.5 inches) of the drop cable outer sheath.



- 2 Cut 38mm (1.5 inches) of rubber tape (self amalgamating) and fit to the ground cable lug. Wrap the tape completely around the lug and cable.



- 3 Fold the ground wire strap around the drop cable screen and fit cable ties.



- 4 Tighten the cable ties with pliers.



Cut the surplus from the cable ties.

- 5 Cut a 38mm (1.5 inches) section of self-amalgamating tape and wrap it completely around the joint between the drop and ground cables.



- 6 Use the remainder of the self-amalgamating tape to wrap the complete assembly. Press the tape edges together so that there are no gaps.



- 7 Wrap a layer of PVC tape from bottom to top, starting from 25 mm (1 inch) below and finishing 25 mm (1 inch) above the edge of the self-amalgamating tape, over lapping at half width.



- 8 Repeat with a further four layers of PVC tape, always overlapping at half width. Wrap the layers in alternate directions (top to bottom, then bottom to top). The edges of each layer should be 25mm (1 inch) above (A) and 25 mm (1 inch) below (B) the previous layer.



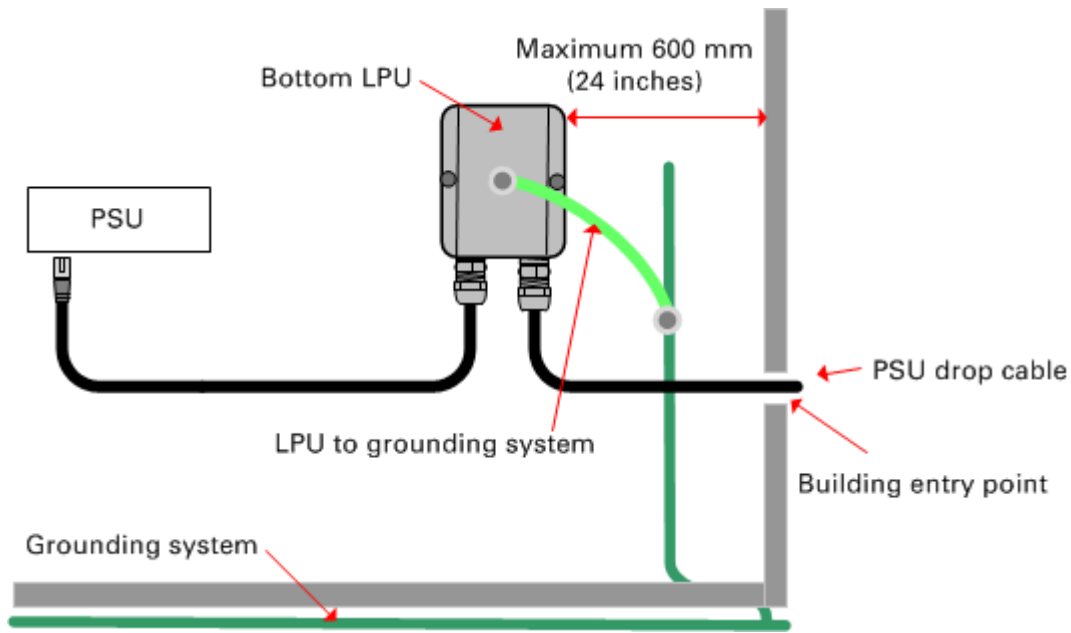
- 9 Prepare the metal grounding point of the supporting structure to provide a good electrical contact with the grounding cable clamp. Remove paint, grease or dirt, if present. Apply anti-oxidant compound liberally between the two metals.
- 10 Clamp the bottom lug of the grounding cable to the supporting structure using site approved methods. Use a two-hole lug secured with fasteners in both holes. This provides better protection than a single-hole lug.

Installing the bottom LPU

Install the bottom LPU, ground it, and connect it to the main drop cable.

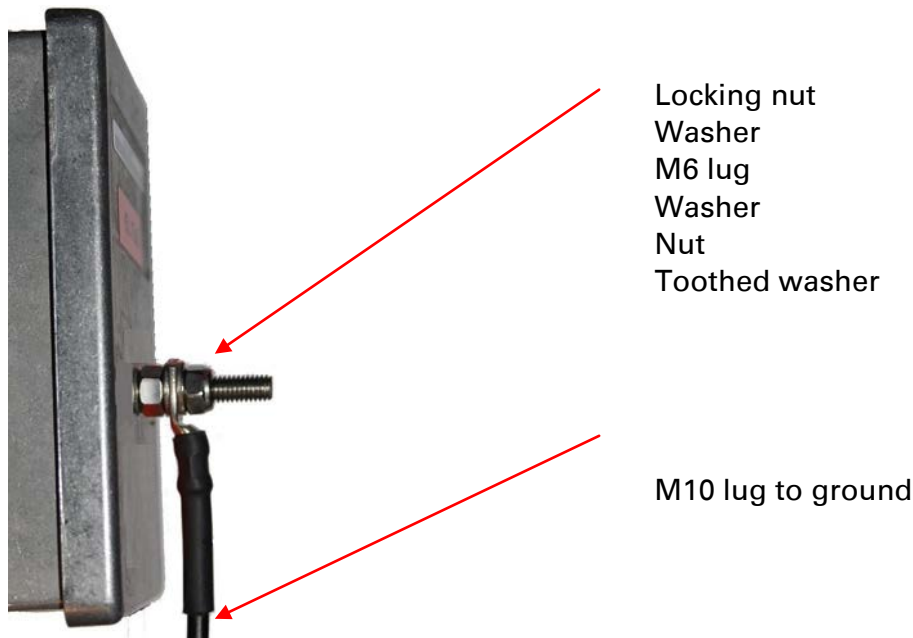
- 1 Select a mounting point for the bottom LPU within 600 mm (24 in) of the building entry point. Mount the LPU vertically with cable glands facing downwards.

In the basic configuration, there is one bottom LPU, for the PSU drop cable:



In a more advanced configuration, there may be two bottom LPUs, one for the PSU and one for a copper SFP drop cable. Mount both LPUs within 600 mm (24 in) of the building entry point:

- 2 Connect the main drop cable to the bottom LPU by following the procedure [Connecting a drop cable to the ODU and LPU](#) on page 20.
- 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.

Installing the LPU-PSU drop cable

Use this procedure to terminate the bottom LPU to PSU drop cable with RJ45 connectors at both ends, and with a cable gland at the LPU end.

Warning

The metal screen of the drop cable is very sharp and may cause personal injury.

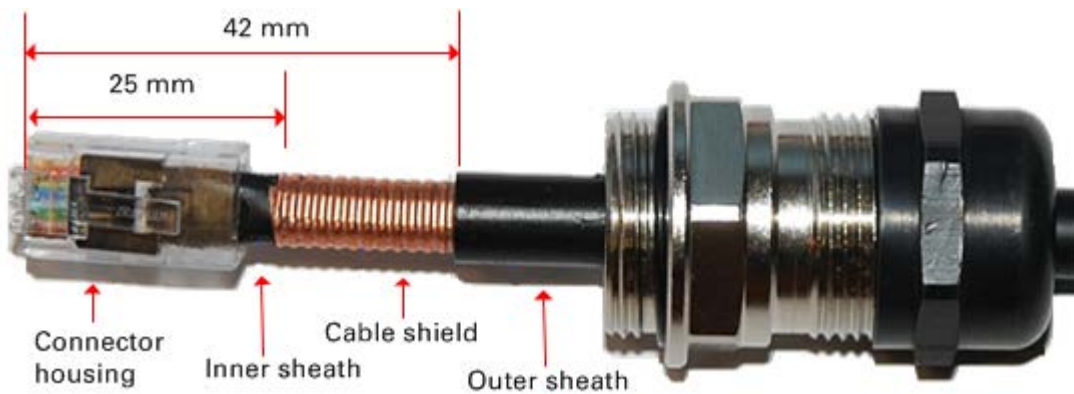
- ALWAYS wear cut-resistant gloves (check the label to ensure they are cut resistant).
- ALWAYS wear protective eyewear.
- ALWAYS use a rotary blade tool to strip the cable (DO NOT use a bladed knife).

Caution

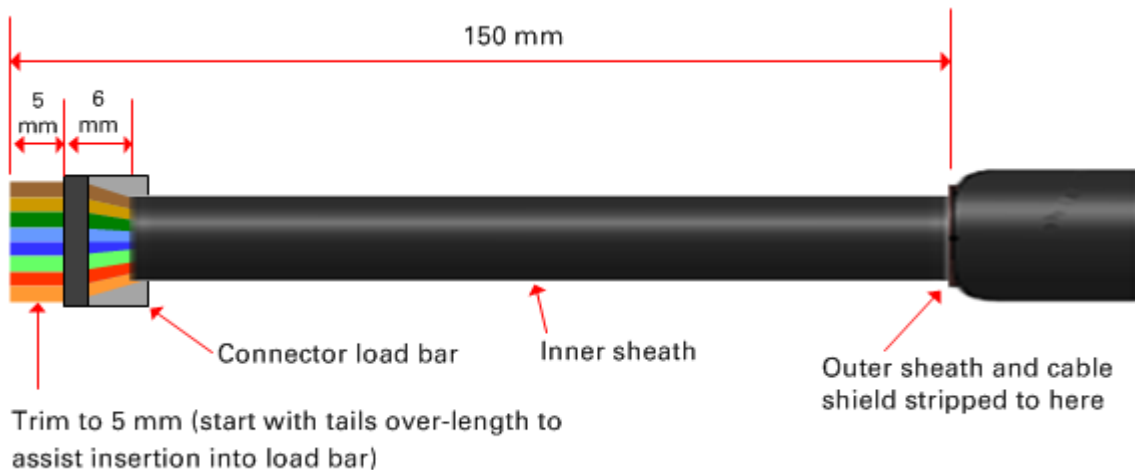
Check that the crimp tool matches the RJ45 connector being used, otherwise the cable or connector may be damaged.

-
- 1 Cut drop cable to length required from bottom LPU to PSU.

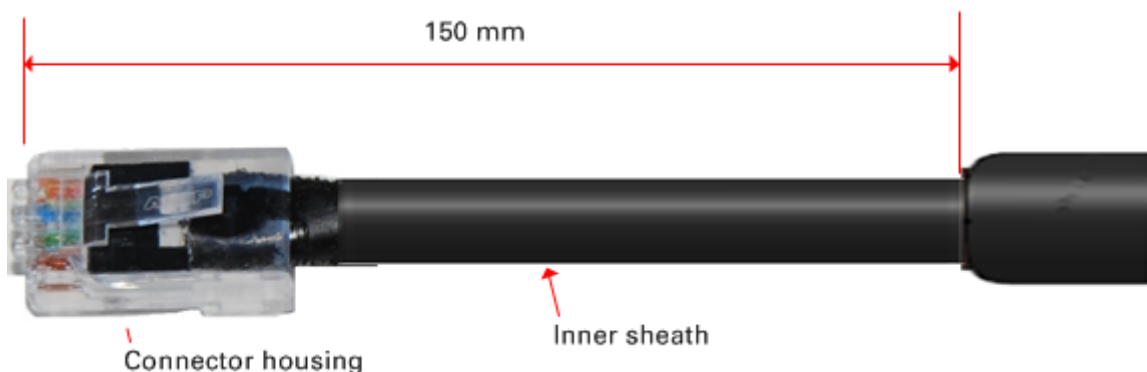
- 2 **At the LPU end only:** Fit one cable gland and one RJ45 connector by following the procedure described in [Terminating the main drop cable](#) on page 23:



- 3 **At the LPU end only:** Connect this cable and gland to the bottom LPU by following the procedure [Connecting a drop cable to the ODU and LPU](#) on page 20.
- 4 **At the PSU end only:** Do not fit a cable gland. Strip the cable end and fit the RJ45 connector load bar. To use the rotary blade tool, fit it around the outer cable sheath and rotate the cutter around the cable once or twice, then remove the stripped outer section:



- 5 **At the PSU end only:** Fit the RJ45 connector housing as shown. To ensure there is effective strain relief, locate the cable inner sheath under the connector housing tang:



Testing resistance in the drop cable

Before connecting the bottom end of the copper Cat5e drop cable to the PSU or network terminating equipment, connect it to a cable tester 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.

Order the PTP drop cable tester from the support website (<http://www.cambiumnetworks.com/support>) by completing the order form.

Perform the following resistance tests on PSU and AUX drop cables:

Measure the resistance between...	Enter measured resistance	To pass test, resistance must be...	Circle "Pass" or "Fail"	Additional tests
Pins 1 and 2	Ohms	<20 Ohms (60 Ohms) (*2)	Pass Fail	These resistances must be within 10% of each other (*1). Circle "Pass" or "Fail":
Pins 3 and 6	Ohms	<20 Ohms (60 Ohms) (*2)	Pass Fail	
Pins 4 and 5	Ohms	<20 Ohms (60 Ohms) (*2)	Pass Fail	
Pins 7 and 8	Ohms	<20 Ohms (60 Ohms) (*2)	Pass Fail	
Pin 1 and screen (ODU ground)	K Ohms	>100K Ohms (*3)	Pass Fail	
Pin 8 and screen (ODU ground)	K Ohms	>100K Ohms (*3)	Pass Fail	

(*1) Ensure that these resistances are within 10% of each other by multiplying the lowest resistance by 1.1 – if any of the other resistances are greater than this, the test has failed.

(*2) A resistance of 20 Ohms is the maximum allowed when the cable is carrying Ethernet. A resistance of 60 Ohms is the maximum allowed when the cable is carrying only power to the ODU (when Ethernet is carried by one of the other ODU interfaces).

(*3) This limit applies regardless of cable length.

Installing the PSU

Install the PSU and connect it to the ODU and network cables.

Mounting the PSU

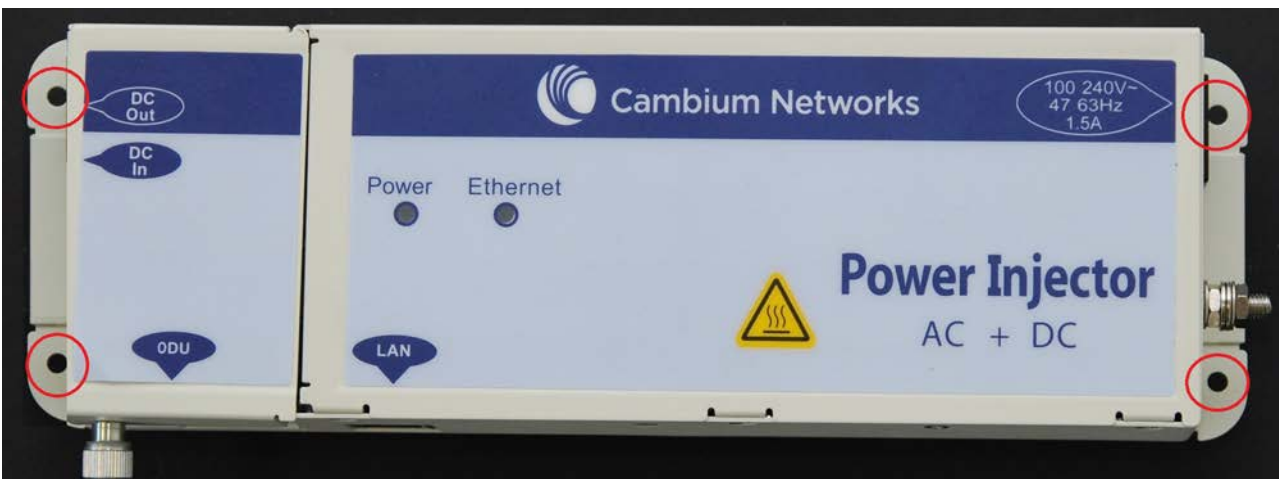
 **Caution**

As the PSUs are not waterproof, locate them away from sources of moisture, either in the equipment building or in a ventilated moisture-proof enclosure.

Place the AC power injector (Cambium part number N000065L001) on a horizontal surface:



Mount the AC+DC power injector (Cambium part number C000065L002) by screwing it to a vertical or horizontal surface using the four screw holes (circled):



Connecting the PSU to the ODU cable

Connect the drop cable from the ODU to the PSU by means of a concealed RJ45 socket.

Caution

Plugging other equipment into the ODU RJ45 socket may damage the equipment due to the non-standard techniques employed to inject DC power into the Ethernet connection between the PSU and the ODU. Plugging the ODU into other equipment may damage the ODU and/or the other equipment.

Caution

Do not dress the PSU cables too tightly, as this may make the connections unreliable.

Caution

The connected network equipment must feature screened RJ45 connectors and must be connected to ground, otherwise the PSU will not be grounded.

- 1 Form a drip loop on the PSU end of the LPU-PSU drop cable. The drip loop ensures that any moisture that runs down the cable into the cabinet or enclosure cannot enter the PSU.
- 2 **AC power injector:** Plug the LPU-PSU drop cable into the ODU port, ensuring that it snaps home:



3 AC+DC power injector:

Undo the retaining screw:



Hinge back the cover:



Plug the drop cable into the port:



Close the cover and secure with the screw:



Connecting the PSU to the network

Caution

The connected network equipment must feature screened RJ45 connectors and must be connected to ground, otherwise the PSU will not be grounded.

Note

The PSU is not normally connected to the network equipment until antenna alignment is complete.

- 1 Prepare the Cat5e cable that will connect the PSU to the network equipment.
- 2 When the system is ready for network connection, connect the Cat5e cable to the LAN port of the PSU:

AC power injector:



AC+DC power injector:



Cambium Networks

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